Assessing the Carpool Potential and Benefits for Furman Employees

James Miller

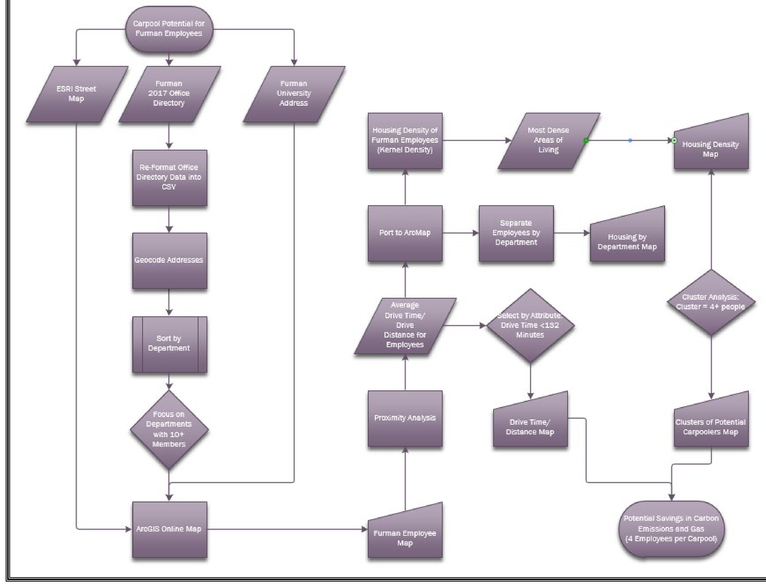
Introduction to GIS, Earth and Environmental Science, Furman University, Greenville, SC 29613

Abstract

Each day, around 800* employees commute to Furman, driving a total of 8,905 miles on their way to school. This drive distance results in roughly 3.6 tons of CO2 being emitted every morning! There are many transportation systems with the goal of reducing the number of vehicles driven to work each day. From the subways in New York to the Bus System in Charlotte, cities across the country are trying to cut down on traffic and emissions. For a campus located outside of a major city, mass transit options are less likely to be approved, especially with the funding challenges that Greenlink, the Greenville County's bus transit system, faces. In such a situation, alternate transportation solutions such as carpooling should be explored and implemented if necessary. The goal of this study was to examine the potential for carpooling among Furman employees and the possible benefits if the of carpooling to work rather than driving individually. Specifically, the study examined the potential savings in driving distance, fuel usage, gasoline money used, and carbon emissions. The potential savings would significantly ease the burden that Furman daily commute has on the environment, as well as the resources of its employees. This study is aimed at proving that carpooling would be an effective as an alternate method of transportation, and that it would be beneficial for Furman to facilitate carpooling through some form of incentives. For the purposes of the study, a carpool was attributed to include 4 employees in each vehicle, and the vehicles were given the average gas mileage of US cars (24.7 miles per gallon). Gas prices were set at $2.10 per gallon.

*** Note:** Of the 952 total employees at Furman, 146 did not list their addresses on the Faculty Directory, and 8 employees listed addresses that were unrealistically far away. These addresses were taken out of the study area, so the faculty that were examined in the study were numbered at 798.

