

Mapping the X- Minute City:

Visualizing how different types of
residents interact with their “15-
Minute Cities”

Outline

- 1 Introduction & Motivation
- 2 Research Objective
- 3 Defining the 15-Minute City
- 4 Methodology
- 5 Visualization Prototype
- 6 Results & Discussion
- 7 Future Work
- 8 Conclusions

Introduction & Motivation

15-Minute City is a popular urban planning approach that focuses on **proximity and the neighborhood**

Has seen rising relevance and importance as cities seek for ways to plan for **resiliency** and combat climate change

The concept advocates for essential services being within a **15-Minute walk or bike ride**



Introduction & Motivation

Cartography & Urban Planning are linked, maps are utilized to plan & design urban space, as well as understand the complexities of the urban environment

La Ville du Quart D'Heure, ARUP



Introduction & Motivation

Research Gap: Most prior research & supporting maps do not include or place emphasis on the different **needs & abilities** of different people in urban space



Main Research Objective

Prototype a visualization and methodology for the 15-Minute City Concept that considers the different needs and abilities of diverse urban residents utilizing qualitative data collection.

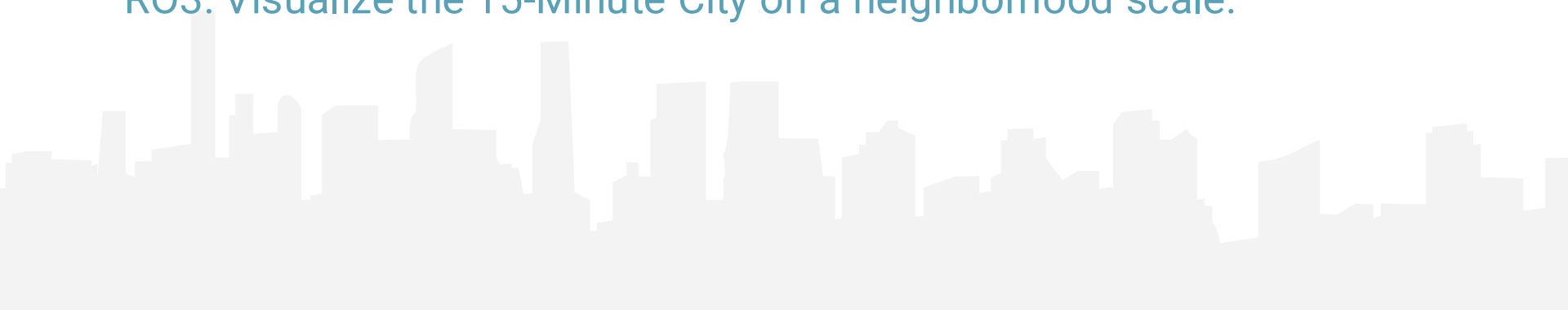


Sub-Objectives

RO1: Establish what the current state of research surrounding the 15-Minute City is and the role of cartography in existing research.

RO2: Develop a methodology to collect information indirectly about the needs and variations between different types of urban residents.

RO3: Visualize the 15-Minute City on a neighborhood scale.



Defining the 15-Minute City

[R01]

