Supply chain calculations for AWS Quick

AWS Prescriptive Guidance



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AWS Prescriptive Guidance: Supply chain calculations for AWS Quick

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Supply chain calculations for AWS Quick

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AWS Quick is a business intelligence platform that makes it easy to analyze data, create visualizations, automate workflows, and collaborate across your organization. It can help you understand your supply chain data through interactive dashboards and visualizations. Quick is powered by machine learning (ML) and artificial intelligence (AI), which can provide advanced analytics and predictive insights into your supply chain, such as accurate forecasting and analysis of what-if scenarios.

Supply chain metrics, also known as *key performance indicators (KPIs)*, are the specific parameters that you use to quantify and define supply chain performance. Working with the right metrics helps supply chains be more productive, more transparent, and ultimately, more profitable. Metrics are often quantitatively measured by using one or more calculations in a business intelligence service.

Digital supply chain technologies and processes use metrics and the predictive insights provided by ML and AI to define, measure, analyze, improve, and control the supply chain. Supply chain metrics provide a solid foundation to measure and communicate performance for a number of essential processes and activities.

If a supply chain lacks structure, vision, and efficiency, or if it is fragmented, costs escalate unnecessarily, and commercial growth suffers. Properly defining, monitoring, and analyzing metrics is critical to a healthy supply chain. Metrics are invaluable tools for measuring the growth, evolution, development, and success of supply, fulfillment, and delivery operations. By analyzing key supply chain metrics, organizations can identify potential bottlenecks and sustainably improve their supply chain functions.

This guide documents standard calculations you can use for your supply chain metrics in Quick. Unlike many other visualization tools, Quick also supports calculations and scenarios.

Intended audience

This guide is intended for anyone who is creating dashboards, reports, or charts in Quick and uses standard supply chain metrics. This guide assumes a general understanding of supply chain management and principals, and it assumes that you have access to the necessary data.

Best practices for supply chain metrics

When establishing supply chain metrics, best practices include maintaining consistency and understanding the business value:

- **Consistency** – Metrics must have the same definition each time they are used so that you can accurately compare time periods. If the calculation or definition is updated, make sure you have full documentation and stakeholder agreement before implementing.
- **Business value** – The metric must have a clear business meaning and application. The supply chain metrics you establish should support your business strategy. For example, if your organization is focusing on turning inventory, you might select the inventory velocity, inventory turn, and inventory aging calculations as your key metrics.

Depending on your situation and the metric you've selected, you might need multiple calculations to create that metric.

In addition to these best practices for selecting your supply chain metrics, we also recommend that you adhere to the Pivot table best practices (Quick documentation). These best practices include recommendations for how to maximize computational performance and viewer accessibility.

Calculations

The supply chain calculations in this guide have been separated into the following categories:

- Forecast error – These calculations help you evaluate the accuracy of previous forecasts.
- Distribution and warehousing – These calculations help you evaluate the throughput of your supply chain.
- Inventory – These calculations help you plan, manage, and control your inventory.
- Transportation – The calculations help you evaluate the process of moving inventory in and out of your organization.

Forecast error

Forecast error calculations provide a quantitative estimate of the quality of past forecasts, and a wide range of calculations are available to help you statistically express the accuracy of a forecast.

The following table contains standard forecast error calculations.

Name	Description	Calculation
Bias	Bias is a consistent error that causes a forecast to be either too high or too low. A forecast is biased if there is a consisten t difference between the actual and forecasted demand in current and historical forecasts. This calculation returns the forecast error, measuring consistent over or under-forecasting.	`(Sum actuals - Sum forecast) / Sum actuals`
Mean	The arithmetic average of a group of values.	`Average(values)`

Mean absolute deviation (MAD)	MAD shows how large, on average, an error is in the forecast. However, because MAD returns the average error in units, it's sometimes not very useful for compariso ns. MAD is the average of the absolute values of the deviations between observed values and expected values.	`Average(Abs(forecast - actual))`
Mean absolute percent error (MAPE)	MAPE expresses the forecast error in relation to sales volume. Basically, it tells you how many percentage points the forecasts are off, on average. MAPE might be the most commonly used forecasting metric when planning demand.	MAPE is computed by taking the MAD, dividing by the average demand, and then multiplying by 100. `(1 / sample size) × ∑((actual - forecast) / actual) × 100`
Mean absolute scaled error (MASE)	MASE is the mean absolute error of the forecast values, divided by the mean absolute error of the in-sample naive forecast. MASE is the recommended calculation for determining comparative accuracy of forecasts.	`Average(Abs(forecast - actual)) / ((1 / sample size) × ∑((actual - forecast) / actual))`

