Closing the gap between perceived and objective accessibility measures

Jaime Soza Parra

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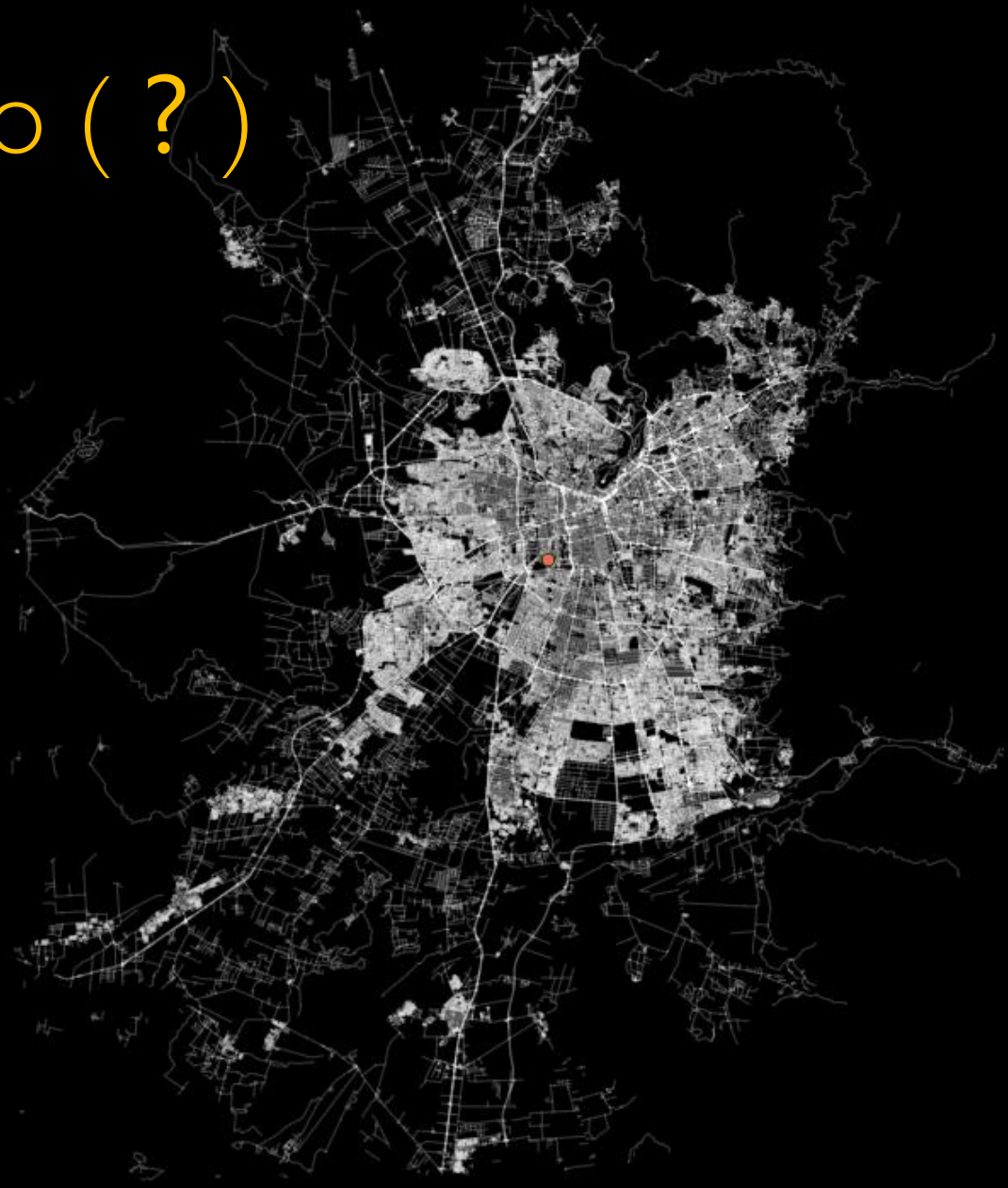
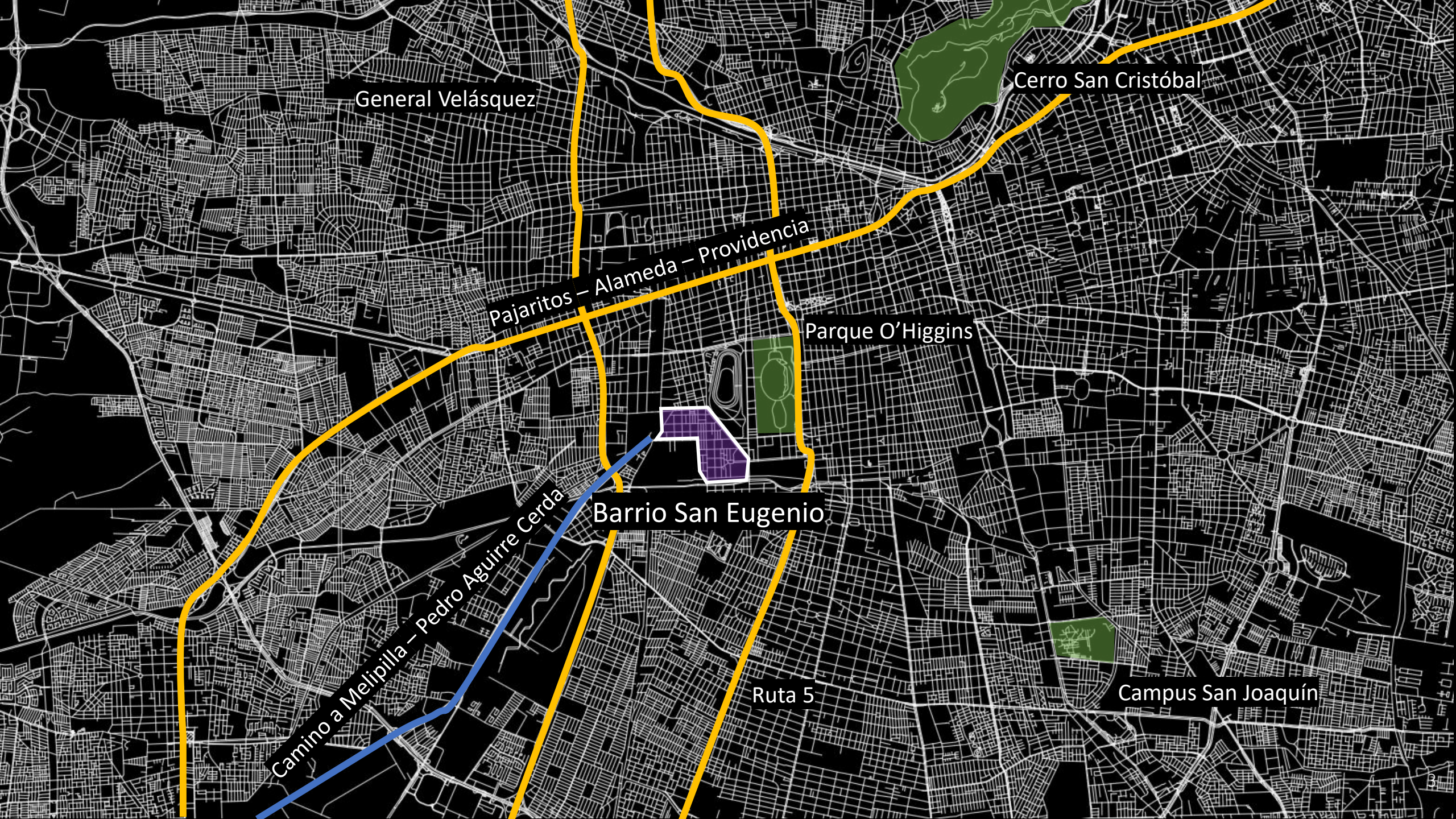
San Eugenio (?)




