



Distance from Student Residence to School Academic Year 2006-07

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Introduction

Management of the growth of the Wake County Public School System (WCPSS) requires student assignment policies designed to integrate new schools, balance utilization of existing facilities, and balance socio-economic factors to maintain a healthy academic environment.

Analyses of the attendance characteristics are an integral part of the reassignment process. One factor of interest is how far the students live from the school they attend. This study examines

the distribution of distances between student residences and the school they attend.

ABSTRACT

The average straight-line distance from student residence to school changed very little between the 2003-04 school year and the 2006-07 school year. For elementary students, 90% of those attending their base school assignment, and 67% of those attending a school by choice live within a 5-mile ring around their school. For middle students, 81% of those attending their base school assignment, and 47% of those attending a school by choice live within a 5-mile ring around their school. For high students, 84% of those attending their base school assignment, and 35% of those attending a school by choice live within a 5-mile ring around their school.

(<http://www.wcpss.net/demographics/distance/index.html>)

Methodology

There are many ways to judge/measure distance. They range from straight-line distance, to distance travelled on a school bus route, to distance travelled walking, to distance travelled by car, to indirect measures such as time travelled using different means.

Of course the straight line distance is not the same as the driving distance from the place of residence to the school. The latter depends on the route traveled to get to the school, and the travel time depends on the mode of transportation, the number and duration of stops, traffic pattern, speed limit, traffic congestion, construction, etc. The straight-line distance between specified geocoding points is a lower bound on the actual travel distance between these points. It is a repeatable measure that allows apples to apples comparison of the assignment distributions among different schools, and among different academic years. This may not be the case for distances measured using bus routes, or other travel measures.

Therefore, in the case of this study the distance is measured as the straight line distance between the address where a student lives, using the corresponding street segment geocoding to describe the address, and the geocoded school parcel. The data are accumulated into one-

mile wide concentric rings around the attending school that emanate around the school in one-mile increments. The first ring counts the number of students living within zero to one mile from the school; the second ring offers the count of all students living at the distance more than one mile and up to and including two miles, etc.

Also included in the information is the type of assignment by indicator codes (Appendix I). In this context, there are two primary groups of Wake school students: by assignment and by choice. The first category are those who are assigned to a school by the school administration based on the Board of Education assignment plan or the special needs of students. In the second category are those who submit an application to WCPSS and are then given an approval to attend a school parents have requested, e.g., magnet, year-round, or a transfer to a school other than their base (assigned) school. There are thirteen official indicator codes that signify a student assignment by the school administration, and thirteen codes that signify an assignment as a result of the parent's choice. These codes are discussed in Appendix I. For example, code "0" (or blank designation) is for students who live in the Board of Education adopted "base attendance areas" (geographic areas – nodes) and are assigned to that school; there is a code for students who are assigned to a particular school because they need a particular program that a local school may not have (e.g., code "L" for English as a Second Language, or code "E" for Special Education).

Results

This report presents 2006-2007 academic year distance analyses for 143 individual schools by educational level (93 elementary, 28 middle, 22 high) (Appendix II). Special/optional schools (4) were excluded. Information is presented in visual format (maps) and tabular format.

The school district summary provides, in tabular format, cumulative data across levels and schools by individual distance rings, as well as by radius, i.e., cumulative count of all attending students within an X mile radius around a school. Full set of tables and maps can be found online at (<http://www.wcpss.net/demographics/distance/index.html>).

Individual Schools

Appendix III illustrates the distance analysis using the Broughton High School data for the 2006-07 academic year. In the graph (Figure AIII.1), each green dot represents a student by place of residence (geocoded by street segment) going to Broughton High School by assignment, while each yellow dot represents a student going to Broughton High School by choice (after the students was admitted through an application process).

The table AIII.1 shows an example of the number of students in each of the one-mile wide concentric rings around the school, the breakdown of student attendance by assignment and by choice categories, and the 5-mile attendance summary.

