

Hafeet Rail Landed-Cost Analysis Framework & Template

A structured financial audit framework and worksheet for quantifying Total Cost of Ownership (TCO) savings when transitioning B2B freight from cross-border road trucking to the Hafeet Rail intermodal network.

Financial Methodology: Landed cost comparisons must extend beyond simple freight rate quotes (\$/truck vs. \$/container). True total cost modeling requires incorporating distance efficiency metrics (Ton-KM), road fuel volatility, hidden border demurrage, inventory holding costs during transit delays, and cargo insurance differentials.

1. THEORETICAL CORE: TON-KILOMETER (TON-KM) EFFICIENCY MODEL

The Ton-Kilometer (Ton-KM) metric measures the direct cost of moving one metric ton of freight over a distance of one kilometer. It reveals structural cost advantages independent of temporary fuel surcharges.

Ton-KM Cost Formula:

$$\text{Cost per Ton-KM} = \frac{\text{Total Freight Expenditure (\$)}}{[\text{Total Weight (Metric Tons)} \times \text{Distance (KM)}]}$$

Transport Mode	Avg. Payload Capacity	Corridor Distance (UAE-Oman)	Avg. Line-Haul Tariff (\$)	Cost per Ton-KM (\$)
Heavy Road Trucking (Trailer/Flatbed)	22 Metric Tons	~450 KM (incl. border detours)	\$1,100 - \$1,350	\$0.111 / Ton-KM
Hafeet Intermodal Rail (Flat Wagon)	60–120 Tons (per wagon pair)	~303 KM (Direct Rail Line)	\$1,200 - \$1,400 (per double-TEU)	\$0.066 / Ton-KM
Net Efficiency Differential (Rail vs. Road):				40.5% Cost Reduction per Ton-KM

2. UNMASKING HIDDEN ROAD COSTS (Border Demurrage & Fuel Friction)

Hidden Road Friction Formula:

$$\text{True Road Cost} = \text{Direct Trucking Rate} + \text{Border Detention Fees} + \text{Extra Fuel Surcharge} + \text{Delay Capital Holding Cost}$$

Hidden Cost Driver	Road Trucking Impact & Variable Range	Hafeet Rail Corridor Mitigation
Border Yard Demurrage	\$150 – \$300 / day per truck for customs inspection queues at Hatta/Wajaja (avg. 12–36 hrs delay).	Zero Yard Friction: Pre-cleared digital manifests and non-intrusive rail scanners eliminate queues.
Fuel Surcharge Volatility	Road freight carries a floating 15%–25% fuel surcharge linked to retail diesel price fluctuations.	Stable Energy Tariffs: Highly efficient diesel-electric/electric rail reduces energy sensitivity by 65%.
Inventory Capital In Transit	Capital tied up for 24–48 hours in highway transit and border delays (WACC interest accumulation).	100-Minute Transit Time: Rapid line-haul frees up working capital and accelerates inventory turnover.
Driver Detention & Layover	Driver accommodation & per-diem fees added when border clearance exceeds standard operating windows.	Included in Rail Operator Tariff: Scheduled block-train service eliminates driver-contingent costs.

3. FILLABLE LANDED-COST CALCULATION WORKSHEET (COMPANY AUDIT FORM)

Financial managers can populate this template with internal company data to perform a direct side-by-side cost audit prior to entering contract negotiations with rail operators.

COST COMPONENT	CURRENT ROAD TRUCKING (\$)	HAFEET RAIL OPTION (\$)	NOTES / VARIANCE CALCULATION
A. Commercial Ex-Works Goods Value	[Enter Value]	[Enter Value]	Base cargo invoice value
B. First-Mile Drayage / Loading	[Included in Rate]	[Enter Factory to Depot]	Trucking to Al Ain Rail Depot
C. Primary Line-Haul Tariff	[Enter Road Quote]	[Enter Rail Rate]	Main transport leg (UAE to Oman)
D. Border Terminal & Handling Fees	[Enter Border Fees]	[Enter ICD Yard Fee]	Customs inspection & terminal handling
E. Estimated Border Delay / Demurrage	[Avg. \$200 x Days]	\$0.00	Historical queue cost average
F. Cargo Insurance Premium	[Enter Road Insurance]	[Enter Rail Insurance]	Typically 15-25% lower on rail
G. Last-Mile Delivery / Unloading	[Included in Rate]	[Enter Depot to Factory]	Final drayage in Sohar / Muscat
TOTAL LANDED COST (A to G)	[Total Road]	[Total Rail]	Net Savings Target: ~40%

4. STEP-BY-STEP LANDED COST CALCULATION PROTOCOL

- Determine Single Container Payload:** Calculate net tonnage per 40ft container or wagon pair. Higher tonnage maximizes rail's cost advantage.
- Factor First & Last-Mile Drayage:** Add road shuttle costs from factory to Al Ain terminal, and destination terminal to final warehouse.
- Apply Digital Customs Savings:** Subtract historical border clearance delay charges experienced on road corridors.
- Input into Tendify Digital Calculator:** Upload these figures to platform.tendify.net/landed-cost to generate real-time sensitivity graphs and export executive PDF reports.

5. ANNUALIZED NET SAVINGS MATRIX BY SHIPPED VOLUME (40% SAVINGS BENCHMARK)

The table below projects total annual operational savings achieved when transitioning volume tiers from heavy road trucking to Hafeet Rail, based on a standardized 400 KM cross-border trade route between UAE industrial zones and Omani commercial centers.

ANNUAL FREIGHT VOLUME (TEU / LOADS)	BASELINE ANNUAL ROAD COST (\$)	PROJECTED HAFEET RAIL COST (\$)	DIRECT ANNUAL COST SAVINGS (\$)	CO2 EMISSIONS REDUCTION (TONS)
100 TEUs / Year SMALL SHIPPER	\$125,000	\$77,500	\$47,500 / yr	~110 Metric Tons
500 TEUs / Year MID-SIZE TRADER	\$625,000	\$381,250	\$243,750 / yr	~550 Metric Tons
1,200 TEUs / Year LARGE B2B ENTERPRISE	\$1,500,000	\$900,000	\$600,000 / yr	~1,320 Metric Tons
5,000 TEUs / Year INDUSTRIAL ANCHOR SHIPPER	\$6,250,000	\$3,750,000	\$2,500,000 / yr	~5,500 Metric Tons

6. ESG & CARBON OFFSETTING FINANCIAL BONUS

ESG Value Addition: Beyond direct freight tariff savings, rail freight reduces greenhouse gas emissions by up to **80% per ton-kilometer** compared to diesel trucking.

Enterprise shippers can monetize these carbon reductions within corporate ESG reporting or convert verified carbon credits to offset first-mile drayage expenses, further increasing net profitability.

7. CFO EXECUTIVE SUMMARY & ACTION STEPS

Next Operational Steps for Financial Controllers:

- Audit previous 12 months of cross-border road trucking invoices to establish baseline TCO.
- Populate Section 3 of this worksheet with exact product weight and volume distribution.
- Access **Platform.Tendify.Net** to simulate multi-variable scenario modeling and download board-ready analytical charts.