

# Demystifying housing choice with spatial data viz



Anna Duan | Philly Data Visualization Meetup | September 11th, 2024

THE HOUSING  
**INITIATIVE** at Penn

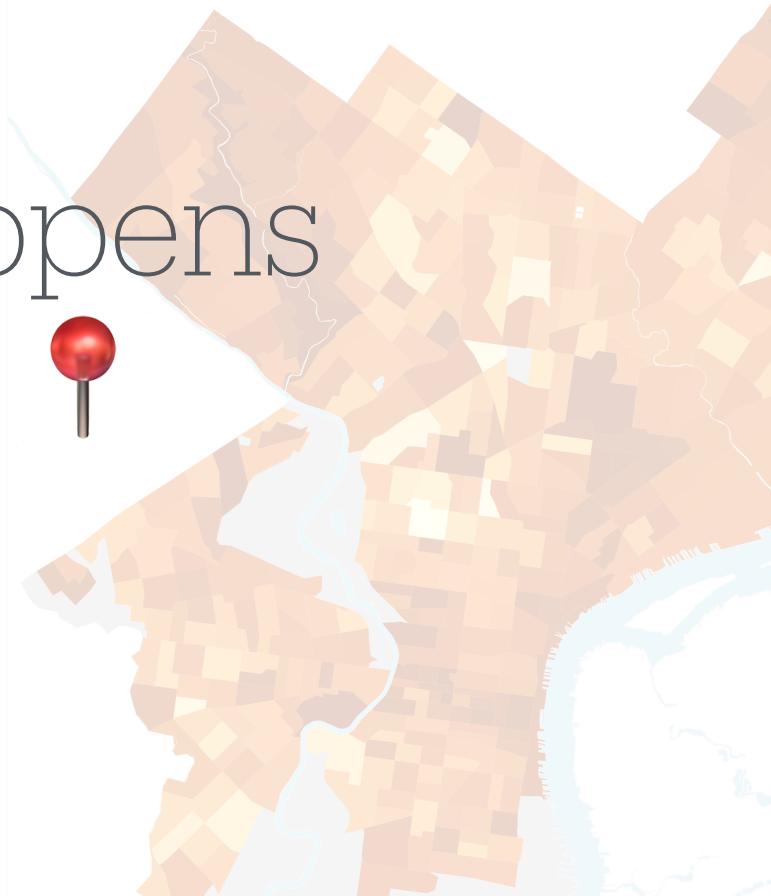
Penn Injury  
Science Center  
STOP IT • FIX IT • LIVE ON

researcher  grad student

Housing initiative at Penn

Master of Urban Spatial Analytics

Everything happens  
somewhere



# On the agenda

1. Section 8, voucher limits, and residential opportunity
2. Knowledge, financial, and social barriers to residential choice
3. Rethinking residential opportunity: building an assets-based neighborhood search tool
4. App demo :)