District Summary

There were 128,260 students enrolled in the WCPSS in October of the 2006-07 school year. This number does not include special/optional students. Of those, 101,313 or 78.99% of the total WCPSS students attended school by assignment. The maximum

distance to attending assigned base school was 14 miles. However, 28 students, who needed special services that were not provided by their base school, lived up to 22 miles from their school. Another 26,947 or 21.01% of the total WCPSS students attended school by choice. The maximum distance in this case was 27 Miles.

The WCPSS district totals show that 86% of all students are assigned to a school within five miles of their home. About 55% of students attending a school by choice live within five miles of their attended school. Overall, about 80% of all students live within five miles of their attended school (Table 1). These results are similar to 2003-04 district level results (Table 2).

Students Attending School, 2006-07	Number of Students	Percent of Total	Students living within 5 miles of the school they attend, 2006-07	Number of Students	Percent of Total
By Assignment	101,313	79.0%	By Assignment	87,324	86.2%
By Choice	26,947	21.0%	By Choice	14,727	54.6%
Total	128,260	100.0%	Total	102,051	79.6%

Table 1. Distance Analysis, 2006-07

Students Attending School, 2003-04	Number of Students	Percent of Total	Students living within 5 miles of the school they attend, 2003-04	Number of Students	Percent of Total
By Assignment	83,883	77.3%	By Assignment	71,769	85.6%
By Choice	24,702	22.7%	By Choice	13,699	55.5%
Total	108,585	100.0%	Total	85,468	78.7%

Table 2. Distance Analysis, 2003-04

Educational Level Summary

For the assigned students by the WCPSS administration, the Analysis of Assignment Patterns, Summary by Educational Level (Appendix IV) shows the following results:

- 89.8% of the elementary school students are assigned to a school within five miles of home, and 99.0 percent are assigned to a school within 10 miles,
- 81.1% of the middle school students are assigned to a school within five miles of home, and 99.0 percent are assigned to a school within 10 miles, and
- 84.2% of high school students are assigned to a school that is within five miles of their home, and 99.5 percent are assigned to a school within 10 miles.

Conclusion

The results of the study *Distance from the Place of Residence of the WCPSS Students to the School they attended for Academic Year 2006-07* are very similar to the study conducted in 2003-04. Students attending a school by choice, such as those going to magnet and year-round schools, or transfers, who use their own transportation, tend to live further from the attending school than “by assignment” students.

Appendix I. Assignment Indicator Codes

Indicator Code	Type	Indicator Label	Indicator Definition
0	Assignment	Base	Student assigned to a school by his/her address of residence and by a corresponding school node in the G&P Assignment Plan
1	Assignment	Year-Round Track 1	Year-Round Tracks
2	Assignment	Year-Round Track 2	Year-Round Tracks
3	Assignment	Year-Round Track 3	Year-Round Tracks
4	Assignment	Year-Round Track 4	Year-Round Tracks
A	Assignment	Early child development	Early child development (4 yr olds & below) S1 = 3 yr olds S2=4 yr olds in grade
D	Assignment	Dual assignment	Dual assignment with transportation (Used for 700/701/702/703 E Wake Schools)
E	Assignment	Self-contained exceptional program out-of-base	Self-contained exceptional program assignment outside of student's base (sp programs only)
L	Assignment	ESL out-of-base	Used for ESL if placed in an ESL program out-of-base LEP status '3'
N	Assignment	New	New student /student assignment only
O	Assignment	Optional/Special	Optional students (Mt Vernon/Longview/Phillips, etc)
P	Assignment	Phase-in nodes	Phase-in nodes - Currently not used by G&P
R	Assignment	Nonregistered	Nonregistered student/ Related services only
B	Choice	Magnet/Year-Round without transportation	Magnet/year-round assignment without transportation
C	Choice	Traditional calendar option for YR base	Traditional calendar option where yr-rd is assigned base and parents applied for a traditional calendar seat (2007-08)
F	Choice	Transfer	Student Services Transfer
G	Choice	Traditional calendar option for YR base	Traditional calendar option where yr-rd is assigned base and parent signed blue consent form for 2007-08
H	Choice	Homeless	Homeless (Non-base students) Base students HM (plus year)
J	Choice	Transfer	Year-round students transportation nodes moved from West Lake Elem to Oak Grove Elem (2003-04) students remaining at West Lake with transportation-
M	Choice	Magnet	Magnet assignment in transportation pattern
S	Choice	Tuition	Tuition student who resides with guardian in Wake County and parents live outside of Wake County - Currently not used by G&P
T	Choice	Transfer	Transfer student
U	Choice	Transfer	Student moved during year, remain at current school until the end of the current year.
W	Choice	Transfer	NCLB Transfer students
Y	Choice	Year-Round	Year-Round assignment in transportation pattern
9	Choice	Tuition	Tuition student who resides outside of Wake County with parent/guardian.

