MCP SERVER | NO CODE | CLOUD HOSTED

Geographic Distance Calculator MCP for AI Agents

Accurate Surveying and Geospatial Boundary Analysis

The Geographic Distance Calculator finds precise distances and bearings between any two points on Earth. It uses multiple established mathematical models—including Haversine, Vincenty, and Euclidean—to pinpoint locations accurately. Need to find a midpoint or map out a travel route? This MCP provides specialized tools for complex geospatial analysis, helping you define exact boundaries and calculate destination coordinates.

A+ Quality Score 100/100

distance | coordinates | latitude | longitude | haversine | vincenty

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vinkius.com/mcp/geographic-distance-calculator

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.

Geographic Distance Calculator MCP

5 tools available
Cloud-hosted on Vinkius

Calculating distances in the real world is more complicated than just pulling up two points on a map. You need precision that accounts for Earth's curvature and varying geometries. This MCP gives your AI client access to high-precision tools for solving complex geospatial problems. Instead of relying on rough estimates, you can calculate the distance between any coordinates using multiple models—Haversine, Vincenty, or Euclidean. Need to map a travel path? You can compute a destination point by specifying both the starting location and the required bearing and travel distance. It also helps you find the exact midpoint between two points or draw a bounding box around an area of interest. Vinkius hosts this MCP alongside thousands of others, giving your agent access to a complete set of professional-grade mapping utilities.

Core Capabilities

01 — Calculate distance using multiple models

Determines the exact separation between two geographic coordinates using Haversine, Vincenty, or Euclidean methods.

02 — Calculate a destination point

Figures out where you'll end up if you travel a specific distance from a starting point along a set bearing.

03 — Identify geographic center points

Pinpoints the mathematical midpoint between any two specified coordinates.

04 — Determine initial and final bearings

Calculates the precise compass bearing needed when moving from one point to another.

05 — Define service boundaries

Generates a defined rectangular area (bounding box) that encompasses a given radius around a central point.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/geographic-distance-calculator** — connect your AI agent in three steps.

01 Your AI client sends the MCP your starting coordinates and the type of calculation needed, like distance or bearing.

02 The MCP runs the specific geospatial math (e.g., Haversine formula) against the provided data points.

03 It returns a clear, precise result: whether that's a calculated distance in kilometers/miles, a new destination coordinate pair, or a defined bounding box.

The bottom line is your agent gets accurate, math-backed spatial measurements without you needing to run complex calculations manually.

Built For

This MCP is essential for anyone dealing with location data. Think field engineers who need to survey sites, logistics managers planning delivery routes, or analysts defining service territories. If your job involves 'where' and 'how far,' this tool belongs in your stack.

Civil Engineer

Uses the MCP to calculate precise distances between construction points or determine optimal placement for new utility lines.

Logistics Planner

Calculates accurate travel paths and midpoints between warehouses and client sites, ensuring optimized delivery routes.

Survey Analyst

Defines service areas using bounding boxes or determines the exact bearing required to move from a known point to an unknown target.

What Changes When You Connect

01 Instead of guessing the distance, use `calculate_distance` to measure separation using Haversine, Vincenty, or Euclidean models for maximum accuracy.

02 `compute_destination` lets your agent map out routes by giving you a starting point, bearing, and exact mileage without needing multiple calculations. It's instant route planning.

03 Need to define where a service area ends? Use `generate_bounding_box` to create precise rectangular boundaries around any radius, perfect for zoning or coverage mapping.

04 `get_midpoint` instantly finds the mathematical center between two points, which is critical when setting up neutral meeting locations or defining asset placement.

05 When planning a path, use `get_bearing_stats` to nail down both the initial and final compass bearings. This saves time figuring out directional changes in complex fields.

Real-World Applications

Defining a Service Area for Utility Mapping

A utility manager needs to define all properties within a 5-mile radius of a new substation. They ask their agent, and it uses `generate_bounding_box` to return the precise coordinates for that service zone, avoiding manual drawing errors.

Calculating Inter-City Logistics Distance

A logistics team needs to know the distance between two cities. They ask their agent and use `calculate_distance` with the Vincenty model, getting a highly accurate measurement for fuel consumption estimates that standard mapping tools miss.

Finding Optimal Meeting Points

Two field agents are in different parts of a county. They ask their agent to find the geographic midpoint using `get_midpoint` so they can schedule an equally accessible meeting spot for all stakeholders.

Mapping Out Navigation Waypoints

A hiker needs to plot a course 10 miles away from their current position at a 45-degree bearing. They ask their agent, and it uses `compute_destination` to provide the exact coordinates for the next waypoint.

Patterns to Avoid

Using rough distance estimates

✗ AVOID

A project manager asks their AI client what's 'about' 10 miles away, leading to ambiguous data that wastes time and money.

✓ INSTEAD

Instead of vague estimates, use `calculate_distance` with the Haversine model. This gives you a precise measurement for reliable planning and accurate reporting.

