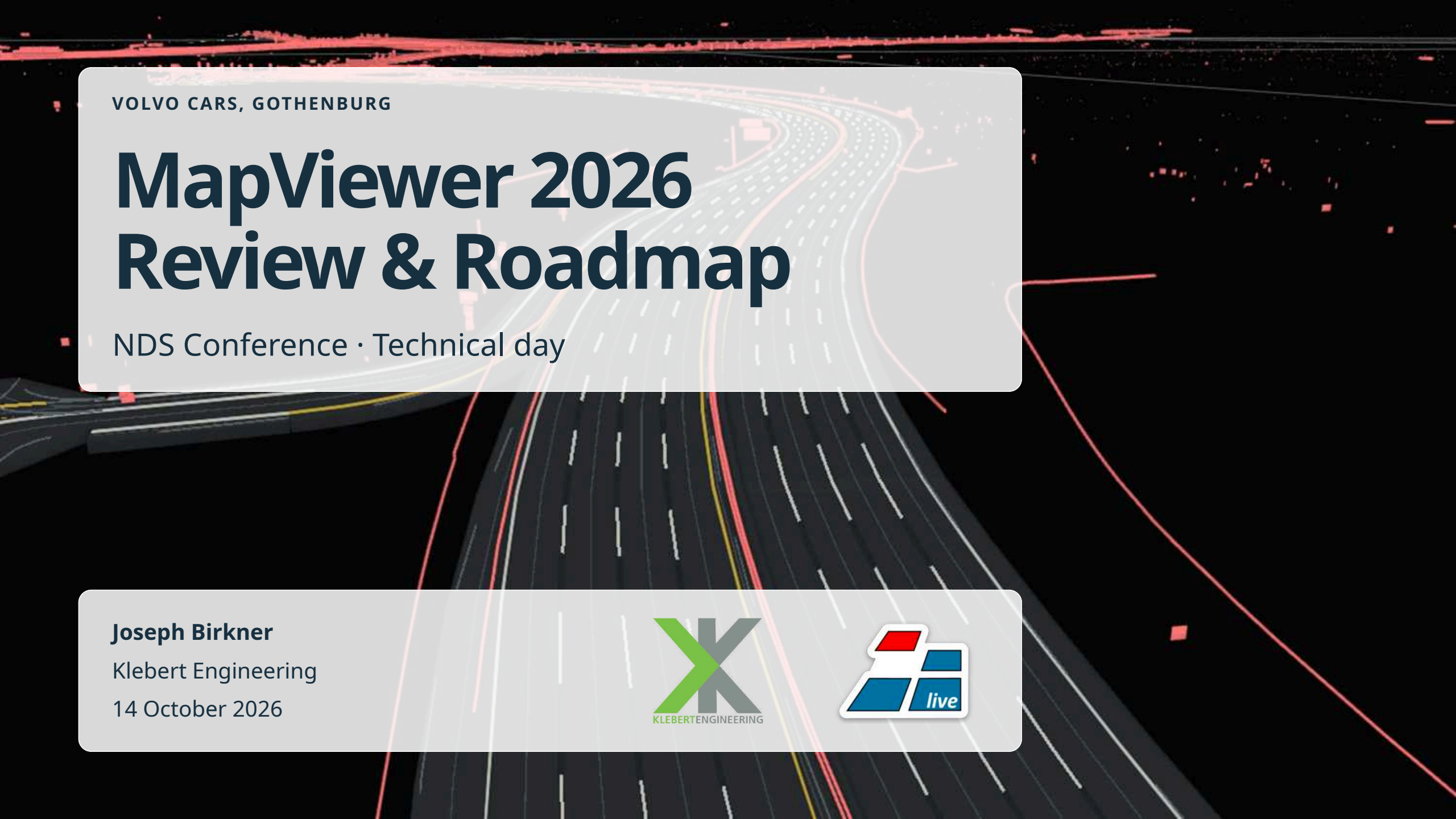


VOLVO CARS, GOTHENBURG

MapViewer 2026 Review & Roadmap

NDS Conference · Technical day

Joseph Birkner
Klebert Engineering
14 October 2026

MapViewer: 2026 review and roadmap

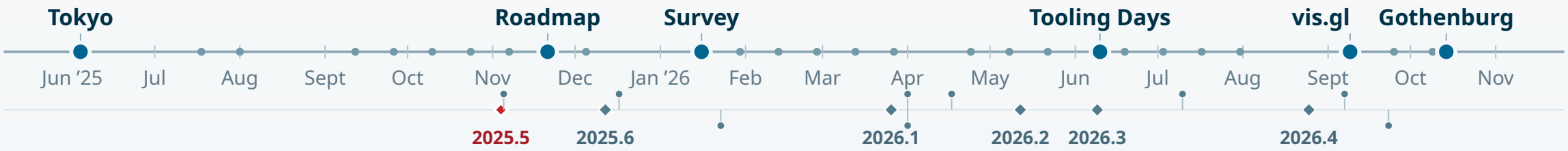
01 **A year of feedback**
Roadmap, survey, Tooling Community, Tooling Days and vis.gl

02 **Project activity**
Usage, downloads, issues, releases and commits

03 **Ten features, in the viewer**
Live examples and implementation details

04 **What comes next?**
Remaining 2026 releases, 2027 ideas and discussion

2026: conference to conference



MapViewer 2025.5.0
4 Nov 2025

Split-screen views · multiple inspectors · per-layer style options

JUNE 2025 — OCTOBER 2026

From Tokyo to Gothenburg

Roadmap discussions, survey results, regular meetings and hands-on workshops.

Tokyo — Gothenburg

26 Tooling Community

58 Tooling Board

Documented meetings between the conferences

Overview | 2025.5 | Roadmap | 2025.6 | Survey | 2026.1 | 2026.2 | 2026.3 | Community | Tooling Days | 2026.4 | vis.gl | Projects | Today

4 June 2025–14 October 2026 · Upper lane: events / meetings. Lower lane: releases (diamonds) / patches (dots), from 2025.5.

2026: conference to conference



MapViewer 2025.5.0
4 Nov 2025

Split-screen views · multiple inspectors · per-layer style options

4 NOVEMBER 2025

MapViewer 2025.5

- Split-screen views
- Multiple inspection panels
- Per-layer style options

FOLLOW-UP RELEASE

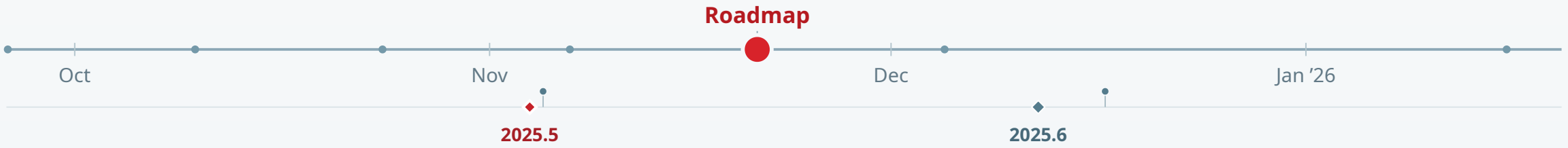
2025.5.1 5 Nov

Jump-to-feature and focus-on-feature fixes.

Overview | 2025.5 | Roadmap | 2025.6 | Survey | 2026.1 | 2026.2 | 2026.3 | Community | Tooling Days | 2026.4 | vis.gl | Projects | Today

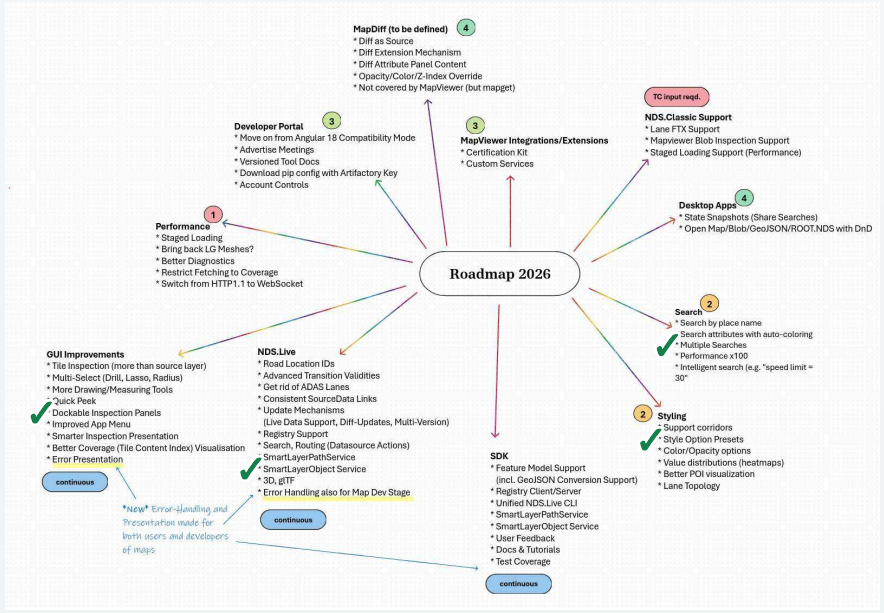
Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

2026: conference to conference



MapViewer 2025.5.0
4 Nov 2025

Split-screen views · multiple inspectors · per-layer style options



21 NOVEMBER 2025

Initial roadmap ideas

- ✓ Dockable inspection panels
  2026.1
- ✓ Multiple searches
  2026.3
- ✓ Style option presets
  2026.4
- ✓ SmartLayerObjectService
  2026.4.2

Roadmap first discussed on 21 November 2025 · Selected implemented items marked.

2026: conference to conference



MapViewer 2025.6.0
12 Dec 2025

Rewritten docs · integration tests · tile-cache expiry

12 DECEMBER 2025

MapViewer 2025.6

- Rewritten documentation
- Browser integration tests
- Tile-cache expiry

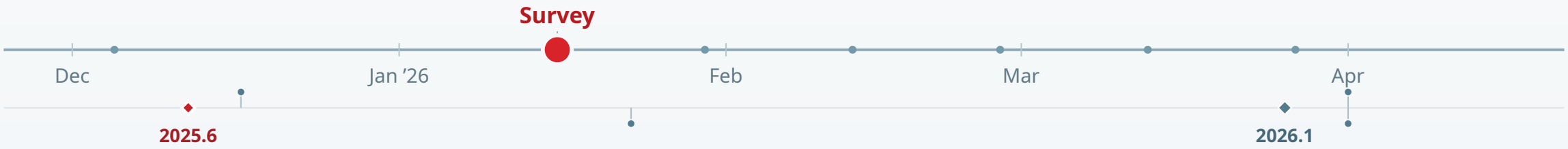
FOLLOW-UP RELEASES

2025.6.1 17 Dec
HTTP authentication configuration-schema fixes.

2025.6.2 23 Jan 2026
GeoJSON manifests for converter output; richer JSONL tile metadata.

Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

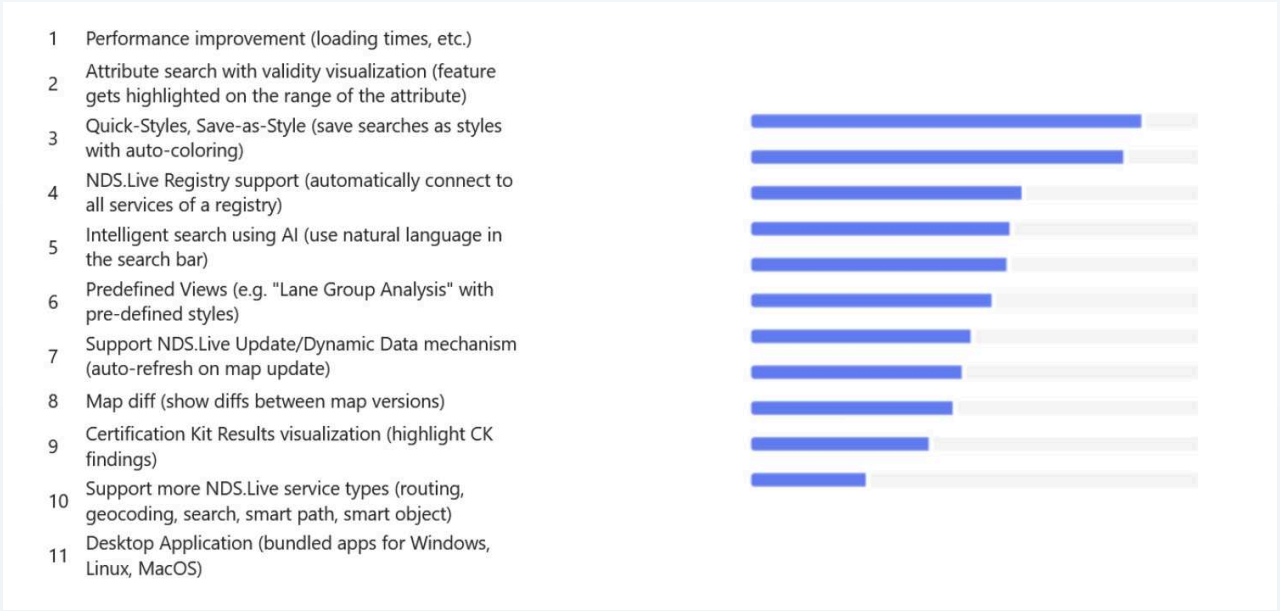
2026: conference to conference



MapViewer 2025.6.0

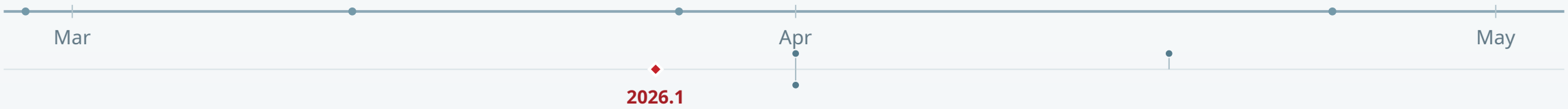
12 Dec 2025

Rewritten docs · integration tests · tile-cache expiry



Tooling Community, 16 January 2026, slide 6 · Published ranking; no vote counts or sample size reported.

2026: conference to conference



MapViewer 2026.1.0
26 Mar 2026

deck.gl renderer · dockable inspectors · pip-based setup

26 MARCH 2026

MapViewer 2026.1

- deck.gl renderer
- Dockable inspection panels
- pip / Python setup

FOLLOW-UP RELEASES

2026.1.1 1 Apr

Lane-group topology toggle; inspection and rendering fixes.

2026.1.2 1 Apr

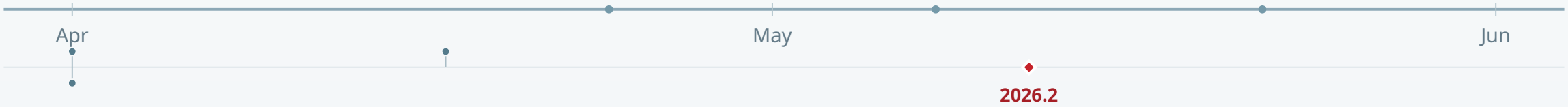
Road/ADAS inspection and merged-point visibility fixes.

2026.1.3 17 Apr

Podman support; April schemas and topology-only road decoding.

Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

2026: conference to conference



MapViewer 2026.2.0
12 May 2026

3D display meshes · satellite imagery · dynamic GeoJSON

12 MAY 2026

MapViewer 2026.2

- 3D Display meshes
- Satellite imagery
- Dynamic GeoJSON

3D context

Display geometry and imagery alongside the road and lane model.

Overview | 2025.5 | Roadmap | 2025.6 | Survey | 2026.1 | 2026.2 | 2026.3 | Community | Tooling Days | 2026.4 | vis.gl | Projects | Today

Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

2026: conference to conference



MapViewer 2026.3.0
9 Jun 2026

Search 2.0 · multiple searches · schemas and heatmaps

9 JUNE 2026

MapViewer 2026.3

- Search 2.0
- Multiple search sessions
- Schema completion and heatmaps

FOLLOW-UP RELEASE

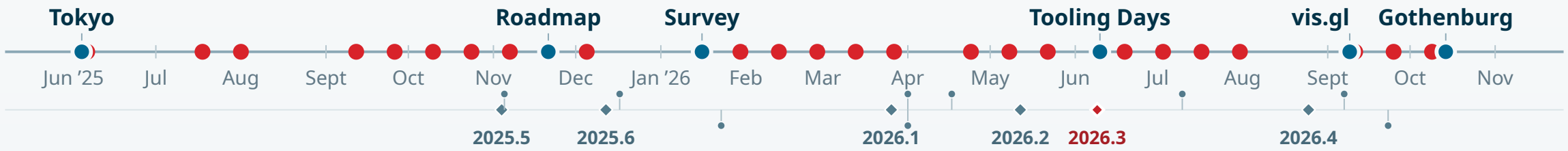
2026.3.1 10 Jul

Independent datasource startup and loading status.

Smarter nested-value inspection, search import and HTTP/2 transport.

Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

2026: conference to conference



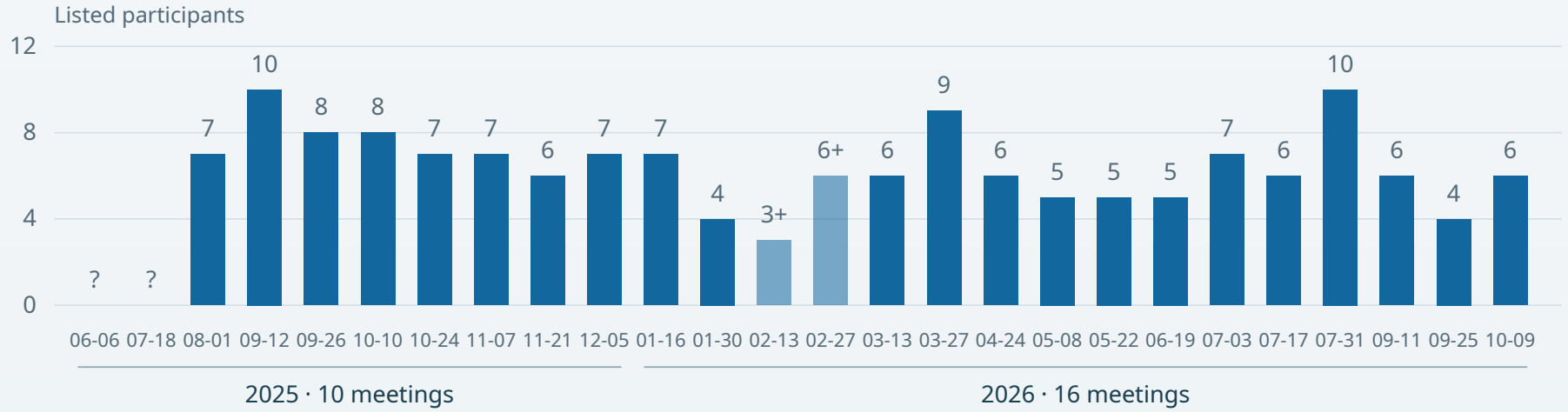
MapViewer 2026.3.0
9 Jun 2026

Search 2.0 · multiple searches · schemas and heatmaps

JUNE 2025 — OCTOBER 2026

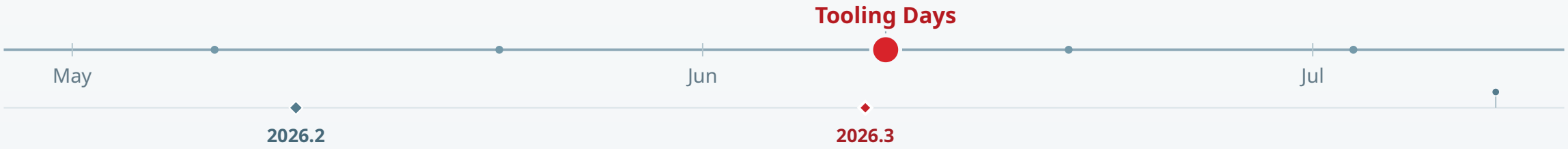
Tooling Community

26 community meetings
plus **58 Tooling Board meetings**



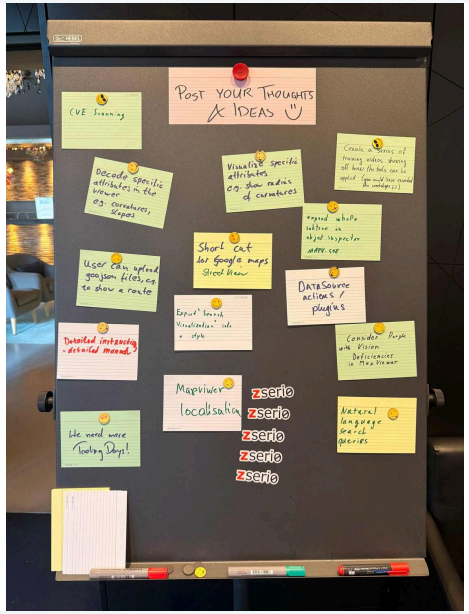
26 community records + 58 Tooling Board/Weekly records · ? no attendee list; + incomplete list. At least 155 recorded attendances.

