Finding small-scale sport spots in suburban areas using QGIS

using buffers, calculations and vector overlay features with the Graphic Modeller

Philipp Schüller QGIS User-Conference 18.04.2023

Who am I?

- Bachelor-Thesis: How are IOC procurement guidelines and sustainable urban planning compatible?
- Master-Thesis: Sport development concept for informal sport in Berlin-Lichtenberg

- Worked for a sport-oriented urban planning office
- Urban-Planning-Department of Fredersdorf-Vogelsdorf

Sportograf.com

Fredersdorf-Vogelsdorf

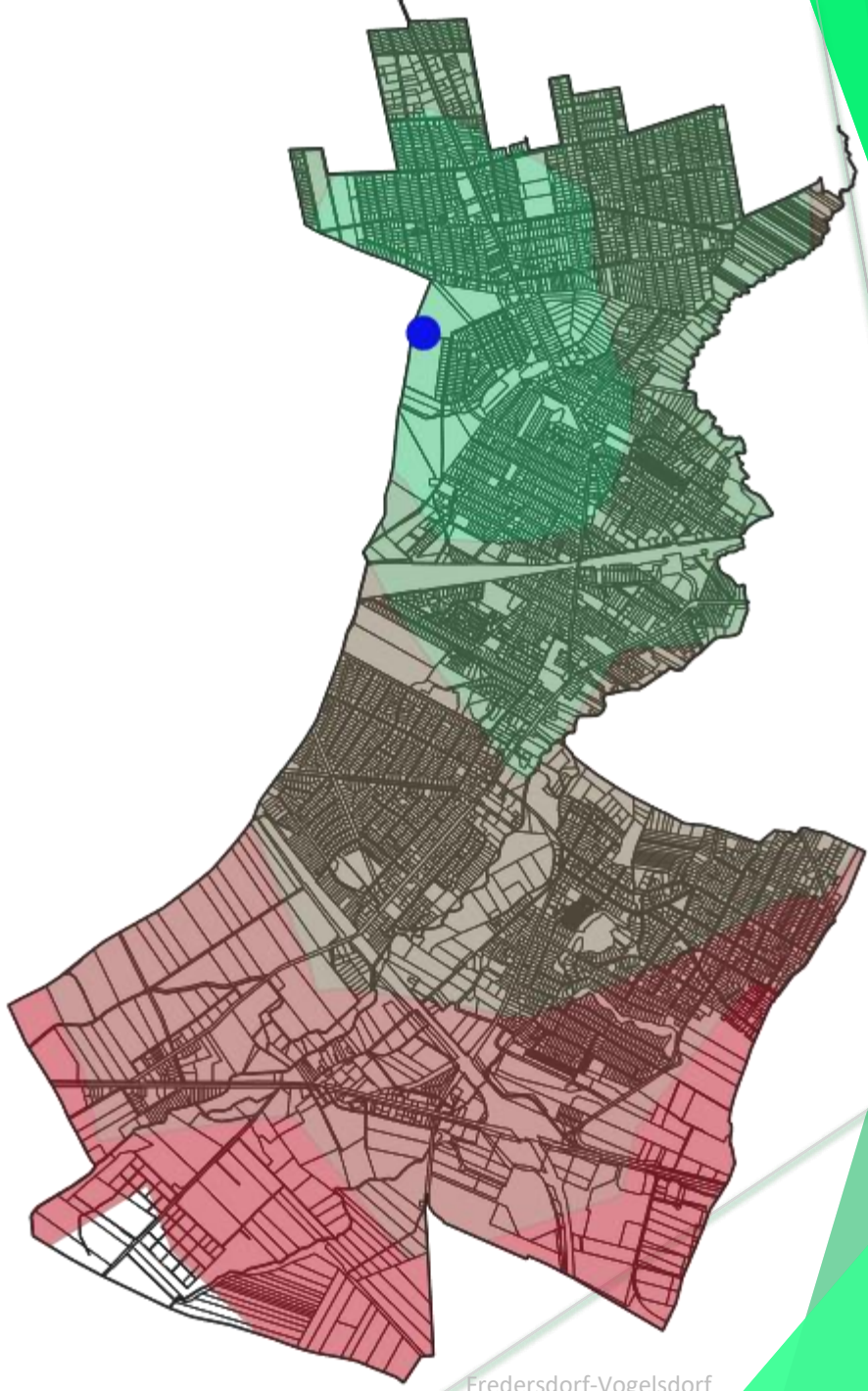
Small municipality east of Berlin

Fredersdorf-Vogelsdorf

- Population: 14,157 inhabitants
- Area: 16.39 sqkm
- North – South: 7.3 km
- East – West: 4.6 km
- mostly single-family houses

