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**TENNESSEE
INFRASTRUCTURE**
State Resources & Rural Challenges

**USING RESEARCH TO SOLVE
COMMUNITY CHALLENGES**
The Scholars Program's Mission

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STATE UNIVERSITY.

THE JOURNAL OF
**Urban and Regional
Perspectives**

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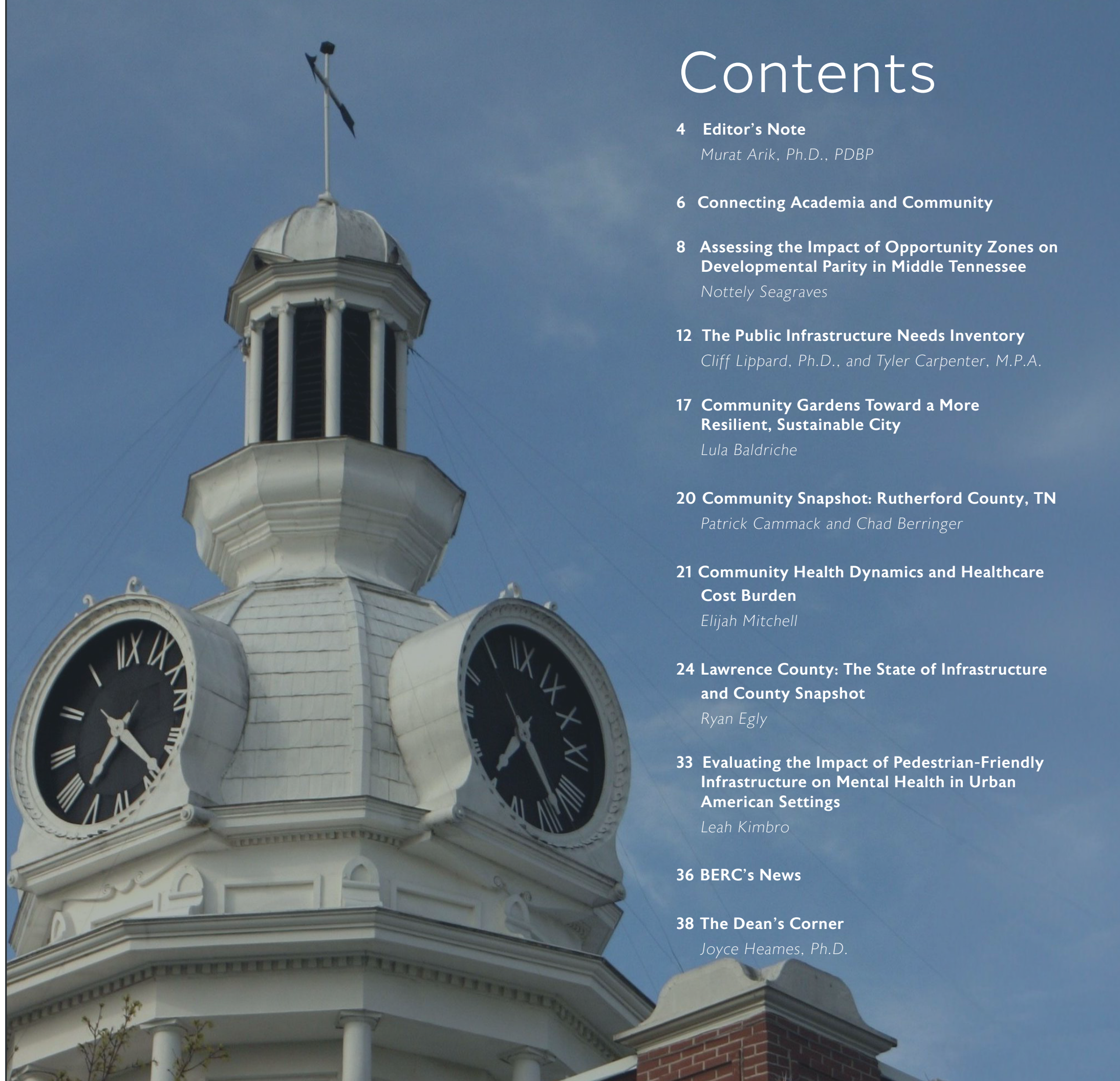
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Editor's Note

The Inaugural Issue of the *Journal of Urban and Regional Perspectives*

I am delighted to welcome you to the inaugural issue of the *Journal of Urban and Regional Perspectives*. This first issue represents the culmination of a collective effort to create a platform that bridges the gap between scholars and practitioners, offering insights and solutions to some of the most critical challenges facing Tennessee.

The *Journal of Urban and Regional Perspectives* is uniquely positioned as a conduit between academia and practice. Our mission is to foster dialogue, share knowledge, and offer actionable guidance that addresses pressing regional issues. We aim to bring together diverse voices—from academic scholars providing in-depth research to local practitioners offering on-the-ground insights. Through this exchange, we hope to build a repository of knowledge that serves as an in-depth discussion of the challenges we face and as a source of innovative solutions and strategies for future growth and sustainability.

To achieve this mission, the journal will focus on five key areas:

Applied Academic Scholarship: Publishing rigorous and relevant research that directly informs urban and regional policies.

Perspectives from Local Practitioners: Providing a platform for local experts to share their experiences and best practices.

County Snapshots: Featuring in-depth profiles and data-driven analyses of specific counties, highlighting their unique challenges and opportunities.

Public Policy Guidance: Offering evidence-based recommendations to policymakers to support informed decision-making.

The Voice of the Citizens: Amplifying the perspectives of community members to ensure that policy discussions reflect the realities of those most affected.

In This Issue:

This inaugural edition features a variety of compelling articles and insights from both scholars and practitioners:

"Assessing the Impact of Opportunity Zones on Developmental Parity in Middle Tennessee" by Nottely Seagraves explores the impact of the Opportunity Zones program on developmental parity in Middle Tennessee by analyzing changes in median house prices, unemployment rates, and poverty levels.

"Community Gardens Toward a More Resilient, Sustainable City: A Geospatial Analysis of Community Garden Potential in Nashville, TN" by Lula Baldrice uses GIS mapping to explore the potential for expanding community gardens in Nashville, TN, to promote sustainability and address food insecurity.

"Community Health Dynamics and Healthcare Cost Burden: A Study of Middle Tennessee Counties" by Elijah Mitchell examines the relationship between community health indicators and healthcare cost burdens in Middle Tennessee, focusing on disparities between rural and non-rural areas.

"Evaluating the Impact of Pedestrian-Friendly Infrastructure on Mental Health in Urban American Settings" by Leah Kimbro employs a comparative observational framework to explore the relationship between pedestrian-friendly infrastructure and mental health outcomes in Nashville, TN, and similar urban areas.

We are honored to include two invited articles in this issue:

"The Public Infrastructure Needs Inventory: A Tool for Policy-Setting and Decision-Making" by Cliff Lippard, Ph.D., and Tyler Carpenter, M.S.A., provides an in-depth look at how public infrastructure inventories can serve as critical tools for policymakers, offering a framework for strategic planning and investment.

"Lawrence County: The State of Infrastructure" by Ryan Egly gives a comprehensive overview of the current state of infrastructure in Lawrence County, shedding light on rural Tennessee's specific challenges and needs.

Additionally, this issue features **Snapshots** from Rutherford County and Lawrence County, providing data-driven profiles highlighting these areas' unique challenges and opportunities.

In the **BERC's News** section, we provide an update on the latest activities and initiatives of the Middle Tennessee State University Business and Economic Research Center (BERC), including recent studies, partnerships, and community engagement efforts that underscore our commitment to fostering economic development and sustainability across the region.


Finally, in **The Dean's Corner**, the Dean offers reflections on the state of urban and regional affairs, the evolving role of academia in local development, and our vision for the journal's future.

We are excited to embark on this journey with you, our readers, contributors, and partners, and look forward to the critical discussions and collaborations that will emerge from these pages.

Thank you for joining us on this endeavor. Welcome to the *Journal of Urban and Regional Perspectives*.

Sincerely,




Murat Arik, Ph.D., PDBP

Editor, *Journal of Urban and Regional Perspectives (JURP)*



CONNECTING ACADEMIA AND COMMUNITY

The MTSU Chair of Excellence in Urban and Regional Planning Scholars Program is a nine-month initiative that brings together undergraduate students, faculty members, and community members to solve regional challenges through academic research.

Through these nine months, students attend lectures on the research process, hear from industry leaders, and work closely with faculty mentors to find solutions to challenges faced in Middle Tennessee. Some examples of regional challenges include housing affordability, waste management, small business funding, and rapid growth.

By the end of the program, students have developed a powerful network in the region, connected with university faculty, and produced a research paper and presentation relevant to the problems faced by their community.

Four summaries from the 2023-2024 Scholars Cohort are included in this issue of the Journal of Urban and Regional Perspectives.



MTSU Student Scholar and physics major, Lula Baldrice, presents her research on the potential land-use for community gardens in Nashville, TN, at the Scholars Program graduation ceremony.
Photo by Andy Heidt.