2026: conference to conference



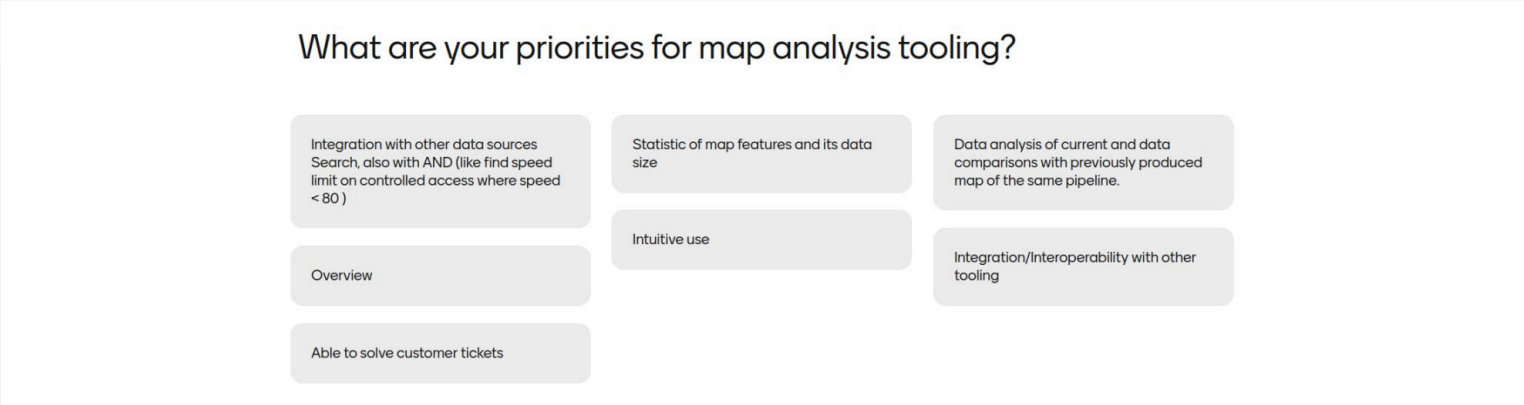
MapViewer 2026.3.0
9 Jun 2026

Search 2.0 · multiple searches · schemas and heatmaps



10–11 JUNE 2026 · GRÖBENZELL

Hands-on feedback



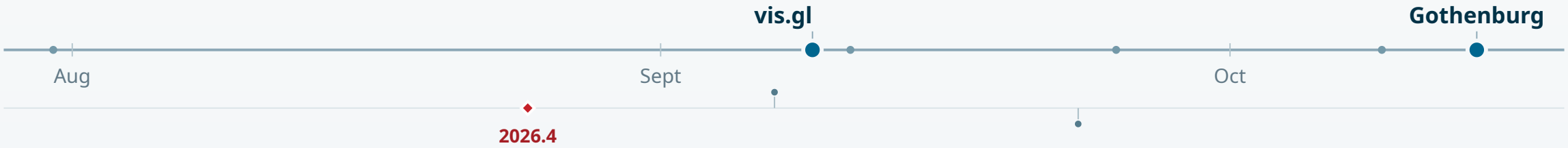
✓ Open in Street View

✓ Inspection without color alone

Overview · 2025.5 · Roadmap · 2025.6 · Survey · 2026.1 · 2026.2 · 2026.3 · Community · Tooling Days · 2026.4 · vis.gl · Projects · Today

Tooling Days, 10–11 June 2026 · Participant feedback and map-analysis priorities.

2026: conference to conference



MapViewer 2026.4.0
25 Aug 2026

Server-side subsets · geometry-aware navigation · hover labels

25 AUGUST 2026

MapViewer 2026.4

- Server-side subsets
- Geometry-aware 3D navigation
- Drill-picking and hover controls

FOLLOW-UP RELEASES

2026.4.1 7 Sep

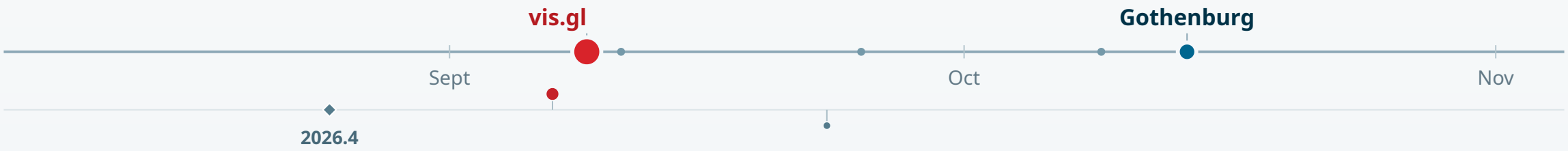
NDS.Live July schemas; streaming, inspection and highlight fixes.

2026.4.2 23 Sep

SmartLayerObjectService and point clouds; embedded presentation controls.

Published MapViewer bundle releases · diamonds: initial releases; dots: patches · GitHub publication dates.

2026: conference to conference



MapViewer 2026.4.1
7 Sept 2026

NDS.Live July schemas · streaming, inspection and highlight fixes



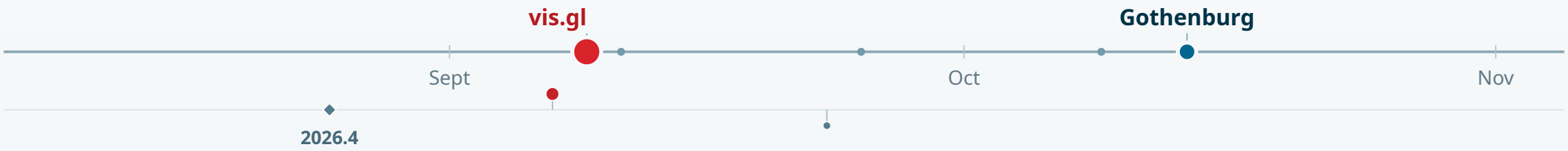
9–10 SEPTEMBER 2026 · ZÜRICH

The wider visualization community

How do other projects solve the same visualization problems?

Open Visualization / vis.gl Summit, 9–10 September 2026 · ETH Zürich.

2026: conference to conference



MapViewer 2026.4.1
7 Sept 2026

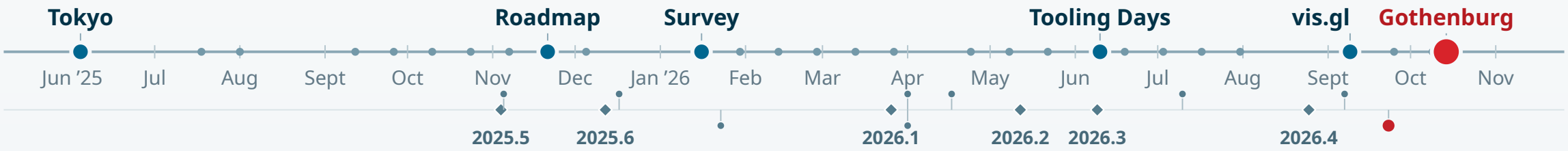
NDS.Live July schemas · streaming, inspection and highlight fixes

Project	Technical approach	Relevant to MapViewer
kepler.gl	Layers, spatial bins, heatmaps	Immediate visual exploration
CARTO	Warehouse queries → tiled layers	Reduce data near the source
SQLRooms	React + in-browser DuckDB	Composable analysis panels
Foursquare Spatial Desktop	SQLRooms + kepler.gl + DuckDB	Web components in a local application
CesiumJS	Globe, terrain, 3D Tiles	Streamed detail and global 3D context

Our assessment: domain-specific styling is state of the art.
Next: more GPU-side filtering and aggregation.

Project names link to technical documentation · GPU work still requires measured transfer and precision trade-offs.

2026: conference to conference



MapViewer 2026.4.2
23 Sept 2026

SmartLayerObjectService · point clouds · presentation embedding

14 OCTOBER 2026 · VOLVO CARS

Back together in Gothenburg

A review of the implementation and a discussion of what comes next.

2026

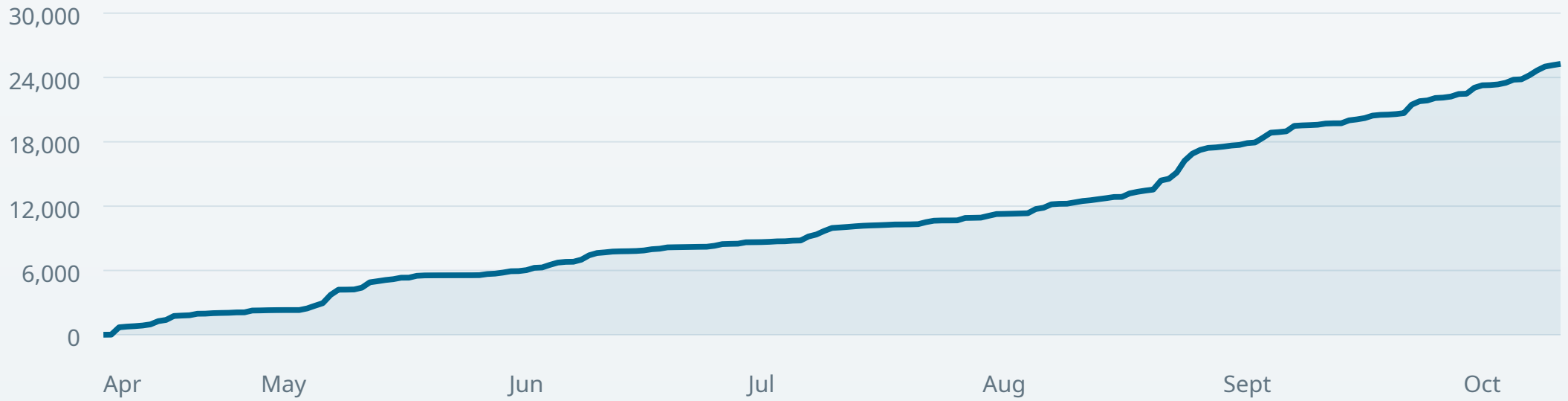
NDS Conference · Technical day

Overview 2025.5 Roadmap 2025.6 Survey 2026.1 2026.2 2026.3 Community Tooling Days 2026.4 vis.gl Projects Today

MapViewer downloads

01 · PyPI cumulative | 02 · PyPI per day | 03 · Community image | 04 · Member image

25,269 PyPI downloads in total · 8 April – 11 October 2026



nds-mapviewer · Cumulative daily observations · known mirrors excluded

PyPI: 8 April–11 October 2026 · Artifactory retained manifest-request counters, snapshot 12 October. Downloads are not unique users.

MapViewer downloads

25,269 PyPI downloads in total · 8 April – 11 October 2026



nds-mapviewer · Downloads per day · no smoothing · known mirrors excluded

PyPI: 8 April–11 October 2026 · Artifactory retained manifest-request counters, snapshot 12 October. Downloads are not unique users.

MapViewer downloads

Community Docker image

8,999

retained image-manifest requests

PyPI: 8 April–11 October 2026 · Artifactory retained manifest-request counters, snapshot 12 October. Downloads are not unique users.

MapViewer downloads

Member Docker image

3,003

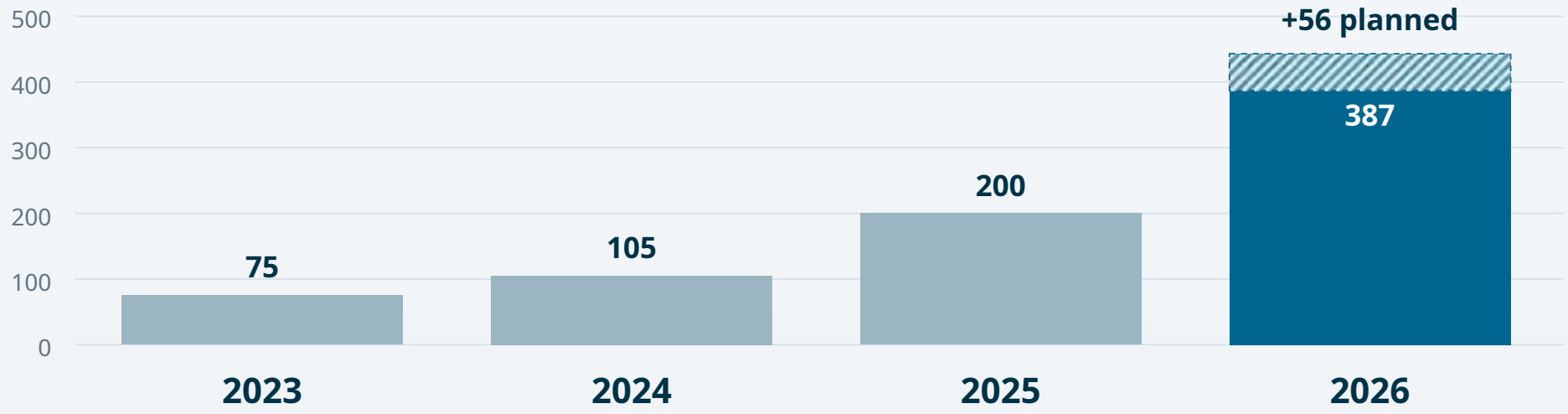
retained image-manifest requests

PyPI: 8 April–11 October 2026 · Artifactory retained manifest-request counters, snapshot 12 October. Downloads are not unique users.

Development activity

01 · Tickets by year | 02 · Excluding Bug | 03 · Source-line history

767 resolved tickets · 2023–13 October 2026



2026 **Full adoption of agentic development**

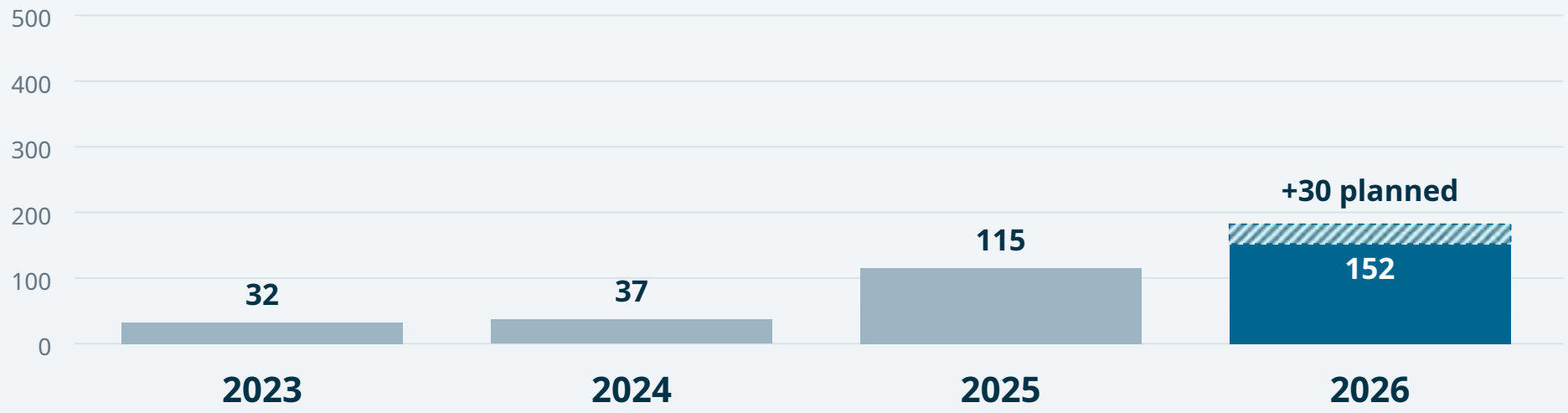
Solid: resolved · Hatched: assigned 2026 work · 2026 year to date

YouTrack MAPV / ERD / MAPGET · 13 October 2026 · Resolutions, not shipped features. Planned work is assigned scope.

Development activity

01 · Tickets by year | **02 · Excluding Bug** | 03 · Source-line history

336 resolved tickets · Bug excluded



2026 **Full adoption of agentic development**

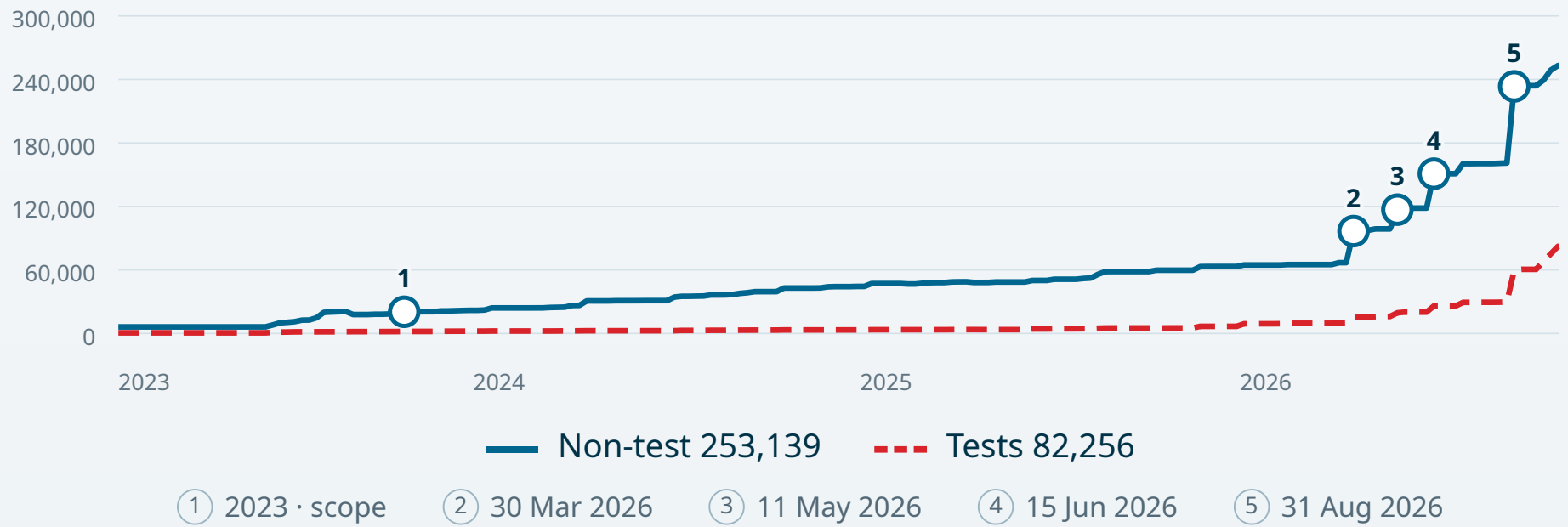
Solid: resolved · Hatched: assigned 2026 work · 29 untyped resolutions retained

YouTrack MAPV / ERD / MAPGET · 13 October 2026 · Resolutions, not shipped features. Planned work is assigned scope.

Development activity

01 · Tickets by year 02 · Excluding Bug **03 · Source-line history**

335,395 source lines · weekly snapshots · 2023–13 October 2026



① 2023 · scope ② 30 Mar 2026 ③ 11 May 2026 ④ 15 Jun 2026 ⑤ 31 Aug 2026

Steps mark release-branch integration, not one week's coding. Dependencies and generated code excluded.

MapViewer · erdblick · mapget · simfil · LiveSource · ClassicSource · Pinned release-integration histories; source size, not productivity.

10

2026 RETROSPECTIVE

The 10 greatest MapViewer improvements of 2026

10

10TH PLACE

Documentation, tests and setup

10 · Setup

terminal

```
$ pip install ndslive-setup

Install the setup wizard
ndslive-setup
Configure registry and package access
Select Community or Member edition
```

1 · Access 2 · Install 3 · Run

Before you start

- Python
- Docker or Podman
- NDS registry access

The CLI owns the backend container.
erdblick runs in your browser.

Docker/Podman and registry access are prerequisites. nds-mapviewer · erdblick documentation

10 · Setup

terminal

```
$ pip install nds-mapviewer

Install the MapViewer CLI
Docker / Podman runs the backend
Configuration and container lifecycle
remain under the CLI's control
```

1 · Access 2 · Install 3 · Run

Before you start

- Python
- Docker or Podman
- NDS registry access

The CLI owns the backend container.
erdblick runs in your browser.

Docker/Podman and registry access are prerequisites. nds-mapviewer · erdblick documentation

10 · Setup

terminal

```
$ mapviewer --demo

Load the sample configuration
Start the viewer container
Open erdblick in your browser
Ctrl+C stops the owned container
```

1 · Access 2 · Install 3 · Run

Before you start

- Python
- Docker or Podman
- NDS registry access

The CLI owns the backend container.
erdblick runs in your browser.

