

Bridge the shortage, not the whole order

Historical worked example · evidence through 7 March 2024
A 30-day purchasing decision for a fictional industrial-component importer serving European customers. Public observations are dated facts; every customer figure, quote, timing case and financial result below is an illustrative assumption or calculation. This is not a current market forecast.

Decision: commit to an emergency replenishment now or wait for the existing sea order? The sea shipment supplies one interchangeable, approved component. Its arrival matters because stock runs out on day 12 at the assumed demand rate. Delays after that point can create missed customer orders; a route headline alone cannot establish the size of that loss.

Customer inputs to replace before use

Input / basis	Illustrative value	Decision relevance
Usable opening stock / assumption	1,200 units	Excludes quarantined or already-reserved stock.
Daily demand / assumption	100 units; 3,000 over 30 days	Constant consumption; sensitivity tested at 80 and 120/day.
Existing sea receipt / assumption	2,400 units; originally day 8	Compare usable arrivals on days 8, 18 and 28.
Standard unit cost / assumption	\$20 per unit	Base inventory cash is separate from emergency expense.
Contribution at risk / assumption	\$18 per unfilled unit	After normal variable costs; not revenue or guaranteed lost profit.
Customer deferral / uncertainty	0% in the initial comparison	Test the fraction of shortage that is actually unrecoverable.

Conditional recommendation

If a written, usable receipt on day 18 becomes the credible planning case, quote an 800-unit air bridge: modeled disruption cost is \$6,900 versus \$10,800 for waiting. If receipt moves to day 28, a qualified 1,600-unit local bridge costs \$10,600 versus \$21,300 for air and \$28,800 for waiting. If day 8 is reliable, wait: either bridge adds expense without avoiding a shortage.

These are scenario choices, not permission to buy. The procurement lead should resolve quotes and the receipt date by day 2. An emergency premium above \$11,000 or gross bridge cash above \$43,000 needs a fresh approval; neither limit authorizes spending without supplier and finance confirmation.

What would change the decision

Backorders that customers will accept can eliminate much of the assumed lost contribution. At a day-18 receipt, air is preferable to waiting only if more than 63.9% of the 600-unit shortage is unrecoverable at an \$18 contribution. Availability, component interchangeability and arrival before stockout are separate feasibility tests. A cheap bridge that arrives too late is not a substitute.

What the evidence supports

The evidence supports testing a longer route and higher freight costs. It does not establish this customer’s arrival date, contract surcharge or supplier performance. The following observations have different windows and denominators; they should not be averaged into a single disruption score.

Observed measures and their use

Dated observation	Basis / source	Customer implication and limit
Suez trade volume: -50%	January–February 2024 versus the same months of 2023. IMF [S1].	Supports a material routing shift; does not mean customer demand fell 50%.
Cape trade volume: +74%	Same two-month year-on-year window. IMF [S1].	Consistent with diversion; aggregate tonnage is not spare bookable capacity.
Average diversion delay: 10+ days	IMF assessment published 7 March 2024 [S1].	Motivates the +10-day planning case; shipment-specific delay remains an assumption.
Shanghai–Europe spot freight: +256%	Week of 26 January 2024 versus early December 2023. UNCTAD [S2].	Index 100 becomes 356, not 256. Does not reprice a contracted booking.
Asia–Europe shipping time: +10–15 days	European Commission Winter Forecast, 15 February 2024 [S4].	Corroborates delay direction; observations overlap and are not independent probabilities.

Why this does not justify buying every alternative

The Commission also reported that inventories, low capacity use and limited broad supply-chain strain could absorb delays [S4]. The ECB described spare shipping capacity and inventory buffers as mitigating factors [S3]. That is relevant counterevidence: an exposed route need not cause an operational shortage. This sample becomes vulnerable because its assumed 12-day stock cover is shorter than a day-18 or day-28 arrival.

Translate the signal into this order

First establish the actual route and usable receipt date, including unloading, customs and quality release. Next compare that date with inventory cover, not the vessel’s arrival alone. Then obtain incremental, all-in bridge quotations. A published percentage change in container rates cannot be multiplied by a product’s entire purchase value; only the relevant freight component is exposed.

Keep the baselines intact

A 256% freight increase means 3.56 times the reference rate. It does not mean a 256% rise in the landed component cost. Suez and Cape figures describe trade volumes, while the freight figure describes prices. None measures the probability of a day-28 receipt.

Compare the same three arrival cases

All values are USD and modeled, not observed results. All bridges are assumed usable on day 8, before stockout, with approved specifications. The original sea purchase remains committed. Emergency units are additional inventory that can offset the next purchasing cycle; that offset and cash availability must be confirmed.