1 the policy

# Housing Choice Vouchers: a primer



Largest federal low-income housing program



2.3 million households served



Low-income, disabled, elderly, veteran households

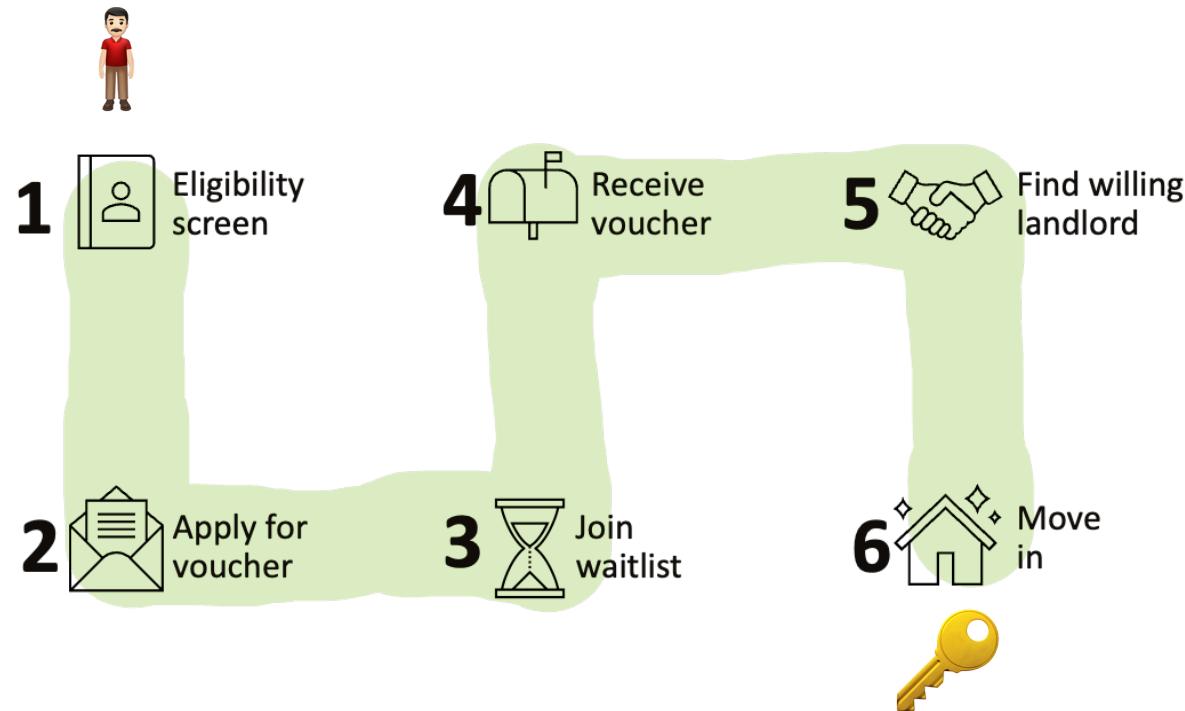


70% rental subsidy



Intended to improve housing choice & stability

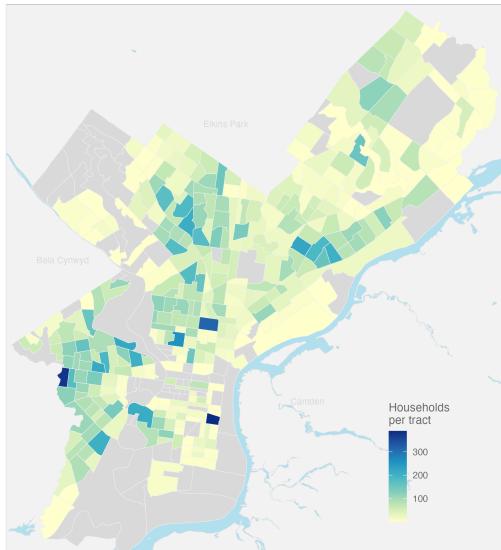
# Housing Choice Vouchers: a primer



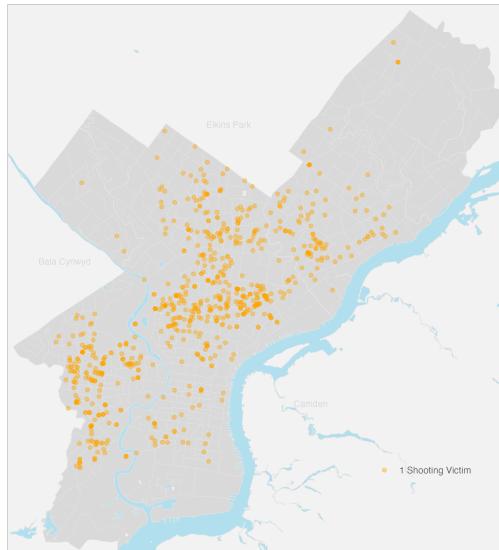
Traditionally, voucher limits were based on the metro-wide 40<sup>th</sup> percentile rent.



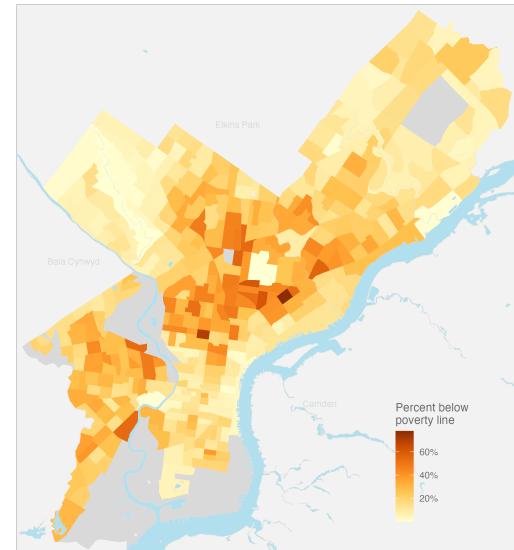
This ruled out high-rent neighborhoods,  
concentrating voucher households in areas with high  
rates of violence and poverty.