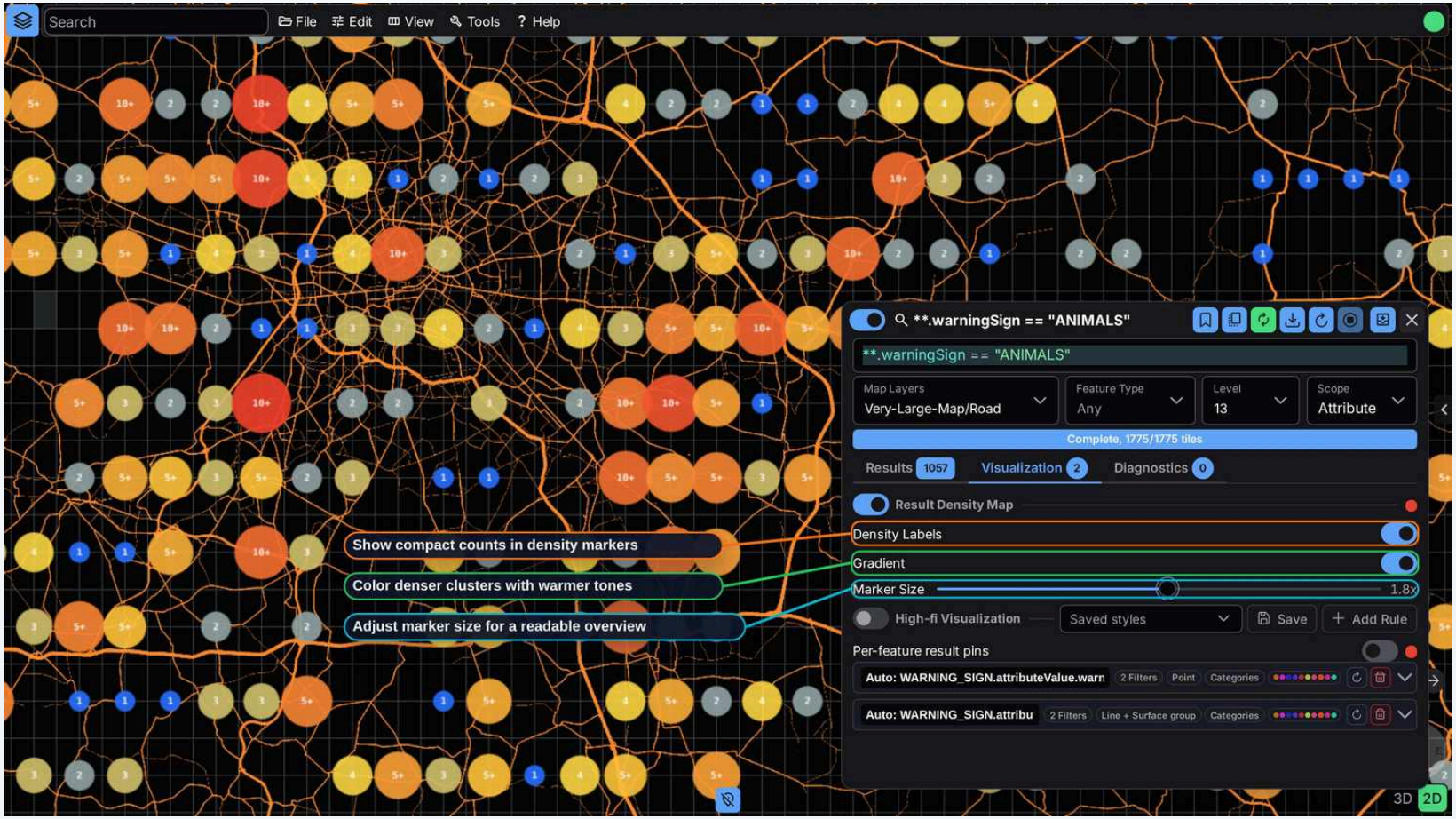
Docker/Podman and registry access are prerequisites. nds-mapviewer · erdblick documentation

10 · Documentation with reproducible examples

133 browser scenarios

88 documentation screenshots

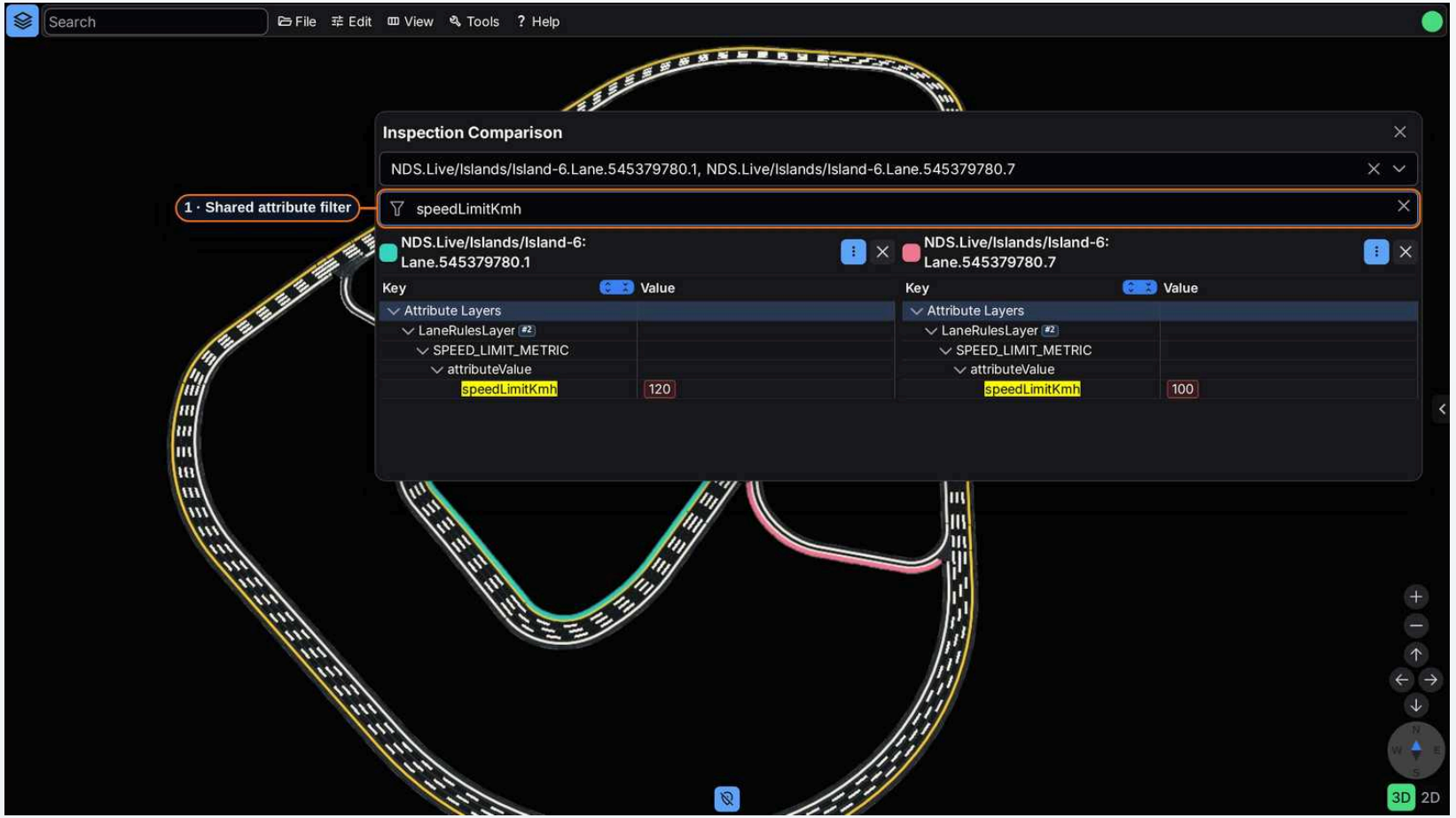
3 browser engines



MapViewer + erdblick suites · scenarios counted once, not once per browser · PNG documentation images, excluding visual baselines

10 · Documentation with reproducible examples

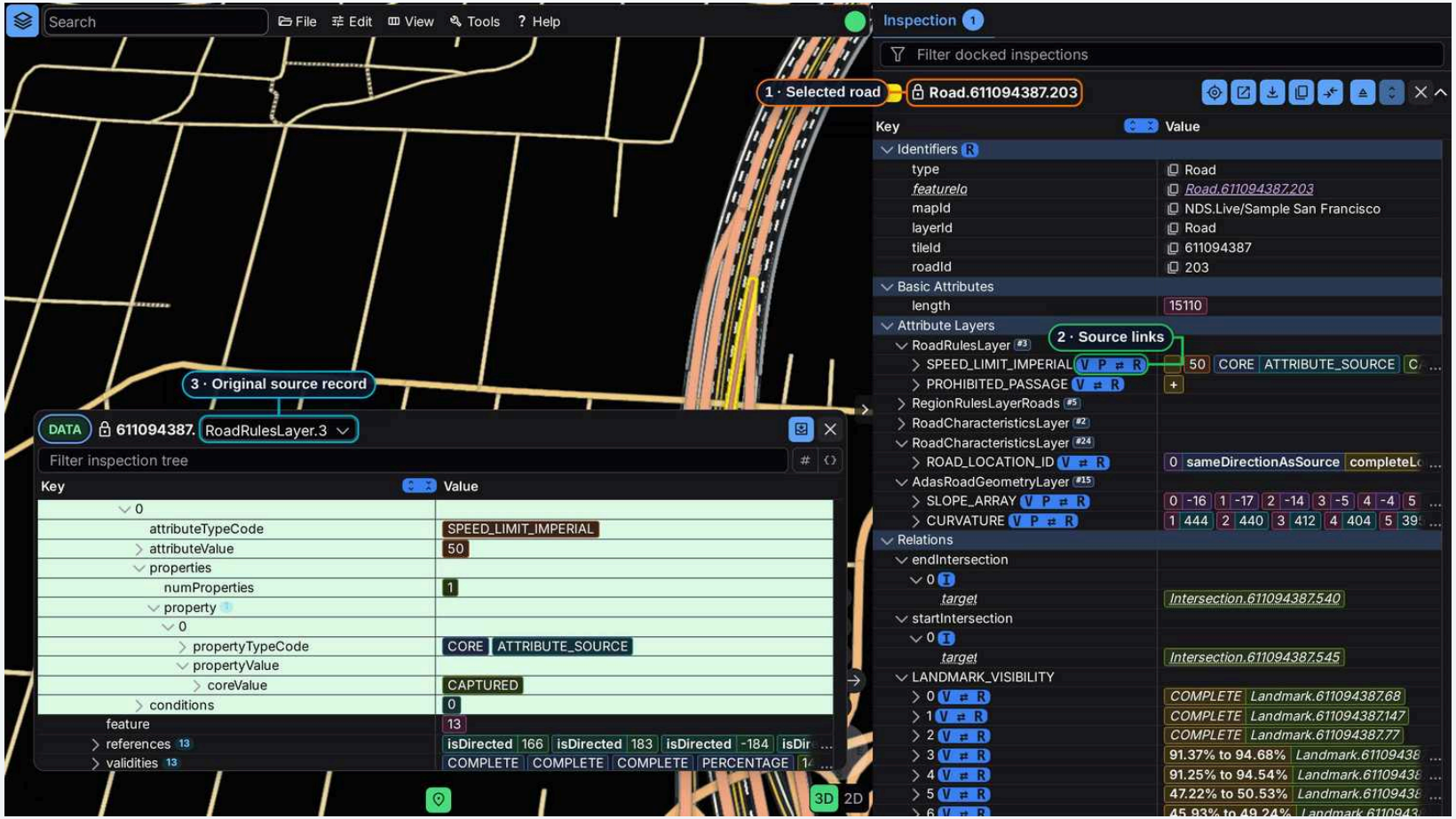
133 browser scenarios **88** documentation screenshots **3** browser engines



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10 · Documentation with reproducible examples

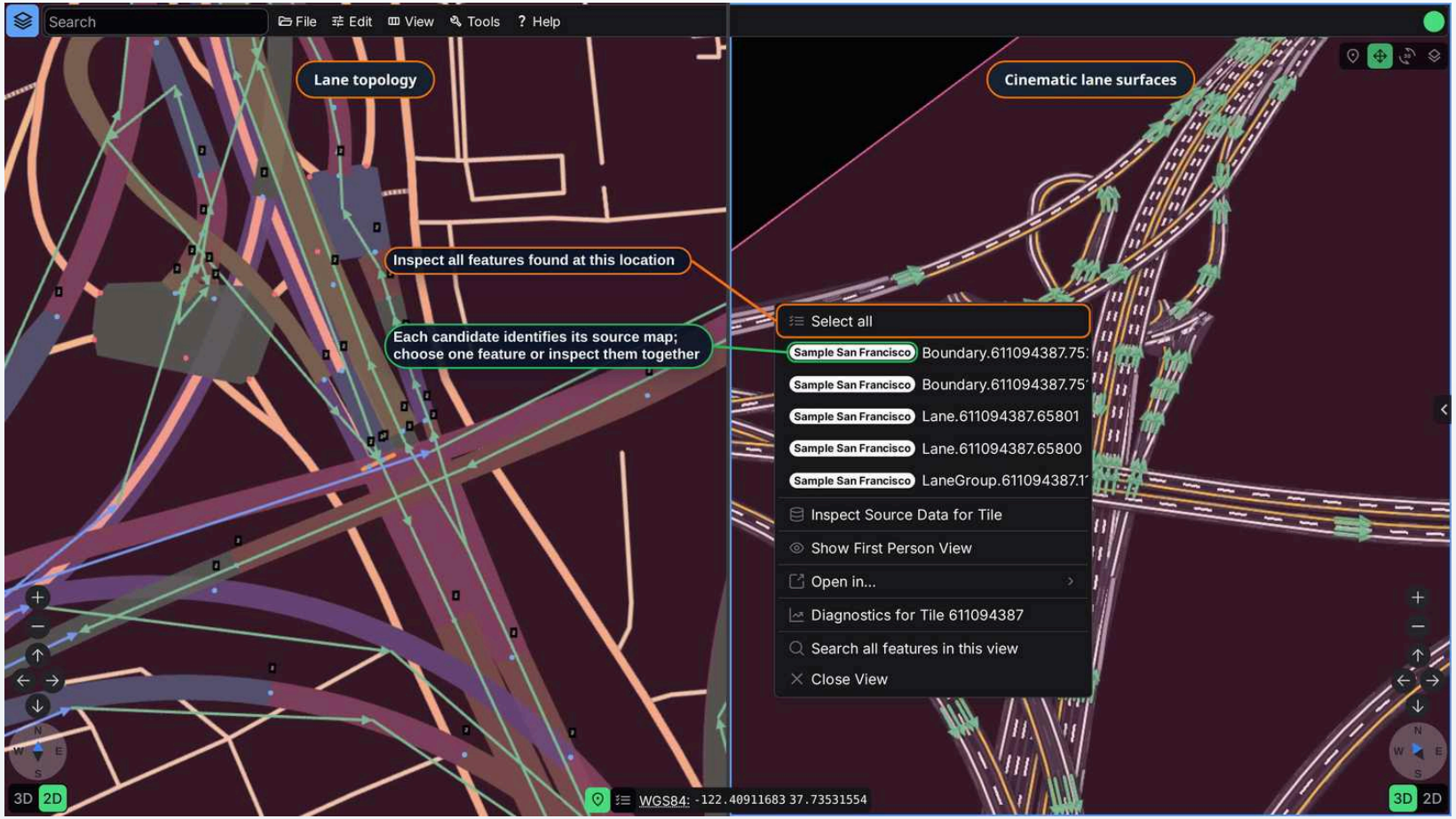
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MapViewer + erdblick suites · scenarios counted once, not once per browser · PNG documentation images, excluding visual baselines

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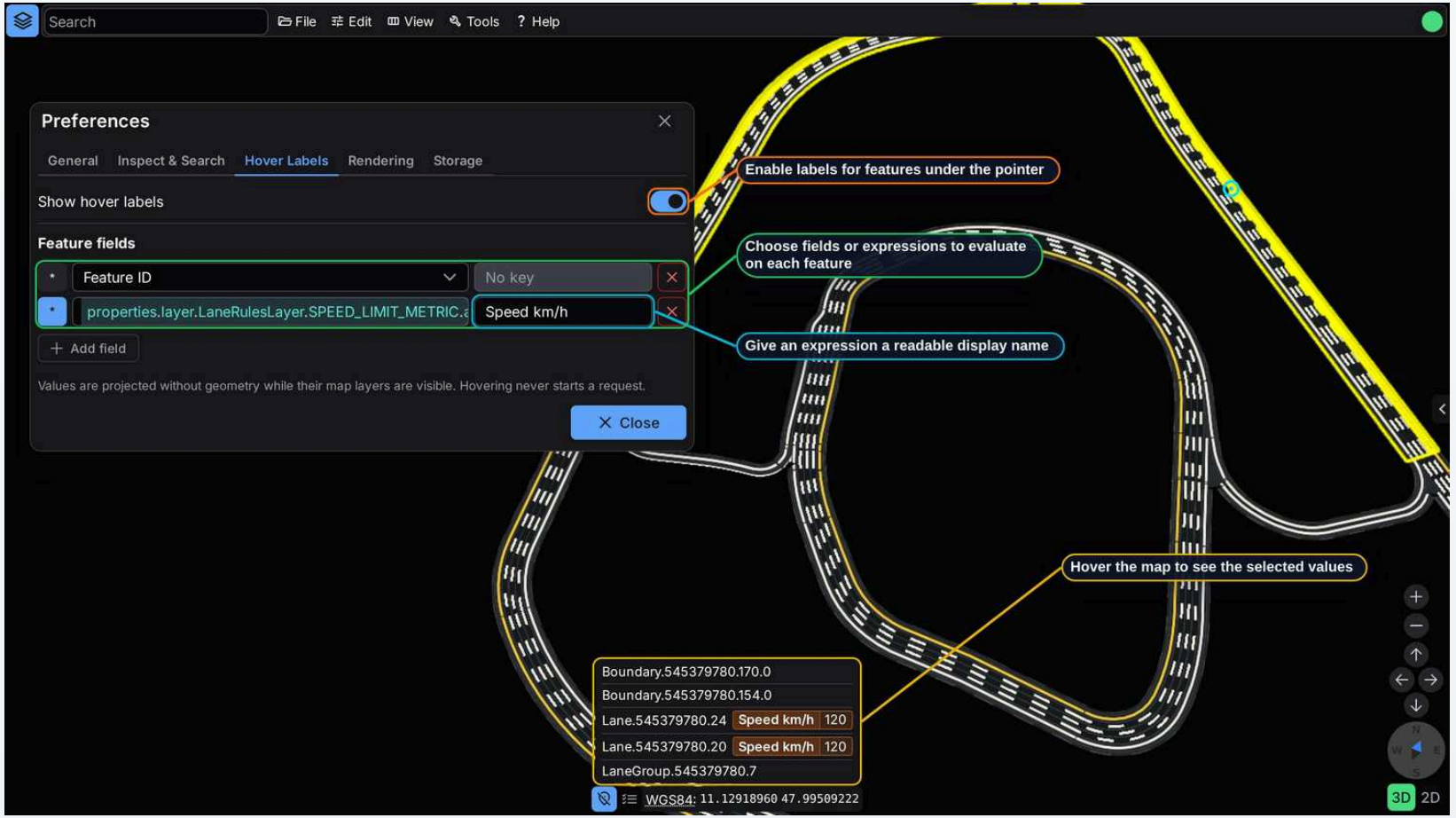
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MapViewer + erdblick suites · scenarios counted once, not once per browser · PNG documentation images, excluding visual baselines

10 · Documentation with reproducible examples

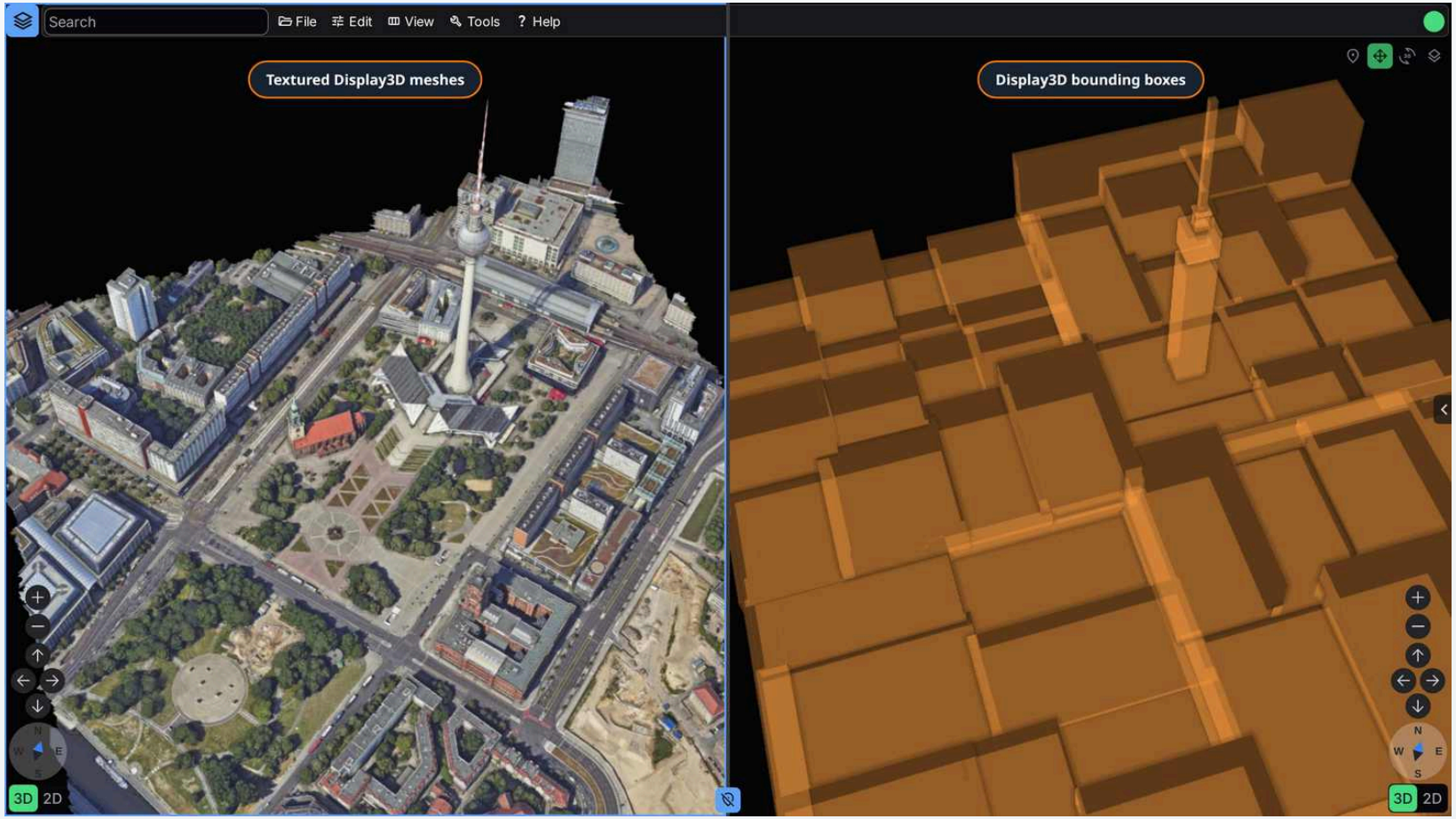
133 browser scenarios **88** documentation screenshots **3** browser engines



MapViewer + erdblick suites · scenarios counted once, not once per browser · PNG documentation images, excluding visual baselines

10 · Documentation with reproducible examples

133 browser scenarios **88** documentation screenshots **3** browser engines



MapViewer + erdblick suites · scenarios counted once, not once per browser · PNG documentation images, excluding visual baselines



