



Accessibility to Emergency Food Services using Public Transportation, in Seattle Washington

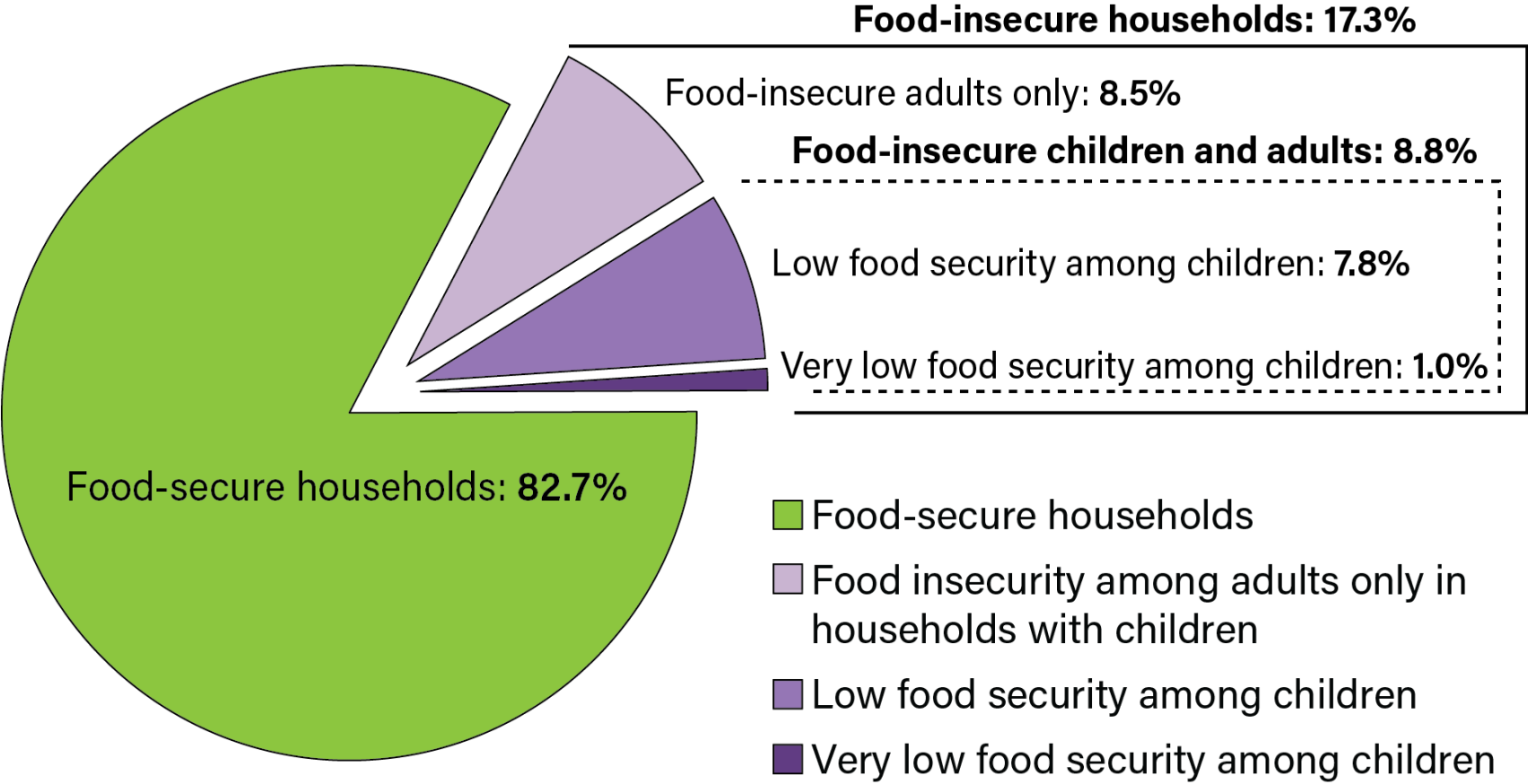
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- EMERGENCY FOOD SERVICES WITHIN THE CONTEXT OF THIS RESEARCH IS DEFINED AS FOOD BANKS OR FOOD PANTRIES
- FOOD BANKS ARE A COMMUNITY LED WAY TO HELP PEOPLE FACING FOOD INSECURITY GET NUTRITIOUS FOOD WHEN THEY MAY NOT BE ABLE TO
- FOOD INSECURITY IS THE LACK OF A RELIABLE SOURCE OF HEALTHY AND NUTRITIOUS FOOD.