General Velásquez
Cerro San Cristóbal
Pajaritos – Alameda – Providencia
Parque O'Higgins
Barrio San Eugenio
Camino a Melipilla – Pedro Aguirre Cerda
Ruta 5
Campus San Joaquín

San Eugenio

2018 | **2019**

Agosto
Reunión con actores locales

Septiembre
Conteo de flujos / Salidas a Terreno

Octubre
1er Diálogo Ciudadano

Definición de Objetivos comunes
- Comunidad
- Municipalidad
- Cedeus

Noviembre
Fiesta de la Primavera

Diciembre
Desarrollo de Plan de Trabajo Proceso Participativo

Enero
2do Diálogo Ciudadano

Febrero
Entrevistas a Adultos Mayores y Encuesta a Residentes

Marzo
3er Diálogo Ciudadano

Mapeos Participativos
- Séptimo de Línea
- Arauco
- Pedro Montt

Abril
4to Diálogo Ciudadano

Caminatas Comentadas

Mayo
5to Diálogo Ciudadano

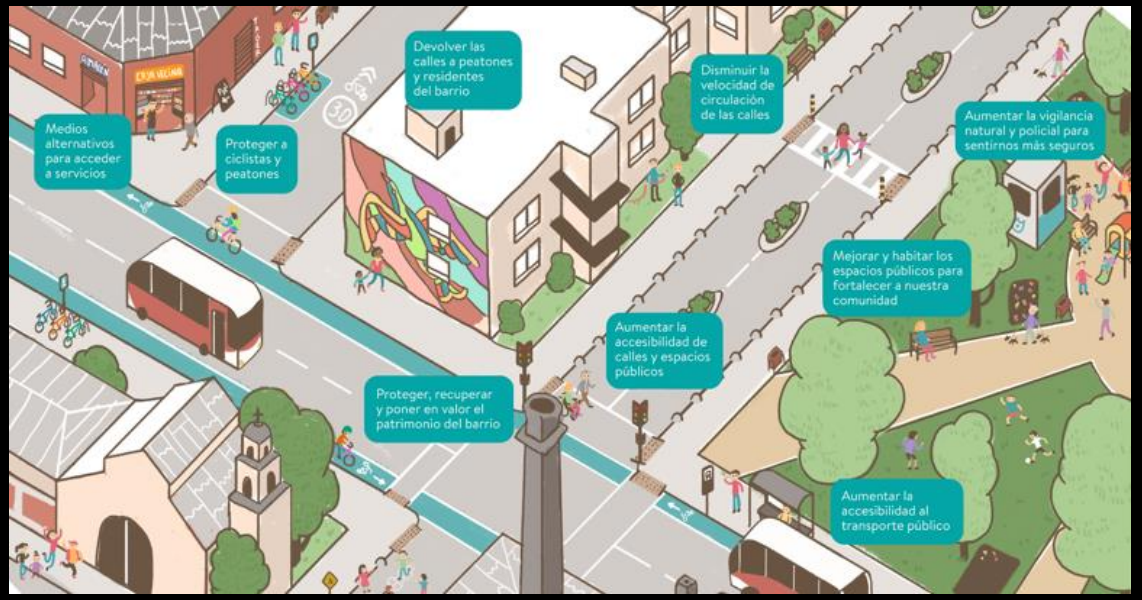
Discusión de propuestas

Junio
Elaboración Informe Final

Julio
Infografía

Agosto
6to Diálogo Ciudadano

San Eugenio



"Diagnóstico y propuestas participativas para el re-diseño del Barrio San Eugenio"