Vouchers, 2023

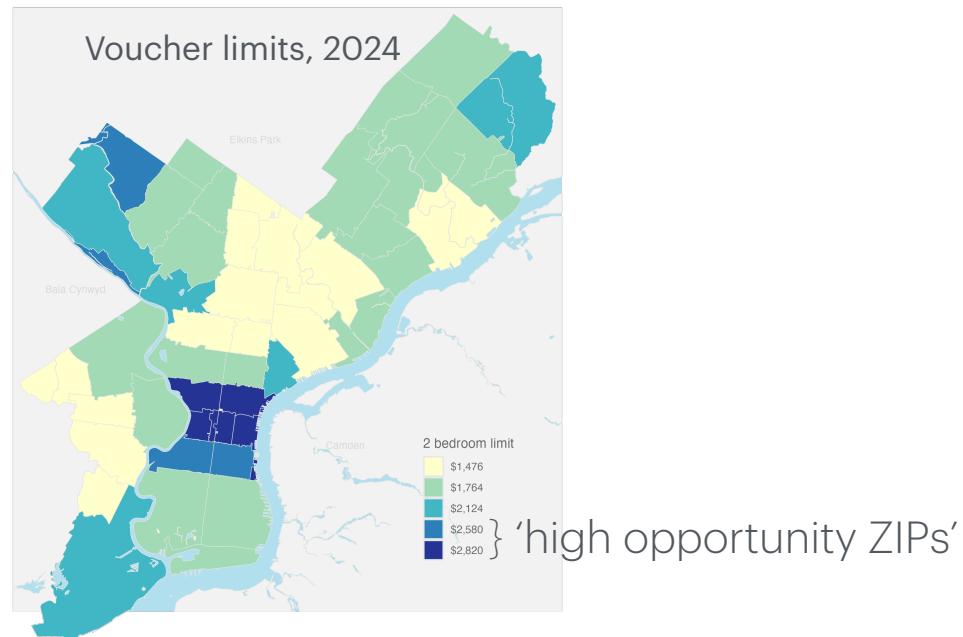


Shootings, 2024



Poverty Rate, 2022

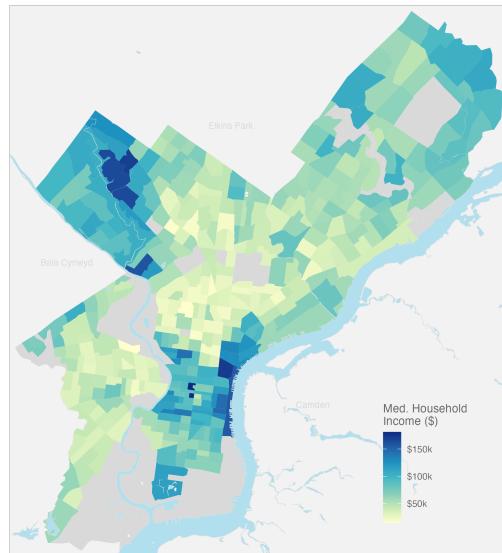
In 2017, Philly + 23 metros switched to ZIP-code level voucher limits.



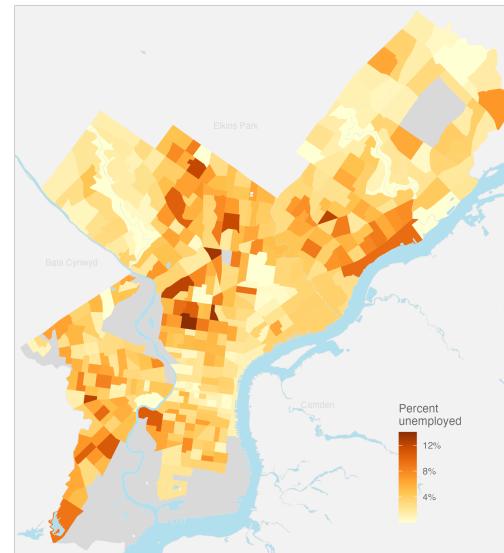
The intent was to give households the option to move to 'opportunity'



