

JTS Johanson Transportation Service

Freight Industry Guidebook

Topical insights from JTS Thought Leaders

Freight Class Handbook: A Shipper's Guide to Getting It Right the First Time

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What this guidebook covers

- Why classification errors cost more than the freight bill
- What NMFC freight class is and the four factors behind it
- Side-by-side examples showing how class drives price
- A step-by-step method to calculate density and choose a class
- A pre-shipment checklist and quick-reference glossary

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1. Why Freight Class Matters

Freight classification is one of the easiest details to get wrong on an LTL shipment, and one of the most expensive to fix after the fact. Carriers reserve the right to reweigh and reclassify any shipment that does not match its stated class, and that correction usually happens after the freight has already moved.

What a misclassification typically triggers:

- A higher invoice. The corrected bill arrives above the original quote, often weeks after the shipment delivered.
- Reconciliation work. Accounting must chase the discrepancy and match a bill that no longer reflects what was budgeted or approved.
- Damage risk. Freight handled and loaded under the wrong class may not receive the care it needs in transit.

Bottom line: Understanding how NMFC classification works, and verifying class before you book, is the most reliable way to avoid administrative and accounting headaches.

2. Understanding Freight Class

The NMFC system

The National Motor Freight Classification (NMFC) is the standard system used across the U.S. trucking industry to classify freight for LTL shipping. It is maintained by the National Motor Freight Traffic Association (NMFTA) and gives carriers, brokers, and shippers a common language for pricing and handling. A "class 60" item is priced and handled consistently no matter which carrier moves it.

The class scale

Freight class is the rating assigned to a commodity within the NMFC. There are 18 classes, from class 50 (least expensive) to class 500 (most expensive). Every commodity, from steel equipment to ping pong balls, is placed on this scale.

The four classification factors

Four characteristics determine where a shipment lands on the 50–500 scale:

Factor	What it measures	Effect on class
Density	Weight relative to the space the shipment occupies. The most influential factor.	Heavy, compact freight → lower class. Bulky, light freight → higher class, even at lower total weight.
Stowability	How easily the freight loads alongside other shipments in a trailer.	Hazardous, oddly shaped, or special-spacing items → higher class.
Handling	The care or special equipment the shipment requires.	Fragile, awkward, or unusually heavy individual pieces → higher class.
Liability	Risk of damage, theft, or spoilage en route, and value per pound.	High-value or easily damaged goods → higher class.

Class is then combined with **weight, distance,** and **accessorial charges** to calculate the actual LTL rate.

3. Freight Class in Action

The examples below show how class, not weight alone, drives cost. Each pair uses the same pallet footprint and lane.

How LTL is priced: Linehaul ≈ hundredweight (CWT, 100 lbs.) × class-adjusted rate per CWT, plus fuel surcharge and accessorials. Many carriers also apply a per-shipment minimum charge (often $150–$250).

Example 1: Same footprint, different density

Shipment A: Steel Brackets (Dense, compact, easy to stack)

Weight:	800 lbs.
Pallet:	8" × 40" × 30" (≈33 cu. ft.)
Density:	≈24 lbs./cu. ft.
Class:	65
Linehaul:	8 CWT × $18 ≈ $144
Est. cost*:	≈$180 with fuel and accessorials

Shipment B: Pillows & Bedding (Light, bulky, awkward to stow)

Weight:	200 lbs.
Pallet:	48" × 40" × 30" (≈33 cu. ft.)
Density:	≈6 lbs./cu. ft.
Class:	150
Linehaul:	2 CWT × ~$45 ≈ $90
Est. cost*:	Likely billed near the $150–$250 minimum

Takeaway: The pillows weigh 75% less but can cost as much, or more to ship.

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Example 2: Same weight, different packaging efficiency

Shipment C: Bagged Rock Salt (Dense, tightly palletized)

Weight: 500 lbs.
Pallet: 48" × 40" × 14" (≈16 cu. ft.)
Density: ≈31 lbs./cu. ft.
Class: 60
Linehaul: 5 CWT × ~$18 ≈ $90
Estimated cost*: ~$115 with fuel

Shipment D: Stacked Patio Chairs (Bulky, nesting chairs do not compress)

Weight: 500 lbs.
Pallet: 48" × 40" × 60" (≈67 cu. ft.)
Density: ≈7.5 lbs./cu. ft.
Class: 125-150
Linehaul: 5 CWT × ~$45 ≈ $225
Estimated cost*: ~$260 with fuel

Takeaway: It is not how much freight weighs; it is how efficiently it is packaged. The chairs cost more than double because their low-density footprint pushed them into a higher class.

4. How to Determine the Right Class

Calculating density

Many shippers rate by density as an alternative to published freight class. To calculate it:

1. **Measure** length, width, and height in inches at the widest points, including the pallet and any overhang.
2. **Calculate cubic feet**: L × W × H ÷ 1,728.
3. **Weigh** the complete shipment, including pallet and packaging.
4. **Calculate density:** total weight ÷ cubic feet = pounds per cubic foot (PCF).
5. **Match** the density and commodity to its NMFC item and class, then verify.

Worked example (Shipment A): 48 x 40 x 30 = 57,600 cu. in. ÷ 1,728 = 33.3 cu. ft. | 800 lbs. ÷ 33.3 = 24 PCF → class 65

Why manual classification falls short

Manual calculation is a skill you can learn, but it is time-consuming and prone to human error. NMFC rules are also updated periodically, so a class that was correct last year may not be correct today. An NMFC lookup or freight class calculator, verified with your broker or carrier, provides more assurance.

The easier way: arriviture® 2.0 TMS

JTS' arriviture® 2.0 automatically identifies and verifies the correct NMFC-linked freight class at the point of booking. This removes the guesswork and helps prevent billing corrections later. The platform is available to all JTS customers at no cost.

5. Pre-Shipment Checklist

Before tendering any LTL shipment, confirm:

- Dimensions are measured at the widest points, pallet included
- Weight reflects the full shipment, pallet and packaging included
- Density (PCF) is calculated and matches the stated class
- Commodity description matches its NMFC item number
- Class is verified in arriviture® 2.0 or with your JTS representative
- Freight is packaged and stacked as efficiently as possible to maximize density
- Fragile, high-value, or hazardous characteristics are disclosed

6. Quick-Reference Glossary

Term	Definition
LTL	Less-than-truckload: shipments that share trailer space with other freight.
NMFC	National Motor Freight Classification: the U.S. standard for classifying LTL freight.
NMFTA	National Motor Freight Traffic Association: the organization that maintains the NMFC.
Freight class	One of 18 ratings (50–500) assigned to a commodity; higher class = higher rate.
Density / PCF	Shipment weight divided by its volume, in pounds per cubic ft.
CWT	Hundredweight (100 lbs.): the unit LTL linehaul rates are based on.
Linehaul	The base transportation charge, before fuel and accessorials.
Accessorials	Charges for services beyond standard dock-to-dock pickup and delivery.
Minimum charge	The lowest amount a carrier will bill for a shipment, regardless of weight.
Reclassification	A carrier's correction of a shipment's class after inspection, usually raising the bill.

**Figures are illustrative only. Quote shipments in the arriviture® 2.0 TMS for accurate pricing.*

For more information on NMFC freight classification or arriviture® 2.0: **Email:** arriviture@johansontrans.com | **Phone:** (800) 261-261-6690.

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