

# W3DS revisited

## recent progress in GDI-3D



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# OGC Standardisierungsprozess

? OGC 08-140

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## 3D Portrayal Services – Use Cases

### Warning

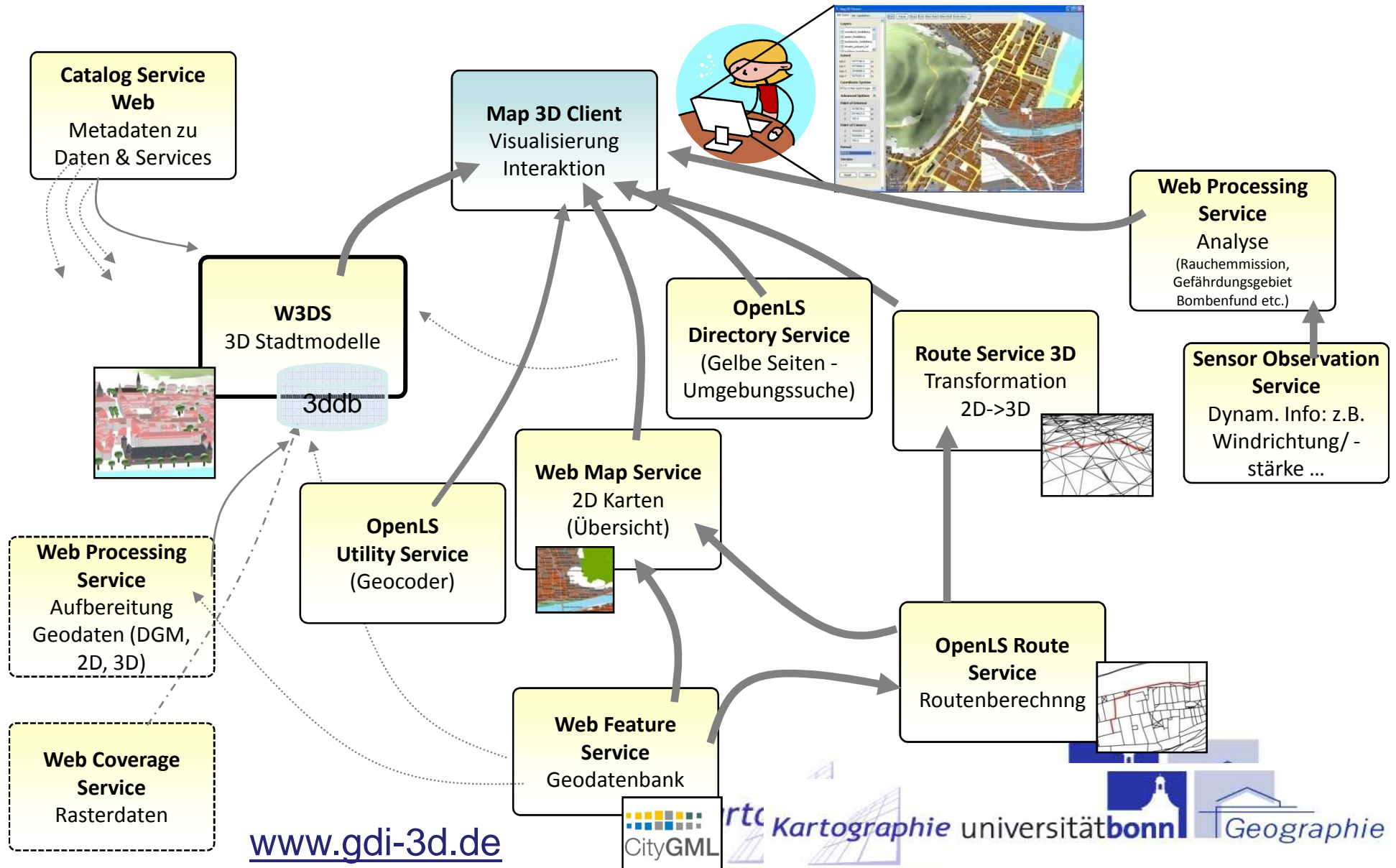
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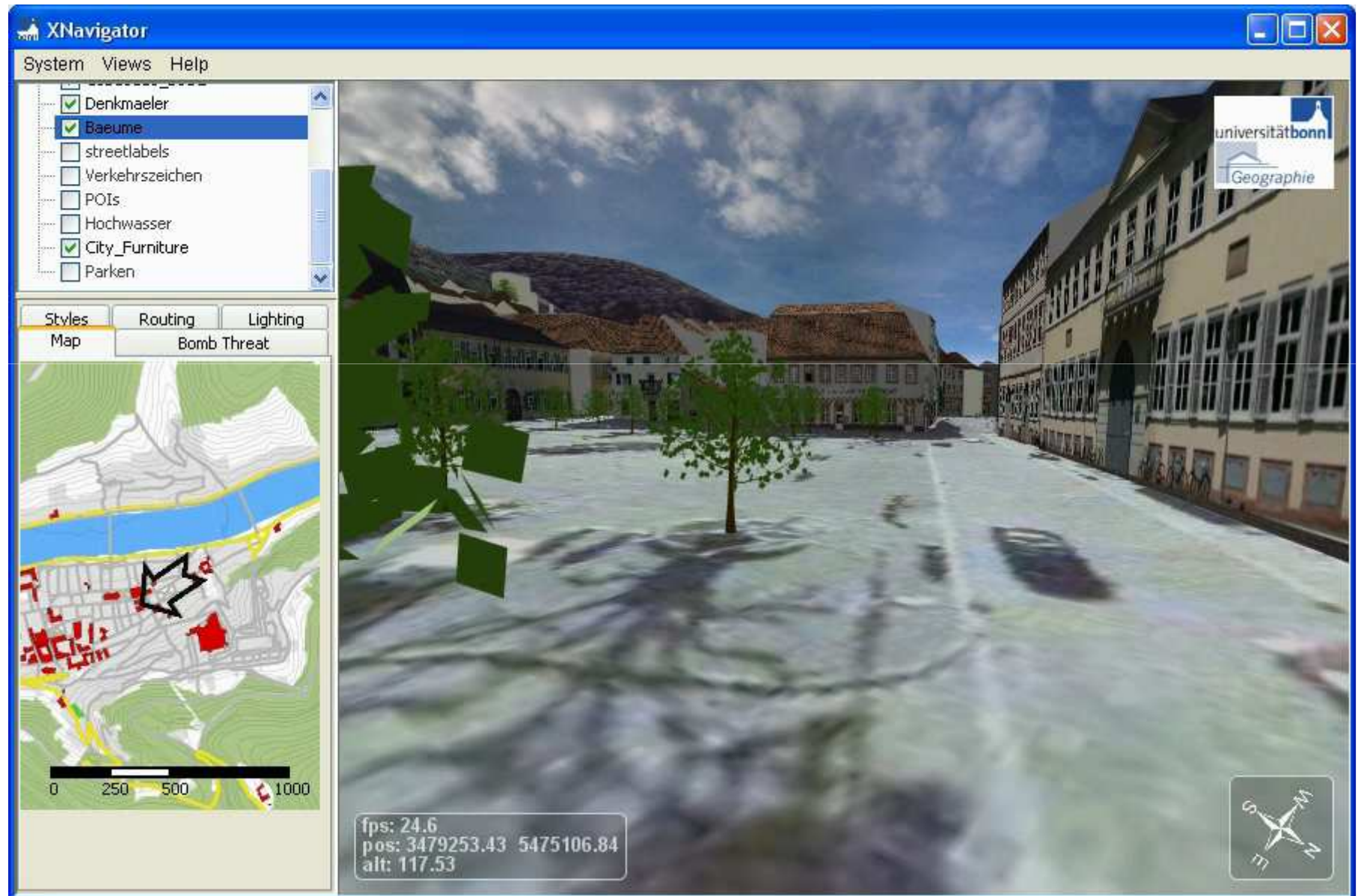
Document type: OpenGIS® Discussion Paper  
Document subtype: Use Cases  
Document stage: Draft  
Document language: English



# Architektur GDI-3D.de basierend auf OGC Diensten

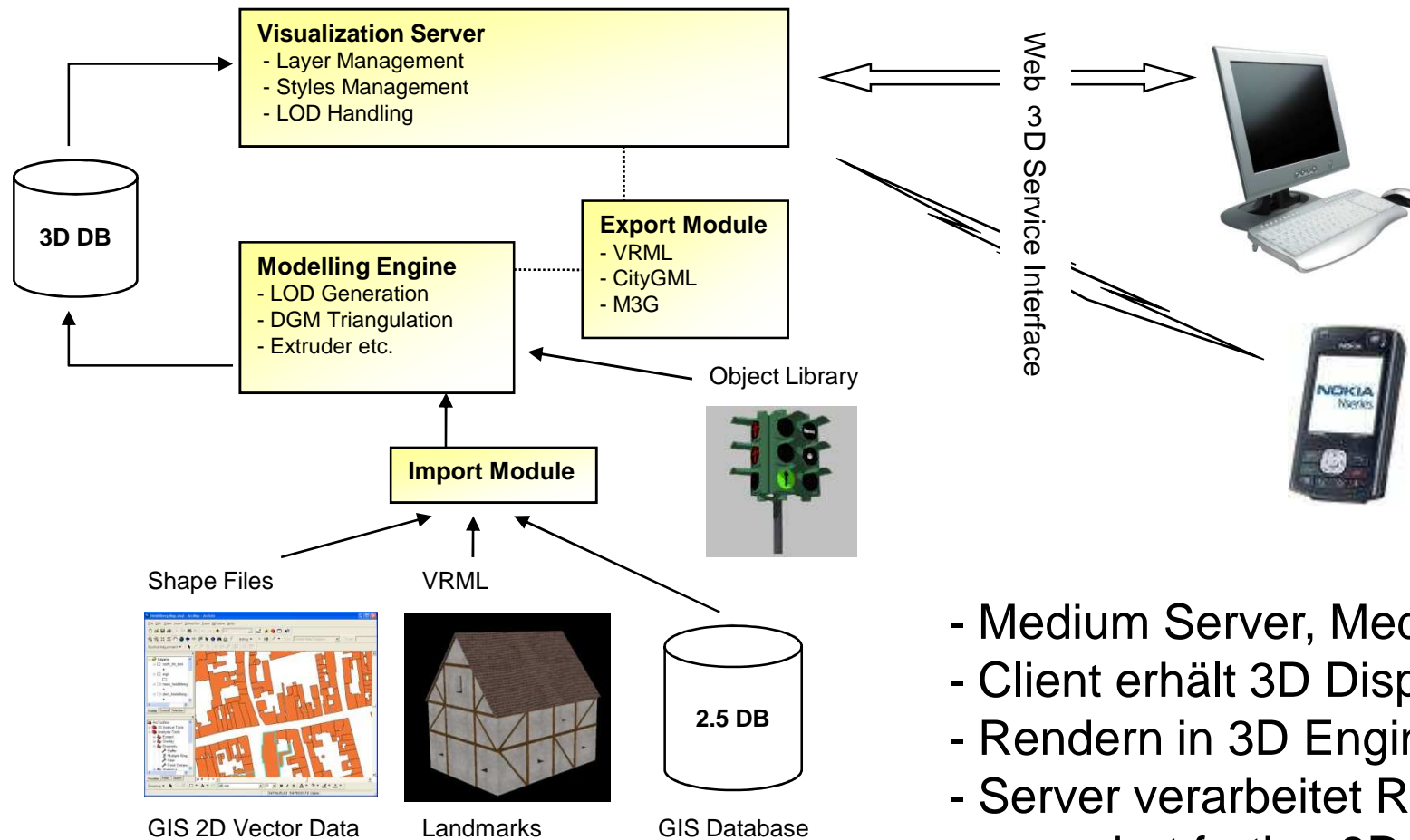


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# W3DS Visualization Server Concept

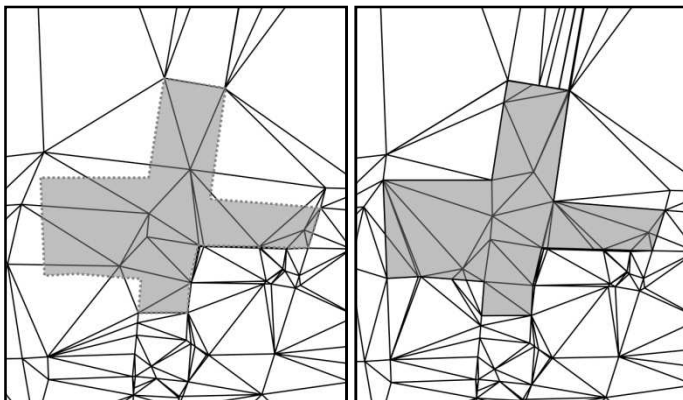


- Medium Server, Medium Client
- Client erhält 3D Display Elemente
- Rendern in 3D Engine des Clients
- Server verarbeitet Rohdaten und generiert fertige 3D Modelle

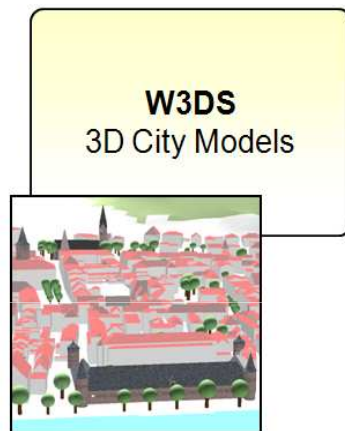
[www.gdi-3d.de](http://www.gdi-3d.de)

# Vektorbasierte 3D-Karten

- Polygone werden in DGM eingerechnet
  - keine Textur/Pixelexeffekte
- Streaming sinnvoll
- für W3DS nicht spezifiziert
- aber durch intelligenten Client realisierbar