What are
Emergency
Food Services?
And What are
They Used
For?

U.S. households with children by food security status of adults and children, 2022

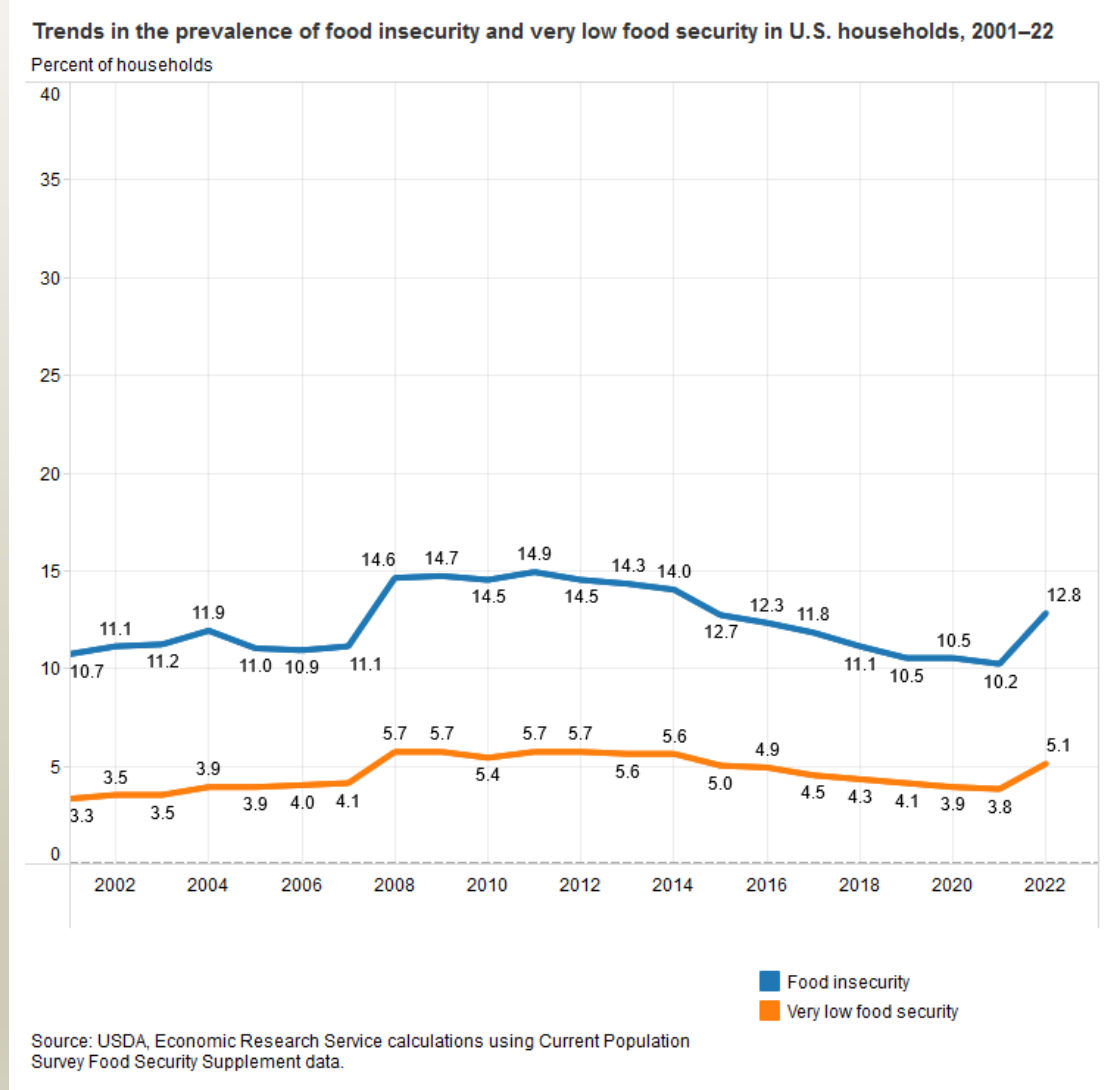


Note: In most instances, when children are food insecure, the adults in the household are also food insecure.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census, 2022 Current Population Survey Food Security

