MCP SERVER | NO CODE | CLOUD HOSTED

LTL-FTL Comparator MCP for AI Agents

Optimize Freight Costs and Plan Shipments by Weight and Volume

The LTL-FTL Comparator is a logistics decision engine that instantly compares Less than Truckload (LTL) versus Full Truckload (FTL) shipping options. It analyzes weight, volume, cargo value, and deadlines to pinpoint the most cost-effective shipment mode.

A+ Quality Score 100/100

shipping | ltl | ftl | transportation | cost-optimization | logistics-engine

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vinkius.com/mcp/ltl-ftl-comparator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

LTL-FTL Comparator MCP

4 tools available
Cloud-hosted on Vinkius

Deciding how to ship goods—whether using consolidated LTL freight or booking a whole truck with FTL—is usually a gut call until you have all the numbers. This MCP changes that by providing deep visibility into your shipping costs, risks, and capacity utilization. You input variables like cargo volume (CBM), total weight, value, and required speed. The system then calculates necessary metrics for both LTL and FTL modes. It even determines the exact tonnage where switching from shared freight to a dedicated truck actually makes financial sense. If you're used to jumping between spreadsheets or calling up multiple carriers just to figure out which method saves money, this is your fix. By connecting through Vinkius, you give your AI agent access to a full catalog of specialized tools, making complex logistics decisions something your agent handles automatically.

Core Capabilities

01 — Determine LTL shipment metrics

Calculates the chargeable weight and cost per kilogram for consolidated Less than Truckload (LTL) shipments.

02 — Assess FTL capacity utilization

Evaluates how efficiently a dedicated Full Truckload (FTL) truck's weight and volume are being used.

03 — Find the cost break-even point

Pinpoints the specific weight threshold at which paying for a dedicated FTL truck becomes cheaper than LTL freight.

04 — Receive shipment mode recommendations

Provides a data-driven choice based on balancing your cargo's cost, speed requirements, and risk tolerance.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/ltl-ftl-comparator** — connect your AI agent in three steps.

01 Provide the system with key variables: total shipment weight, volume (CBM), cargo value, and required delivery deadline.

02 The MCP processes these inputs to run multiple comparisons, calculating specific metrics for both LTL and FTL modes simultaneously.

03 It outputs a clear recommendation, showing the optimal mode—whether it's cost savings, speed assurance, or risk mitigation.

The bottom line is, you give your agent the shipment details, and it returns an optimized logistics strategy that saves you time and money.

Built For

This MCP is built for supply chain managers, freight coordinators, and operations directors. If your job involves optimizing shipping routes or dealing with carrier quotes daily, this tool cuts through the spreadsheet headache.

Logistics Coordinator

Uses the comparator to quickly generate multiple cost scenarios for new routes, ensuring they always select the most economically viable transport method.

Operations Director

Relies on the system's recommendations to set company policy regarding minimum load sizes and when dedicated shipping is mandatory due to deadlines.

Procurement Manager

Feeds in large volumes of shipment data to identify patterns, like the exact weight point where FTL costs drop below LTL rates across multiple vendors.

What Changes When You Connect

01 Instantly compare complex LTL vs. FTL costs using the `calculate_ltl_metrics` tool, so you never pay for excess weight or volume.

02 Stop guessing about truck capacity. The MCP calculates detailed metrics via `calculate_ftl_metrics`, ensuring your shipment maximizes space and minimizes waste.

03 Avoid overpaying by finding the exact tonnage break-even point with `find_break_even_threshold`—you'll know precisely when FTL is cheaper than LTL.

04 Get a single, actionable answer from `get_shipment_recommendation`. This tool weighs cost against speed and safety risk for you.

05 Reduces manual calculation time. Instead of cross-referencing multiple carrier spreadsheets, your agent gives you the final decision in seconds.

Real-World Applications

Deciding between consolidation vs. dedicated truck runs

A manager needs to ship 30 tons across three different regions. They ask their agent, 'Should I use LTL or FTL?' The MCP processes the data and uses `get_shipment_recommendation` to tell them that while LTL is cheaper for two legs, FTL on the third leg saves money overall due to tight deadlines.

Analyzing minimum shipment sizes

A company needs to determine if they must send a full truckload or if smaller shipments are fine. They run a test using `find_break_even_threshold` and discover that even small batches of cargo trigger an FTL rate below the LTL cost, changing their fulfillment strategy.

Handling urgent, high-value goods

A client has a time-critical shipment (12 hours) with high risk tolerance. The agent runs metrics and uses `get_shipment_recommendation` to strongly advise FTL, prioritizing speed and safety over the initial cost savings of LTL.

Calculating accurate carrier quotes

An internal team member has raw dimensions (500kg, 2 CBM) and needs a quick quote. They use `calculate_ltl_metrics` to get the chargeable weight instantly, preventing manual miscalculations when talking to carriers.

Patterns to Avoid

Using only one metric for comparison

✗ AVOID

Only looking at LTL cost and ignoring delivery deadlines. This might make you pick a cheap option that arrives too late, costing you the contract.

✓ INSTEAD

Always run `get_shipment_recommendation`. It forces the system to balance cost *with* speed and risk tolerance, giving you the full picture.

Ignoring volume limitations

✗ AVOID

Calculating LTL costs based only on weight, but forgetting that the cargo is bulky. This leads to paying for excess space when volume should be the constraint.

✓ INSTEAD

Use `calculate_ltl_metrics` and ensure your input data includes CBM (volume) alongside weight; the tool accounts for both.