Key Components

Defining Amenities

Role of Maps

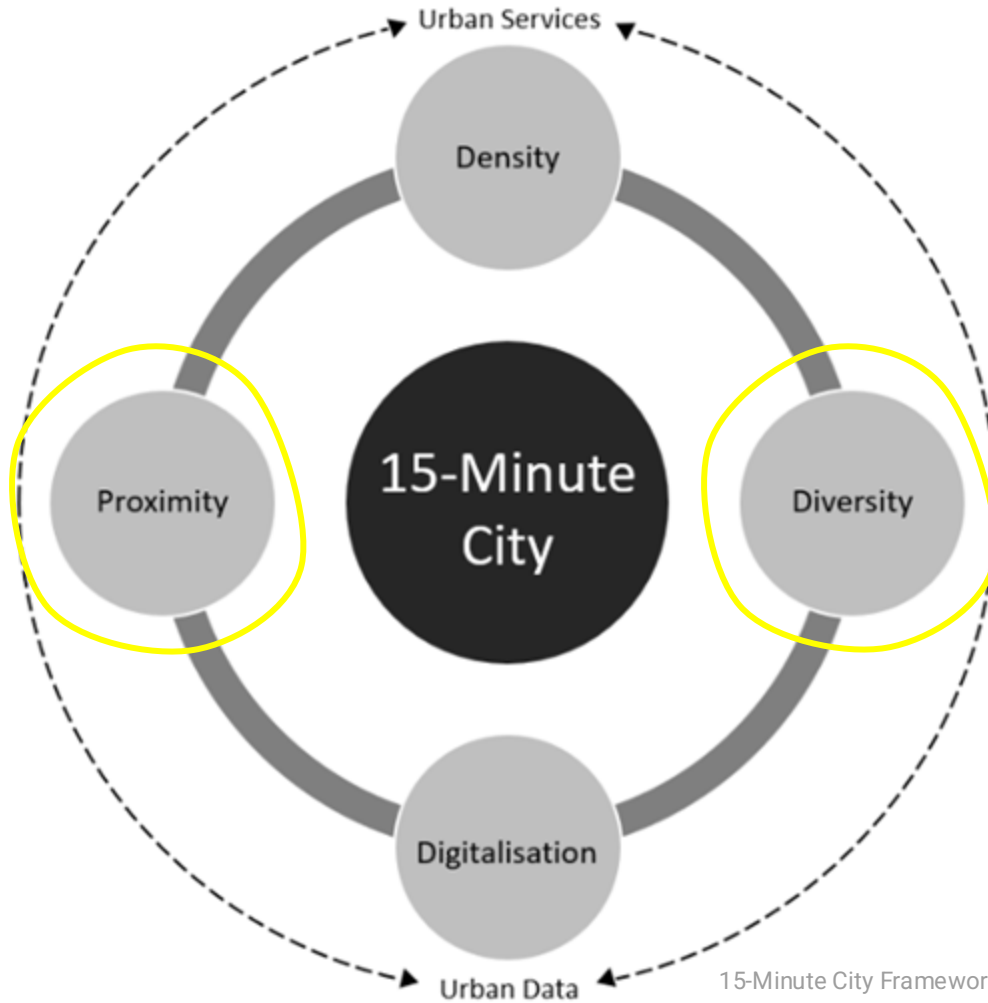
Resident Groups



Needs and services can be reached by residents in 15-minutes or less (Moreno, 2016)



Needs and services can be reached by residents in 15-minutes or less (Moreno, 2016)