Mean squared error (MSE)	MSE measures the average squared difference between the estimated values and the actual values. Divide the sum of the residuals by the total number of data points, and then take the square root of the quotient.	`(1 / sample size) × Σ(actual – forecast) ^2`
Tracking signal	This calculation measures persistent bias, either under-forecasting or over-fore casting. Tracking signal is the ratio of the cumulative algebraic sum of the deviation between forecasts and actual values to the mean absolute deviation. You can use this calculation to alert you when the forecast model is biased.	Ratio of the cumulative sum of forecast errors (the deviations between the estimated forecasts and the actual values) to the mean absolute deviation. *Mean absolute deviation* is ratio of the cumulative absolute sum of forecast errors (forecast and actual values) to the number of periods.
Weighted mean absolute percent error (WMAPE)	WMAPE weights the forecast error by actual demand**.** It gives weight to the prioritiz ed item, biasing the forecast error toward it. Because MAPE does not account for possible differences in priority between products or moments in time, WMAPE is often used.	`∑ (weight|forecast – actual demand|) / ∑ (weight|actual demand|)`

Distribution and warehousing

These calculations help you evaluate the throughput of your supply chain.

The following table contains distribution and warehousing calculations. In the following table, *units* refers to cases, cartons, or another standard unit of product measure or count, as appropriate for your supply chain.

Name	Description	Calculation

Aged backorder	This calculation reports the number of past-due orders, or *backorders*, based on the requested delivery date or ship date. An order is a backorder if the actual ship date occurs after the requested ship date.	`Count(# of backorders past due)`
		
		To calculate if a backorder is past due:
		
		`Requested ship or delivery date < actual ship or delivery date`

Average units received per hour	This calculation returns the rate at which units are received per hour, for a defined time period.	`# of units received / # of hours worked`
Average units shipped per hour	This calculation returns the rate at which units are shipped per hour, for a defined time period.	`# of units shipped / # of hours worked`
Average units stocked per hour	This calculation returns the rate at which units are stocked (sometimes referred to as *put away*) per hour, for a defined time period.	`# of units stocked / # of hours worked`
Average units picked per hour	This calculation returns the rate at which units are picked per hour, for a defined time period.	`# of units picked / # of hours worked`
Average units received per purchase order (PO)	This calculation returns the rate at which units are	`Total units received / # of POs`

	received per hour, for a defined time period.	
Average cost per unit received	This calculation returns the average cost (or *value*) of the units received, for a defined time period.	`Total cost of units received / # of units received`
Average inventory value at each DC	This calculation returns the average value of the on-hand inventory at each distribution center (DC). You can perform this calculation for cost value or retail value, depending on your finance rules. You typically run this calculation at the beginning or end of a fiscal period.	`Sum of inventory value in each period / # of periods`
Average value per line picked	This calculation returns the average value of the lines picked, for a defined time period.	`Total value of order lines / # of lines processed`
Average value per order	This calculation returns the average value of the orders picked, for a defined time period.	`Total value of orders / # of orders processed`
Average lines picked per hour	This calculation returns the average number of lines picked per hour, for a defined time period.	`# of order lines processed / # of hours worked`

Average operational cost per order	This calculation returns the average total warehouse operational cost per order, for a defined time period. You can perform this calculati on for fixed costs or for both variable and fixed costs.	`Total warehouse cost / Total # of orders`
Average orders packed per hour	This calculation returns the rate at which orders are packed per hour, for a defined time period.	`# of order numbers packed / # of hours worked`
Average orders picked per hour	This calculation returns the rate at which orders are picked per hour, for a defined time period.	`# of order numbers picked / # of hours worked`
Average SKU count per tote	This calculation returns the average number of individual SKUs packed into totes, for a defined time period.	`Count of SKU-tote combinations / # of totes`
Average totes processed per shipment	This calculation returns the average number of totes processed for each shipment, for a defined time period.	`Total # of totes / # of shipments`

Inventory

Inventory must be managed, planned, and controlled. The purpose of inventory is to be able to satisfy customer demand without overstocking. It represents both opportunity and risk in the supply chain. For example, if there is not enough inventory, customer service and revenue will be impacted negatively. If there is too much inventory, cost to carry and capital investment will be higher than necessary, impacting profitability.

