

Introduction

America's public schools are re-segregating; at least one sixth of the nation's Black students attend schools that are "virtually all" minority (Frankenberg, Lee, & Orfield, 2003). In many school districts in the south, the goal of neighborhood schools is often cited as the reason for the segregation. Neighborhood schools are usually defined as those where students are assigned to a particular school in the attendance area in which they live, where "families must undertake expensive moves in order to change public schools," versus a system which allows intra-district choice (Cullen & Rivkin, 2003, p. 88). According to Marcus (2006), the return to neighborhood schools that followed in many systems after a release from court oversight has allowed a reversion to segregation, resulting in more segregation today than was seen in the 1970s. This has especially affected Black children, who are more likely to attend schools that are mostly minority in all regions of the nation. According to the Harvard Civil Rights Project, 73% of Black children attended majority-minority schools in 2003, versus 66% in 1991 (Orfield & Lee, 2007).

In general, schools segregated by race are also usually schools that are segregated along other dimensions, including poverty (Orfield & Lee, 2005). The long-term effects of concentrating race and poverty have severe consequences for the educational prospects for all children. A 1993 study by the United States Department of Education reported that schoolwide poverty affects individual student achievement, independent of a student's economic status (Puma, Jones, Rock, & Fernandez, 1993). For poor and middle-class students, scores decline as the percentage of poor students increases.

The level of racial and economic integration in a particular school is a function of attendance zone boundaries and of the school's enrollment (i.e., students who attend their assigned school, as opposed to a charter school, magnet school, or private school). In 2007, a United States Supreme Court joint ruling in *Parents Involved in Community Schools v. Seattle School District No. 1* and *Meredith v. Jefferson County Board of Education* invalidated the two school districts' consideration of a student's race in school assignment decisions. The decision, split 4-1-4 with Justice Kennedy offering a more narrowly tailored opinion, confused school boards across the nation regarding their rights and obligations to address segregation. In light of this ruling, it is important to look at segregation in public schools, including the processes that lead to segregation and the possible avenues to address it.

Using Wayne County, North Carolina as a case study, we examine high schools and their attendance zones, and we explore methods that school systems can use to end school segregation in a manner consistent with the Supreme Court's June 2007 findings, while also maintaining neighborhood schools. We use

Geographic Information Systems (GIS) to show how Wayne County has used school attendance zone boundaries to foster segregation by race and income, under the guise of maintaining neighborhood schools. Further, we use GIS to adjust attendance zone boundaries to create racially- and economically-balanced high school attendance zones, demonstrating that these zones are not incompatible with neighborhood schools and that—at least in Wayne County—neighborhood schools can be created without increasing segregation.

The Costs of Segregation in Wayne County

Wayne County has a population of 113,167 and is largely rural. It has one city—Goldsboro, population of 37,597 (American Community Survey, 2008). According to the 2000 Census, Wayne County is 60% White-non-Hispanic (hereinafter “White”) and 33% Black, while Goldsboro is 43% White and 52% Black.¹ Among the county’s school-age population (ages 5-17), Black students are distributed throughout, with a high concentration in Goldsboro, the county seat situated in the middle of the county. Thus, in Wayne County, Black residents’ residential patterns actually facilitate diversity among the county’s schools without sacrificing neighborhood schools. Yet almost half of Wayne County’s high school students—47.6% public (National Center for Education Statistics [NCES], 2010) and 55% private (Private Schools Report, 2005)—attend schools that are highly segregated, defined here as over 72% of one race. Goldsboro High School (GHS) was 98% Black in the 2008-09 school year (North Carolina Public Schools [NCPS], 2010, p. 97).

Segregation by race and class exists in schools across the United States; approximately 40% of all Black and Latino students attend high-poverty elementary schools, while only 5% of White students attend such schools (Aud et al., 2010). According to the NAACP Legal Defense Fund (LDF) (2005), “In schools of extreme poverty (in which poor students constitute 90-100% of the population), 80% of the students are black and Latino. This means that statistically, black and Latino students are more than three times as likely as Whites to be in high poverty schools and twelve times as likely to be in schools where nearly all students are poor (90-100%)” (p. 13). In contrast, over half of all White students in the nation attend schools in which 25% or fewer of students are poor (NAACP LDF et al., 2005, pp. 13-14). In Wayne County, 86% of the students at GHS in 2008-09 were economically disadvantaged (i.e., eligible for the free and reduced price lunch program; NCPS, 2010, p. 97).