Current situation

- just one Streetball/Football-Court
- Located in the north
- Long ways

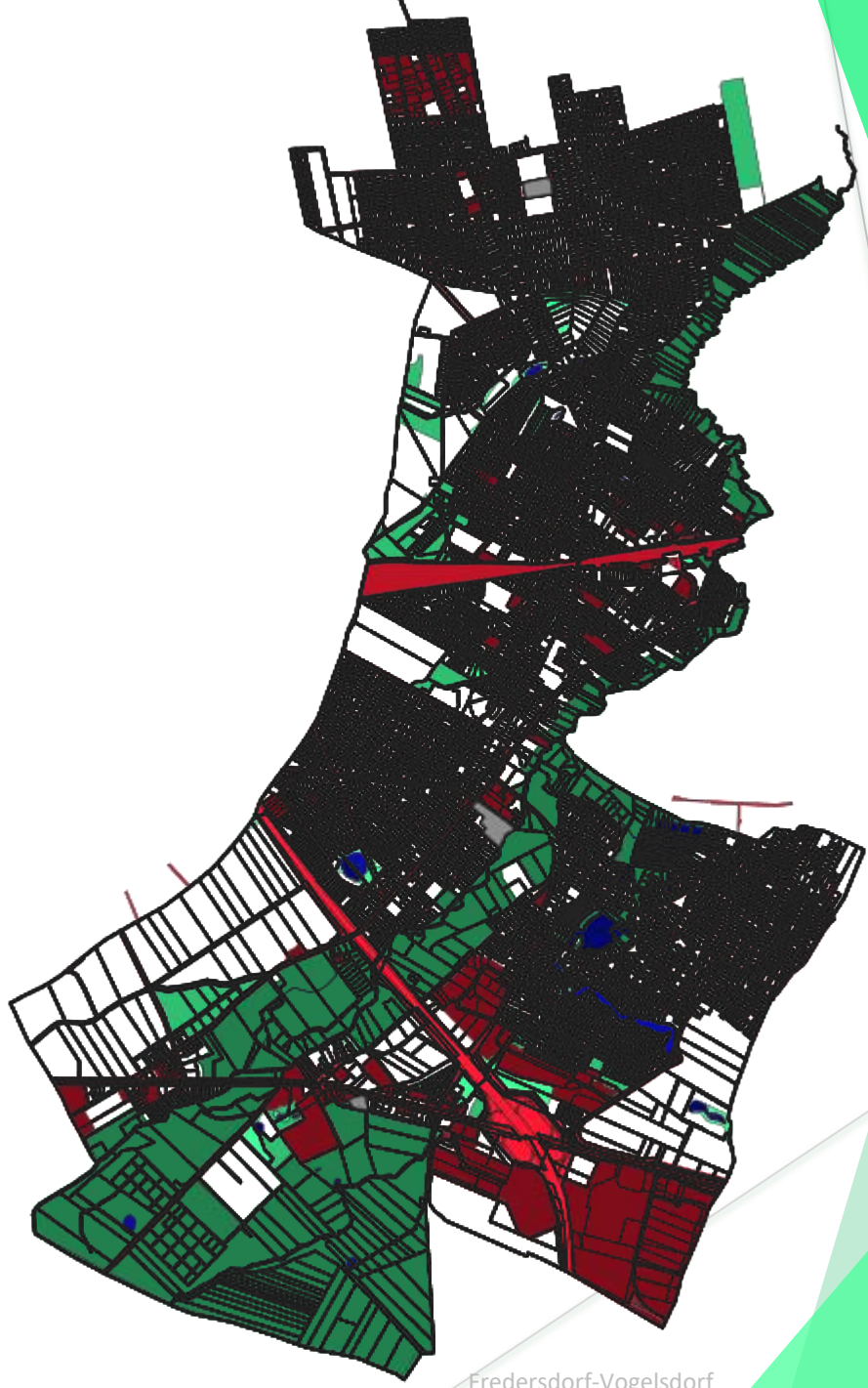


Current situation

- Noise problems in the neighborhood
- strict closing time at 20:00
- no place for teenagers/young adults
- -> creates further problems
  - Graffiti and Vandalism