Methods



Results

Employee Residences and the Average Drive Time to Furman University

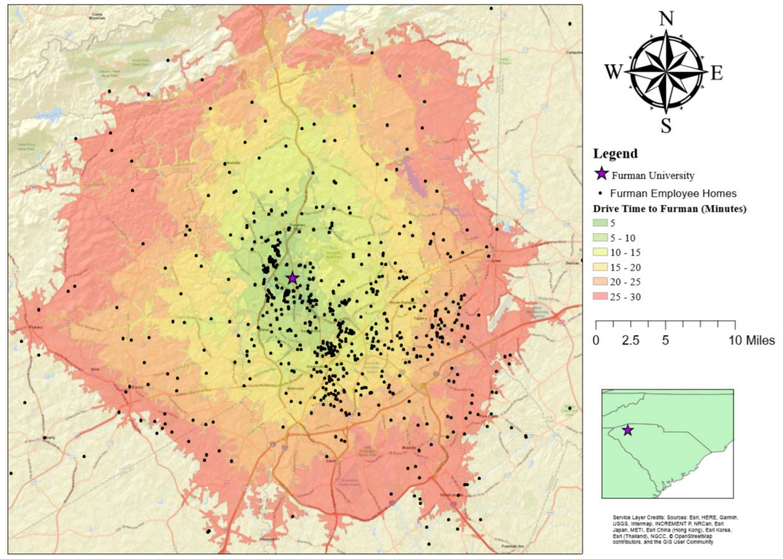


Figure 1: The map shows the location of Furman Employee Homes in the Greenville Area (Black Dots) along with the drive time radius of Furman University. The drive time radius extends to a 30 minute drive, with the color changing in increments of 5 minutes of drive time. Shows that the 87% of Furman Employees live within a 30 minute drive time of Furman, which would make the facilitation of employee carpools much easier.

Neighborhood Clusters of Furman Employees

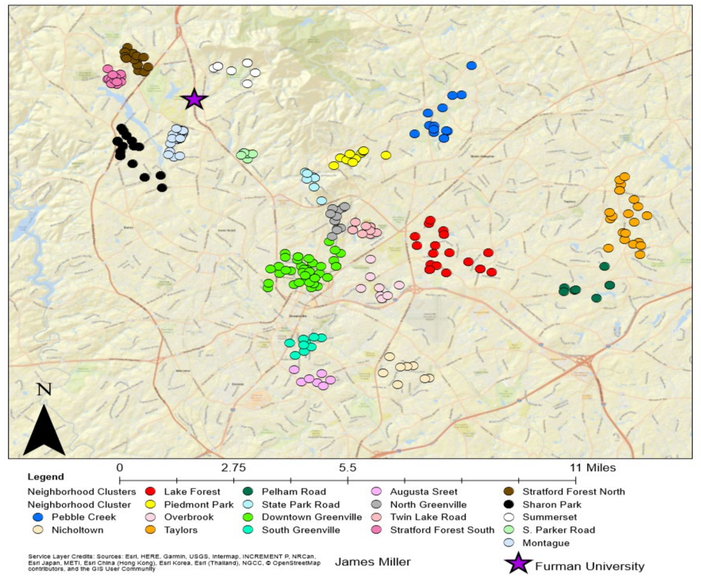


Figure 2: The map shows the housing clusters of Furman Employees. To be considered a cluster, an area needed to contain more than 4 employees living in close proximity to each other. There were 19 clusters found, with 266 employees living in a clustered area. These clusters (and the average drive time from each cluster to Furman) were used to calculate the potential savings due to carpooling.

Neighborhood	Avg. Drive Time (min)	Avg. Drive Distance (km)	Employees In Cluster	Total Drive Distance (km)	Total Drive Time (min)	Drive Distance Saved by Carpool (km)	Cars Used (4 Employees in each Carpool)	Cars No Longer in Use
Pebble Creek	22.1	19.9	15	299	332	80	4	11
Nicholtown	22.7	16.5	8	132	181	33	2	6
Lake Forest	20.2	16.7	19	317	384	83	5	14
Piedmont Park	10.6	8.6	13	111	137	34	4	9
Overbrook	16.5	13.0	9	117	148	39	2	7
Taylors	25.5	20.4	21	428	536	122	6	15
Pelham Road	20.2	16.9	8	135	162	34	2	6
State Park Road	8.4	6.6	9	59	76	20	3	6
Downtown Greenville	10.6	9.2	41	376	435	101	11	30
South Greenville	16.4	11.6	9	104	147	35	3	6
Augusta Street	19.6	13.9	7	98	137	28	2	5
North Greenville	10.3	8.4	13	109	134	33	4	9
Twin Lake Road	10.9	9.8	11	107	120	29	3	8
Stratford Forest South	7.6	7.5	13	97	99	30	4	9
Stratford Forest North	6.2	6.4	16	103	100	26	4	12
Sharon Park	5.9	4.6	16	73	95	18	4	12
Summerset	4.6	4.0	8	32	37	8	2	6
S. Parker Road	3.8	3.4	11	38	42	10	3	8
Montague	4.6	3.0	19	57	88	15	5	14
Totals			266	2792	3390	778	73	193