This is not new

- USDA tracks this information over time
- Grows with economic downturns
- Recent growth due to the Coronavirus pandemic



- Supplemental Nutrition Assistance Program (Food Stamps)
- Income requirements based on household size
- Food Stamps can be used by people without a permanent residence (Houseless)

How we Quantified Food Insecurity For Our Research

The Reasons Behind Studying Seattle



Size

Proximity

Availability
of data

Research Objectives

1

Observe the spatial-temporal relationship between transportation and food bank accessibility.

2

Use General Transit Feed Specification (GTFS) data to estimate transit-based travel times at the census block group level.

3

Evaluate where possible socioeconomic disparities between different Seattle neighborhoods and food bank accessibility exist.

Total City-Wide Hours of Operation for Food Banks

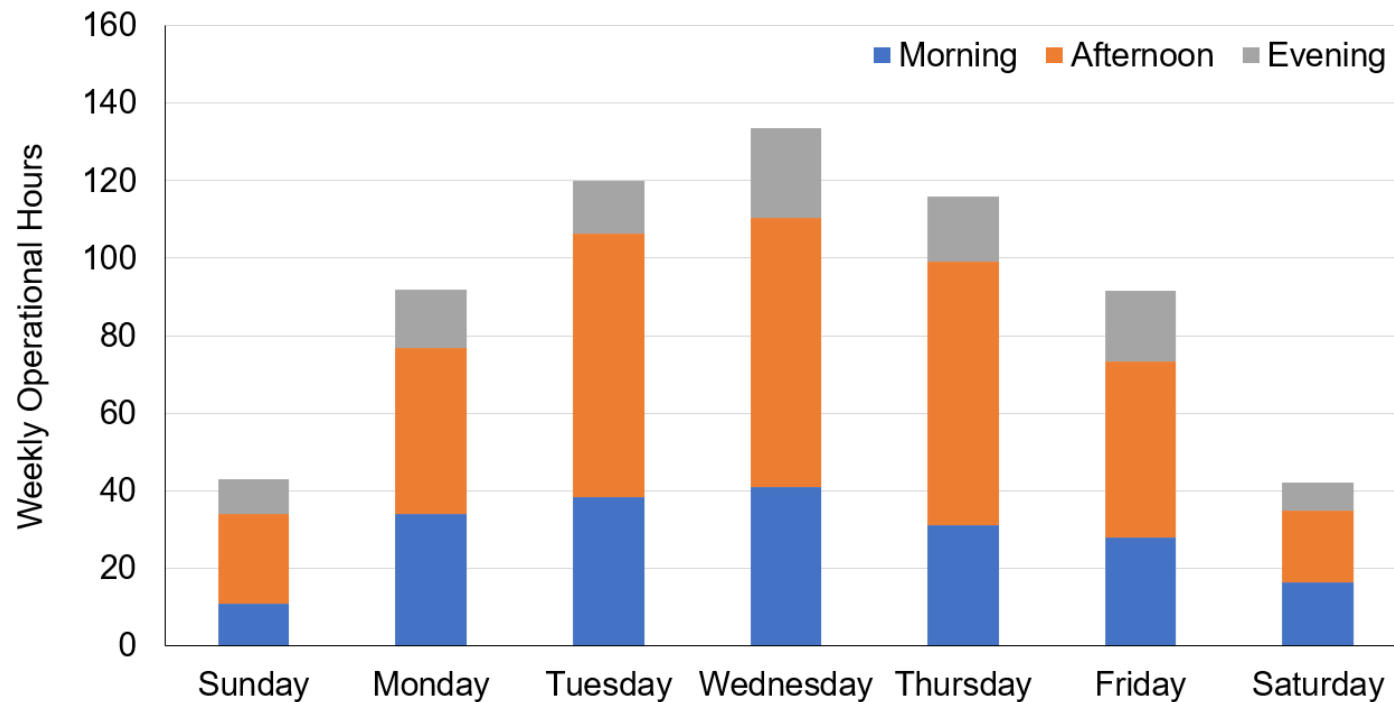


Fig. 1 Total city-wide hours of operation for food banks in Seattle

- Primary dates open are Tuesday, Wednesday, and Thursday in the Afternoon, (between 12:00pm and 5pm)
- Few foodbanks open on the weekend and for restricted hours