Limiting Factors

- Nature Reserve
- Forrests
- Water
- Railways and Streets
- Industry and Commerce
- Cemetery



Fredersdorf-Vogelsdorf

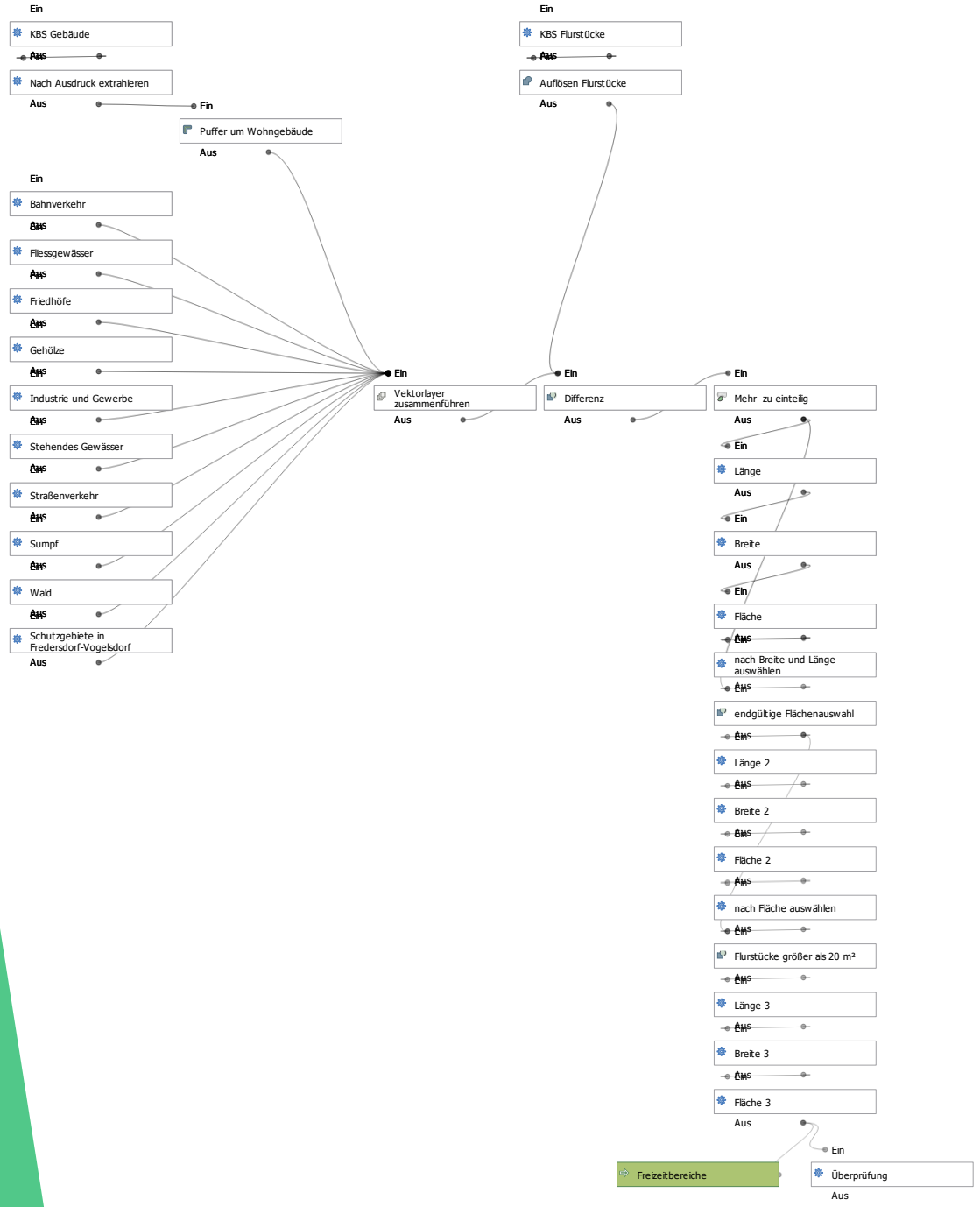
Fredersdorf-Vogelsdorf

The Noise Problem

- some sports need a certain distance
- „Lärmfibel“ – Noise Guideline
- Basketball 50 m
- Football 100 m
- necessary distance to residential housing
- Limits possible areas for sport spots

