Who has access to Philadelphia's senior centers?

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1. INTRODUCTION

- **Older adults' mobility** may decline with age, due to driving cessation, location, and physical and cognitive constraints (Nordbakke, 2013; Karthaus and Falkenstein, 2016)
- Low mobility is correlated with **social isolation** and poor health outcomes (Lucas, 2012; Dobbs, Hussey, and Pidborochynksi, 2018)
- **Age-friendly public transportation** is important for older adults' mobility and social participation (Cvitkovich and Wister, 2001; Dickerson, Molnar, Bédard, Eby, Berg-Weger, and Choi, 2017)
- **Senior centers** are a key destination for older adults (Turner, 2004; Kendig, Gong, Cannon, and Browning, 2017; Ashida and Heaney, 2008)
- We implement the **gravity model** (Karner, 2018) of accessibility measurement to study access to senior centers, a proxy for older adults' activities and resources
- We use **open-sourced data** to measure the **spatial accessibility** of Philadelphia senior centers and how it varies **geographically** and between **demographic groups**

2. LITERATURE REVIEW

- Minority, low-income, and disabled individuals face greater **transport barriers** and are more likely to be **transit-dependent** (Lubitow, Rainer, and Bassett, 2017; Turdalieva and Edling, 2018; Syed, Gerber, and Sharp, 2013)
- Growing availability of open-source data like **General Transit Feed Specification** (GTFS) makes it viable to measure accessibility via public transit (Boisjoly and El-Geneidy, 2016; Chia and Lee, 2020; Widener, Farber, Neutens, and Horner, 2015)
- **Accessibility measurement** studies focus on healthcare, employment, and food destinations (Syed, Gerber, Sharp, 2013; Owen, Levinson, 2015; Farber, Morang, Widener, 2014)
- Older adult accessibility studies focus on individual-level **barriers**, **capabilities**, and perceptions (Beyazit, 2011; Nordbakke, 2013; Ryan, Wretstrand, and Schmidt, 2015) and many are based in Europe and Canada (Nordbakke, 2013; Ryan, Wretstrand, and Schmidt, 2015)

3. CASE STUDY AREA: PHILADELPHIA, PA

- **Poorest** major American city and **minority-majority** (Figure 1)
- Southeastern Pennsylvania Transportation Authority offers **bus, rail, and trolley** service
- Uneven dispersion of SEPTA stations and route **frequency** (Figure 2)
- **Geographic disparities** in poverty and senior center placement (Figure 3)

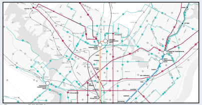
Figure 1: Philadelphia Demographics

	Philadelphia	United States
Non-White Population	65.4%	39.6%
Poverty Rate	24.3%	11.8%
Share of Adults 65+	13.7%	16%

Source: US Census Bureau

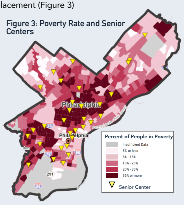
Figure 2: SEPTA Service Frequency

15 minute routes | 30 minute routes | 60 minute routes



Source: SEPTA

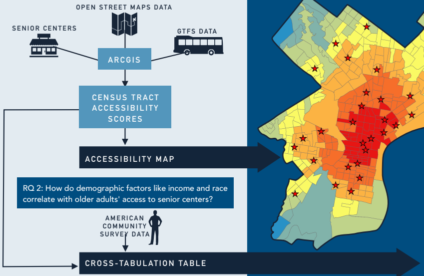
Figure 3: Poverty Rate and Senior Centers



Source: PolicyMap

4. METHODS

RQ 1: How does the accessibility of senior centers via public transit vary between census tracts?

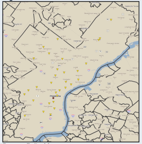


RQ 2: How do demographic factors like income and race correlate with older adults' access to senior centers?

5. DEFINING THE 'SENIOR CENTER'

Senior centers in Philadelphia offer a wide variety of services and programming including food, religious services, housing, and social activities. In this study, we use the **Philadelphia Corporation for Aging** (PCA)'s list of senior centers that they partner with. This list consists of 35 senior centers which are funded by PCA and offer a full range of social, educational, and recreational activities in addition to food and transportation.

Figure 4: PCA Funded Senior Centers



Source: PolicyMap

6. PRELIMINARY FINDINGS

Figure 5: Senior Center Accessibility, Philadelphia

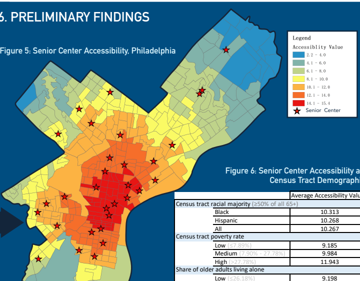


Figure 6: Senior Center Accessibility and Census Tract Demographics

		Average Accessibility Value
Census tract racial majority (≥50% of all 65+)		
	Black	10.313
	Hispanic	10.268
	All	10.267
Census tract poverty rate		
	Low (≤7.89%)	9.185
	Medium (7.90% - 27.78%)	9.984
	High (>27.78%)	11.943
Share of older adults living alone		
	Low (≤26.18%)	9.198
	Medium (26.19% - 44.35%)	10.177
	High (>44.35%)	11.548
Census tract disability rate		
	Low (≤33.23%)	9.656
	Medium (33.24% - 51.85%)	10.079
	High (>51.85%)	11.284
Share of older adults without a car		
	Low (≤14.5%)	7.484
	Medium (14.6% - 37.3%)	10.677
	High (>37.3%)	12.223

* For Poverty Rate, Living Alone, Disability Rate, and Older Adults Without a Car, Low Is the First Quartile, Medium Is Quartile 2 and 3, and High Is the Fourth Quartile

7. IMPLICATIONS

GEOGRAPHICAL:

1. Accessibility is highest in **Center City** and lowest in the **Northwest**, **Northeast** and **South**.
2. This is expected, as the majority of senior centers are in the Center City district.