Key Amenities in Literature

Health
&
Medical Care

Education

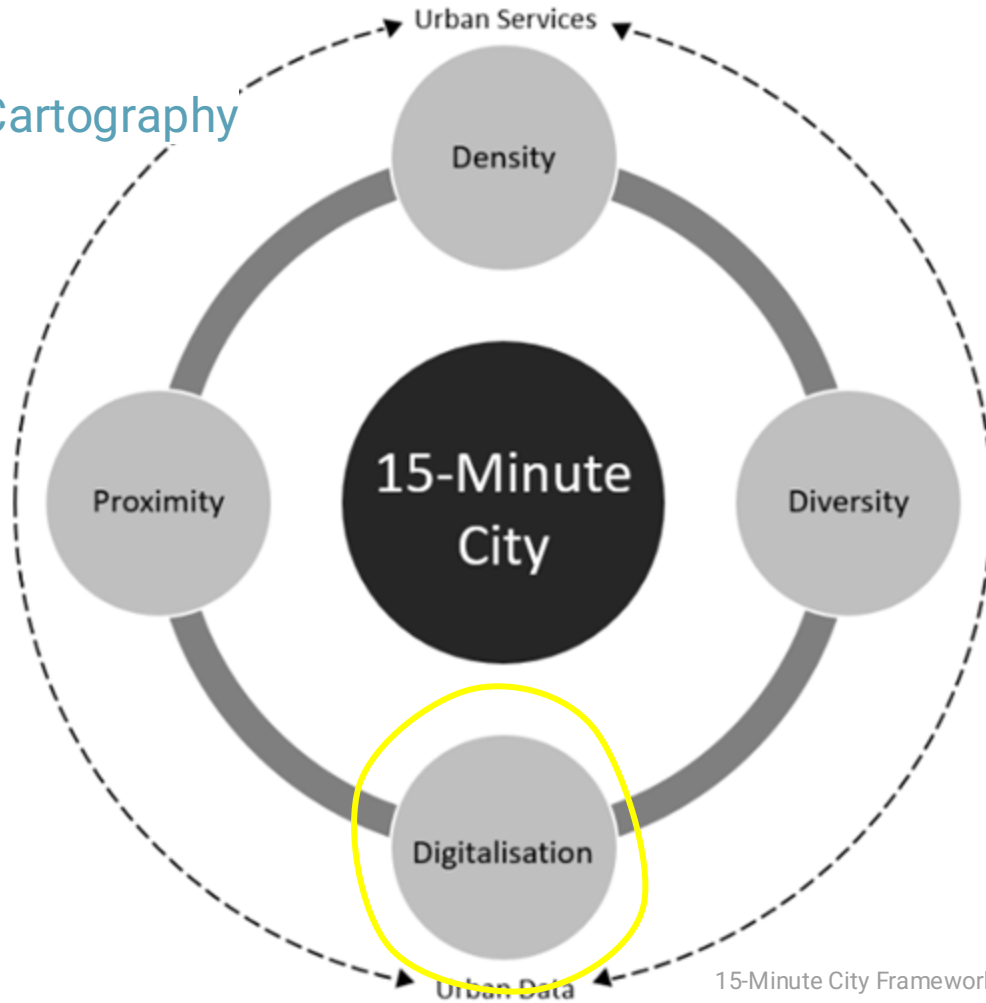
Shops
&
Commerce

Entertainment
&
Culture

Green Space
&
Parks



Digitalization ↔ Cartography



15-Minute City Framework (Moreno, Allam, Chabaud, Gall, & Pratlong, 2021)

Do you live in a "15-minute" city?

Check your access to essential living needs.

1160 1st St NE, Washington, DC 20002-4696, United States

15 min 20 min 15 min

Not quite there yet...
 1160 1st St NE, Washington, DC 20002-4696 does not yet meet the criteria for a 15-min city.

- Groceries 5
- Medical 4
- Culture 0
- Education 8
- Transit 16
- Leisure 4



In Vienna, Austria, 1.8M residents, or 95% of the urban population, has access to services within a 15 minute walk.

Austria average: 95% Vienna

% of pop within 15 min of services: 0% 25% 50% 75% 100%

Filter for areas where services are available within a 15 min. walk [SAVE] [RESET]

▼ How should services be weighted?

<input checked="" type="checkbox"/> Public transit stations	<input checked="" type="checkbox"/> Casinos, nightclubs, and theaters
<input checked="" type="checkbox"/> Parks, stadiums and gyms	<input checked="" type="checkbox"/> Pharmacies, clinics, and hospitals
<input checked="" type="checkbox"/> Libraries and community centers	<input checked="" type="checkbox"/> Education facilities
<input checked="" type="checkbox"/> Restaurants, food trucks, and supermarkets	

[APPLY] [RESET]

activate tooltip [Download data](#)



Map4Citizens

How does your neighborhood score in terms of accessibility?

Search Address



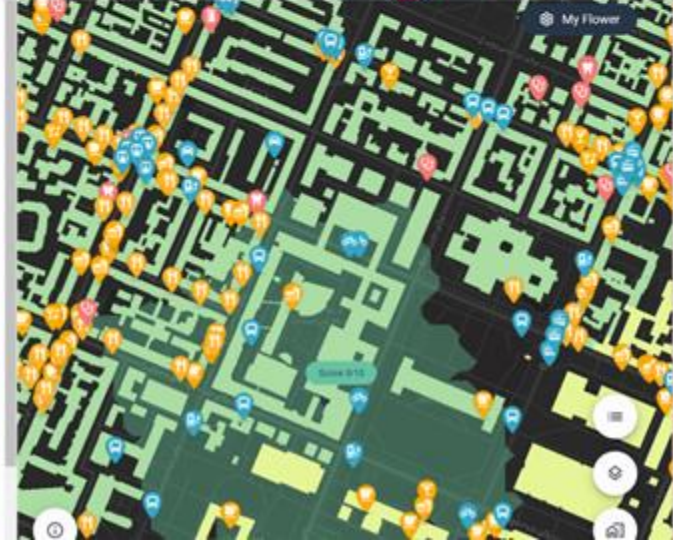
Travel time (5 min)