+

2 trabajos sobre drenaje urbano

Mobility survey

MÓDULO C: MOVILIDAD DEL ENCUESTADO	
ENCUESTADOR: Este módulo solo se aplica al encuestado	
SERVICIOS Y COMERCIOO	**P.30.** Le voy a nombrar una serie de servicios y comercios, y para cada uno de ellos, me gustaría que me dijera si es posible encontrarlos en su barrio, o si es necesario salir del barrio para encontrarlos en otros sectores de la comuna 1.Hay en el barrio → → **Continuar con P.31** 2. Hay que salir del barrio → **Pasar a P.32**
1. Parques y plazas	1 2
2. Café o restaurant	1 2
3. Farmacia	1 2
4. Consultorio o centro médico público	1 2
5. Consultas de salud privadas	1 2
6. Cajero automático o banco	1 2
7. Establecimiento educacional	1 2
8. Sede social o comunitaria	1 2
9. Centros culturales, como cine, teatro, biblioteca, museo u otro	1 2
10. Centro deportivo o infraestructura como multicanchas	1 2
11. Punto de Recarga Bip	1 2
12. Supermercado	1 2

Café & Restaurants

26% There are facilities and I visit them…

31% There are facilities but I don't visit them…

43% There are no facilities…

in the neighbourhood

(Some) research questions

Is it posible to understand what “the neighbourhood” means based on the answers to these questions?

Is there any “systematic” perception of this neighbourhood concept?

Is it posible to predict the perception of each service existence within each individual neighbourhood?

