

Transport Risk: Mastering Hazards to Goods and the Supply Chain in Transit

Transport risk denotes the danger that goods are damaged, lost, delayed in transit or legally in the wrong sphere of responsibility on their way from supplier to recipient. It encompasses physical, temporal, legal and financial dimensions and is determined primarily by Incoterms, packaging, mode of transport and insurance cover. For technical buyers, transport risk is a central element of supply chain management because it affects availability, costs and liability alike.

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Key facts at a glance

- 01 Transport risk encompasses damage, loss, delay and legal liability issues along the entire transport route.
- 02 The transfer of risk and costs is governed primarily by the agreed Incoterms.
- 03 Suitable packaging, transport insurance and freight forwarder qualification are the most important control instruments.
- 04 Especially for dangerous goods (ADR), temperature-controlled loads and special transports, risks and costs rise significantly.
- 05 KPIs such as delivery reliability, damage rate and demurrage/detention costs make transport risks measurable.
- 06 Without clear provisions in the framework supply agreement, claims settlement frequently remains contentious and protracted.

Definition: transport risk

Transport risk is the probability and potential extent of loss with which goods are damaged, destroyed, lost or delayed during carriage – or that economic disadvantages such as demurrage, compensation claims or production downtime arise. It forms part of general procurement risk but has its own causes,

responsibilities and mitigation instruments.

Physical, temporal and legal dimensions

Physically, the spectrum ranges from transport damage through theft to total loss, for example in the event of an accident or sinking of the ship. In temporal terms, transport risk means delay due to congestion, border clearance or capacity bottlenecks, which directly burden inventory cover and materials planning. Legally, the question is who bears risk, duty of care and liability from which point – typically governed by Incoterms such as EXW, FCA or Incoterms CIP.

- Physical: damage, loss, theft, contamination
- Temporal: delay, delivery reliability risk, production downtime
- Legal: transfer of risk, burden of proof, limitations of liability

Distinction from supplier and procurement risk

Transport risk relates exclusively to the phase between the goods leaving the supplier and arriving at the recipient. It overlaps with supplier failure risks but is distinct in its own right: a reliable supplier can still carry a high transport risk if it produces in crisis regions or uses unstable freight partners. In procurement controlling, both risk fields are assessed separately, for example via a scoring matrix for supplier and risk evaluation.

Legal foundations: Incoterms, transfer of risk and liability

The legal side of transport risk is essentially determined by commercial delivery terms. Anyone who does not actively choose them leaves the allocation of risks to chance or to the contractual partner.

Incoterms as a risk-allocation instrument

The Incoterms determine from which point costs and risk pass to the buyer. Under EXW, the buyer bears practically the full transport risk from the factory gate; under DDP, the seller bears it up to the recipient's location. In practice, Incoterms CIP are often sensible for buyers with their own logistics expertise: the seller owes insurance up to the named destination, but risk passes to the buyer early – keeping freight control in one's own hands.

- EXW: maximum risk for the buyer
- CIP: seller organises and insures, risk passes early
- DDP: minimal risk for the buyer, often higher prices

Contractual protection and liability issues

The framework supply agreement should explicitly anchor transport provisions: packaging requirements, freight forwarder selection, notification chains in the event of delays and claims settlement. The liability of carriers is often limited internationally, for example under CMR, the Montreal Convention or sea freight rules – the actual loss frequently exceeds these limits. Separate transport insurance closes this gap; whether the supplier or the buyer takes it out follows from the Incoterms. For

sensitive design data or tooling on transport routes, a non-disclosure agreement (NDA) with logistics partners is additionally recommended. Legally binding statements must always be reviewed on a case-by-case basis.

| Causes and influencing factors of transport risk

Transport risks arise from several levels: goods characteristics, transport route, chosen modes of transport and external disruptions. Those who record these factors systematically can reduce them in a targeted manner instead of merely settling claims for damage.

Goods characteristics and packaging

Fragile, sensitive or dangerous goods require special precautions. Dangerous goods transports are subject to ADR and require trained personnel, labelling and special documentation. Temperature, moisture and impact sensitivity determine packaging type and container choice; moisture damage in sea containers is a frequently underestimated cost driver in practice, countered by desiccants and purpose-designed packaging.

Mode of transport, route and external disruptions

Sea, air, rail and road transport differ considerably in damage probability, costs and transit time. Multimodal chains increase handling risk due to transshipment points but often shorten overall lead time. External factors – port congestion, strikes, weather events, geopolitical tensions – can hardly be influenced, but can be buffered through alternative routes and buffer times in the planning model.

Supplier and freight forwarder quality

Not every supplier is equally adept at export packaging, customs documentation and transport coordination. Freight forwarder quality should therefore form part of supplier evaluation, supported by damage statistics and delivery reliability. A structured supplier portal facilitates the exchange of consignment data, documents and status information.

| Methods and approach for risk minimisation

Transport risks can never be eliminated entirely, but they can be assessed systematically and reduced to an acceptable level. A continuous cycle has proven its worth: identify, assess, control, monitor.

Risk identification and assessment

First, material classes are grouped by transport sensitivity, value and criticality for production. A scoring matrix allows transport risks to be compared consistently by material class, route and supplier. Network analysis helps to identify critical dependencies – for example a single port or a single freight forwarder through which the majority of volume flows.

Control via Incoterms, insurance and contracts

Assessment leads to control: choosing Incoterms so that the party bearing transport risk and control is the one best able to manage them; reviewing transport insurance for coverage limits and exclusions; contractually fixing packaging and handling requirements. For critical parts, an emergency order or a dual-sourcing approach can absorb residual risk should a consignment be lost or delayed.