From impossible to possible

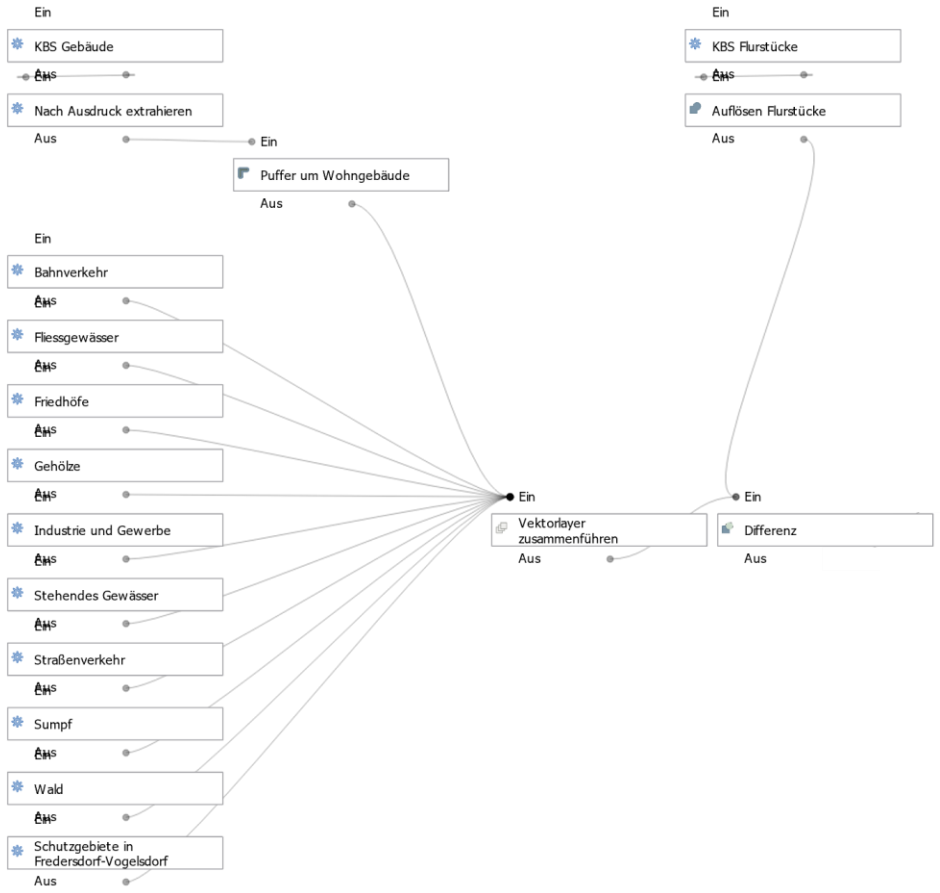
- All limiting factors combined
- Map with unavailable areas
- the rest is available