Appendix II. School Roster, 2006-07

Elementary School	Calendar	Elementary School	Calendar	Middle School	Calendar	High School	Calendar
Adams	YR	Lead Mine	T	Apex	T	Apex	T
Apex	T	Leesville Road	T	Camage	Magnet	Athens Drive	T
Aversboro	T	Lincoln Heights	Magnet	Carroll	T	Broughton	Magnet
Bailewick Road	T	Lockhart	T	Centennial	Magnet	Cary	T
Ballentine	T	Lynn Road	T	Daniels	Magnet	East Wake	T
Barwell	YR	Middle Creek	T	Davis Drive	T	Enloe	Magnet
Baucom	T	Millbrook	Magnet	Dillard Drive	T	Fuquay-Varina	T
Brassfield	T	Morrisville	YR	Durant Road	YR	Gamer	Magnet
Brentwood	T	North Ridge	T	Reedy Creek	T	Green Hope	T
Briardiff	T	Northwoods	T	East Gamer	Magnet	Holly Springs	T
Brier Creek	YR	Oak Grove	YR	East Millbrook	Magnet	Knightdale	T
Brooks	Magnet	Olds	Magnet	East Wake	T	Leesville Road	T
Bugg	Magnet	Olive Chapel	T	Fuquay Varina	T	Middle Creek	T
Carpenter	YR	Partnership	Modified	Heritage	YR	Millbrook	T
Carver	Modified	Penny Road	T	Holly Ridge	T	Panther Creek	T
Cary	T	Pleasant Union	T	Leesville Road	T	Sanderson	T
Cedar Fork	T	Poe	Magnet	Ligon	Magnet	Southeast Raleigh	Magnet
Combs	Magnet	Powell	Magnet	Lufkin Road	YR	Wake Early College	Magnet
Conn	Magnet	Rand Road	T	Martin	Magnet	Wake Forest-Rolesville	T
Crech Road	T	Reedy Creek	T	More Square	Magnet	Wakefield	T
Davis Drive	T	River Bend	YR	North Gamer	Magnet	East Wake School of Health Science	T
Dillard Drive	T	Rolesville	T	Salem	T	East Wake School of Int. Technology	T
Douglas	Magnet	Root	Magnet	Wake Forest-Rolesville	T		
Durant Road	YR	Salem	T	Wakefield	T		
Famington Woods	Magnet	Smith	T	West Cary	T		
Forest Pines	T	Stough	T	West Lake	YR		
Forestville Road	T	Swift Creek	T	West Millbrook	T		
Fox Road	T	Timber Drive	YR	Zebulon	Magnet		
Fuller	Magnet	Turner Creek	YR				
Fuquay-Varina	T	Underwood	M				
Green	YR	Vance	T				
Green Hope	T	Vandora Springs	T				
Harris Creek	T	Wake Forest	Magnet				
Heritage	YR	Wakefield	T				
Highcroft Drive	T	Wakelon	T				
Hilbum Drive	T	Washington	Magnet				
Hodge Road	T	Weatherstone	T				
Holly Grove	YR	Wendell	Magnet				
Holly Ridge	T	West Lake	YR				
Holly Springs	T	Wilbum	YR				
Hunter	Magnet	Wildwood Forest	T				
Jeffreys Grove	T	Wiley	Magnet				
Jones Dairy	YR	Willow Springs	T				
Joyner	Magnet	Yates Mill	T				
Kingswood	T	York	T				
Knightdale	T	Zebulon	Magnet				
Lacy	T						

