MCP SERVER | NO CODE | CLOUD HOSTED

ArcGIS MCP for AI Agents

Analyze Optimal Routes and Calculate Service Areas from Coordinates

ArcGIS MCP connects your AI client to professional-grade spatial analysis tools. Use this MCP to convert addresses into precise coordinates, calculate optimal routes for fleets, analyze service boundaries, and process massive batches of geographic data—all through natural conversation.

A+ Quality Score 100/100

spatial-analysis | mapping | geocoding | route-optimization | location-intelligence | geographic-data

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vinkius.com/mcp/arcgis

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.

ArcGIS MCP

10 tools available
Cloud-hosted on Vinkius

Stop switching between specialized GIS dashboards just to map a few points or check a delivery route. This MCP lets your AI agent handle all the complex location intelligence you need, right where you're working. You can use it to find the exact address closest to any given latitude and longitude pair, run batch geocoding on thousands of addresses at once, or solve multi-stop routes for your entire fleet.

Whether you’re optimizing logistics paths or defining market reach, this MCP gives your AI agent a full command center for spatial data. You connect your account through Vinkius, and suddenly, your AI client can calculate everything from drive-time service areas to complex origin-destination matrices, all based on simple instructions. It's like having an expert cartographer living inside your chat window.

Core Capabilities

01 — Calculate Service Areas

Determines the geographic boundaries reachable by car, foot, or distance from a specified facility.

02 — Geocode and Suggest Addresses

Uses autocomplete suggestions to help pinpoint valid addresses before converting text into precise coordinates.

03 — Batch Process Geocoding

Converts bulk lists of up to 1,000 raw street addresses into usable geographical coordinates in a single operation.

04 — Solve Complex Routes (Turn-by-Turn)

Calculates the most efficient driving route between multiple stops, providing detailed turn-by-turn directions and travel estimates.

05 — Optimize Fleet Deliveries

Solves Vehicle Routing Problems for entire fleets, finding the optimal sequence of stops to minimize total distance and time.

06 — Analyze Market Coverage Boundaries

Calculates specific drive-time or walk-time polygons that define a facility's effective service range.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/arcgis** — connect your AI agent in three steps.

01 Subscribe to the ArcGIS MCP and enter your API Key into Vinkius.

02 Connect this MCP to any compatible AI client (Claude, Cursor, etc.) through your preferred workflow.

03 Ask your agent questions like, 'What is the optimal route from Point A to B via C?' or 'Give me the service area around this warehouse.' The AI handles the rest.

The bottom line is that you get high-power geospatial data analysis without leaving your natural conversation flow.

Built For

This MCP is for anyone who deals with physical location data professionally. Think logistics managers needing to optimize delivery routes, real estate agents mapping out property value zones, or data scientists cleaning up large datasets of coordinates.

Logistics Manager

Optimizes daily truck routes and calculates the necessary service area for new depot locations.

Real Estate Agent

Runs batch geocodes on property listings to enrich them with hyper-local context and identify optimal neighborhoods.

Data Scientist

Cleans up messy coordinate data, resolving anomalies and calculating complex origin-destination matrices for models.

What Changes When You Connect

01 Batch processing of addresses: Don't copy-paste 100 lines. Use `batch_geocode_addresses` to convert up to 1,000 raw addresses into coordinates in one go.

02 Total route control: Instead of relying on separate mapping apps, use `solve_nav_route` to get detailed, turn-by-turn directions and travel time estimates directly from your chat window.

03 Logistics optimization: Run complex fleet planning using `solve_vehicle_routing` to minimize mileage and optimize stops for multiple vehicles simultaneously.

04 Market understanding: Determine a business's exact reach by calculating service areas with the `calculate_service_area` tool, showing drive-time polygons from any facility.

05 Data cleanup: Easily convert coordinates back into human-readable addresses using `reverse_geocode`, verifying location data instantly.

Real-World Applications

Optimizing a Delivery Route for 50 Stops

A logistics manager needs the best path visiting multiple warehouses. By feeding the stops into the agent and calling `solve_vehicle_routing`, they get an optimized, sequenced route that saves hours of driving time compared to manual planning.

Defining Retail Service Zones

A retail business wants to know how far customers can realistically travel from a new store location. They use the agent to calculate service areas with `calculate_service_area`, getting precise drive-time polygons for their pitch deck.

Validating Property Listings

A real estate agent receives 50 potential client addresses via email. Using `batch_geocode_addresses` allows them to instantly validate and convert every address into coordinates, ensuring accuracy before contacting the client.

Patterns to Avoid

Assuming simple point-to-point travel is enough

✗ AVOID

Trying to calculate a route for 15 stops by manually chaining multiple `find_address_candidates` calls together, resulting in an incomplete or unoptimized path.

✓ INSTEAD

For multi-stop trips, don't list them individually. Use the dedicated `solve_vehicle_routing` tool once, providing all stop details to let the MCP optimize the entire sequence for you.

Handling addresses with typos or partial names

✗ AVOID

Running a standard geocoding request on a misspelled address like 'New Yrok Street', which fails entirely and provides no useful data.

✓ INSTEAD

First, use `suggest_geocoding` to get autocomplete suggestions. The agent helps you select the correct option before you run the full conversion.

Forgetting regional boundaries when searching

✗ AVOID

Asking for 'Central Park coordinates' without specifying a country, which might return global results instead of the intended New York location.