Research shows that concentrations of high-poverty students have negative consequences for achievement growth, with as much impact on advantaged as on disadvantaged students, and almost as much impact on White students as on Black students (Rumberger & Palardy, 2005). It is important to

note that differential academic performance is not always the result of racial and economic segregation between schools. Systemic racism and tracking, a process of grouping students by academic performance, within a school has similar effects (Oakes, 1985). In Wayne County, two additional notable consequences of a high-poverty concentration of students concern teacher retention and dropouts. Teacher turnover is 50% higher in high-poverty schools than in more affluent ones (Ingersoll, 2001, p. 516). Teacher turnover at GHS for 2006-07 was 20%, though it had decreased to 7% in 2008-09 (NCPS, 2010, p. 21). Teacher turnover represents a loss of resources to the education system and the taxpayer in terms of the financial costs of hiring and training new teachers, and it costs the students in terms of teacher experience and quality. In North Carolina, segregated high-poverty schools have less experienced teachers, fewer fully-qualified teachers, and fewer teachers with advanced degrees as compared to the district (Henry et al., 2008). When teachers find other professions, schools lose the experience and expertise that would have benefitted their students (Hitz, 2002). To make matters worse, many teachers who leave cannot be replaced by properly qualified teachers as there are shortages in some subject areas. According to the U.S. Department of Education, North Carolina has experienced teacher shortages in high school science and math and in special education each year for the past decade. This problem is exacerbated in Wayne County because it is a rural county, and it is difficult to hire teachers in many rural districts (Southeast Center for Teaching Quality, 2001).

Teacher turnover is associated with increased student absences, especially increased absences for Black children (Dworkin, 1986). Teacher turnover and absenteeism, disciplinary problems, and student achievement can be a function of reverse causation. That is, “while low student achievement may induce teachers to leave a school, high teacher turnover and instability may also contribute to low student achievement, making the causal relationship a two-way, rather than a one-way phenomenon” (Elder & Reed, 2007, p. 3). Teacher absenteeism at GHS was 8.1% in 2008-09 (NCPS, 2010, p. 20), compared to a national average of approximately 5% (Clotfelter, Ladd, & Vigdor, 2009). For the 2006-07 school year, GHS had five teacher vacancies, while no other high school in the district had more than one (Wayne County Schools, 2007). The number of vacancies at GHS would probably have been larger if student enrollment was not shrinking radically, down 30.7% over the past seven years from 807 in 2001-02 to 559 in 2008-09 (North Carolina Department of Public Instruction [NCDPI], 2010b).

In addition to issues relating to teacher turnover, a high-poverty, majority-minority high school like GHS is five times more likely to have weak promoting power (promoting 50% or fewer freshmen to senior status within four years) than a majority-White school (Balfanz & Legters, 2004). About 2,000 high schools in the United States produce nearly half of the nation’s dropouts. In these high

schools, the number of seniors is routinely 60% or less than the number of freshmen four years earlier, representing a dropout rate of approximately 40% (Balfanz & Legters, 2006). The four-year cohort graduation rate for students graduating in the 2008-09 school year was 44.8% for all students (41% for male students; NCDPI, 2010d). While the graduation rate for the county as a whole has been increasing, the rate for GHS has declined (down from 51.5% in 2005-06 for all students, 52.7% for male students; NCDPI, 2010c). The cost of dropping out is high; for example, over their lifetime, men with a high school diploma are projected to earn nearly \$333,000 more than those who do not graduate (Wise, 2007). The Alliance for Excellent Education (2009) estimated that dropouts from the class of 2008 will cost North Carolina almost \$11 billion in lost wages over their lifetimes.

The price of segregation in Wayne County is also paid by all state and federal taxpayers. The Wayne County school district receives a smaller percentage of its revenue from local sources (18%) than the average North Carolina county (31%). State and federal revenues (68% and 14%, respectively in Wayne County, versus a state average of 59% and 10%) are required to supplement local resources (NCES, 2006). Taxpayers are sometimes required to pay higher taxes to provide increased resources for racially- and economically-segregated schools. To address the achievement gap in the 44 worst schools in North Carolina, 40 of which are both racially- and economically-segregated, additional financial resources have been mandated by the Court (see *Leandro v. State of North Carolina*). According to Henry et al. (2008), North Carolina spends an average of \$105 per student on supplementary instruction and \$456 per student on student services in Priority and Low-Performing Schools, without a discernible contribution to higher levels of academic performance.

The abysmal performance of GHS was singled out by Judge Howard Manning, when presiding in *Leandro v. State of North Carolina* (1997). In this case, the state was sued for its failure to guarantee all students—especially disadvantaged students—an equal opportunity to receive a sound, basic education (Leandro, 1997). As required by Judge Manning, the Wayne County school district has recently provided teacher sign-on bonuses as well as annual salary supplements, and GHS now has smaller classes. Still, according to the North Carolina Department of Public Instruction (NCDPI, 2010a), compared to the school district for 2008-09, GHS has a lower percentage of fully-licensed teachers, teachers with advanced degrees, and National Board Certified Teachers. The school also has fewer books per student, and the average age of the books is older than the district average. Furthermore, despite the salary mandates, research suggests that increased teacher pay does not appear to have a major effect on improving student outcomes as long as students are grouped into low-performing

schools, and increased pay does not buy higher-quality teachers in highly-segregated schools (Hanushek, 1997; Hanushek, Kain, & Rivkin, 1999).