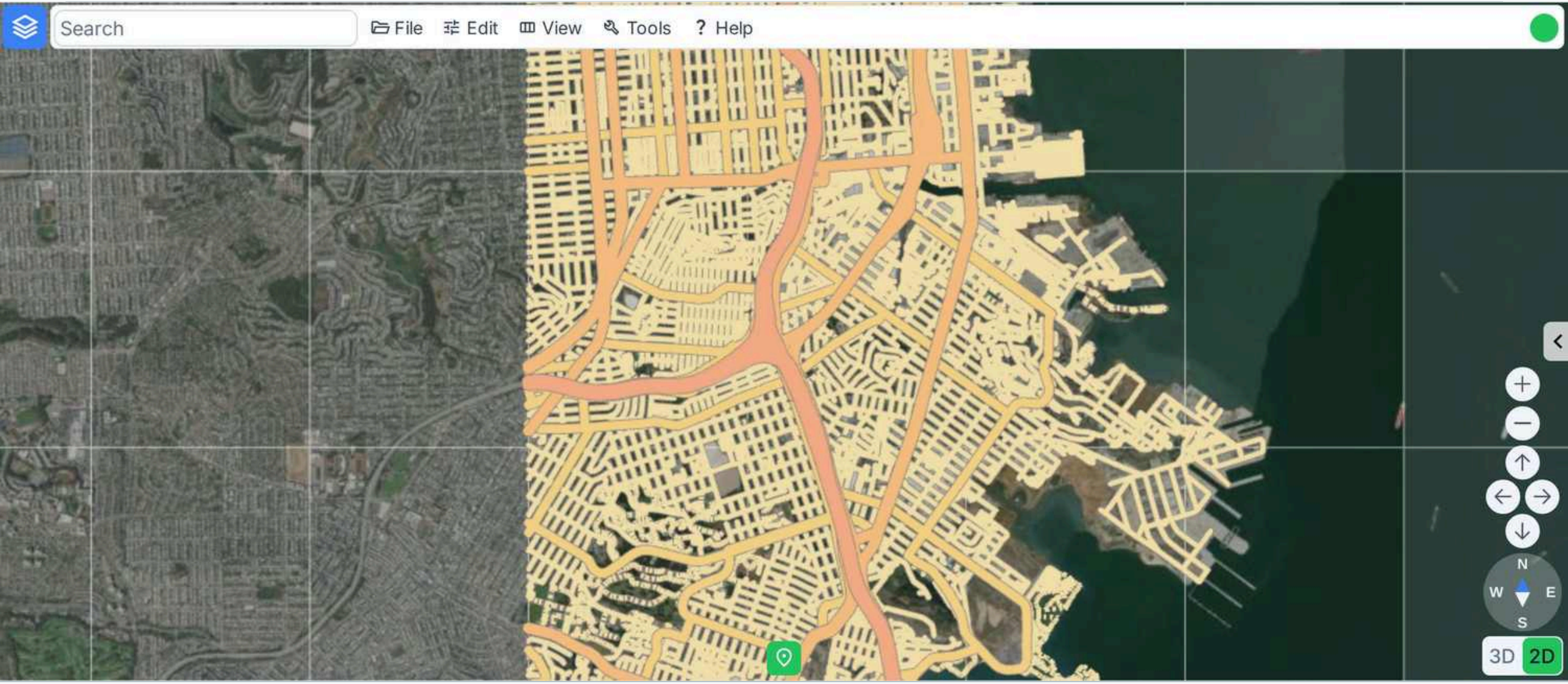
9TH PLACE

Viewer UI, grid and backgrounds

9 · UI, place search, grid and backgrounds

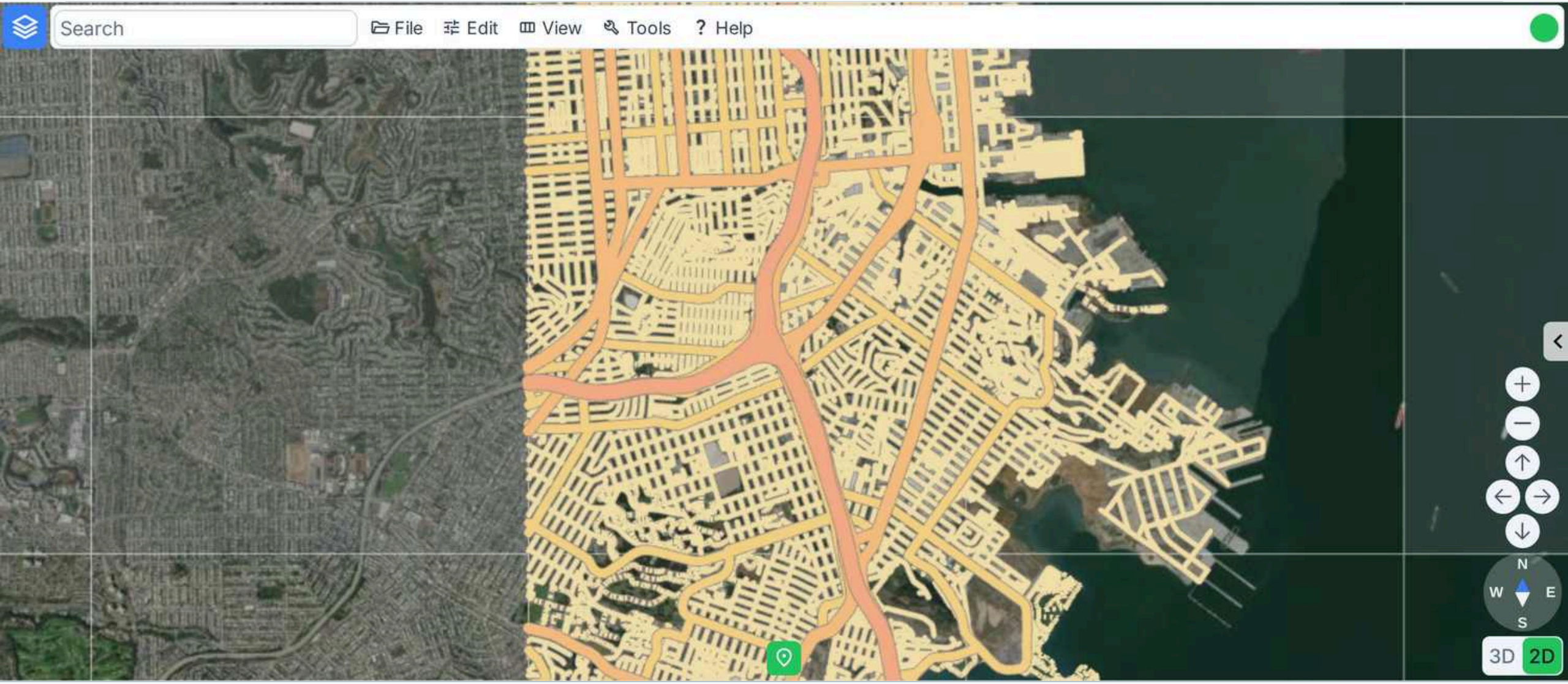
Open viewer ↗

San Francisco · NDS grid › San Francisco · XYZ grid › Munich · backgrounds and place search



9 · UI, place search, grid and backgrounds

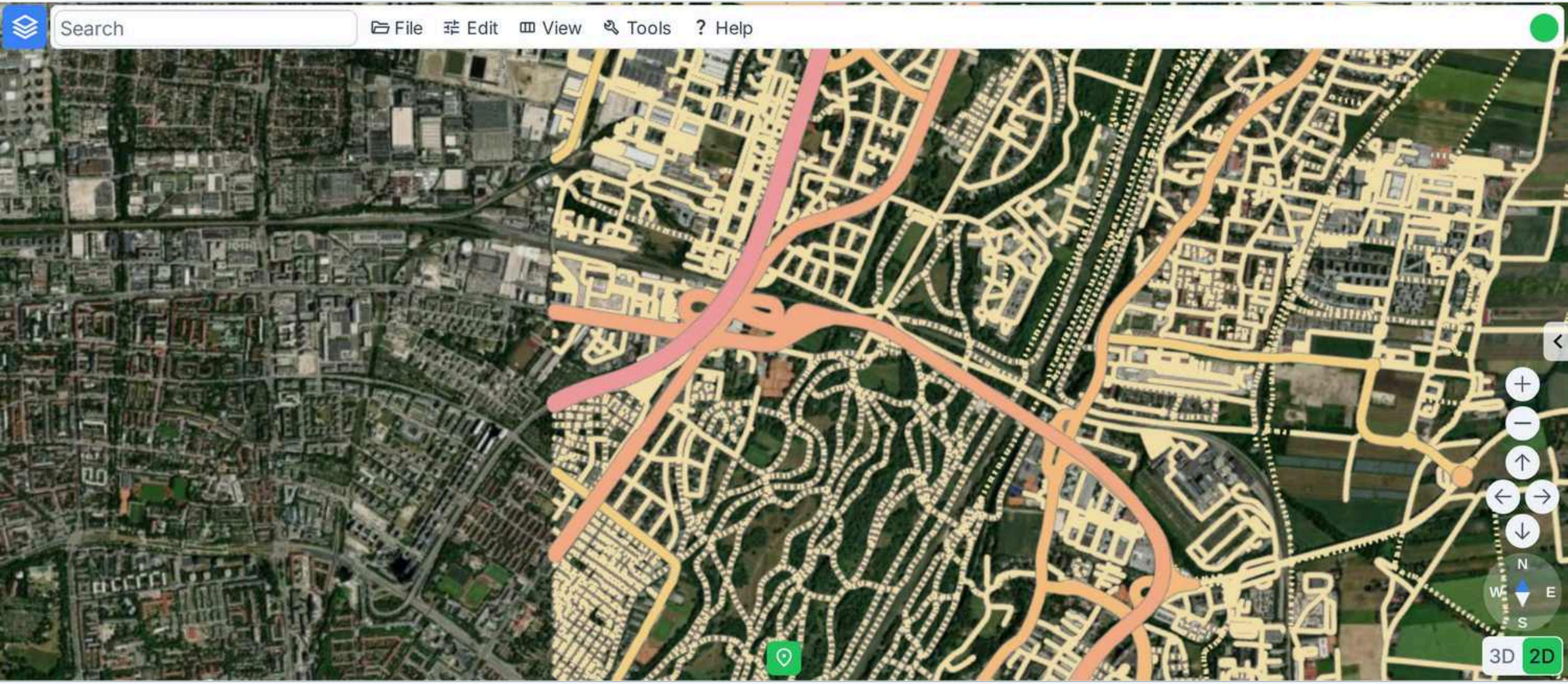
Open viewer ↗



9 · UI, place search, grid and backgrounds

Open viewer ↗

San Francisco · NDS grid › San Francisco · XYZ grid › Munich · backgrounds and place search



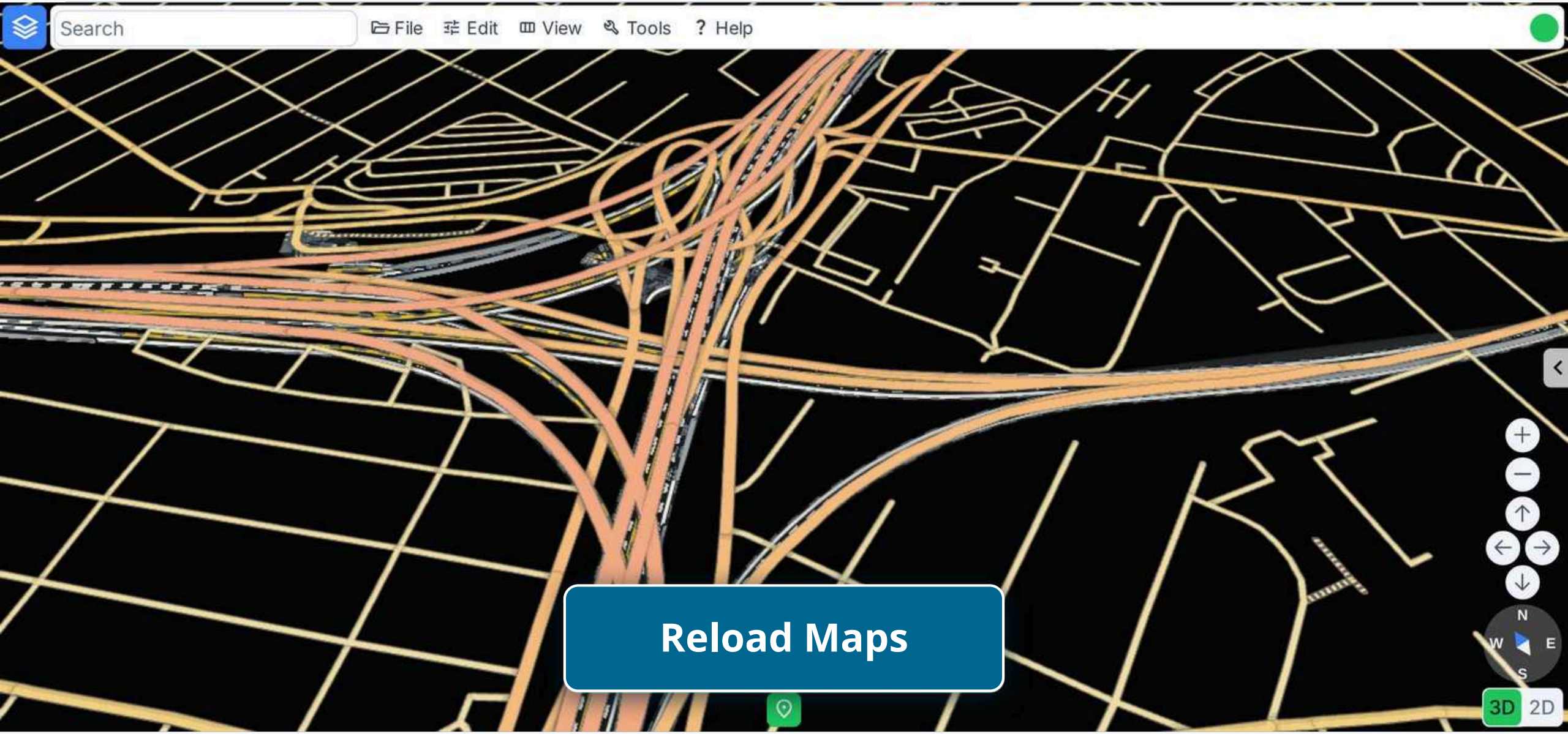


8TH PLACE

Asynchronous data source loading

8 · Asynchronous datasource loading

Open viewer ↗



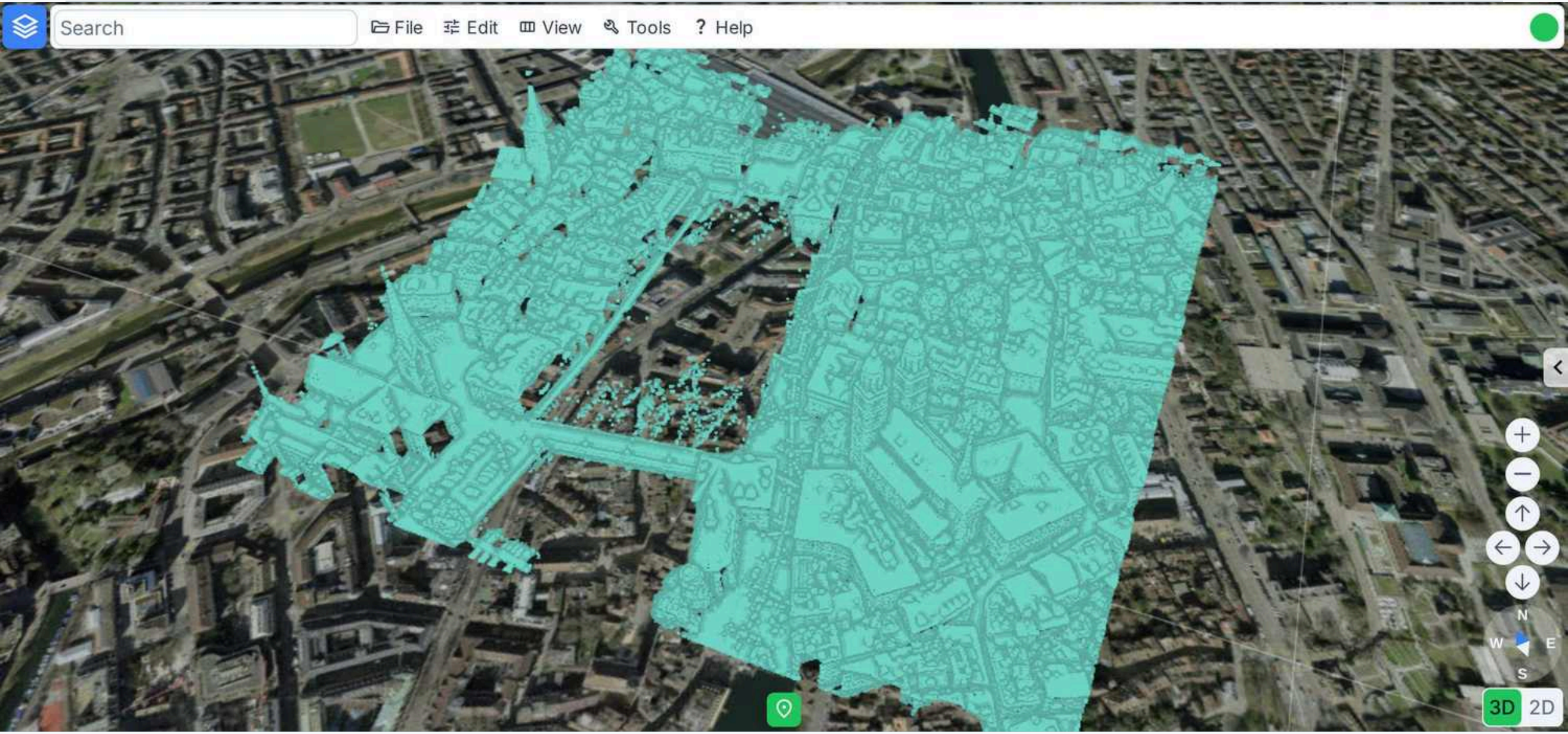
7

7TH PLACE

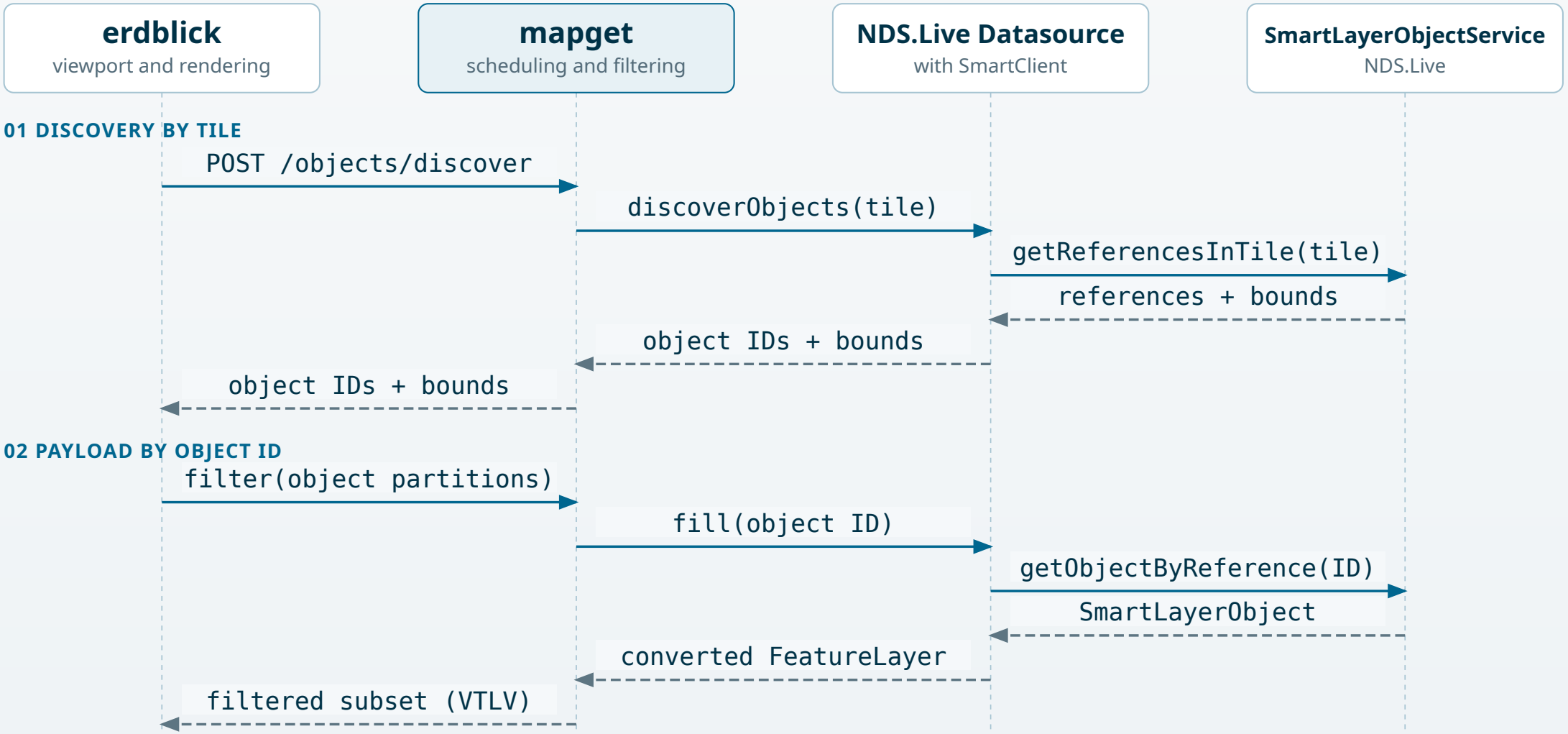
Point clouds and object services

7 · Point clouds and SmartLayerObjectService

Open viewer ↗



Object discovery and payload loading



Solid: request. Dashed: response. Objects can cross tile boundaries and are deduplicated by partition ID.



