Tredence

Connect the Dots

Transportation Spend Management

Driving the Next Wave of Growth for Transportation & Logistics Companies

Latest insights into the factors driving the modern global network and why Transport Spend Management is critical across the industry and worldwide.

Transportation Spend Management (TSM) uses data to monitor and optimize a logistics network's financial and operational performance and other factors that impact value. It builds upon collecting, normalizing, and managing spend-related data from various systems to provide higher visibility, enabling more effective transportation planning and execution in the future. Further, it highlights the big picture, allowing organizations to centrally manage all modes of transportation and carrier tariffs to optimize and support real-time decision-making.

Transportation and Logistics Industry Profile in 2021

The global transportation business is expected to increase at a CAGR of 3.4% by 2027, reaching $7.8 trillion. This gives us reason to be optimistic. However, the growth rate is lower than the 19.8% predicted before the pandemic.

Reviewing the latest trends in transportation modes can provide more context on TSM.

Pandemic Created Biggest Crisis Aviation Has Ever Faced

The air transportation market is expected to grow at a CAGR of 9.9% and is expected to reach $1.3 trillion by 2022. However, rising fuel prices have brought the burden of airfreight shipments to companies. The probability of reducing limited capacity if passenger-led airlines move towards cargo-only service as observed during the start of the pandemic is a real possibility.

The following examines segmentation by air transportation type and geography:

By Type :
- Passenger air transportation (largest segment)
- Chartered air transportation
- Air cargo services
- Passenger chartered air transportation (domestic/international)
- Freight-chartered air transportation
- Airmail
- Airfreight

By Geography :
- North America
- South America
- Asia-Pacific (largest region)
- Eastern Europe
- Western Europe
- Middle East and Africa

Rising fuel prices and increasing operational costs are constraining the air transportation market. E.g., with the gradual lifting of blockades by various countries and the implementation of production restrictions by OPEC and other oil-producing countries, the price of Brent crude oil rose by $3 per barrel to $65 per barrel from February 2021 to March 2021. Airline specialists are hinting that the airline industry has a daunting task ahead to return to cash-positive operations.

Labor is the most crucial factor impacting the airlines' operational costs, at 32.3%, followed by fuel at 17.7%. Seventy-five percent of non-fixed expenses for airlines are contributed by labor, and layoffs have been the most common strategy used to mitigate costs during the pandemic.

Other associated operational costs include owning and renting aircraft, rental charges for terminal facilities, professional services (advertising, legal, etc.), and indirect services (transport, maintenance, etc.).

Pandemic Has Mixed Impact on Rail Transportation

In terms of the latest trends in rail transportation, the global pandemic had a mixed impact on rail freight markets. Especially in the past 18 months, rail traffic in North and South America has declined, while traffic in Asia and Europe has increased. Liquid bulk and non-containerized cargo account for the vast majority of railway freight, and the increase in multimodal transport has strengthened the category of container cargo.

The pandemic has restricted sea and air transportation. Rising freight costs and shortage of truck drivers have led to the further development of rail transportation, which enjoys an advantage in the supply chain.

Segmentation by Type and Geographies Served:

Types of Cargo
Containerized (intermodal), non-containerized, and liquid bulk

Types of Service
Transportation and transportation-related services

Terminus
Domestic and international

Geography
North America, Europe, Asia-Pacific, and other parts of the globe

In 2020, the rail transit market was valued at US$247.39 billion and is expected to grow at a CAGR of 2% from 2021 to 2026.

North America remains the world leader in rail freight movement, with one of the largest rail networks that span more than 200,000 miles. In 2021, the United States saw an increase in railway usage by 5.3% compared to 2016. China is also one of the biggest beneficiaries of rail transport, with a freight turnover increase of 10.7% from 2016. Similar growth was observed for European Union with 3.5% and Russia at 6.4%.

Rail transportation requires lower interest for capital tie-ups, and in some cases, can pay higher transportation costs, making rail freight a cost-effective alternative to shipping.