The team

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BRT+ Centre of Excellence

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CEDEUS

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Outline

(brief) Context

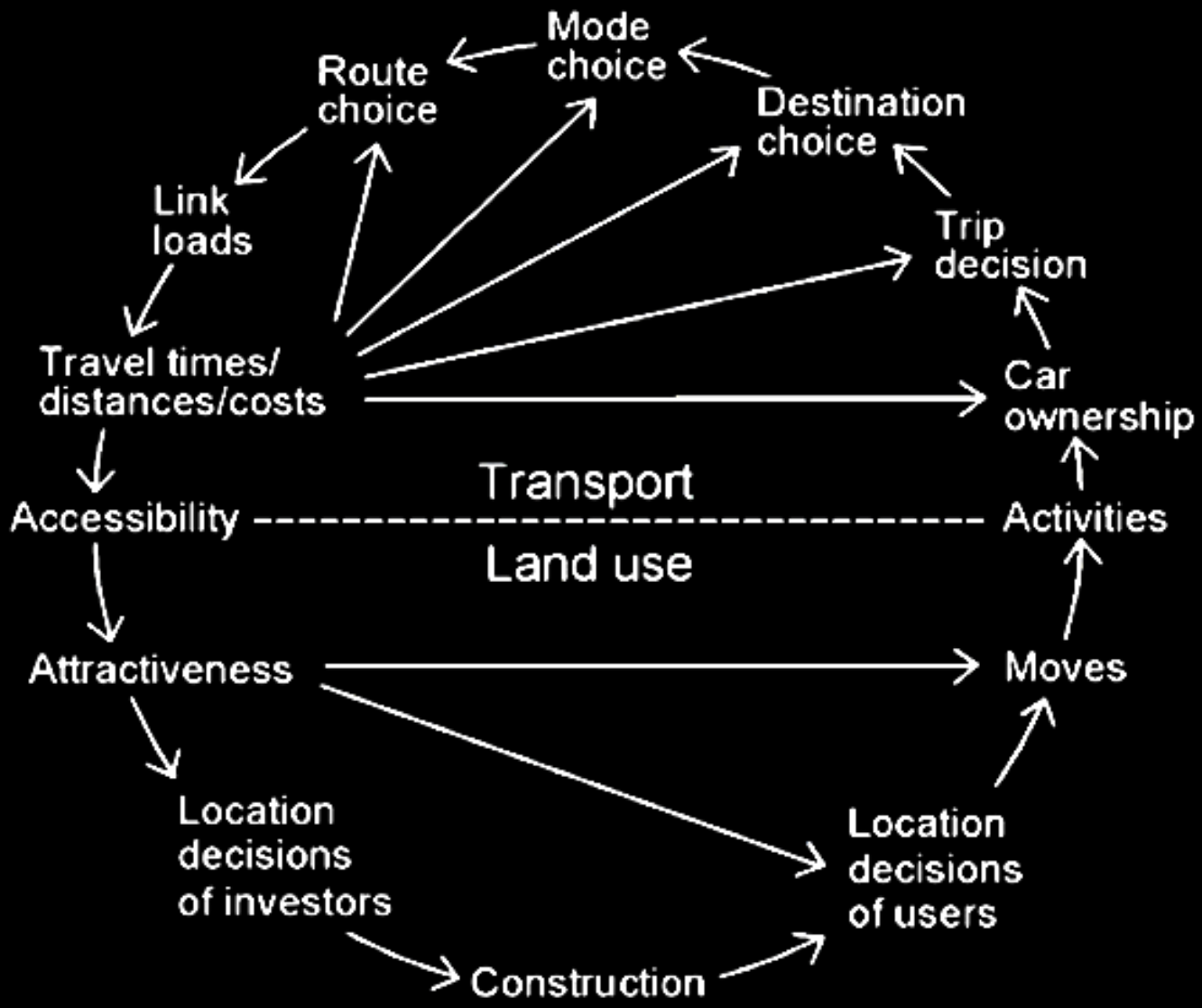
Generating the dataset

- Location of services and facilities
- Walking distance from every household to every facility
- Accessibility responses
- Latent perceptions

Modelling & early results

On going work / suggestions

Context



Wegener & Fürst (1999)

Context

Ottawa Citizen

Time is right to embrace the '15-minute neighbourhood'

The concept of a planning term known as the "15-minute neighbourhood" is not only achievable but makes a lot of sense, says Basem Hanna, ...

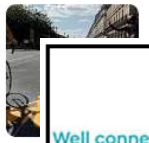
hace 4 semanas

Bloomberg

How the '15-Minute City' Could Help Post-Pandemic Recovery

"Walking and cycling present huge opportunities for small businesses in the neighborhood to thrive. It's not just the reduction of emissions." As ...

hace 4 semanas



Treehugger

The 15-Minute City Is Having a Moment by Lloyd Alter

If more people were to work from home, neighborhoods might spring ... has become known as the 15-minute city, where you can do your job, ...

