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Webinar: Transportation Resources And Behaviors Among Older Immigrants And Migrants

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Transportation resources and behaviors among older immigrants and migrants

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Acknowledgements

Research participants
Research sites & partners
Research team

Agenda

- Background & theoretical foundations
- Introduction to 2 related studies
- Study 1 (Older Vietnamese Immigrants)
  - Aims and methods
  - Study 1, Phase 1 results
  - Study 1, Phase 2 analysis and results
- Study 2 (Hispanic Senior Center)
- Conclusion & Key Takeaways
- Discussion

Background

- Nearly 4.6 million immigrants aged 65 and older live in the United States

- A lack of culturally appropriate transportation solutions for older immigrants creates disparities

- A growing number of older immigrants live in low-density urban environments, which are characterized by high automobile dependency and limited public transportation.

- Negative aspects of this reliance on others are that the private transportation providers may be at risk for caregiver burden and stress, and older immigrants may lack transportation to social or health opportunities

Capabilities Approach

- The key idea of the **capability approach** is that social arrangements (e.g., transportation systems) should aim to expand people's capabilities – their freedom to promote or achieve valuable beings and doings.

- The capabilities approach, by combining the concepts of freedom, welfare and equity, focuses on what individuals are capable of achieving.

- How we conceive of it in our studies
  - Transportation as a component of capability
  - Activity space = manifestation of capabilities into actual movement across space & indicates ability to access resources and spaces

Two Related Studies

STUDY 1

- Survey research of older Vietnamese immigrants and their ride providers in the Dallas-Fort Worth metroplex
- 2 phases

STUDY 2

- Social network analysis of members of a senior center serving predominantly Puerto Rican older adults in Hartford, CT

Study 1 – Phase 1 Aims (Older Adults)

1: Describe the transportation resources and behavior among the sample (e.g., household automobile ownership, modes of transportation, frequency of transportation use).

2: Describe the sample's level of knowledge of public transportation in their community, including paratransit services.

3: Understand the effects of lack of transportation on key social, health care, and household maintenance activities (i.e., missed appointments and opportunities).

4: Identify associations between ride dependency among older adults and various indicators of their well-being.

5: Describe the regular activity spaces among the sample, including types and frequency of routine activities, and accessibility of key activities based on regular activity space boundaries.

6: Assess the association of ride dependency among older adults and the size of their regular activity spaces.

7: Identify associations between the size of older adults' regular activity spaces and various indicators of their well-being.

Study 1 – Phase 2 Aims (Ride Providers)

1. Describe the transportation resources and behavior among the sample (e.g., household automobile ownership, modes of transportation, frequency of transportation use).

2: Describe the types and frequency of rides provided.

3: Describe the impacts (i.e., financial cost, missed work, missed healthcare appointments, increased personal stress, increased family stress) of providing rides reported by ride providers.

4: Using regular and ride-provision activity spaces, calculate metrics (i.e., geospatial burden indicators) for assessing the geospatial burden of providing rides.

5: Evaluate the association of the geospatial burden indicators with each other and with impacts of providing rides.

Recruitment - Study 1

- **Phase 1 (Older adults)**
  - Inclusion criteria
    - 65+ years old
    - Vietnamese or Vietnamese American
    - DFW metroplex
    - Communicate in Vietnamese or English
  - Convenience sampling
  - $20 Walmart gift card incentive
  - 95 eligible respondents

- **Phase 2 (Ride providers)**
  - Inclusion criteria
    - 18+ years old
    - Provide ride to older Vietnamese person in DFW metroplex
  - Snowball sampling from P1 + convenience sampling
  - $10/$20 Walmart gift card incentive
  - 20 eligible respondents (11 paired with P1 participant)

Data Collection - Study 1

- July 2020 – January 2021
- Interviewer administered by telephone in Vietnamese or English
- Qualtrics (with Google Maps integration)
- Phase 1 (30-40 minutes):
  - 98% in Vietnamese
- Phase 2 (20 minutes):
  - 55% in Vietnamese

Questionnaire Items - Study 1

Automobile ownership ("Do you or someone in your household own an automobile?")

Modes of transportation

- Types (Which of the following modes of transportation do you use? Select all that apply):
  - Walking for transportation; Drive myself; Get a ride with someone else; City bus or other public transportation; Taxi or ride-sharing services like Uber, Lyft, Via, etc.; Handi-Tran, ACCESS, DART paratransit, or other dial-a-ride services; Other

- Frequency:
  - Less than once per month; Once per month; A few times per month; Once per week; More than once per week; Once per day; More than once per day

Transportation Costs ("Approximately how much money (in dollars) do you spend each month on your transportation??")

Questionnaire Items - Study 1

Routine Activities (older adults & ride providers)
- **Type**
  - "Which of the following activities do you do routinely, at least once a month?"
  - 20 items (e.g., grocery shopping, visit family and or friends, exercise, healthcare, other)
- **Frequency (0-30 days/month)**
- **Location**
  - "most common location where you go to…"
  - exact location or closest cross streets as indicated by pin on Google Maps integration in Qualtrics

Unmet Travel Needs (older adults)
- "In the past month, which of the following activities have you been unable to do because you did not have transportation?"
- Same 20 items as routine activities plus "other" option

Rides Provided (ride providers)
- **Type**
  - Which of the following activities do you routinely go to when you give rides to…"
- **Frequency**
- **Location**

Calculated Measures – Study 1

Primary Mode of Transportation

- Based on most frequently used mode of transportation among all types endorsed by the respondent

Transportation Cost Burdened

- > 15% of income spent on transportation

Impacts of Providing Rides

- Any impact from a list of Y/N items
  - incurred transportation related expenses;
  - missed work;
  - missed own healthcare appointments;
  - increased personal stress;
  - increased family stress; and
  - other