Operational protection in day-to-day business

In day-to-day operations, clear processes matter: incoming inspection with documented transport damage, complaint deadlines, joint damage recording with the driver and a structured escalation system. Mobile approval (P2P) solutions can, in the ERP environment, accelerate the rapid approval of replacement and repeat orders after transport damage, thereby reducing downtime.

Key KPIs for controlling transport risk

Only those who measure transport risks can control them. A small number of consistently collected KPIs, regularly discussed with suppliers and freight forwarders, has proven effective.

Damage, quality and schedule KPIs

Core indicators are the transport damage rate (damage cases per consignment), on-time and in-full delivery reliability, and average transport lead time including variability. High lead time variability is often more dangerous for materials planning than a moderate average lead time, because it inflates safety stock and inventory cover.

Cost and process KPIs

In addition, cost aspects should be monitored: insurance loss per consignment, freight costs per unit of weight and standing time charges such as demurrage (standing charges in port) or detention, which are incurred when containers are collected late. Adherence to deadlines for complaints and refunds for transport damage also belongs in the reporting.

Current developments and digitalisation

Transport risk is increasingly managed digitally: tracking data, integrated procurement systems and forward-looking planning reduce blind spots and reaction times.

Tracking, e-procurement and data integration

E-procurement in purchasing increasingly integrates consignment and status data directly into ordering and planning processes, so that delays become visible early and materials planning can react before a production stoppage looms. Real-time shipment tracking and forward-looking arrival forecasts significantly shorten reaction times to disruptions.

Resilience, diversification and procurement strategy

After several years of disrupted supply chains, route and mode-of-transport diversification are moving more strongly into focus within procurement strategy. Buyers are establishing alternative routes, reviewing nearshoring and holding safety stocks for critical materials or agreeing options for emergency orders. Within the scope of tenders – for example via an e-auction – the transport competence of bidders can also be included as an evaluated criterion.

Typical metrics

Metric	Typical value
Transport damage rate	< 0.5 % of consignments <i>Typical benchmark for established industrial supply chains; industry-dependent.</i>
Delivery reliability (on-time delivery)	> 95 % <i>Assess together with lead time variability, not just the average.</i>
Lead time variability	± 2–3 days for sea freight <i>Higher variability requires larger safety stocks in materials planning.</i>
Demurrage/detention costs	close to €0 per consignment <i>Demurrage usually arises from planning errors and is largely avoidable.</i>

Practical example

A medium-sized mechanical engineering company sourced precision components from Asia and repeatedly recorded transport damage to sensitive base bodies as well as unpredictable lead time fluctuations. After several production delays, the company carried out a systematic review.

- Switching critical parts to Incoterms CIP so that the supplier ships insured, while the buyer retains freight selection and control.
- Introduction of a scoring matrix for transport risks by material class and route, including ADR-relevant items.
- Contractual fixing of packaging requirements, notification chains and claims settlement in the framework supply agreement.
- Establishment of an alternative freight forwarder and a reserve buffer route to enable switching in the event of disruption.

Conclusion

Transport risk is not a peripheral logistics topic but a direct influencing factor on availability, costs and liability. Those who consciously choose Incoterms, qualify packaging and freight forwarders and consistently measure damage reduce not only the damage rate but also safety stock and thus tied-up capital. The combination of legally clear contracts, operational control processes and digital transparency is more effective than any single measure. Buyers are well advised to regularly assess transport risks with suppliers and to explicitly take them into account in procurement decisions – from the e-auction to the framework supply agreement. Ultimately the rule is: the more critical the material for production, the sooner active transport risk management pays off.

Frequently asked questions

? Who bears the transport risk in procurement?

That depends on the agreed Incoterms. Under EXW, the buyer bears the risk from the factory; under DDP, the seller bears it up to the place of receipt; under Incoterms CIP, risk passes to the buyer early, while the seller organises transport and insurance. The specific arrangement should additionally be anchored in the framework supply agreement and reviewed legally on a case-by-case basis.

? How can transport risks be reduced?

Effective levers include choosing the right Incoterms, packaging tailored to the goods' characteristics, qualified and audited freight forwarders, and adequate transport insurance. In addition, alternative routes, safety stocks for critical parts and clear processes for incoming inspection and complaints help. Regular assessment via a scoring matrix keeps risk awareness high.

? What is the difference between transport risk and transport insurance?

Transport risk describes the danger of damage, loss or delay along the transport route. Transport insurance is an instrument for financially covering this risk. It does not replace prevention and typically does not cover all consequential costs such as delay damages or production downtime – contractual provisions and buffers in materials planning are needed for this.

? Which Incoterms are most advantageous for buyers?

There is no one-size-fits-all answer. DDP minimises risk and effort for the buyer, but often leads to higher prices and less control over freight costs. Many technical buyers choose Incoterms CIP or FCA in order to actively manage freight costs and transport risk when they have their own logistics expertise and insurance solutions. What matters is aligning with your own materials planning and risk-mitigation strategy.

? What does transport risk mean for dangerous goods (ADR)?

For dangerous goods under ADR, statutory requirements apply: dangerous goods classification,

labelling, packaging regulations, documentation and trained personnel on all transport routes. Violations can result in fines, liability consequences and transport bans. Buyers should therefore only use suppliers and freight forwarders who can demonstrably meet ADR requirements.

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