The following table contains calculations to help you plan and manage your inventory.

Name	Description	Calculation
Average age of inventory	This calculation returns the average number of days it takes for a company to sell off its inventory.	`(Average cost of inventory at its current level / cost of goods sold) × 365`
Average inventory cost	This calculation returns the average cost of inventory for a defined time period. You typically run this calculation at the beginning or end of a fiscal period.	`Sum(inventory cost at each time period) / # of time periods`
Average inventory level	This calculation returns the average number of units of on-hand inventory, for a defined time period. You typically run this calculation at the beginning or end of a fiscal period.	`Sum(inventory units in each time period) / # of time periods`
Inventory-to-sales ratio (ISR)	This calculation compares the value of your inventory to your total sales, for a defined time period. It helps you monitor the amount of capital allocated to inventory , and it's a measurement of the financial stability of the company. ISR is closely related to inventory turnover ratio. The primary differenc e is that ISR returns capital investment in inventory at a specific point in time, whereas inventory turnover ratio	`Inventory value for a specific point in time / Sales value for a date range`

	returns how many times you churn the inventory for a defined time period.	
Inventory turnover ratio	This calculation returns how many times a company turned over (or *cycled*) its inventory over a defined time period. The period of time is most commonly 12 months. You can calculate inventory turnover by using cost value, retail value, or units.	For a 12-month inventory turn using cost value: `Annual cost of goods sold (COGS) / Average value of inventory level`
Inventory turn (units)	This calculation returns how many times a company turned over (or *cycled*) its inventory over a defined time period. The period of time is most commonly 12 months. You can calculate inventory turnover by using cost value, retail value, or units.	For a 12-month inventory turn based on units: `Annual unit sales / Average unit inventory level`
Inventory velocity (IV)	Inventory velocity is measured in units and is the portion of inventory that is projected to be consumed within the next specified period. This metric helps you optimize inventory levels to balance inventory and sales.	`Opening stock / Sales forecast for upcoming period`

Turn-earn index (TEI)	This calculation helps you evaluate profits and use of inventory. It helps account for the differences between slow-moving, high-profit inventory and fast-moving, low-profit inventory so that you can see how your inventory turn ratio and gross profit are related. Generally, most companies want a turn-earn index of 150 or higher.	`(Inventory turnover ratio × Gross profit percentage) × 100`

Transportation

Transportation is the function of planning, scheduling, and controlling the activities surrounding mode, vendor, and movement of inventory into and out of an organization. Transportation includes the actual movement of the product. Many transportation teams incorporate capabilities such as in-transit storage, documentation, diversion and reconsignment services, loading and unloading, terminal and freight services, and other value-added services.

Transportation modes typically include the following:

- Truckload
- Less than truckload
- Rail
- Air
- Ocean
- Pipeline
- Intermodal
- Parcel, carrier, or express

The stakeholders of transporting inventory typically include the following:

- The shipper

- The recipient
- Carriers and agents
- The government
- The public

Inbound transportation

Inbound transportation is the logistics and cost of bringing finished goods, supplies, or materials into the business. For inbound transportation, the business is the recipient. The following table contains calculations you can use to assess inbound transportation for your supply chain.

> **Note**
>
> All of the calculations in this table are intended to evaluate the supply chain for a specific period of time that you define. For example, you could use these calculations to evaluate costs and throughput on a quarterly or yearly basis, for either a fiscal year or a calendar year.