Mode: Walk Bicycle Car

15 Minute Score
 Technical University Munich
 21 Munich, Bavaria, 80551, Germany
 9 / 10

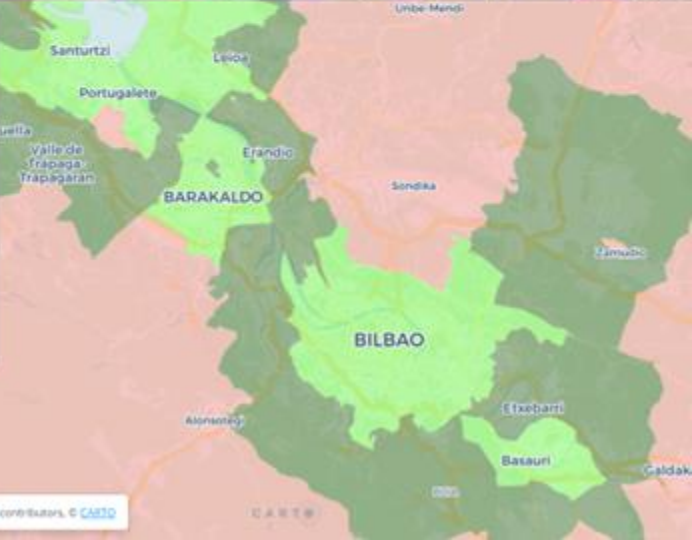
Food and Drinks 8/10

Transport 8/10



15-minute cities in Spain...

- All categories
- 15 MIN WALK
- 15 MIN BY BICYCLE
- IT DOESN'T COMPLY
- Supply
- Education
- Leisure
- Health
- Work
- Quality of Life



Parent



Child



Elderly



Young Adult



Retiree

Methodology

[R02]