Assessing the Impact of Opportunity Zones on Developmental Parity in Middle Tennessee

Nottely Seagraves

Introduction

Middle Tennessee has experienced substantial growth, driven by thriving industries and an increasing population. However, this prosperity has not been equally distributed across the region. Affluent areas continue to expand, while lower-income communities face persistent challenges, including inadequate access to essential services, such as healthcare, education, and infrastructure, as well as underdeveloped economic opportunities. These disparities highlight the need for targeted interventions. This study evaluates the impact of the Opportunity Zones (OZ) program, a place-based initiative introduced under the Tax Cuts and Jobs Act of 2017. The OZ program incentivizes investment in designated low-income areas through tax benefits, aiming to spur economic development and address developmental disparities.¹ The study examines whether the OZ program has succeeded in fostering developmental parity in Middle Tennessee.

Literature Review

Opportunity Zones are designated based on a combination of economic distress indicators and political factors. Alm et al. found that high unemployment and low median income were significant criteria for OZ selection, while political considerations, such as Democratic representation, negatively influenced nominations.² Brazil and Portier raised concerns that OZ designations were often linked to areas undergoing gentrification, rather than to genuinely distressed neighborhoods, suggesting that the program may inadvertently favor more affluent or transitioning areas.³ The literature on the program's success is divided. Some research, such as Arefeva et al., has shown positive impacts on employment growth, while other research, including Freedman et al., has found little



evidence of meaningful improvements in poverty reduction, earnings, or housing stability.⁴ This mixed evidence emphasizes the need for region-specific studies like this one to assess the program's impact in diverse economic contexts.

Methodology

The study used publicly available U.S. Census data to assess the socio-economic impacts of the Opportunity Zones program in Middle Tennessee, focusing on key indicators such as median house prices, unemployment rates, and poverty levels over the period from 2010 to 2021. The data were analyzed at the census tract level, with a specific focus on areas designated as Opportunity Zones. Additional data were obtained from the Tennessee Department of Economic and Community Development to provide more granular insights into which census tracts were designated as OZs. The analysis employed linear regression models and the Welch Two Sample t-test to identify significant changes in the key indicators following the policy's implementation in 2017. By comparing designated OZ tracts with non-designated tracts, the study aimed to isolate the effects of the OZ program from broader economic trends in the region.⁵

Results

Median House Prices

The analysis revealed a statistically significant increase in median house prices following the implementation of the Opportunity Zones program in 2017. The Welch Two Sample t-test showed a t-value of 8.027 and a p-value of 1.102e-14, indicating that the rise in house prices between the pre- and post-2017 periods was not a result of random chance. The average of the median house prices from each OZ increased from \$113,563.4 in the pre-2017 period to \$158,701.6 in the post-2017 period. This significant increase suggests that the OZ program may have successfully attracted investment into distressed areas, driving up property values. Linear regression models supported these findings, demonstrating a modest but statistically significant rise in house prices before the policy, followed by a sharp acceleration post-policy.⁶ While higher property values could indicate revitalization, they may also suggest potential gentrification, which could displace low-income residents.

Unemployment Rates

The study's findings on unemployment rates were more nuanced. The Welch Two Sample t-test indicated a statistically significant decline in unemployment rates post-2017, with the average rate dropping from 12.32% pre-2017 to 7.55% post-2017. However, linear regression models offered a more



Author Nottely Seagraves (left) is presented with a completion award for her research at the Scholars Program graduation ceremony by Dr. Murat Arik, program director, (middle) and Dr. Kristie Abston, her faculty mentor (right).

Photo by Andy Heidt.

complex view, showing that the decline in unemployment was only marginally significant before 2017 and became more pronounced post-2017. Despite this, the relatively low R-squared values suggest that factors beyond the OZ policy—such as broader economic trends, regional industrial shifts, or additional local policies—may have played a significant role in reducing unemployment. This finding aligns with other studies, such as Freedman et al., which caution against attributing too much of the change in unemployment solely to the Opportunity Zones initiative.⁷

Poverty Levels

The analysis of poverty levels also re-

vealed promising results. The t-test showed a significant decline in the percentage of the population living below the poverty line, with the rate dropping from 24.75% pre-2017 to 19.77% post-2017. This finding suggests that the OZ program may have contributed to poverty alleviation in designated areas. However, the linear regression models showed only a marginally significant trend in poverty reduction following the policy change, suggesting that while the program may have helped reduce poverty, other factors may also have played a role. Brazil and Portier similarly found that Opportunity Zones did not always lead to substantial poverty reduction in other regions, raising questions about the program's long-term effectiveness in addressing deep-seated socio-economic disparities.⁸

Discussion

The results of this study highlight the Opportunity Zones program's mixed success in addressing developmental disparities in Middle Tennessee. The program has had a positive impact on housing prices and poverty reduction, suggesting that it has successfully attracted investment and contributed to economic development in low-income areas. However, the increase in house prices also raises concerns about gentrification and the potential displacement of existing low-income residents. This echoes findings from other studies that warn of unintended consequences when revitalization efforts lead to increased housing costs.⁹ The unemployment findings, while initially promising, suggest that external factors may be driving much of the change, indicating that the program's effectiveness in reducing unemployment remains unclear.

Furthermore, while the OZ program has demonstrated some success in fostering economic growth, its potential long-term impacts remain uncertain. The increase in property

values and the moderate reduction in poverty levels suggest that the OZ program may be benefiting wealthier investors more than the low-income residents it was intended to help. As other researchers have pointed out, the risk of gentrification remains a significant concern, and the program's focus on stimulating private investment could inadvertently deepen economic disparities if not carefully managed.

Conclusion

This study provides an in-depth assessment of the Opportunity Zones program's impact on socio-economic indicators in Middle Tennessee, with a particular focus on median house prices, unemployment rates, and poverty levels. The findings indicate that the program has had a positive impact on housing prices and has contributed to poverty reduction, but its effect on unemployment remains uncertain. The study also raises important concerns about the potential for gentrification and displacement in OZ-designated areas, emphasizing the need for policymakers to

ensure that the benefits of the program are equitably distributed. Future research should consider additional variables, such as income inequality and housing affordability, and employ more sophisticated econometric techniques to further isolate the effects of the OZ program. Qualitative research that captures the lived experiences of residents in Opportunity Zones could also provide valuable insights into how the program is shaping local communities, offering guidance for future policy development.¹¹

Nottely Seagraves is an undergraduate mathematics and accounting major at Middle Tennessee State University in Murfreesboro, TN.

Kristie Abston, Ph.D., is a professor of management at Middle Tennessee State University. She served as faculty mentor on this project.

¹ Alm, J., Dronyk-Trosper, T., & Larkin, S. (2021). In the land of OZ: Designating opportunity zones. *Public Choice*. <https://doi.org/10.1007/s11127-020-00848-9>.

² Ibid.

³ Brazil, N., & Portier, A. (2020). Investing in gentrification: The eligibility of gentrifying neighborhoods for federal place-based economic investment in U.S. cities. *Urban Affairs Review*. <https://doi.org/10.1177/10780874211032637>

⁴ Arefeva, A., Davis, M. A., Ghent, A. C., & Park, M. (2021). Job growth from opportunity zones. *Social Science Research Network*; Freedman, M., Khanna, S., & Neumark, D. 2021. "JUE Insight: The impacts of opportunity zones on zone residents." *Journal of Urban Economics*. <https://doi.org/10.1016/j.jue.2021.103407>. <https://doi.org/10.2139/ssrn.3645507>.

⁵ Freedman, Khanna, & Neumark, "Impacts of opportunity zones...."

⁶ Arefeva, Davis, Ghent, & Park. "Job growth from opportunity zones."

⁷ Freedman, Khanna, & Neumark, "Impacts of opportunity zones...."

⁸ Brazil & Portier, "Investing in gentrification...."

⁹ Ibid.

¹⁰ Arefeva, David, Ghent, & Park, "Job growth from opportunity zones."

¹¹ Brazil & Portier, "Investing in gentrification...."

The Public Infrastructure Needs Inventory

A Tool for Policy-Setting and Decision-Making

Cliff Lippard, Ph.D.
Tyler Carpenter, M.P.A



Since 1996, the Tennessee Advisory Commission on Intergovernmental Relations (TACIR), working with Tennessee’s nine regional development districts, has inventoried the state’s needed infrastructure improvements. This inventory, the Public Infrastructure Needs Inventory, combines data from state agencies like the Department of Transportation with data from surveys of local government officials and shows reported infrastructure needs for a five-year window across six categories: transportation and utilities; education; health, safety, and welfare; recreation and culture; general government; and economic development. The January 2024 edition of the report found that Tennessee needs at least \$68 billion worth of public infrastructure improvements during the five-year period of July 2022 through June 2027. (See Table 1, reproduced from that report.)

TACIR’s infrastructure report garnered considerable attention each year, with news articles and elected officials tending to focus on the bottom-line statewide and county-level needs, as well as large price tags reported for individual categories. Sometimes, people focus on the needs as if they are entirely a bad thing, an ever-growing list of neglected public works projects. While some of the projects in the inventory are there because it is time or past time to replace aging structures and facilities, many are indicators of the dynamism and success of the state and its local governments. The inventory captures the new schools, roads, water treatment facilities, etc., needed to support and serve the state’s growing population and expanding economy. Staff analyses support this observation, showing strong associations between economic strength and the need

for infrastructure. We will look at that analysis and discuss the potential for further analysis, but first, we will provide a little background on the inventory, how the data is collected, and how the reported information is used.

The Inventory

Public infrastructure, for the purpose of the inventory, is defined as capital facilities and land assets that are under public ownership or operated or maintained for public benefit.