GIS Method used

GTFS to Public Transit Model to convert GTFS data into usable features



Connect Public Transit Data Model To Streets Tool



Create Network Dataset From Template Tool



Build Network tool and Closest Facility Tool

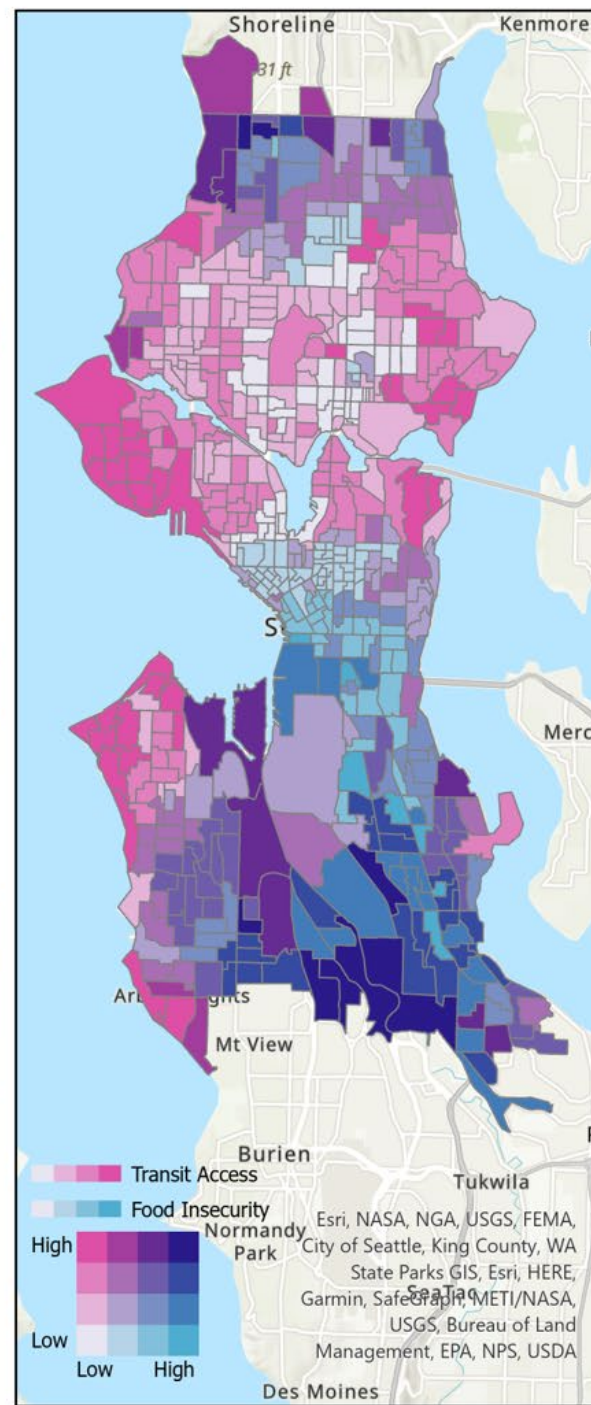