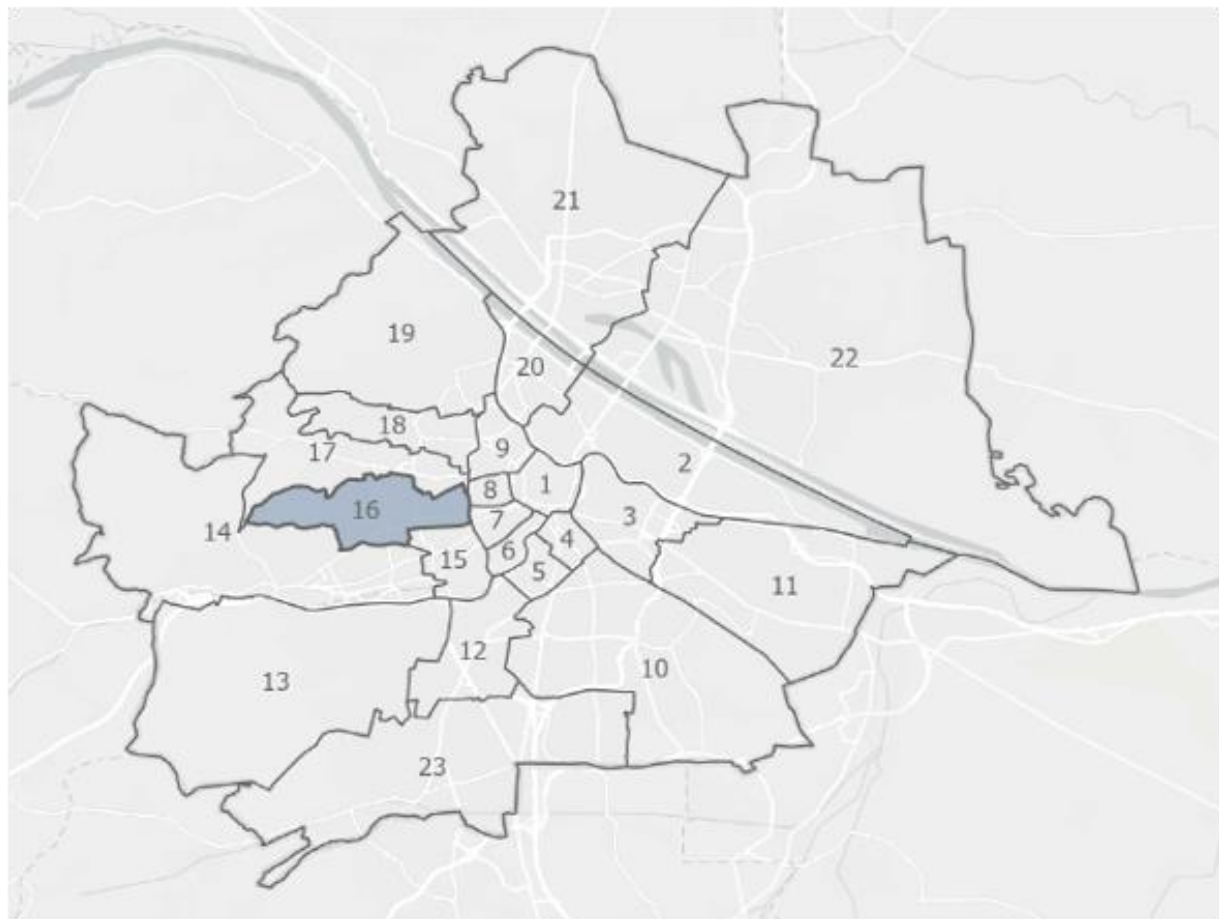
Case Study Selection

Interviews & Data Collection

Network Analysis

Walkshed Generation





Interviews & Data Collection

Expert Interviews

Map & Literature Review



Interviews & Data Collection

Expert Interviews

Map & Literature Review



**Decisions on
amenities and
walkspeeds for each
group**

All Groups	Young Adult	Parent	Child	Retirement Age	Elderly
Public Transport Station Park Pharmacy Supermarket	Bar Cafe Library Sports Center	Bar Cafe Kindergarten Playground	Library Playground Primary School Public School Sports Center	Bank Bar Cafe Doctor Hospital Library Sports Center	Bank Cafe Doctor Hospital Library



Network Analysis

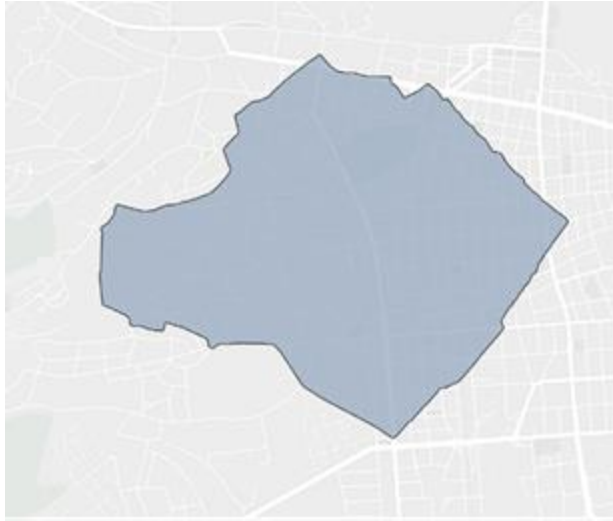
Original Data Set



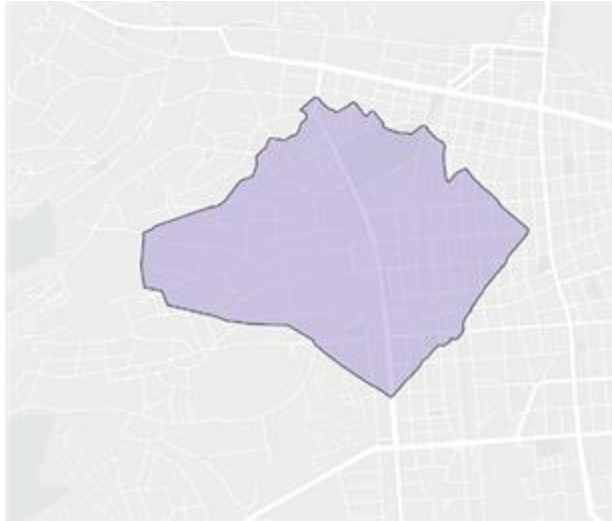
Corrected Data Set



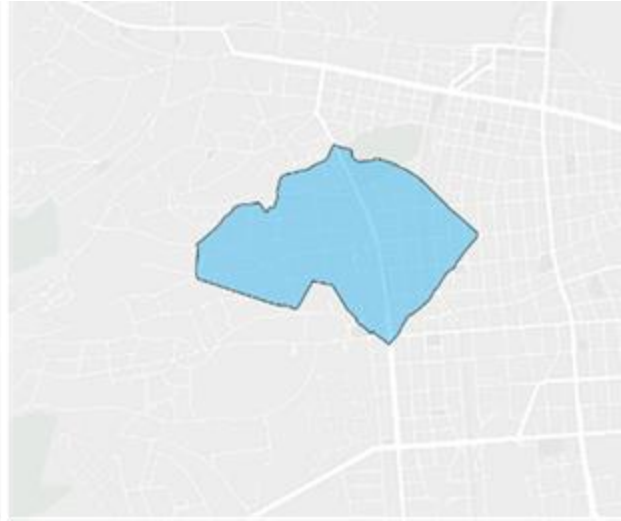
Walkshed Generation



Baseline - 5 km/h



Retiree - 4.1 km/h



Elderly - 3 km/h

Visualization Prototype [R03]