Activity Spaces

- Regular Activity Space
- Ride Provision Activity Space

Results – Study 1

Transportation and unmet travel needs of older Vietnamese immigrants

Sample (*N* = 84)

- 100% born in Vietnam and primarily speak Vietnamese at home
- Average time in US = 27 years (*SD* = 11)
- Average age 74 (*SD* = 6.5)
- 64% female
- 51% married
- 70% live with others
- 57% less than high school education
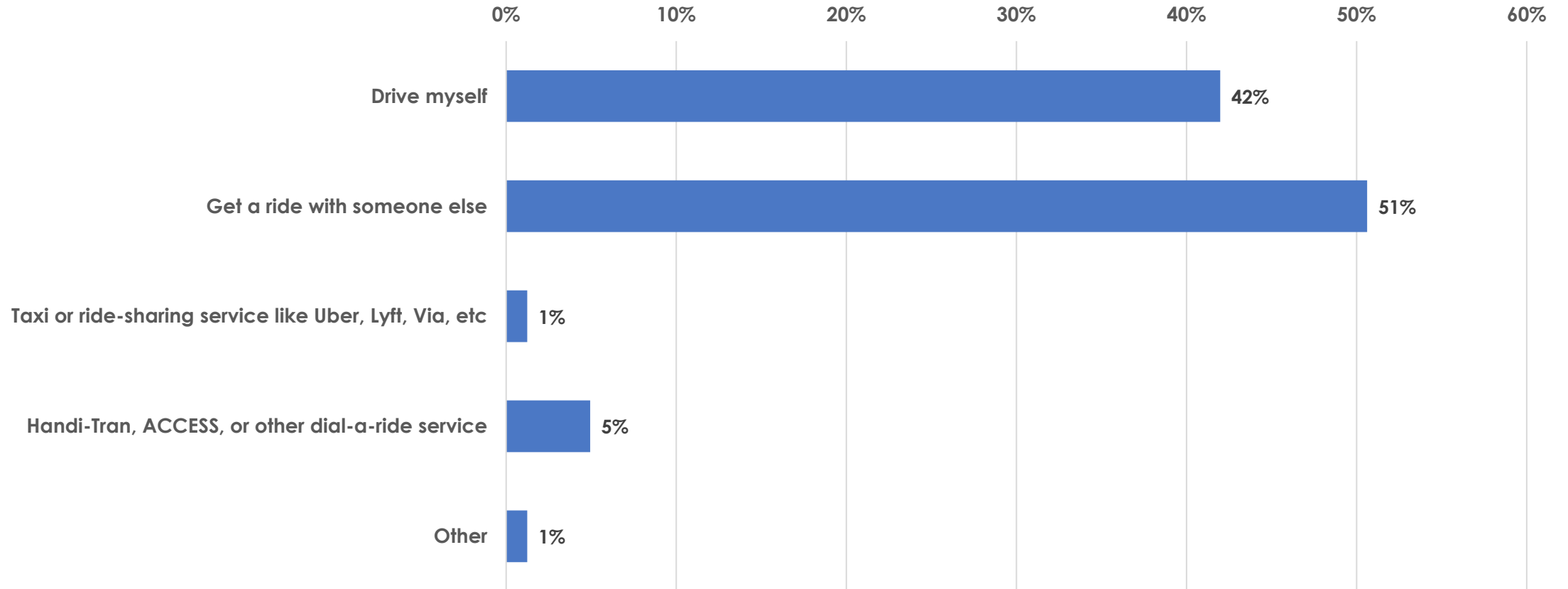- 80% had < $1,000/month income

Note: When more than one respondent from a household, randomly selected one to be in sample

Table 4.4. Modes of transportation among sample of older Vietnamese adults. *N* = 84.

Variable	*n*	%
Drive self	41	48.8
Once per day	7	17.1
More than once per week	23	56.1
Once per week	4	9.8
A few times per month	5	12.2
Once per month	2	4.9
Walk for transportation	8	9.5
More than once per day	2	25.0
Once per day	1	12.5
Once per week	1	12.5
A few times per month	2	25.0
Less than once per month	2	25.0
Get ride with someone else	45	53.6
Once per day	1	2.3
More than once per week	11	25.0
Once per week	10	22.7
A few times per month	14	31.8
Once per month	3	6.8
Less than once per month	5	11.4
Public transportation	1	1.2
Less than once per month	1	100.0
Taxi or ride sharing	3	3.6
More than once per week	1	33.3
A few times per month	1	33.3
Less than once per month	1	33.3
Paratransit	4	4.8
More than once per week	1	25.0
A few times per month	3	75.0

Transportation to health care

|	0%	10%	20%	30%	40%	50%	60%
Drive myself					42%		
Get a ride with someone else						51%	
Taxi or ride-sharing service like Uber, Lyft, Via, etc	1%						
Handi-Tran, ACCESS, or other dial-a-ride service	5%						
Other	1%						