Confusing distance with bearing

✗ AVOID

A field team only knows they need to go 'roughly due north' but don't know how far or what the true compass heading is.

✓ INSTEAD

First, use `get_bearing_stats` to confirm the required initial and final bearings. Then, use those stats with a distance calculation to get concrete coordinates.

Trying to define an area by corners

✗ AVOID

An analyst manually draws four corner points on a map to simulate a radius check, which is inaccurate and time-consuming.

✓ INSTEAD

Use `generate_bounding_box`. You just give it the center point and the radius, and it outputs the perfect, mathematically correct boundary box.

The Right Fit

Use this MCP if your work requires rigorous spatial math. If you need to calculate distances between two points or find a precise midpoint, this is what you want. Use `calculate_distance` when distance accuracy matters more than anything else; it handles the complexity of Earth's curvature. Don't use it if you simply need turn-by-turn directions—those services are better for general navigation. If your goal is just to know 'which way,' then using

`get_bearing_stats` alone might be enough, but if you also need coordinates, stick with this MCP.

Geographic Distance Calculator: Precision Surveying and Mapping

Manual site surveying is tedious. You're stuck copying latitude/longitude pairs from one sheet to another, constantly checking if your calculations account for the Earth's curvature or if you used the right formula (Haversine vs. Vincenty). It’s slow, and a single decimal error can invalidate an entire project.

With this MCP, your agent takes coordinates and instantly runs them through multiple mathematical models. You get accurate distance measurements immediately—no more cross-referencing formulas or worrying about whether the math is sound.

Geographic Distance Calculator: Defining Operational Boundaries

Defining service areas used to mean drawing approximate shapes on paper. You'd calculate rough corners and accept that your boundaries weren't mathematically perfect, leading to coverage gaps or overlap issues.

Now, you simply tell the agent the center point and the required radius. The MCP uses `generate_bounding_box` to give you a perfectly defined rectangular area, ensuring your service map is precise down to the coordinate.

Geographic Distance Calculator: 5 Geospatial Calculation Tools

Use these tools to calculate precise distances, find midpoints, define service boundaries, or determine coordinates along a specific bearing.

#	TOOL	DESCRIPTION
01	`get_bearing_stats`	Calculates the precise starting and ending compass bearings between two geographic points.
02	`generate_bounding_box`	Creates a rectangular area that perfectly contains a circular zone defined by a center point and radius.
03	`compute_destination`	Determines the coordinates of an endpoint based on starting location, travel distance, and bearing.
04	`calculate_distance`	Finds the direct measured distance between two specified geographic points using three different mathematical models.
05	`get_midpoint`	Calculates the precise geometric center point that lies exactly halfway between two coordinates.

See It in Action

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

U What's the distance between our HQ (34.0522, -118.2437) and the client site at (37.7749, -122.4194)?

Distance Calculation Results

Based on your coordinates, here are three methods for estimating separation:

- **Haversine Model:** 560 km (or 348 miles)
- **Vincenty Model:** 561 km (most accurate for this span)
- **Euclidean Model:** 721 km (use only for flat-plane approximation)

U If we start at the depot and travel exactly 50 kilometers due east, where will we land?

Destination Coordinates Found

Starting Point: Latitude 34.1, Longitude -118.2
Travel Distance: 50 km
Bearing: 90 degrees (East)

Calculated Destination:
Latitude: 34.10
Longitude: -118.208 (This is your new waypoint).

U Find the exact center point between Miami and Tampa.

Midpoint Analysis

The geographic midpoint between those two locations is located at:

- Latitude: 27.5
- Longitude: -80.5

This spot represents the most balanced central location for your planning.

Frequently Asked Questions

01 **How can I use the Geographic Distance Calculator to plan a new supply route?**

It helps you calculate precise distances between all stops on your planned route, using models like Haversine or Vincenty. You also get bearings, so you always know exactly which direction and how far you're going at each leg of the journey.

02 **What is the best way to define a service area boundary?**

You use the bounding box tool. Instead of sketching corners, you provide a center point and a radius, and the MCP generates the mathematically perfect rectangular coordinates for that coverage zone.

03 **Does the Geographic Distance Calculator help with finding halfway points?**

Yes, it calculates the exact geographic midpoint between any two locations. This is useful when you need a neutral, equally accessible location for multiple parties or assets.

04 **Can I figure out where I'll end up if I travel a specific distance?**

Absolutely. By using the destination tool, you input your starting coordinates along with the bearing and desired mileage, and it tells you the exact latitude and longitude of that endpoint.

05 **Is this better than just using Google Maps for distances?**

This MCP provides raw mathematical data (Haversine/Vincenty models) directly. It gives you coordinates and angles, which is critical for engineering or surveying where the precise calculation method matters more than a visual route.

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 `"geographic-distance-calculator": { "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

Geographic Distance Calculator 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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