Gekacheltes 5m-DGM mit LOD



OGC Web3D Service

**For each Tile**

```
request=GetScene
&bbox={Tile.bbox}
&layers=DEM
```

VRML 2.0

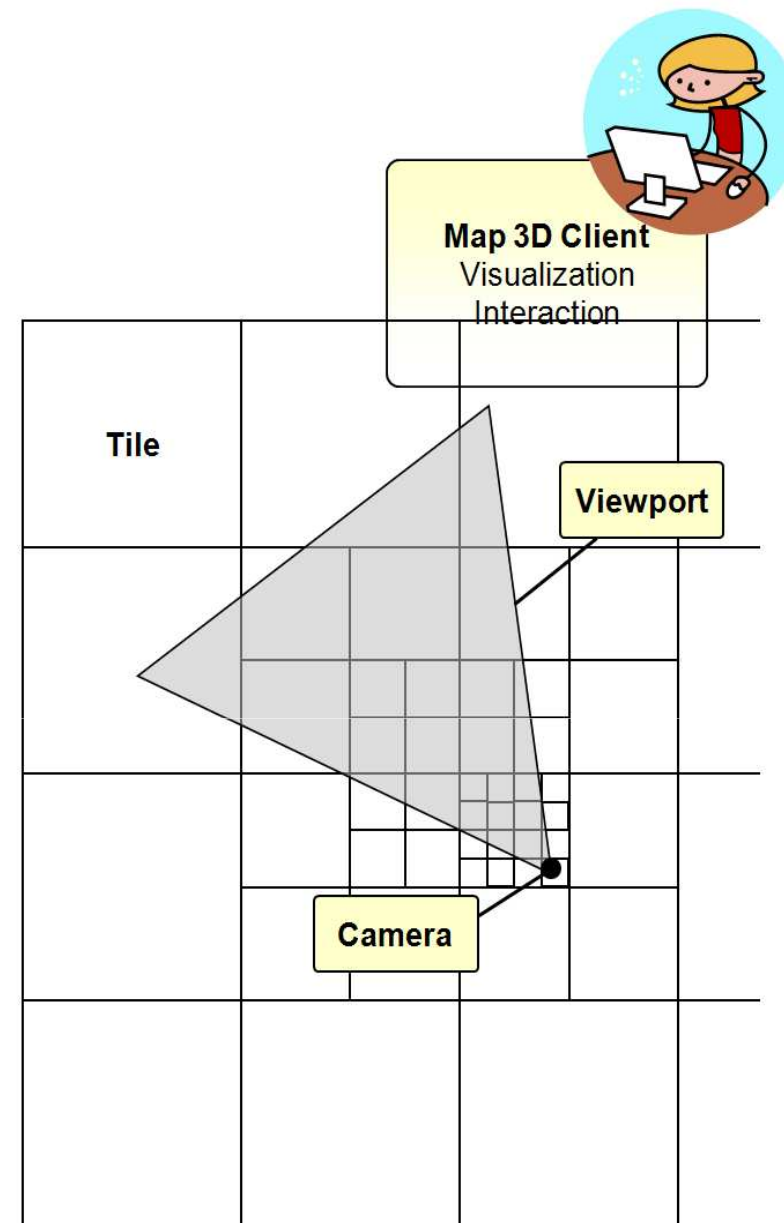
```
request=GetScene
&bbox={Tile.bbox}
&layers=Buildings
```

VRML 2.0

⋮

one request  
for each layer

-> dynamic browsing and  
navigation using open  
standards for 3D SDI



# XNavigator

stem Views Help

- ☒ Buildings LOD 2
- ☒ Trees
- ☐ Parking Meters
- ☐ Traffic
- ☐ Street Names
- ☐ Labels

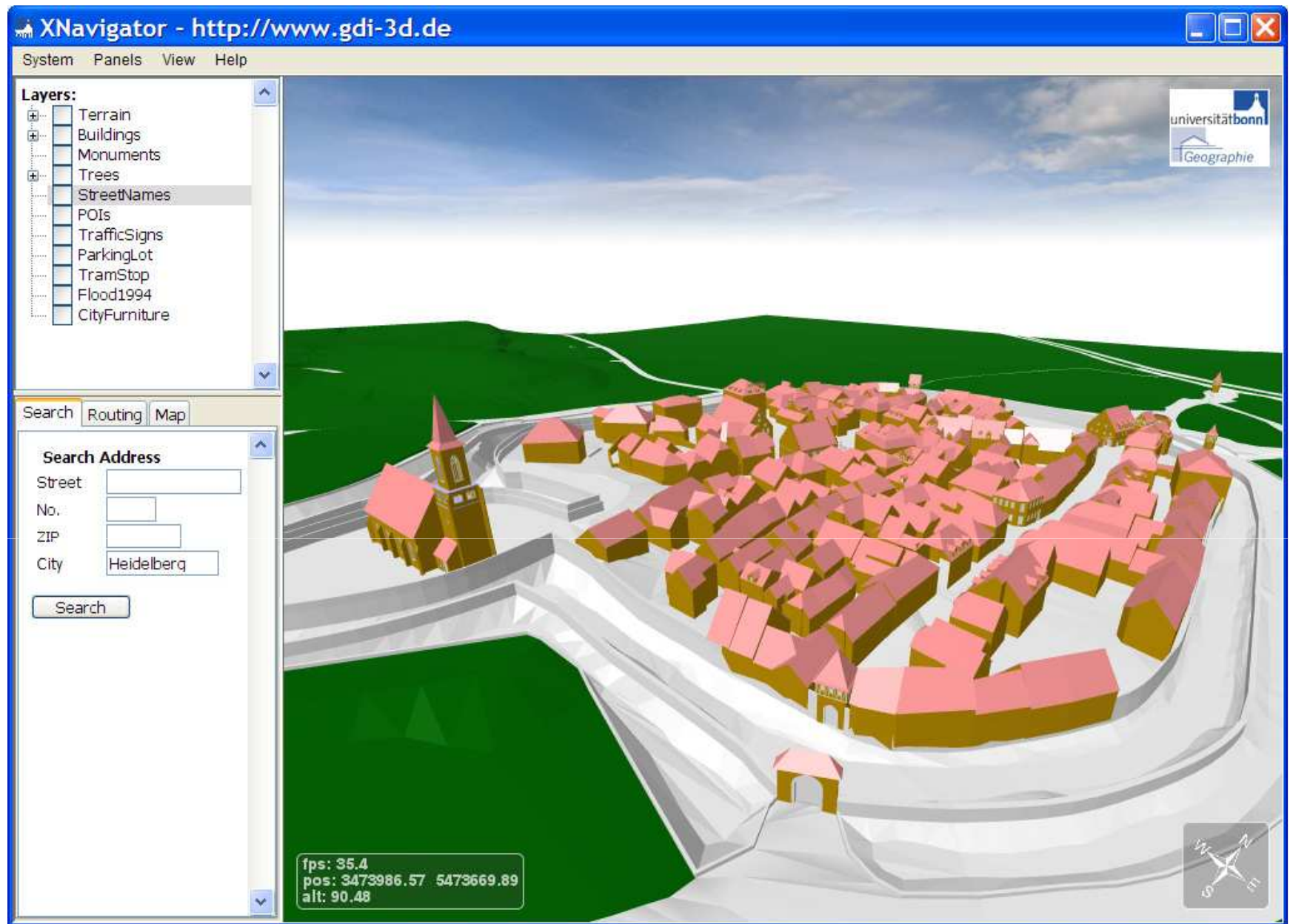


fps: 64.1  
pos: 3477349.52 5476098.14  
alt: 4862.0

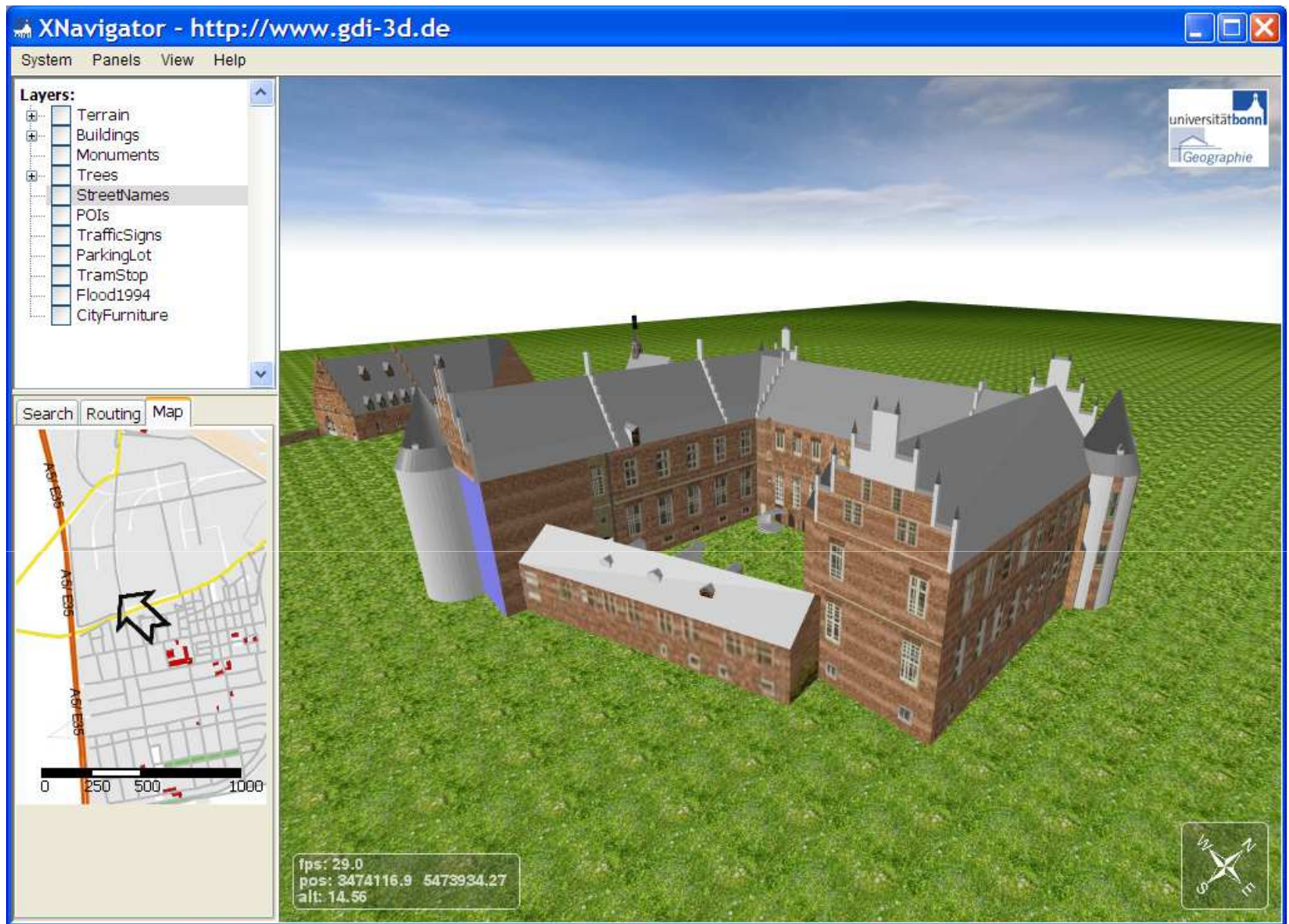
universität **bonn** Geographie [www.heidelberg-3d.de](http://www.heidelberg-3d.de)







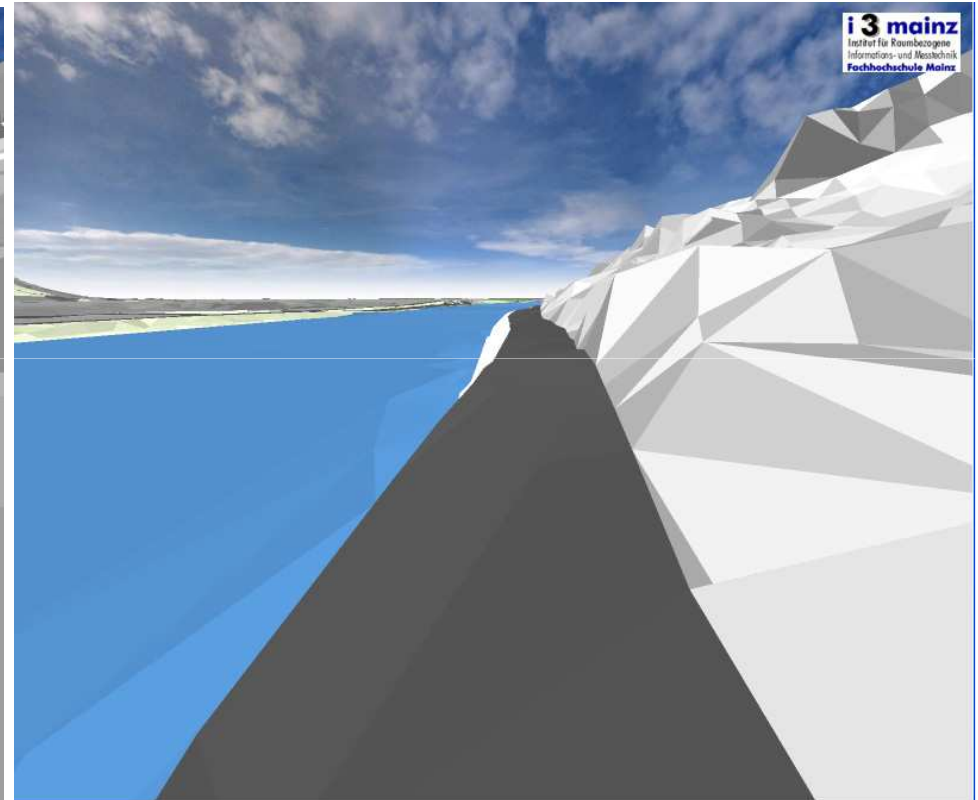
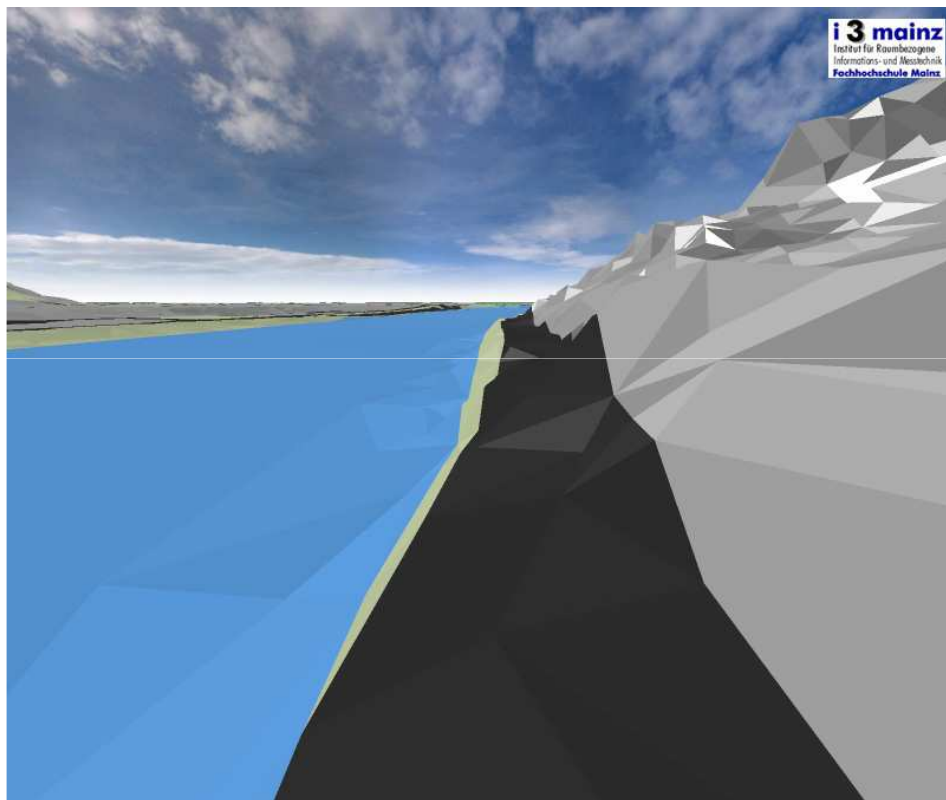
CityGML Import