walksheds that utilized different walking speeds for different types of urban residents segmented by age.

For this study, five different groups were chosen:

Baseline

Young Adult

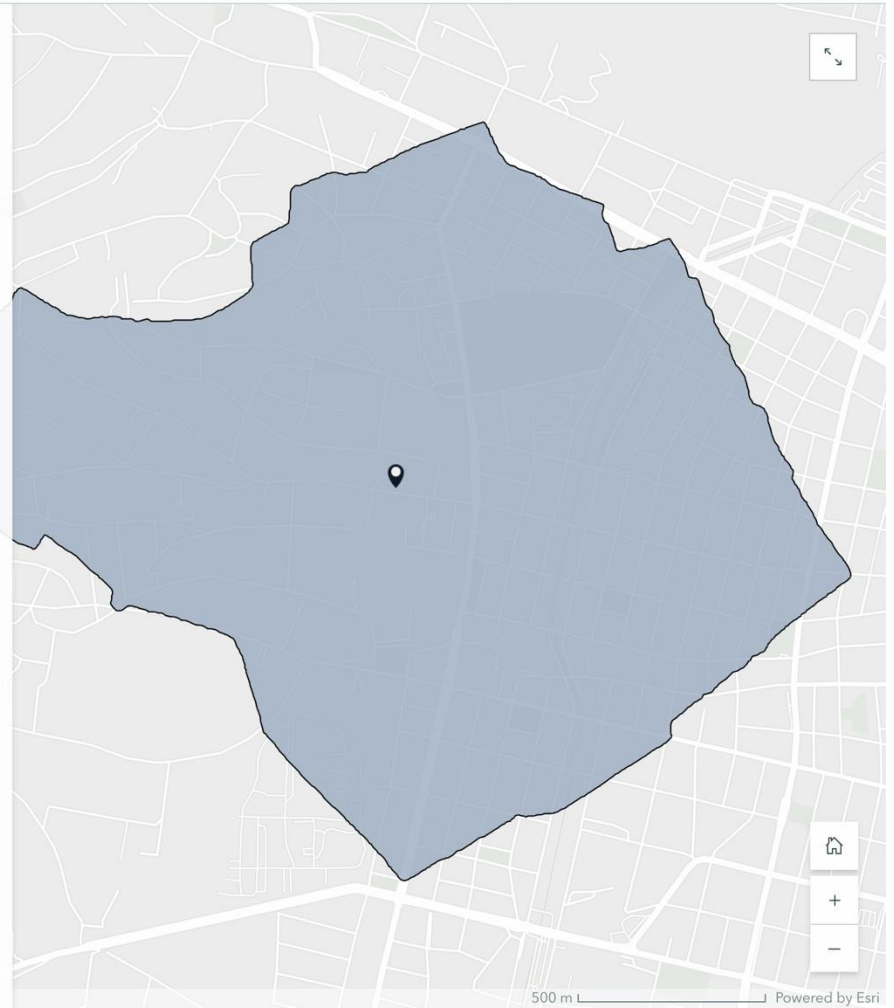
Parent

Child

Retiree

Elderly

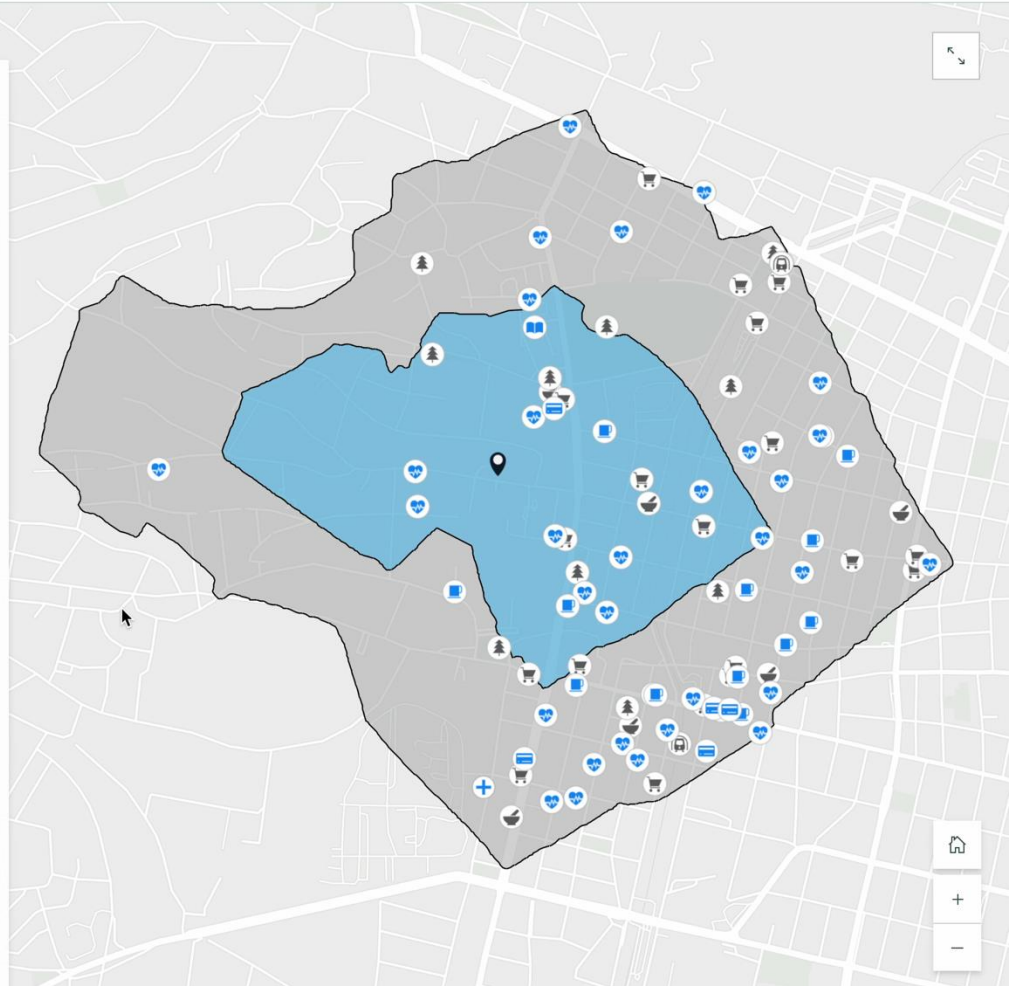
For each group, a walk speed was settled on based on literature review and input from interviews conducted with experts in the field of urban planning. By using the buttons above you can toggle between the different walkspeeds and see how the walkshed changes.



Elderly



The elderly, age approximately 80, has an average walkspeed of 3 km/h. As she lives alone, she likes to get out of the house and go to libraries, cafes or parks. Its important to her to doctors nearby due to here old age and limited mobility, but she also wishes that there was a hospital closer to her apartment incase something urgent happened with her health. She wishes that there were closer U-Bahn and S-Bahn stations in her neighborhood as she often likes to visit her children who live in a



Results & Discussion

Variation between users

StoryMap as a Visualization Method



Variation

Assessment of variation was based on simple metrics that account for changes in number of services available between the baseline walking area and group walking area

Looks at: general amenities & group specific amenities



Variation

Younger more mobile populations → minimal reductions in access to amenities

Retirees and the elderly → steep decline in ability to reach essential services



Use of StoryMap

Pros:

- Provides overview of area
- Highlights differences
- Simple narrative for exploring topic area

Cons:

- Limitations in interactivity
- Limited geographic scope



Use of StoryMap

Overall this method is useful for introducing the topic area and highlighting basic findings while prototyping how this area can be explored



Future Work

1. Examine other types of diversities
2. Interviews with residents
3. Expand visualization to include more data
4. User testing with policy makers



Conclusions

1. Proximity is not uniform for all groups
2. Study can be replicated for different areas
3. Diversities should be considered when addressing this topic area
4. Cartographic visualization can be a powerful tool for highlighting differences



Thank you!



QR Code to View
the StoryMap