



# FOOD ACCESS FOR LOW INCOME INDIVIDUALS

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August 8, 2018



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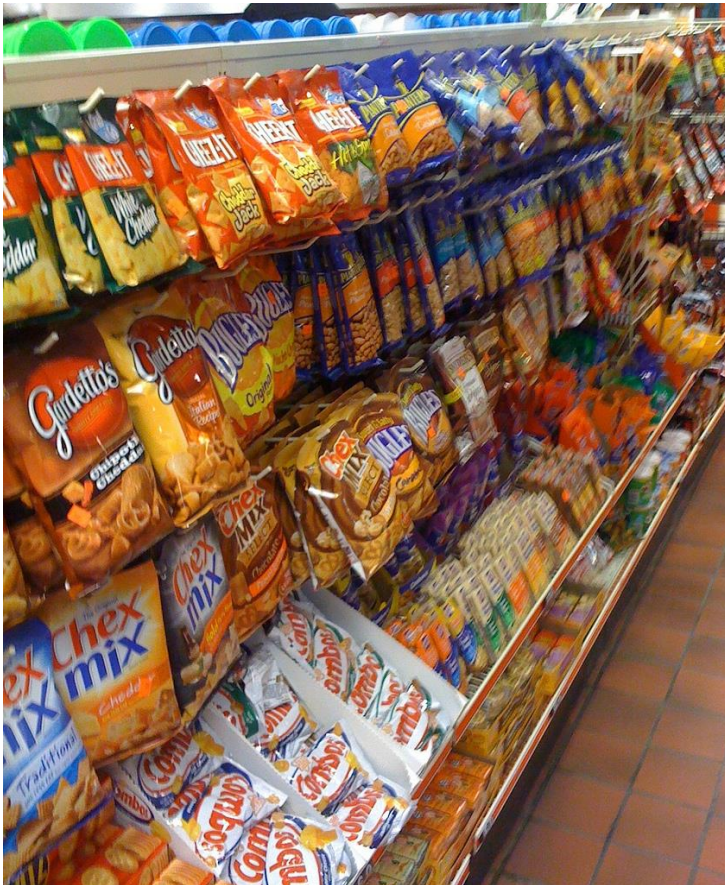
# Land use consolidation changed how food was purchased



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Source: Austin Briggs and YourHub.com, <https://www.denverpost.com/2014/09/02/longtime-mom-and-pop-store-golds-corner-grocery-closing-in-wheat-ridge/>

# Food purchasing patterns led to unhealthy food environments and food deserts



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- Defining *Food Environments* (FEs)
- Healthy options further away
- Negative effects of unhealthy FE



## USDA Definition of a Food Desert

*Any low-income census tract in which either 500 people or 33 percent of the population reside more than one mile from a supermarket or large grocery store.*

# Flaws in FD definition

The USDA definition is lacking:

- Mobility options available
- Through-the-network distances
- Food shopping behaviors



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Additionally, many different metrics exist in the literature, there is no standard measure

# Location choice modeling

Food shopping location data for low income individuals used to understand the relationship between food access and

