



## City GML

Jan Růžička

<http://gis.vsb.cz/ruzicka/>  
[jan.ruzicka@vsb.cz](mailto:jan.ruzicka@vsb.cz)



- Based on GML 3.1.1
- Description of urban areas
- Focused mainly on buildings and infrastructure





- LOD (Level of Detail)
- Five levels of details
  - Region (positional accuracy  $< 5$  m)
  - City (positional accuracy 5 m)
  - Quarter (positional accuracy 2 m)
  - Buildings (positional accuracy 0.5 m)
  - Interiors (positional accuracy 0.2 m)

# City GML - Zajímavé možnosti

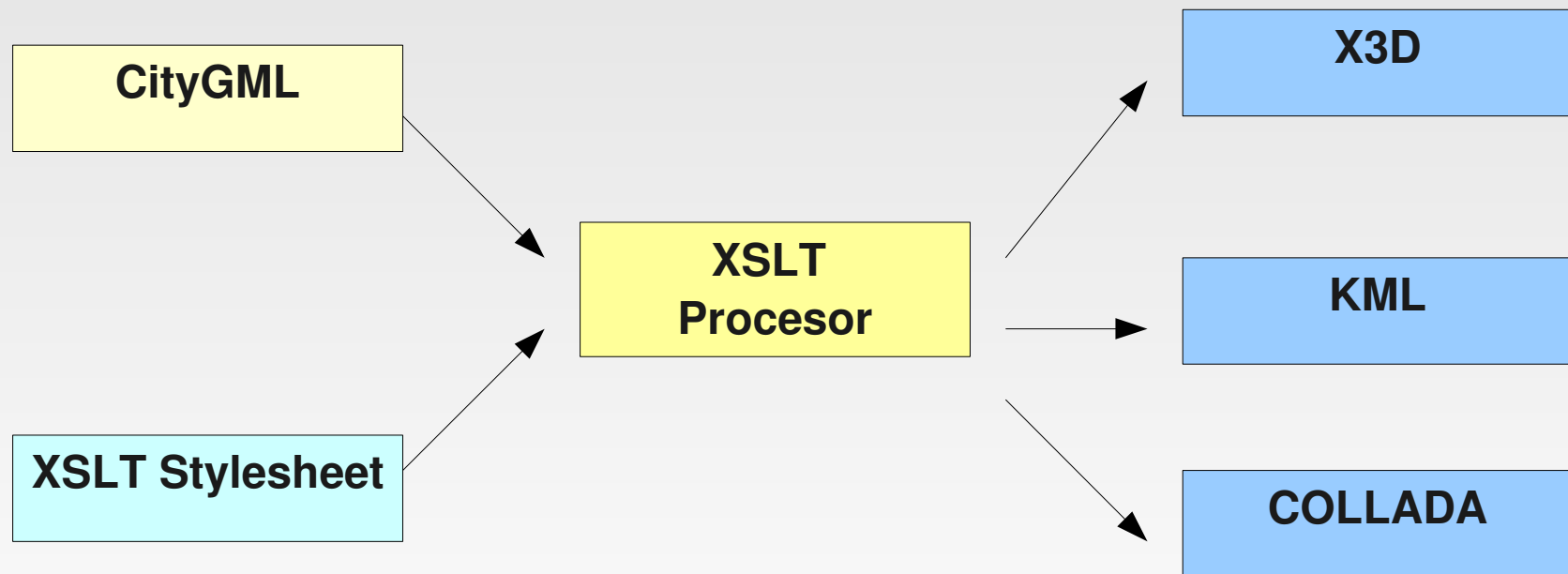


- Semantics
- Several predefined namespaces
  - transport
  - water bodies
  - furniture
  - vegetation
  - buildings

# City GML - Visualization



- Not very well supported
- Conversion to other formats (for example via XSLT)





- <http://schemas.opengis.net/citygml/relief/1.0/relief.xsd>
- TIN
- GRID
- MassPoint
- BreakLine



- Geometry gml:Triangle
- Coordinates gml:posList - X,Y,Z

```
<gml:Triangle>  
<gml:exterior>  
<gml:LinearRing>  
<gml:posList srsDimension="3"> 3499943.71541513 5399990.51365886  
3.47825945823388e-013 3499995.98678034 5399992.61  
-4.08743619019931e-012 3499943.71541513 5399992.61  
3.47825945823388e-013 3499943.71541513 5399990.51365886  
3.47825945823388e-013</gml:posList>  
</gml:LinearRing>  
</gml:exterior>  
</gml:Triangle>
```



- Geometry gml:RectifiedGridCoverage
- Could be reference to external file

```
<gml:DataBlock>  
  <gml:tupleList>  
    0 0 2 0 1 3 0 2 3 0 3 5  
    .....  
    3 0 2 3 1 3 3 2 3 3 3 5  
  </gml:tupleList>  
</gml:DataBlock>
```

```
<gml:File>  
<gml:fileName>http://gis.vsb.cz/data/surface.cdf</gml:fileName>  
<gml:mimeType>application/x-netcdf</mimeType>  
</gml:File>
```





- Geometry gml:MultiPoint

```
<gml:MultiPoint gml:id="1">  
  <gml:pointMember>  
    <gml:pos srsDimension="3">1 1 5</gml:pos>  
  </gml:pointMember>  
  <gml:pointMember>  
    <gml:pos srsDimension="3">3 1 7</gml:pos>  
  </gml:pointMember>  
  <gml:pointMember>  
    <gml:pos srsDimension="3">5 1 9</gml:pos>  
  </gml:pointMember>  
</gml:MultiPoint>
```

# City GML - BreakLines



- Element - general breakline or ridge (valley)
- Geometry gml:MultiCurve

```
<gml:MultiCurve gml:id="1">  
  <gml:curveMember>  
    <gml:LineString gml:id="2">  
      <gml:posList srsDimension="3">1 1 1 2 2 3 3 5 6 1 1 1</gml:posList>  
    </gml:LineString>  
  </gml:curveMember>  
</gml:MultiCurve>
```



- Commercial
  - SketchUp (GeoRES plug-in), Autodesk, ESRI (ArcGIS 10)
- Non-comercial
  - Deegree, Aristoteles, GDAL/OGR, Libraries for development (mainly Java based)



- Olson, E. Exporting 3D Geoinformation from Baggis Database to CityGML. KTH. 2009.
- <http://www.schemacentral.com/>
- [http://portal.opengeospatial.org/files/?artifact\\_id=36848](http://portal.opengeospatial.org/files/?artifact_id=36848)