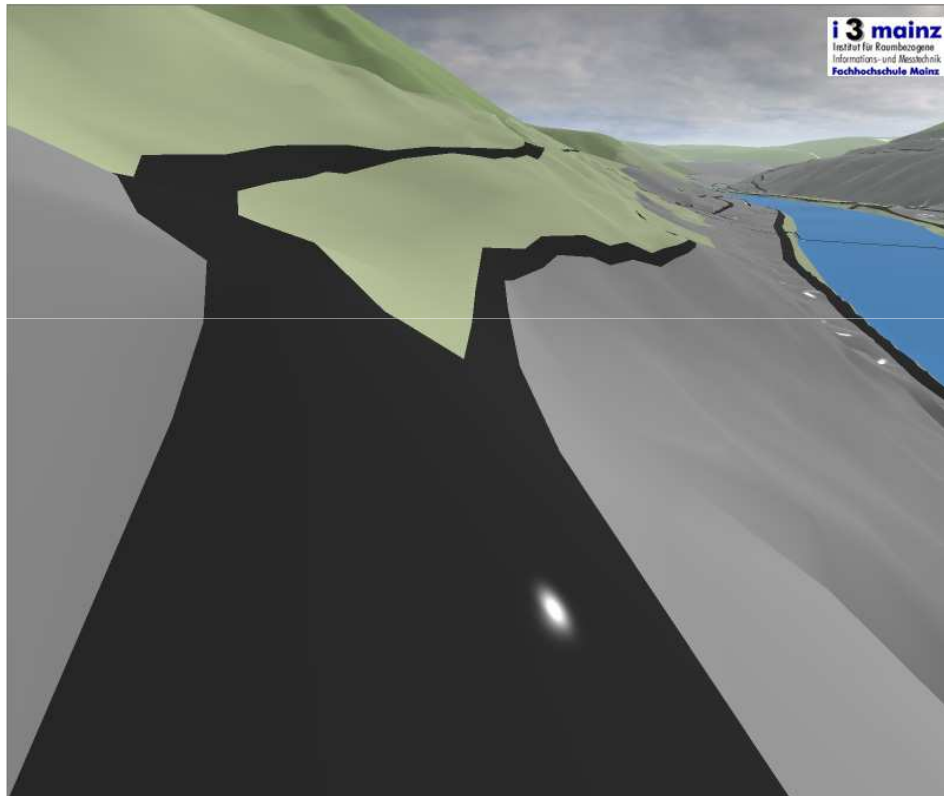
# CityGML Import



# DGM Vorverarbeitung: Einebnung Straßen



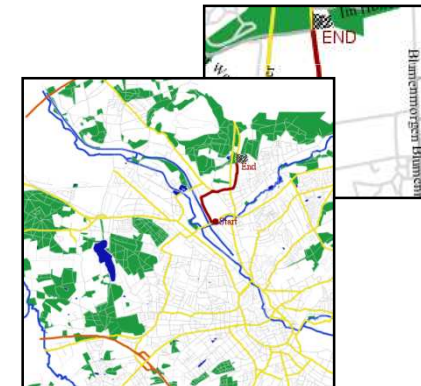
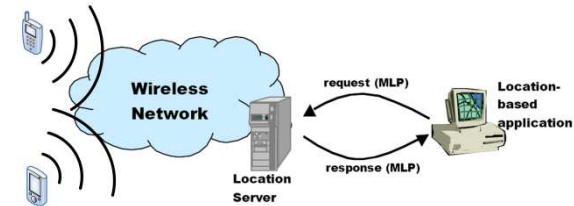
# DGM Vorverarbeitung: Einebnung Straßen





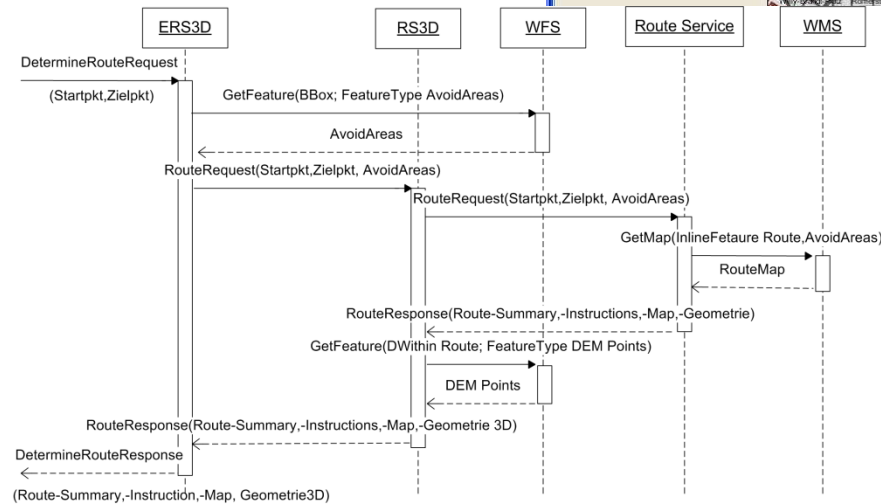
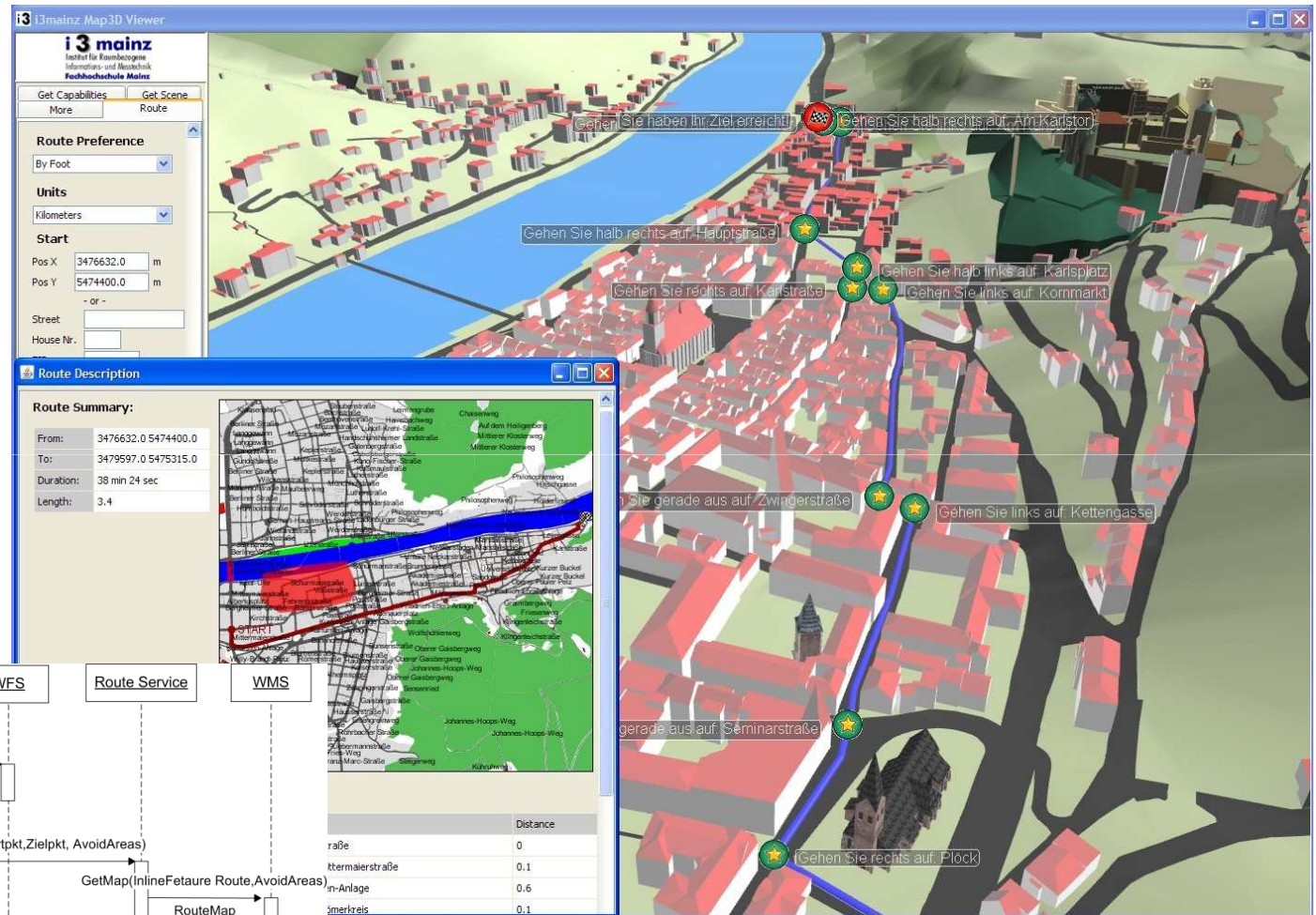
# OpenLS – Core Service Version 1.1

- **Part 1. Directory Service**
- **Part 2. Gateway Service**
- **Part 3. Location Utility Service**
- **Part 4. Presentation Service**
- **Part 5. Route Service**