Name	Description	Calculation
Percent of inbound transportation cost per receipt	This calculates the value of the inbound receipts to the total inbound transportation costs.	`Total inbound receipt value / Total inbound transportation cost`
Percent of inbound freight by carrier	This calculates the percentage of inbound freight handled by a specific carrier.	`# of inbound shipments for a specific carrier / Total inbound shipments`
Percent of inbound freight by mode	This calculates the percentage of the inbound freight delivered by a specific transportation mode.	`# shipments for a specific transport mode / Total inbound shipments`

Percent of inbound freight by origin	This calculates the percentage of the inbound freight from a specific origin, such as country or a supplier.	`# of shipments from a specific origin / Total inbound shipments`
Percent of inbound transportation costs by department	This calculates the percentage of the inbound transportation costs for a department, as assigned to the product.	`Inbound transportation costs for a specific department / Total inbound transportation costs`
Percent of inbound shipment acceptance	This calculates the percentage of inbound shipments accepted for a committed carrier. A *committed carrier* is a confirmed, contracted partner for specific shipment lanes.	`# of accepted inbound shipments / Total inbound shipments`
Percent of committed lane shipments compared to random shipments	The calculation compares committed lane shipments to random shipments.	`Total random shipments / # of committed lane shipments`
Accessorial changes as percent of total freight	This calculates the percent of freight costs that are due to accessorial charges. *Accessorial charges* and *surcharges* are fees charged by the carrier for services beyond standard delivery, such as trailer detention or demurrage, redelivery, or fuel increases. Often, these are extra costs incurred due to inefficient processes.	`(Accessorial charges + surcharges) / Total freight`

Average inbound cubic volume per shipment for a specific route	This calculates the average cubic volume, such as cubic feet or cubic meters, of inbound shipments for a specific route.	`Total cubic volume shipped by route / # of shipments by route`
Average inbound distance traveled per shipment	This calculates the average distance traveled for each inbound shipment.	`Total inbound distance traveled / # of shipments`
Average inbound rate per mile or kilometer	This calculates the average inbound rate for each mile or kilometer traveled. You can run this calculation for all transportation modes or for a specific mode, such as truckload, rail, air, or ocean.	`Total inbound rate charged / Total inbound distance traveled`
Average inbound transport ation cost per shipment	This calculates the average inbound transportation cost for each shipment.	`Total inbound transportation cost / # of inbound shipments`
Average inbound transport ation cost per shipment by transportation mode	This calculates the average inbound transportation cost for each shipment sent by a specific inbound transport ation mode, for inbound product flow. Transportation modes can include truckload , less than truckload, rail, ocean, and intermodal.	`Total inbound transportation cost for the mode / # of inbound shipments for the mode`
Average inbound transport ation cost per case	This calculates the average inbound transportation cost for each case shipped.	`Total inbound transportation cost / Total inbound cases shipped`

Average inbound transportation cost per cubic unit	This calculates the average inbound transportation cost for each cubic unit of measure, such as a cubic foot or cubic meter.	`Total inbound transportation cost / Total inbound cubic volume shipped`
Average inbound transportation cost by value of shipped materials	This calculates the average inbound transportation cost for each monetary unit of value, such as a dollar, of goods and materials shipped.	`Total inbound transportation cost / Total inbound value shipped`
Average inbound transportation cost per mile or kilometer	This calculates the average inbound transportation cost for each mile or kilometer traveled.	`Total inbound transportation cost / Total inbound distance traveled`
Average inbound transportation cost per pallet	This calculates the average inbound transportation cost for each pallet shipped.	`Total inbound transportation cost / Total inbound pallets shipped`
Average inbound transportation cost per purchase order	This calculates the average inbound transportation cost for each purchase order.	`Total inbound transportation cost / Total inbound purchase orders shipped`
Average inbound transportation cost per SKU or item	This calculates the average inbound transportation cost for each SKU or item shipped.	`Total inbound transportation cost / Total inbound SKUs shipped`
Average inbound transportation cost per store	This calculates the average inbound transportation cost for each store serviced.	`Total inbound transportation cost / Total store count`

