CityGML 3.0 Transportation Objects

generated from **OpenDRIVE** data using the OpenSource tool **r:trån**

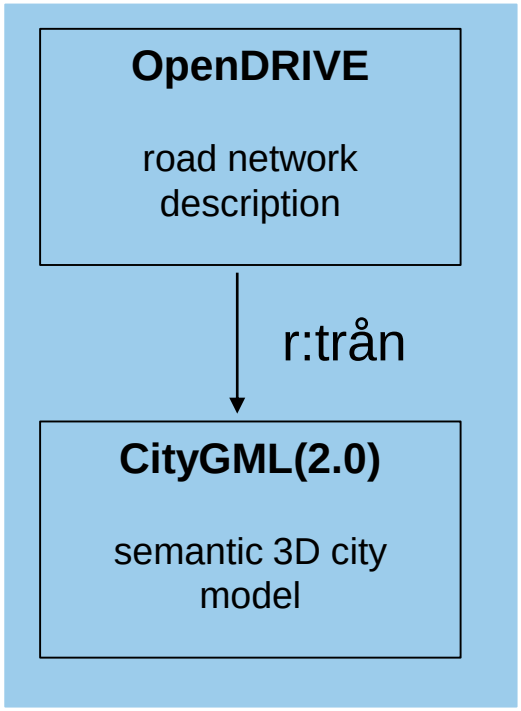
Real word example for an intersection in Ingolstadt

The original OpenDRIVE data was produced by
3D Mapping Solutions GmbH https://www.3d-mapping.de/

Find more information on the OpenDRIVE to CityGML converter
r:trån https://rtron.io/

CityGML 3.0 – Transportation from OpenDRIVE

- Open Source tool for OpenDRIVE→CityGML conversion: https://rtron.io
- https://github.com/tum-gis/rtron