The inventory only includes infrastructure projects with a capital cost of at least \$50,000 that are not considered normal or routine maintenance. The projects in the inventory are reported by local officials or derived from state capital budget requests. Local officials are asked to report their needs as they relate to developing goals, strategies, and programs to improve their communities; they are not constrained by any independent assessment of need. The projects reported cover a 20-year period, but the annual report focuses on just the first five years of projects. Both state and local officials are asked to identify each project’s stage of development—conceptual, planning and design, or construction—as of July 1 of the survey year.¹

Many state and local officials use the inventory as a tool for setting priorities and making informed decisions, with the annual inventory process offering an opportunity to set funding issues aside and think proactively and broadly about real infrastructure needs. Because the inventory is not limited to needs that can be funded in the short term, it may be the only formal opportunity officials have to consider the long-range benefits of infrastructure. With the inventory, public officials are better able



Cliff Lippard, Ph.D., is the executive director of the Tennessee Advisory Commission on Intergovernmental Relations (TACIR). Tyler Carpenter, M.P.A., serves as a research manager for TACIR.

Map 1. Total Estimated Cost of Needed Infrastructure Improvements
Five-Year Period July 2022 Through June 2027

Table 1. Comparison of Estimated Cost of Needed Infrastructure Improvements
July 2021 Inventory vs. July 2022 Inventory

Category and Type of Infrastructure	July 2021 Inventory	July 2022 Inventory	Difference	Percent Change
Transportation and Utilities	\$ 35,266,674,212	\$ 35,307,439,611	\$ 40,765,399	0.1%
Transportation	34,752,874,212	34,721,964,611	(30,909,601)	-0.1%
Other Utilities	505,810,000	553,485,000	47,675,000	9.4%
Broadband	7,990,000	31,990,000	24,000,000	300.4%
Education	\$ 14,815,976,368	\$ 16,738,121,237	\$ 1,922,144,869	13.0%
Post-secondary Education	5,569,076,520	6,816,175,940	1,247,099,420	22.4%
School Renovations*	5,455,890,542	5,675,715,916	219,825,374	4.0%
New Public Schools & Additions	3,608,454,520	4,062,872,544	454,418,024	12.6%
Other Education**	90,170,000	128,180,000	38,010,000	42.2%
School-System-wide	92,384,786	55,176,837	(37,207,949)	-40.3%
Health, Safety and Welfare	\$ 8,949,487,932	\$ 10,957,901,089	\$ 2,008,413,157	22.4%
Water and Wastewater	5,269,214,128	6,418,370,636	1,149,156,508	21.8%
Law Enforcement	2,094,023,552	2,588,546,121	494,522,569	23.6%
Public Health Facilities	784,295,092	1,091,396,012	307,100,920	39.2%
Housing	256,984,080	233,470,350	(23,513,730)	-9.1%
Fire Protection	356,857,313	420,875,265	64,017,952	17.9%
Storm Water	109,537,474	115,735,416	6,197,942	5.7%
Solid Waste	78,576,293	89,507,289	10,930,996	13.9%
Recreation and Culture	\$ 2,275,528,258	\$ 2,511,889,567	\$ 236,361,309	10.4%
Recreation	1,785,925,373	1,920,259,506	134,334,133	7.5%
Libraries, Museums, and Historic Sites	208,908,188	206,048,188	(2,860,000)	-1.4%
Community Development	280,694,697	385,581,873	104,887,176	37.4%
General Government	\$ 1,328,740,909	\$ 2,496,495,846	\$ 1,167,754,937	87.9%
Public Buildings	1,082,802,857	2,237,257,628	1,154,454,771	106.6%
Other Facilities	245,938,052	259,238,218	13,300,166	5.4%
Economic Development	\$ 245,741,014	\$ 239,248,302	\$ (6,492,712)	-2.6%
Industrial Sites and Parks	202,121,608	187,118,896	(15,002,712)	-7.4%
Business District Development	43,619,406	52,129,406	8,510,000	19.5%
Grand Total	\$ 62,882,148,693	\$ 68,251,095,652	\$ 5,368,946,959	8.5%

*School Renovations includes school technology projects with estimated costs below the \$50,000 threshold used for other types of infrastructure included in the inventory. Individual technology projects under the threshold totaled \$4,204,829 in 2021 and \$3,422,369 in 2022.
 **Other Education includes infrastructure improvements reported at state educational institutions not associated with institutes or higher education or at the county, city, or special school systems level. Examples include the Tennessee School for the Deaf and Alvin C. York Institute.

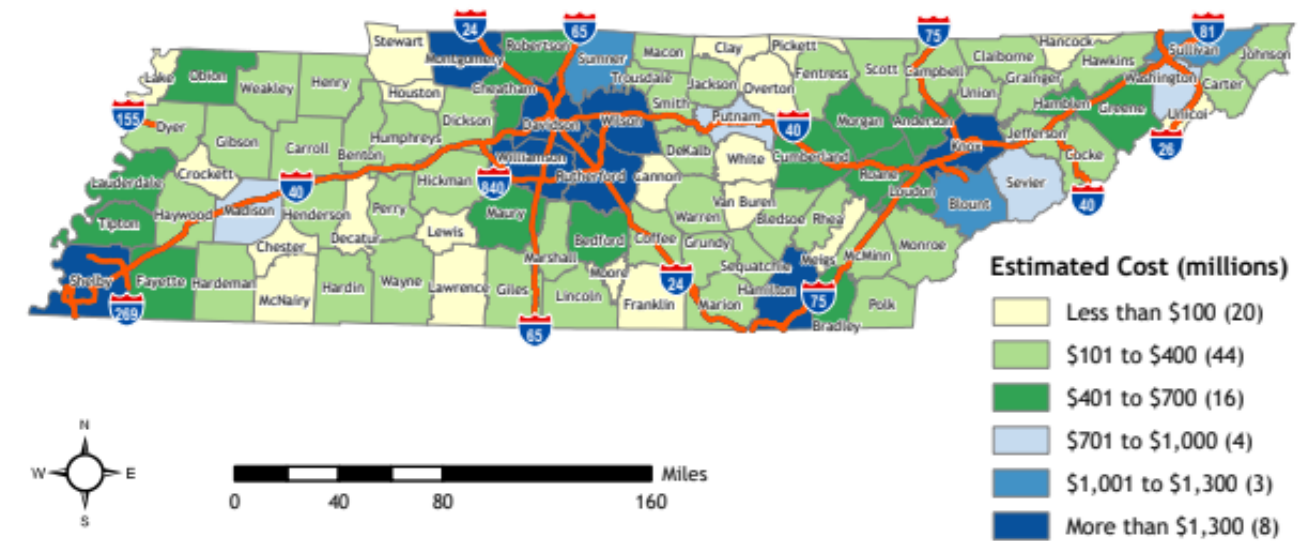
to match critical needs to limited funds and increase public awareness, communication, and collaboration among decision-makers about infrastructure needs. Further, the inventory provides the only statewide review of the conditions and needs of public school facilities.²

Factors Affecting Needed and Completed Infrastructure

In addition to assisting with planning and decision-making, the inventory can give clues about which factors contribute to the need for more infrastructure, as well as the ability to complete

projects. Looking at the county level, the higher the population and the higher the population growth, the greater the need for more infrastructure. Map 1, also reproduced from the January 2024 report, shows the total estimated costs of needed infrastructure improvements by county. The five most populous counties—Shelby, Davidson, Knox, Hamilton, and Rutherford—are among those with the highest needs. However, per capita, counties with small populations often need as much or more infrastructure than counties with large populations (see Map 2).

The analysis presented in previous edi-



Note: County totals include the total estimated cost of both regional and local infrastructure needs but do not include the \$5,095,168,535 for infrastructure improvements that cross county lines.

Map 2. Estimated Cost Per Capita of Needed Local Infrastructure Improvements
Five-Year Period July 2022 Through June 2027



tions of the inventory report supports the observation that population, along with population growth, is tied to how much infrastructure is needed. In the August 2016 report, staff calculated correlation coefficients measuring the relationships reported projects for each county area with each of six factors: taxable property, taxable sales, income, population, population gain or loss, and population

change rate.³ All but population change rates were strongly associated with the need for infrastructure (see Table 2). The wealth-related factors of taxable property, taxable sales, and income had the strongest relationships. Staff also calculated correlation coefficients for the same six factors and completed infrastructure projects, finding similar correlations.⁴

Table 2. Correlation Between Infrastructure Needed and Related Factors Divided by Land Area

Factor per Square Mile	Correlation with Improvement Needs per Square Mile
Taxable Property	0.90
Taxable Sales	0.89
Income	0.88
Population	0.84
Population Gain or Loss	0.80
Population Change Rate	0.38

Conclusion

The Public Infrastructure Needs Inventory provides a wealth of information about infrastructure needs across Tennessee. It also offers extensive opportunities for analysis and research, as shown by the TACIR staff analyses discussed above and by recent staff reports examining the effect of the COVID-19

pandemic on infrastructure needs.⁵ It remains a largely untapped publicly available data resource. For example, a statistical analysis comparing individual categories of needed and completed infrastructure—such as transportation, water and wastewater, or industrial development sites and parks—with economic growth and prosperity could be a potentially fruitful avenue for further study.