Average inbound transport ation cost per units shipped	This calculates the average inbound transportation cost for each unit shipped.	`Total inbound transportation cost / Total inbound units shipped`
Average inbound transport ation cost by weight	This calculates the average inbound transportation cost for each unit of weight, such as a pound or kilogram, shipped.	`Total inbound transportation cost / Total inbound weight shipped`
Average weight of inbound shipments	This calculates the average weight, in pounds or kilograms, of inbound shipments.	`Total inbound weight shipped / Total number of inbound shipments`
Percent of inbound shipments with consolidations	This calculates the percent of inbound shipments that have consolidations. *Consolidation* is the process of combining multiple shipments into a single container, to reduce transport ation costs. Shipments can be combined to make multiple deliveries in a particular geographic region, or they can be consolidated to make a single delivery to a single recipient.	`# of inbound shipments with consolida tions / Total inbound shipments`

Inbound freight costs as percentage of purchases	Calculated by dividing inbound freight costs by purchase value. It is important to understand the underlyin g detail. The measurement can vary widely, depending on whether raw materials are purchased on a delivered, prepaid, or collect basis.	`Total inbound freight costs / Net sales`
Percent of inbound shipments that arrived on time	This calculates the percentag e of inbound shipments that were received within the delivery window specified on the purchase order.	`Total inbound orders received on time / # of inbound orders`
Percent of weight capacity utilized for inbound shipments	This calculation is generally used for shipments over a specified weight, such as 10,000 pounds. This calculate s the percentage of inbound weight capacity used. For example, assume you have 1 truck that has a weight capacity of 40,000 pounds. If you received 675 shipments with that truck, the total weight capacity was 27 million pounds. However, if you received only 22.95 million pounds of product, then you used 85% of the weight capacity. The 15% unused capacity is an opportunity for more efficienc y.	`Total inbound weight shipped / Total inbound weight capacity`

Percent of inbound shipments that offer tracking	This calculates the percentage of inbound shipments that were sent through a carrier that offers tracking information. Tracking information provides visibility and helps you trace the shipment. This metric is an indicator of the relative sophistication of your carrier base, and it's one measure of the non-price value available from your carrier base.	`# of inbound shipments sent through carriers that offer tracking / Total number of inbound shipments`

Outbound transportation

Outbound transportation is the logistics and cost of moving finished goods and products to end recipients, such as customers. Outbound transportation focuses on delivery rather than receipt. The following table contains calculations you can use to assess outbound transportation for your supply chain.

> **Note**
>
> All of the calculations in this table are intended to evaluate the supply chain for a specific period of time that you define. For example, you could use these calculations to evaluate costs and throughput on a quarterly or yearly basis, for either a fiscal year or a calendar year.

Name	Description	Calculation
Total outbound transportation distance (also known as *distance run*)	This calculates the total outbound transportation distance, in miles or kilometers.	`Sum(outbound transportation distance of all shipments)`

Percent of outbound freight by carrier	This calculates the percentage of the outbound freight handled by a specific carrier.	`# of outbound shipments for a specific carrier / Total outbound shipments`
Percent of outbound freight by mode	This calculates the percentage of the outbound freight by shipped by a specific transportation mode.	`# outbound shipments for a specific transport mode / Total outbound shipments`
Percent of outbound transportation cost by department	This calculates the percentage of the outbound transportation costs for a department, as assigned to the product.	`Outbound transportation cost for a specific department / Total outbound transportation cost`
Average number of stops per outbound shipment	This calculates the average number of stops the trucks make on their route.	`Total stops / # of shipments`
Average cubic volume per outbound shipment for a specific route	This calculates the average cubic volume, such as cubic feet or cubic meters, of outbound shipments for a specific route.	`Total cubic volume shipped by route / Total # of shipments by route`
Average distance traveled per outbound shipment	This calculates the average distance traveled for each outbound shipment.	`Total distance traveled / # of shipments`
Average outbound rate per mile or kilometer	This calculates the average outbound rate for each mile or kilometer traveled. You can run this calculation for all transportation modes or for a specific mode, such as truckload, rail, air, or ocean.	`Total outbound rate charged / Total outbound distance traveled`