OpenDRIVE: commonly used format in the automotive industry

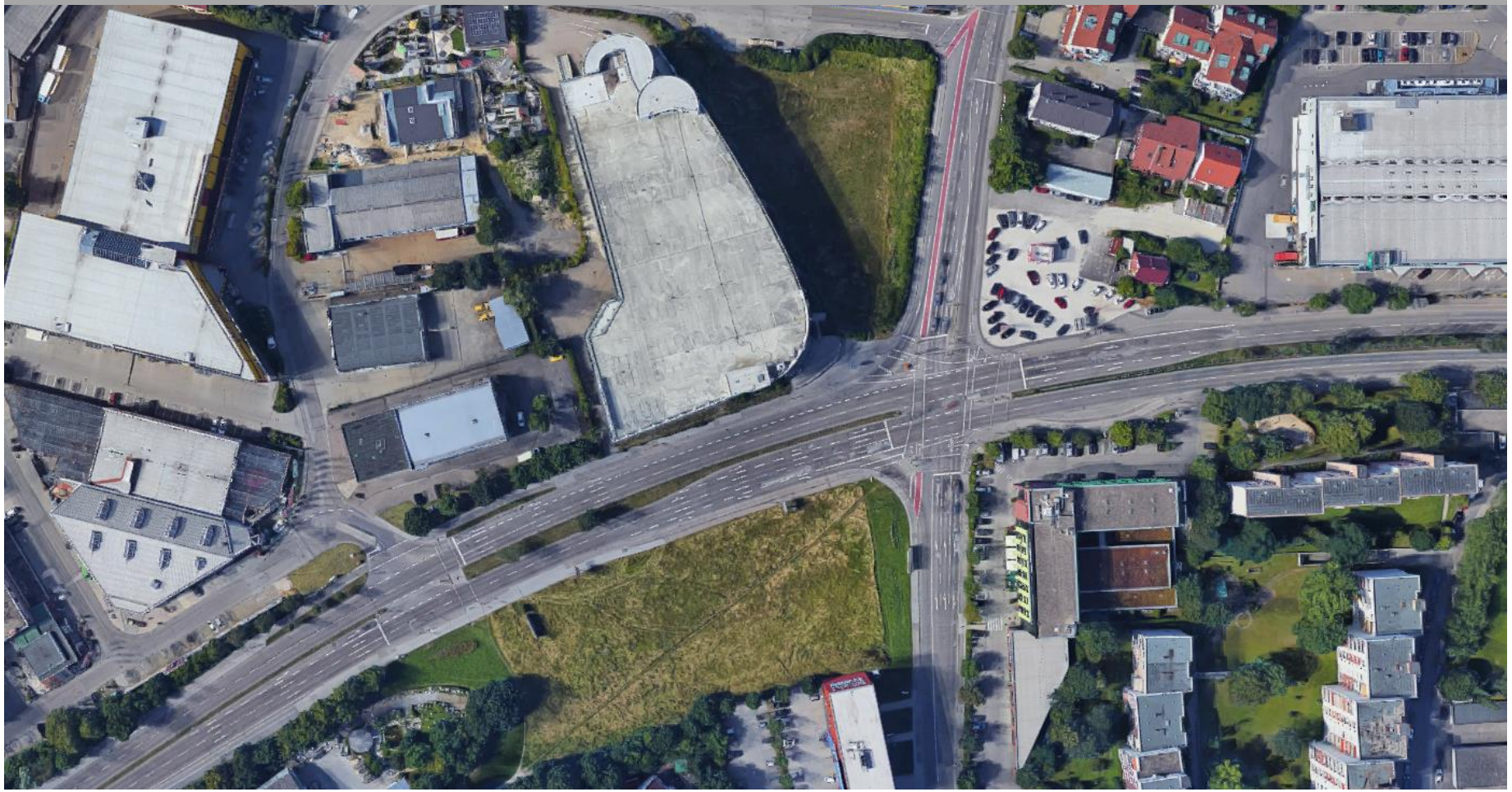
→ **Parametric representation**

CityGML: commonly used format for semantic 3D city and landscape modelling

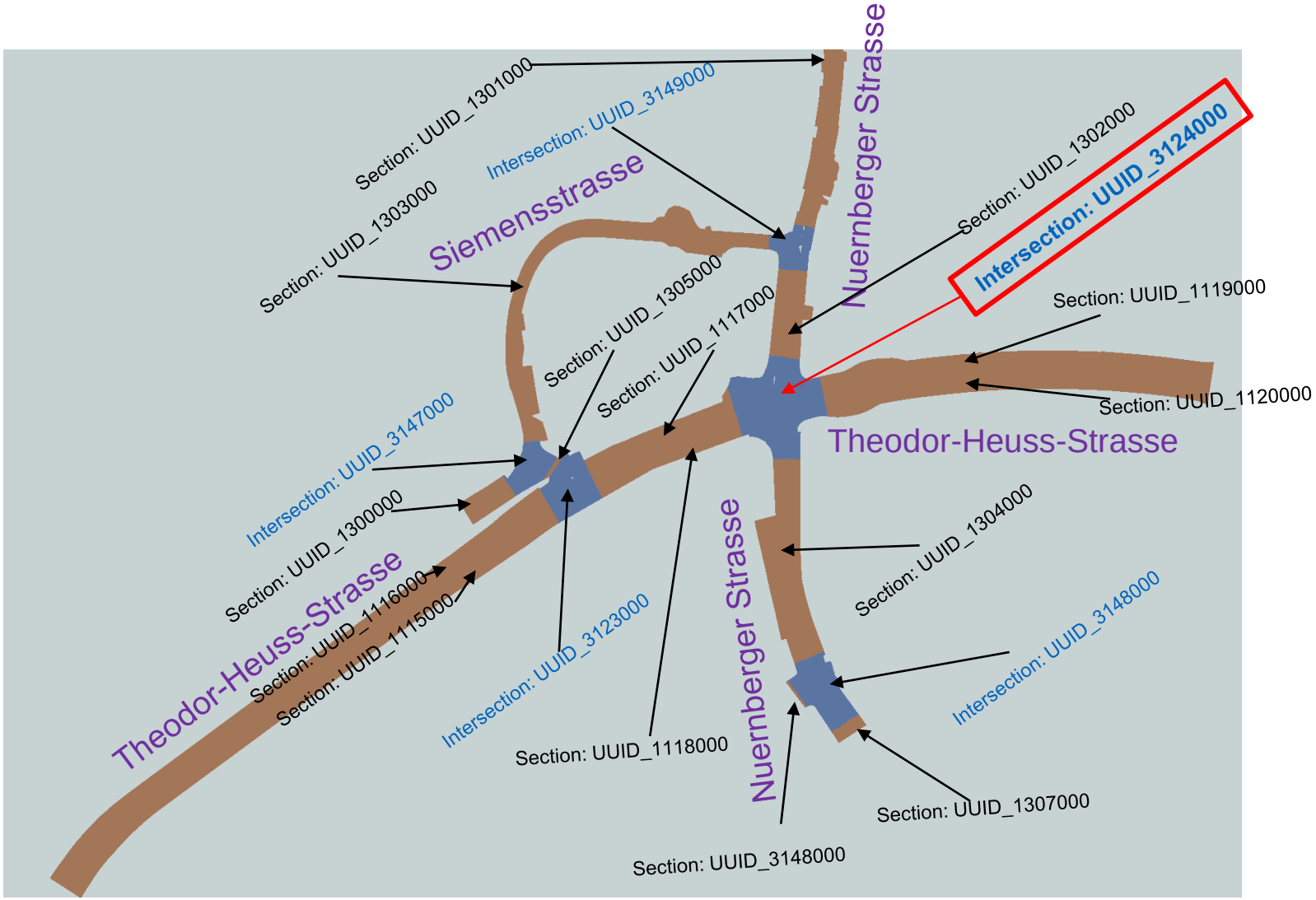