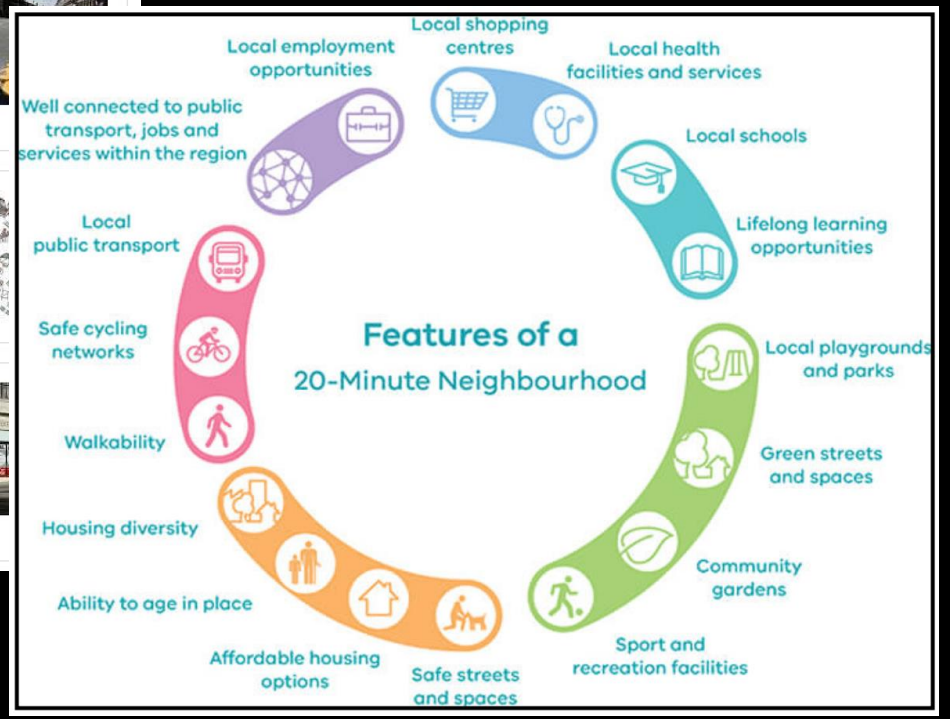
hace 3 semanas

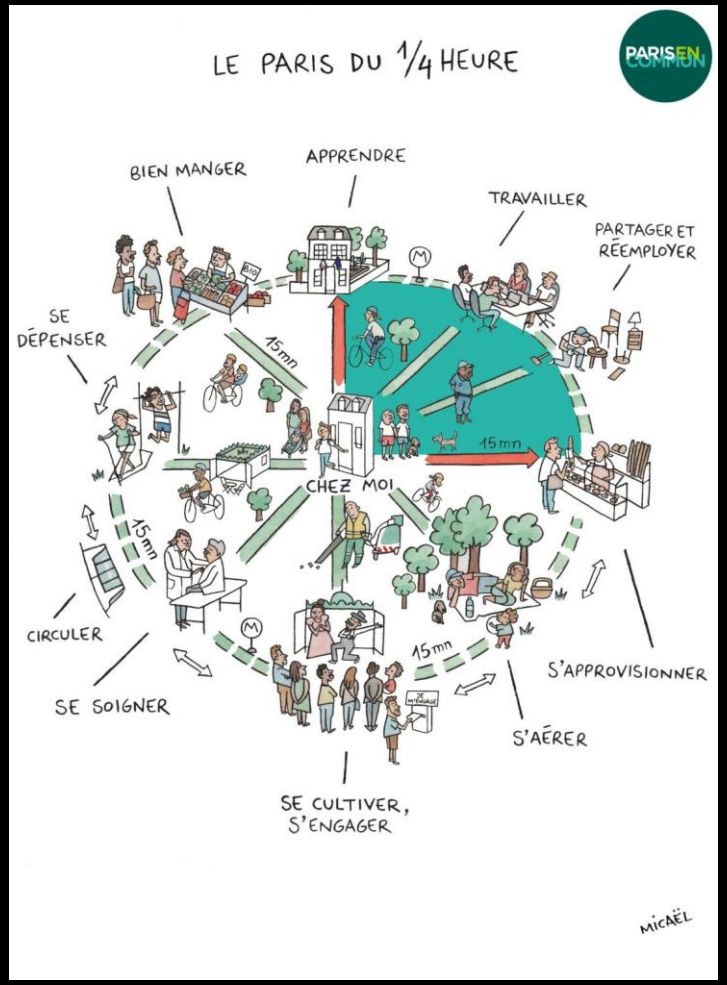
Streetsblog New York

Top Mayors Pledge to Build 15-Minute Cities For COVID-19 ...

... as its cornerstone: the transformation of the world's megacities into "15-minute cities," or metropolises composed of neighborhoods "where all ...

Hace 1 semana





Context

1. Normative accessibility (Hansen, 1959)

    All potential opportunities and desirable thresholds

2. Positive accessibility (Páez et al., 2012)

    How people travel within the city

3. Perceived accessibility (Lättman et al., 2016)

    How easy is to live a satisfactory life considering convenience

Generating the dataset

Location of services and facilities

12 services:

green areas – café & restaurants – pharmacies – public health centers
private health centers – atm & banks – educational centers – community centers
cultural centers – sport centers – bip! top-up place - supermarkets

Location of services and facilities

8 services:

green areas – café & restaurants – pharmacies – public health centers

private health centers – atm & banks – educational centers – community centers

cultural centers – sport centers – bip! top-up place - supermarkets

Location of services and facilities

OpenStreetMap

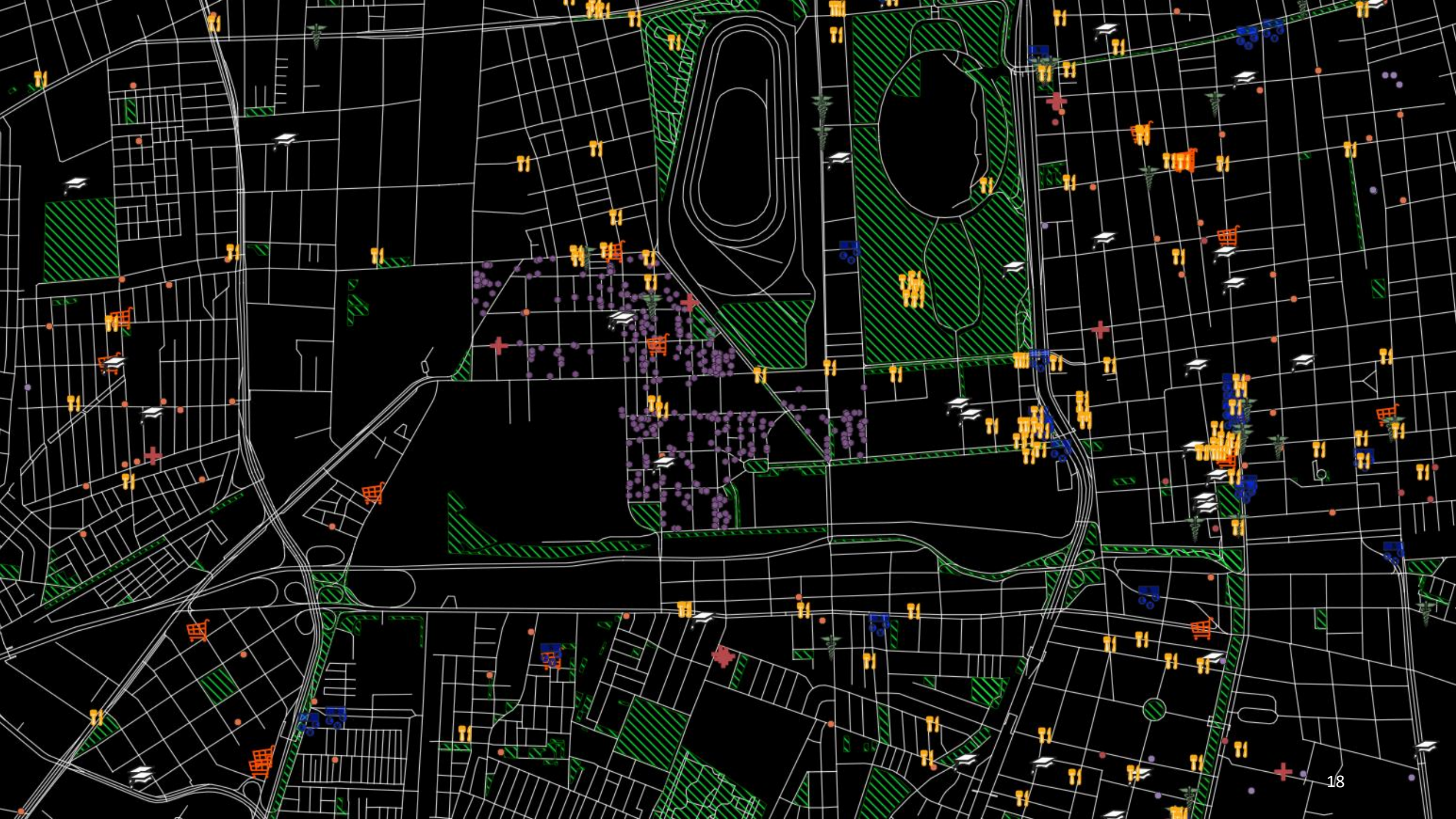
filtered by categories

GoogleMaps API

queries by type: “health”, “education”

queries by specific concept: “centro+salud+familiar”