DEMOGRAPHIC:

3. Majority **Black** and majority **Hispanic** census tracts have better access to senior centers than Philadelphia as a whole.
4. Census tracts with high shares of older adults who are **in poverty**, **living alone**, **disabled**, and **carless** have better senior center accessibility than tracts with low shares.
5. These findings are surprising because the literature suggests that these traits correlate with lower transit accessibility and more transport barriers (Lubitow, Rainer, and Bassett, 2017).
6. These trends may be indicative of successful efforts by the City of Philadelphia, Pennsylvania Department of Aging, Philadelphia Corporation for Aging, and SEPTA to make transit and senior centers accessible to older adults with differing needs and levels of mobility.

REFERENCES

1. Ashida, S., & Heaney, C. A. (2008). Social Networks and Participation in Social Activities at a New Senior Center: Reaching Out to Older Adults Who Could Benefit the Most. *Activities, Adaptation & Aging, 32*(1), 40–58.
2. Beyazit, E. (2011). Evaluating Social Justice in Transport: Lessons to be Learned from the Capability Approach. *Transport Reviews, 31*(1), 117–134.
3. Boisjoly, G., & El-Geneidy, A. (2016). Daily fluctuations in transit and job availability: A comparative assessment of time-sensitive accessibility measures. *Journal of Transport Geography, 52*, 73–81.
4. Chia, J., & Lee, J. (Brian). (2020). Extending public transit accessibility models to recognise transfer location. *Journal of Transport Geography, 82*, 102618.
5. Cvitkovich, Y., & Wister, A. (2001). The Importance of Transportation and Prioritization of Environmental Needs to Sustain Well-Being among Older Adults. *Environment and Behavior, 33*(6), 809–829.
6. Dickerson, A. E., Molnar, L. J., Bédard, M., Eby, D. W., Berg-Weger, M., Choi, M., Grigg, J., Horowitz, A., Meuser, T., Myers, A., O'Connor, M., & Silverstein, N. M. (2017). Transportation and Aging: An Updated Research Agenda to Advance Safe Mobility among Older Adults Transitioning From Driving to Non-driving. *The Gerontologist, 59*(2), 215–221.
7. Farber, S., Morang, M. Z., & Widener, M. J. (2014). Temporal variability in transit-based accessibility to supermarkets. *Applied Geography, 53*, 149–159.
8. Karner, A. (2018). Assessing public transit service equity using route-level accessibility measures and public data. Journal of Transport Geography, 67, 24–32.
9. Karthaus, M., & Falkenstein, M. (2016). Functional Changes and Driving Performance in Older Drivers: Assessment and Interventions. *Geriatrics (Basel, Switzerland), 1*(2), 12. PubMed.
10. Kendig, H., Gong, C. H., Cannon, L., & Browning, C. (2017). Preferences and Predictors of Aging in Place: Longitudinal Evidence from Melbourne, Australia. *Journal of Housing For the Elderly, 31*(3), 259–271.
11. Lubitow, A., Rainer, J., & Bassett, S. (2017). Exclusion and vulnerability on public transit: Experiences of transit dependent riders in Portland, Oregon. *Mobilities, 12*(6), 924–937.
12. Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy, 20*, 105–113.
13. Nordbakke, S. (2013). Capabilities for mobility among urban older women: Barriers, strategies and options. *Journal of Transport Geography, 26*, 166–174.
14. Owen, A., & Levinson, D. M. (2015). Modeling the commute mode share of transit using continuous accessibility to jobs. *Transportation Research Part A: Policy and Practice, 74*, 110–122.
15. Ryan, J., Wretstrand, A., & Schmidt, S. M. (2015). Exploring public transport as an element of older persons' mobility: A Capability Approach perspective. *Journal of Transport Geography, 48*, 105–114.
16. Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling Towards Disease: Transportation Barriers to Health Care Access. *Journal of Community Health, 38*(5), 976–993.
17. Turdalieva, C., & Edling, C. (2018). Women's mobility and 'transport-related social exclusion' in Bishkek. *Mobilities, 13*(4), 535–550.
18. Turner, K. Whisnant. (2004). Senior Citizens Centers. *Journal of Gerontological Social Work, 43*(1), 37–47.
19. Widener, M. J., Farber, S., Neutens, T., & Horner, M. (2015). Spatiotemporal accessibility to supermarkets using public transit: An interaction potential approach in Cincinnati, Ohio. *Journal of Transport Geography, 42*, 72–83.