Language of Ride Providers

97% Vietnamese
3% English

Unmet Travel Needs

Types of activities missed among those who were unable to participate in an activity due to lack of transportation in past month (*n* = 25, 30%)
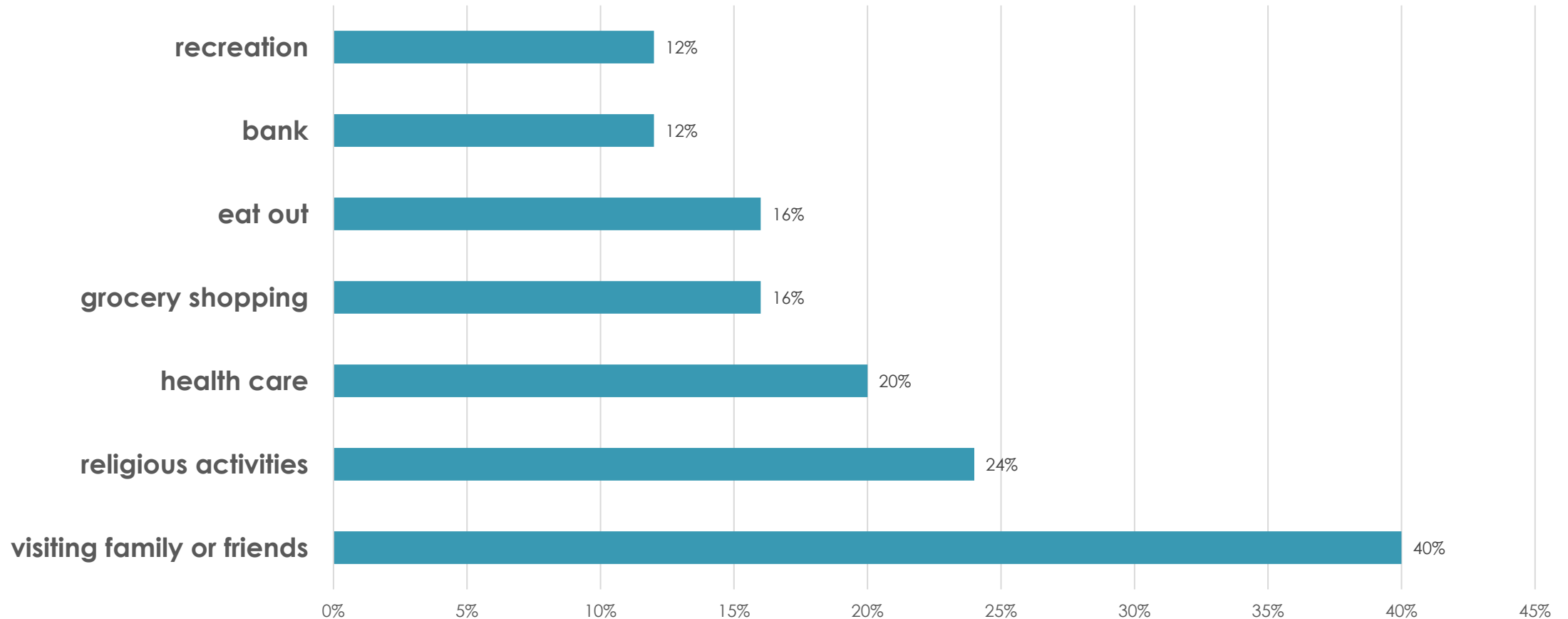
Phase 2
Analysis & Results – Geospatial Burden Indicators

# Study 1 – Calculating Regular Activity Spaces

- ArcGIS translates the survey latitude/longitude responses related to regular monthly destination points into geographic locations
- 2 cases:
  - Participants with home address and at least two routine activity locations (i.e., three geographic locations)
    - Create one standard deviation geospatial ellipse (SDE1)
      - Weight activity space by activity frequency
        - number of days/month
        - Home = 30
    - SDE1 contains approximately 68% of the locations within its boundaries
  - Participants with only two geographic locations
    - Half-mile road network buffer
    - Shortest path between these two points using the Network Analyst function in ArcGIS
- Identify presence of key health, social, and household maintenance activities within the activity space