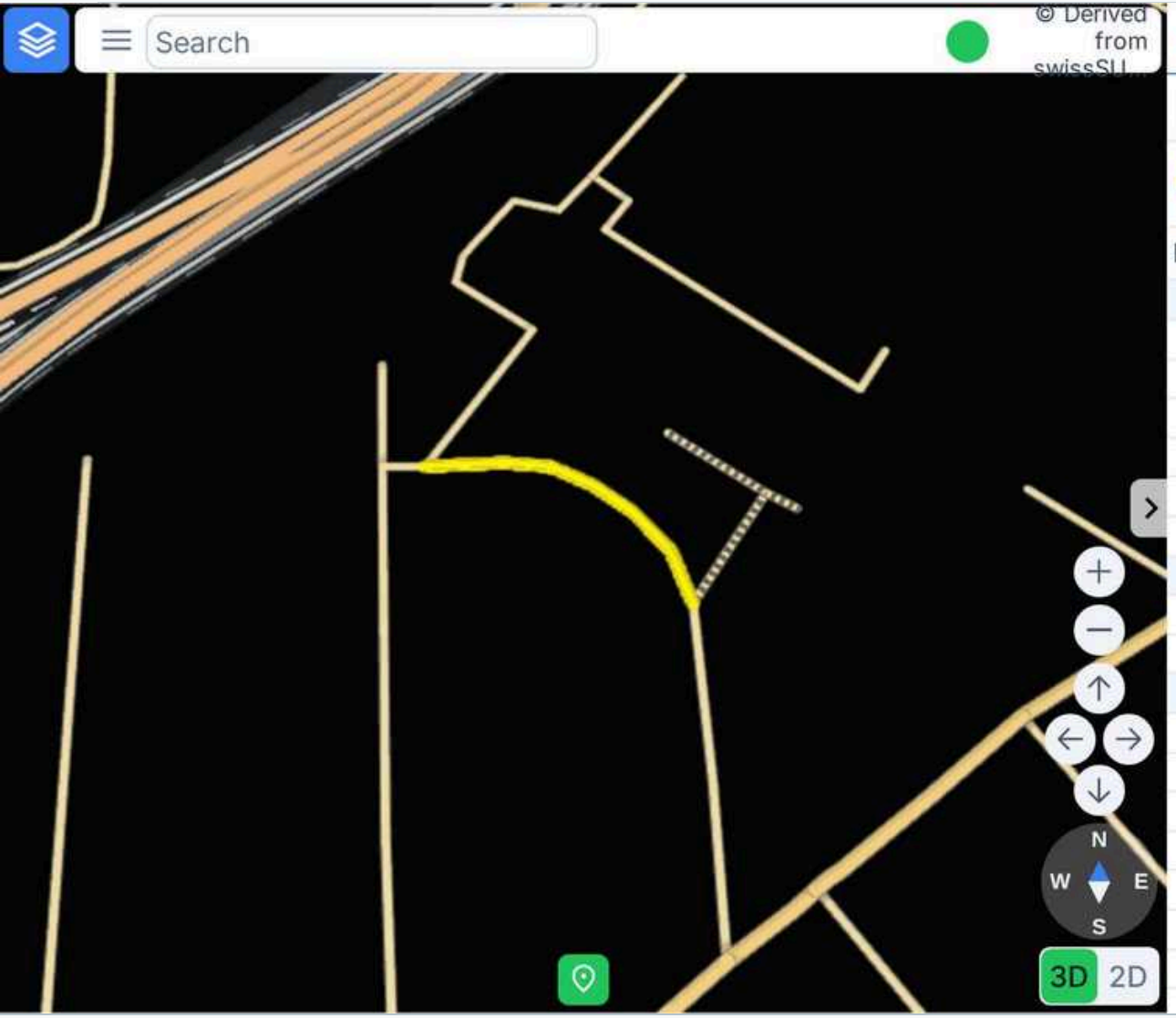
6TH PLACE

Feature and source inspection

6 · Feature, source and relation inspection

Open viewer ↗

School-time speed limit › Prohibited transitions



Inspection 1

Filter docked inspections

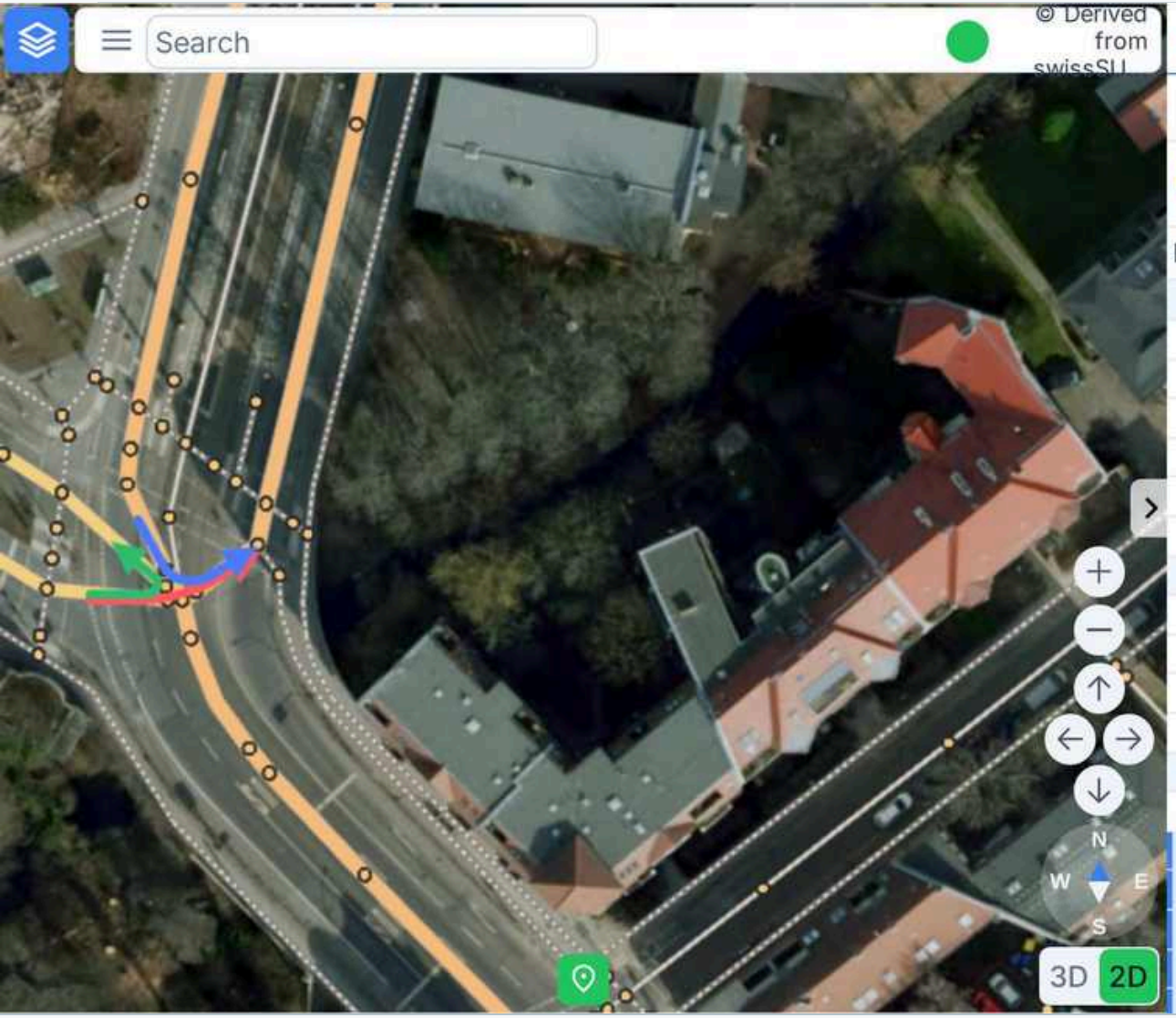
Road.611094387.1688

Key	Value
Identifiers R	
type	Road
featureId	Road.611094387.1688
mapId	NDS.Live/Sample San Francisco
layerId	Road
tileId	611094387
roadId	1688
Basic Attributes	
length	8954
systemToken	e40862cbb4bb3ad0a171ef3ed376a317
Attribute Layers	
RoadRulesLayer #3	
SPEED_LIMIT_IMPERIAL V P ⇄ R	25 CORE ATTRIBUTE_SOURCE ARTI ...
SPEED_LIMIT_IMPERIAL V C ⇄ R	24 FUZZY_TIME_DOMAIN SCHOOL is ...
SPEED_LIMIT_IMPERIAL V C ⇄ R	24 FUZZY_TIME_DOMAIN SCHOOL is ...
RegionRulesLayerRoads #5	
RoadCharacteristicsLayer #2	
FUNCTIONAL_ROAD_CLA... V ⇄ R	4
MIDDLE_DIVIDER_TYPE V ⇄ R	UNKNOWN_DIVIDER_TYPE

6 · Feature, source and relation inspection

Open viewer ↗

School-time speed limit › Prohibited transitions



Inspection 1

Filter docked inspections

Intersection.545666689.450

Key	Value
Identifiers I	
type	Intersection
featureId	Intersection.545666689.450
mapId	NDS.Live/Very-Large-Map
layerId	Road
tileId	545666689
intersectionId	450
Basic Attributes	
connectedRoads 6	Road.545666689.2610 + POSITIVE 3 ...
isArtificial	false
zLevel	32
systemToken	96d94656510b4f41ae507e6c71dd32b9
Attribute Layers	
RoadRulesLayer #3	
PROHIBITED_TRANSITION V ⇄ R	
attributeValue	
prohibitedTransition	NULL
transition	true
validity	T12 T15 T24

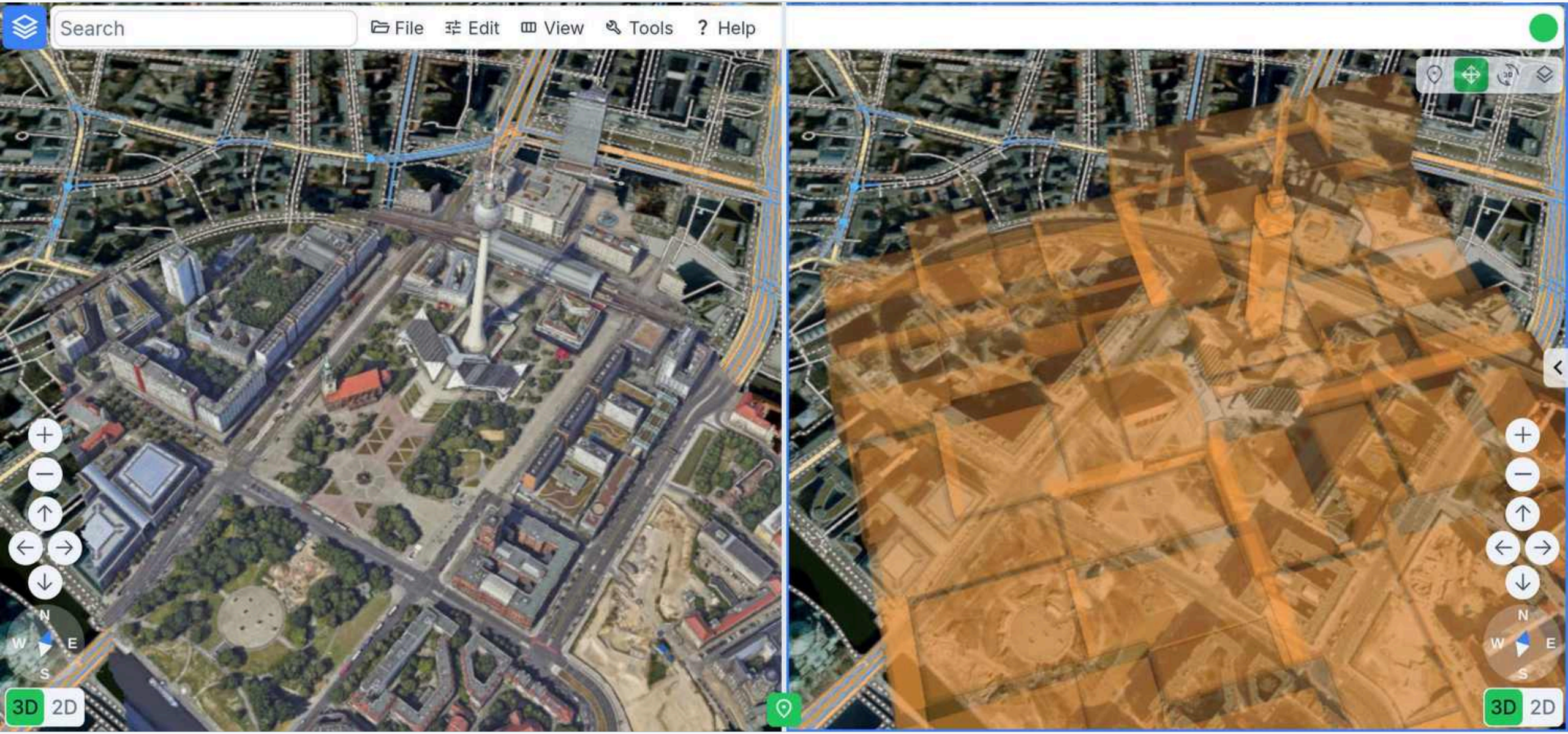


5TH PLACE

Split-screen views

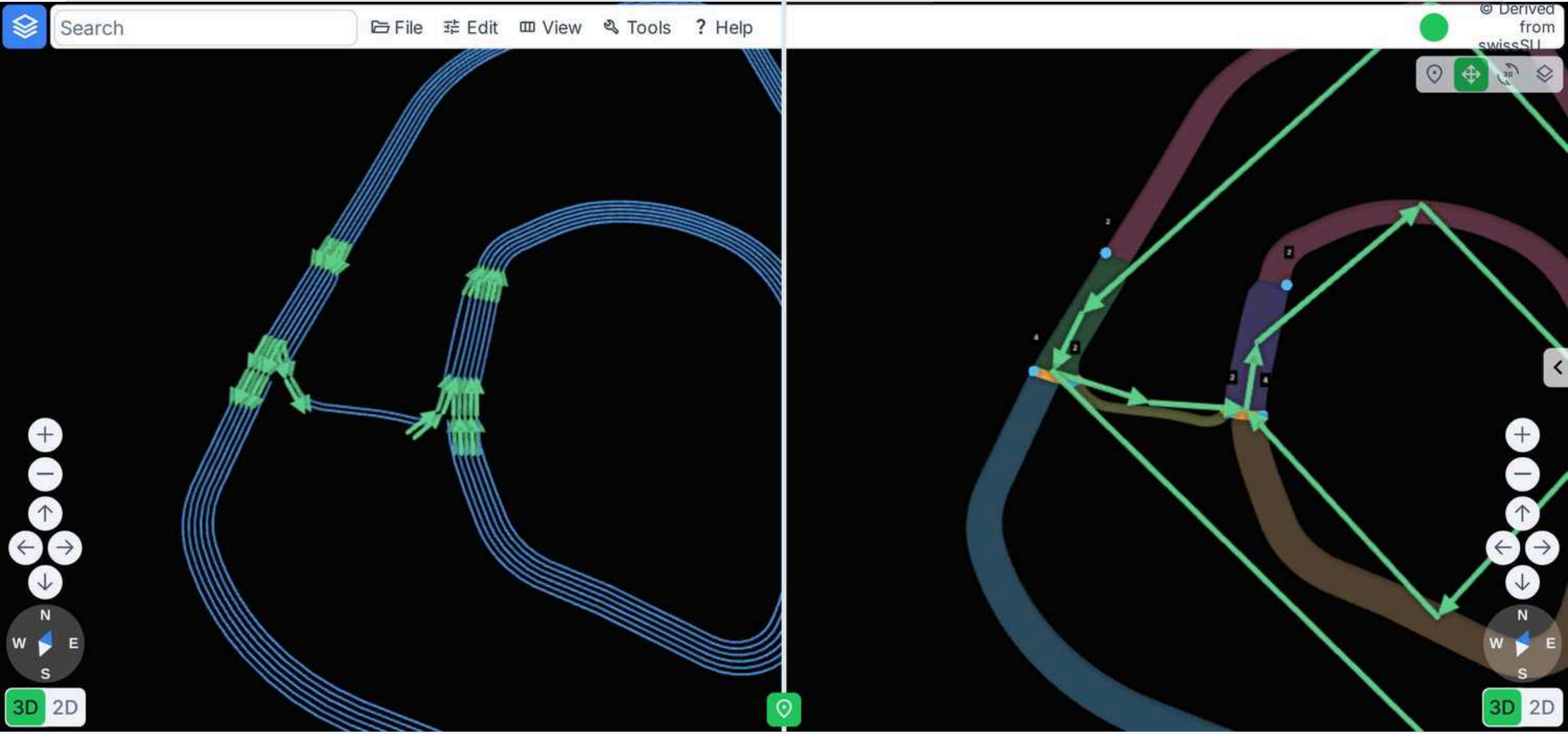
5 · Textured geometry and bounding boxes