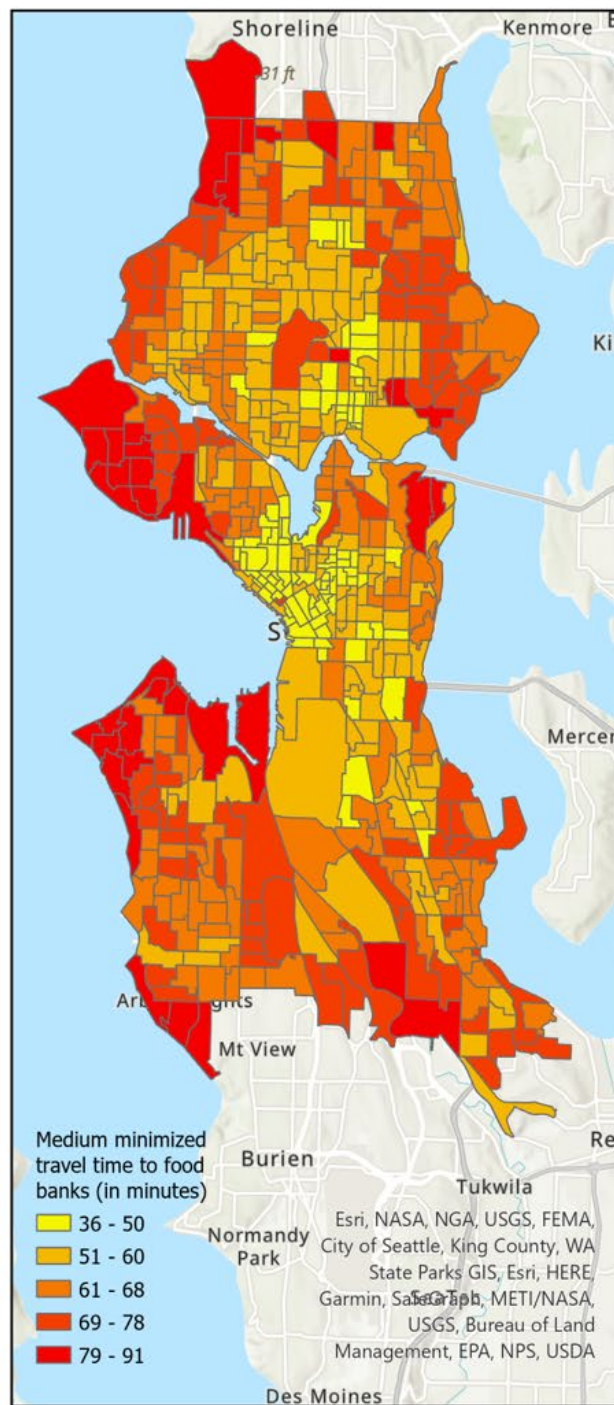
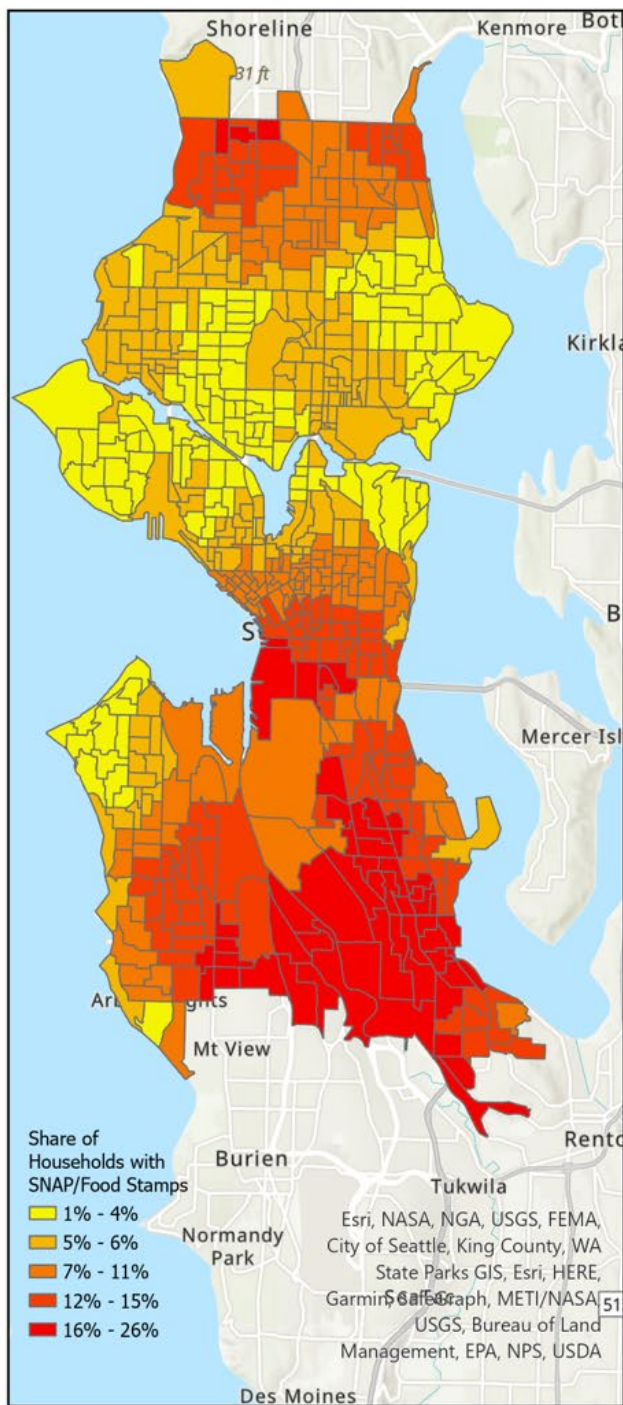
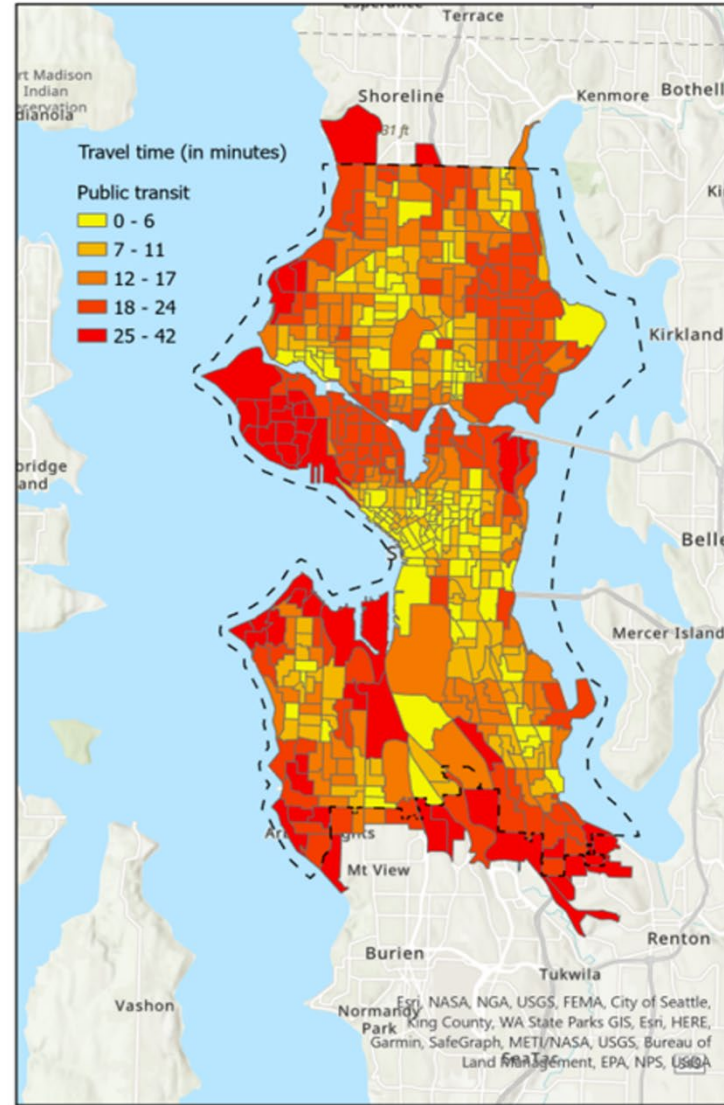
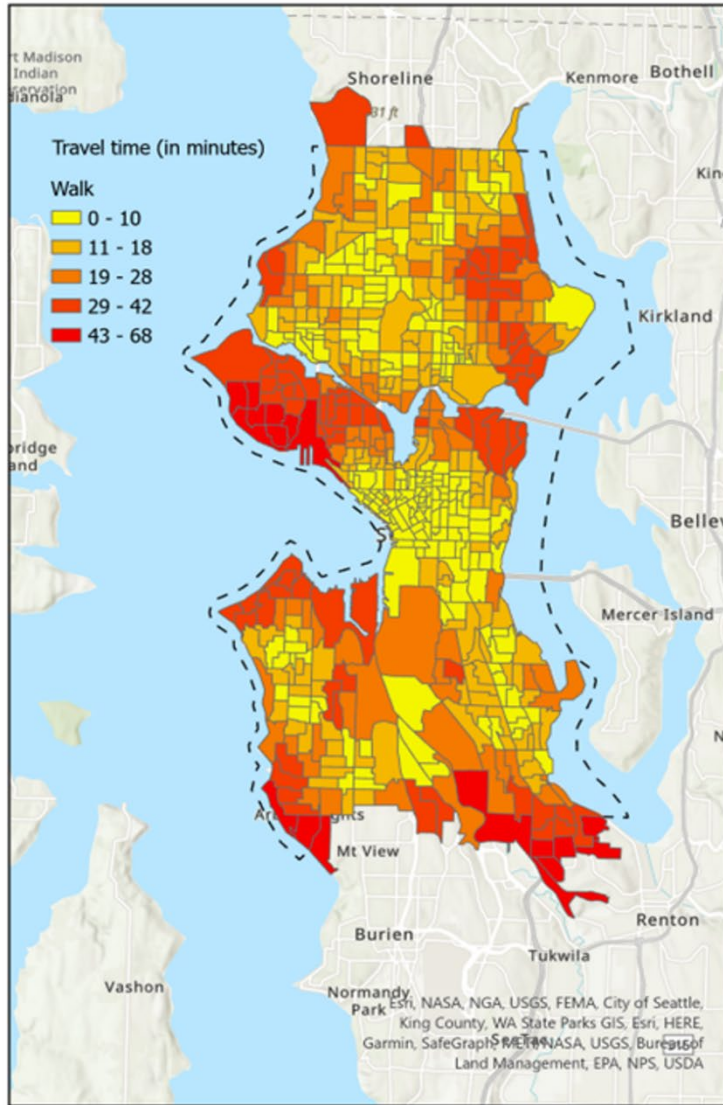