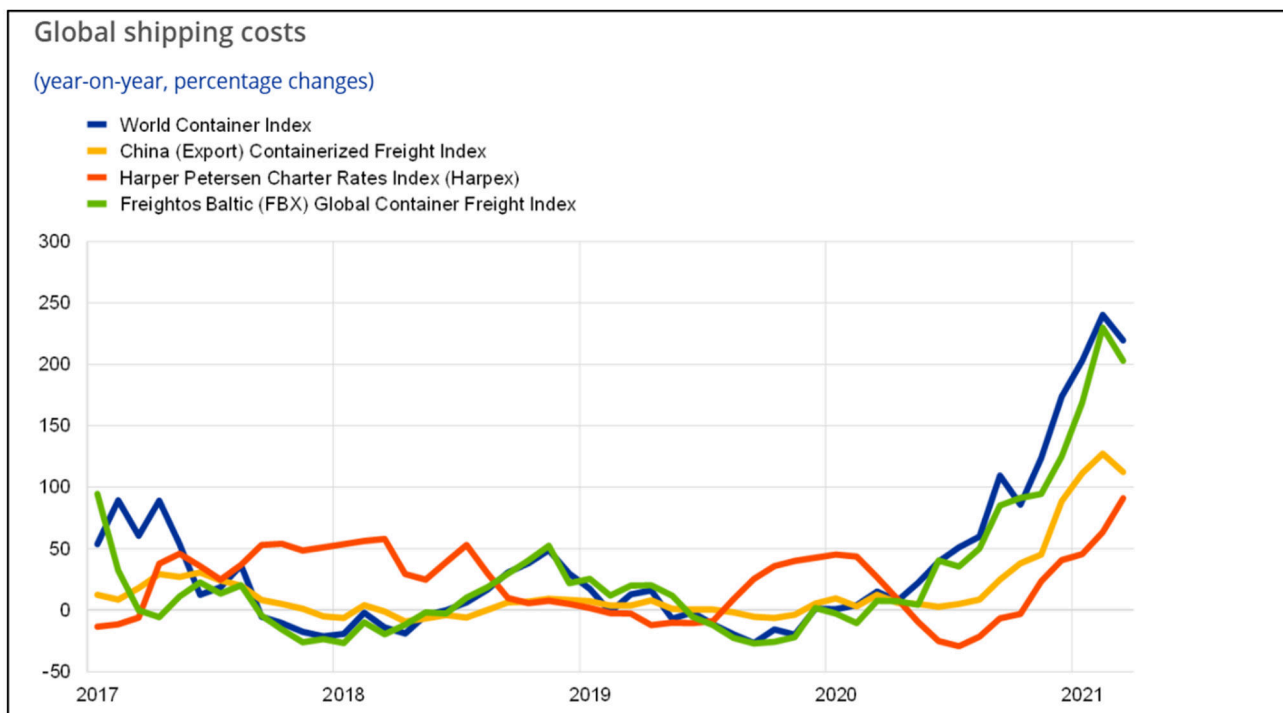# Ocean Transportation Continues to Face Inflation Pressure

Sea container transport prices remain high in an inflationary economic environment, with the health crisis moving most industrialized countries into an economic downturn. Inflationary pressure is still looming with the increase in raw materials, energy, and sea freight rates. In the Asia-Europe corridor, prices increased by 10% in the first quarter of 2021.

Prices remain high due to capacity control policies administered by shipping companies and demand in the maritime transport industry. Global freight costs are steadily rising and routes from Asia and China to the United States, Europe, and the Mediterranean have significantly increased.

Two key factors attributed to the increase in shipping costs: a significant increase in the demand for intermediate consumption in the context of regular production activities, especially the demand for Chinese exports and container transportation. Therefore, the dearth of containers in Asian ports has exacerbated the transportation bottleneck, and the transportation cost has further increased. According to reports, companies in Asian ports have to pay higher fees to recover the containers. Limited air transportation capacity has further exacerbated the increase in transportation costs.

As per European Central Bank's report, the following is the year-on-year growth in global transportation costs:

Global shipping costs
(year-on-year, percentage changes)
— World Container Index
— China (Export) Containerized Freight Index
— Harper Petersen Charter Rates Index (Harpex)
— Freightos Baltic (FBX) Global Container Freight Index

Note: The World Container Index (WCI) is a composite indicator of container freight rates for eight major trade lanes between Asia, Europe and North America. The China Containerized Freight Index (CCFI) is a composite indicator of container freight rates from all major ports in China. The Harpex is a composite indicator of weekly container shipping rate changes in the time charter market for eight different classes of container ships. The Freightos Baltic Global Container Freight Index (FBX) is a composite indicator of container freight spot rates across twelve major global trade lanes.

