



Transportation Issues Affecting Independent Grocers and Fresh Food Distribution: A Comparison Study of Rural and Urban Communities in the US (Summary)

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This is a summary of *Transportation Issues Affecting Independent Grocers and Fresh Food Distribution: A Comparison Study of Rural and Urban Communities in the US* by Michelle Miller, Aichih (Jasmine) Chang, Regina Hirsch, Jim (Junmin) Shi, David Long.¹ This research and analysis received funding from USDA's Agricultural Marketing Service (AMS) through cooperative agreement number 21-TMTSD-WI-0010. The opinions and conclusions expressed are the authors' and do not necessarily reflect the views of USDA or the Agricultural Marketing Service. The full report is available online at <https://minds.wisconsin.edu/handle/1793/84841>.

WHAT IS THE ISSUE?

Most food, especially perishable food, is distributed by truck in the US. Food distribution logistics, which are shaped by the highway system, are a transportation-relevant factor affecting food access. While food access has implications for health outcomes, few studies have examined the role transportation and rural logistics play in contributing to food access.

This study investigates transportation-related food accessibility issues in US rural and urban areas, from the perspective of improving the food supply, with an objective to bring fresh foods closer (i.e., commercially available and affordable) to low-income communities. By sharing data and information collected in urban and rural areas, this study highlights the shared challenges and unique difficulties faced in each region regarding roadways, logistics, market structure, and food access. The study addresses a significant research gap regarding the transportation sector's role in food access—specifically, wholesale market access (which is virtually nonexistent in rural areas).²

¹ Miller is a researcher at the Center for Integrated Agricultural Systems, University of Wisconsin Madison; Chang and Shi are assistant professor and Leir Chair professor of supply chain management and financial technology respectively at the Martin Tuchman School of Management, New Jersey Institute of Technology; Hirsch is a food systems scientist at the Center for Integrated Agricultural Systems, University of Wisconsin Madison; Long is a director of Applied Population Laboratory at the University of Wisconsin Madison.

² The urban New Jersey team interviewed grocery wholesalers. There is not a similar business model operating in the rural Wisconsin study region and it is a consequential difference between rural and urban logistics.

HOW WAS THE STUDY CONDUCTED?

Recognizing the inherent differences between rural and urban areas, this study is conducted in two States by two research teams: (urban) New Jersey and (rural) Wisconsin. By comparing results for an urban area and a rural area, researchers considered food accessibility issues from supply and demand perspectives. Each team of researchers identified a study region in their respective State; conducted a literature search; investigated existing databases, mapping, and modeling efforts; and interfaced with key people representing organizations integral to moving food into the respective study regions.

For urban NJ, the researchers selected cities to study using two criteria: income level and population density. The New Jersey Economic Development Authority (NJEDA) ranks Camden, Atlantic City, and Newark as the State's three communities with the lowest food access. Camden and Newark were chosen because they also have high population densities.

For rural Wisconsin, the researchers chose a study area encompassing 13 northern Wisconsin counties with food insecurity greater than 12 percent, based on analysis from the Mind the Meal Gap, 2021. USDA's Economic Research Service also classifies the counties in this study area as "Frontier and Remote" areas, where significant numbers of people have limited access to fresh food and produce, as well as to other public services, such as health care. The 13 counties included in the rural Wisconsin study area were: Ashland, Bayfield, Burnett, Douglas, Forest, Iron, Langlade, Marinette, Menominee, Price, Rusk, Sawyer, and Vilas.

The teams interviewed retail grocers and distributors in each area. Both teams used the same basic questions to allow comparison of findings for urban and rural areas. Questionnaires were created for different business types in the supply chain: (1) urban grocers (six in NJ); (2) independent grocery store managers (five in WI); (3) wholesalers (two in NJ); and (4) distributors (two in NJ, three in WI). Finally, an optimization model was estimated to investigate the effectiveness of supply- and demand-oriented policies in the urban and rural areas, while considering the areas' inherent differences.³

WHAT DID THE STUDY FIND?

The authors found marked differences in the ways some transportation challenges affect urban food access versus the ways they affect rural areas. They also observed urban/rural differences in the effects of potential remedies to these challenges—in the form of subsidies. Even where many common challenges seem to affect urban and rural areas in similar ways, the research revealed the causes of these challenges may differ.

More Than Urban Areas, Rural Areas Face Logistic Challenges. Rural distributors are responsible for managing inbound movements from distant production areas, managing distribution centers, and coordinating outbound distribution. The complexity of these operations often leads to disorganization of inbound freight in rural areas, which in turn, results in lower returns to rural distributors and limited outbound distribution.

Distribution into rural areas is also more costly than moving food within the city from a wholesaler or a produce terminal (a distribution center shared by several distributors managing inbound freight to stores). Urban distribution is primarily a last-mile effort: companies load products into their trucks from a central terminal facility for delivery on a fixed route for the last leg to the retail sales outlet.