Graphic Modeller

- Combining the single steps of the analyses to one modell

Graphic Modeller



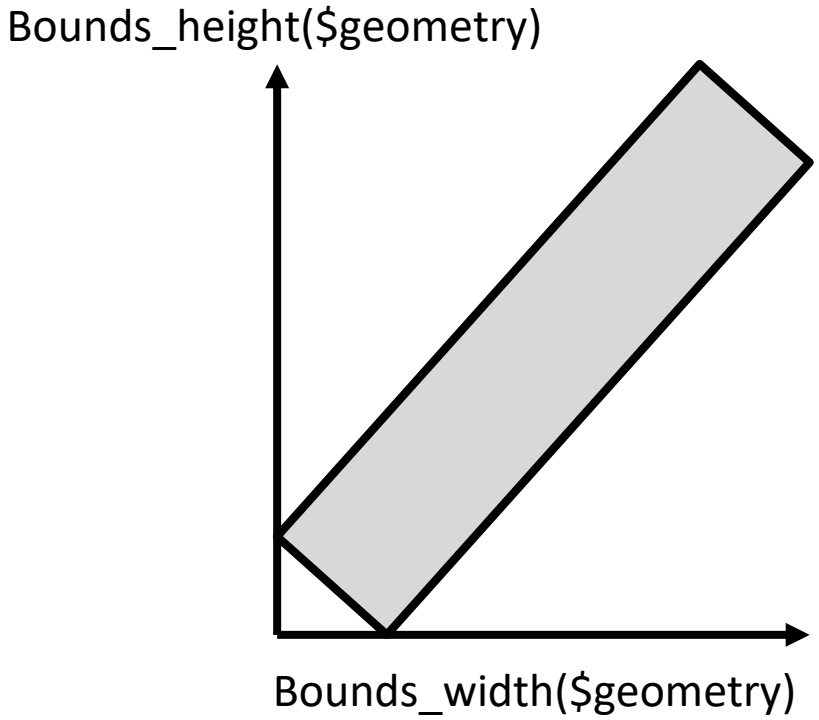
- Filtering residential housing from all buildings
  - extract by Expression
- Buffer around residential housing
  - Buffer
- Need to combine all limiting factors
  - Combine Vectorlayers
- Difference between the area Fredersdorf-Vogelsdorf
  - Difference
- all available spaces