Trucking Industry Struggles with Driver Shortages

The trucking industry uses road transportation to transport goods across overland routes using semi-trailers and light trucks. The majority of overland freight movements in the United States captured a market worth $792 billion in 2019, with 947,000 truck drivers falling far short of need. Due to the shortage of drivers, driver-related costs are one of the trucking industry's biggest challenges.

In 2019, about 11.84 billion tons of freight were hauled, representing 73% of the total domestic cargo in the U.S alone, a 2% increase from 2018 in total domestic tonnage shipped. Softening demand in 2019 was due to the impact of Chinese and American tariffs on the U.S trucking industry, with the removal of about 13,482 carriers and 34,906 tractors from the truckload capacity market, according to FMCSA and FTR Transportation Intelligence reports.

2020 brought a different narrative with unexpected twists and turns due to the impact of the COVID-19 pandemic, with some recovery observed in the second quarter. According to the Coyote report for 2020-2023, the world experienced the market floor by May.

Four Sustainability Trends that Emerged in the Trucking Industry in 2021

Payment Structure Changes:

According to industry experts, there is a probability of increasing the payment structure. However, pricing will remain low if the industry does not undergo substantial change.

Alternative Fuel Trucks:

Companies today are looking towards alternative energy sources such as electric trucks. These alternatives not only prove to be cost-effective but also make the industry more sustainable. Vehicle sales dropped by 29% in the first three quarters of 2020, whereas electric vehicle sales increased 119% in the same period. It is estimated that the global electric truck industry will experience a CAGR of 25.8% from 2021-2027.

Electronic Logging Device (ELD):

Real-time tracking of driver hours to monitor fuel consumption and route guidance helps fleet managers monitor drivers with improved data management capabilities.

Use of Data Analytics:

Data-driven analytics help optimize businesses for growth with big data in decision making. For example, Peloton Technology uses telematics or direct vehicle-to-vehicle communication (V2V) to enable platooning, and Geotab uses data analytics for fleet management via the internet.

Responding to the Crisis: AI-powered Transport Spend Management Solution

Transportation is one of the most significant cost components in supply chain management, so monitoring transportation expenses is crucial. Data from Logistics Management's annual logistics and transportation trend study shows that for companies with sales of less than US$250 million, the average transportation expenditure is 10-11% of sales. In comparison, for companies with sales of more than US$9 billion, transportation expenditure is about 2 to 3%.

Although monitoring transportation costs sounds easy, multiple enterprise resource planning systems and different data sources make it a challenge.

Transportation transparency can be achieved through appropriate analytical tools to manage complexity and ensure transparency, continuously improving the company's operational efficiency, optimizing the supply chain, and improving the bottom line-adding value to shareholders.

Most of the spend management capabilities help provide visibility of shipments, centralize shipping documents and analyze freight spend. However, gaps exist due to the lack of complete transportation data, low freight spends visibility, the absence of spend projections and forecasts, etc.

A holistic spend management tool provides the following capabilities:

- Accurate freight spends and transportation data, centralized and visualized
- Freight audit
- Cost analysis
- Costs projections for the future
- Cost benchmarking
- Ability to react to uncertainties

Some signs of transportation overspending include:

- High claim expenses by carriers over contract rates due to hidden charges
- No direct management on fuel surcharges
- Poor modal management
- Overload or late shipments are specified to incorrect modes or carrier service provider
- No KPIs or scorecards to measure actuals against standards or objectives
- Poor consolidation of shipment
- Short-term measures to control spend, which might not be a correct strategy for the long term

How to Achieve Efficient TSM?

Before delving into the details of various aspects of transport-related spend, it is crucial to understand the components of transportation cost elements.

Terminal costs

It is related to the cost of loading, unloading and transportation. Although loading and unloading are necessary costs, companies can usually avoid intermediate or trans-shipment costs.

Line-haul costs

This special cost is related to the distance of the transportation unit. Here, weight also plays a role. In addition, the cost of line-haul is about labor and fuel.

Capital costs

It is about the infrastructure, terminals and vehicles involved in physical transportation. The purchase of new assets also falls into this category. Shippers must pay the cost of capital continuously to maintain physical assets.

The American Transport Research Institute worked closely with industry experts to identify which areas of marginal cost are most pertinent and statistically relevant.