→ **Explicit geometries**

- Resulting data is further transformed to CityGML3.0 compliant data using FME (ongoing development of r:trån for direct CityGML3.0 support)

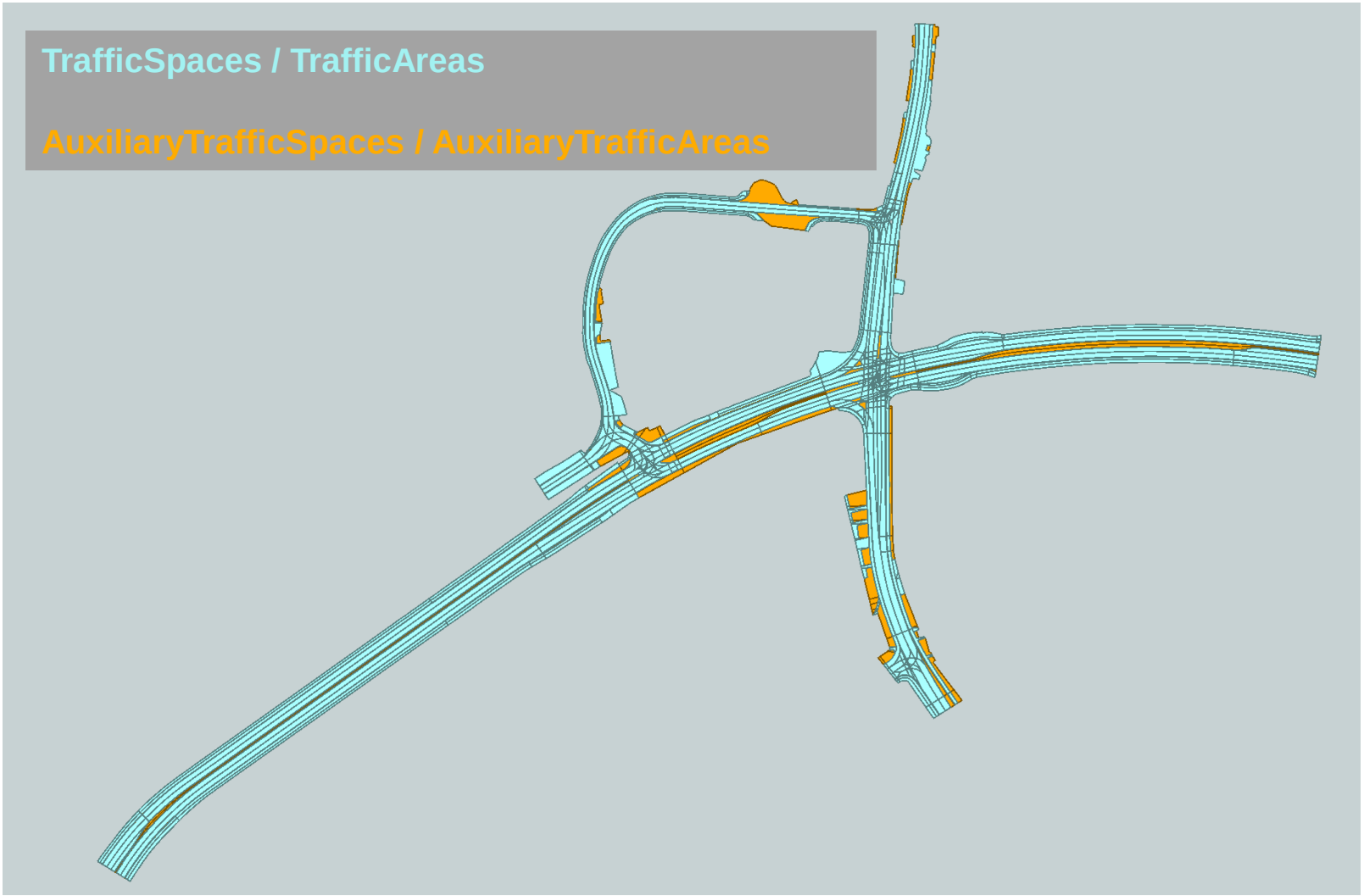
“Markkaufkreuzung” in Ingolstadt (Bavaria, Germany)