Open viewer ↗



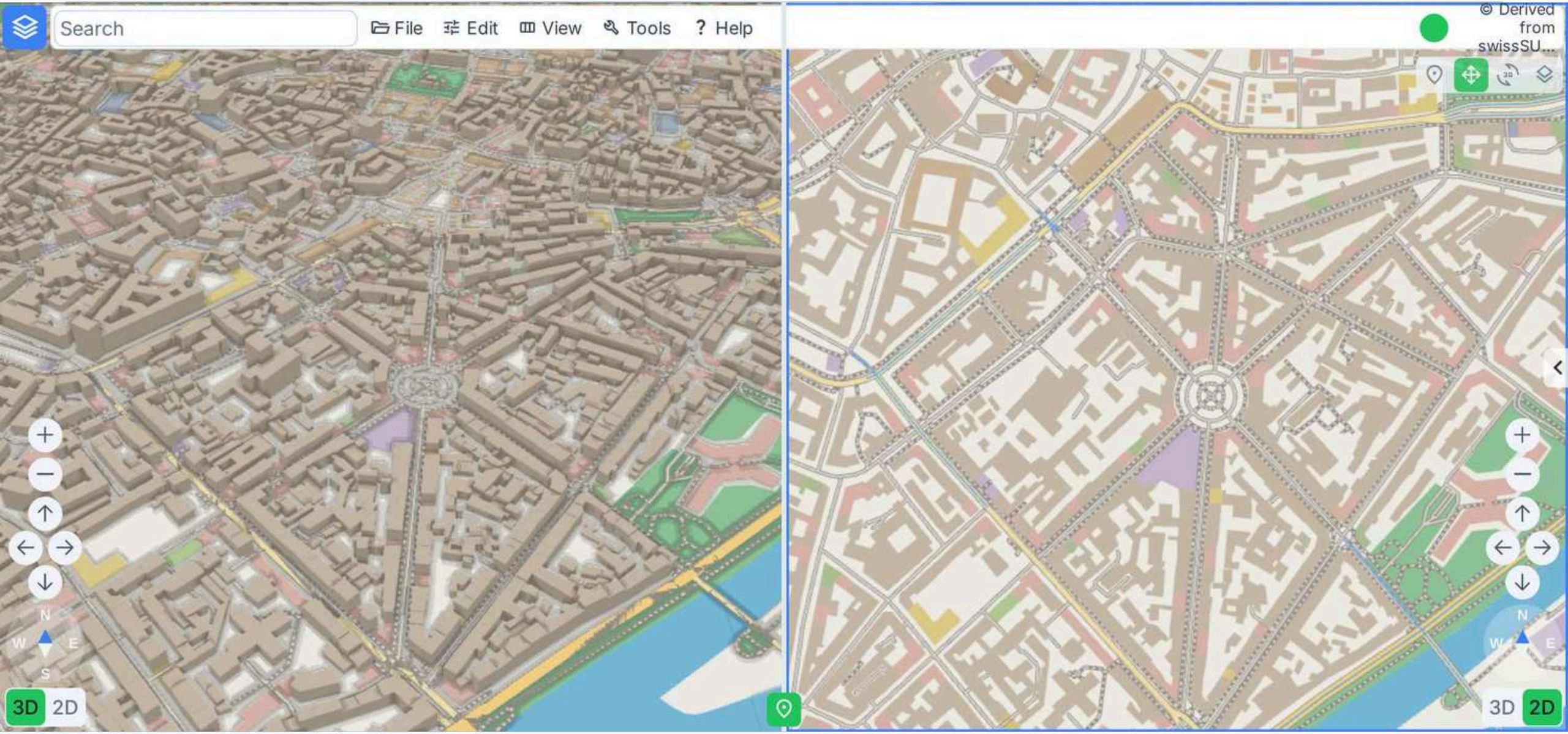
5 · Lane and lane-group topology

Open viewer ↗



5 · 3D road network and 2D comparison

Open viewer ↗





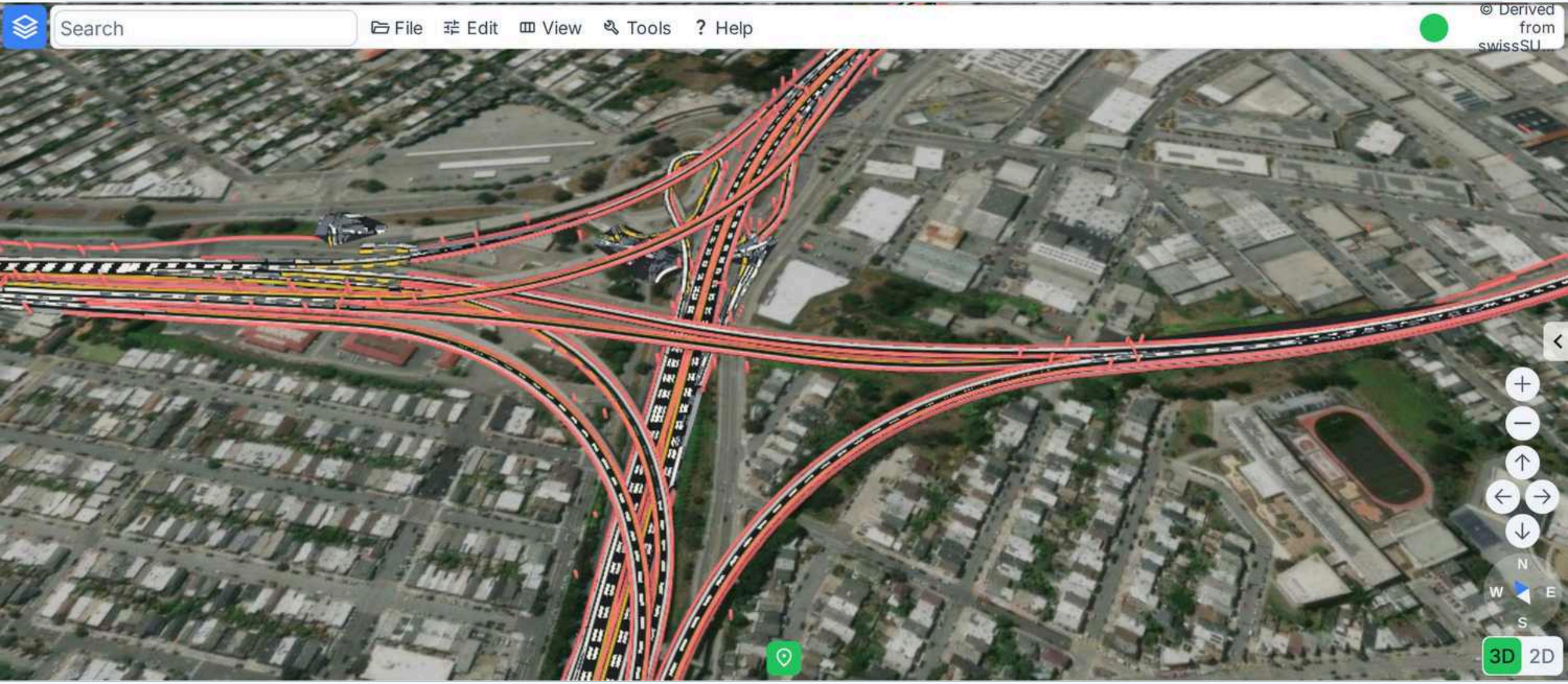
4TH PLACE

3D navigation and cinematic styles

4 · Geometry-aware 3D navigation

Open viewer ↗

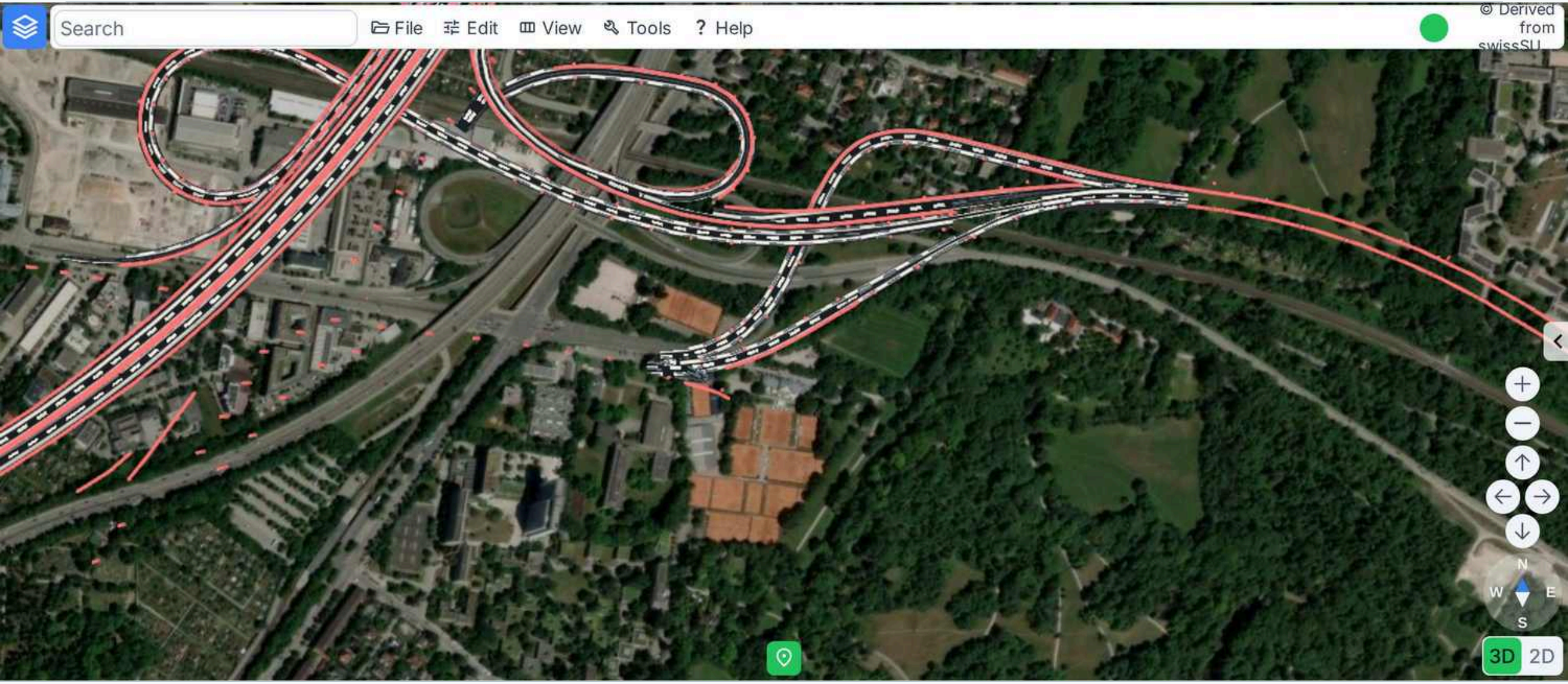
San Francisco › HERE Munich › Zenrin · Japan › First-person entry



4 · Geometry-aware 3D navigation

Open viewer ↗

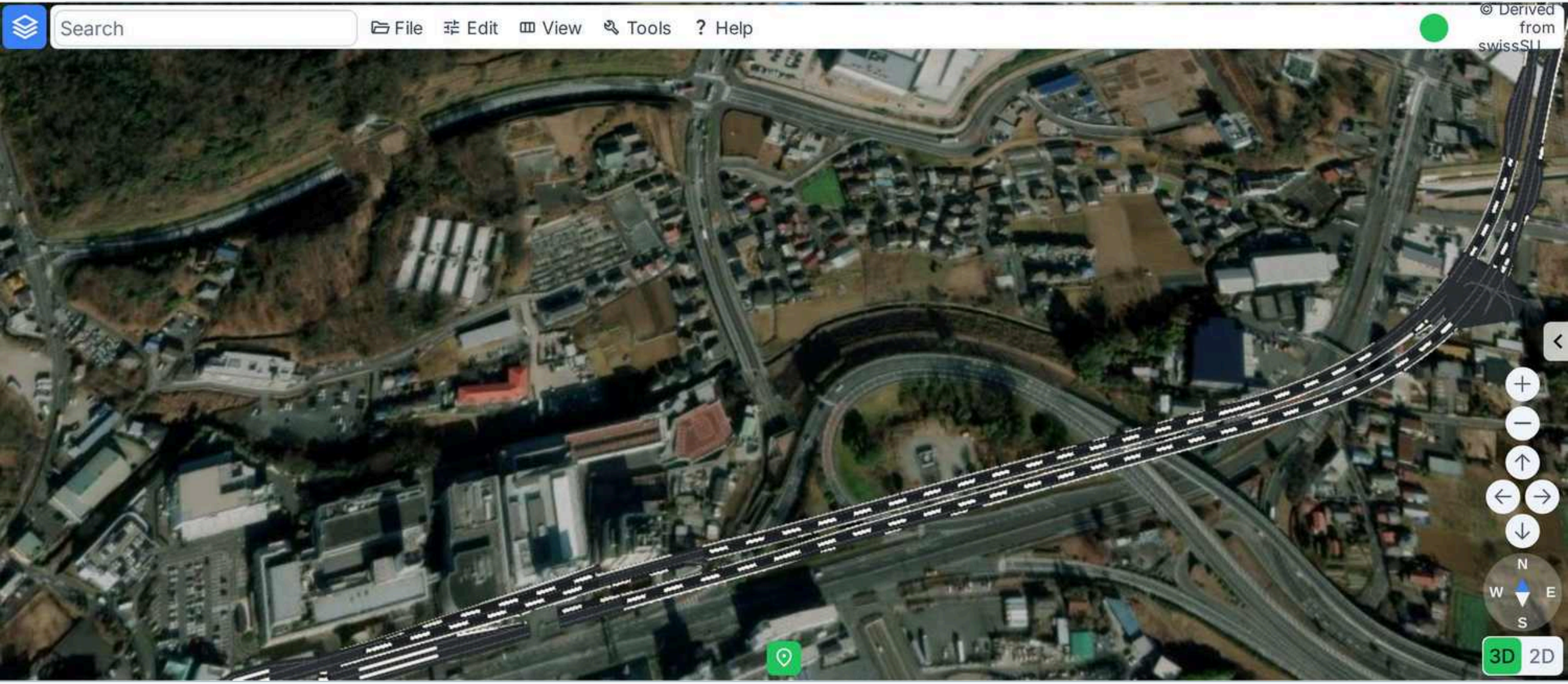
San Francisco › HERE Munich › Zenrin · Japan › First-person entry



4 · Geometry-aware 3D navigation

Open viewer ↗

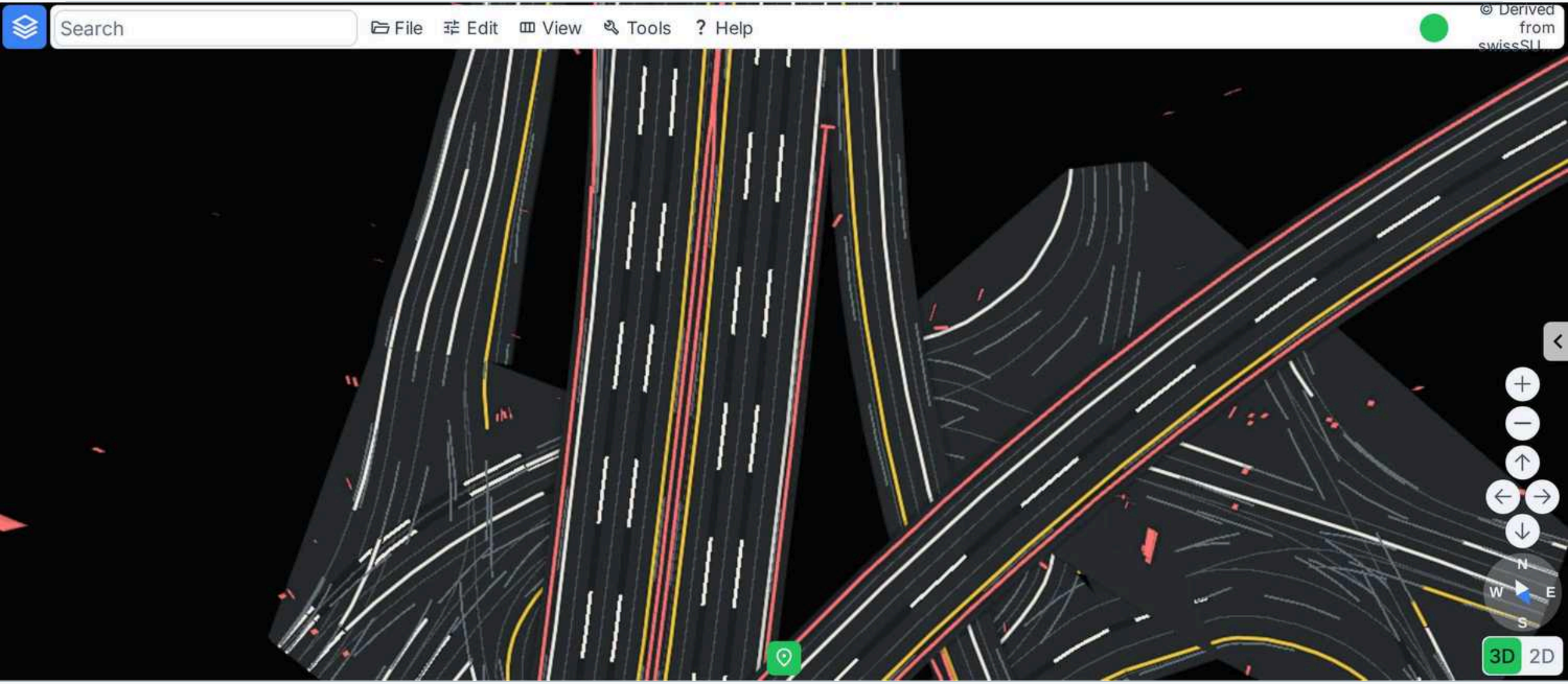
San Francisco › HERE Munich › Zenrin · Japan › First-person entry



4 · Geometry-aware 3D navigation

Open viewer ↗

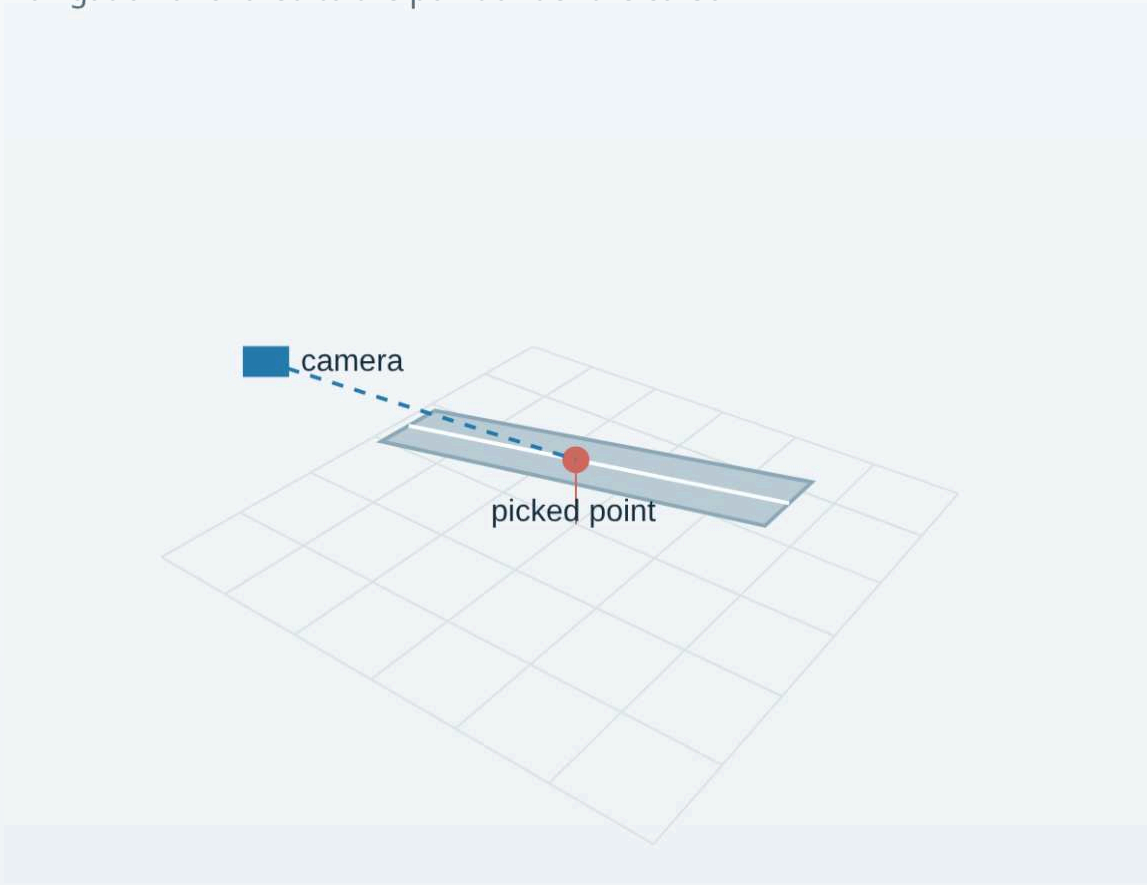
San Francisco › HERE Munich › Zenrin · Japan › First-person entry



Target-centered 3D navigation

Camera and world

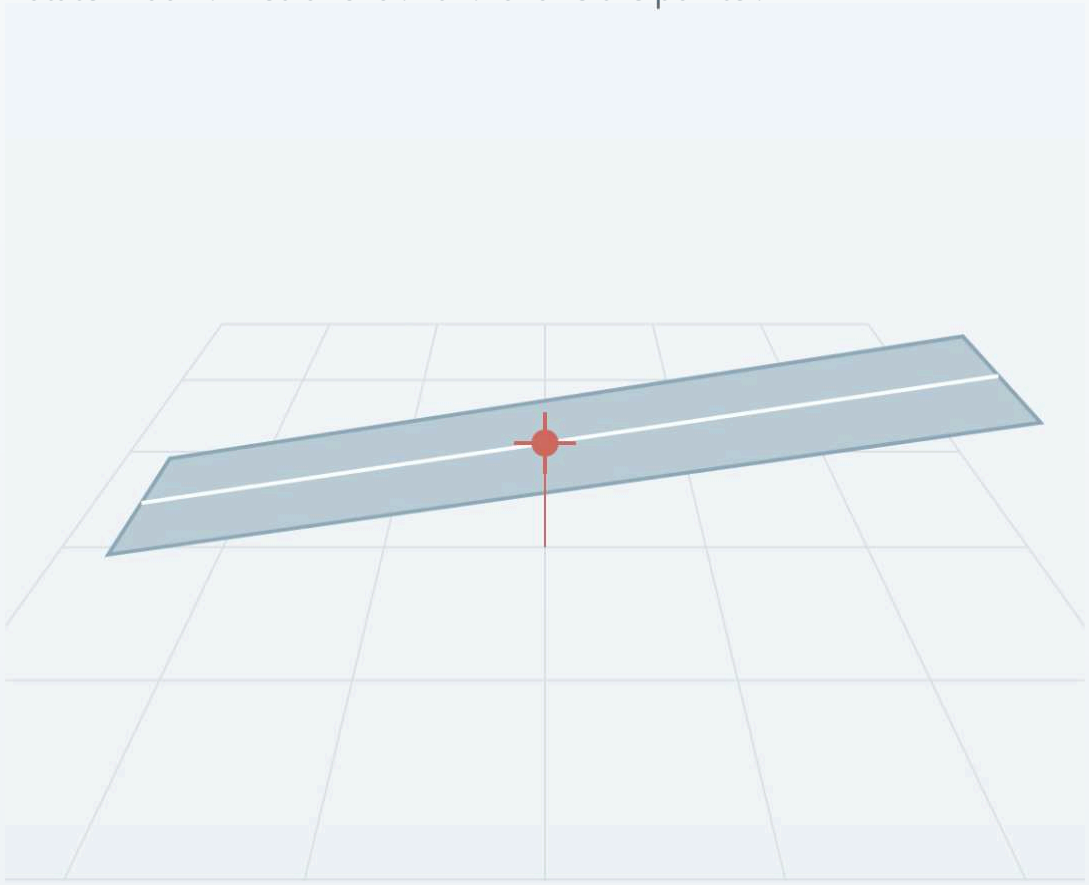
Navigation anchored to the point under the cursor



rotate pan zoom

Camera view

Rotate / zoom: fixed anchor. Pan: follows the pointer.



rotate pan zoom

Pick once. Retain the anchor throughout the gesture.