Fig. 2 Maps of (left) food insecurity, (middle) transit access to food banks, and (right) transit access vs. food insecurity



Distance and Travel Time	# of Neighborhoods or Census Block Groups	Share of total (%)
<i>Walking Distance</i>		
Half a mile	219	39.67
1 mile	382	69.20
2 miles	522	94.57
<i>Transit-based Travel Time</i>		
10 MINUTES	251	45.47
20 MINUTES	467	84.60
30 MINUTES	536	97.10

Fig. 3 Travel time to the closest food pantry by (left) walking or (right) public transit

Conclusions and Policy Implications



Within 20 minutes of transit time using public transportation, more than 80% of the population of Seattle has access to food pantries, however, they may be restricted by operational hours (midweek, afternoon).



Hotspots of neighborhoods most likely to experience food insecurity and inadequate access to emergency food services via public transit exist in Southern Seattle.



Transportation agencies should consider providing on-demand services when large-size food banks are open or routing mobile food pantries to those vulnerable communities with low transit access to the network.

Other applications for GTFS

Using ArcGIS Pro there are a few other ways you could use GTFS data as it allows you to import facilities locations relatively indiscriminately and as long as they are within the network you created, they should be useable for your analysis.

An example that we encountered within this study was through imitating much of this study but for SNAP accessible stores.

Questions?