Average outbound transportation cost per shipment	This calculates the average outbound transportation cost for each shipment.	`Total outbound transportation cost / # of outbound shipments`
Average outbound transportation cost per shipment by transportation mode	This calculates the average outbound transportation cost for each shipment by transportation mode, for outbound product flow. Transportation modes can include truckload, less than truckload, rail, ocean, and intermodal.	`Total outbound transportation cost for the mode / # of outbound shipments for the mode`
Average outbound transportation cost per case	This calculates the average outbound transportation cost for each case shipped.	`Total outbound transportation cost / Total outbound cases shipped`
Average outbound transportation cost per cubic unit	This calculates the average outbound transportation cost for each cubic unit of measure, such as a cubic foot or cubic meter.	`Total outbound transportation cost / Total outbound cubic volume shipped`
Average outbound transportation cost by value of shipped goods	This calculates the average outbound transportation cost for each monetary unit of value, such as a dollar, of goods shipped.	`Total outbound transportation cost / Total outbound value shipped`
Average outbound transportation cost per mile or kilometer	This calculates the average outbound transportation cost for each mile or kilometer traveled.	`Total outbound transportation cost / Total outbound distance traveled`

Average outbound transportation cost per pallet	This calculates the average outbound transportation cost for each pallet shipped.	`Total outbound transportation cost / Total outbound pallets shipped`
Average outbound transportation cost per purchase order	This calculates the average outbound transportation cost for each purchase order.	`Total outbound transportation cost / Total outbound purchase orders shipped`
Average outbound transportation cost per SKU or item	This calculates the average outbound transportation cost for each SKU or item shipped.	`Total outbound transportation cost / Total outbound SKUs shipped`
Average outbound transportation cost per store	This calculates the average outbound transportation cost for each store serviced.	`Total outbound transportation cost / Total store count`
Average outbound transportation cost per unit shipped	This calculates the average outbound transportation cost for each unit shipped.	`Total outbound transportation cost / Total outbound units shipped`
Average outbound transportation cost by weight	This calculates the average inbound transportation cost for each unit of weight, such as a pound or kilogram, shipped.	`Total outbound transportation cost / Total outbound weight shipped`
Average weight of outbound shipments	This calculates the average weight, in pounds or kilograms, of outbound shipments.	`Total outbound weight shipped / Total number of outbound shipments`

Total and overall transportation

The following table contains calculations you can use to assess overall transportation for your supply chain, including inbound and outbound transportation.

> **Note**
>
> All of the calculations in this table are intended to evaluate the supply chain for a specific period of time that you define. For example, you could use these calculations to evaluate costs and throughput on a quarterly or yearly basis, for either a fiscal year or a calendar year.

Name	Description	Calculation
Percent of freight by carrier	This calculates the percentage of freight handled by a specific carrier.	`# of shipments for a specific carrier / Total shipments`
Percent of freight by mode	This calculates the percentage of freight delivered by a specific transportation mode.	`# shipments for a specific transport mode / Total shipments`
Percent of transportation cost by department	This calculates the percentage of transportation costs for a department, as assigned to the product.	`Transportation cost for a specific department / Total shipments`
Average cubic volume per shipment for a specific route	This calculates the average cubic volume, such as cubic feet or cubic meters, of shipments for a specific route.	`Total cubic volume shipped by route / Total # of shipments by route`
Average distance traveled per shipment	This calculates the average distance traveled for each shipment.	`Total distance traveled / # of shipments`

Average rate per mile or kilometer	This calculates the average rate for each mile or kilometer traveled.	`Total rate charged / Total distance traveled`
Average rate per mile or kilometer by transportation mode	This calculates the average rate for each mile or kilometer traveled by a specific transportation mode.	`Total rate charged by mode / Total distance traveled by mode`
Average SKU count per shipment	This calculates the average number of unique items (SKUs) in each shipment.	`# of unique SKUs shipped / # of shipments`
Average transportation cost per shipment	This calculates the average transportation cost for each shipment.	`Total transportation cost / # of shipments`
Average transportation cost per shipment by transport ation mode	This calculates the average transportation cost for each shipment by transportation mode. Transportation modes can include truckload, less than truckload, rail, ocean, and intermodal.	`Total transportation cost by mode / # of shipments by mode`
Average transportation cost per case	This calculates the average transportation cost for each case shipped.	`Total transportation cost / Total cases shipped`
Average transportation cost per cubic unit	This calculates the average transportation cost for each cubic unit of measure, such as a cubic foot or cubic meter.	`Total transportation cost / Total cubic volume shipped`