'Opportunity' ZIPs, 2024



Median Household income, 2023



Unemployment Rate, 2023

# 2 the problem

# Barriers to moving to ‘opportunity’



Financial



Landlord discrimination in ‘high opportunity’ ZIPs

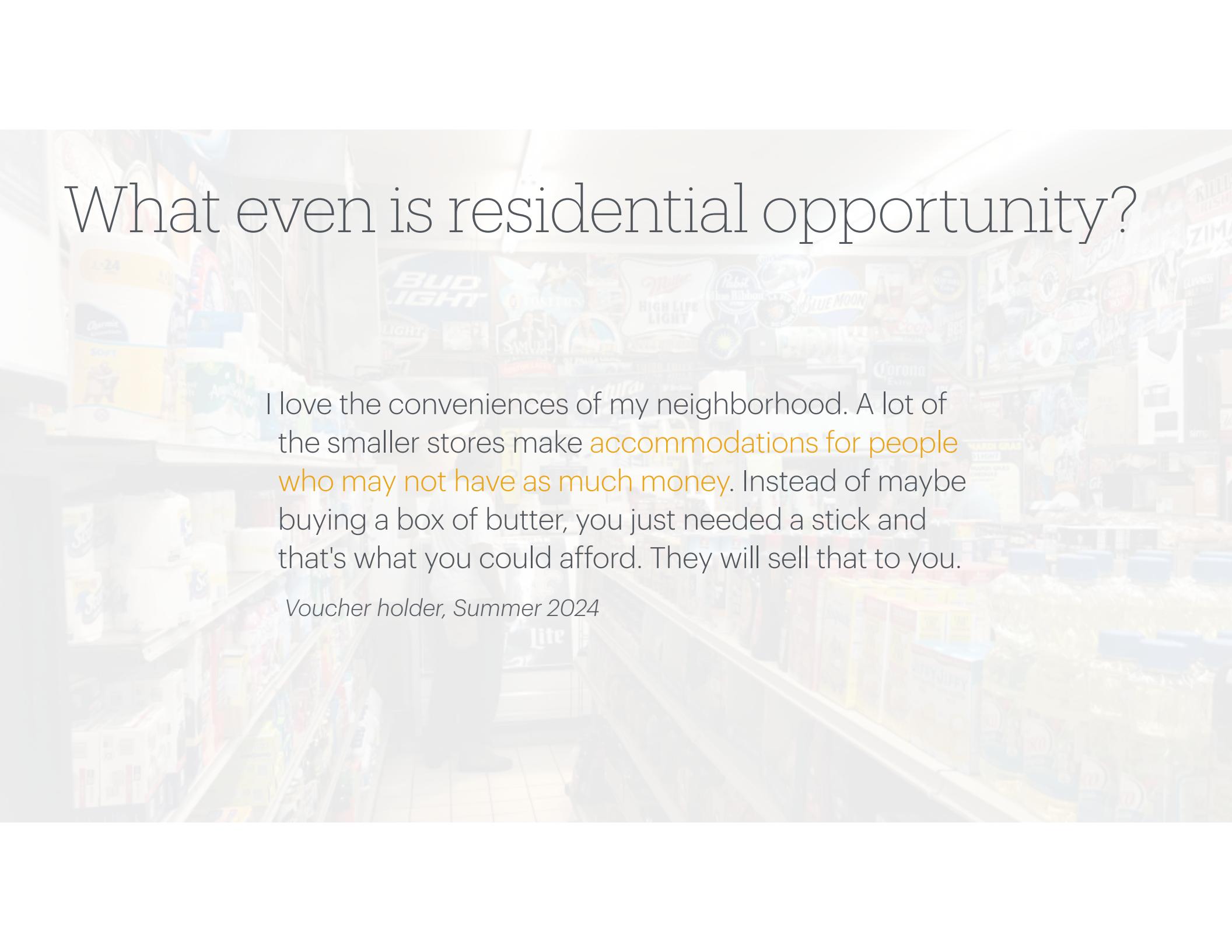


Information deficit: HCV program



Information deficit: Philly neighborhoods

# What even is residential opportunity?



I love the conveniences of my neighborhood. A lot of the smaller stores make **accommodations for people who may not have as much money**. Instead of maybe buying a box of butter, you just needed a stick and that's what you could afford. They will sell that to you.