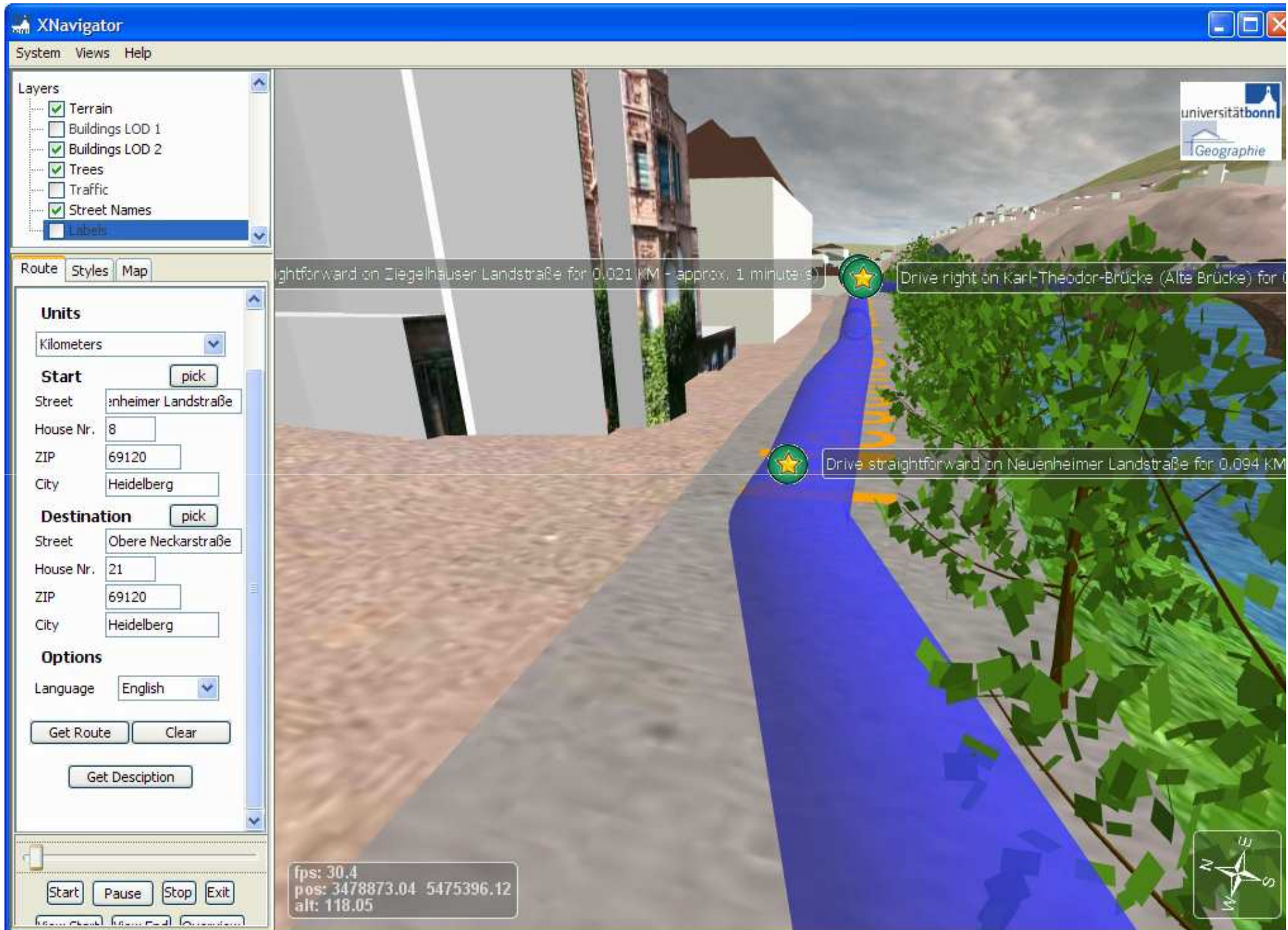


Under development: Tracking Service / Navigation Service

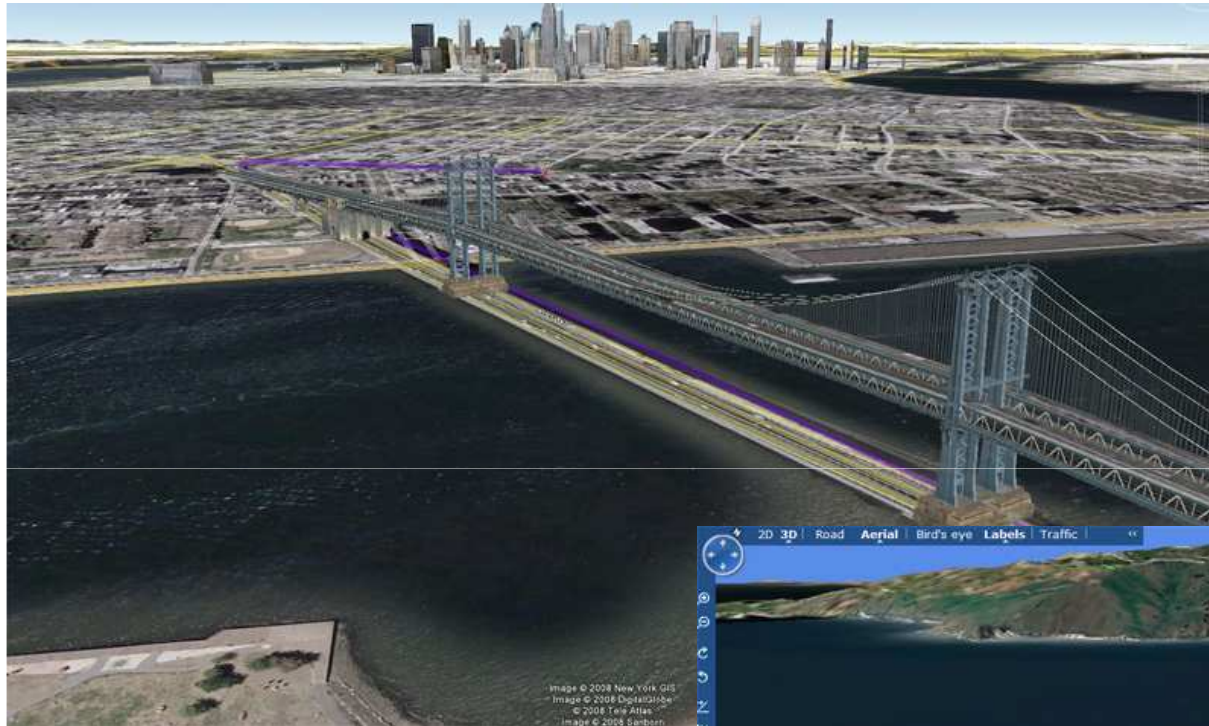
# Route Service 3D







# Brückennavi Google / MS





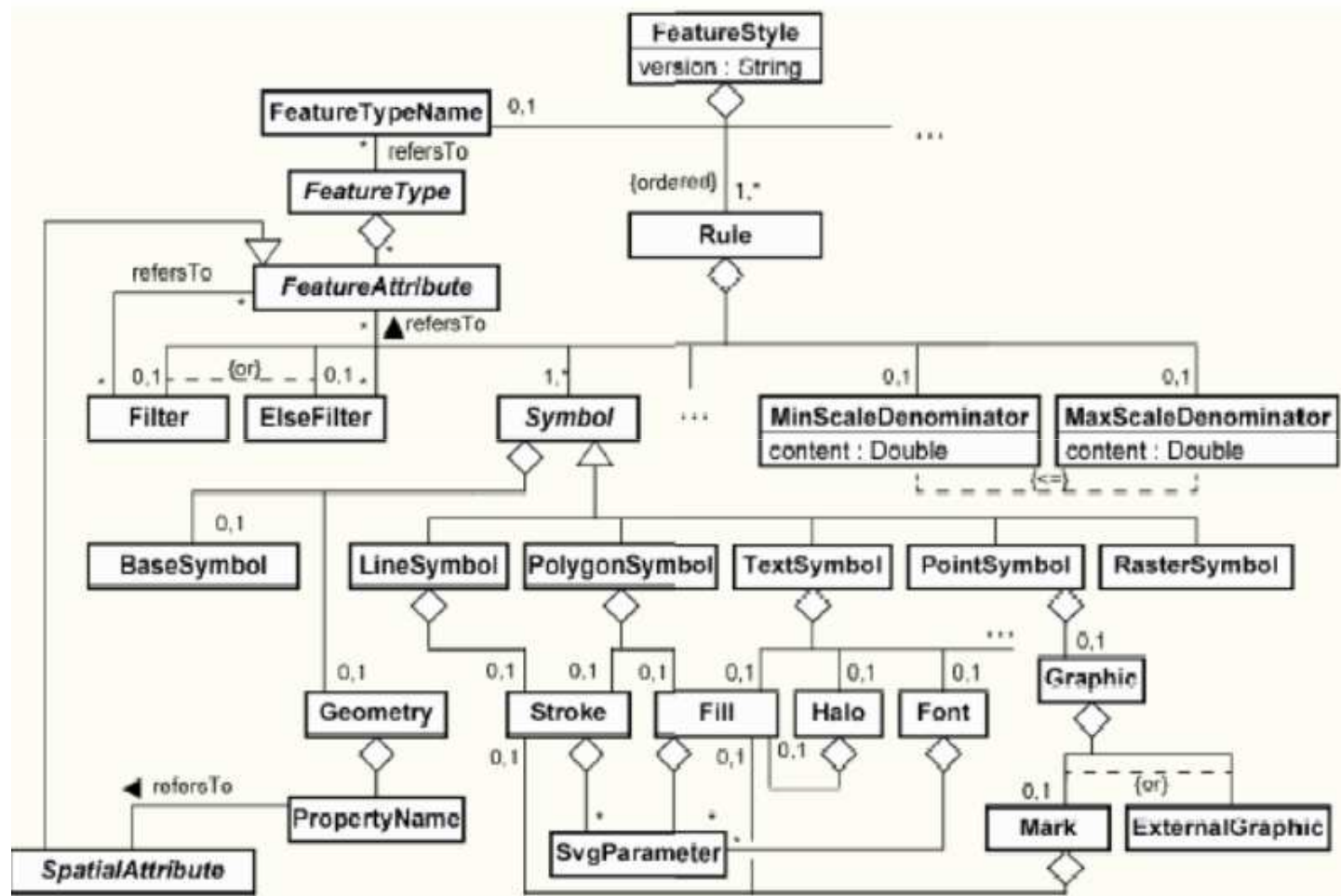
# OSM POIs in Hd-3D per OpenLS Directory Service







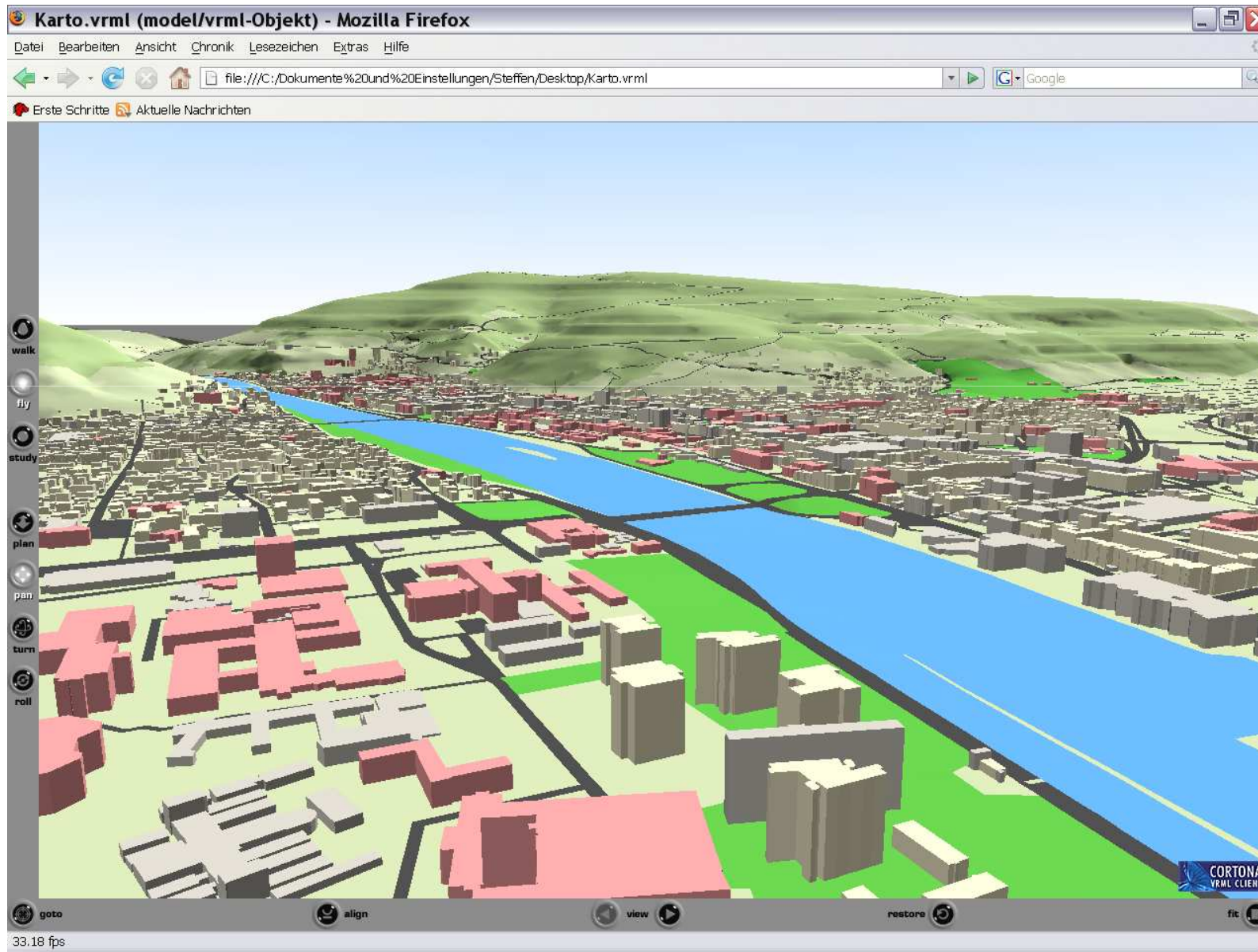
# OGC Styled Layer Descriptor (SLD)



(Brinkhoff)