Specific shapefiles: bip! & green areas



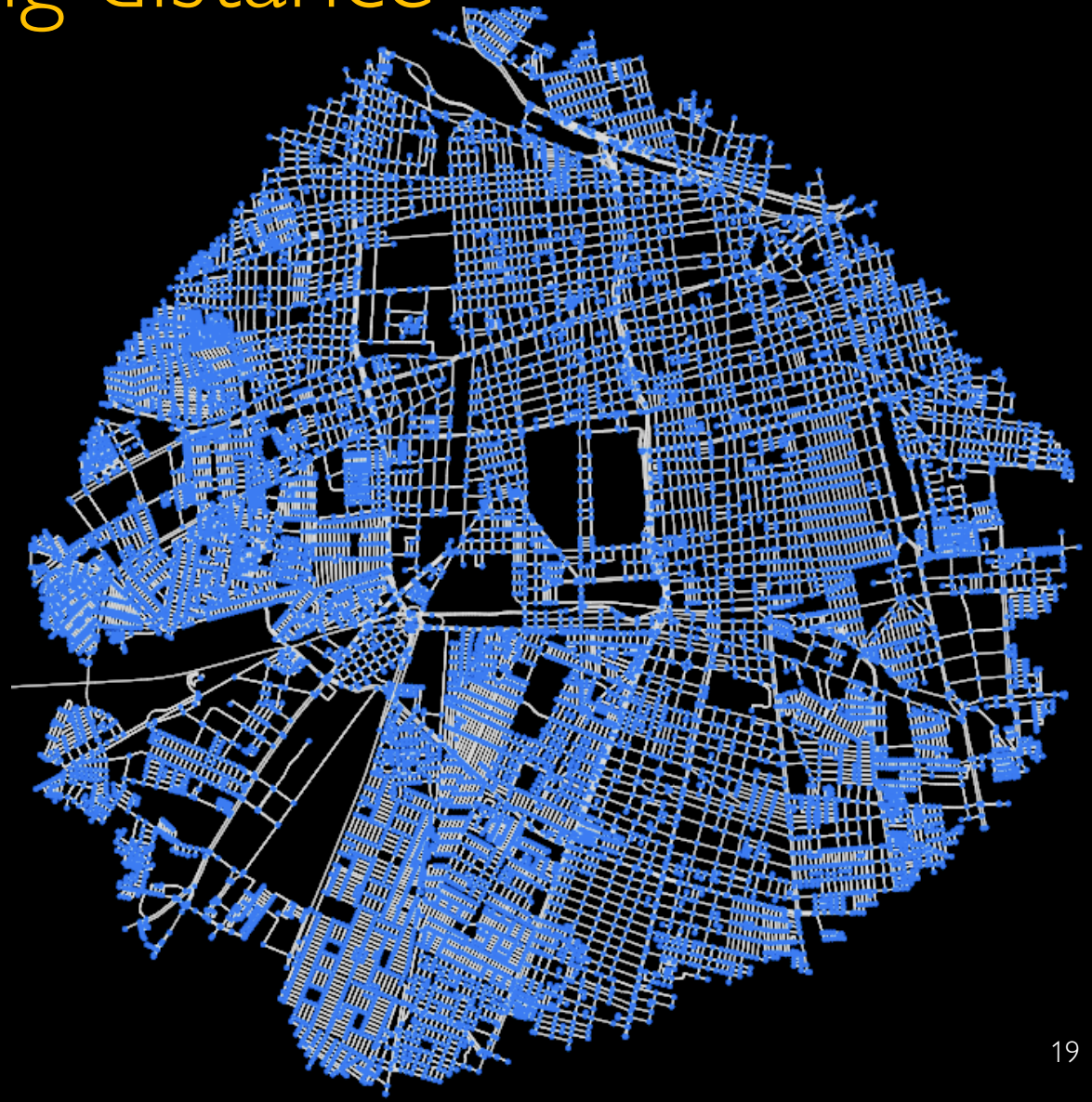
Household - facility walking distance

Python script – osmnx package

Downloaded graph from center to 7km network distance

Computed shortest path matrix

Assigned to each household and service facility the closest node



Household - facility walking distance

Four buffer areas: 300m, 500m, 800m, 1000m

4.5 min ,7.5 min ,12 min ,15 min at 4km/hr

Accesibility indicators:

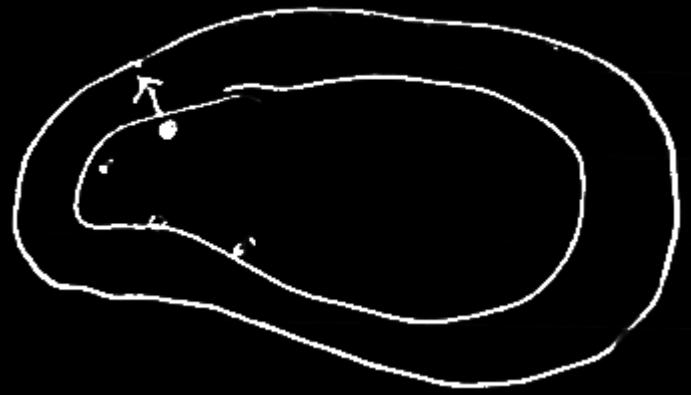
for each individual

for each service

for each walking distance threshold

facilities

average distance



Accesibility responses

Three accesibility leves were defined

For each service:

- there are facilities in my neighborhood
  - usage?: yes → level I
  - usage?: no → level II
- there are no facilities in my neighborhood → level III

Latent perceptions

25 statements about how frequent are some situations regarding:

streets, sidewalks, and green areas.

Ordered answers: yes, always / sometimes / no, never

PCA & FA: 1/3 of the variance is explained with 3 factors

Latent perceptions

Factor 1: Infrastructure quality

"The quality of the sidewalks allows safe movement of every person, including baby strollers, wheel-chairs, and elder people"

"There are urban facilities (like benches) that allow pedestrians to rest"

" Cross-walks are safe and respected by car-drivers "

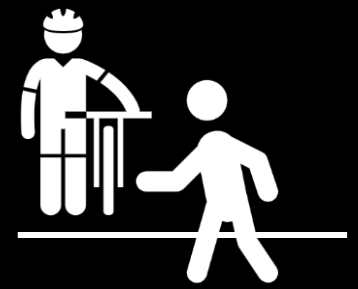
Latent perceptions

Factor 2: Cycle-friendly neighborhood

"The quality of the bikeways allows safe transit of cyclists"

"Existent bikeways are well connected and are part of a network"

"Cyclists respect pedestrians and transit exclusively on bikeways or at the street"



Latent perceptions

Factor 3: Usage of public spaces

"I see kids playing in the parks and squares of the neighborhood"

"I see groups of neighbors talking in the sidewalks"

"I use the parks and squares of the neighborhood"

Modelling & early results

Modelling

Ordinal logit model

"Specific constants" for each type of service

Accesibility indicator + SE information as explanatory variables

$$V_{i,s} = Acc_{i,s} + SE_i + SC_s$$

Early results

Proposed model is significantly better than a model with constants only

Likelihood decreases when distance threshold increases

Best models so far: 300m threshold

Two accessibility indicators performed better:

$$Acc_{i,s} = \#\text{facilities}_{i,s} \qquad Acc_{i,s} = \#\text{facilities}_{i,s} \cdot \frac{\#\text{facilities}_{i,s}}{\text{distance}_{i,s}}$$

Joint model indicates that the second measure is better

Early results

No gender differences

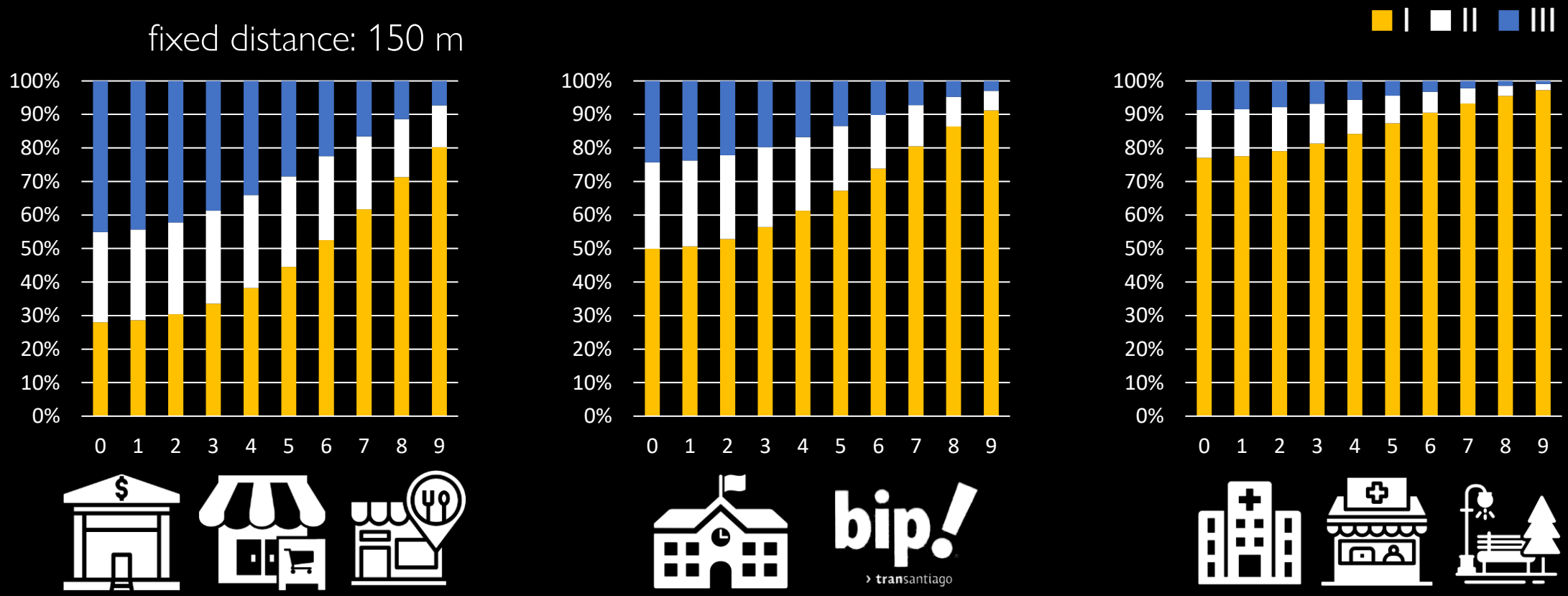
Age has a significant impact in accesibility perception