✓ INSTEAD

Always use `find_address_country` to constrain your search. This ensures that even ambiguous place names resolve to the correct geographic region.

The Right Fit

Use this MCP if your job requires translating text addresses into precise coordinates, or if you need to calculate complex travel paths and service boundaries. Specifically, use it when optimizing multiple stops (use `solve_vehicle_routing`) or when processing large address lists (use `batch_geocode_addresses`). Don't use this if you simply need a map view of static points; your AI client handles the calculation *for* you. You shouldn't use it if all your data is already in perfect, clean coordinate format and you only need simple arithmetic on those numbers.

ArcGIS MCP for Geospatial Address Geocoding

Right now, validating a large list of addresses means opening the GIS dashboard, running one query, downloading the CSV, fixing errors manually, and repeating. It's a tedious cycle of copy-pasting data into specialized tools just to get clean latitude/longitude pairs.

With this MCP, you tell your agent, 'Geocode these 80 addresses.' The AI handles the entire workflow: it validates the names, converts them in bulk using `batch_geocode_addresses`, and returns a clean, structured list of coordinates—no dashboard switching required.

ArcGIS MCP for Route Optimization Logistics

Planning out a delivery route used to involve drawing lines on paper or loading the stops into a dedicated routing portal. You had to manually adjust the order and then re-calculate everything every time one stop changed.

Now, you simply ask your agent for the optimal path visiting multiple points. The MCP handles the complex calculations (like using `solve_vehicle_routing`), giving you the most efficient sequence, total mileage, and estimated travel time in a single response.

ArcGIS MCP: 10 Tools for Advanced Geospatial Analysis

Use these tools to perform advanced geographic computations like calculating service areas, resolving coordinates, and finding optimal routes.

#	TOOL	DESCRIPTION
01	`calculate_service_area`	Calculates the geographic area reachable from a facility based on drive time, walking distance, or travel distance.
02	`suggest_geocoding`	Provides autocomplete suggestions to help users select valid addresses before running a full coordinate conversion.
03	`batch_geocode_addresses`	Converts up to 1000 raw street addresses into coordinates using an ArcGIS-compatible JSON array format.
04	`solve_nav_route`	Finds the best turn-by-turn driving route between two or more specified points, including distance and time estimates.
05	`find_address_country`	Locates an address while ensuring results are geographically bounded to a specific country (e.g., USA, France).
06	`find_address_candidates`	Turns general text addresses or place names into precise latitude and longitude coordinates using the ArcGIS Geocoding service.
07	`calculate_od_matrix`	Computes a cost matrix detailing travel time and distances between multiple designated starting points and ending points.
08	`reverse_geocode`	Takes coordinates (lon,lat) and returns the nearest physical street address associated with that location.
09	`solve_vehicle_routing`	Solves complex Vehicle Routing Problems for an entire fleet using a detailed ArcGIS Orders JSON mapping string.
10	`suggest_location_bias`	Provides autocomplete suggestions that are weighted toward a specific, user-defined geographic area.

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 best driving route to hit these three client sites today?

Optimal Route Calculated

- **Total Distance:** 68 miles
- **Estimated Time:** 2 hours, 15 minutes

Stops Order:

1. Start at (34.05,-117.19)
2. Head North to Stop A: (34.10,-117.25). Travel time: 22 mins.
3. Continue East to Stop B: (34.08,-117.10). Travel time: 18 mins.
4. Finish at Stop C: (34.02,-116.95). Travel time: 35 mins.

U I need to know the service area around our new warehouse location.

Service Area Analysis Complete

Based on a maximum 20-minute drive time from (40.78,-73.96), your facility can effectively cover an area with these approximate boundaries:

- **North Limit:** 41.5 degrees latitude
- **South Limit:** 39.5 degrees latitude
- **East Limit:** -72.0 degrees longitude
- **West Limit:** -76.0 degrees longitude

This polygon represents the maximum reach for your team.

U Find the coordinates and address details for 'Downtown Office' in Miami.

Location Found!

The best candidate location is:
- **Address:** 123 Ocean Dr, Miami, FL 33139
- **Coordinates:** (25.76,-80.13)

We also ran a reverse geocode check on these coordinates and confirmed the nearest intersection is near Biscayne Blvd.

Frequently Asked Questions

01 **How does the ArcGIS MCP help me find service areas for my business?**

This MCP calculates precise drive-time or walk-time polygons from a central facility. You tell your agent where you are, and it maps out exactly what area is reachable within a set time limit, helping you define market boundaries.

02 **What if I have hundreds of addresses to convert? Can the ArcGIS MCP handle that?**

Yes. You can use the batch geocoding capability to process up to 1,000 addresses in a single request. This saves you massive amounts of time compared to manual lookups.

03 **Can I calculate the most efficient route for my delivery fleet?**

Absolutely. The MCP solves Vehicle Routing Problems (VRP), optimizing the entire sequence of stops for your vehicles so you minimize total travel distance and time, which is crucial for logistics.

04 **I just have a coordinate pair; how do I find out what street address it belongs to?**

You can use reverse geocoding. Simply provide the latitude and longitude coordinates to your agent, and it will return the closest physical street address associated with that exact point.

05 **Is this MCP better than using a standalone mapping website?**

Yes. The advantage of integrating this into an AI client is control and context. You get the powerful calculations—like origin-destination matrices—without leaving your conversation flow or switching tabs.

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 `"arcgis": { "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

ArcGIS 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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