# Auswahl per OGC Filter Encoding im SE





# OGC Styled Layer Descriptor -> 3D



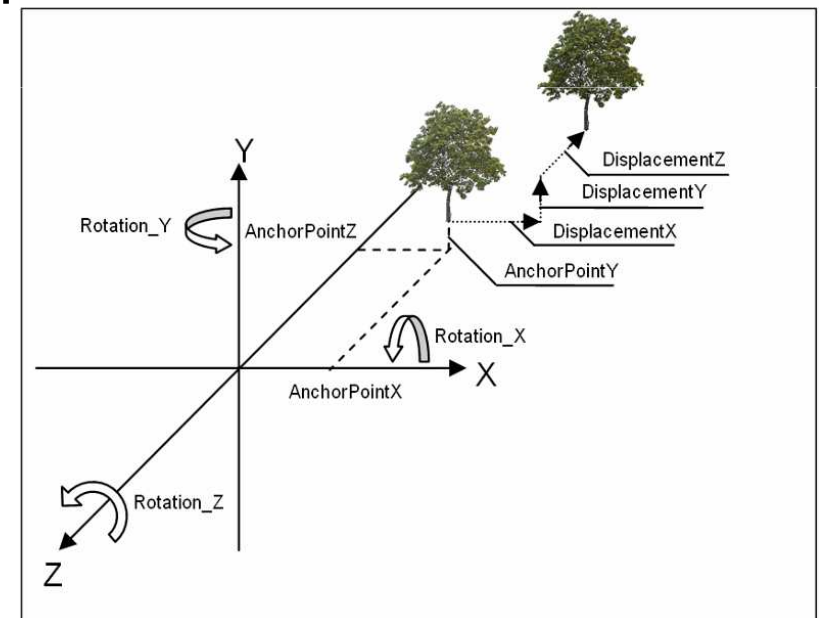
Simple Materials, Flat Shading



Textures, Phong Shading

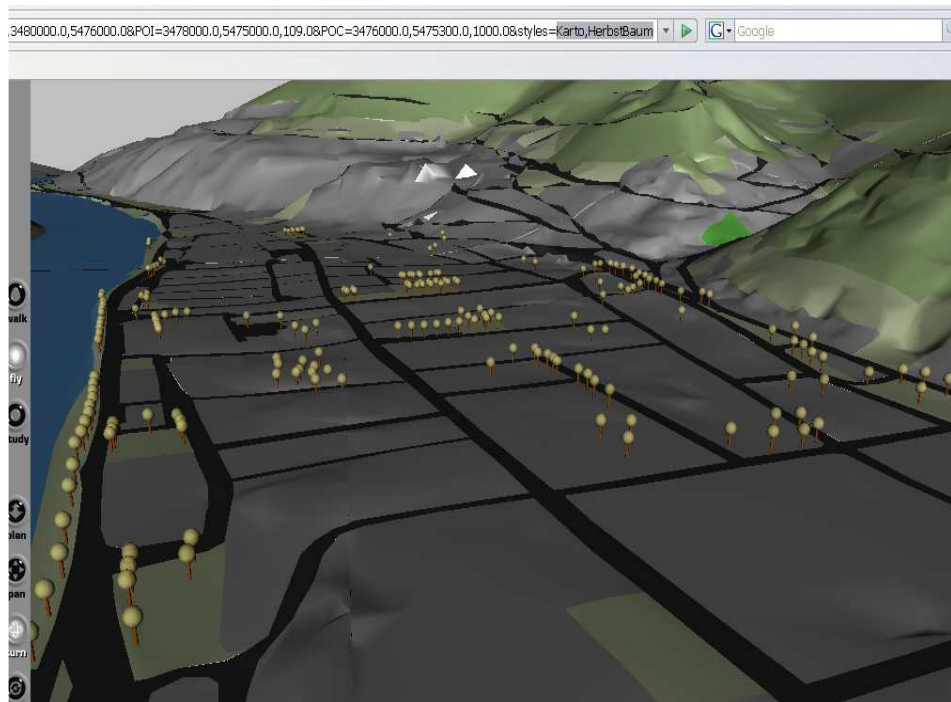
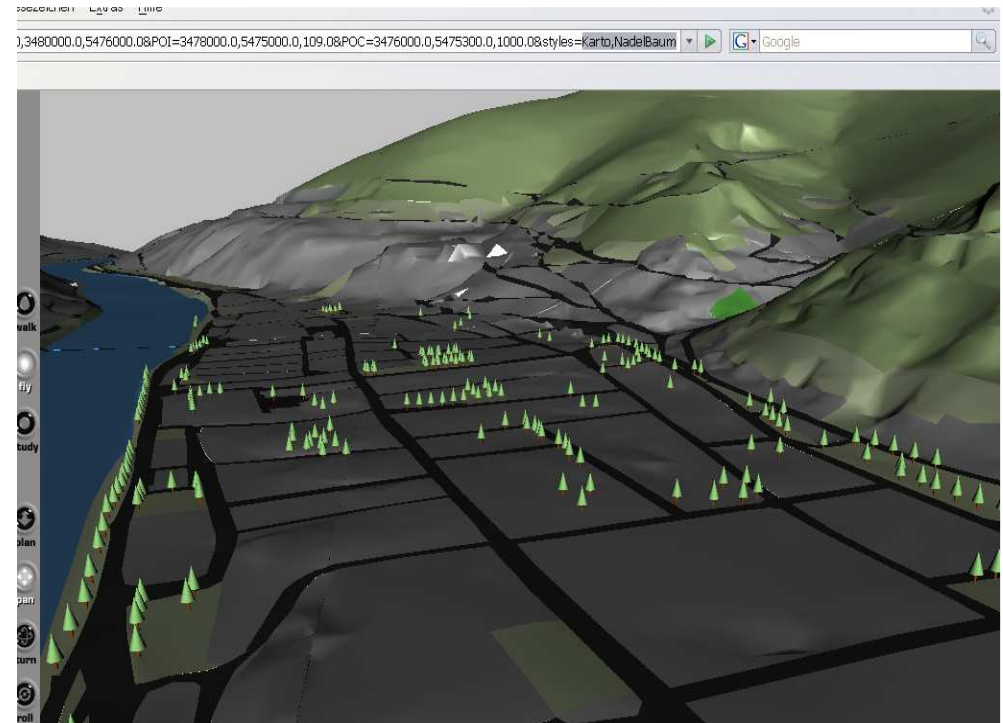
# 3D Erweiterung OGC Symbology Encoding

- Rotation um alle drei Achsen
- Verschiebungen & Positionen um Z
- Materialbeschaffenheit / Reflexionseigenschaften v. Licht
- SolidSymbolizer für Volumenkörper
- SurfaceSymbolizer für DGMS
- Einbinden externer 3D-Objekte
- Billboards für 2D Grafik
- Legenden 3D
- Linien als Zylinder
- Shading-Modell



# 3D Symbole

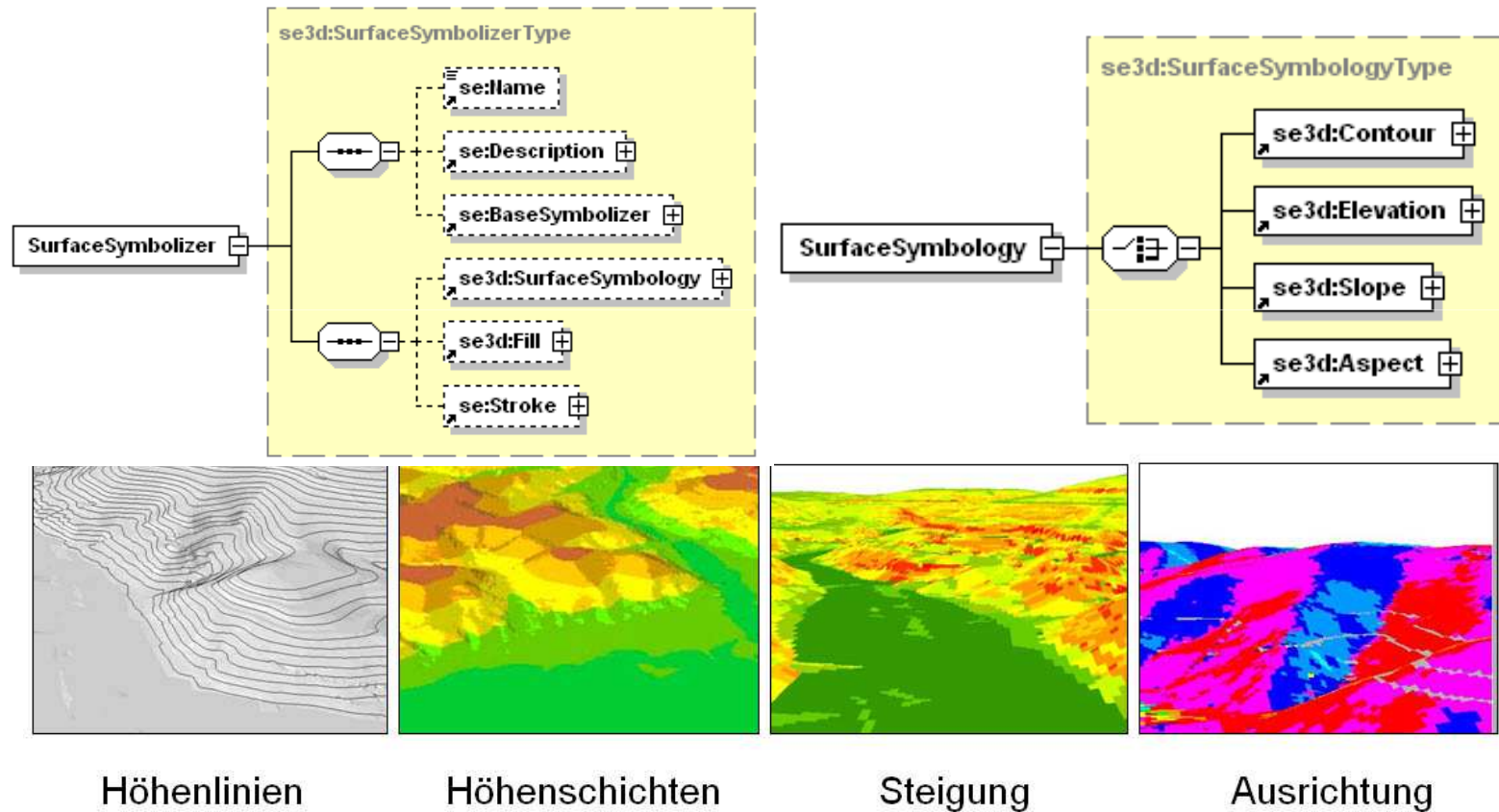
Benutzerdefinierte  
externe Stile per  
3D Symbology Encoding





# 3D Symbology Encoding

*SurfaceSymbolizer* für analytische DGM-Visualisierung



# 3D Symbology Editor (Client)

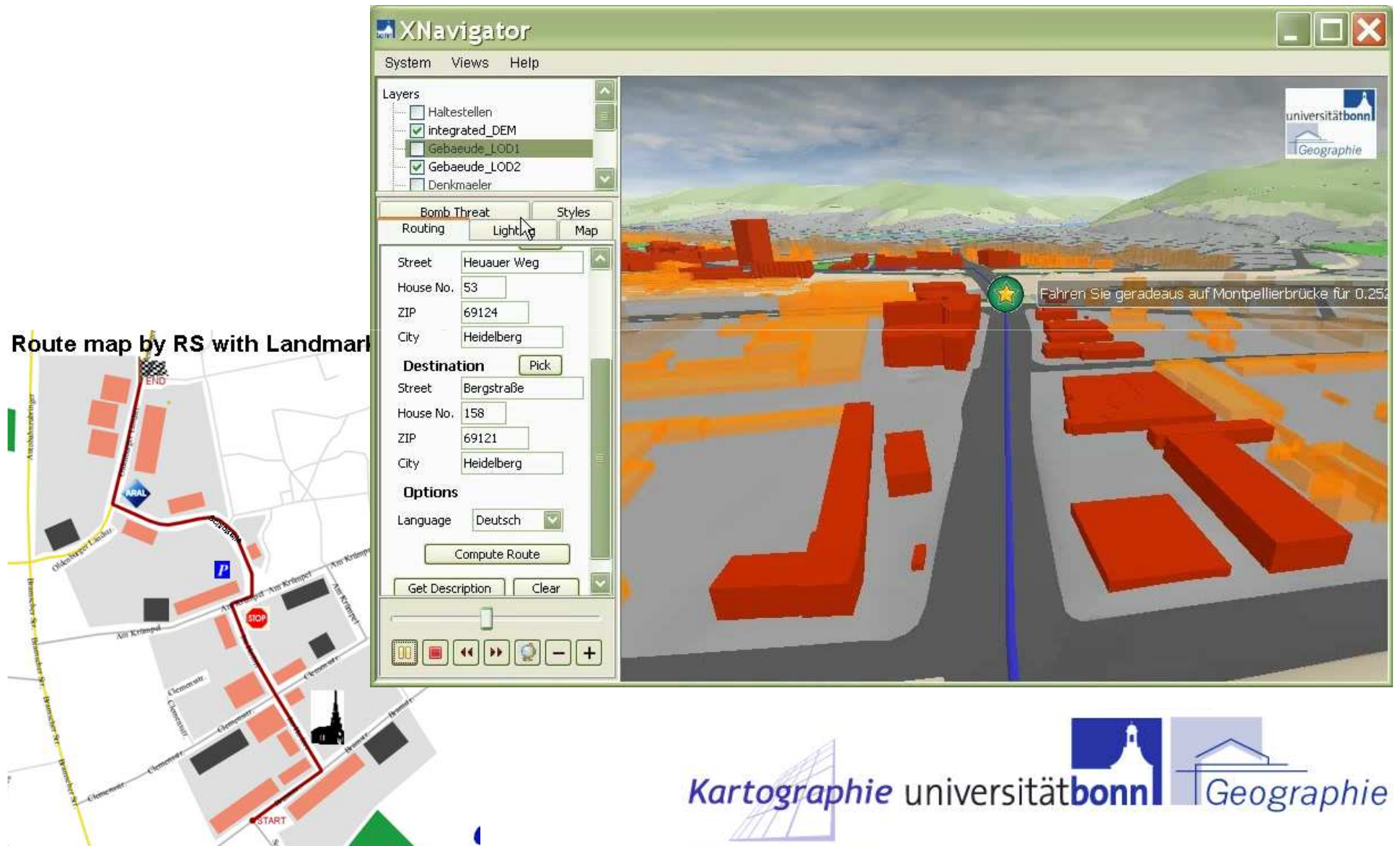




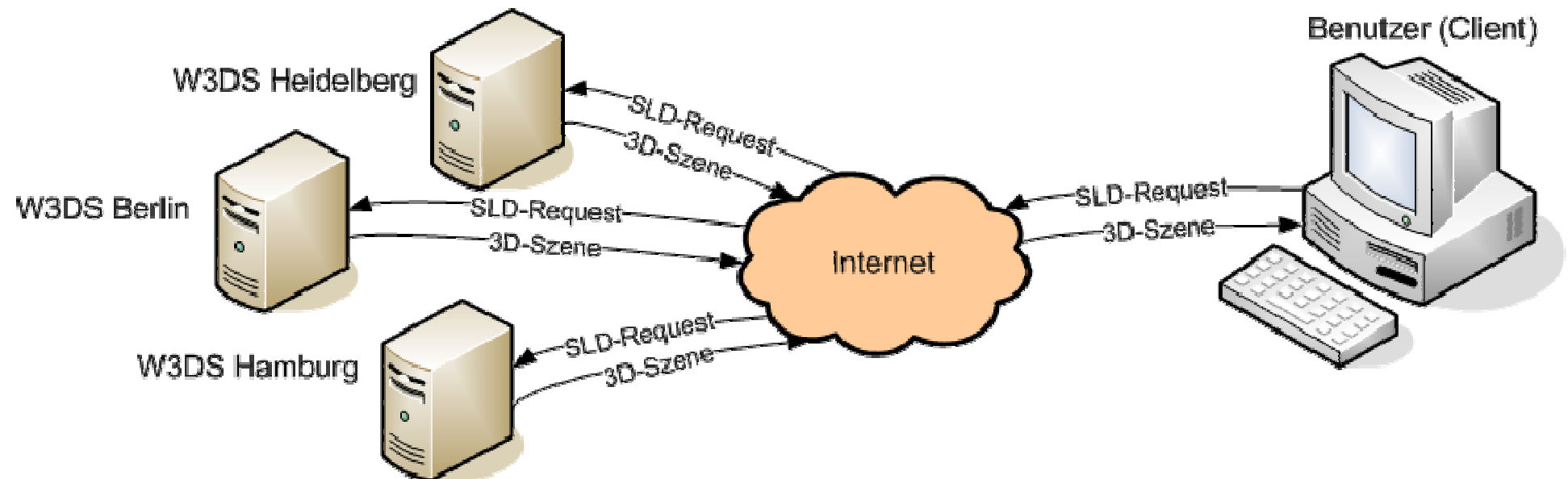




# Umsetzung Fokuskarten 2D & 3D



# Szenario verteilte W3DS mit 3D-SE



# Web Processing Service (WPS)

## - *Realisierte generische & domänenspezifische Prozesse:*

- Buffer, intersections (overlay), Thiessen Polygons
- several SpatialJoins with Aggregation
- SupplyAreas
- Bomb threat / Smoke emission
- Site Selection (housing market)