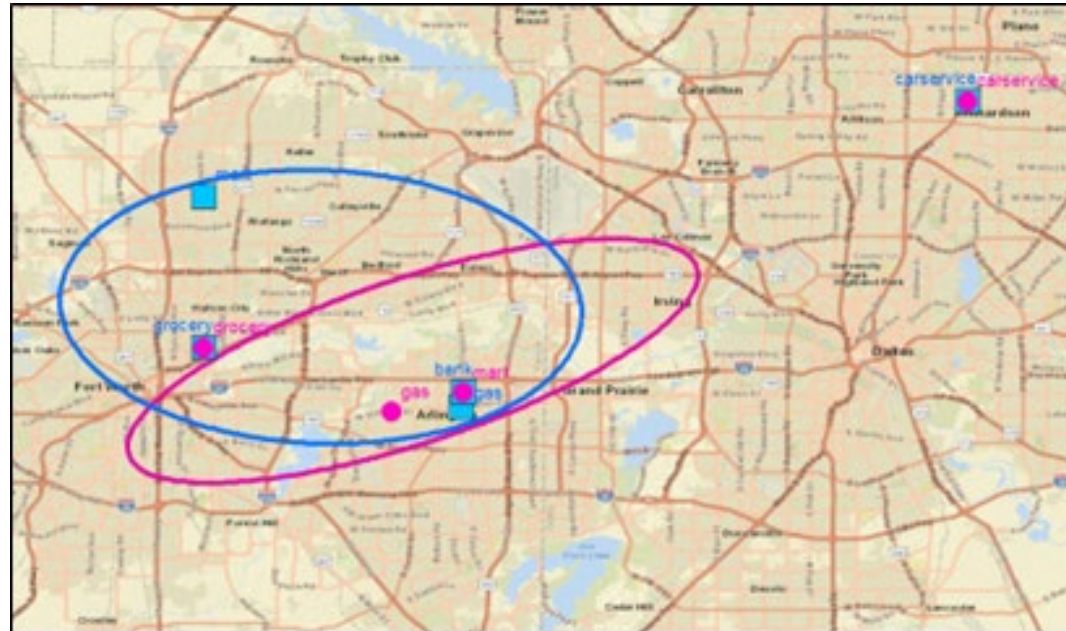# Study 1 – Regular Activity Space

Case 1
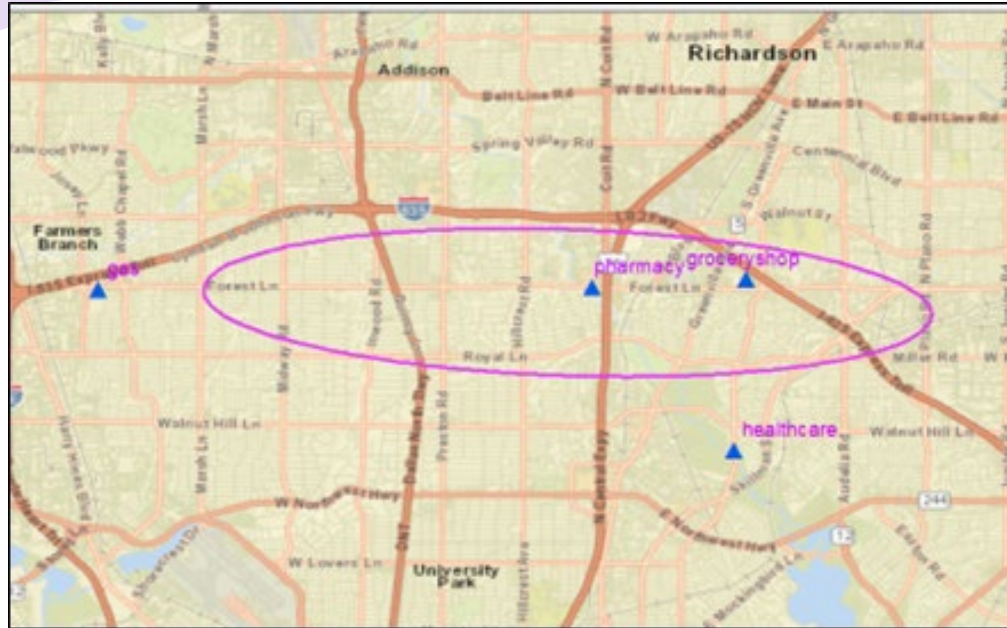
Case 2
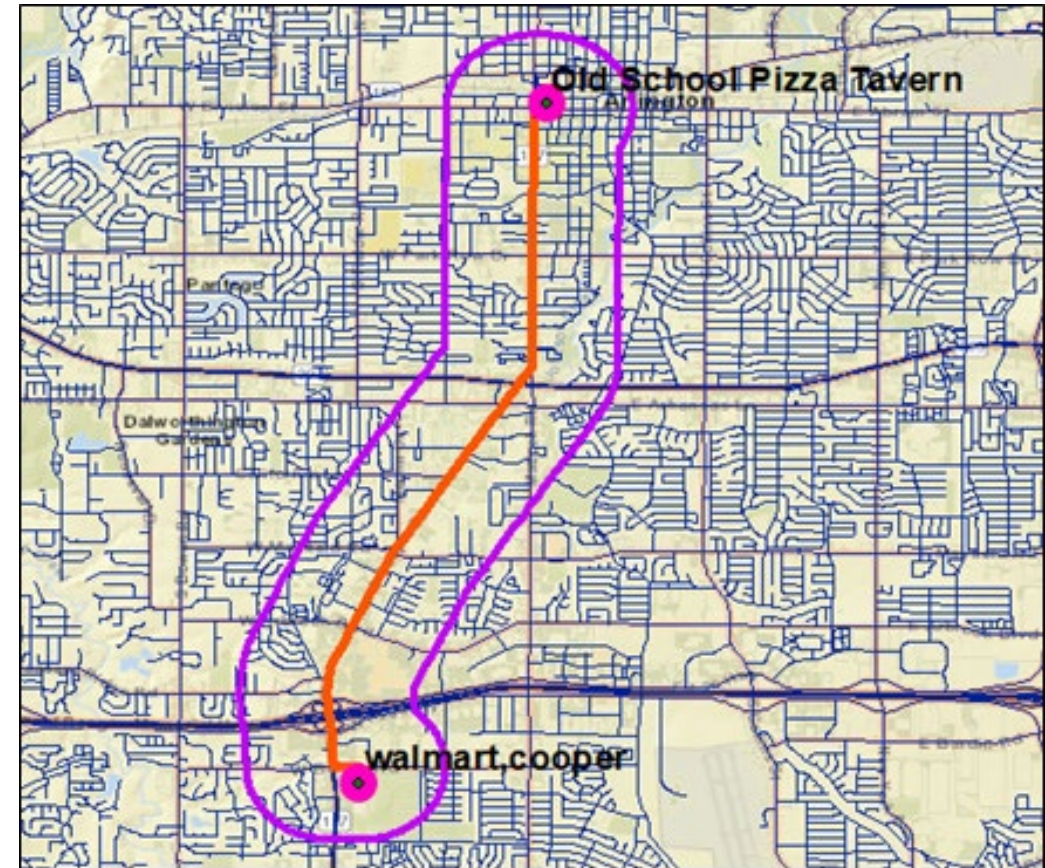
Study 1- Ride Provision Activity Spaces

- Locations of the activities where rides are provided to the older adult
    - Locations of the activities weighted by the frequency of providing rides to that location
    - When available, the older adult's home address