Bridge expense and liquidity

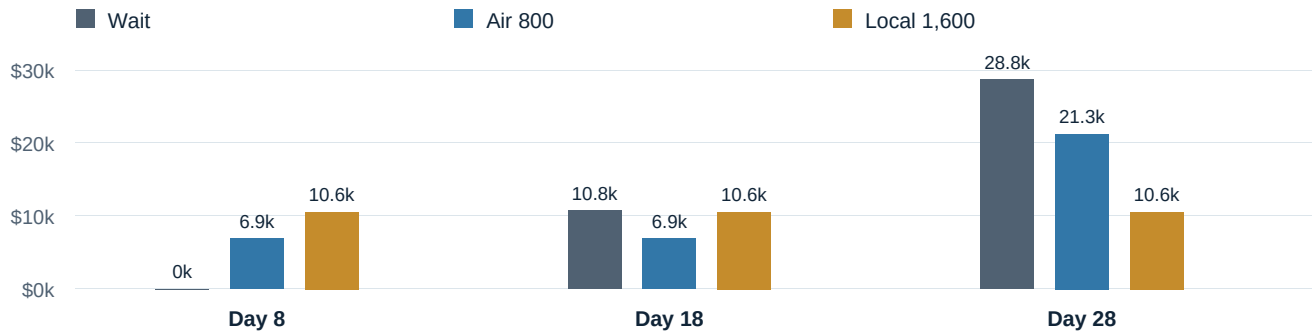
Option	Incremental expense	Gross bridge cash
Wait / no bridge	\$0; exposure to unfilled demand	\$0 additional
Air / 800 units	$800 \times \$8 \text{ premium} + \$300 \text{ handling} + \$200 \text{ financing reserve} = \$6,900$	$800 \times \$20 \text{ goods} + \$6,900 = \$22,900$
Local / 1,600 units	$1,600 \times \$6 \text{ premium} + \$600 \text{ setup} + \$400 \text{ financing reserve} = \$10,600$	$1,600 \times \$20 \text{ goods} + \$10,600 = \$42,600$

The \$20 goods cost is inventory cash, not an extra expense in this comparison: every unit is assumed saleable and displaces a future purchase. The reserve is \$0.25 per bridge unit for this 30-day exercise, not a quoted interest charge. Recalculate if stock is obsolete, offsets are unavailable, or financing lasts longer. Taxes, duties and quality costs must already be reflected in quotes; add any difference before approval.

Incremental expense + contribution at risk

Sea receipt / shortage without bridge	Wait	Air 800	Local 1,600
Day 8 / 0 units	\$0	\$6,900	\$10,600
Day 18 / 600 units	\$10,800	\$6,900	\$10,600
Day 28 / 1,600 units	\$28,800	\$21,300	\$10,600

Modeled disruption cost by receipt day



USD; full loss of shortage contribution assumed. Lower is preferable only when the option is feasible.

Calculation: $\text{shortage} = \max(0, \text{receipt day} \times \text{daily demand} - \text{opening stock} - \text{bridge units})$. Modeled disruption cost = bridge expense + shortage $\times$ \$18 $\times$ unrecoverable fraction. For air at day 28: $\max(0, 28 \times 100 - 1,200 - 800) = 800$ units; $\$6,900 + 800 \times \$18 = \$21,300$. Receipt replenishes sufficiently through day 30 in these cases.

No scenario weights are assigned: the retained sources cannot calibrate this order's arrival probabilities. Therefore the brief makes no expected-savings claim. Even the \$3,900 day-18 advantage for air over waiting is conditional avoided exposure, not an achieved saving.

Test the assumptions that change the choice

Customer deferral is more important than the headline rate

Let f be the share of unfilled demand permanently lost, from 0 to 1. At a day-18 sea receipt, waiting costs $600 \times \$18 \times f$. Air costs \$6,900 and covers the whole modeled gap. The crossover is $f = 6,900 \div (600 \times 18) = 63.9\%$. Below that threshold, waiting has lower modeled cost unless penalties, production stoppages or customer damage create another quantified exposure.

At day 28, local versus air crosses at $f = (10,600 - 6,900) \div (800 \times 18) = 25.7\%$. But that pairwise crossover does not establish the overall winner: waiting remains cheaper than local until f exceeds $10,600 \div (1,600 \times 18) = 36.8\%$. Under these assumptions, air is never the cheapest day-28 option across $f = 0\text{--}1$. Compare all feasible options, not just one attractive pair.