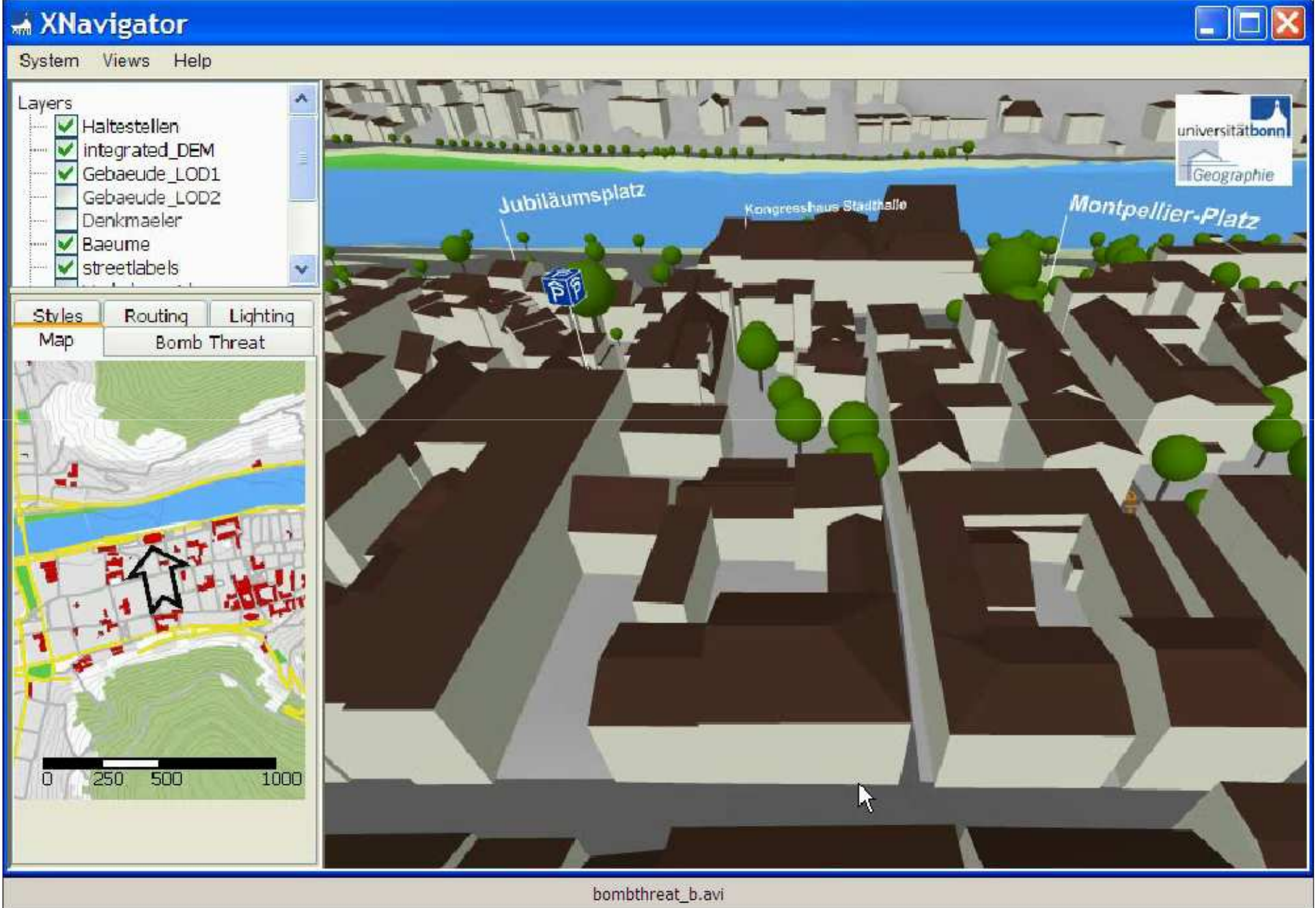
## - *In Entwicklung*

- Visibility analysis (DEM viewshed)
- 3D city model generation
- DEM processing (tiling, triangulation, generalization...)
- Raster processing
- Accessibility Analysis (Isochrones)
- ...

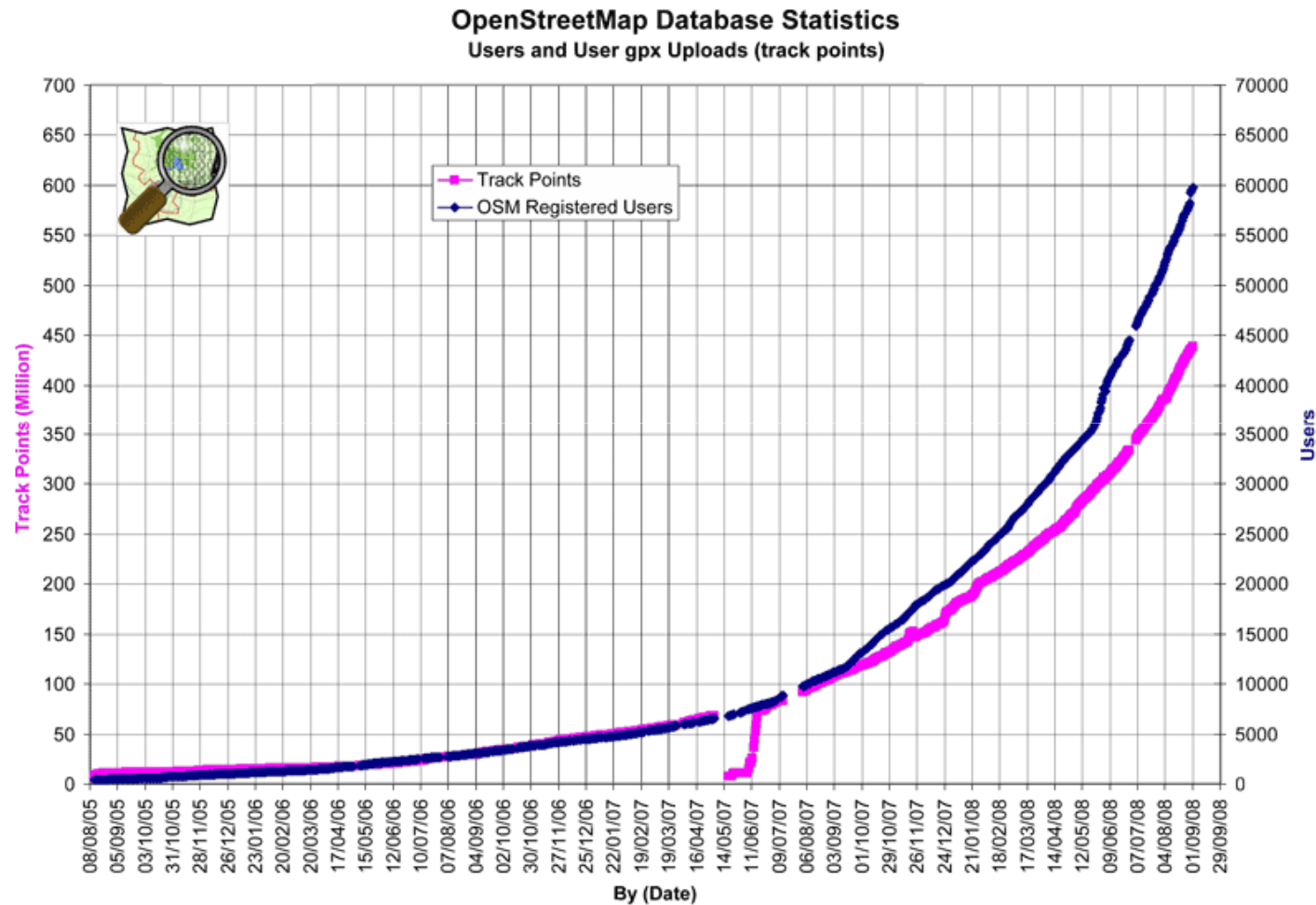




Sensor based WPS simulation 3D pollution cloud



# OpenStreetMap Entwicklung



<http://wiki.openstreetmap.org/index.php/Stats>





# OpenRouteService.org

Free OpenLS Route Service with Free OpenStreetMap Data

MAP&ROUTING · HELP · INFO · NEWS · EXAMPLES · FREEOPENLS · CONTACT

Routing with user-generated, collaboratively collected free geodata. This service is based on open standards by the Open Geospatial Consortium (OGC). Thanks to [OpenStreetMap.org](http://OpenStreetMap.org) - please donate your geographic data to [openstreetmap.org](http://openstreetmap.org)!

**Map** ☒ Map Interaction ☐ Get Information [Where am I?](#)

**Search**    
e.g. 'Bonn Meckenheimer Allee' or Postcode '53111'

**POIs** ☐ Position  [m] Click on position in the map to search for Points of Interest, such as hotels, restaurants

**Routing** ☐ Start    
☐ End

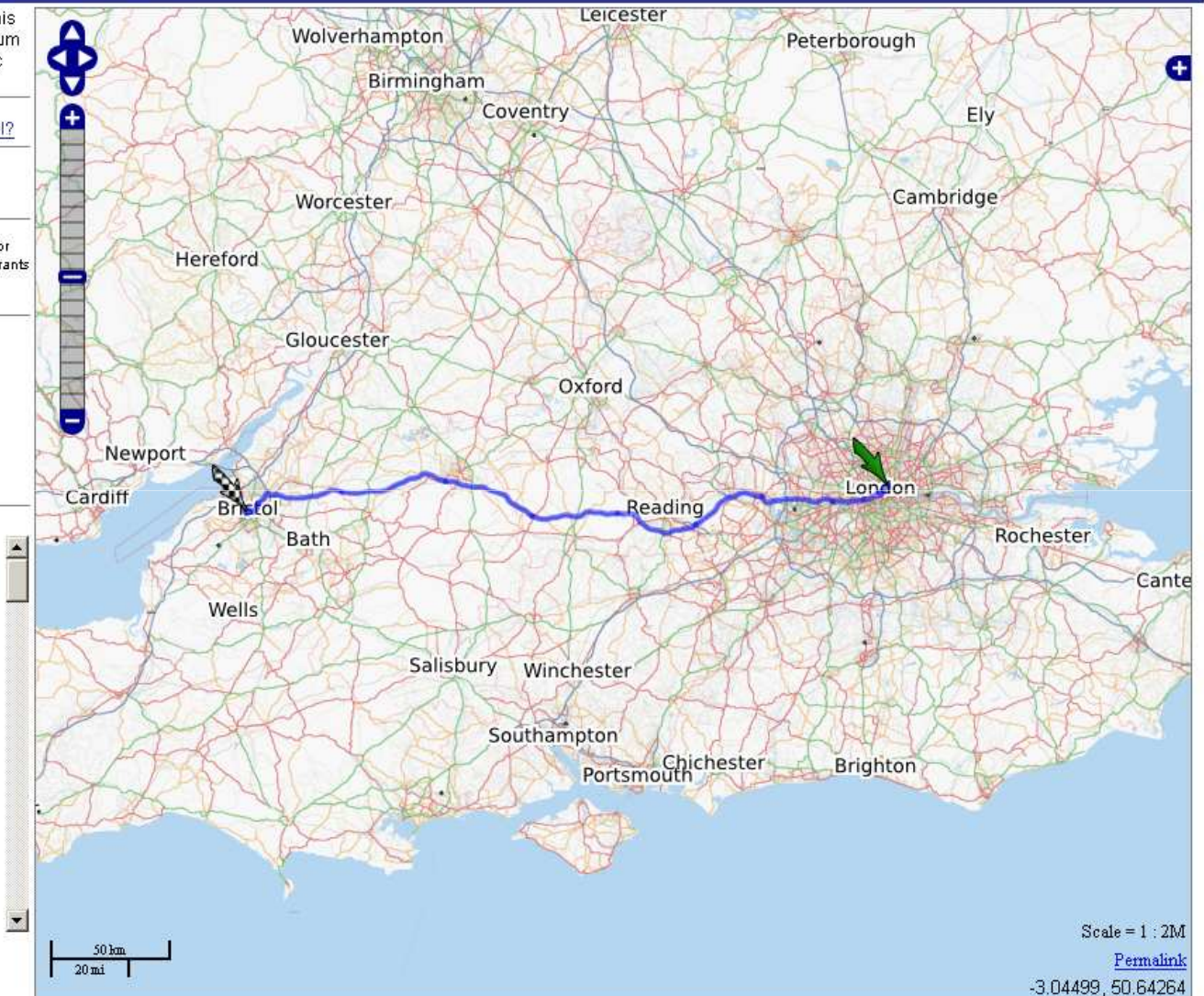
Add regions to be avoided when routing: [Extended Routing Version](#)  
Calculates reachable regions in given time: [Accessibility Analysis](#)