Average transportation cost by shipped goods value	This calculates the average transportation cost for each monetary unit of value, such as a dollar, of goods and materials shipped.	`Total transportation cost / Total value shipped`
Average transportation cost per mile or kilometer	This calculates the average transportation cost for each mile or kilometer traveled.	`Total transportation cost / Total distance traveled`
Average transportation cost per pallet	This calculates the average transportation cost for each pallet shipped.	`Total transportation cost / Total pallets shipped`
Average transportation cost per purchase order	This calculates the average transportation cost for each purchase order.	`Total transportation cost / Total purchase orders shipped`
Average transportation cost per SKU or item	This calculates the average transportation cost for each SKU or item shipped.	`Total transportation cost / Total SKUs shipped`
Average transportation cost per store	This calculates the average transportation cost for each store serviced.	`Total transportation cost / Total store count`
Average transportation cost per units shipped	This calculates the average inbound transportation cost for each unit shipped.	`Total transportation cost / Total units shipped`
Average transportation cost by weight	This calculates the average transportation cost for each unit of weight, such as a pound or kilogram, shipped.	`Total transportation cost / Total weight shipped`
Average weight of shipments	This calculates the average shipment weight, in pounds or kilograms.	`Total weight shipped / Total number of shipments`

Number of carriers per transportation mode	This calculates percentage of freight carriers for a particular transportation mode, such as truckload, rail, or ocean. This is an indication of your volume leverage and control over the transportation function.	`Total freight carriers for the transportation mode / Total freight carriers`
On-time pickups	This calculates the percentage of pickups that were on-time. You can run this calculation for a specific carrier or as a total of all carriers. This metric is an indication of the freight carrier's performance and effect on your shipping operations and customer service.	`# of on-time pickups / # of shipments`
On-time shipping rate	The *on-time shipping rate* is the percentage of times your customer receives product within the promised shipping window. Tracking this metric helps assess the efficiency of your supply chain processes.	`Number of items delivered on time / Total items shipped`

Percent of truckload cubic volume capacity utilized	This calculates the percentage of truck volume capacity used. For example, assume you have 1 truck that has a volume capacity of 1,800 cubic feet. If you receive 675 shipments with that truck, the total volume capacity was 1.2 cubic feet. However, if you received only 1.0 million cubic feet of product, then you used 83% of the volume capacity. The 17% unused capacity is an opportunity for more efficiency.	`Total cubic volume shipped / Total cubic volume capacity`
Supplier on-time delivery	This calculates the percentage of time a supplier delivers products within the agreed-on time frame.	`Number of items supplier delivered on time / Total items supplier shipped`

Transit time (sometimes referred to as *transit lead time*)	*Transit time* is the number of days or hours between when a shipment leaves your facility and arrives at the destination. Often measured against a standard transit time quoted by the carrier for each traffic lane. Unless you are integrated into your customers' systems, you have to rely on freight carriers to report their own performan ce. Transit time is often an important component of overall lead time. Transit times can vary substanti ally, based on transportation mode, carrier, and distance.	`Count(days travel time)`
Truck turnaround time	This calculates the average time elapsed between a truck's arrival at the facility and its departure. This is an indicator of the efficienc y of the lot and dock door space, receiving processes, and shipping processes. This also directly affects freight carrier profits on the business.	`Average(truck arrival time - truck departure time)`

FAQ

Do all supply chains use the same metrics?

No, many supply chains use the same metrics, but not all. This is because each organization sets up their supply chain differently, and organizations might prioritize different metrics based on their business objectives.

When using currencies in calculations, such as for cost or price, how can I verify that I have the correct values?

In general, verifying with your finance team is the best way to clarify which currency value should be used.

Resources

AWS Quick documentation

- Getting started with AWS Quick
- Using table calculations in pivot tables
- Pivot table best practices

Other resources

- ASCM SCOR Model
- Balanced Scorecard Institute

Document history

The following table describes significant changes to this guide.

Change	Description	Date
Initial publication	—	December 2, 2022