Table 1: Table shows both the average and total drive distances and times. Also includes the number of employees in each neighborhood cluster, as well as the total cars, and the cars that will no longer be in use if a carpool system were to be implemented. Finally, the table shows the drive distance that would be saved for each neighborhood if the carpooling were to take place, with the totals of each column posted at the bottom.

Furman Employee Housing Density in the Greenville Area

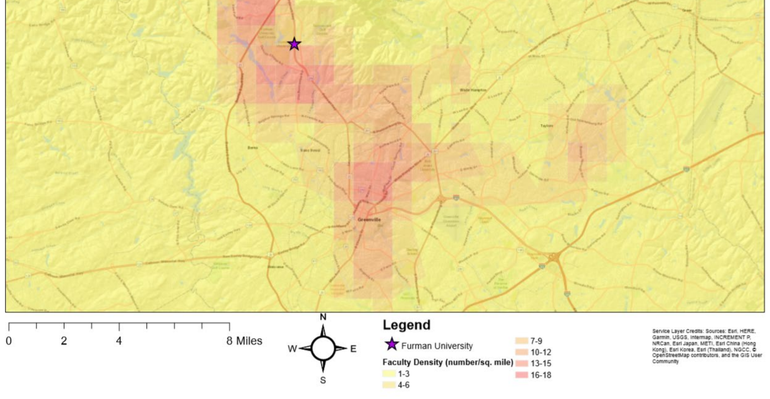


Figure 3: The map shows the housing density of Furman Employees in the Greenville Area. The darker the shade of red, the more houses per square mile in the sector. There are three areas of highest density (more than 16 homes per square mile): Stratford Forest, Montague, and Downtown Greenville. These three areas had the largest neighborhood cluster groups in Figure 2, and these areas stand to benefit the most from the introduction of a carpool system.

	Totals	Total Savings	Per-Capita Savings
Driving Distance	1365.5 Miles	483.7 Miles	663.7 miles driven per person per year saved
Gas Usage	55.3 gallons of gas used	19.58 gallons of gas saved	26.9 gallons of gas saved per person per year
Money Spent on Gas	$116 spent on gas	$41.12 of gas money saved	$56.42 saved on gas per person per year
Burning 1 Gallon of Gas = 19.6 pounds of CO2			
CO2 Emissions	1083.8 pounds of CO2 used each day	383 pounds of CO2 saved each day	1.4 pounds of CO2 saved per person per day
	197.8 tons used each year	70 tons of CO2 saved per year	.26 tons of CO2 saved per person per yar

Table 2: Table shows the final results of the study. The first column shows the totals for the 266 cluster members without any transportation system. The second column highlights the total miles driven, gas used, money spent, and carbon emissions that would be saved by the 266 cluster members if they were to carpool. Also shows the savings that each member of the cluster could expect over the course of a year.

Conclusion

Through the completion of this study, several things have been made clear:

- Furman University Employees would benefit from increased carpooling, both in money spent on purchasing gasoline and a reduction of total cars on the roads.
- Increased carpooling would help the University as well as the environment, with a 35% reduction in carbon emissions expected, and reduced demand for gasoline The University would benefit directly in the form of reduced carbon footprint
- The Greenville Community would benefit from the reduced number of vehicles on the roads
- This can also pave ways for developing new friendships, exchange of innovative ideas, and improving overall social environment at the University.

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