- Demographic characteristics
- mobility options
- Other FE factors

***Purpose: to develop a multivariate metric for food accessibility***



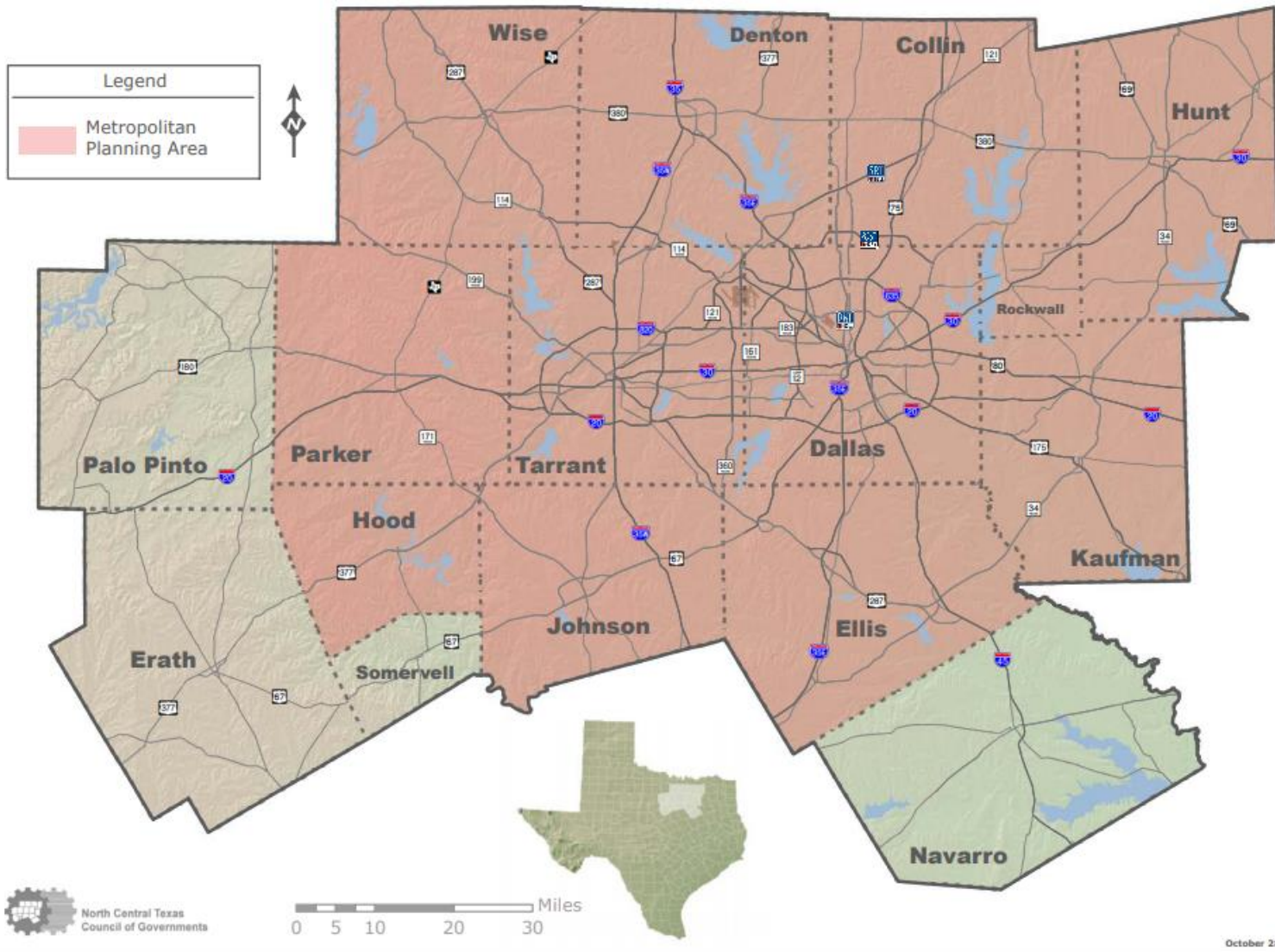
# Methodology

- Zones with food-shopping locations form choice set
- Bhat *et al.* (2003) describe the mathematical procedure used to apply the spatial location choice model
- MNL prediction procedure is used to predict the spatial location choice





# The North Central Texas Council of Governments Region



Courtesy North Central Texas Council of Governments, 2011: [https://www.nctcog.org/nctcg/media/Transportation/DocsMaps/Data/Maps/RegionalMap\\_Web.pdf](https://www.nctcog.org/nctcg/media/Transportation/DocsMaps/Data/Maps/RegionalMap_Web.pdf)

## Low Income food-shopping trips

- 1,005 food shopping outings of low-income HH analyzed
- Up to 50 zone alternatives for every outing
- Avg. dist. of food shopping location from home is 6.45 miles
- 93.5% of travel is by car, SUV, van, truck
- Mean vehicle ownership 1.39 per household
- 15.9% of low-income food shoppers in final sample are full-time workers

# Results

- Num. of Wholesale (0.2990,  $t = 2.07$ ) and Supercenters (0.4152,  $t = 4.69$ )
- Distance from home is significant
- Alt zone if adjacent (0.8966,  $t = 5.06$ ) or home zone (0.7995,  $t = 4.03$ )

# Results

- Interactions with distance:
  - fulltime worker (0.1315,  $t = 7.86$ )
  - Number of wholesale stores (0.0228,  $t = 2.22$ )
  - Number of supercenters (0.0248,  $t=2.56$ )
  - Presence of children < 5 years (0.0906,  $t = 5.08$ )
  - High density (persons/sq. mi.) home zone (0.0172,  $t = 2.45$ )

# Discussion

- Supercenters and Wholesale stores
- Proximity is important
- Presence of children
- Home zone density



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# Study impact and future work

- We remove limitations of USDA food desert definition
- Wholesale/Supercenters should be encouraged to market healthy food to low-income shoppers
- *Work-in-progress*: Metric formulation
- Future: shopping choices and health



**THANK YOU!**





# References

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