Demand sensitivity at a day-18 receipt; $f = 1$

Demand / cover	Wait cost	Air cost	Local cost / preferred
80/day / 15 days	\$4,320	\$6,900	\$10,600 / wait
100/day / 12 days	\$10,800	\$6,900	\$10,600 / air
120/day / 10 days	\$17,280	\$9,780	\$10,600 / air

At 120 units/day and a day-28 receipt, even the local bridge leaves 560 units unfilled: $28 \times 120 - 1,200 - 1,600 = 560$. Its modeled cost rises to \$20,680. This is not complete continuity protection. The buyer must change quantity, demand allocation or the receipt plan; choosing the largest listed bridge alone does not solve the problem.

Break-even checks before commitment

Variable	Threshold / result	Interpretation
Air premium at day 18; $f = 1$	$(\$10,800 - \$500) \div 800 = \$12.875/\text{unit}$	Above this, waiting costs less; the illustrated \$8 premium is below it.
Lost contribution at day 18; $f = 1$	$\$6,900 \div 600 = \$11.50/\text{unit}$	If actual contribution is lower, air loses its cost advantage.
Air quantity / stock cover	$(1,200 + 800) \div 100 = 20 \text{ days}$	Arrival after day 20 creates residual shortage despite the air bridge.

Reversal rule

Before a non-refundable commitment, cancel the bridge if the usable sea receipt is confirmed no later than day 12, customer deferral changes the cost ranking, or the bridge misses its required receipt date. After commitment, treat sunk costs separately: reselling or cancelling for a fee is a new decision, not a way to erase money already spent.

What to do, by when, and within which limit

Day 0 is the day this fictional team reviews the order. These relative deadlines make the operational dependency explicit; a live brief must translate them into dated local cutoffs. No booking, supplier contact, inventory inspection or monitoring was performed for this example.

Decision sequence

Owner / deadline	Evidence required	Action or stop condition
Inventory lead / day 0	Released stock by SKU; reservations; daily orders; substitution rules.	Replace the 1,200 and 100/day assumptions. Recalculate cover and shortage before seeking emergency approval.
Logistics lead / day 1	Written route and usable receipt window, terminal/customs allowance and next update time.	Map the window to days 8, 18 or 28. If it spans cases, assess both; do not convert a range to false precision.
Buyer / by day 2	All-in air and local quotes; confirmed quantities; day-8 receipt; expiry and cancellation terms.	Reject unqualified parts or uncertain delivery as confirmed alternatives. Identify taxes, duties and fees missing from either quote.
Sales lead / by day 2	Customer-approved deferral, contribution and contractual service exposure.	Estimate f from actual orders. Distinguish delayed revenue from permanently lost contribution.
Finance + procurement / day 2	Recomputed ranking, cash availability and purchase-offset plan.	Illustrative caps: \$11,000 incremental expense; \$43,000 gross bridge cash. Choose one bridge, not both, under these limits.
Receiving lead / day 8 target	Usable quantity after quality release, not just arrival scan.	Escalate a short or late receipt immediately. A revised demand allocation is required if the continuity gap remains.

The latest safe decision is conditional

The air option assumes six days from acceptance to usable receipt. Day 2 is the chosen cutoff for receipt on day 8, leaving four days of stock buffer. Day 6 would use all nominal slack before day-12 depletion and leaves no allowance for a missed collection, customs or quality hold. If quotes require an earlier acceptance, that earlier cutoff governs; if day-8 delivery is unavailable, rerun the model rather than retain its cost ranking.

Separate budget, cash and authority

Local requires \$42,600 gross bridge cash, including \$32,000 tied up in goods. The \$10,600 comparison cost alone is not a cash budget. Existing sea-order payments remain due and are outside these incremental caps. Finance must confirm cash after those commitments and payroll; a scenario that cannot be funded is not feasible even if it minimizes modeled loss.

Close the loop once the receipt is usable

Record actual quantity, date, all-in charges and deferred/lost orders. Compare them with the original assumptions without retroactively changing the baseline. Only that reconciliation can establish realized outcomes. This document supplies decision triggers, not an active watch service.

Risk Context: disruption reaches the customer through timing

Exposure and confidence

Exposure: the component's assumed Asia–Europe sea path uses the Red Sea/Suez corridor. Confidence is moderate that the early-2024 disruption was material to that route, but low for this fictional order's date or alternative capacity. No likelihood percentage is assigned.

Documented basis: IMF reported a sharp fall in Suez traffic and longer diversions in early 2024 [S1]. The ECB examined a prolonged disruption through the third quarter followed by gradual normalization, while excluding escalation to major oil producers from that scenario [S3]. That is a conditional macro scenario, not evidence that this component will arrive on day 28.