CityGML3.0 Streetspace Model – Roads / Sections / Intersections



Each Section / Intersection is further divided into individual (Auxiliary)TrafficSpaces (granularity = lane)



```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Chair of Geoinformatics, Technical University of Munich -->
<!-- The original OpenDRIVE data was provided by 3D Mapping Solutions GmbH, https://www.3d-mapping.de -->
<!-- The OpenDRIVE data was converted to CityGML compliant data using the Open Source converter r:trån, https://rtron.io/ -->
<core:CityModel xmlns:wtr="http://www.opengis.net/citygml/waterbody/3.0" xmlns:dem="http://www.opengis.net/citygml/relief/3.0" x
    <gml:boundedBy>
        <gml:Envelope srsName="EPSG:32632" srsDimension="3">
            <gml:lowerCorner>678289.9549581341 5405418.524695843 0</gml:lowerCorner>
            <gml:upperCorner>679162.0053748304 5406029.909172351 0</gml:upperCorner>
        </gml:Envelope>
    </gml:boundedBy>
    <core:cityObjectMember>
        <tran:Road gml:id="id_Siemensstrasse">
            <tran:section>
            <tran:section>
            <tran:section>
            <tran:intersection>
        </tran:Road>
    </core:cityObjectMember>
    <core:cityObjectMember>
        <tran:Road gml:id="id_Theodor_Heuss_Strasse">
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            <tran:section>
            <tran:section>
            <tran:section>
            <tran:section>
            <tran:section>
            <tran:intersection>
            <tran:intersection>
        </tran:Road>
    </core:cityObjectMember>
    <core:cityObjectMember>
        <tran:Road gml:id="id_Nuernberger_Strasse">
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            <tran:section>
            <tran:section>
            <tran:section>
            <tran:section>
            <tran:intersection>
            <tran:intersection>
        </tran:Road>
    </core:cityObjectMember>
</core:CityModel>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Chair of Geoinformatics, Technical University of Munich -->
<!-- The original OpenDRIVE data was provided by 3D Mapping Solutions GmbH, https://www.3d-mapping.de -->
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<core:CityModel xmlns:wtr="http://www.opengis.net/citygml/waterbody/3.0" xmlns:dem="http://www.opengis.net/citygml/relief/3.0" xmlns:ct="urn:oasis:names
    <gml:boundedBy>
        <gml:Envelope srsName="EPSG:32632" srsDimension="3">
            <gml:lowerCorner>678289.9549581341 5405418.524695843 0</gml:lowerCorner>
            <gml:upperCorner>679162.0053748304 5406029.909172351 0</gml:upperCorner>
        </gml:Envelope>
    </gml:boundedBy>
    <core:cityObjectMember>
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            <tran:section>
                <tran:Section gml:id="UUID_1300000">
                    <tran:trafficSpace>
                        <tran:TrafficSpace gml:id="UUID_5b2ec054-5bb1-42ed-b075-3e1da733c56b">
                            <core:boundary>
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                                            <gen:value>50.0</gen:value>
                                        </gen:StringAttribute>
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                                    <core:genericAttribute>
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                                        </gen:StringAttribute>
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                                        <gml:MultiSurface gml:id="UUID_b983f725-687a-4b5f-a127-84df8a13e854" srsName="EPSG:32632" srsDimension="3">
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                                                        <gml:PolygonPatch>
                                                            <gml:exterior>
                                                                <gml:LinearRing>
                                                                    <gml:posList>678611.1457808578 5405700.462874372 0 678611.5664771802 5405700.7331198
                                                                </gml:LinearRing>
                                                            </gml:exterior>
                                                        </gml:PolygonPatch>
                                                    </gml:patches>
                                                </gml:Surface>
                                            </gml:surfaceMember>
                                        </gml:MultiSurface>
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                                </tran:TrafficArea>
                            </core:boundary>
                            <tran:granularity>lane</tran:granularity>
                        </tran:TrafficSpace>
                    </tran:trafficSpace>
```

Link to interactive Online Demo (Blender + 3DCityDB Web-Map Client visualization)
https://wiki.tum.de/display/gisproject/Online+Demo+Collection

Including CityFurniture, Vegetation etc.
(the visualization is currently based on CityGML2.0)