Average Marginal Costs per Mile 2011-2019

Motor Carrier Costs	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicle-based									
Fuel Costs	$0.590	$0.641	$0.645	$0.583	$0.403	$0.336	$0.368	$0.433	$0.396
Truck/Trailer Lease or Purchase Payments	$0.189	$0.174	$0.163	$0.215	$0.230	$0.255	$0.264	$0.265	$0.259
Repair & Maintenance	$0.152	$0.138	$0.148	$0.158	$0.156	$0.166	$0.167	$0.171	$0.143
Truck Insurance Premiums	$0.067	$0.063	$0.064	$0.071	$0.074	$0.075	$0.075	$0.084	$0.068
Permits and Licenses	$0.038	$0.022	$0.026	$0.019	$0.019	$0.022	$0.023	$0.024	$0.023
Tires	$0.042	$0.044	$0.041	$0.044	$0.043	$0.035	$0.038	$0.038	$0.036
Tolls	$0.017	$0.019	$0.019	$0.023	$0.020	$0.024	$0.027	$0.030	$0.034
Driver-based									
Driver Wages	$0.460	$0.417	$0.440	$0.462	$0.499	$0.523	$0.557	$0.596	$0.533
Driver Benefits	$0.151	$0.116	$0.129	$0.129	$0.131	$0.155	$0.172	$0.180	$0.160
TOTAL	$1.706	$1.633	$1.676	$1.703	$1.575	$1.592	$1.691	$1.821	$1.652

The visibility of data for different expenses in all cost dimensions is a good starting point for the following considerations:

Freight Density:

Shippers who cannot control the freight volume of different densities end up at the mercy of freight carriers.

Segregation of Freight Charges:

A good database of separate line transportation costs, fuel costs, tariffs, itemized charges, and taxes can reveal patterns of additional charges or false tariffs that may indicate bad business practices or unethical freight carriers.

Transit times:

A well-structured database contains the source and destination of each shipment, including postal and zip code, port of entry and carrier. It enables shippers to track actual and promised service levels to see where outages occur.

In addition to the transparency of the above parameters, a robust spend management process is needed to support proactive measures in the event of spend leakages. The framework suggested below will help solve this problem.

Visualizing spend data → Visual Analytics → Transportation and freight spend forecasts → Scenario planning capabilities → Usage of metrics to analyze transportation cost

A. Visualizing Transport Spend Data

The visualization of the spend data showcases the integrated process over time and creates an environment where users can make decisions and take actions. By creating a visualization platform, companies can view various aspects of transportation spend through scenario simulation and the following capabilities:

- A good freight database containing segregated line-haul costs, fuel costs, customs duties, itemized accessorial costs, etc., for detailed cost monitoring and budgeting
- Harmonization of cost breakdown structure of freight forwarders rates
- Seamlessly tracking of cargos on a unified platform through truck loading, LTL, rail, sea, parcel, multimodal transport and express delivery
- Full transparency and visibility of invoice issues and status to monitor shippers'/carriers' KPIs, such as freight variance, quotation savings comparison, freight mode

B. Visual Analytics

A visualization platform that utilizes data flowing through TSM (such as freight audit and payment, route planning, and carrier data) can be used to make real-time decisions in the following ways:

- Displaying transportation provider data in a valuable and relevant format to highlight performance
- Comparing freight and on-time delivery data to show the competitive position

C. Transportation and Freight Spend Forecasts

Transportation forecasting enables planners to move from responding to orders to manage the cargo capacity proactively. A successful solution creates demand-based forecasts and detailed information required by the transportation team.

Transportation and freight spend forecasts can be by lane, mode, protection level, or carrier. The solution needs to provide insights into promotional activities so that planners can adjust shipments based on historical forecasts before the demand for sales peaks. Risk drivers can be proactively identified by finding risks in the forecasting module with
AI/ML offerings, such as supply-side shocks, delivery interruptions, and increased raw material costs.

Most forecasts are aggregates at the major commodities level. Nevertheless, most companies still need a deeper understanding of the types of cargo that may grow and the most promising routes.

Tredence's Comprehensive TSM Offerings

Some capability offerings include:

○ Transportation and freight spend forecasting by lane/mode/carrier/day/cost per kg should be implemented. It can be done by extracting data from the ERP and setting the cost per kilogram/lane based on the information of the demand planner.

○ Rating of forecasting tools, which can provide forecasts up to 52 weeks in advance and 3-day short-term forecasts.

○ Evaluation of the benchmarking capabilities and visibility of surcharges and fuel costs on the preferred lanes and the market demand distribution on the map.