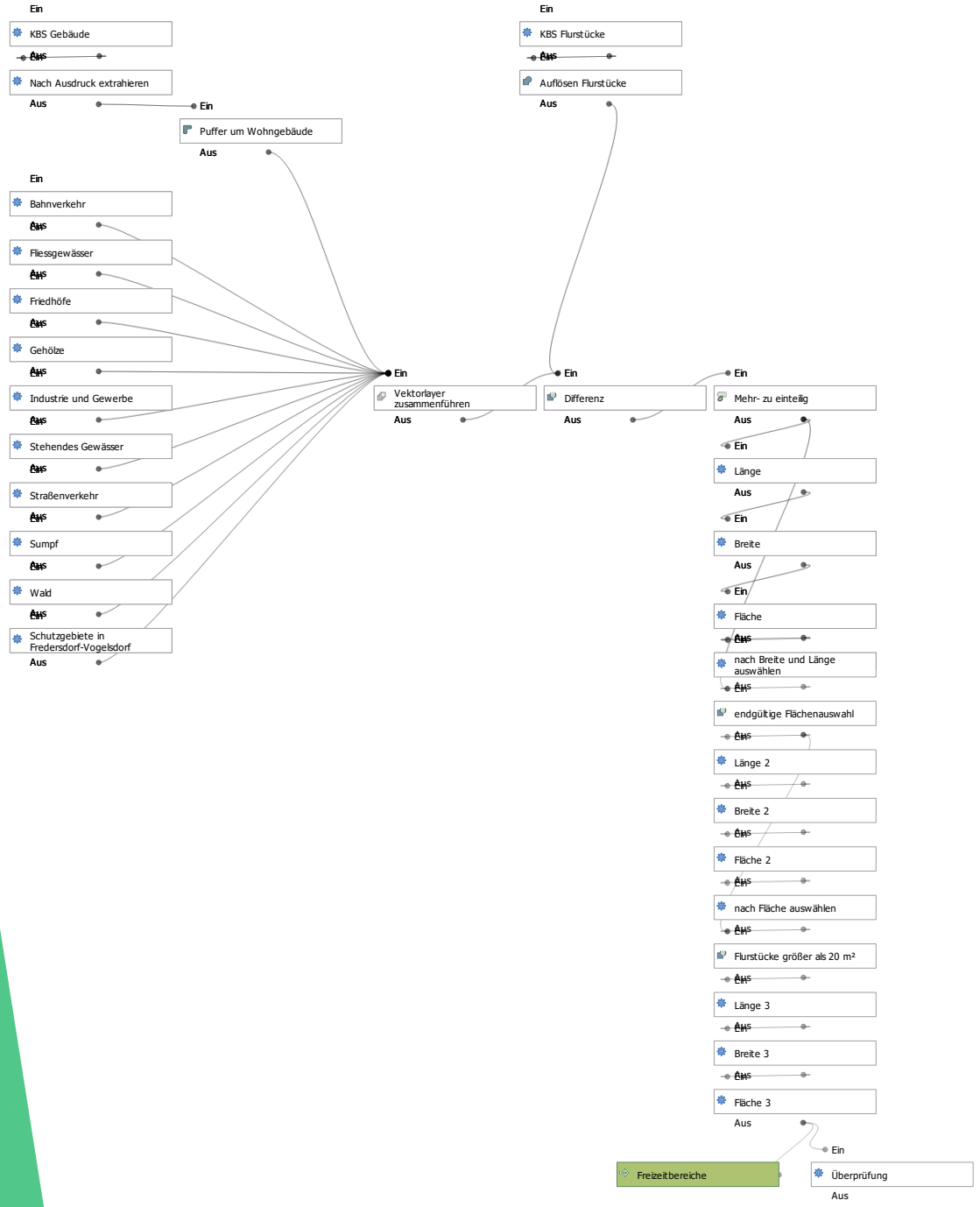
Graphic Modeller

- Create multiple Polygones
  - Multipart to singlepart
- Calculate the dimensions of the spaces
  - Bounds_heigth($geometry) and bounds_width($geometry)
- Remove too small areas
  - Select by expression
  - Difference

Problem

- bounds_heigth($geometry) and bounds_width($geometry) calculate north-south and west-east
- Not real length and width
- Especially problematic with complex geometry





