MODELLING THE COVERAGE OF PUBLIC UTILITY PROVIDERS

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Agenda

- initial situation
- model fundamentals
- modelling the coverage of public utility providers
- implementation
- results
initial situation
model fundamentals

three main input parameters:
- public utility providers
  - information about the capacities
- demographic characteristics
  - grid dataset, spatial resolution of 250 m
- street graph
  - Graph Integration Platform (GIP)
  - individual transport

additional: regions
modelling the coverage of public utility providers

based on:

- calculation of service areas for different public utility providers
- spatial distribution of demography of the domain specific population group inside the calculated service areas
- distinguish between accessibility and coverage of public utility providers
classification of the coverage of public utility providers per grid cell

4 classification values:

**supplied:**
- enough capacities to supply

**partially supplied:**
- inside of a service area but little capacity

**inadequately supplied:**
- inside of a service area but capacity is equal to zero

**not supplied:**
- outside any service area
classification of the coverage of public utility providers – initial situation
classification of the coverage of public utility providers – assignment

- **School 1**
  - Capacity: 25
  - 5 children
  - 2 min
  - 8 children
  - 6 min
  - 8 children
  - 8 min

- **School 2**
  - Capacity: 25
  - 20 children
  - 7 min
  - 20 children
  - 14 min
  - 10 children
  - 14 min
  - 10 children
  - 9 min
  - 15 children
  - 12 min
  - 15 children
  - 5 min
classification – supplied

School 1
Capacity: 20

- 5 children
- 8 children
- 6 min
- 8 min
- 5 min

School 2
Capacity: 25

- 20 children
- 12 min
- 14 min
- 9 min
- 5 min
- 10 children
- 10 children
- 15 children
- 14 min
classification of the coverage of public utility providers – assignment

school 1
capacity 20

school 2
capacity 25

5 children

20 children

12 min

14 min

6 min

8 min

8 children

20 children

14 min

7 min

12 min

5 min

10 children

5 children

10 children

15 children

8 children

20 children

5 children

15 children
classification – supplied

**School 1**
- Capacity: 20
- 5 children supplied
- 8 children
- 6 min
- 8 min

**School 2**
- Capacity: 15
- 10 children supplied
- 20 children
- 7 min
- 14 min
- 12 min
- 9 min
- 10 children
- 15 children

5 children supplied
classification of the coverage of public utility providers – assignment

school 1
capacity 20

school 2
capacity 15

8 children
5 children
6 min

10 children
20 children
7 min

15 children
10 children
14 min

10 children supplied

5 children supplied
classification – supplied

school 1
capacity 12

school 2
capacity 15

8 children supplied
5 children

10 children supplied
15 children

7 min
8 min

12 min
14 min

9 min

5 children
8 children
10 children
20 children

classification of the coverage of public utility providers – assignment

school 1
capacity 12

8 children
5 children

supplied

20 children
20 children

7 min
7 min

school 2
capacity 15

10 children
10 children

14 min
14 min

12 min
12 min

8 min
8 min

9 min
9 min

10 children
10 children

15 children
15 children

10 children supplied
10 children supplied
classification – partially supplied

- School 1: Capacity 0
  - 5 children
  - 8 children supplied
  - 14 min

- School 2: Capacity 15
  - 12 of 20 children supplied
  - 9 min

- 10 children supplied
classification of the coverage of public utility providers – assignment
classification – inadequately supplied

school 1
capacity -

5 children supplied

8 children
0 of 5 children supplied

school 2
capacity 15

12 of 20 children supplied

14 min

10 children

12 min

14 min

15 children

10 children supplied

9 min
classification of the coverage of public utility providers – assignment

**School 1**
- Capacity: 
- 8 children supplied
- 0 of 5 children not supplied

**School 2**
- Capacity: 15
- 10 children supplied
- 12 of 20 children supplied
- 14 min

12 min

9 min
classification – supplied

School 1
capacity -

8 children supplied
0 of 5 children supplied

School 2
capacity 5

12 of 20 children supplied
12 min

10 children supplied
10 children supplied
15 children
classification of the coverage of public utility providers – assignment

- School 1 capacity:
  - 5 children supplied
  - 8 children supplied
  - 0 of 5 children supplied

- School 2 capacity 5:
  - 12 of 20 children supplied
  - 10 children supplied

12 min
classification – partially supplied

School 1
- Capacity: 20 children
- 5 children supplied
- 0 of 5 children supplied

School 2
- Capacity: 15 children
- 17 of 20 children supplied
- 10 children supplied

Total supplied: 27 children
Total capacity: 35 children
classification – not supplied

school 1
capacity -

5 children supplied
8 children
0 of 5 children supplied

school 2
capacity -

17 of 20 children supplied
10 children supplied
10 children supplied
0 of 15 children supplied
implementation

- ArcGIS® Desktop Add-in
- .NET Framework in C#
- GUI: WPF
results – example

- Kalsdorf near Graz
- 5 minutes travel time
- individual motorized traffic
- no regionalization
THANK YOU