Making assumptions about break-even points

✗ AVOID

Estimating when FTL becomes cheaper by hand, which often misses minor variations in tonnage. You might pick a mode that is actually slightly more expensive.

✓ INSTEAD

Run `find_break_even_threshold`. It gives you the precise weight threshold where the cost crossover point occurs, giving you reliable data.

The Right Fit

Use this MCP if your decision hinges on a direct financial comparison between consolidated and dedicated shipping. You need to know not only *if* FTL is cheaper than LTL, but also precisely at what weight or volume threshold that switch happens using `find_break_even_threshold`. Don't use it if you simply need a general estimate of costs; this tool requires detailed inputs like CBM and cargo value. If your problem is solely about optimizing internal warehouse flow or managing employee schedules, then this MCP won't help—you'll need a different inventory management type of tool instead.

LTL-FTL Comparator: Optimizing Supply Chain Freight Costs

Right now, figuring out the best way to ship goods means juggling spreadsheets. You have carrier A's LTL quote, which only considers weight, versus carrier B's FTL rate that factors in volume and minimum load sizes. Then you have to manually determine if those numbers even mean anything together—do you save money on LTL until a certain weight, or does the cost structure change completely when you hit dedicated truckloads? It's a massive amount of copy-pasting and comparing apples to oranges.

With this MCP, that headache vanishes. You give your agent the shipment details once. The tool calculates all necessary metrics for both LTL and FTL simultaneously, giving you one clean comparison. You get an answer that doesn't just show two prices, but tells you which mode is optimal based on speed, risk, and cost.

LTL-FTL Comparator: Managing Shipping Risk and Deadlines

A major pain point in logistics is when a cheap shipping option conflicts with tight deadlines. You might calculate that LTL saves 15%, but if the

This MCP solves this by running `get_shipment_recommendation`. It forces your agent to look at the entire picture—the deadline

carrier's slower transit time means you miss the client window, the cost savings are irrelevant. These decisions require weighing financial metrics against operational risks.

and the risk profile *and* the cost structure. You stop making compromises and start making data-driven choices.

LTL-FTL Comparator: 4 Logistics Comparison Tools for Freight Planning

These tools allow your agent to calculate LTL metrics, assess FTL capacity, find the cost break-even point, and provide a final shipment recommendation.

#	TOOL	DESCRIPTION
01	`find_break_even_threshold`	Determines the precise weight at which a dedicated Full Truckload (FTL) shipment becomes more cost-effective than Less than Truckload (LTL).
02	`calculate_ftl_metrics`	Calculates detailed financial and utilization metrics specific to Full Truckload (FTL) shipping.
03	`calculate_ltl_metrics`	Determines the chargeable weight, cost per kg, and total cost for Less than Truckload (LTL) shipments.
04	`get_shipment_recommendation`	Processes all inputs to provide a data-backed recommendation on whether LTL or FTL is best based on cost, speed, and risk.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U I'm shipping 10,000 kg of electronics (25 CBM) that must arrive in two days. What should I use?

🚚 **Recommended Mode: Full Truckload (FTL)**

While the LTL rate is initially lower, your strict two-day deadline and high cargo value push the risk profile too high for shared freight. FTL guarantees dedicated routing and expedited handling required to meet that critical SLA.

Metrics Breakdown:

- **LTL Risk Score:** High (Due to limited carrier flexibility)
- **FTL Estimated Cost:** $4,500.00
- **FTL Capacity Utilization:** 85% Weight / 70% Volume

U I have a shipment of 500kg and 2 CBM with $1000 value. What's the LTL cost?

📋 **LTL Metrics for Your Shipment**

Based on standard rates, your chargeable weight is 666 kg (using a 333 factor). The total estimated LTL cost comes out to $1,100.00, giving you a solid rate of $2.20 per kg.

- **Chargeable Weight:** 666 kg
- **Volume Utilization:** 3.2% (Low)
- **Cost Per Kilogram:** $2.20

U What tonnage makes FTL cheaper than LTL for my region?

📈 Break-Even Analysis Complete

For your specific lane and commodity type, the financial break-even point is **3,850 kg**.

If your shipment weighs less* than 3,850 kg, LTL will be the cheaper option.
If your shipment weighs more* than 3,850 kg, you should switch to FTL for maximum savings.

Frequently Asked Questions

01 **How does the LTL-FTL Comparator help me decide between shipping methods?**

It provides a data-driven recommendation by running multiple calculations. Instead of just showing two prices, it weighs your cargo's cost against required speed and risk tolerance to suggest the absolute best mode for the job.

02 **Can I use LTL-FTL Comparator if my shipment is very large or heavy?**

Yes. It handles large volumes of data, assessing both weight capacity and cubic meter utilization. You can run metrics on massive loads to ensure you're not overpaying for unused space.

03 **What does the break-even threshold mean in practice?**

The break-even point is the exact weight where switching from consolidated freight (LTL) to a dedicated truck (FTL) stops being more expensive and starts saving you money. It gives you clear financial data for scaling your shipments.

04 **Is this tool just for calculating costs, or does it consider speed?**

It considers everything. The recommendation tool factors in deadlines and risk tolerance alongside cost. This means if a cheap option is too slow or unsafe for your cargo, the MCP will warn you.

05 **Do I need to know my CBM before using LTL-FTL Comparator?**

Yes, volume (CBM) is critical. The tool calculates chargeable weight and utilization based on both weight and physical space, making sure your quotes are accurate for bulky items.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"ltl-ftl-comparator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

LTL-FTL Comparator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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Endpoint	`https://edge.vinkius.com/{token}/mcp`

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