*Voucher holder, Summer 2024*

# Opportunity, according to interviewees



Safety



Amenities



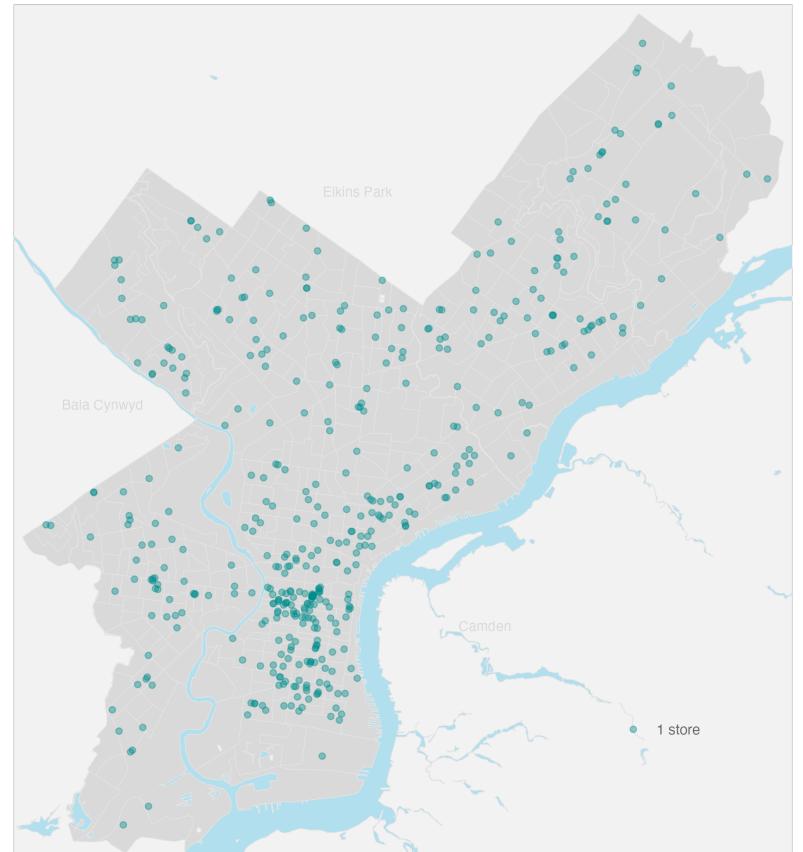
Kids' activities and rec spaces



Transportation and walkability



Community



Grocery Stores, 2023

3 design process

# Bridging the gap — and redefining opportunity



Operationalize resident priorities into a neighborhood search



Make Section 8 more transparent using visual design



Granular neighborhood recs > broad ZIP code hierarchy