More Than Urban Regions, Rural Regions Benefit From Supply-Side Policies. Through investment in local distribution infrastructure (e.g. highway and transportation system upgrades, cold warehousing investment), food can be transported much closer to consumers than it would be otherwise. The researchers' model results (using hypothetical investment increases) revealed that the rural region is more sensitive than the urban region to changes in distribution investment. This finding implies that highway investment will be more efficiently implemented in rural regions than urban regions, because these investments would largely benefit a far-reaching highway network.

³ Supply-oriented policies are intended to financially support the fresh food supply chain by reducing transportation costs (e.g., by upgrading transportation systems, increasing cold warehousing, etc.). Demand-oriented policies are intended to financially encourage low-income households to purchase fresh food (e.g., food assistance programs, such as USDA's Supplemental Nutrition Assistance Program; Special Supplemental Nutrition Assistance Program for Women, Infants, and Children; etc.).

More than Rural Regions, Urban Regions Benefit From Demand-Side Policies. Demand-oriented policies such as food purchasing assistance programs offer socio-economic benefits for both rural and urban consumers. In both groups, purchasing assistance programs may motivate low-income consumers to travel farther to get food. Modeling hypothetical impacts showed that food assistance programs (e.g., Supplemental Nutrition Assistance (SNAP) Program, Women, Infants and Children (WIC) Program etc.) are more effective in the urban areas in easing the lack of food access— This is because the ease of accessing food through these programs is often more challenging in rural areas due to transportation, infrastructure, and geographical barriers, despite higher participation rates. In other words, low-income populations in rural communities similarly utilize food assistance programs but in contrast to urban areas, they also require support for food distribution to realize comparative socio-economic benefits.

Roadway Disadvantages. In both urban and rural areas, food distribution on poor roads negatively affects food quality and raises truck maintenance costs. In contrast to the rural stores with ample customer parking and space to add and/or expand docking, urban grocery stores are located on narrow streets with heavy traffic. The urban limitations of parking and docking space (i.e., small parking lot or street-only parking) make distributors' efforts to load and unload products difficult and costly. Additionally, the poor road conditions in cities require funding for improvements from municipal and State (Transportation Trust Fund (TTF)) sources in the urban low-income communities.

Distributors serving rural regions need to travel longer distances to move foods inbound to warehouses and outbound to retail groceries, sometimes on roads deteriorated by spring thaw or other weather-related stressors. However, these roads may be improved with Federal, State, county, and/or municipal funds.

Similar Challenges—Between Urban and Rural Food Systems—Can Have Different Causes. Urban and rural food systems face many similar challenges in serving low-income communities: fierce competition, weak demand, high operational costs and limited capital and resources. However, the root causes of many of these challenges differ fundamentally between urban and rural food systems.

Weak Demand. Although demand for fresh food in both rural and urban areas is weak, that weakness stems from different reasons. In urban areas, which have high population density, demand for grocery store food is weak because of bad road and sidewalk conditions, insufficient parking space which hinders customers shopping capability, and the fact that customers make only small purchases. Customers' small purchases result from their limited access to transportation, cold storage space and low store loyalty. Low-income customers tend to have low store loyalty and shop at stores that offer the lowest price resulting in uncertain demand and intensive price competition for grocery stores).

In rural areas, demand for grocery store food is weak because a substantial part of rural grocers' business comes from seasonal residents and tourists, an unstable revenue source, and year-round residents tend to be lower income. The proximity to customers that urban stores enjoy is absent in rural retailing. Operating costs surge because of low population density—along with demand volatility (due to seasonally fluctuating population)—thus eroding profitability for rural grocery stores.

Despite the different causes involved, weak demand complicates efforts of both urban and rural grocers to meet the minimum ordering requirements, let alone offer bulk order discounts.

High Operating Costs. The urban grocery stores have high operating costs because of extended business hours, high space costs, and security costs. Rural grocery stores have high labor and utility costs to run their spacious stores.

Limited Capital and Resources. Weak demand and high operating costs erode profit margins, and in both rural and urban areas, grocery stores report limited access to capital and resources to update their technologies, stores, and shopping environments. Both urban and rural grocery stores struggle to survive, but they employ different strategies.

To strengthen negotiation and purchasing power, both urban and rural grocers form store alliances, which allow allied stores to place group orders to access bulk discounts. However, forming store alliances is more practical and effective in urban areas than in rural areas. Because suppliers are willing to deliver to multiple stores only if the delivery can be finished in one trip, allied stores must be fairly near one another, as they are in urban areas.

Although rural stores also rely on store alliances, theirs are at a regional scale through cooperative distribution strategies. With bigger, cheaper spaces than urban stores, rural stores are better positioned to diversify their businesses. Rural stores may salvage food through in-house processing and deli counters or by selling unsold foods to farms for animal feed. Meeting other community needs (besides supplying food), rural stores provide services such as meat processing, hardware, pharmacy, and banking—which may improve the stores' resilience.

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