    - Ride provider regular – blue
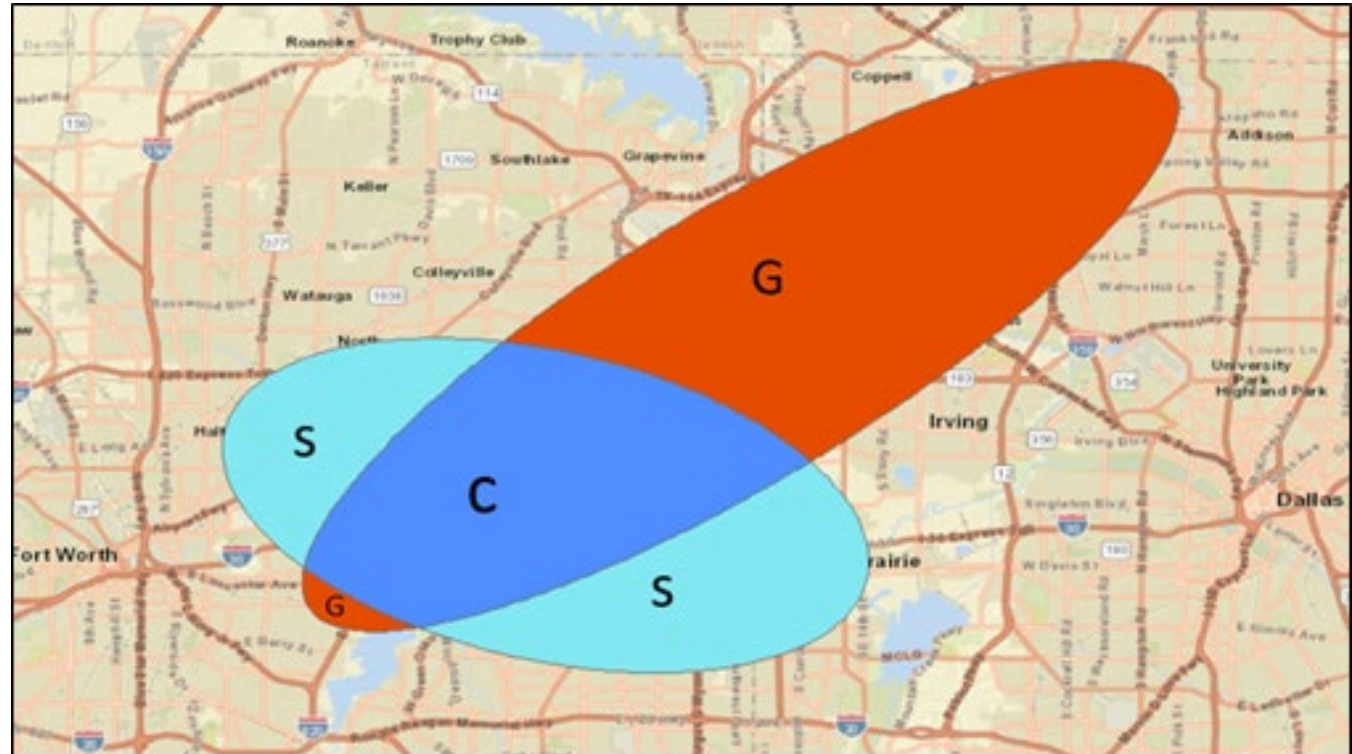   - Ride provision - magenta

Methods: Study 1 – Geospatial Burden

- Burden Indicator A: Size of Ride-Provision Activity Space
  - Size of the ride-provision activity space can indicate a geospatial burden for the ride provider
  - Burden Indicator A = area of the ride-provision SDE1 in square miles
- Burden Indicator B: Percentage of Ride-Provision Activity Space that is Not "Accessible" to the Ride Provider
  - Determine the proportion of the ride provision activity space outside the regular activity space of the ride provider
- Burden Indicator C: Ratio of Inaccessible Ride-Provision Activity Space to Ride Provider's Regular Activity Space
  - Assesses burden of providing trips outside the ride provider's regular activity space based on the size of their regular activity space
    - A large activity space may make ride providers accustomed to traveling long distances for their routine activities.
    - Taking on additional spatial travel responsibilities for providing rides may be less burdensome

Methods: Study 1 - Burden Example

- G = Area of rides provided that do not fall within the boundaries of the ride provider's regular activity space; considered "inaccessible"

- C = Area that is common to both the ride provider's regular activity space and ride-provision activity space

- Burden A - G+C = Area of the ride provider's SDE1 ride-provision activity space

- S+C = Area of the ride provider's SDE1 regular activity space

- Burden B – C/(G+C)

- Burden C – G/(S+C)

Results – Study 1: Geospatial Burden Indicators

Geospatial burden indicators for providing rides to older Vietnamese adults among ride providers. $N = 18$.

Variable	M	SD	min	max
1. Geospatial Burden Indicator A Size of ride-provision activity space (sq. miles)	34.1	74.9	.17	279.5
2. Geospatial Burden Indicator B % of ride-provision activity space inaccessible to ride provider	49.4	30.5	0.0	99.6
3. Geospatial Burden Indicator C Ratio of inaccessible ride-provision activity space to ride provider's regular activity space	4.4	14.6	<.001	61.8

- Indicator A ranges from very small to over 30% of the county area
- Indicator B has a mean of 50% and ranges from 0 to 100%
- Indicator C
  - Most of the ratios ($n = 13$, 72%) were less than 1.0
  - Substantial minority ($n = 5$, 28%) greater than 1
  - Max is 61 times as large

Results – Study 1: Geospatial Burden Correlation

Pearson's correlation of geospatial burden indicators and impacts of providing rides to older Vietnamese adults. $N = 18$.

Variable	1	2	3	4	5
1. Geospatial Burden Indicator A size of ride-provision AS	-				
2. Geospatial Burden Indicator B % ride-provision AS inaccessible	.29	-			
3. Geospatial Burden Indicator C inaccessible ride-provision AS/regular AS	.01	.50*	-		
4. Frequency of Providing Rides Days/month	-.08[a]	-.54[†a]	-.18[a]	-	
5. Monthly Expenses for Providing Rides	.50[b]	-.26[b]	.02[b]	.94[c]	-

Note. AS = Activity Space; $*p<.05$; $†p<.10$; [a]$n = 13$; [b]$n = 7$; [c]$n = 3$