Expedite unit search process to prevent voucher expiration



# Operationalizing preferences with open-*ish* source data

**OpenDataPhilly:** crime, green space, landmarks, healthcare

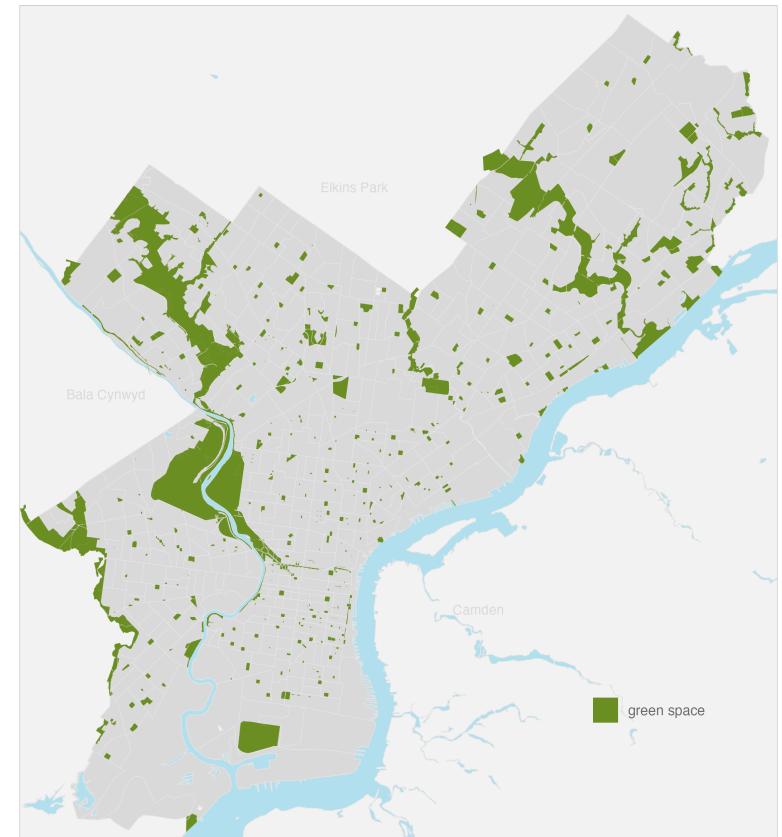
**Census:** community composition

**Yelp API:** grocery stores, restaurants, stores

**SEPTA:** transportation

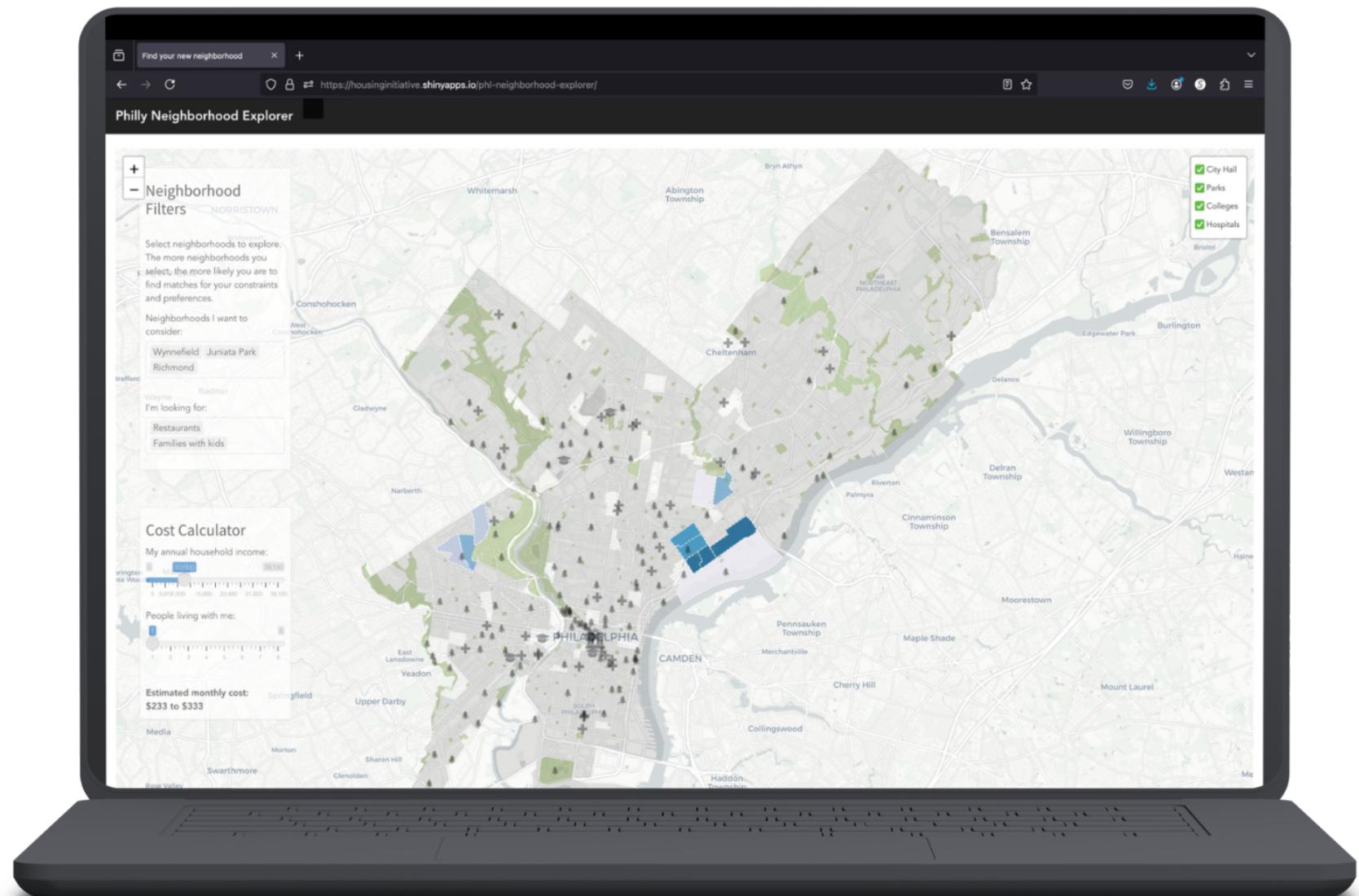
**OpenStreetMaps:** walkability

**Housing and Urban Development (HUD):** voucher households



Parks, 2024

4 app demo



# Next steps



Add neighborhood recommendation feature