Calendar Key	
T	= Traditional Calendar School
YR	= Year-Round Calendar School
Mbdified	= Mbdified Calendar School
Magnet	= School with Magnet Programs

Appendix III. Example of Analysis for an Individual School

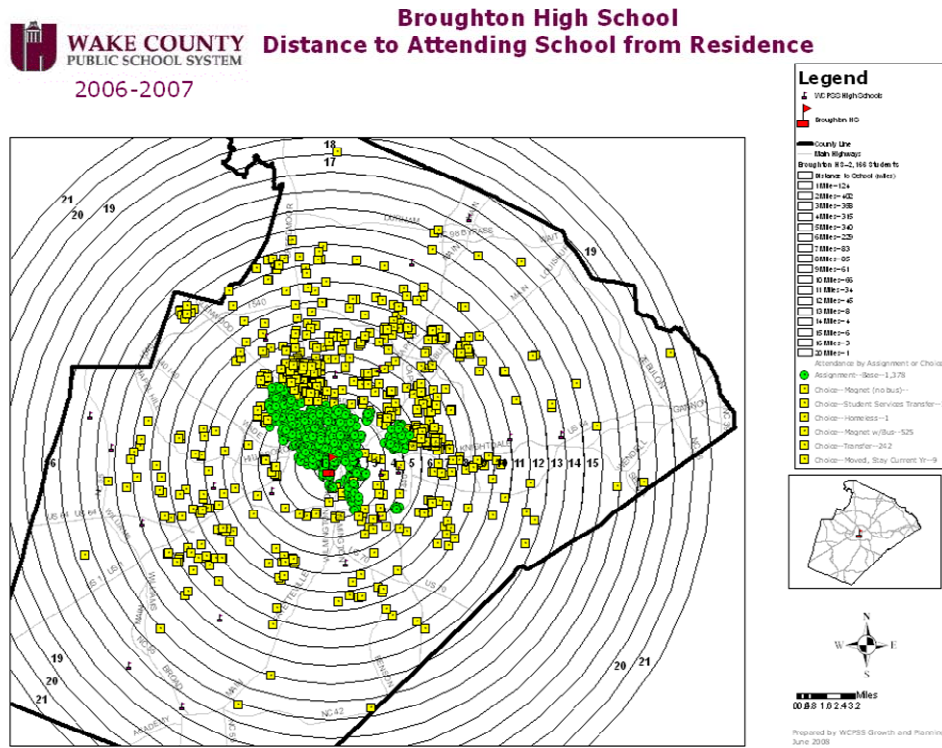


Figure AIII.1. 2006-07 distance analysis for Broughton High.