## RouteSummary:

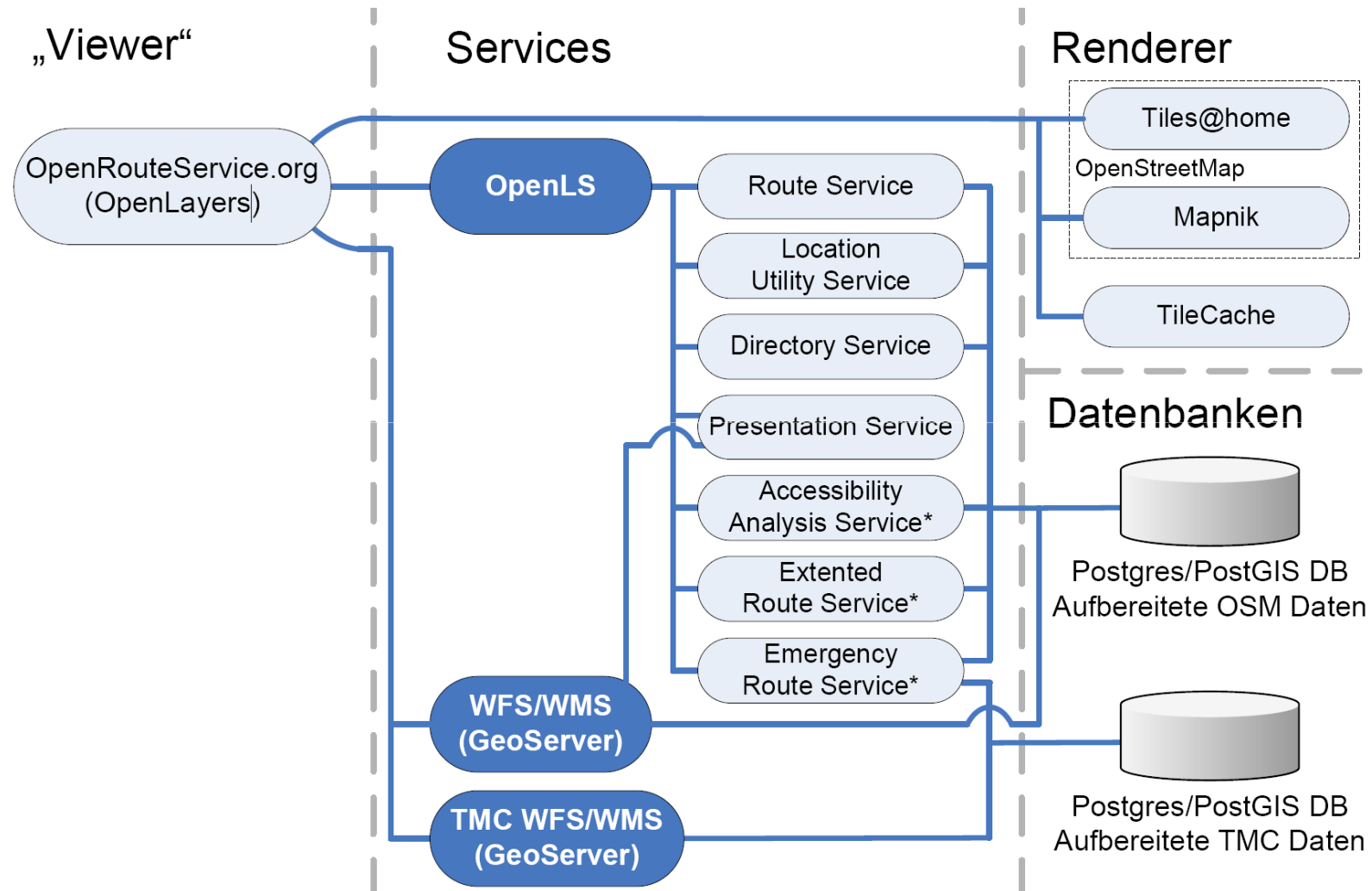
Total-Time: ~ 1 hour(s) 53 minute(s) 10 second(s)  
Total-Distance: ~ 197.0 KM

## RouteInstructions:

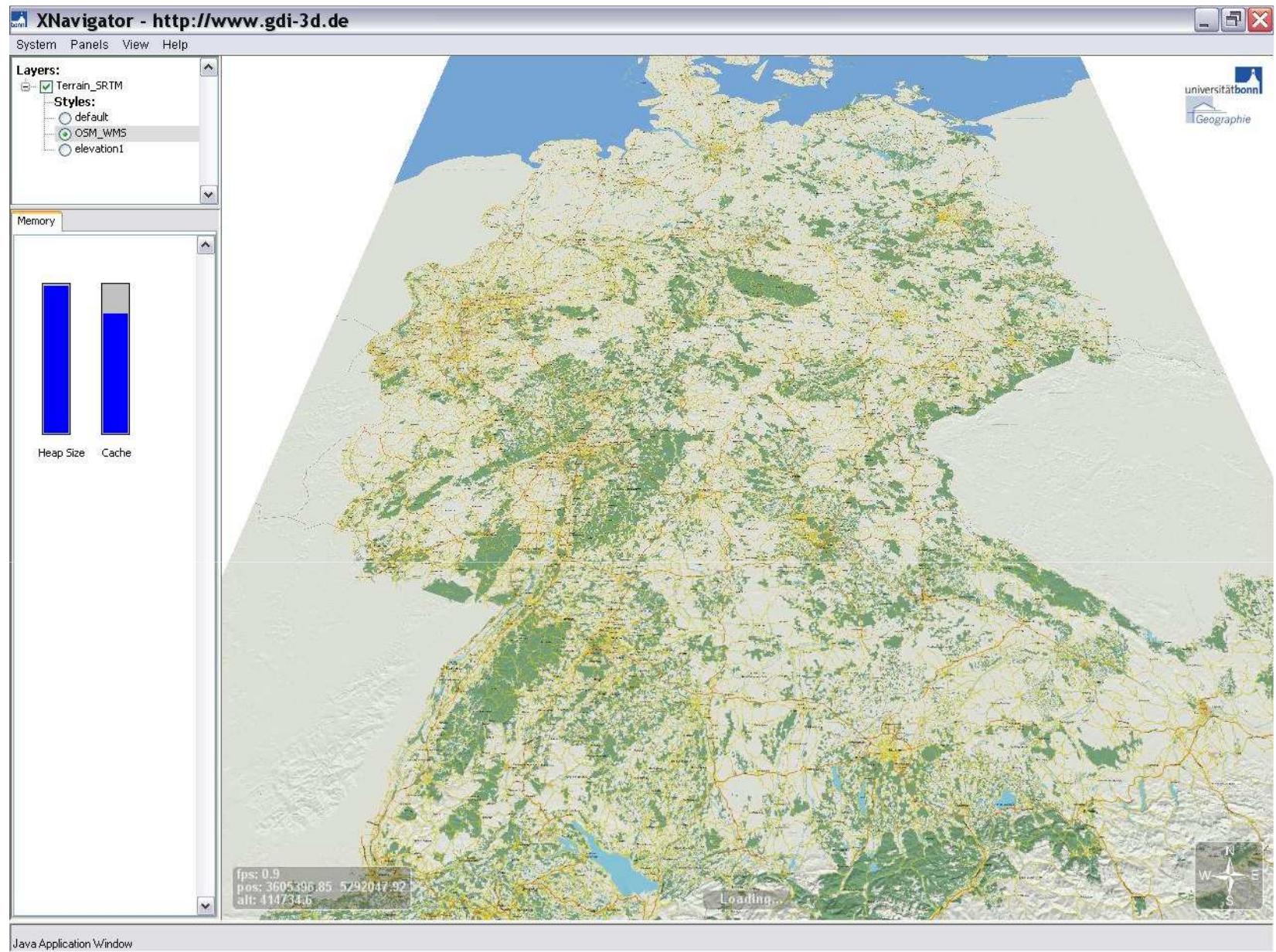
1. You start on: City Road
2. Please drive straightforward on City Road for 0.28 KM - approx. <1 minute(s)
3. Please drive left on Wakley Street for 0.13 KM - approx. <1 minute(s)
4. Please drive right on Goswell Road for 0.08 KM - approx. <1 minute(s)
5. Please drive half left on Friend Street for 0.14 KM - approx. <1 minute(s)



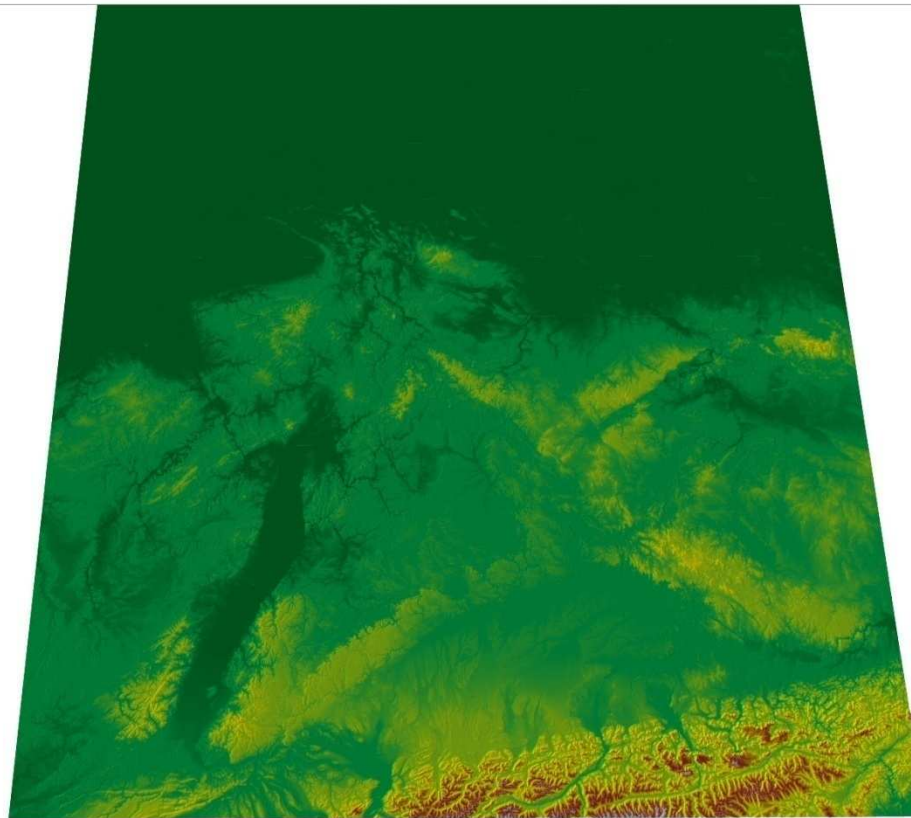
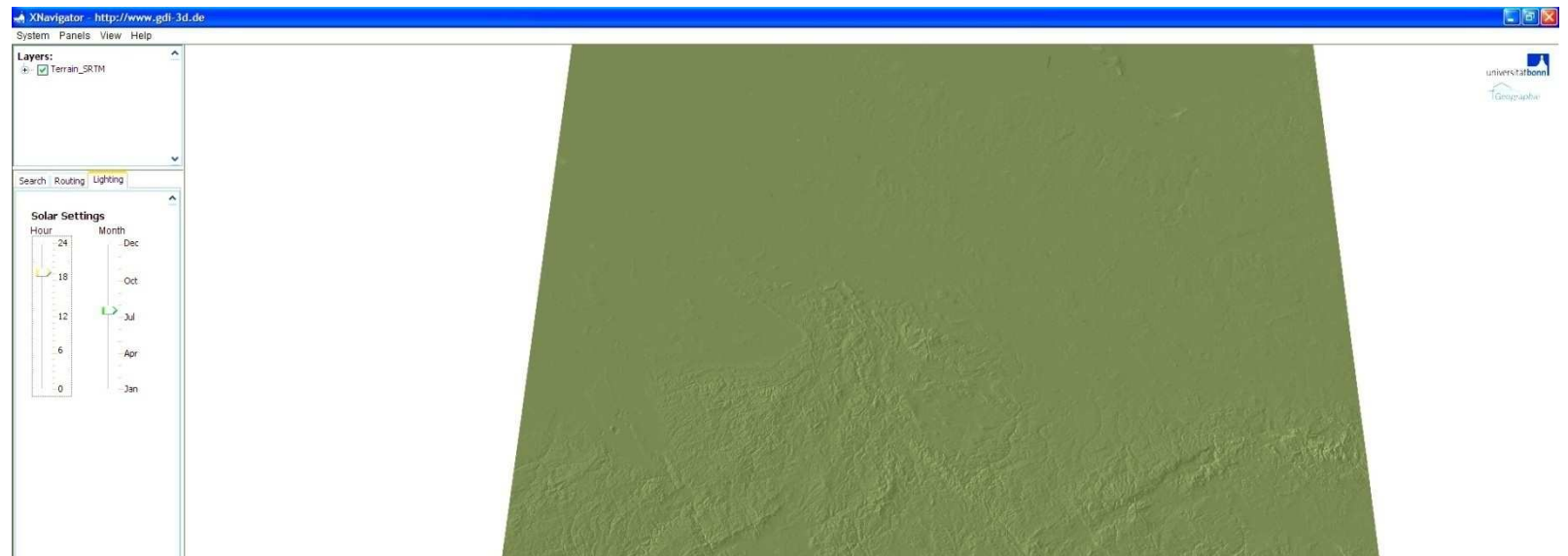
# OpenRouteService Architektur