Upstream API proposal · deck.gl #10552

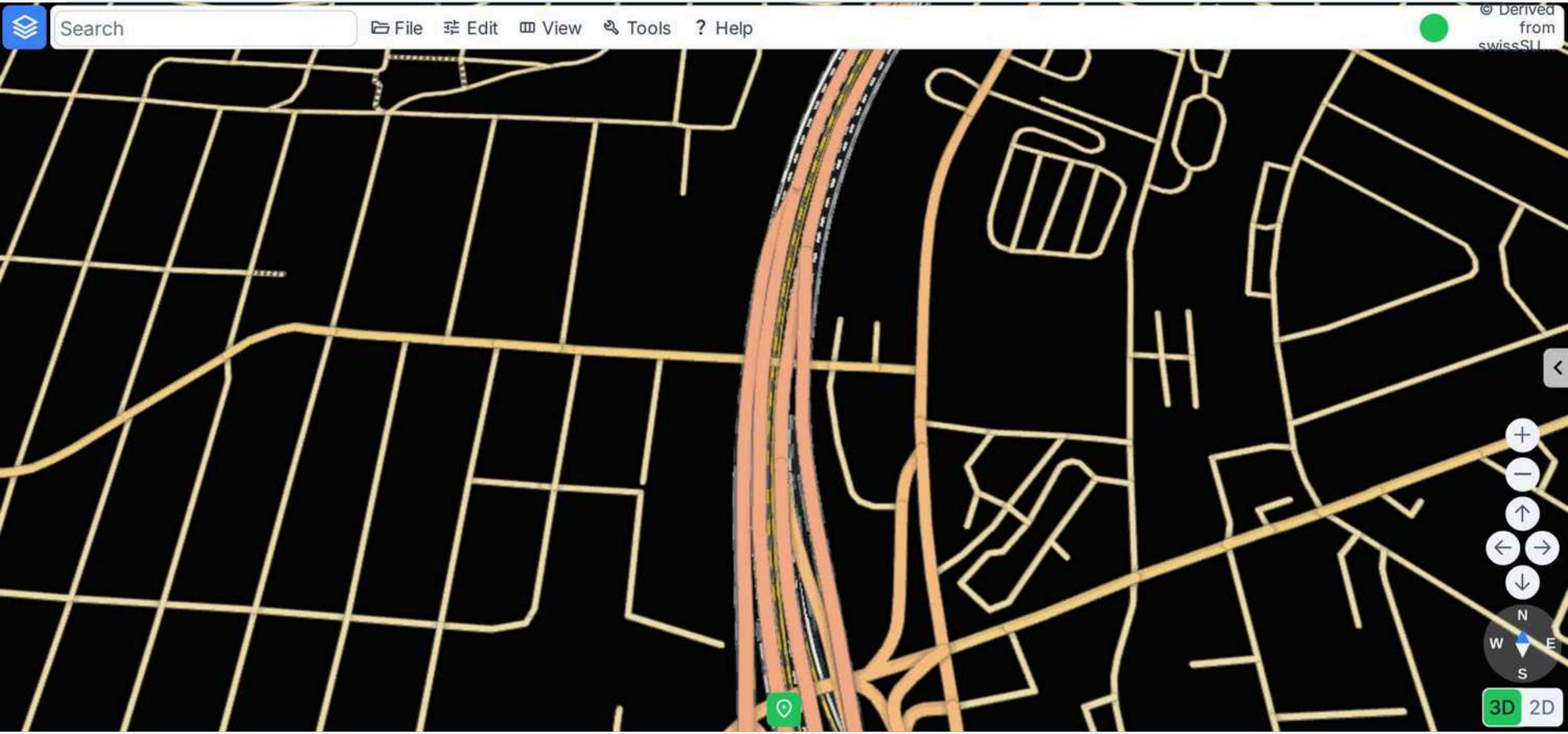


3RD PLACE

Drill picking, inspections and docking

3 · Drill-picking and multiple inspections

Open viewer ↗

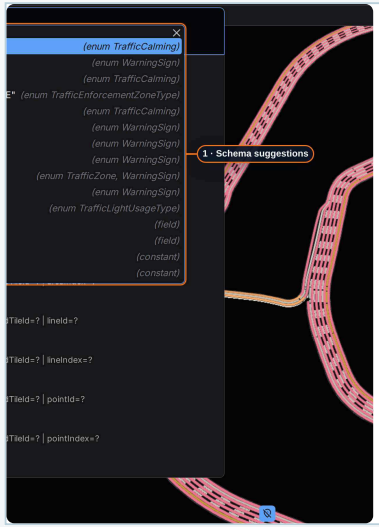




2ND PLACE

Search 2.0

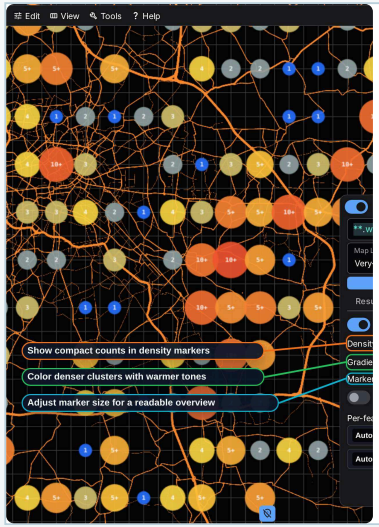
2 · Search 2.0



01 · SCHEMA

Schema-aware completion

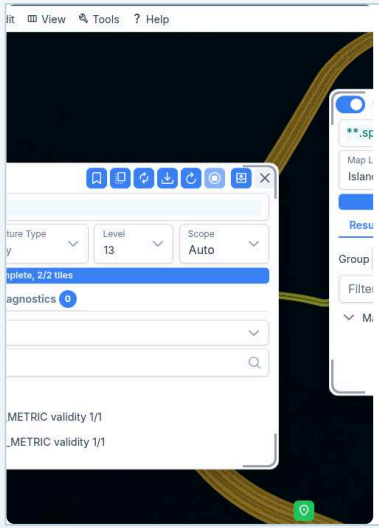
Field names and enum values from the Feature Model Schema.



02 · STYLING

Density and geometry rules

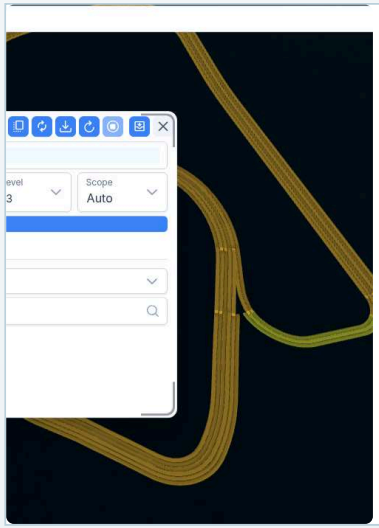
Tile-level result density and detailed styling of matching geometry.



03 · MULTIPLE

Concurrent search sessions

Independent predicates, result sets and visualization settings.



04 · SCOPE

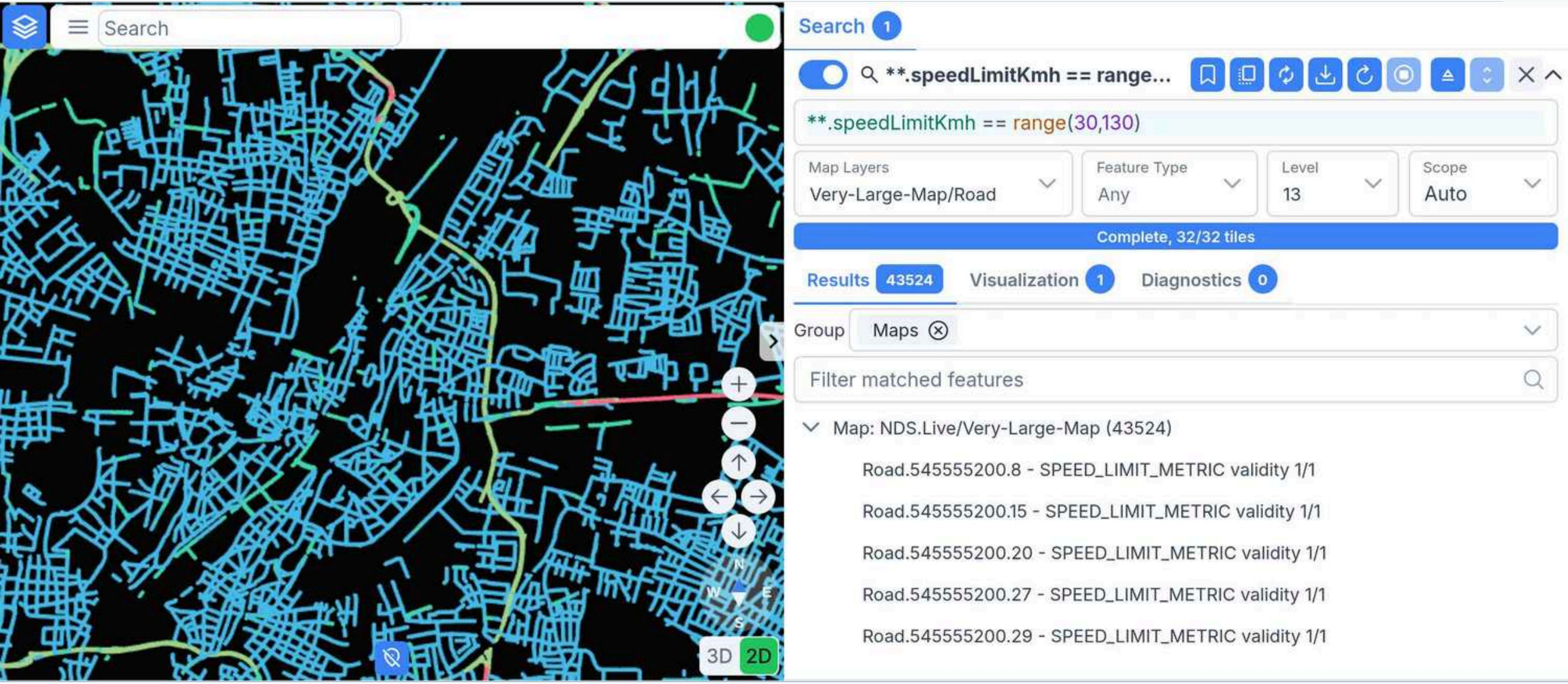
Feature or attribute scope

Match whole features or attributes with their effective validity geometry.

2 · Search 2.0

Open viewer ↗

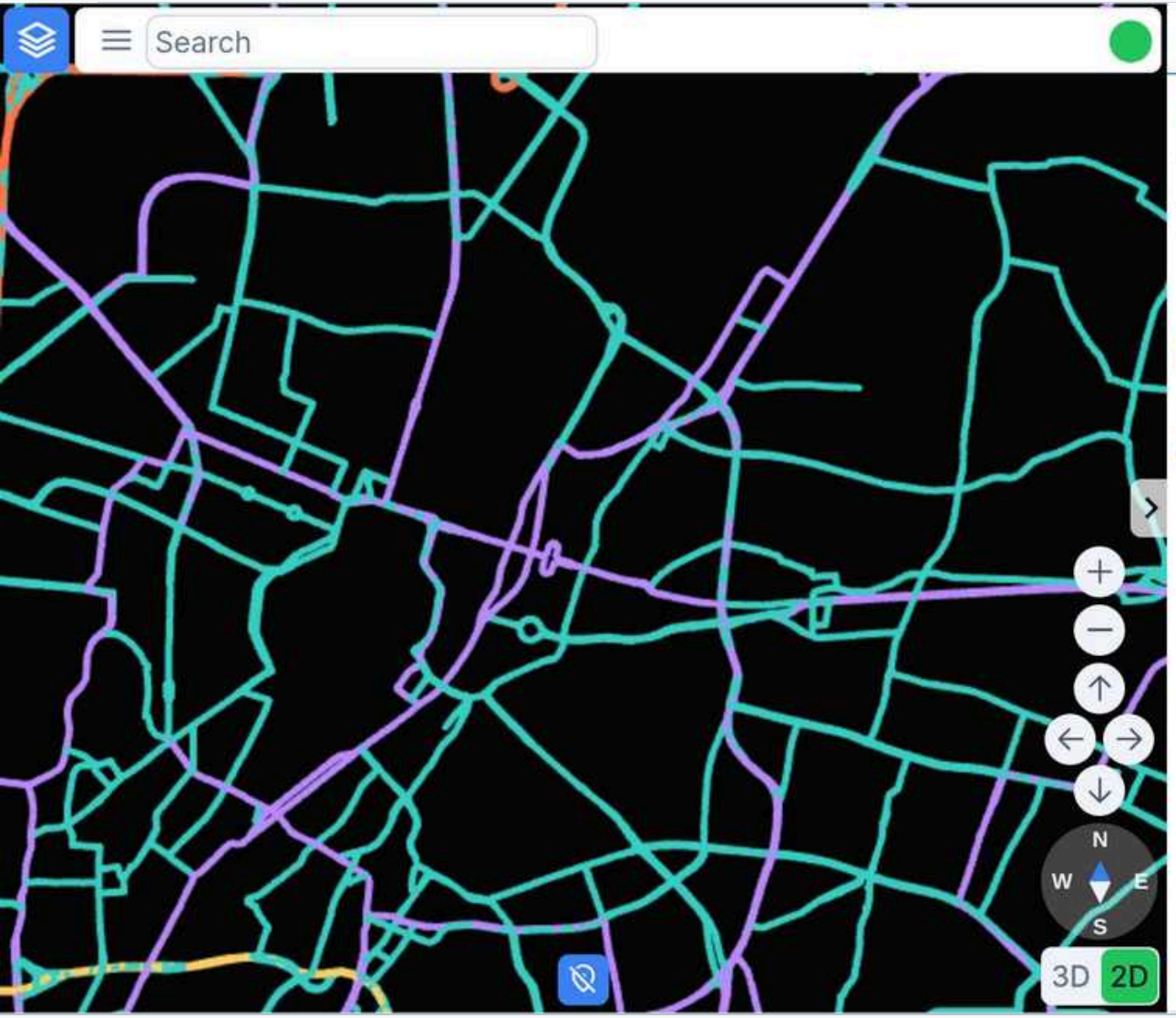
Munich · speed limits › Road hierarchy › Gothenburg · 30 km/h + Lundbyleden › Wildlife warnings · density



2 · Search 2.0

Open viewer ↗

Munich · speed limits › Road hierarchy › Gothenburg · 30 km/h + Lundbyleden › Wildlife warnings · density



Search 1

**.functionalRoadClass <= 3

**.functionalRoadClass <= 3

Map Layers: Very-Large-Map/Road

Feature Type: Any

Level: 13

Scope: Auto

Complete, 32/32 tiles

Results 16430 | Visualization 1 | Diagnostics 0

Group: Maps

Filter matched features

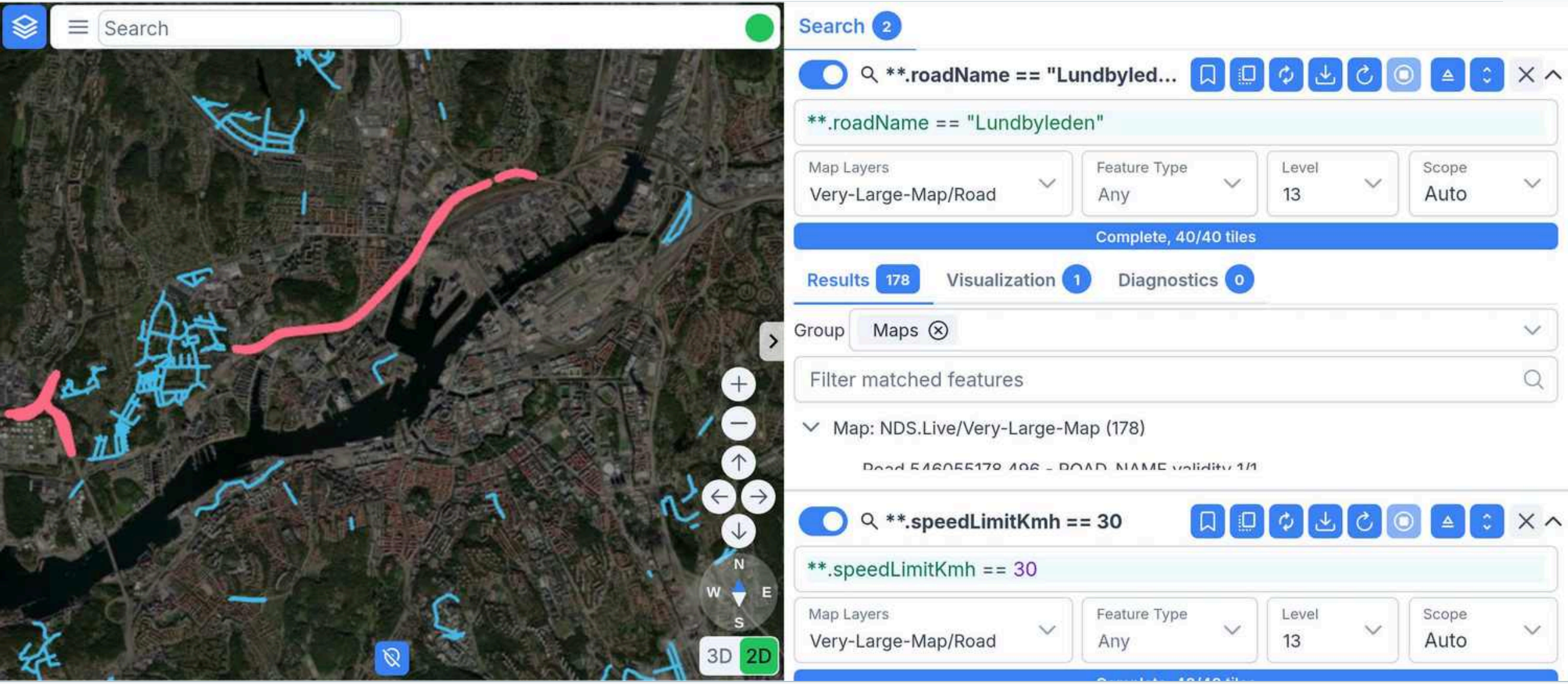
Map: NDS.Live/Very-Large-Map (16430)

- Road.545555200.11 - FUNCTIONAL_ROAD_CLASS validity 1/1
- Road.545555200.33 - FUNCTIONAL_ROAD_CLASS validity 1/1
- Road.545555200.75 - FUNCTIONAL_ROAD_CLASS validity 1/1
- Road.545555200.143 - FUNCTIONAL_ROAD_CLASS validity 1/1
- Road.545555200.324 - FUNCTIONAL_ROAD_CLASS validity 1/1

2 · Search 2.0

Open viewer ↗

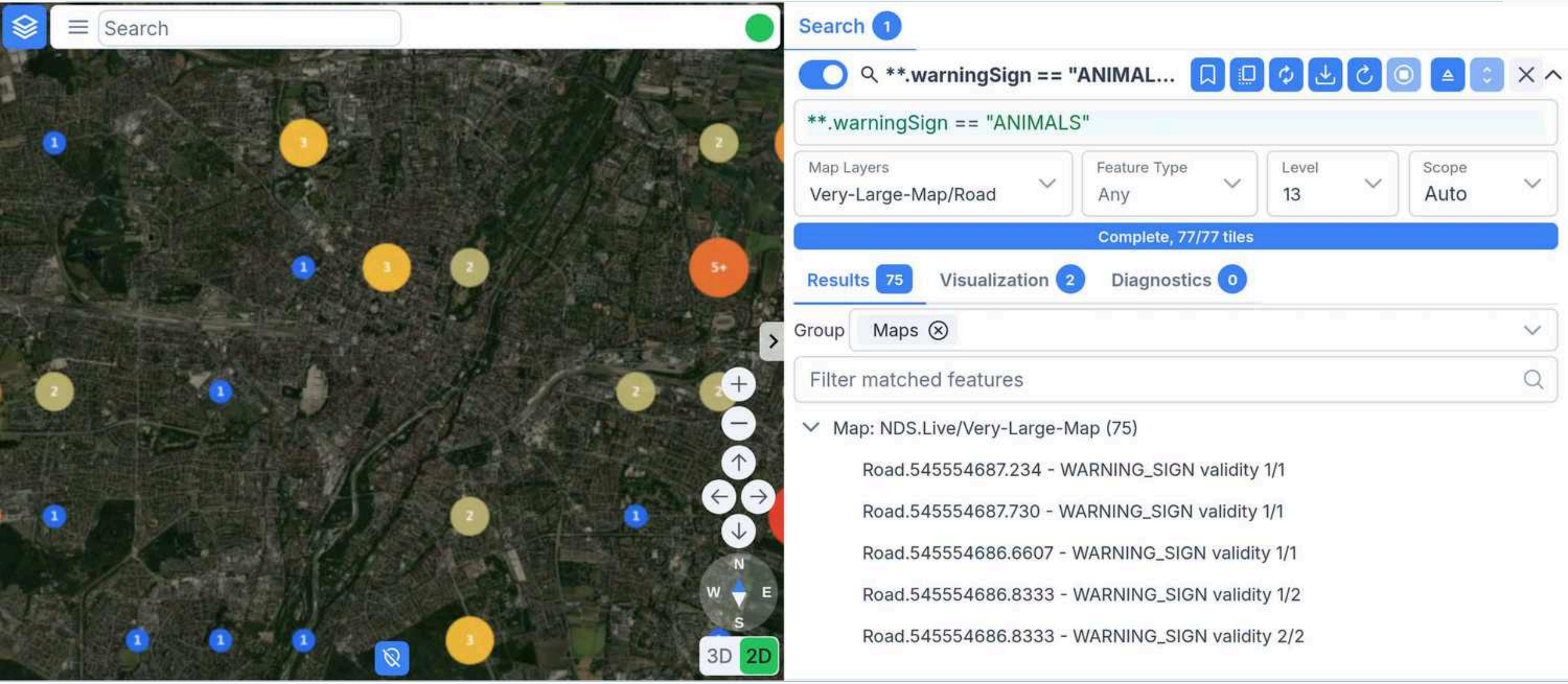
Munich · speed limits › Road hierarchy › Gothenburg · 30 km/h + Lundbyleden › Wildlife warnings · density



2 · Search 2.0

Open viewer ↗

Munich · speed limits › Road hierarchy › Gothenburg · 30 km/h + Lundbyleden › Wildlife warnings · density