D. Scenario Planning Capabilities

According to McKinsey & Company, scenario planning can capture the range of possible outcomes, including an in-depth analysis of the relative attractiveness of asset classes in different scenarios. Macro drivers, supply and demand, and profitability all play a role in scenario planning.

Risk and return drivers
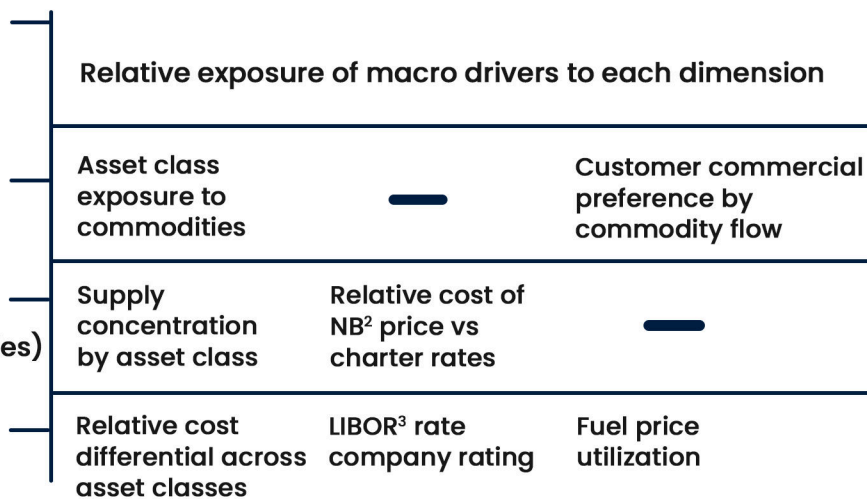
Portfolio composition dimensions

Asset class mix (eg, Capesize vs Panamax)	Asset control (owned vs charter-in)	Commercial choice (eg, TC[1] out vs contracts of affreightment)

Macrodrivers (incl recovery fromCOVID-19)

Relative exposure of macro drivers to each dimension

Demand outlook (commodity flows)	Asset class exposure to commodities	—	Customer commercial preference by commodity flow
Supply outlook (incl future technologies)	Supply concentration by asset class	Relative cost of NB[2] price vs charter rates	—
Profitability and cost structure	Relative cost differential across asset classes	LIBOR[3] rate company rating	Fuel price utilization

[1]Time chartered.
[2]New build.
[3]London InterBank Offered Rate.

McKinsey & Company

* Scenario analysis can help ensure risk factors and minimize the spend propensity

Risk and return matrix of portfolio

● Current portfolio ● Other vessel portfolios

Risk
Expectation profitability across all different pos-sible futures

High — Low (vertical axis)

Low — Return — High
Value at risk
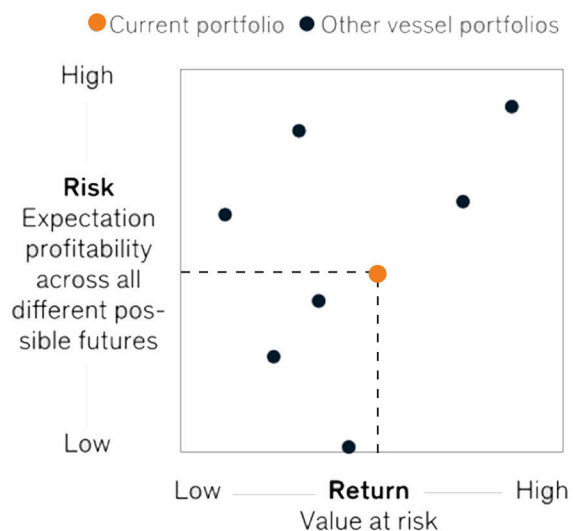
E. Usage of Metrics to Analyze Transportation Spend

01. Freight cost per unit shipped:

Total freight costs are divided by the total units shipped in each period. This can also be determined based on the mode of transportation (barge, rail, sea, truck loading, general cargo, parcel, air, intermodal, etc.).

02. Outbound freight cost represented as a percentage of total sales:

Outbound freight costs are divided by total sales. It may vary depending on the sales mix. However, it is an essential indicator of financial performance.

03. Incoming freight costs as a percentage of the total purchase:

Incoming freight charges divided by the purchase amount. The measurement criteria may vary depending on whether the raw material is delivered, pre-paid, or picked up.

04. Transit times:

The time it takes for the goods to reach the customer from the factory. It is usually measured according to the expected transit time specified by the carrier. If it is not integrated with the customer's system, one can rely on the operator to report their performance.