- Large and significant correlation (r = .50, p = .035) between Indicators B and C
- Moderate correlation between Indicators B and A but not statistically significant (r = .29, p = .247)
- As geospatial burden providing rides increased, the number of days/month rides provided decreased
  - Large negative correlation (r = -.54, p = .059) between Indicator B and # of days/month providing rides
- Monthly expenses for providing rides
  - Indicators A and C positive though non-significant correlation
  - Indicator B negative though non-significant correlation; fewer rides provided when a greater portion of the ride-provision activity space inaccessible
  - Frequency of rides high positive correlation (not significant due to sample size)
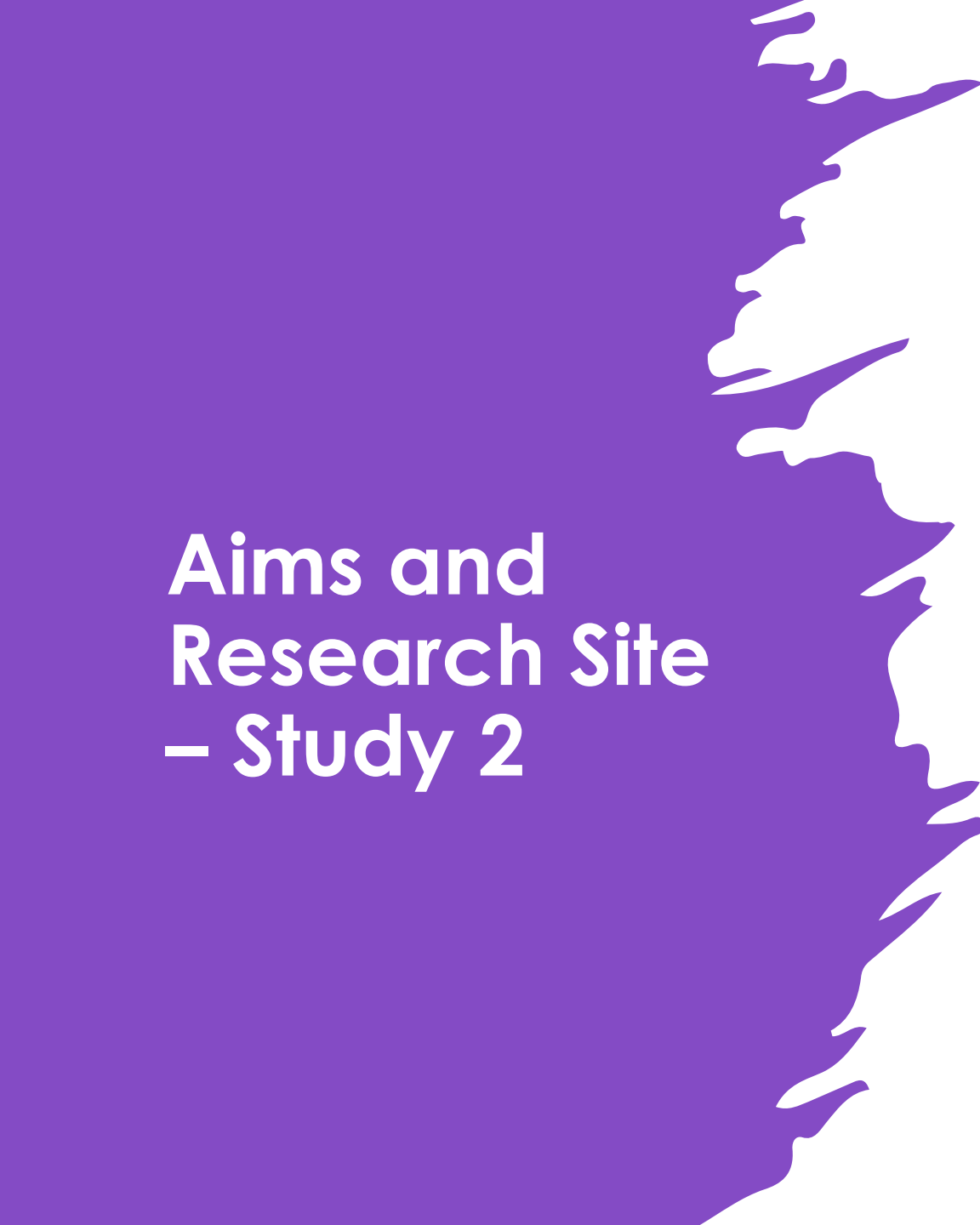
Results – Study 1: Geospatial Burden Indicators

Differences in geospatial burden indicators between ride providers who report no impacts of giving rides and those who report one or more impacts (i.e., incurring expenses, missed work, increased personal stress) $N = 18$.

Variable	No impacts reported			One or more impact reported			p
	n	M	SD	n	M	SD	
Burden Indicator A	10	11.9	10.2	8	61.9	109.1	.696
Size of ride-provision activity space							
Burden Indicator B	10	43.5	37.4	8	56.8	18.7	.573
% of ride-provision activity space inaccessible to ride provider							
Burden Indicator C	10	7.6	19.4	8	.52	.72	1.00
Ratio of inaccessible ride-provision activity space to ride provider's regular activity space							
Frequency of Providing Rides	9	13.0	10.0	5	7.0	2.8	.298
Days/month							

Note. p-values calculated using Independent-Samples Median Test/Mann-Whitney U Test.

- Larger values of indicators A and B
- Indicator C may not reflect burden as well as A and B
- Provide fewer rides per month
- None of these differences statistically significant

Aims and Research Site – Study 2

- To understand the role of transportation-related factors in companionships within the senior center

- Hispanic Senior Center, Hartford, CT

Recruitment & Data Collection - Study 2

- **Recruitment**
  - Inclusion criteria
    - Member of the Hispanic Senior Center (59 +) in Hartford, CT (living in area)
    - Communicate in Spanish or English
    - Have companionships within center
  - 100% Hispanic or Latin American
  - Goal to recruit entire population of those who returned after center reopened in Aug 2021 (93% enrollment)
  - $20 Walmart gift card incentive
- **Data Collection**
  - Data were collected from Sep 2021 - Dec 2021
  - Interviewer administered in-person (90% in Spanish)
  - Qualtrics and paper
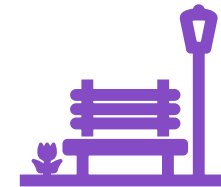 - Approximately 60 minutes