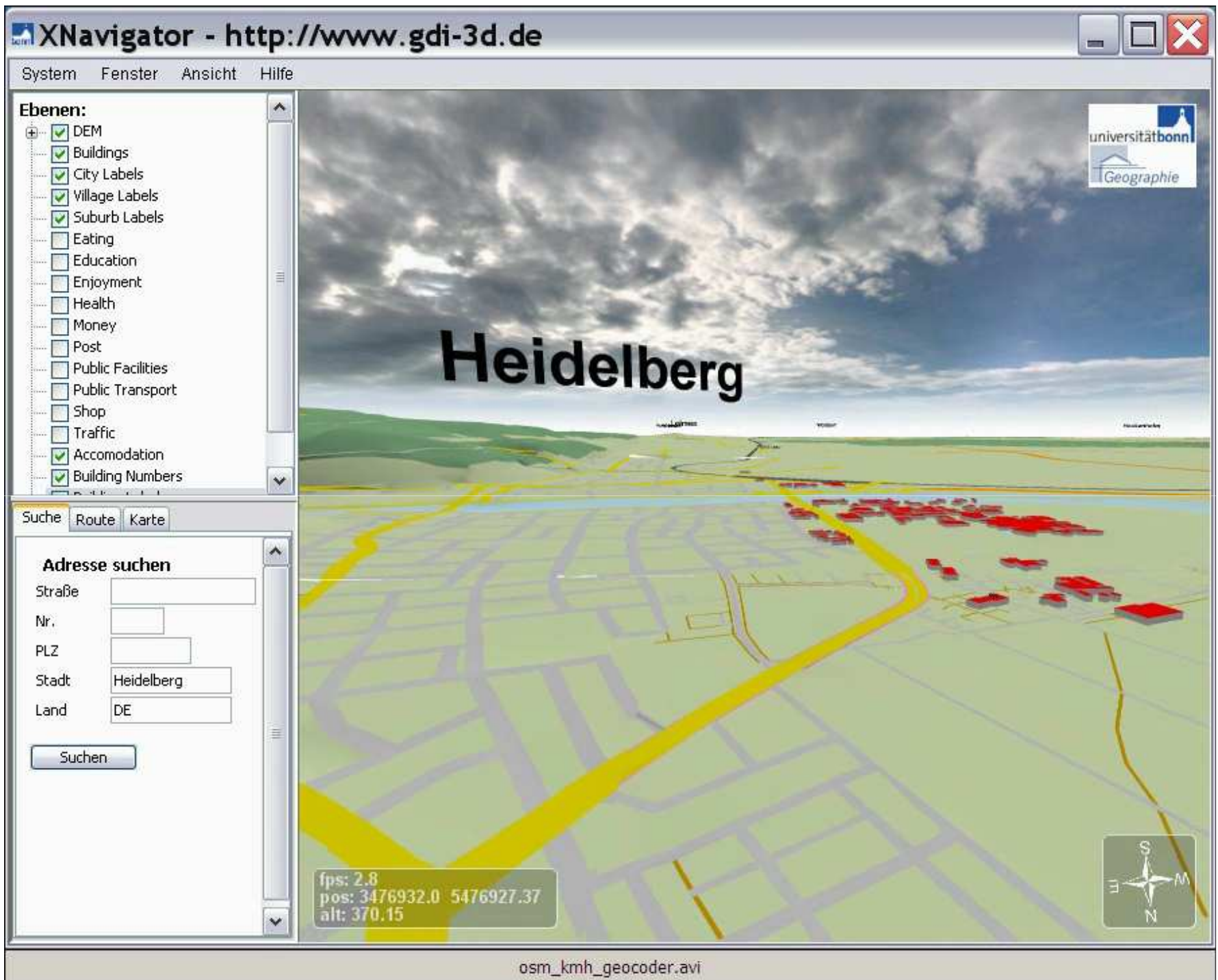




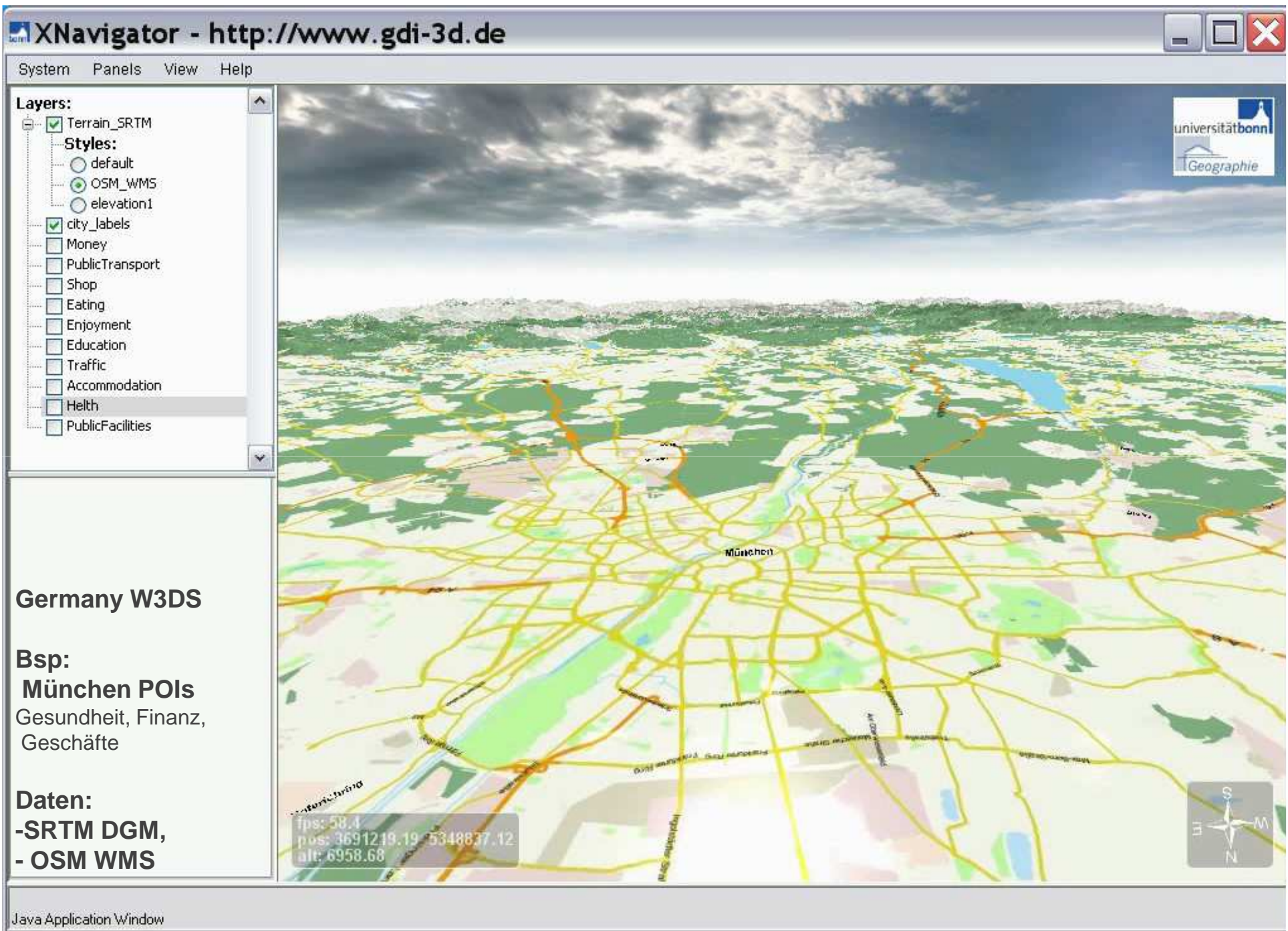




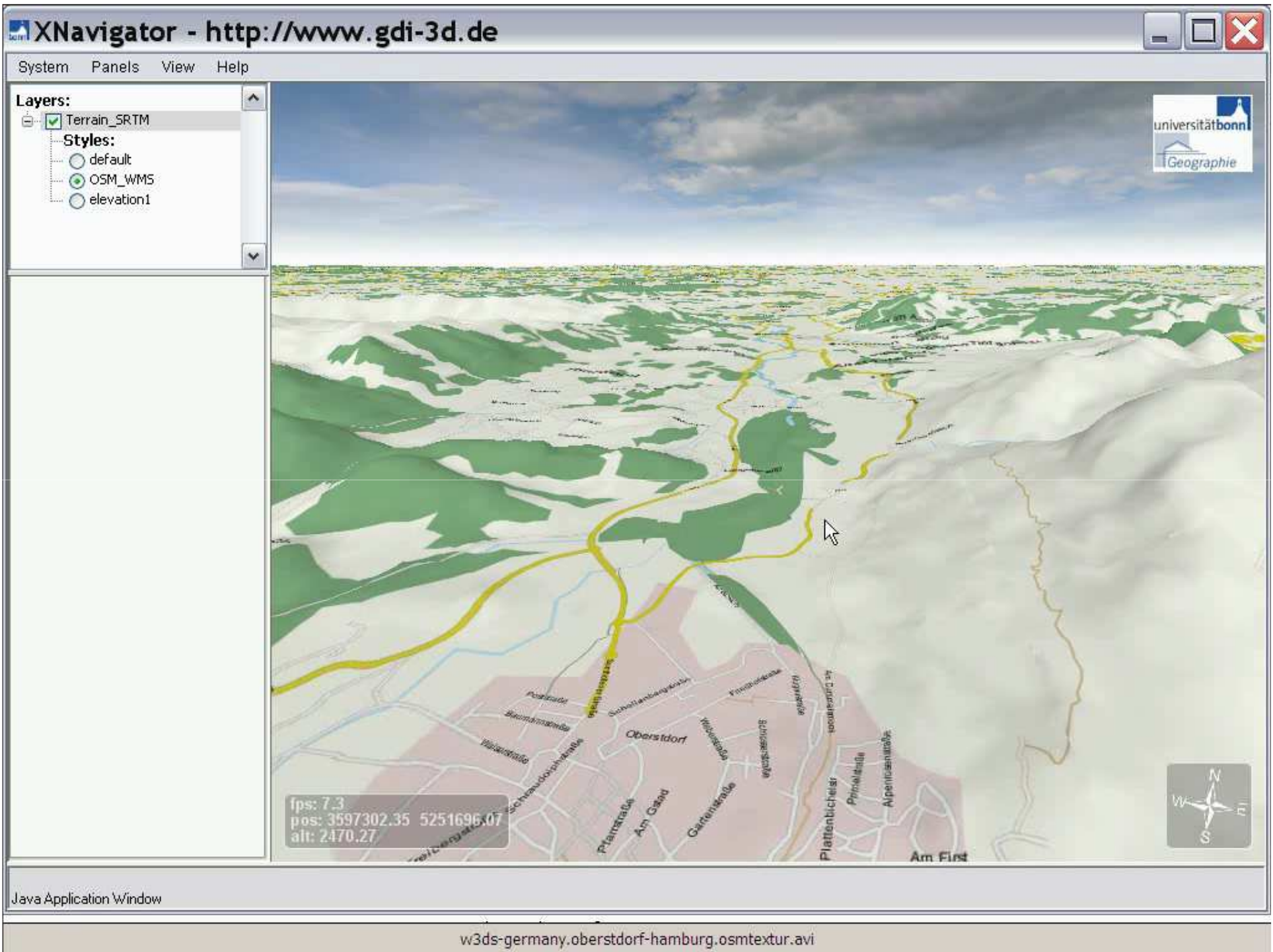


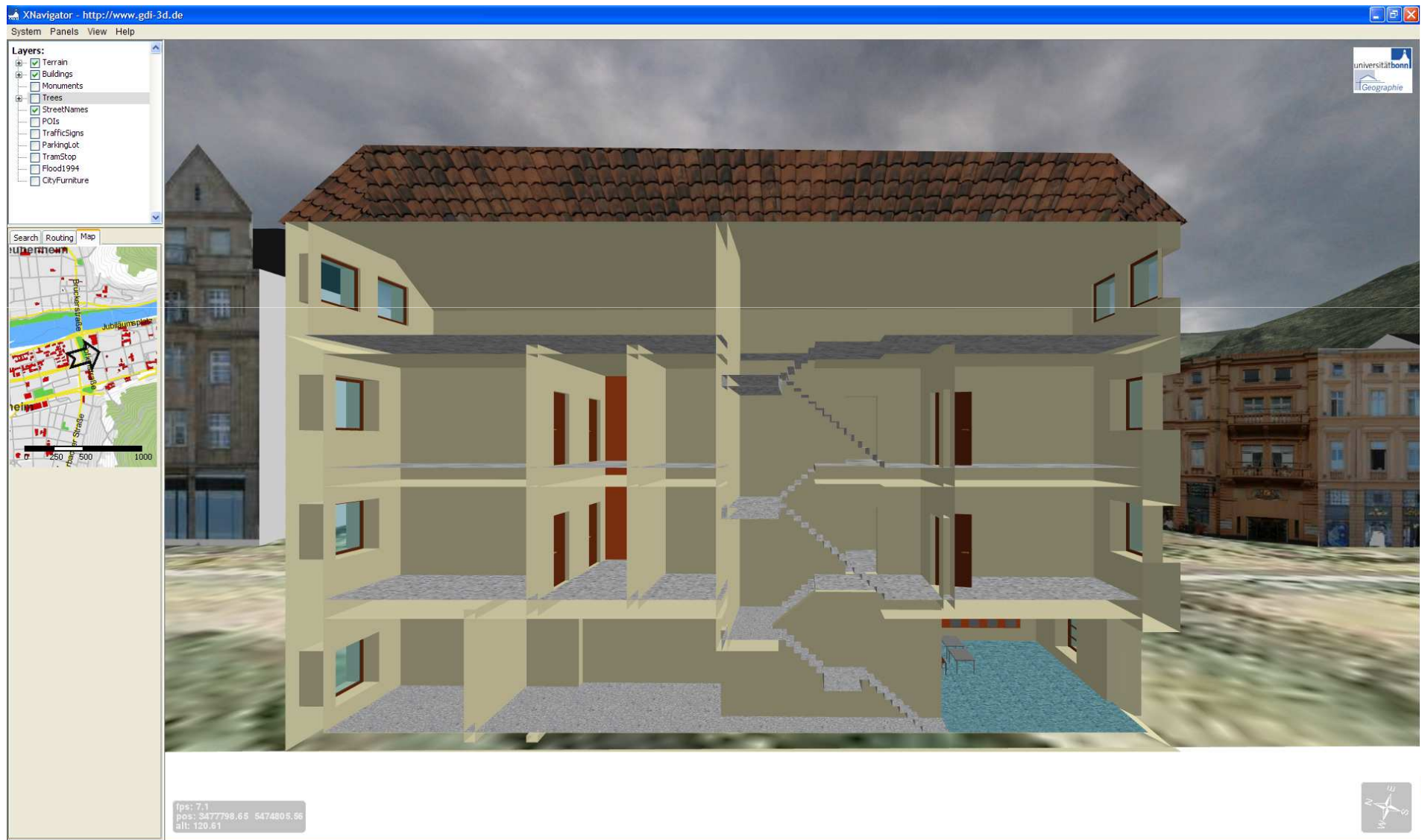












Videos can be found at:

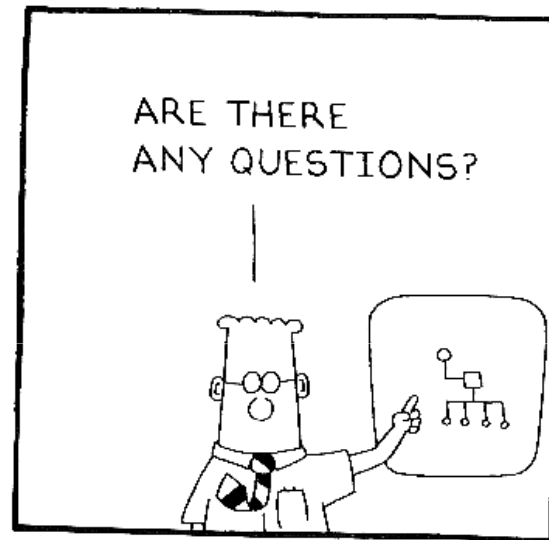
- [www.gdi-3d.de](http://www.gdi-3d.de) ->> videos
- <http://www.geographie.uni-bonn.de/karto/hd3d/videos.en.htm>
- All videos had been coded with the XviD Codec. If an attempt to play one of those videos does not succeed, you have to install the following codec:
- main address: <http://www.xvid.org>  
alternative: <http://www.divx.com>



# References

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# Vielen Dank für Ihre Aufmerksamkeit!



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<http://www.mona3d.de>  
<http://www.gdi-grid.de>  
<http://www.ok-gis.de>  
<http://www.hgis-germany.de>  
<http://www.3dgismarkt.de>  
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