05. Claims as a percentage of freight outlay:

Total damage and loss compensation claims are divided by the total freight and calculated in full and per carrier. A higher number indicates a packaging or workmanship problem with the carrier.

06. Freight bill precision:

The amount of correct freight bills in a period is divided by the total amount of freight bills, usually measured by the aggregate number and per carrier.

07. Accessorial as a percentage of aggregate freight:

Accessories and surcharges are divided by aggregate freight. Many carriers charge additional charges for trailer confinement/demurrage, redelivery, fuel increase, and other fees or additional services.

08. Truckload as a percentage of capacity utilization:

Usually used for cargo above 10,000 pounds, it is assessed by the ratio of total pounds shipped and the maximum capacity.

09. Truck turnaround time (TAT):

It is the average time between arrival and departure of a truck as an efficiency indicator.
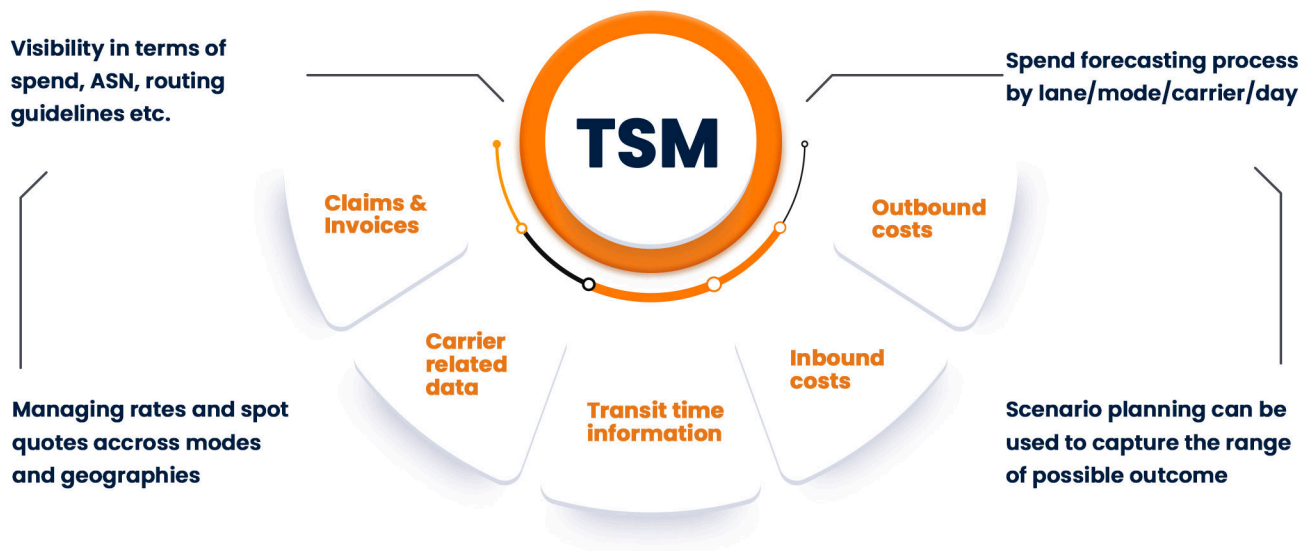
Best Practices For TSM

- Create efficiencies of scale in data loading and normalization

- An automated approach to cleansing and classification (machine learning/AI, data processing rules, etc.) to fix naming inconsistencies and conventions, missing data, incorrectly entered data, applying the right taxonomic structure to underlying datasets, etc.

- Get to line level detail

- Offer predictive coding/analysis, classifying data in real-time at the point of requisition

- Build the capability to 'spend model' data based on near-term events and forecasts

Future Outlook with Tredence

Connectivity, accessibility, and affordability are often considered the main goals of combining various levers of expense loss and responding to cost-reducing opportunities quickly. Increased connectivity and digital information services have created practical prerequisites for a continuous multimodal transport system for the first time. Therefore, implementing a visibility system to display cost information and forecasts, data release, and model possibilities by mode can enable rapid response and create agile strategies. A complete spend management process can improve the operations and revenues of shippers and carriers. In addition, this provides an opportunity to work with stakeholders to ensure the integration of payment and ticketing and define parameters such as

Tredence's supply chain practice team helps eliminate inefficiencies in transport spend data, provides cross-system connectivity, supports overall transparency to speed up decision-making, and provides predictive modeling capabilities, rate forecasts, and spend analytics. The E2E offerings can help companies solve their day-to-day operational problems and enjoy quick value realization.