Measures – Study 2
Transportation and Social Networks @ Hispanic Senior Center

Same measures as Study 1 plus social network measures

Roster

Companionship

"provide me with good company and companionship, include me in things they are doing, or does social or recreational activities with me."
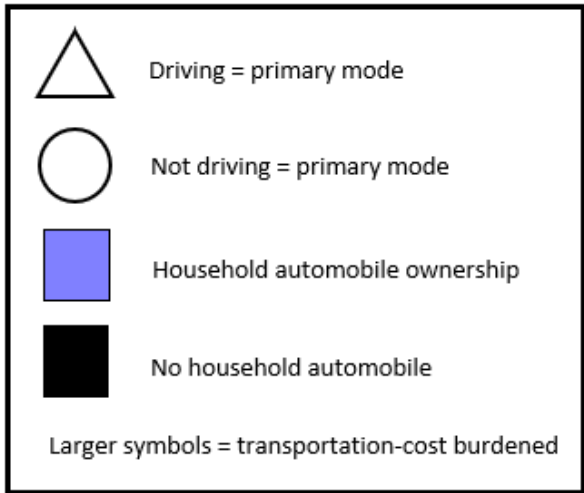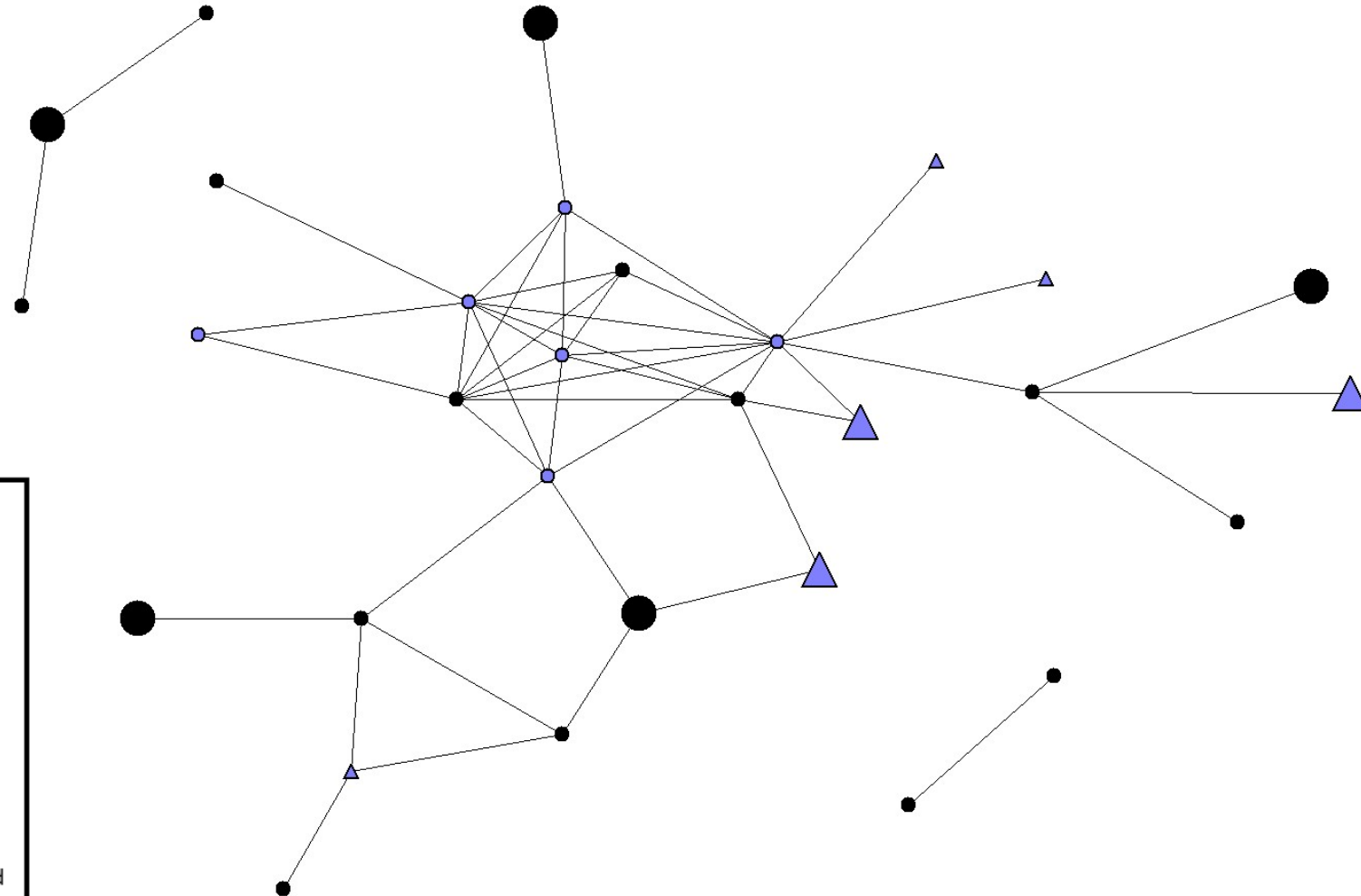
Sample Characteristics – Study 2
Transportation and Social Networks @ Hispanic Senior Center

Variable	*n*	%	*M*	*SD*	*r*	*r*	*r*
1. Female (ref = *male*)	22	73.3					
2. HS Education or more (ref = *less than h.s.*)	12	40.0					
3. Low Income (ref = *greater $1K/month*)	20	66.7					
4. Household automobile ownership (ref = *no*)	12	40.0					
5. Driving as primary transportation mode (ref = *no*)	6	20.0					
6. Unmet travel needs to senior center (ref = *no*)	4	13.3					
7. Transportation cost burdened (ref = *no*)	8	26.7					
					8	9	10
8. Age	30		74.6	10.0	-		
9. Number of IADL limitations (0 - 10)	30		2.6	2.2	0.299	-	
10. Frequency of attending senior center	30		17.4	7.6	0.054	0.004	-
Note: correlations between variables 8-9 are all non-significant at the alpha = .05 level.							