Broughton High School	Total Students	By Assignment		By Choice				
		0 - Base Assignment	B - Magnet (No Transportation)	F - Student Services Transfer	H - Homeless	M - Magnet (w/Transportation)	T - Transfer Student	U - Moved, Remain for Current Year
1 Mile Radius Ring (0.00-1.00 miles)	124	124						
2 Mile Radius Ring (1.01-2.00 miles)	402	395				4	3	
3 Mile Radius Ring (2.01-3.00 miles)	358	347				4	4	3
4 Mile Radius Ring (3.01-4.00 miles)	315	252	1	1	1	38	21	1
5 Mile Radius Ring (4.01-5.00 miles)	340	242				52	45	1
6 Mile Radius Ring (5.01-6.00 miles)	229	18	1			102	107	1
7 Mile Radius Ring (6.01-7.00 miles)	83		1			66	14	2
8 Mile Radius Ring (7.01-8.00 miles)	85		4			65	15	1
9 Mile Radius Ring (8.01-9.00 miles)	61		1			53	7	
10 Mile Radius Ring (9.01-10.00 miles)	66		1			55	10	
11 Mile Radius Ring (10.01-11.00 miles)	34		1			30	3	
12 Mile Radius Ring (11.01-12.00 miles)	45					37	8	
13 Mile Radius Ring (12.01-13.00 miles)	8					8		
14 Mile Radius Ring (13.01-14.00 miles)	4					3	1	
15 Mile Radius Ring (14.01-15.00 miles)	6					4	2	
16 Mile Radius Ring (15.01-16.00 miles)	2					1	1	
18 Mile Radius Ring (17.01-18.00 miles)	3					3		
20 Mile Radius Ring (19.01-20.00 miles)	1						1	
Total	2,166	1,378	10	1	1	525	242	9
		63.6%	0.5%	0.0%	0.0%	24.2%	11.2%	0.4%
	By Assignment	1,378	63.6%					
	By Choice	788	36.4%					
	Within 5-Mile Assignment	1,360	98.7%					

Table AIII.1. 2006-07 distance analysis for Broughton High.

Appendix IV. Wake County Public School System Analysis of Assignment Patterns, Summary by Educational Level, 2006-07

Mile Radius Ring to the Attending School, 2006-07	Number of Students Residing within "X" Miles of School (Cumulative)	Percent of Students Residing within "X" Miles of School (Cumulative)
WCPSS Total Students (Special/Optional Students Excluded)	128,260	
By Assignment maximum distance to attending school (assigned) = 22 Miles	101,313	78.99%
By Choice maximum distance to attending school (by choice) = 27 Miles	26,947	21.01%
Within 3 miles (assigned)	67,812	66.93%
Within 5 miles (assigned)	87,324	86.19%
Within 5 miles (by choice)	14,727	54.65%
Within 5 miles (assigned or by choice)	102,051	79.57%
Within 10 miles (assigned)	100,449	99.15%
Within 10 miles (by choice)	23,470	87.10%
Within 10 miles (assigned or by choice)	123,919	96.62%
Elementary School Total Students	62,674	
By Assignment maximum distance to attending school (assigned) = 19 Miles	48,764	77.81%
By Choice maximum distance to attending school (by choice) = 27 Miles	13,910	22.19%
Within 3 miles (assigned)	37,136	76.15%
Within 5 miles (assigned)	43,772	89.76%
Within 5 miles (by choice)	9,297	66.84%
Within 5 miles (assigned or by choice)	53,069	84.67%
Within 10 miles (assigned)	48,276	99.00%
Within 10 miles (by choice)	12,725	91.48%
Within 10 miles (assigned or by choice)	61,001	97.33%
Middle School Total Students	29,014	
By Assignment maximum distance to attending school (assigned) = 22 Miles	21,656	74.64%
By Choice maximum distance to attending school (by choice) = 24 Miles	7,358	25.36%
Within 3 miles (assigned)	12,128	56.00%
Within 5 miles (assigned)	17,556	81.07%
Within 5 miles (by choice)	3,424	46.53%
Within 5 miles (assigned or by choice)	20,980	72.31%
Within 10 miles (assigned)	21,448	99.04%
Within 10 miles (by choice)	6,412	87.14%
Within 10 miles (assigned or by choice)	27,860	96.02%
High School Total Students	36,572	
By Assignment maximum distance to attending school (assigned) = 21 Miles	30,893	84.47%
By Choice maximum distance to attending school (by choice) = 22 Miles	5,679	15.53%
Within 3 miles (assigned)	18,548	60.04%
Within 5 miles (assigned)	25,996	84.15%
Within 5 miles (by choice)	2,006	35.32%
Within 5 miles (assigned or by choice)	28,002	76.57%
Within 10 miles (assigned)	30,725	99.46%
Within 10 miles (by choice)	4,333	76.30%
Within 10 miles (assigned or by choice)	35,058	95.86%