TSM

- Visibility in terms of spend, ASN, routing guidelines etc.
- Claims & Invoices
- Spend forecasting process by lane/mode/carrier/day
- Outbound costs
- Carrier related data
- Inbound costs
- Managing rates and spot quotes accross modes and geographies
- Transit time information
- Scenario planning can be used to capture the range of possible outcome

Conclusion: As demand increases and shipping costs decrease, supply will adjust accordingly. Now is the time for companies to pay attention to TSM.

Transportation Spend Management is becoming one of the most critical parameters to be considered when designing cost control strategies. Organizations across the globe have started implementing various technologies and concepts to increase the transparency of spend data and eliminate inaccuracies in cost management. With advanced analytics capabilities and optimization methodologies, E2E visibility's real-time capabilities, audit management and predictive recommendations, enhance the spend management process, enabling it to better respond to changing market conditions.
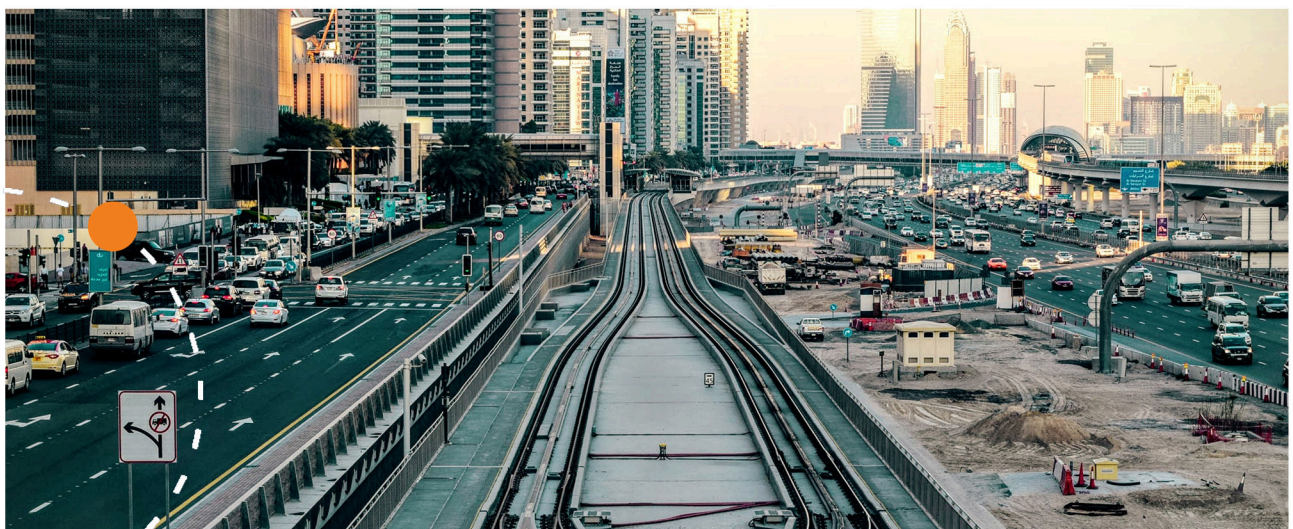
Tredence Inc., Your Partner in Transportation Spend Management

Tredence provides full-stack supply chain analytics solutions for global organizations across logistics, inventory and distribution, demand and supply planning, and customer service. Our supply chain capabilities include:

- End-to-end Supply Chain Transformation
- Smart Transportation Planning
- Supply Chain Control Tower
- Supply Chain Visibility
- Logistics and Fulfillment
- Advanced Analytics Implementation and Integration

For more details on how to address the challenges and opportunities in this report, or for more information on Tredence's supply chain management consulting and services, please visit: https://www.tredence.com/services/supply-chain-analytics

About Tredence

Tredence Inc. is a data science and AI engineering company focused on solving the last mile problem in analytics. The 'last mile' is defined as the gap between insight creation and value realization. We are 1000+ employees strong and have offices in five countries at ten different locations, with clients including the world's leading brands in retail, CPG, Hi-Tech, telecom, travel, and industrials.

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Ankuresh is a seasoned Supply Chain professional with over a decade of experience in Supply Chain and Analytics, assisting companies in optimizing their supply chain operations and achieving excellence.