Exposure → observable trigger → response

Transmission path	Customer trigger to verify	Decision consequence
Rerouting extends the usable receipt date	Forwarder's written receipt window moves beyond day 12.	Recompute shortages. A day-18 case may justify air only if the lost-contribution and quote thresholds are met.
Persistent delay exhausts a small bridge	Usable sea receipt moves beyond day 20 at 100 units/day.	The 800-unit air bridge no longer covers the entire gap. Evaluate the local option, quantity or demand allocation.
Alternatives tighten or become unusable	Quote expires; day-8 bridge receipt or part approval cannot be confirmed.	Remove that option from the feasible set. Escalate the residual shortage instead of treating a theoretical quote as capacity.
Partial recovery reaches the actual order	Written usable sea receipt returns to day 12 or earlier.	Cancel avoidable bridge expense before its commitment cutoff; broad traffic recovery alone is insufficient.

Adverse case and limits

Use day 28 as a severe timing stress, not as a forecast of military escalation. At the initial inputs, waiting exposes 1,600 units and \$28,800 of contribution; a local bridge removes the modeled gap at \$10,600 incremental expense and \$42,600 gross cash. At 120 units/day it does not remove the gap. Confirm route exposure before applying this scenario to a different customer or product.

A wider energy shock, a new trade restriction, insurance exclusions or the loss of the proposed local source would invalidate parts of this three-option model. The current evidence does not quantify those customer costs. Keep them as explicit reassessment triggers instead of adding unsupported surcharges or political probabilities.

Operational boundary

Carrier routing, safe navigation, insurance coverage and regulatory compliance remain decisions for qualified operators and advisers. This brief addresses procurement consequences. It neither recommends entering unsafe waters nor claims independent security intelligence, continuous monitoring or verified alternative capacity.

Evidence ledger and calculation record

S1 • International Monetary Fund • 7 March 2024

[Red Sea Attacks Disrupt Global Trade](#)

Suez and Cape trade-volume changes; average diversion delays. Aggregate PortWatch estimates do not locate this fictional shipment.

S2 • UN Trade and Development (UNCTAD) • 26 January 2024

[UNCTAD raises alarms on escalating disruptions to global trade due to geopolitical tensions and climate change](#)

Shanghai-origin spot-rate changes relative to early December 2023. These are reported market benchmarks, not a customer quote.

S3 • European Central Bank • 7 March 2024

[ECB staff macroeconomic projections, Box 3: Red Sea disruption scenario](#)

Capacity and inventory transmission; a prolonged-disruption scenario with explicit limits. No ECB scenario probability is assigned to this customer.

S4 • European Commission • 15 February 2024

[European Economic Forecast, Winter 2024, Box 1.1, printed page 7 \(PDF page 13\)](#)

Asia-Europe delay range and evidence that inventories and spare capacity could cushion production. Aggregate resilience is not proof of customer resilience.

Calculation record

Reproducible checks from the stated inputs

Quantity	Working	Result
Opening cover	$1,200 \div 100$	12 days
Day-18 shortage / waiting	$\max(0, 18 \times 100 - 1,200)$	600 units
Air modeled cost / day 18	$800 \times 8 + 300 + 200$	USD 6,900
Local gross bridge cash	$1,600 \times 20 + 10,600$	USD 42,600
Day-28 local vs waiting / conditional	$28,800 - 10,600$	USD 18,200 lower exposure
Demand stress / local / day 28	$10,600 + (28 \times 120 - 1,200 - 1,600) \times 18$	USD 20,680

Method: retain dated observations; identify the exposed order; separate customer assumptions from observations; calculate inventory shortfall and incremental costs; compare the same alternatives in every timing case; vary demand, contribution and deferral; then set operational cutoffs, cash caps and reversal rules. Relative days are illustrative, with receipt at the stated time and continuous consumption. All bridge stock is assumed available before opening stock is exhausted.

Review record: source passages and calculations were checked while preparing this sample on 28 September 2026. The historical evidence cutoff remains 7 March 2024. UNCTAD's indexed official release supplied the reported price change; the Commission PDF was read directly. No original market dataset was reconstructed, client records inspected, supplier contacted or outcome verified. No independent human review or live monitoring is claimed.

Material limits: f is a customer input, not a fitted probability; demand is simplified to a constant rate; stock is interchangeable; unfilled demand earns no contribution unless recovered; unsold usable bridge stock offsets future purchases. Capacity, credit, taxes, obsolescence, service penalties and cancellation terms can change the ranking. If those facts cannot be obtained, present a conditional recommendation or hold the decision—do not replace missing evidence with a longer narrative.