¹ Tennessee Advisory Commission on Intergovernmental Relations. 2024. *Building Tennessee’s Tomorrow: Anticipating the State’s Infrastructure Needs*. Pages 2-3. There is a lag between the survey year and the report publication date. For example, the data in the 2024 report reflects the status of projects required to be completed between 2022 and 2027, as of July 1, 2022.

² Ibid, pp. 5-7.

³ Tennessee Advisory Commission on Intergovernmental Relations. 2016. *Building Tennessee’s Tomorrow: Anticipating the State’s Infrastructure Needs*. Page 25. Because Tennessee’s 95 counties vary so much in size, each of the factors was divided by square miles to ensure that land area did not distort the analysis.

⁴ Ibid.

⁵ See Johnson, Emma, Bob Moreo, Michael Mount, Matt Owen, Mark McAdoo, and Melissa Brown. 2021. *The Effect of the COVID-19 Recession on Public Infrastructure Needs, Interim Report: Lessons Learned from the Great Recession (December 2007 – June 2009) and Early Observations from Local Government Officials* and Carpenter, Tyler, Presley Powers, Michael Mount, Matt Owen, Jennifer Barrie, and Mark McAdoo. 2023. *The Effect of the COVID-19 Recession on Public Infrastructure Needs Phase Two: Effects of the Great Recession and COVID-19 Recession Compared*.

Community Gardens Toward a More Resilient, Sustainable City

A Geospatial Analysis of Community Garden Potential in Nashville, Tennessee

Lula Baldriche

The global state of agriculture is facing a crisis. With over 56% of the global population currently living in cities, urban areas now constitute over half of the worldwide food demand. However, current farming trends demonstrate a decline in the number of farms, while the average farm size is increasing, a trend evident in the United States as well.¹ This shift has environmental implications, such as biodiversity loss and increased reliance on fossil fuels.² The need for alternative food production methods is critical, especially as urban food insecurity rises.

Urban agriculture, particularly community gardens, offers a sustainable solution to these challenges. Community gardens can increase urban food production, reduce environmental stressors, and provide a buffer

against economic and climatic shocks.³ In Nashville, approximately 13-14.5% of residents live at or below the poverty line, with a food insecurity rate of 10.4% as of 2021.⁴ These statistics make Nashville a prime location for expanding community garden initiatives.

Methodology

The study employed Geographic Information Systems (GIS) to evaluate and document potential land for community gardens in Nashville. The initial step involved inventorying existing community gardens and similar agricultural spaces. Data were collected from various sources, including government databases and literature on urban agriculture initiatives in Middle Tennessee.



Figure 1. Final output layer of identified potential land area within a 0.25-mile buffer of Nashville’s public transportation network.



■ Parcels Within 0.25 Miles of a Bus Stop
● Bus Stop

The study aimed to identify spatial gaps in food accessibility and assess the potential for expanding urban agriculture.

GIS mapping was conducted using ArcGIS Pro version 3.0. The mapping process included identifying land parcels suitable for community gardens, considering various land-use categories such as parks, university campuses, schools, libraries, vacant lots, and church properties.

Multiple screenings were conducted to eliminate unsuitable areas, such as those with dense vegetation or steep slopes. The parcels were then validated using satellite imagery and aerial imaging data layers.

Results

Total Mapped Parcels

The final output layer identified 19,231 parcels, totaling 21,517.6 acres of potential urban land for community garden implementation. This mapped area represents approximately 6.7% of Nashville's total land area. The parcels varied in size, with the smallest being approximately 0.01 acres and the largest 180.67 acres.

Parcel Distribution by Parcel Type

The distribution of parcels by type was as follows:

- Parks: 4,211 parcels, 7,556.2 acres
- University campuses: 23 parcels, 439.6 acres
- Non-profits: 399 parcels, 194.58 acres
- Libraries: 160 parcels, 126.82 acres
- Vacant commercial lots: 2,030 parcels, 2,322.24 acres
- Vacant residential lots: 7,939 parcels, 4,848.41 acres
- Churches: 372 parcels, 255.52 acres
- Schools: 925 parcels, 1,925.09 acres
- Open spaces: 3,172 parcels, 3,849.2 acres

Parcel Proximity to Public Transportation

The analysis revealed that 4,509 parcels were within 0.25 miles of a bus stop, representing 23.4% of the mapped parcels. Proximity to public transport was considered a critical factor in determining the suitability of these parcels for community gardens.

Discussion and Implications



Author Lula Baldriche presents her research at the Scholars Program graduation ceremony.

Photo by Andy Heidt.

The spatial distribution of potential garden sites was centrally clustered, with fewer parcels identified on the outskirts of Davidson County. The study assumed that 100% of the identified land could be used for gardening, an unlikely scenario. Therefore, a more realistic estimate, following the Oakland CA GIS study's assumption, is that 75% of the total identified land area would be used for productive space, with the remaining 25% allocated for infrastructure and non-productive uses.

The potential for community gardens to

enhance urban sustainability and resilience is significant. However, the study also highlighted the challenges associated with implementing such projects, including land suitability, potential contamination, and the need for community engagement. Future studies could focus on refining the selection criteria, incorporating biogeophysical screening, and exploring the economic viability of urban agriculture.

Conclusion

The study identified a substantial amount of potential urban land for community gardens in Nashville, highlighting the opportunities for expanding urban agriculture in the city. The identified parcels, if utilized, could enhance food security, increase biodiversity, and provide social and environmental benefits to the community. The findings underscore the importance of strategic planning and community involvement in the successful implementation of urban agriculture initiatives.

Lula Baldriche is an undergraduate physics major at Middle Tennessee State University in Murfreesboro, TN.

Ying Gao, Ph.D., is a professor of agriculture and director of the International Ginseng Institute at Middle Tennessee State University. She served as the faculty mentor on this project.

¹ USDA. 2022. 2022 Census of Agriculture. [usda.gov/census2022](https://www.usda.gov/census2022). Retrieved 2024.

² Knudsen, M. T., Halberg, N., Olesen, J. E., Byrne, J., Iyer, V., & Toly, N. 2006. "Global Trends in Agriculture and Food Systems." *Global Development of Organic Agriculture: Challenges and Prospects*, 1–48. <https://doi.org/10.1079/9781845930783.0001>.

³ Goldstein, B. P., Hauschild, M. Z., Fernández, J. E., & Birkved, M. 2017. "Contributions of local farming to urban sustainability in the Northeast United States." *Environmental Science and Technology*. <https://doi.org/10.1021/acs.est.7b01011.s001>.

⁴ Metro Nashville Climate Adaptation and Resilience Plan. 2023. [Nashville.gov](https://www.nashville.gov/departments/mayor/sustainability-resilience-environment/climate-adaptation-and-resilience-plan). <https://www.nashville.gov/departments/mayor/sustainability-resilience-environment/climate-adaptation-and-resilience-plan>.

RUTHERFORD COUNTY, TN

RUTHERFORD COUNTY CHAMBER OF COMMERCE & VISITORS CENTER

RUTHERFORD COUNTY INSIGHTS



LARGEST PRIVATE EMPLOYERS & EMPLOYEE COUNT

Nissan	8,000	General Mills	1,000
Amazon	2,700	Bridgestone	987
Ascension Saint Thomas	1,741	TriStar StoneCrest	950
Ingram	1,700	Murfreesboro Medical Clinic	925
Taylor Farms	1,700	Cardinal Health	816
Asurion	1,250	Vijon	730

2023 RUTHERFORD COUNTY QUICK FACTS

Population 369,868	Median Home Price \$415,000	3 Colleges 25,000 students
Median Age 34	Median HH Income \$81,505	College Degrees 43% hold Associate or above

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THE SCHOLARS PROGRAM RESEARCH

Community Health Dynamics and Healthcare Cost Burden

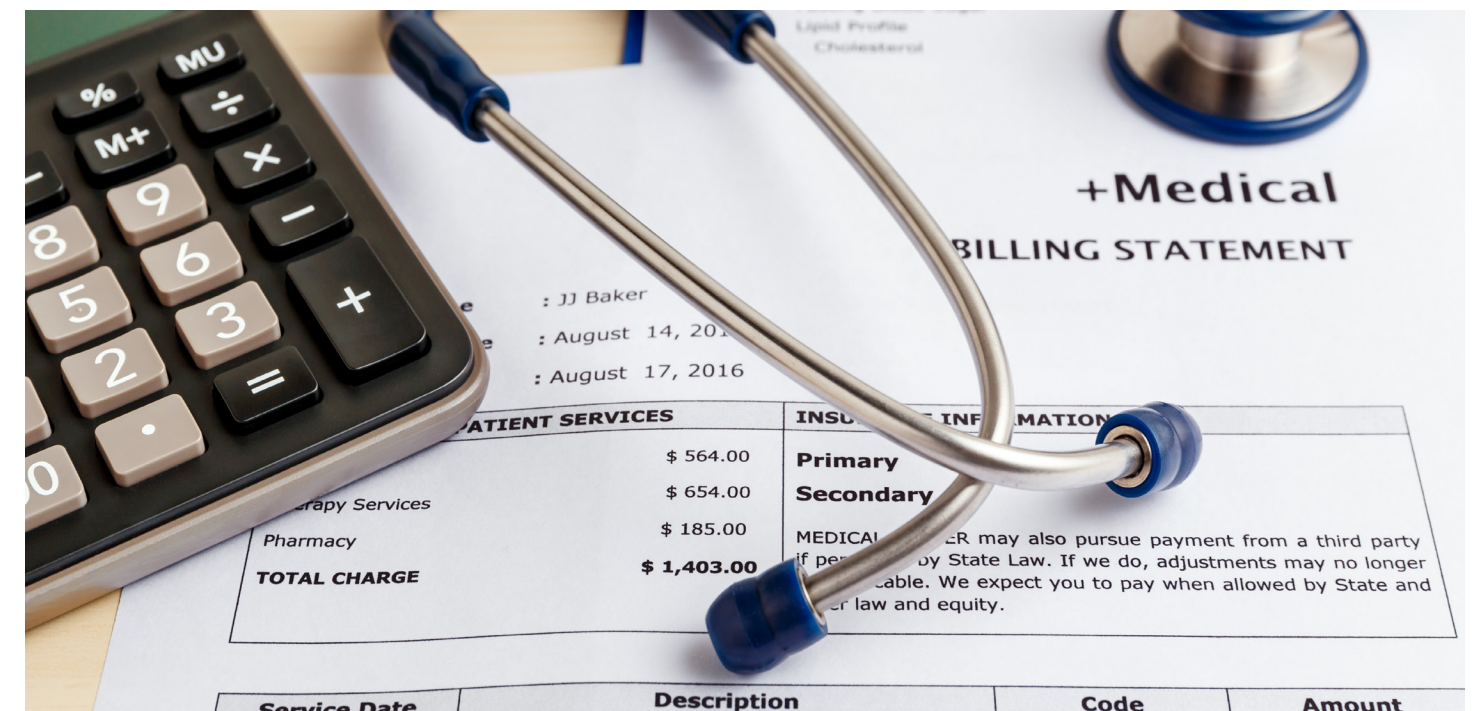
A Study of Middle Tennessee Counties

Elijah Mitchell

Healthcare costs and community health dynamics are critical components of public health and healthcare economics. Understanding the relationship between community health indicators and healthcare costs in Middle Tennessee is essential for developing effective interventions and policies to improve health outcomes and mitigate financial burdens for residents. A 2021 study by the Healthcare Value Hub found that in Tennessee, almost 7 in 10 (67%) of rural adults experienced one or more healthcare affordability burdens in the prior 12 months.¹ These burdens included difficulty paying medical bills, delaying or forgoing medical care due to cost concerns, or accumulating medical debt. This statistic highlights the pressing need to ex-

amine the factors contributing to healthcare affordability issues, particularly in rural areas where access to healthcare services may be limited and financial resources constrained.

This study aims to address the question: What influence has community health, as reflected by health behavior indicators, had on the healthcare cost burden for residents in Middle Tennessee counties from 2012 to 2018? Specifically, the research investigates the relationship between community health indicators—such as the percentage of adults reporting fair or poor health, the average number of physically unhealthy days per month, the percentage of adults who are physically inactive, and the percentage of obesity—and healthcare





cost burden, assessed by comparing the average annual healthcare expenditure per county to its median household income. Through this analysis, the study aims to uncover patterns and disparities in the healthcare cost burden across the region, track trends over time, and propose targeted interventions that could enhance health outcomes and reduce financial pressures on residents of Middle Tennessee.

Methodology

The study utilizes an observational research design to examine the healthcare cost burden across Middle Tennessee counties. Data were collected from the Centers for Medicare & Medicaid Services and County Health Rankings.³ Key variables included hospital-related data (e.g., number of hospitals, cost-to-charge ratios) and community health statistics (e.g., healthcare costs, household income, uninsured rates, rural population percentage).

The healthcare cost burden was assessed by comparing healthcare costs as a percentage of household income. The LASSO Regression Model was selected over other models due to its superior performance in handling multicollinearity and providing a more parsimonious model. A 5-fold GridSearch was conducted to determine the optimal alpha value for the model, ensuring minimal bias and im-

proved predictive performance. The analysis also included an 80/20 train-test-split with a standard scaler for consistency.

Results

The analysis revealed distinct regional disparities in healthcare costs. Middle Tennessee had a lower mean healthcare cost percentage (24.93%) compared to the state average (26.89%). However, rural areas within Middle Tennessee experienced a significantly higher healthcare cost burden (27.55%) compared to non-rural areas (18.94%). Counties with above-average health standings had lower healthcare costs (22.73%) compared to counties with below-average health (28.00%).

The LASSO Regression Model identified key predictors of the healthcare cost burden. The county's rural status emerged as the most significant factor, with rural areas facing higher healthcare costs. The uninsured rate and poor health status were also significant predictors, indicating that lack of insurance and poor health outcomes substantially increase healthcare expenditures. Conversely, a higher percentage of the population under 18 and greater physical inactivity were associated with lower healthcare costs, likely due to younger populations generally incurring fewer healthcare expenses.

Table 1. Healthcare Costs Percentage of Household Income Broken Down in Middle Tennessee

Breakdown	Count	Mean	Standard Deviation	Minimum	1st Quartile	Median	3rd Quartile	Maximum
Rural	128	27.55	4.96	17.08	24.22	27.2	31.18	39.44
Non-Rural	56	18.94	4.7	8.19	17.85	19.04	20.72	29.47
Above Average Community Health	112	22.73	6.16	8.19	18.8	21.74	27.42	37.08
Below Average Community Health	96	28	4.91	17.95	24.28	27.54	32.47	39.44



Author Elijah Mitchell presents his research at the Scholars Program graduation ceremony.

Photo by Andy Heidt.

Discussion

The findings underscore the critical impact of community health indicators on healthcare costs, particularly in rural areas. The study confirms that rural areas, with their poorer health metrics and limited healthcare access, bear a greater healthcare cost burden. This aligns with previous research that highlights the challenges rural populations face, including fewer medical resources and greater travel distances to healthcare facilities.³

The correlation between poor community health indicators and increased healthcare costs underscores the need for targeted interventions. These could include enhanced healthcare infrastructure, such as more primary care facilities and telemedicine services, and community health promotion programs aimed at improving physical activity and nutrition. The study also advocates for expanded insurance coverage and financial support mechanisms to alleviate the financial strain on households.

Conclusion

This study provides a comprehensive analysis of the relationship between community health indicators and healthcare costs in Middle Tennessee, revealing significant disparities between rural and non-rural areas. The findings highlight the profound impact of community health behaviors, such as obesity and poor health reporting, on the economic burden of healthcare. The research suggests that targeted interventions, including improved healthcare infrastructure and community health promotion programs, are necessary to address these disparities and reduce healthcare costs.

Elijah Mitchell is an undergraduate data science major at Middle Tennessee State University in Murfreesboro, TN.

Keith Gamble, Ph.D., is a professor of economics and finance and director of the Data Science Institute at Middle Tennessee State University. He served as the faculty mentor on this project.

¹ Healthcare Value Hub. 2021. "Tennessee Residents Struggle to Afford High Healthcare Costs, Particularly in Rural Areas." (Data Brief No. 96). <https://www.healthcarevaluehub.org/advocate-resources/publications/tennessee-residents-struggle-afford-high-healthcare-costs-particularly-rural-areas>.

² Centers for Medicare & Medicaid Services. n.d. "National Health Expenditure Data." Retrieved from <https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/state-residence>; County Health Rankings. 2012-2018. "Explore health rankings: Tennessee data and resources." Retrieved from <https://www.countyhealthrankings.org/explore-health-rankings/tennessee/data-and-resources>.

⁴ Cyr, M., Etchin, A., Guthrie, B., & Benneyan, J. 2019. "Access to specialty healthcare in urban versus rural US populations: a systematic literature review." *BMC Health Services Research*. <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4815-5>.

LAWRENCE COUNTY

THE STATE OF INFRASTRUCTURE

RYAN EGLY

Lawrence County, Tennessee, a region rich in heritage and community spirit, finds itself at a critical juncture in terms of infrastructure development. With a population of 46,000 spread across a predominantly rural area, the county's infrastructure directly impacts its economic growth, quality of life, and overall sustainability. Infrastructure plays a significant role in ensuring connectivity, access to essential services, and opportunities for future development. In this article, we explore the state of Lawrence County's infrastructure, dividing it into two main categories: traditional infrastructure—such as utilities, roads, and broadband—and social infrastructure, which includes childcare, housing, civic organizations, and lifestyle amenities.

Traditional Infrastructure

Utility Infrastructure

Utility infrastructure forms the backbone of modern life and business, encompassing services like electricity, water, wastewater, and

natural gas. Lawrence County is serviced by municipal and regional utility providers, each offering a variety of services and facing unique challenges related to the area's rural geography.

Electricity in Lawrence County is provided by the Tennessee Valley Authority (TVA) through its local distributor, Lawrenceburg Utility Systems (LUS). TVA, a public utility, ensures a steady supply of electricity through a vast network of generation assets and transmission channels across Tennessee and in parts of six other southeastern states. Lawrence County, which is the state's ninth largest county by area, is mostly rural except for its more densely populated county seat, Lawrenceburg. It is historically more challenging to serve less dense, rural areas as distribution lines span longer distances and are further removed from transmission assets. However, TVA and LUS have been proactive in creating redundancy for their 20,000 local customers. TVA has numerous transmission lines crossing the county from which LUS main-



Ryan Egly is a Lawrenceburg native and a graduate of Columbia State Community College, Middle Tennessee State University and Lipscomb University, where he recently completed his master's. He has worked for the Lawrence County Chamber of Commerce since 2015, where he has served as the President and CEO since 2019.

tains six substations, giving residents and businesses alike ample access to reliable power.

Natural gas in Lawrence County is served by three municipal distributors: Lawrenceburg Utility Systems, the City of Loretto, and Pulaski Natural Gas. Lawrenceburg Utility Systems has access to two natural gas suppliers: East Tennessee Natural Gas and Texas Eastern. Both run southwest to northeast through the county, providing abundant natural gas availability for business. This provides redundancy and a unique reliability for businesses looking to operate in the greater Lawrenceburg area, where Lawrenceburg Utility Systems serves more than 6,500 customers and maintains more than 300 miles of distribution infrastructure. Coverage is generally limited to the more densely populated areas, and there is limited penetration into the more rural regions. While natural gas is a preferred energy source for heating and cooking,

many rural homes still rely on alternatives like propane or electric heating due to limited access.

Water infrastructure in Lawrence County is maintained by various municipal and regional utility districts. Municipal water service providers include Lawrenceburg Utility Systems and the City of Loretto, both of which offer wastewater treatment for their respective service areas. While these centers of population and commerce enjoy stable water supplies, more rural areas face issues like system capacity caused by increased demand and insufficient supply from the system's source. On the distribution side, water loss caused by leaking pipes compounds the system issues, with customers experiencing low water pressure and limited water access, generally. In the more rural areas, it is common for residents to find their own water source by digging a well.



As mentioned previously, wastewater treatment facilities primarily serve the population centers of Lawrenceburg and Loretto. Residents and businesses located “in the county” often rely on septic systems. As the population grows, there is increasing pressure to modernize and expand the reach of public sewer systems, though this comes with significant financial constraints. When considering economic development, including residential and small business development, in rural Lawrence County, access to water and sewer service is limited, and development is therefore deterred. However, the system capacity of Lawrenceburg Utility Systems gives economic development efforts a leading edge. The water system has an excess capacity of more than six million gallons per day, and the wastewater treatment plant is rated to treat an additional nine million gallons per day.

In today's economy, broadband internet is as essential as traditional utilities. However, Lawrence County has struggled with widespread broadband access, particularly in its more remote areas. While the county is served by several providers, including local providers Loretto Telecom and Cloud 9 Fiber and regional providers like Charter Spectrum and AT&T, the digital divide remains stark. Only about 65% of households have access to high-speed internet, and even fewer have access to fiber-optic networks, which offer faster speeds and more reliable service.

The lack of high-speed internet in rural parts of Lawrence County hampers educational opportunities, business development, telehealth services, and access to government resources. Both federal and state governments have identified this issue and have directed grants toward expanding rural broadband to the tune of more than \$10 million since 2019.

Transportation Infrastructure

Transportation infrastructure is critical for connectivity, economic activity, and commu-



nity access. In Lawrence County, the transportation network includes highways, local roads, short-line rail, and minor airports.

Lawrence County is served by two interstate-caliber, four-lane divided highways. U.S. Highway 64 runs east and west from Chattanooga to Memphis—and from the North Carolina coast to Arizona when thinking nationally. U.S. Highway 43 extends from Tennessee to the Gulf Coast in Alabama, running parallel to Interstate 65 from Columbia, Tennessee, to Mobile, Alabama. These highways link residents to regional urban centers like Huntsville, Alabama, and Nashville, Tennessee. Interstate



65 is one of the most important corridors in the southeastern United States, especially for the automotive industry. This major artery is located 30 miles north and east of Lawrence County, accessed by either U.S. Highway. These thoroughfares are maintained by the Tennessee Department of Transportation.

Locally, city streets are maintained by municipal public works departments, and county roads are maintained by the Lawrence County Highway Department. While these streets and highways are generally well-maintained, many of the rural roads need improvement. Issues such as potholes, narrow lanes, and lack of shoulders are common. Rural road maintenance is a persistent challenge due to budget limitations and inflationary pressures, which often necessitate prioritization of repairs in areas with higher traffic volumes. The road infrastructure also struggles to accommodate the increasing number of large trucks transporting goods from local farms and industries.

Public transportation options in Lawrence County are limited. The South Central Tennessee Development District (SCTDD) offers a rural transit service primarily aimed at seniors, individuals with disabilities, and low-income residents. However, the availability and frequency of these services are sparse, limiting mobility for those without personal vehicles. Further, ride-sharing is not readily available from service providers like Uber or Lyft due to limited demand.

Lawrence County is home to a small gener-

al aviation airport, the Lawrenceburg-Lawrence County Airport. The airport operates a 5,003 ft. runway with a 25,000 lb. maximum weight for single-wheel aircraft and a 37,000 lb. ceiling for dual-wheel airplanes. Fuel is available from 8:00 a.m. to 5:00 p.m. daily. The airport is well-equipped for corporate jets, with courtesy vehicles available for ground transportation. There is a pilot's lounge and planning area with easy access to weather information. The airport has T-Hangars, a community hangar, and tie-downs for rent. Flight instruction is available from single instrument to commercial, along with educational programs. While it is suitable for private aircraft and some business needs, it does not accommodate commercial flights. Residents must travel to Nashville or Huntsville for commercial service.

The Tennessee Southern Railroad (TSRR) runs parallel to U.S. Highway 43 in Lawrence County, from Maury County to the Port of Florence on the Tennessee River. The TSRR interchanges with Class I carrier CSX 40 miles to the north. Lawrenceburg offers a cross-dock facility with the ability to transload products between rail cars and trucks. The Port of Florence provides intermodal service between the railroad, river barges, and trucks 40 miles to the south.

Social Infrastructure

Beyond roads and utilities, the quality of life in Lawrence County is significantly impacted by its social infrastructure—housing,

childcare, civic organizations, and lifestyle amenities. These services and resources are essential for attracting and retaining residents and fostering a sense of place and community.

Education and Workforce Development

The quality of education is a key factor in economic and community development. The Lawrence County School System is governed by nine elected board members and is operated as one county system by the Director of Schools, Mr. Michael Adkins. The system serves 7,000 students and is composed of 13 schools, including eight primary schools, one middle school, three high schools, and one virtual school. LCSS also operates an Adult High School, giving students and adults a non-traditional classroom opportunity to earn a high school diploma.

For many years, the public school system has maintained one of the leading graduation rates in the state and has definitively led the region in terms of academic achievement, as evidenced by many awards and accolades. Many organizations partner with and advocate for the continued success and improvement of Lawrence County Schools. The Lawrence County Education Foundation supports students financially through mini-grants and individual project donations. The Ayers Foun-

ation provides the system with college counselors who support students as they plan their academic future. Additionally, many schools maintain a strong Parent-Teacher Organization (PTO), and the business community sponsors programs that promote work ethic and career awareness throughout the entire system.

The system focuses on Career and Technical Education (CTE) programs and Early Post-Secondary Opportunities (EPSOs), which has created a culture of college and career success. High school juniors and seniors can earn academic credit for both high school graduation and college-level coursework through dual enrollment opportunities provided by Columbia State Community College and three Tennessee Colleges of Applied Technology (TCAT). During the 2022-2023 school year, Lawrence County Schools awarded more than 1,000 nationally recognized industry certifications as students worked towards graduation—simultaneously building a resumé while earning a diploma.

Education institutions and local leadership understand the value of technical education in training the next generation of skilled tradespeople. This is because local businesses and industries engage the education system in a meaningful way, creating a culture

where the trades are celebrated, not looked down upon. While Lawrence County is the 35th most populous county of Tennessee's 95 counties, its students make up more than 6% of the state's total technical college enrollment.

Lawrence County is served by two TCAT locations operating five local instructional service centers offering technical degrees in welding, industrial maintenance, CNC machining, building technologies, and nursing. TCAT-Pulaski and TCAT-Hohenwald enroll a combined 1,736 full-time and nearly 800 part-time students annually and award more than 375 degrees each year. Through the Tennessee Promise and Tennessee Reconnect programs, these programs are available at no cost to students as they pursue their vocational education. Businesses can connect directly with instructors and students alike to either recruit quality talent or design customized training for employees as businesses grow.

For two- and four-year degree opportunities, Lawrence County is served by Columbia State Community College, the University of Tennessee Southern, and Tennessee Technological University at the Southern Tennessee Higher Education Center. Columbia State offers more than 50 associate-level programs of study and enrolls 5,449 students annually, including 518 Lawrence Countians. Tennessee Tech and the University of Tennessee offer on-ground bachelor's- and master's-level programs.

Housing and Childcare

Housing affordability and availability are critical issues in Lawrence County. The median home price is significantly lower than in metropolitan areas, making it an attractive destination for first-time homebuyers and retirees. However, the availability of quality housing stock is limited. Much of the housing in the county is older, with a significant portion built before 1980. While the lower cost of living is a draw, the condition of some homes presents challenges, particularly in terms of energy efficiency and maintenance.

There has been some recent develop-

ment of new housing, particularly in the rural parts of Lawrence County, which have no regulation regarding planning or zoning, and the City of Loretto, which has more available land within its corporate limits to support housing. Affordable housing for low-income residents remains scarce. Additionally, rental options are limited, with few multi-family units and high demand for the units that do exist. This lack of affordable and diverse housing options is a barrier to growth, particularly for young families and young professionals.

A study commissioned by the Lawrence County Chamber of Commerce and conducted by Next Move Group in August 2024 indicated that there is a significant demand for additional housing development. Because of organic population growth and new job creation, the report states that Lawrence County needs 890 new single-family homes and 335 new rental units (apartments) over the next five years.

As more housing is developed, community leaders anticipate an increasing number of families living and working in Lawrence County.



As such, access to affordable childcare is an issue the community faces. The county has a limited number of licensed childcare centers, and the demand far outweighs the supply. Many families must rely on informal childcare arrangements, which can be unreliable and lack the developmental benefits of formal early childhood education. The shortage of childcare options is particularly problematic for working families and single parents, limiting workforce participation and economic mobility. Early education services, such as Head Start programs, are available but are often



oversubscribed. The Lawrence County School System offers pre-kindergarten programs, but space is limited, and enrollment is competitive.

Civic Organizations and Community Engagement

Lawrence County has a strong tradition of civic engagement, with numerous organizations that contribute to community life. These include local chapters of national organizations like Rotary Club, Kiwanis Club, and the Lions Club, as well as grassroots community groups focused on specific issues like food security, youth programs, and senior services.

Churches play a central role in community cohesion, serving not only as places of worship but also as hubs for social services, volunteerism, and community events. The county's faith-based organizations are deeply embedded in the fabric of local life, offering everything from food pantries to after-school programs.

Lifestyle Amenities and Recreation

The availability of lifestyle amenities and recreational opportunities is crucial for enhancing the quality of life in any community. Lawrence County is rich in natural beauty, offering numerous parks, hiking trails, and outdoor activities. David Crockett State Park is a major draw, providing opportunities for camping, fishing, and family outings. The county is also home to several smaller community parks, recreational sports leagues, and events like the Middle Tennessee District Fair.

However, the range of cultural and entertainment options remains limited. Residents often travel to larger cities like Nashville, Huntsville, or Florence for shopping, dining, and cultural experiences. The lack of diverse dining options, entertainment venues, and cultural activities is a challenge for attracting younger residents and professionals. While there are local efforts to expand these offerings, such as community theater productions and festivals, more investment is needed to make Law-



rence County a vibrant place for all age groups.

Healthcare Infrastructure

Access to healthcare is another critical component of social infrastructure. Lawrence County has a regional medical center, the Southern Tennessee Regional Health System-Lawrenceburg, which offers a range of services, including emergency care, surgery, and outpatient clinics at its 99-bed facility and various clinics located throughout the county. However, specialized care often requires traveling to larger markets. The shortage of healthcare professionals, particularly in specialized fields, limits local access to care. Telemedicine has emerged as a partial solution, especially during the COVID-19 pandemic, but the digital divide hampers its widespread adoption in rural areas. Luckily, there is an array of specialists located in nearby Florence, Alabama, at the North Alabama Medical Center and in Columbia, Tennessee, at Maury Regional Health Center. Regional trauma centers and acute care are accessible in Nashville and Huntsville.

Public health services delivered by the Lawrence County Health Department include vaccination programs, health education, and mental health resources but are often stretched thin. The county has made strides in addressing opioid addiction and mental health challenges through the Lawrence County Substance Abuse Prevention Coalition.

Conclusion

Looking ahead, Lawrence County's infrastructure will need to evolve to meet the demands of a changing economy and population. Strategic planning efforts, such as those led by the Lawrence County Chamber

of Commerce, the South Central Tennessee Development District, and the Tennessee Department of Economic and Community Development, are focused on attracting new businesses, improving transportation networks, and expanding broadband access.

Federal and state grants have been crucial in funding infrastructure improvements, but sustained local investment will be necessary to maintain momentum. Public-private partnerships could play a key role in funding new housing developments, childcare centers, and digital infrastructure projects.

Community input will be vital in shaping these initiatives. As the county grows, there will be a need for inclusive dialogue that incorporates the perspectives of long-time residents and new neighbors alike. By fostering a spirit of collaboration and innovation, Lawrence County can build a resilient infrastructure that supports a high quality of life for all its residents.

Lawrence County, Tennessee, stands at a crossroads in its infrastructure development journey. While it faces challenges related to its rural geography, limited budgets, and aging infrastructure, there are also significant opportunities. By focusing on both traditional and social infrastructure, the county can create a sustainable future that meets the needs of its residents and attracts new growth.

The future of Lawrence County will depend on these strategic investments, community involvement, and innovative solutions that balance tradition with progress. As citizens navigate these challenges, the county has the potential to serve as a model for other rural areas seeking to build resilient, vibrant communities in the 21st century.



LAWRENCE COUNTY TENNESSEE



TOTAL POPULATION
46,114



+9.2% SINCE 2010

POP. GROWTH SINCE 2020
4.4%



TENNESSEE: 3.1%
U.S.: 1.0%

POP. PROJECTION
50,675



+14.8% GROWTH
2020-2030

MEDIAN HOUSEHOLD INCOME
\$55,562



+25.5% SINCE 2016

COST OF LIVING
77.8



AVERAGE AGE
39



ECONOMIC DEVELOPMENT

8
PROJECTS ANNOUNCED
(SINCE 2018)

871
JOBS COMMITTED
(SINCE 2018)

\$248
MILLION INVESTED
(SINCE 2018)

STRONG JOB GROWTH IN LAWRENCE COUNTY, TN

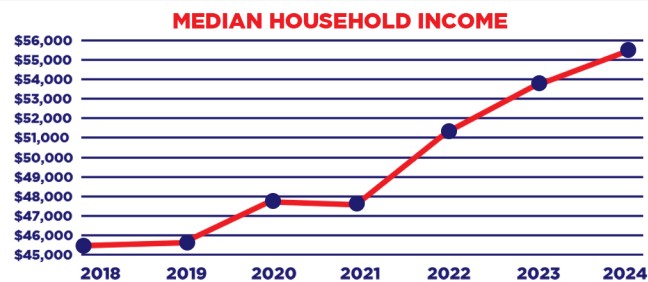


WORKFORCE DEVELOPMENT LAWRENCE COUNTY SCHOOL SYSTEM

14 SCHOOLS
6,949 STUDENTS
96.8% GRADUATION RATE
88% CTE CONCENTRATION RATE



Lawrence County, TN, offers a high quality of life with its blend of small-town charm and modern amenities. The county is known for its scenic landscapes, including parks, lakes, and the nearby Natchez Trace Parkway, which provide ample opportunities for outdoor recreation. The community is tight-knit, with a low cost of living, affordable housing, and access to quality healthcare and education making Lawrence County an ideal place to live, work, and raise a family. Lawrenceburg, the county seat, features a revitalized downtown area with local shops, restaurants, and cultural attractions.



THE SCHOLARS PROGRAM RESEARCH



Evaluating the Impact of Pedestrian-Friendly Infrastructure on Mental Health in Urban American Settings

Leah Kimbro

This study explores the relationship between pedestrian-friendly infrastructure—such as walkways, bike paths, and public transit—and mental health outcomes in Davidson County, Tennessee, compared to similar urban areas nationally over the past five years. It investigates whether the quality of this infrastructure, quantified by walk, bike, and transit scores, correlates with improved mental and physical health outcomes. Nashville, which is noted for its underdeveloped pedestrian infrastructure, is hypothesized to show lower mental health ratings than cities with more developed pedestrian environments. This research aims to offer insights into how urban planning and pedestrian infrastructure relate to public health, advocating for integrated urban development strategies that prioritize community well-being.

Methodology

The study uses a comparative observation-

al framework, analyzing Nashville from 2019 to 2023 and comparing it with 39 other U.S. cities with populations within ±250,000 of Nashville. These cities, spread across 26 states, were chosen to ensure demographic consistency. Due to limitations in city-level data, county-level data was used to approximate urban characteristics.

Data sources include walkability scores from WalkScore.com, health and socioeconomic data from the County Health Rankings, and depression risk data from Mental Health America. A composite Mental Health Rating was calculated by normalizing data to a scale of 100. Data processing was conducted using Python, employing robust scaling techniques and an 80/20 split for training and testing datasets.

To address potential overfitting and assess feature importance, the study employed LASSO and Ridge regression models using bootstrap techniques. Model performance was evaluated using RMSE, MAE, MAPE,



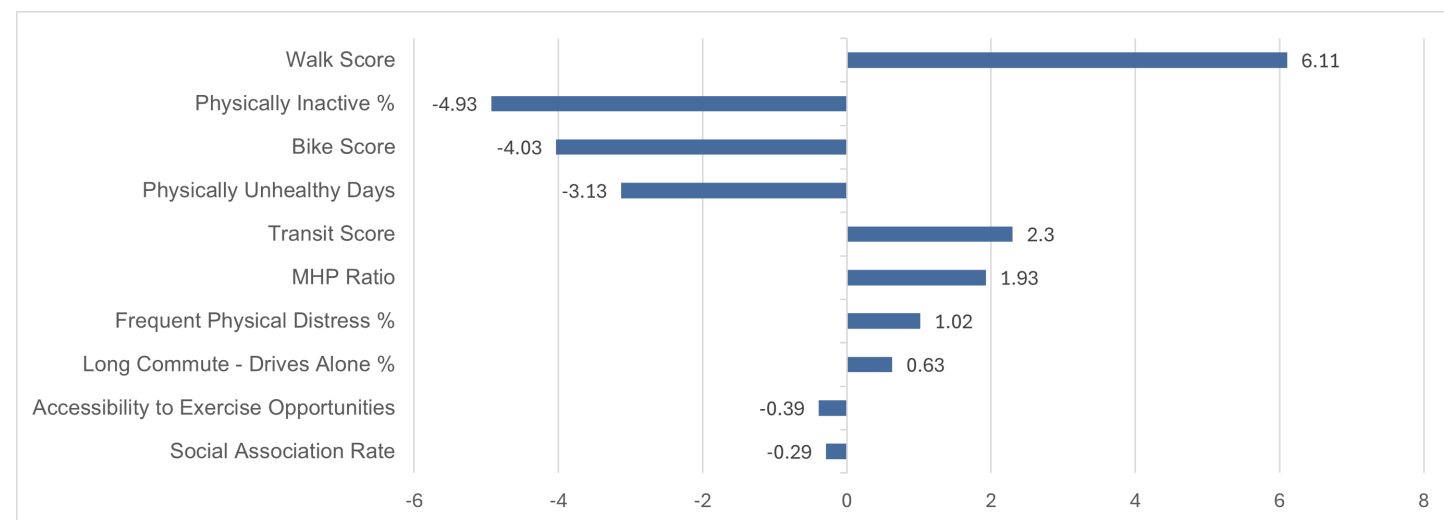
and R-squared metrics. Ethical considerations adhered to best practices for data privacy. Limitations include geographical variability, reliance on county-level data, and the use of secondary data sources, which may affect the generalizability of the findings.

Results

The regression analysis shows that higher walk scores are positively associated with better mental health ratings, while higher levels of physical inactivity and physically unhealthy days negatively affect mental health. The mod-

els reveal that increased walkability is linked to improved mental health outcomes, whereas higher physical inactivity levels are associated with poorer outcomes. The Ridge regression model showed a slightly better fit than the LASSO model, demonstrating consistent performance across bootstrap samples. These results emphasize the critical role of pedestrian-friendly infrastructure in urban settings, advocating for improvements in walkability and transportation to enhance public health.

Figure 1. Mean Coefficients of Predictors in Ridge Regression Model



Author Leah Kimbro presents her research at the Scholars Program graduation ceremony.

Photo by Andy Heidt.

Discussion

The findings underscore the importance of pedestrian-friendly infrastructure in improving urban mental health. The data demonstrate a strong correlation between walkability scores and mental health outcomes, indicating that well-designed urban spaces can significantly benefit residents' well-being. The

analysis also highlights the negative impact of physical inactivity on mental health, aligning with prior research.¹ This reinforces the need for well-planned urban environments that support both mental and physical health.

Nashville's low walkability scores correlate with its below-average mental health ratings, highlighting the necessity for enhanced pedestrian infrastructure. The study supports integrating health-focused strategies into urban planning, advocating for investments in pedestrian-friendly environments to improve public health. The resilience of walkable areas during the COVID-19 pandemic further emphasizes the role of pedestrian infrastructure in maintaining mental health and supporting social interactions.² Urban planners and policymakers are encouraged to prioritize pedestrian-friendly infrastructure to foster healthier, more resilient communities.

Leah Kimbro is an undergraduate communications major at Middle Tennessee State University in Murfreesboro, TN.

Sean Salter, Ph.D., is an associate professor of finance at Middle Tennessee State University in Murfreesboro, TN. He served as the faculty mentor on this project.

¹ Mendzina, E., & Vugule, K. 2020. "Importance and planning of pedestrian streets in urban environment." *Scientific Journal of Latvia University of Life Sciences and Technologies Landscape Architecture and Art*, 16(16). https://www.researchgate.net/publication/351107460_Importance_and_planning_of_pedestrian_streets_in_urban_environment; Roe, J., & Aspinall, P. 2011. "The restorative benefits of walking in urban and rural settings in adults with good and poor mental health." *Health & Place*, 17(1), 103-113. <https://doi.org/10.1016/j.healthplace.2010.09.003>.

² Amerio, A. et al., 2020. "COVID-19 lockdown: Housing built environment's effects on mental health." *International Journal of Environmental Research and Public Health*, 17(16), 5973. <https://www.mdpi.com/1660-4601/17/16/5973>; Mouratidis, K. 2021. "How COVID-19 reshaped quality of life in cities: A synthesis and implications for urban planning." *Land Use Policy*, 104, 105392. <https://doi.org/10.1016/j.landusepol.2021.105392>.

BERC'S NEWS

UPDATES ON THE BUSINESS AND ECONOMIC RESEARCH CENTER AT MTSU



Recent years have brought innovation for the MTSU Business and Economic Research Center (BERC). From the launch of the Jennings and Rebecca Jones Chair of Excellence in Urban and Regional Planning Scholars Program to the recognition by our peers through various awards, the BERC not only produced research but also actively engaged in the local and research community.

We fostered meaningful conversations and collaborations among students, faculty, stakeholders, experts, and researchers, nurturing both dialogue and growth—two key focuses of our research center. As we enter 2024, we are committed to building on this positive trend of dialogue and participation, enriching our community and its members at each step along the way.

BERC STUDENTS

“BERC has been instrumental in my academic and professional growth, offering exposure to real-world community challenges.”

Elijah Mitchell, Data Science

17 STUDENTS

Students were involved in BERC as student workers, graduate assistants, and TSBDC interns.

8 COUNTRIES REPRESENTED

In 2023, we had the privilege of working with students from China, Canada, the Bahamas, Germany, India, Lebanon, Nigeria, and the U.S.

14 DEGREE PATHS

Through their diverse backgrounds and skill sets, our students have learned from each other and enhanced our center's research.



CONFERENCE AWARDS

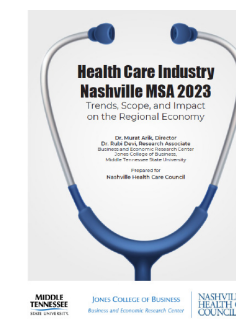
“ This year’s recognition by our peer institutions demonstrates the dedication and hard work of our staff to create exceptional products to serve our communities. ”

Murat Arik
BERC Director



AUBER AWARD OF EXCELLENCE IN PRINT PUBLICATIONS

BERC was awarded the National AUBER 2023 Award of Excellence for its study on the Nashville health care industry at the Association for University Business and Economic Research (AUBER) conference in San Antonio, Texas.



C2ER SUMMER 2024

The BERC team was awarded the C2ER Award in Recognition of Projects Supporting Collaborative Community/Regional Initiatives for the Wage and Benefit Survey.



IGBR FALL 2023

Dr. Murat Arik and Dr. Richard Tarpey received the Distinguished Research Award at the Institute for Global Business Research (IGBR) fall conference for their paper on the evolution of the Nashville health care industry cluster.

BERC PARTNER ORGANIZATIONS





THE DEAN'S CORNER

A VISION FOR OUR REGION'S FUTURE

As we launch this inaugural issue of the *Journal of Regional and Urban Perspectives*, I am thrilled to share with you my vision for the future of our region and the vital role that the Jones College of Business at Middle Tennessee State University (MTSU) will play in shaping it.

Middle Tennessee is one of the fastest-growing regions in the United States, a dynamic area where growth, innovation, and community engagement converge. As someone recently joining this vibrant community, I've witnessed firsthand the energy and potential here. At MTSU, we take great pride in being a key driver of this growth. Nearly one in every eight holders of a bachelor's degree or higher in Tennessee is an MTSU graduate, and the Jones College of Business is the top producer of business talent in the Greater Nashville Area. According to our most recent economic impact report, MTSU contributes \$1.42 billion in business revenue to our local economy—a clear testament to our crucial role in shaping this region's future.

Our commitment to innovation and excellence is evident in the new initiatives we have launched. In January 2024, we introduced a major in Cybersecurity Management, reaffirming our dedication to equipping our students with the skills and knowledge needed in today's rapidly evolving business landscape. The demand for cybersecurity experts in our region is proliferating, and we are preparing our graduates to meet this need, ensuring they have the foundational knowledge and specialized expertise to thrive in this high-demand field.

But our efforts extend far beyond academics. We are deeply committed to fostering partnerships and creating meaningful dialogue and collaboration opportunities across our community. Events like the annual Growth and Challenges Forum provide a unique space for students, faculty, and community stakeholders to come together, learn, and work toward solutions for regional planning challenges. Our partnership with organizations like

Cumberland Region Tomorrow is a proof of our belief in the power of collaboration to inspire responsible growth and development.

Since joining the Jones College of Business in July 2023, I have been focused on driving our mission through the lens of Engage, Elevate, and Empower. This vision guides everything we do, from the reorganization of our graduate programs to make them more accessible and flexible to the creation of our Young Professional Advisory Council, which ensures we are

Thank you for being a part of this journey. Let's continue to engage, elevate, and empower—together.



Warm regards,

Joyce Heames, Ph.D.
Dean, Jones College of Business
Middle Tennessee State University

servicing our graduates as they embark on their professional journeys. We have also reframed our Executive Education program to become a premier resource for training and development for companies across Middle Tennessee.

I am incredibly proud of our accomplishments and even more excited about what lies ahead. Together, we will continue to unlock new possibilities, drive innovation, and shape a prosperous future for Middle Tennessee.

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