Companionship Network – Study 2
Transportation and Social Networks @ Hispanic Senior Center

Driving = primary mode

Not driving = primary mode

Household automobile ownership

No household automobile

Larger symbols = transportation-cost burdened

Model Specification – Study 2

Exponential Random Graph Model (ERGM)

DV = Likelihood of Companionship Relationship

- Controlled for network structural features

- Demographic characteristics & homophily
  - Age, gender, education, income, physical functioning

- Frequency of attending senior center (0-30)

- Transportation (Y/N)
  - Primary mode = driving (+)
  - Household automobile ownership (+)
  - Transportation-cost burden (-)
  - Missed going to senior center in past month due to no transportation (-)

- α = .10
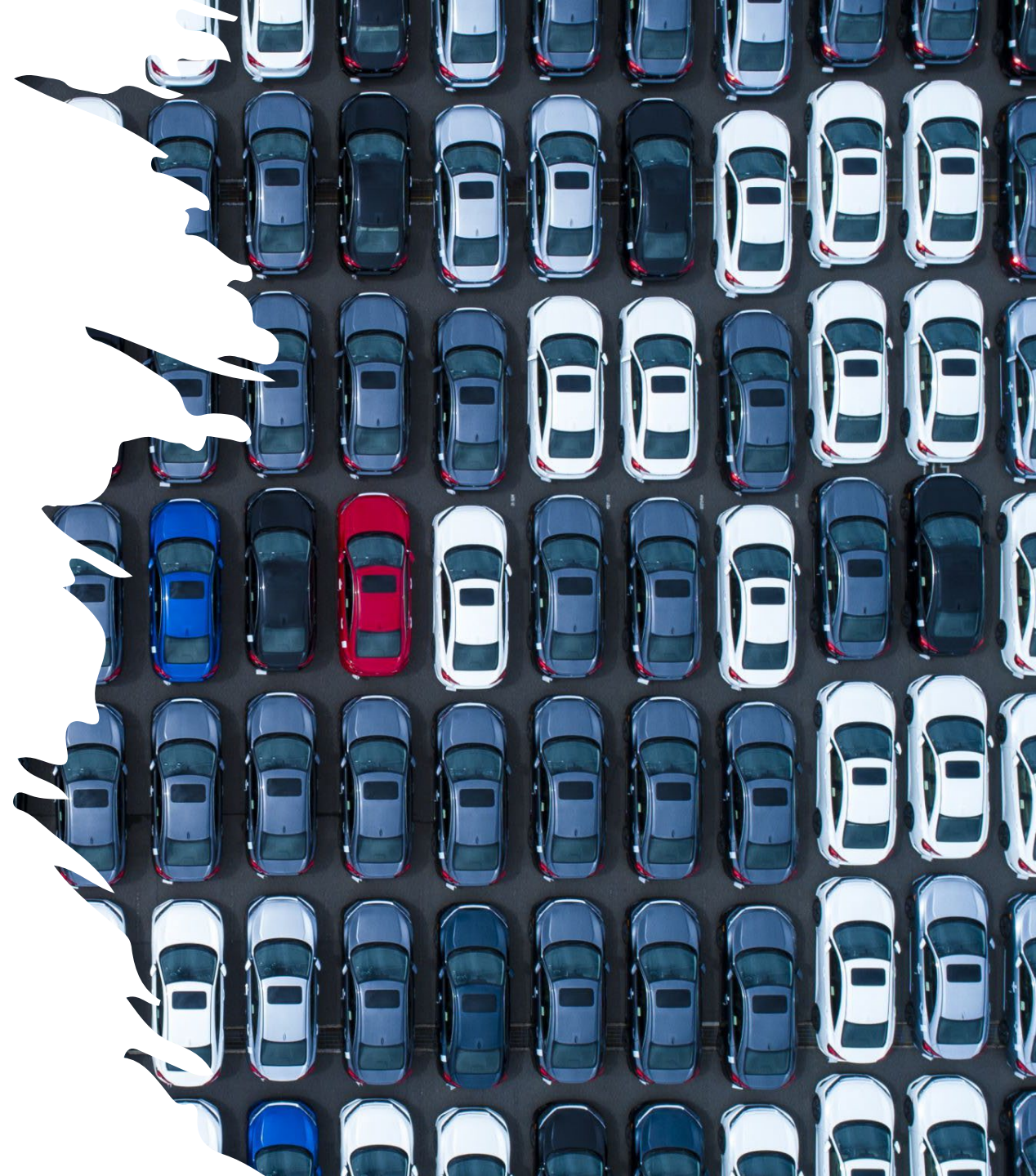
Results – Study 2

+

Frequency of attending
$p = .025$

Household automobile ownership, $p = .024$

Transitivity (friend of a friend effect), $p = .054$

Social activity (variability in # of companions), $p = .022$

–

Primary mode is driving, $p = .002$

Unmet travel need to center, $p = .075$

n.s.

Transportation cost burdened, $p = .633$

All demographic characteristics

Note. Parameter estimates for all demographic characteristics and homophily were non-significant

Conclusions and Key Takeaways

- Exploratory research with small sample sizes, yet promising indications for further inquiry

- Unique transportation patterns and needs of older immigrants exist (e.g., culturally appropriate ride providers)

- Assessing geospatial transportation burden among ride providers is an important way to understand capacity for supporting older adults

- Transportation-related factors are associated with the social network of older adults in a senior center and may be an important area of intervention for enhancing social networks

Discussion