Around (~35% ,~55%) more probable
to answer there are no facilities

Early results

Facilities effect:

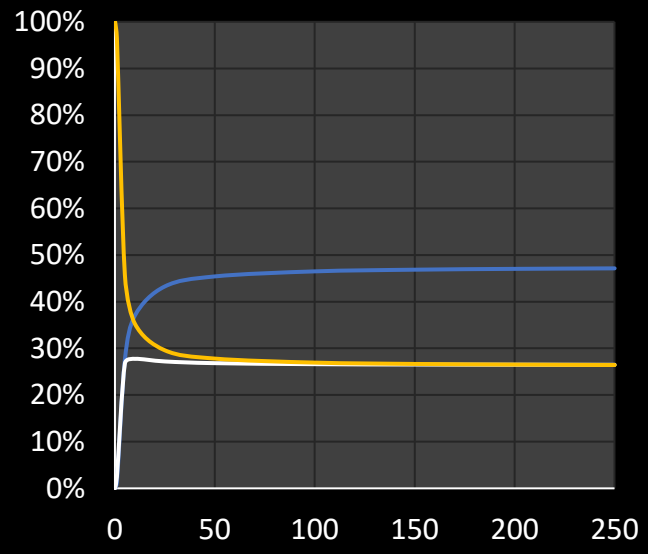
fixed distance: 150 m



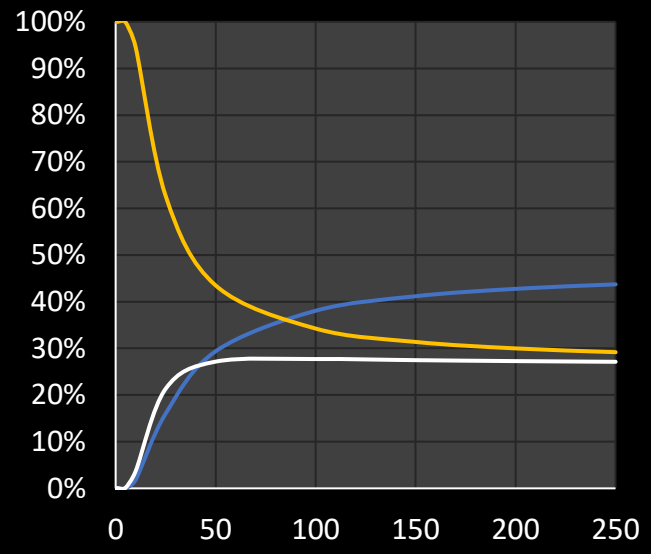
Early results

Distance effect:

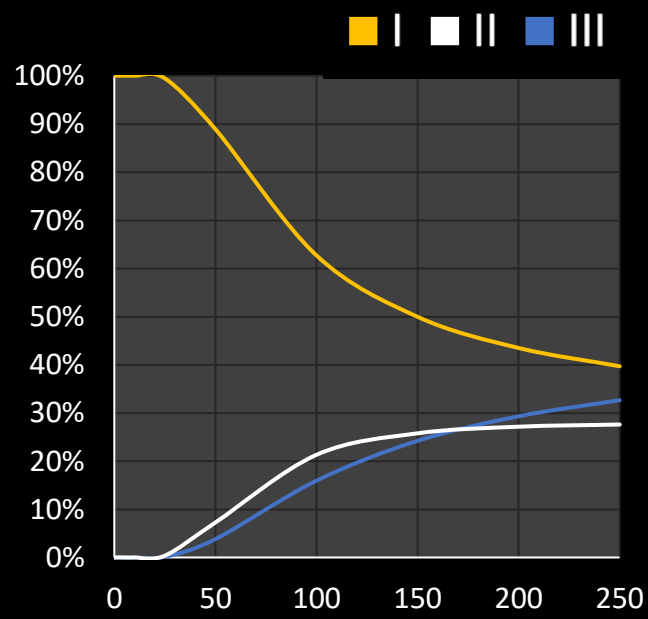
Corrects the prediction for low average distance individuals



1 facility



3 facilities



6 facilities

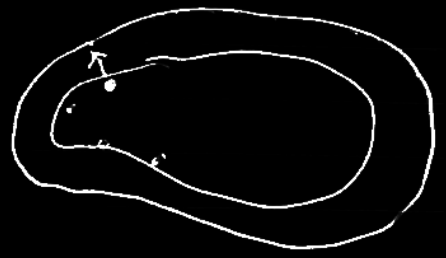
Ongoing work

Ongoing work

Some unexplored paths…

Distance threshold

Continious threshold?

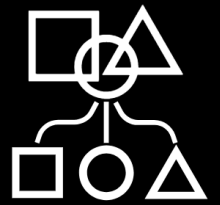


Systematic taste variation

Latent perception

Panel effect

Latent classes for distance threshold



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