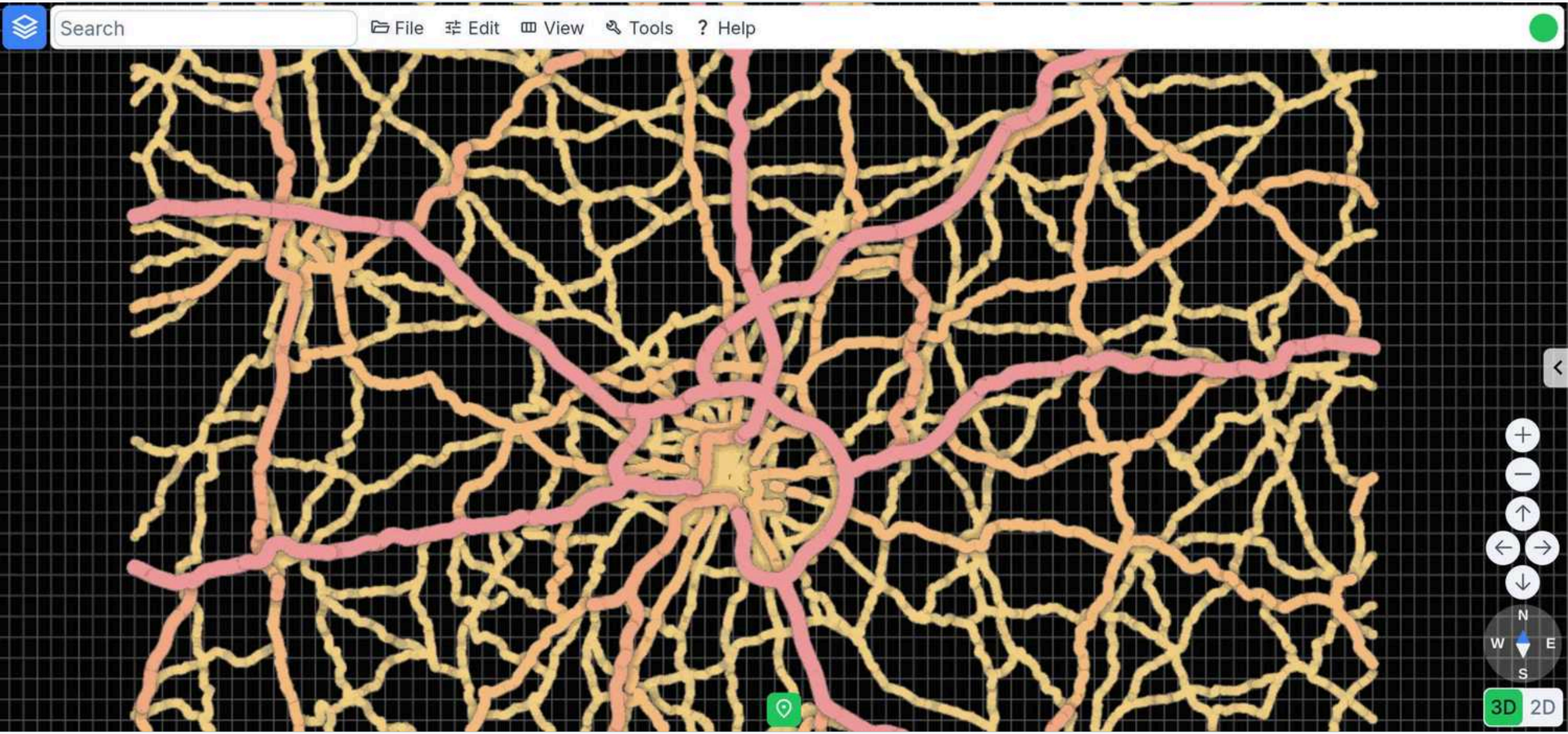


1ST PLACE

Performance

1 · Performance: thousands of source tiles

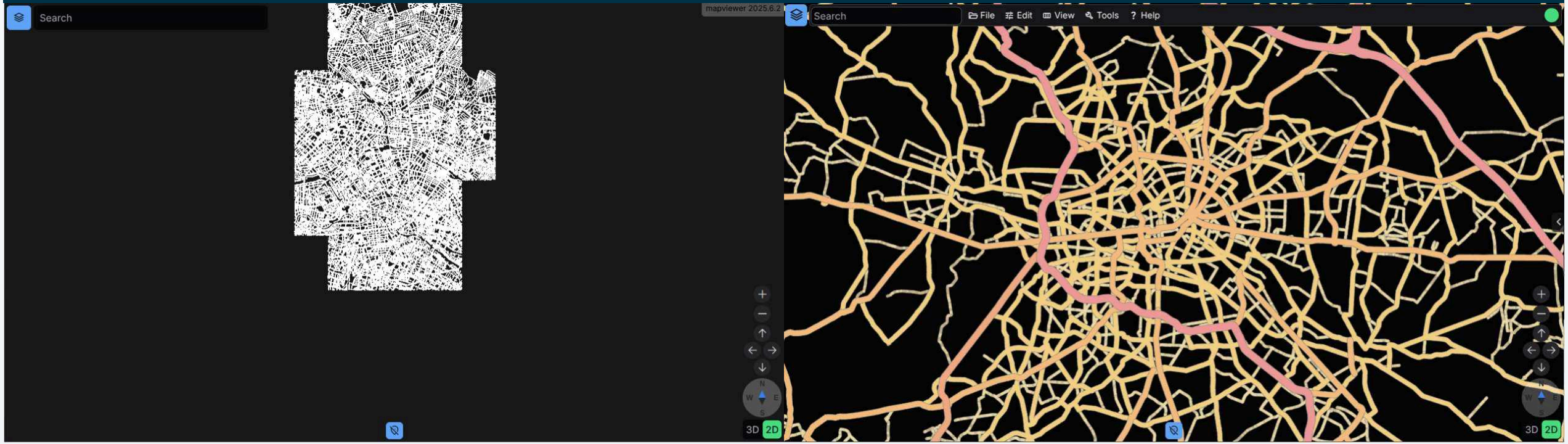
Open viewer ↗



Performance · tile loading

2025.6.2 · Cesium

2026.4.3 dev-rc · deck.gl



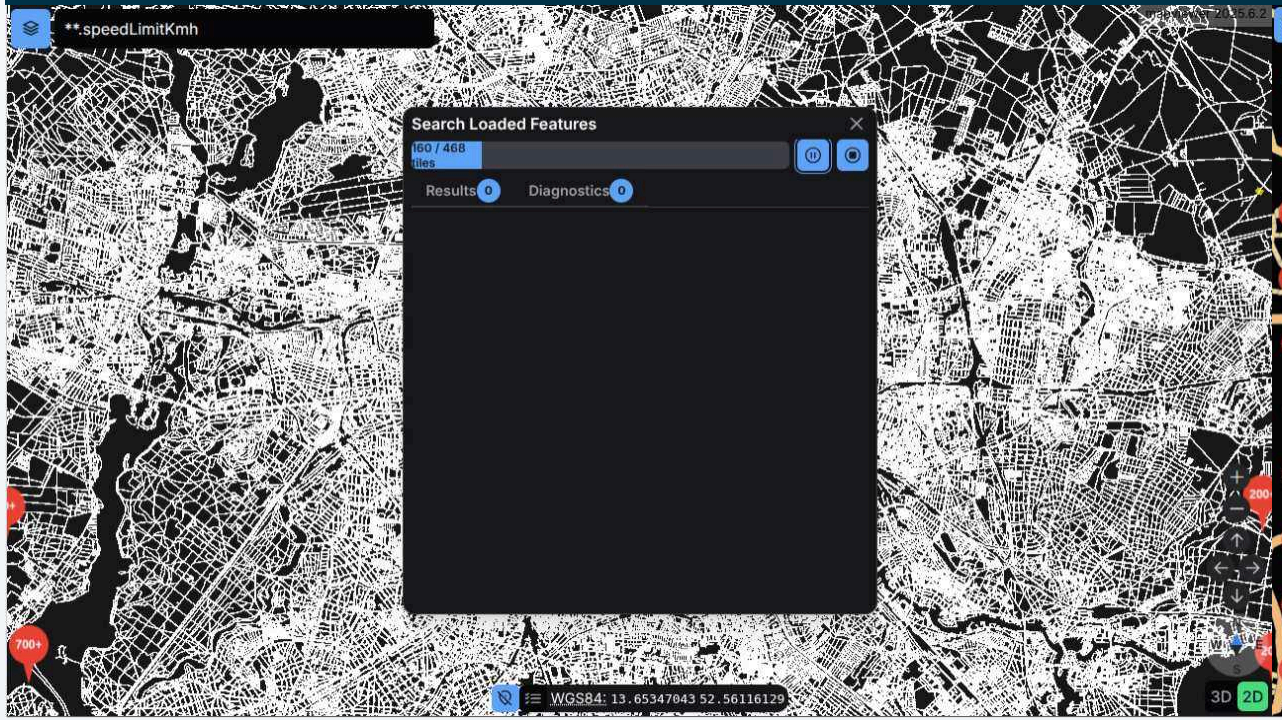
Recording stills at 35.0 s

140.3 s → 31.3 s 468 identical Road tiles · fresh application tile cache

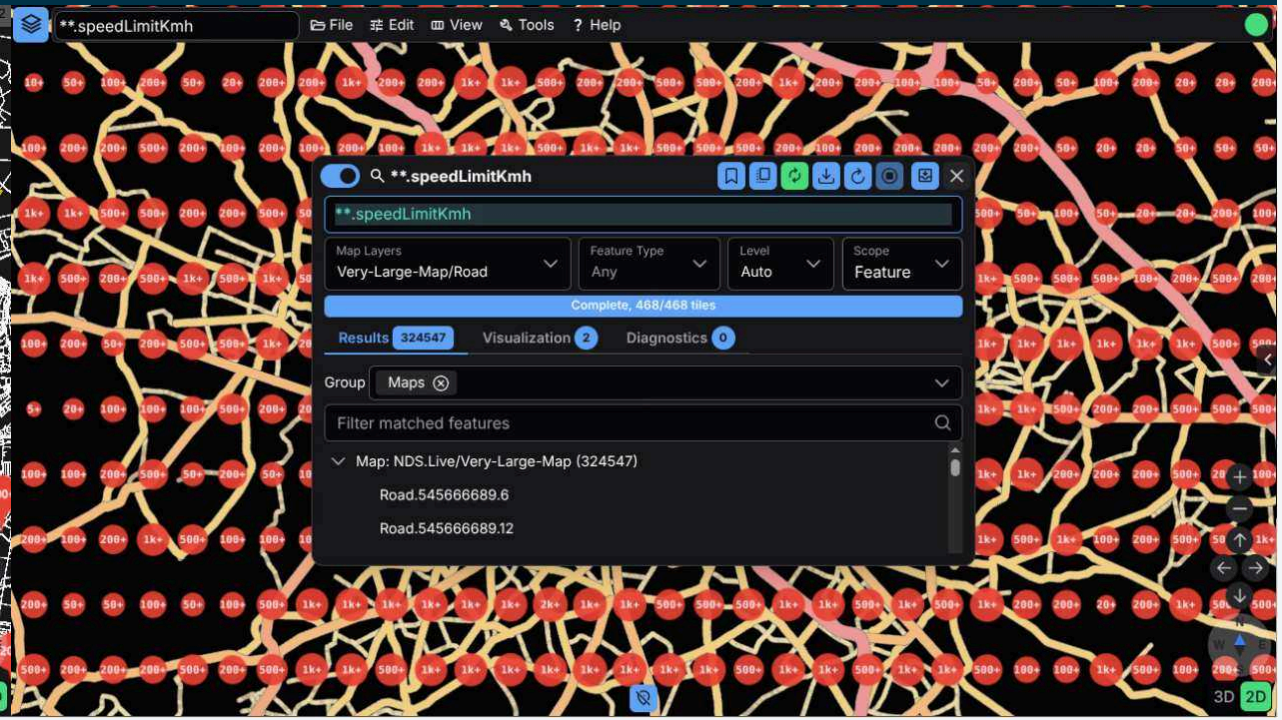
TomTom · shared workstation, heavy builds paused · single-run whole-stack demonstration · raw 1× / playback 2×.

Performance · speed-limit search

2025.6.2 · Cesium



2026.4.3 dev-rc · deck.gl



Recording stills at 21.0 s

125.8 s → 14.2 s **.speedLimitKmh · 324,547 feature matches · 468 loaded tiles

Enter → all results received · matching Feature scope · shared workstation, heavy builds paused · 2× playback.



0TH PLACE

One more thing...



Next talk

- Initial release: **2026.5.0**
  End of October
- Try it now at viewer.nds.live
- **NDS-member Docker image**
  Not the community image
- Embedded erdblick chat: **2026.5.1**

Roadmap themes

01

Performance. Performance. Performance.

Loading, search and rendering

02

Tool integration

Certification Kit
Converters

03

Natural-language interaction

Integrated chat
Speed, smoothness and capabilities

04

NDS.Live model coverage

Complete support for the standard

Rest of 2026

2026

Q4

MCP foundations are in place.

Embedded chat comes next.

2026.5

MCP foundation

- Remote erdblick sessions, mapget relay + OAuth, WebMCP
  ERD-416 · MAPGET-200 · ERD-496

2026.5.1

Interaction + map access

- Embedded chat / natural-language omnibar
  ERD-483
- Measuring tools + shape-point styling
  MAPV-378 · MAPV-240 · ERD-418
- Versioned tile / object requests and comparison
  MAPV-491 · MAPV-409
- Place / named-area search and coverage interaction
  ERD-449 · MAPV-416

2026.6

Discovery + model coverage

- NDS.Live Registry support
  MAPV-359
- Rectangle selection
  ERD-422
- Attribute geometry via RoadLocationId / RoadId
  MAPV-549

No release assigned: TMC location / attribute support MAPV-548

Tooling Dev sprint assignments · Checked 13 October 2026 · Planned scope, not release completion.

Ideas for 2027

Workspace and integration

Desktop applications

Certification Kit integration

Documentation integration

NDS.Live services

Routing Service

Search Service

SmartLayerPathService

2027

MapViewer

Analysis

Spatial and graph-based searches

Better side-by-side feature comparison

Tiles as features

Filter and style tile blobs themselves

Coverage and rendering

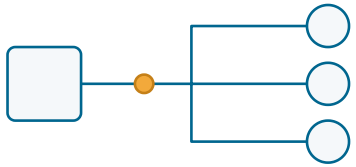
Resolve indirect and region attributes

Terrain, occupancy grids
and other unsupported layers

Map-layer tint, opacity and ordering

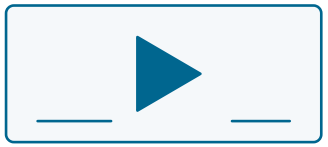
Wildcards

Which one would change your work?



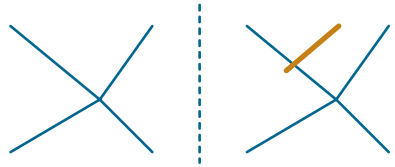
Pub-Sub Service

Subscribe to changes instead of polling.



Videos and tutorials

More worked examples for real map-analysis tasks.



Bulk map diff

Find differences across map versions.



OpenDRIVE

Convert road networks and visualize them.



Other map formats

Reuse the viewer beyond NDS.

Let's get out there and show what we have.



Open-source projects grow through integration.

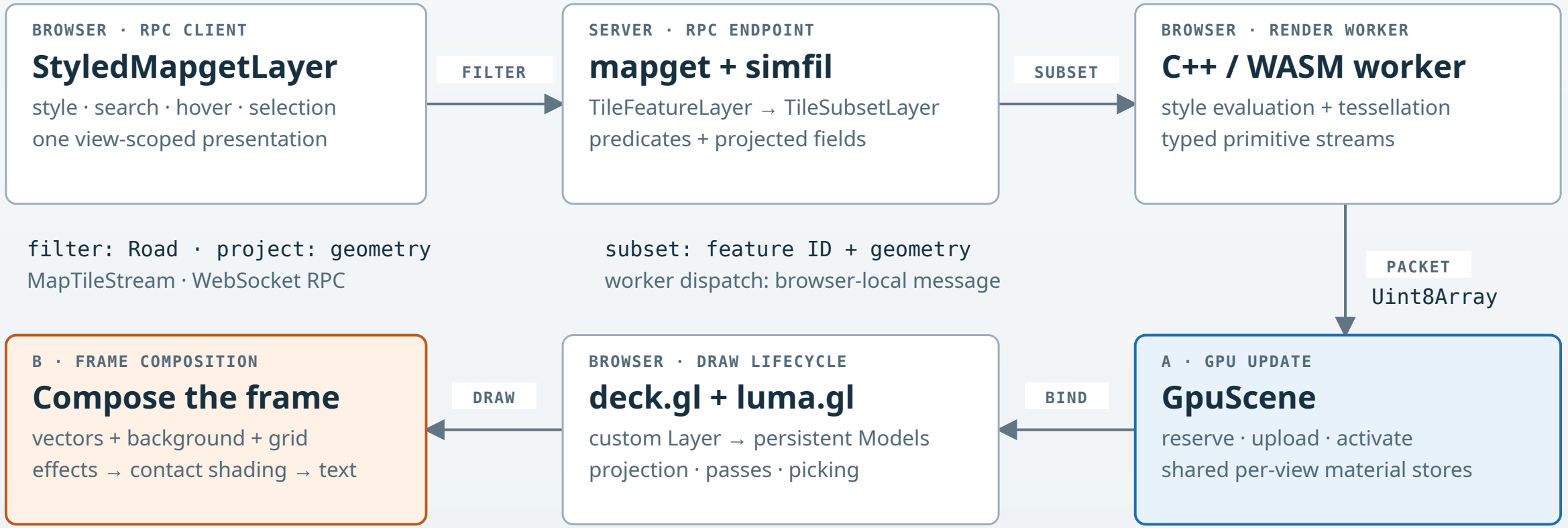
Questions

Open viewer ↗



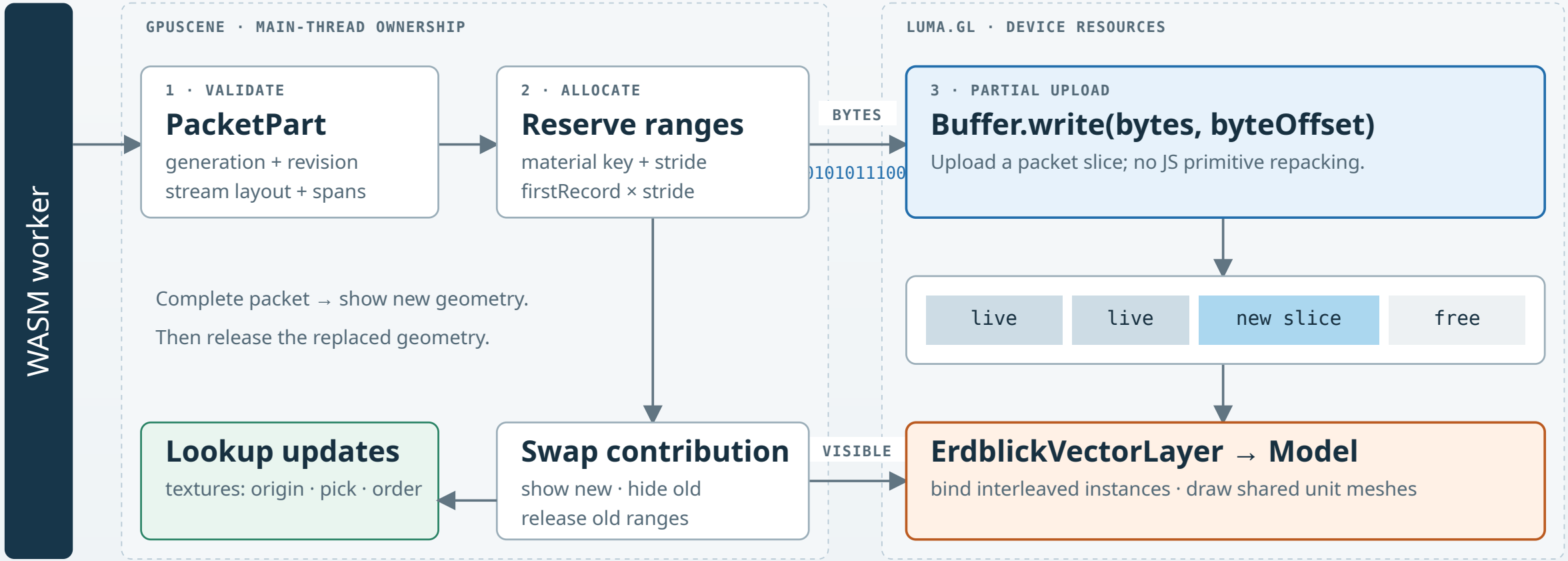
From a map question to a frame

Style / search → mapget subset → WASM primitives → **A · GPU update** → **B · Frame composition**



Two reductions: map semantics → a requested subset; subset + style → GPU primitives. No GeoJSON object graph on this render path.

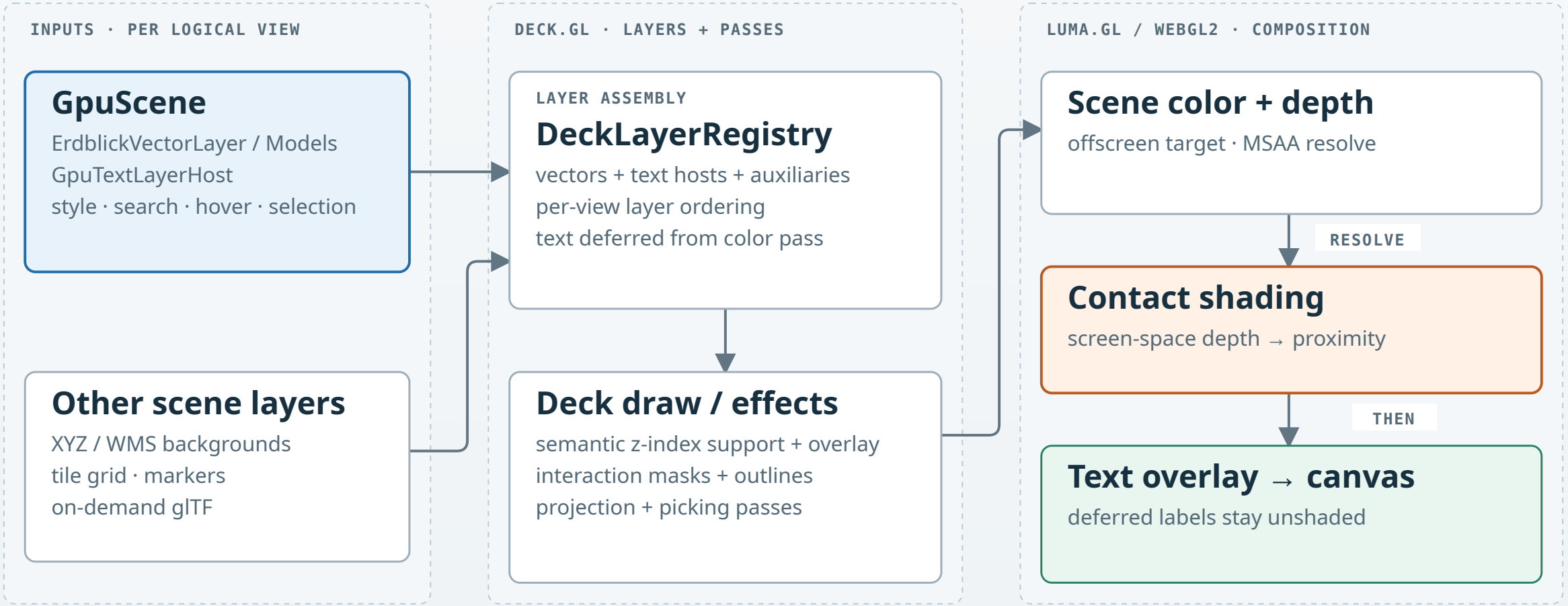
A · From packet slices to draw calls



Growth: createBuffer → copyBufferToBuffer → rebind. **Cost:** spare capacity + holes; no CPU geometry mirror in GpuScene.

B · Compose a map, not just vector buffers

Style / search → mapget subset → WASM primitives → A · GPU update → **B · Frame composition**



Actual order: Deck scene/effects → optional contact shading → text. Picking is a separate pass; contact shading is not a shadow map.