Build out option to draw geographic boundaries



Accessibility check



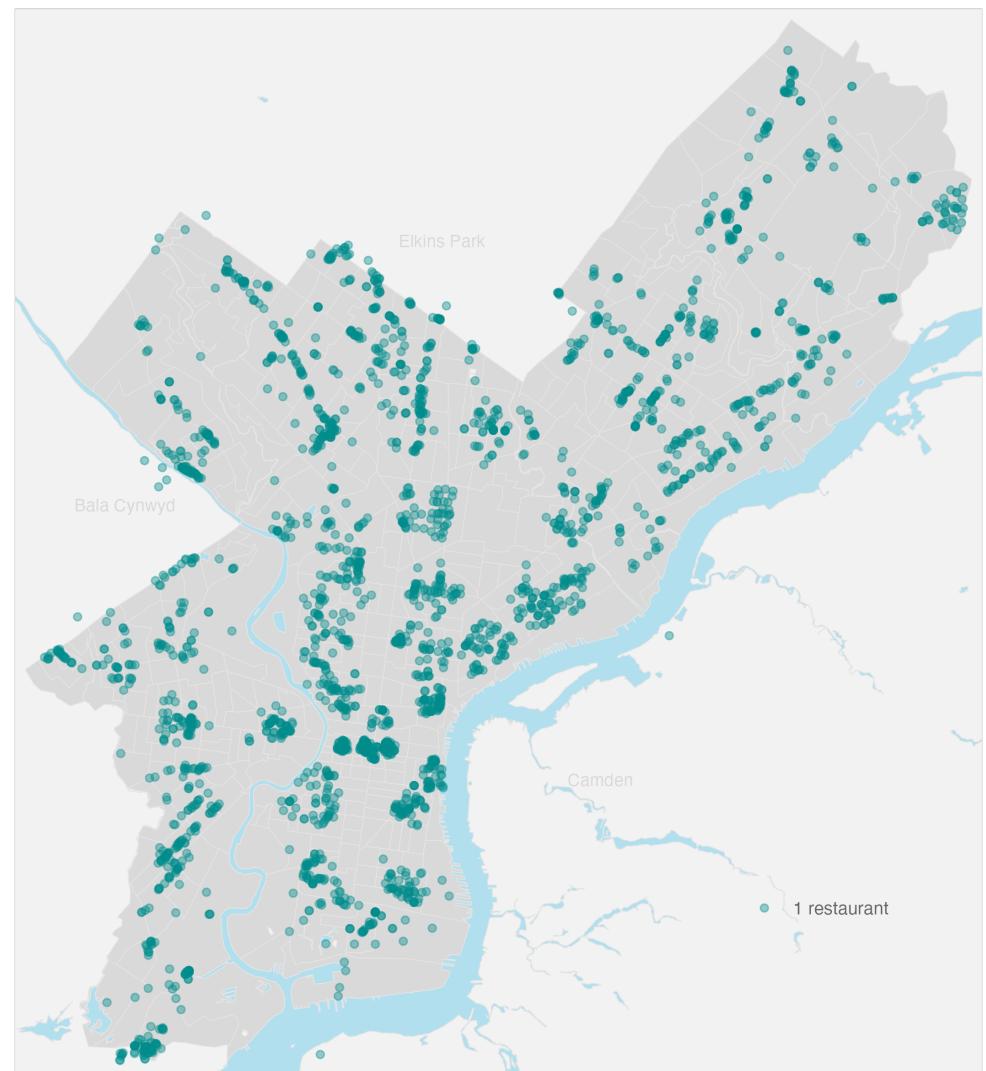
Convene voucher user focus group to test and provide feedback



Propose tool to tenant assistance groups and housing nonprofits

Thanks!  
Let's chat.

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# Technical appendix

R libraries:

❑ Analysis: [tidyverse](#), [tidycensus](#)

📍 Spatial: [sf](#), [tigris](#)

gMaps Visualization: [ggplot2](#), [shiny](#), [leaflet](#)

GitHub repo:

