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Sustainable Rural Transportation Through the Lens of the Waccamaw Regional Council of
Government's 2040 Long Range Rural Transportation Plan

Connor Denny-Lybbert

SUST310 - Methods and Tools in Sustainability and Coastal Resilience: Youth Corps

Dr. Pamela Martin

Summer, 2022

Introduction and Project Thesis

The Waccamaw Regional Council of Governments (WRCOG) is a regional agency that serves three counties on the northeast coast of the United States: Georgetown County, Williamsburg County, and Horry County. The purpose of a council of governments (COG) is to “establish a consensus about the needs of an area and the actions and the actions needed to solve local and interlocal problems” (Vlassis, 2013). The WRCOG specifically seeks to offer, “a wide variety of planning, economic development and social services in order to aid in the orderly growth and development of the area” (WRCOG, 2022). The WRCOG is run by a Board of Directors that is represented by both elected officials and citizens from the three-county area and is staffed in four primary areas. These areas are Planning and Transportation, Aging and Disability Services, Community and Economic Development, and Workforce Development.

The first half of my internship at the WRCOG was aiding them in updating their Rural Long Range Transportation Plan. My job was to take the traffic counts provided by the South Carolina Department of Transportation (SCDOT) and to input the numbers onto a spreadsheet for the years 2006-2022. After doing this, we took the spreadsheet and used it to graph the traffic counts for each road in the tri-county area and see how the traffic counts changed over time. This data is important because it allows the WRCOG to see where they ought to put more funds into expanding roads, placing traffic cameras, building stoplights, and more. We then put the data into GIS software, and mapped it onto road maps for Williamsburg, Horry, and Georgetown Counties. This GIS software allowed us to color code our maps, with softer colors representing low traffic counts and harsher colors representing high amounts of traffic, giving us another tool to analyze the data.

This paper will focus on the Planning and Transportation Department of the WRCOG and their 2040 Long Range Transportation Plan. The 2040 Long Range Transportation Plan is a transportation plan made twenty years into the future that organizes resources for the tri-county area's roads, public transportation system, and other transportation-related projects such as walking and bike paths. I will view the transportation plan primarily through the lens of sustainability and the United Nations Sustainable Development Goals (SDGs) to better understand how transportation can be made more sustainable and improved in the future.

Relations to SDGs:

The SDGs that I will be analyzing in relation to Georgetown County are SDG 1 – No Poverty, SDG 8 – Decent Work and Economic Growth, SDG 9 – Industry, Innovation, and Infrastructure, and SDG 11 – Sustainable Cities. I will first be discussing SDG 1. Target 1.1 says that the United Nations seeks to eliminate extreme poverty, which is considered living on less than \$1.25 a day, although the United States puts this benchmark at \$12,670 a year, or \$35 a day. The median household income in Georgetown County is \$52,000, while the per capita income is \$34,600 (US Census Bureau 2021). While this average is above the poverty rate, the poverty rate in Georgetown County is still high at 15% (US Census Bureau 2021). Target 1.5 discusses building resiliency plans to help those who are lower income and in “vulnerable situations” not be exposed to extreme climate events and other economic or social disasters. There are theoretically resources available to people to help with these events through state and national organizations and nonprofits, but there is not a Georgetown County resilience system from what I could see (Georgetown County Planning).

SDG 8 focuses on decent work and economic growth. There are specific targets within Goal 8 I found that relate directly to my experience. Consider Target 8.6, which is about reducing youth unemployment and getting more youth into education and training. Georgetown County's rate of people aged 16-19 not attending school and not working is 8.5%, almost double that of Richland County (Literacy 2030). Target 8.9 discusses sustainable tourism, which the Waccamaw Region is heavily involved in with the location of Myrtle Beach. Recent data shows that tourism in Georgetown County is only an increasing aspect of the county's economy. In the past year, vacation rentals saw almost 100% occupancy rates, a 20% increase from the previous year (Caines 2021). This is not simply tourism rebounding from the pandemic, as tourism rates kept steady during 2020. Rather, this is a growing field, with tourists spending over \$300 million a year in Georgetown County and the industry employing almost three thousand (Caines 2021). Because this is such a tourist heavy area, making sure sustainability is a part of planning will be important, especially since this area borders the ocean with its own unique ecosystem. Tracker 8.10 has to do with financial access, specifically with banks, insurance, and other services. According to BankForge, Georgetown County has 41 bank branches, and many ATMs, with eight in the downtown area. This is linked to transportation as if there were few banks in the county, residents in the more rural regions would have to travel longer distances to receive financial services. It would also require more expansive public transportation for those who lack their own means of transportation in order to reach these services.

SDG 9 is Industries, Innovation and Infrastructure. The two targets I will be looking at are 9.2 and 9.4. Target 9.2 covers promoting inclusive and sustainable industrialization and raising the amount of employment in industry. Currently, Georgetown County has 8% of its population employed in manufacturing (Georgetown County, SC). Per the target, Georgetown

County is below this. Compared to the United States, Georgetown County is about 4% below the national average per the Census Bureau (Grundy 2020), which stands at 12%. The other target I want to cover is 9.4, which seeks to upgrade infrastructure and make industry more sustainable and to adopt more clean technologies. One way of looking at this is through solar energy installations by county per year. In this metric, Georgetown County is in the upper half of counties, but is still significantly lower compared to Charleston, Greenville, and Richland counties (SC Energy 2020).

The final SDG I will be examining is 11, Sustainable Cities and Communities. There are also a couple of targets in particular I will be covering. Target 11.1 is that by 2030, for everyone to have access to safe, affordable and adequate housing. Housing statistics in Georgetown County show that the eviction rate is 10.4%, ten times higher than the national average and 1.5% higher than the state average (US News). Almost thirty percent of households spend at least 30% on housing, 6% higher than the national average and 2% higher than the state (US News). Target 11.2 has to do with access to transportation. For this indicator, I looked at how much of Georgetown County's population is within 0.5 miles of walkable destinations, which is about 13%, on par with national and state averages (US News).

Literature Review

The United Nations Sustainable Development Goals (SDGs) were created as a call to action for all United Nations member countries, and they, “recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests” (United Nations Department of Economic and Social Affairs).

The way I have interpreted this is that, in relation to transportation, we ought to consider multiple factors when discussing how we can improve the rural transportation system in the Waccamaw Region. These factors include economic development, environmental impact, infrastructure, and sustainability. Two of the Sustainable Development Goals that are interconnected with the literature that I will be reviewing are SDGs 9 and 11 as covered previously. The United Nations has found that inclusive and sustainable industrialization when combined innovation and infrastructure have positive effects on the economy. They state that manufacturing growth has been declining which is why innovation is so important. Lesser developed countries tend to spend less money on research and development than developing countries, which is a statistic that I believe we can tie into our analysis of rural areas. Goal 11 tackles creating sustainable communities and cities, mostly through the lens of urbanization. However, it is important to frame it through the lens of rural communities as well. The United Nations discusses how much of the world's GDP and carbon emissions are from metropolitan and rural areas, and people, specifically, in less developed areas are moving to cities. We see this in Williamsburg County where the population has been declining over time while Horry County has been growing rapidly. As shown in the figure below, the population projections for Williamsburg County show

that over the next twenty years, the overall population will decline by 0.01% while the population in Horry County will increase by 32%.

**POPULATION PROJECTIONS
2015 - 2040**

Census County Division	1970	1980	1990	2000	2010	2015	2020	2025	2030	2035	2040	Avg Growth Rate/Yr		Avg Growth Rate/5 Yr		Avg Growth Rate/10 Yr		
												(1970 - 2040)	(2000 - 2040)	(1970 - 2040)	(2000 - 2040)	(1970 - 2040)	(2000 - 2040)	
Horry, SC																		
Aynor	5,634.00	7,190.00	6,844.00	8,908.00	10,052.00	10,241.00	10,475.00	10,760.00	11,067.00	11,302.00	11,456.00	1.03%	0.64%	5.35%	4.31%	11.31%	11.27%	
Conway	18,665.00	23,868.00	26,881.00	33,575.00	39,715.00	41,244.00	42,905.00	44,736.00	46,611.00	48,526.00	50,421.00	1.43%	1.03%	7.42%	5.88%	15.50%	13.61%	
Conway East	3,419.00	8,546.00	17,552.00	31,639.00	65,364.00	79,266.00	92,715.00	106,025.00	119,113.00	132,135.00	145,158.00	5.54%	3.95%	31.97%	22.49%	76.34%	55.81%	
Floyds Crossroads	3,420.00	3,771.00	2,964.00	3,195.00	3,301.00	3,212.00	3,130.00	3,063.00	3,006.00	2,978.00	2,969.00	-0.20%	-0.18%	-0.87%	-0.38%	-1.49%	0.15%	
Little River	4,960.00	8,781.00	17,988.00	26,315.00	33,652.00	35,977.00	38,352.00	40,834.00	43,340.00	45,853.00	48,366.00	3.34%	1.58%	18.48%	9.15%	42.09%	22.55%	
Longs	2,788.00	3,299.00	3,371.00	5,625.00	6,645.00	6,897.00	7,171.00	7,475.00	7,789.00	8,106.00	8,422.00	1.61%	1.03%	8.56%	7.40%	18.60%	21.93%	
Loris	9,895.00	11,137.00	11,290.00	13,785.00	15,878.00	16,315.00	16,815.00	17,389.00	17,994.00	18,602.00	19,211.00	0.95%	0.84%	4.90%	4.88%	10.13%	11.39%	
Myrtle Beach	21,211.00	34,827.00	58,410.00	73,587.00	94,684.00	101,444.00	108,333.00	115,514.00	122,757.00	130,012.00	137,267.00	2.72%	1.60%	14.86%	8.52%	32.30%	18.84%	
Total	69,992.00	101,419.00	145,300.00	196,629.00	269,291.00	294,596.00	319,896.00	345,796.00	371,697.00	397,514.00	423,270.00	2.61%	1.96%	13.85%	10.68%	29.90%	24.23%	
Georgetown, SC																		
Andrews	5,174.00	6,914.00	7,433.00	7,929.00	7,608.00	7,340.00	7,117.00	6,934.00	6,775.00	6,648.00	6,552.00	0.34%	-0.46%	1.88%	-1.73%	4.17%	-2.39%	
Georgetown	15,638.00	19,281.00	19,662.00	20,111.00	19,865.00	19,420.00	19,031.00	18,703.00	18,399.00	18,159.00	17,988.00	0.20%	-0.27%	1.09%	-1.10%	2.37%	-1.74%	
Plantersville	2,499.00	2,706.00	2,661.00	3,199.00	2,957.00	2,786.00	2,623.00	2,470.00	2,320.00	2,173.00	2,026.00	-0.29%	-1.11%	-1.33%	-3.91%	-2.32%	-4.57%	
Pleasant Hill	3,059.00	3,518.00	3,568.00	3,994.00	3,592.00	3,332.00	3,082.00	2,846.00	2,616.00	2,389.00	2,162.00	-0.49%	-1.50%	-2.25%	-5.93%	-4.05%	-8.96%	
Sampit	3,977.00	3,519.00	3,455.00	3,918.00	3,913.00	3,842.00	3,776.00	3,718.00	3,662.00	3,622.00	3,597.00	-0.14%	-0.21%	-0.66%	-0.24%	-1.19%	1.00%	
Waccamaw Neck	3,153.00	6,523.00	9,721.00	16,646.00	22,223.00	24,577.00	26,867.00	29,127.00	31,324.00	33,499.00	35,674.00	3.55%	1.97%	19.63%	11.85%	44.57%	31.22%	
Total	33,500.00	42,461.00	46,500.00	55,797.00	60,158.00	61,297.00	62,496.00	63,798.00	65,096.00	66,490.00	67,999.00	3.22%	0.56%	18.00%	3.24%	10.94%	8.06%	
Williamsburg, SC																		
Cades	2,703.00	3,126.00	2,769.00	2,681.00	2,409.00	2,320.00	2,220.00	2,154.00	2,082.00	2,035.00	2,011.00	-0.42%	-0.71%	-2.00%	-3.31%	-3.80%	-6.16%	
Greeleyville	3,352.00	2,999.00	2,773.00	2,632.00	2,465.00	2,431.00	2,387.00	2,384.00	2,379.00	2,352.00	2,329.00	-0.52%	-0.31%	-2.55%	-1.63%	-5.01%	-3.41%	
Hemingway	5,257.00	5,857.00	5,578.00	5,356.00	4,753.00	4,545.00	4,311.00	4,143.00	3,961.00	3,777.00	3,593.00	-0.54%	-0.98%	-2.62%	-4.55%	-5.04%	-8.39%	
Indiantown	2,010.00	2,299.00	1,996.00	1,931.00	1,591.00	1,450.00	1,299.00	1,163.00	1,017.00	867.00	717.00	-1.45%	-2.42%	-6.85%	-10.49%	-12.75%	-18.08%	
Kingstree	11,648.00	14,093.00	14,369.00	14,709.00	13,424.00	13,050.00	12,611.00	12,377.00	12,121.00	11,942.00	11,821.00	0.03%	-0.53%	0.20%	-2.26%	0.59%	-3.76%	
Lane	3,657.00	3,624.00	3,662.00	3,742.00	4,099.00	4,367.00	4,629.00	4,989.00	5,375.00	5,781.00	6,219.00	0.76%	1.27%	3.92%	5.95%	8.09%	11.29%	
Nesmith	3,460.00	3,909.00	3,297.00	3,617.00	3,181.00	3,104.00	3,092.00	3,172.00	3,275.00	3,332.00	3,351.00	-0.04%	-0.18%	-0.10%	-0.27%	0.06%	0.62%	
Trio	2,156.00	2,319.00	2,371.00	2,549.00	2,501.00	2,529.00	2,548.00	2,615.00	2,685.00	2,708.00	2,728.00	0.34%	0.18%	1.71%	1.17%	3.47%	2.90%	
Total	34,243.00	38,226.00	36,815.00	37,217.00	34,423.00	33,796.00	33,097.00	32,997.00	32,895.00	32,794.00	32,769.00	-0.06%	-0.31%	-0.28%	-1.33%	-0.47%	-2.25%	

Source Notes

- US Census numbers from 1970, 1980, 1990, 2000, 2010.
- Population projections for county totals through 2030, provided by the South Carolina Budget and Control Board and the North Carolina Office of Management and Budget as of 6/1/15.
- Population projections for census county divisions and county totals for 2035 and 2040, provided by the Waccamaw Regional Council of Governments 5/29/2015.
- Prepared by Waccamaw Regional Council of Governments. Forecast of time series using an exponential smoothing state space model. No spatial interactions were considered.

Figure 1: Population projects from Waccamaw Regional Council of Governments

This shows that in fact we need to spend more time analyzing rural areas and how we can keep them sustainable and growing to some degree, which I will cover in my other sources

These goals are further tied to rural transportation in “The Contribution of Rural Transport to Achieve the Sustainable Development Goals” by Jasper Cook, Cornie Huizenga, Rob Petts, Caroline Visser, and Alice You. They discuss in their paper the importance of a sustainability and providing services to those in rural areas. Despite the lack of specific SDG goals on “rural access,” they view there as being multiple connections between rural access and the SDGs. The authors mention in particular, SDG 1 (alleviate poverty), 4 (access to education),

5 (empower women in rural areas), and SDGs 8, 9, 11, and 13 which have to do with developing infrastructure and communities in sustainable ways, as well as climate resilience. Specific ways this is being worked towards is in the Vientiane Declaration on Sustainable Rural Transport Towards Achieving the 2030 Agenda for Sustainable Development, adopted by 23 member and 14 observer countries of the Regional Environmentally Sustainable Transport Forum in Asia. This declaration, as the writers state, works towards achieving SDGs

Case Studies

This section analyzes national and global case studies of rural transportation. The first case study I will go over was put together by the National Association of Development Organizations (NADO) Research Foundation, Association of Metropolitan Planning Organizations (AMPO) and Federal Highway Administration (FHWA). This case study is from Arizona, where the state's small urban MPOs and rural COGs have started hosting an annual Rural Transportation Summit that helps them develop and enhance their staff and officials. These summits led to the formation of the Rural Transportation Advocacy Council that helps deliver a comprehensive message on federal and state issues and monitors activity at the state DOT. This has given rural and small metro areas a voice in the state legislature and has made the issues they face more well-known. In Vermont, local regional planning commissions along with other agencies and planning partners put together a guide that would help project growth and assess local communities' ability to manage that expected growth. This guide let planners and governments better analyze how development and population growth would impact land use and transportation (NADO, AMPO, FWHA 2009).

Flexibus is another example of a rural transport initiative seeking to give more transportation access to people in rural Ireland, specifically older citizens. They had multiple options for improving rural transportation. First was to support existing private operations, including taxis, however there was little private incentive for taxis to operate in these areas due to the low population, so without funding this strategy was unviable. There was the option for community cars, in which volunteers bring passengers to necessary services and then get reimbursed. The third option was for community groups to own and operate their own vehicles, and finally brokerages could share vehicles between different organizations. They ended up developing Flexibus, which had incredibly positive benefits for the users of its service. The services Flexibus provided were transported to shopping facilities, health services, retirement groups, trips to leisure activities in rural areas, and transport to bigger cities. Door-to-door transport is provided in advance. Flexibus showed that it reduced isolation for the population that used it, gave its users more independence, and it allowed people to have better access to important health services (Kenny and McKenna 2006).

Bicycle and pedestrian infrastructure need to be expanded more effectively in rural communities. One business the Miriam McKenna and Michael Kenny analyzed stated that improved walking and biking infrastructure led to them getting more business, a clear economic benefit. The infrastructure also saw heavy use in the communities the authors looked at. The authors did state that although more funding is necessary to create this infrastructure, there must also be an effort to continue funding in order to maintain this infrastructure, as it can become a safety concern if not maintained (Kenny and McKenna 2006).

Data

Data for this report is from the WRCOG Rural Transportation Plan and the Bureau of Transportation Statistics. Also included is other data from my above discussion of the United Nations SDGs. There is a variety of data within the transportation plan that will be useful for my paper. First, population projections and trends. Looking at the population trends for the three counties lets us see how we ought to tackle rural transportation considering that people are moving out of areas such as Williamsburg County. The transportation plan also has the data for road fatalities, which is critical in understanding how we can not only make transportation sustainable but also safe. Other data contained is the cost and financing of all of the transportation projects the WCROG is a part of.

The Bureau of Transportation Statistics contains important data on rural transportation that help put the situation in the Waccamaw region into context. For example, they state that despite 19% of Americans living in rural areas, 68% of our total road miles are in rural areas (Bureau of Transportation Statistics 2022). While this data makes sense when considering population density, it shows that for many people, rural roads are how they're able to interact with their world, and that their upkeep is particularly important. Fatalities on rural roads are also higher than on urban. The Bureau also states that rural roads are particularly important because of the amount of freight that either originates in or is transported through rural areas. The ability for us to get those in rural areas their product needs is something important that we ought to consider. Poor road infrastructure also impacts those in rural areas much more than those in urban, with the Bureau stating that the average detour required when a bridge is closed or posted is almost twice the length of those in urban areas (Bureau of Transportation Statistics 2022).

Recommendations

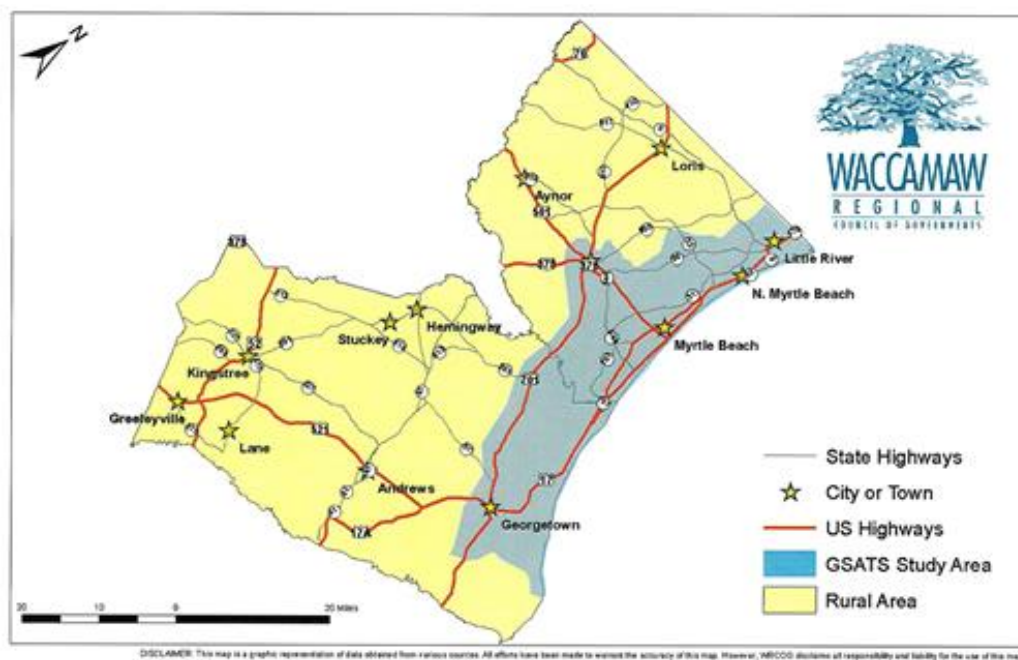


Figure 2: Map of WRCOG region from Waccamaw Regional Council of Governments

Moving forward, I believe that it would be most effective for rural regions to focus on developing pedestrian and bike travel paths while still improving road and intersection infrastructure. Much of the WRCOG's Rural Long Range Transportation Plan (RLRTP) focuses on improving highway and road infrastructure with little focus on non-vehicular transport. For example, three most prioritized projects were the US Highway 521 Andrews Bypass along with intersection improvements, with a total funding cost of \$61 million dollars (WRCOG 2016).

These projects are all important, but there seems to be little focus on improving other infrastructure within the Plan. Chapter 9 of the Plan is a short blurb written discussing Bicycle and Pedestrian facilities, and it states: “Due to the rural dispersion of the population, biking and walking are not often the most efficient or safe option, as compared to using a personal vehicle or transit, but it may be the only option available. Very few rural roads have shoulders for walking and/or biking” (WRCOG, 2016). While the chapter continues that there are plans to add some biking and walking transit paths for residents in rural areas for the East Coast Greenway, there are currently no steps being taken at this time to add these.

As discussed in the case studies, expanding transportation options for those in rural areas appears to only have benefits for residents, whether economic or relating to health and well-being. Making alternative transportation options more prevalent by expanding paths and making them safer by adding guardrails or other means of protecting walkers and bikers would be one place to start. Another is by increasing funding and expanding bus travel as covered in Chapter 8 of the plan. The WRCOG has already identified that local service providers and residents would like to see an expansion of hours of service, extending geographic reach, and commuter needs better met. How attainable these goals are is not stated but continuing to increase funding for these services should be a stated goal of the WRCOG in their next RL RTP.

Conclusion

This paper looked at the WRCOG 2040 Rural Transportation Plan through the lens of the United Nations Sustainability Goals. The primary SDGs looked at were Goals 1 (Eliminate Poverty), 9 (Infrastructure), and 11 (Sustainable Cities). Each of these SDGs had attached empirical evidence and case studies to see how the WRCOG Transportation Plan is achieving

these sustainability goals and how the Waccamaw region compares to other regions both globally and within the United States. This paper also looked at the strategies other rural areas were applying to achieve their own rural transportation goals. The conclusion reached is that currently, the amount of bike and walking infrastructure available is lacking, especially in rural counties such as Williamsburg County. If the Waccamaw Region is to create more sustainable transportation infrastructure, there must be more outreach to those who have the least amount of accessibility, such as the elderly and those in remote areas. Once this is accomplished, more effort can be put into improving current infrastructure such as in downtown Georgetown County.

There is a lot of room for future research as the field of sustainable rural transportation is not well developed. What is most important to look into is the intersection between poverty and transportation. Rural areas are often poorer than urban areas yet require the people who live there to have consistent means of transportation such as a car, along with the money for upkeep and fuel. Research in this area could consider how local governments and NGOs can work together to create transportation systems in rural areas that are consistent and inexpensive. This can include a more extensive bus, taxi, or carpool-like system, along with creating more bike lanes and pedestrian paths. Along with this research, studies could be done to see how a significant expansion in rural transportation effects local and regional economies. An example of this research could see if expanding bus routes or pedestrian paths increases local business or local employment. This has already in part been done by authors Natalie Villwock-Witte and Karalyn Clouser in “Case Studies of Communities of Less Than 10,000 People with Bicycle & Pedestrian Infrastructure” They found that some businesses had vastly increased revenue when they were attached to pedestrian infrastructure, and they also found that this infrastructure when built was used. Continuing this research and focusing on South Carolina and the Waccamaw Region would

be useful in seeing where there is need for pedestrian infrastructure and how it can aid the area's economy. Other research in this field should investigate how we can make public transportation more sustainable, although this field is more well developed than what I discussed earlier.

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