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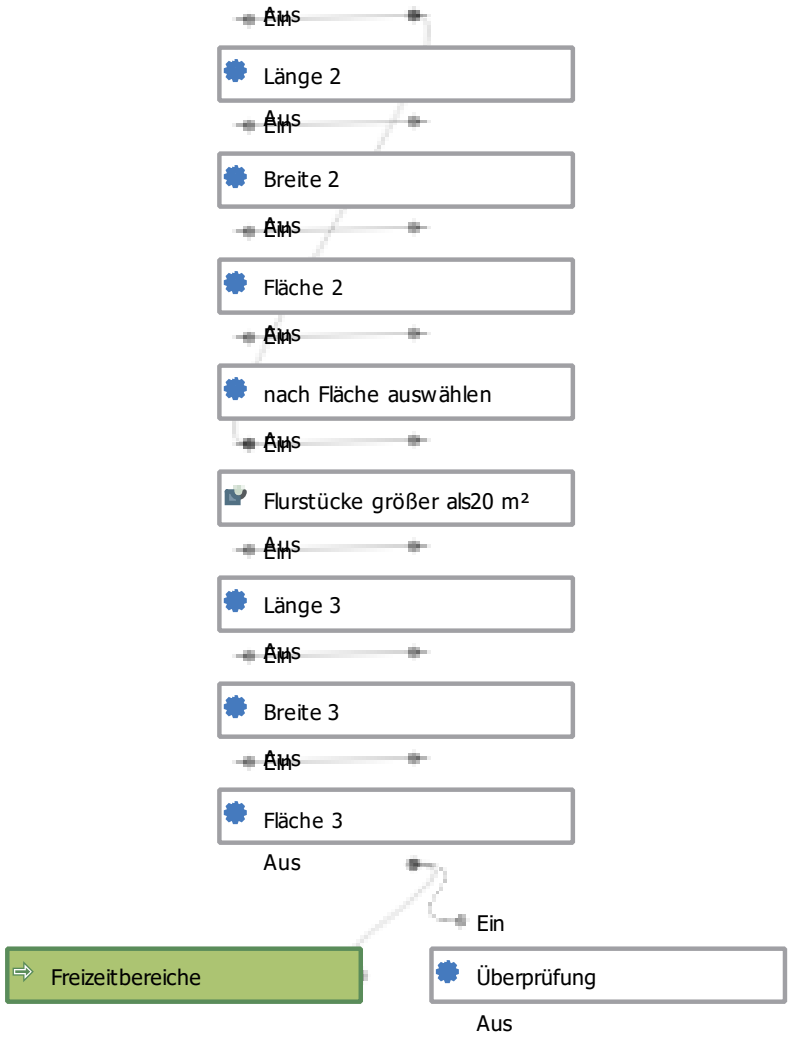
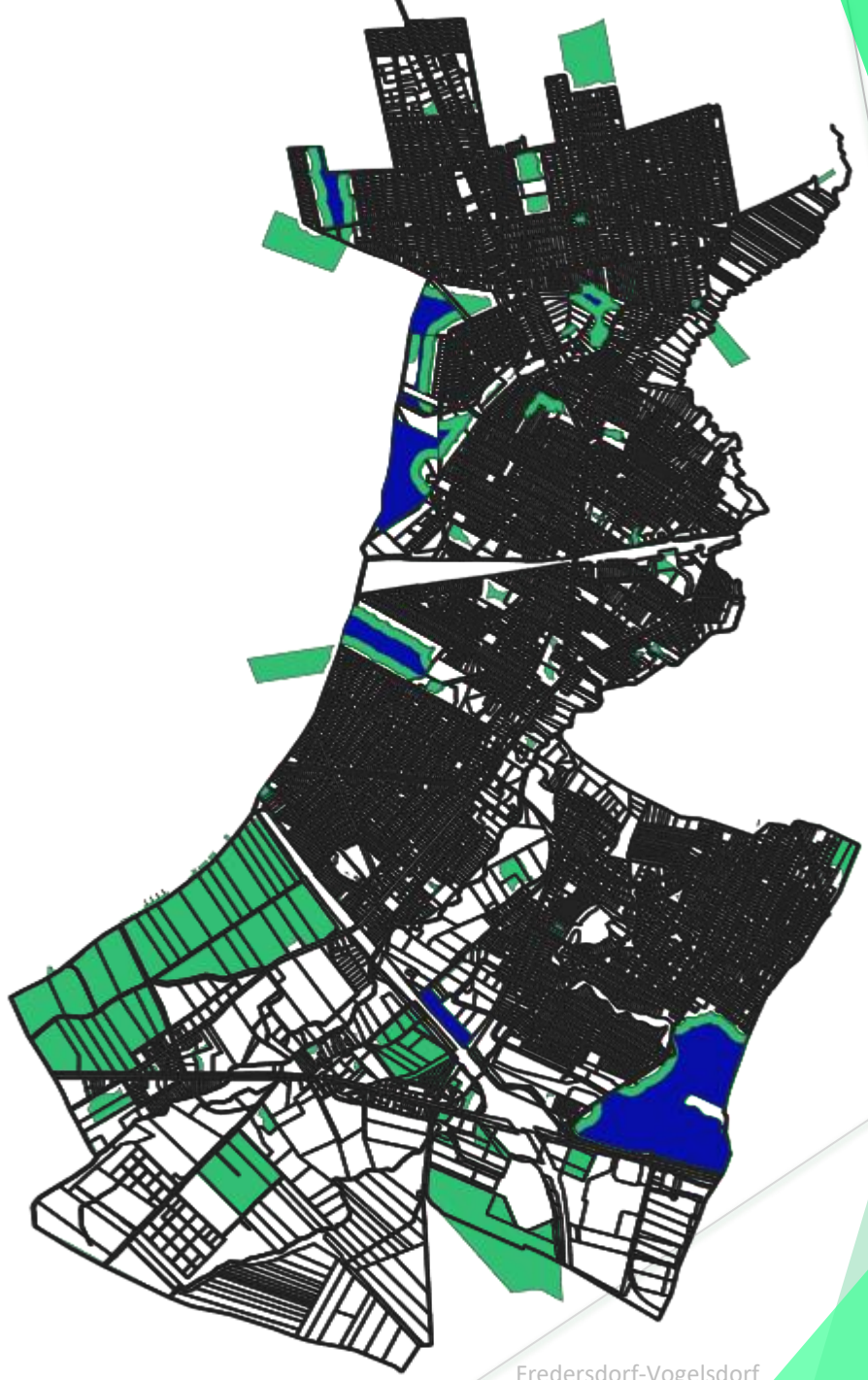


- Calculate area
  - §area
- Remove too small spaces
  - Select by expression
  - Difference
- Check: heigth x width > 4 x Area
  - Select by expression
- Export to the project
  - Some areas are selected

Final result

- Participation of the Children and Youth Advisory Board
- Reduction of the number of areas
- For different sports different possibilities of spaces



Fredersdorf-Vogelsdorf

Why Graphic Modeller

- Repeatable
- not all the maps of the single steps
- Change of single values without repeating all the single steps
- Usabel for QGIS inexperienced colleagues

Future

- Further analyses like e.g. needs analyses
  - In combination with inventory analysis
- Use in bigger cities
- Ideas for combination with german BISP-Formel (requirement formula)
  - More complex calculation

Thank you for listening!