Rather than address the effects of racial and economic segregation, the Wayne County school system has focused on finding additional financial resources to spend on the hyper-segregated GHS. In its attempts to address the failures at GHS, the school system applies annually for a School Improvement Grant (SIG), which includes a \$125,000 per year contract to America's Choice (NCPS, 2010, p. 28) to act as "the Lead Partner in the educational reform initiative" (NCPS, 2010, p. 145). America's Choice is a private provider of educational services being targeted to schools and districts with significant achievement gaps. Recently acquired by a British Company for \$80 million, the service is currently applied in more than 2,000 schools in 38 states, and it is now targeting the "rapidly growing demand for comprehensive reform in America's most struggling schools" (Pearson, 2010, p. 1). For the past three years, the school system has used the America's Choice Transformation Model, a "voluntary partnership" between a district and the NCDPI that focuses on leadership change coaches coupled with instructional facilitators (NCPS, 2010, p. 28). The 2010 SIG application summarized the school system's reform efforts and concluded, "Growth, although slower than desired, is evident, and persistence and continuity are needed for success" (NCPS, 2010, p. 29). The application listed the dropout rate as a "leading indicator" for success (NCPS, 2010, p. 2), but omitted academic achievement. The 2009 graduation rate was 44.8%. Student performance was not included on the list, and performance scores show the average GHS student is failing, with only 32.2% proficient in reading and 54.1% proficient in math (NCDPI, 2010a).

In authorizing a low-performing school that is 99% minority and 86% economically disadvantaged (NCPS, 2010), the Wayne County School Board has ensured that GHS will be a "hard-to-staff school" with all of the concomitant penalties. The Southeast Center for Teaching Quality (2001) defines "hard-to-staff" schools as: often located in rural areas; 50% or more of students are below grade level; 40% or more of high school students are economically disadvantaged; 15-18% annual teacher turnover rate; 25% of teachers have provisional licenses, are lateral entry (up to five years to earn full licensure), emergency or temporary, or probationary. There were 40 such schools in North Carolina in 2001, and they included GHS. The School Improvement Grant recognizes the desire to pay for better teachers by budgeting more than \$750,000 for staff bonuses for three years. However, only \$30,000 of these funds is for sign-on bonuses, and none of this amount is tied to additional training (NCPS, 2010, p. 145). In addition, there is no indication of where such funds will be found after the grant period.

The hyper-segregation in Wayne County is a result of actions taken by the school board in drawing attendance zones, and it represents on a local level how our nation's schools are currently trending toward re-segregation. It is common practice for governments of small and medium-sized towns to use their powers of annexation, zoning, provision of infrastructure and public services, and long-term planning to exclude minority and low-income communities from full participation in the town's benefits and governance (Johnson, Joyner, & Parnell, 2005). City boundaries are selectively drawn to include new, wealthier subdivisions while older, minority, and lower income communities are kept outside municipal boundaries. Local school districts are using similar powers via school attendance zone boundaries to re-segregate schools, setting back progress made since the passage of *Brown v. Board of Education* in 1954.

Using GIS to Analyze Segregation

Community and school boundaries are all but invisible from the ground. Who drives down a road and knows where attendance zone boundaries for individual schools lie? While disparities are not readily visible to the community as a whole, most residents who are treated inequitably know "how the land lays." What they may not know is the extent of the problem and that other school populations share their plight. Geographic Information Systems (GIS) have a unique power to illuminate this problem and begin the process of change. The power of GIS is the layering of different types of information onto a single map so that connections can be made, such as those between race, income, and school attendance zones. Using data collected from different sources, we can employ spatial analysis to explore cause-and-effect relationships and what-if scenarios, and offer potential solutions.

We used GIS to examine the current situation among Wayne County high schools, starting with the demographics of Goldsboro city. For our analysis, we used data from the 2000 United States Census (school age population), the North Carolina Department of Instruction (NCDPI), and the National Center for Education Statistics (NCES). We obtained additional data from Wayne County school staff as well as from documents produced by the county school system. We added this data to GIS layers of socioeconomic data from the 2000 census, and we created maps to illustrate racially- and economically-balanced attendance zones. Dr. Marsh created new school attendance areas using regression analysis to evaluate racial and economic balance in the attendance zones via iterations to achieve best-fit. Design of the maps was a collaborative effort by the authors.

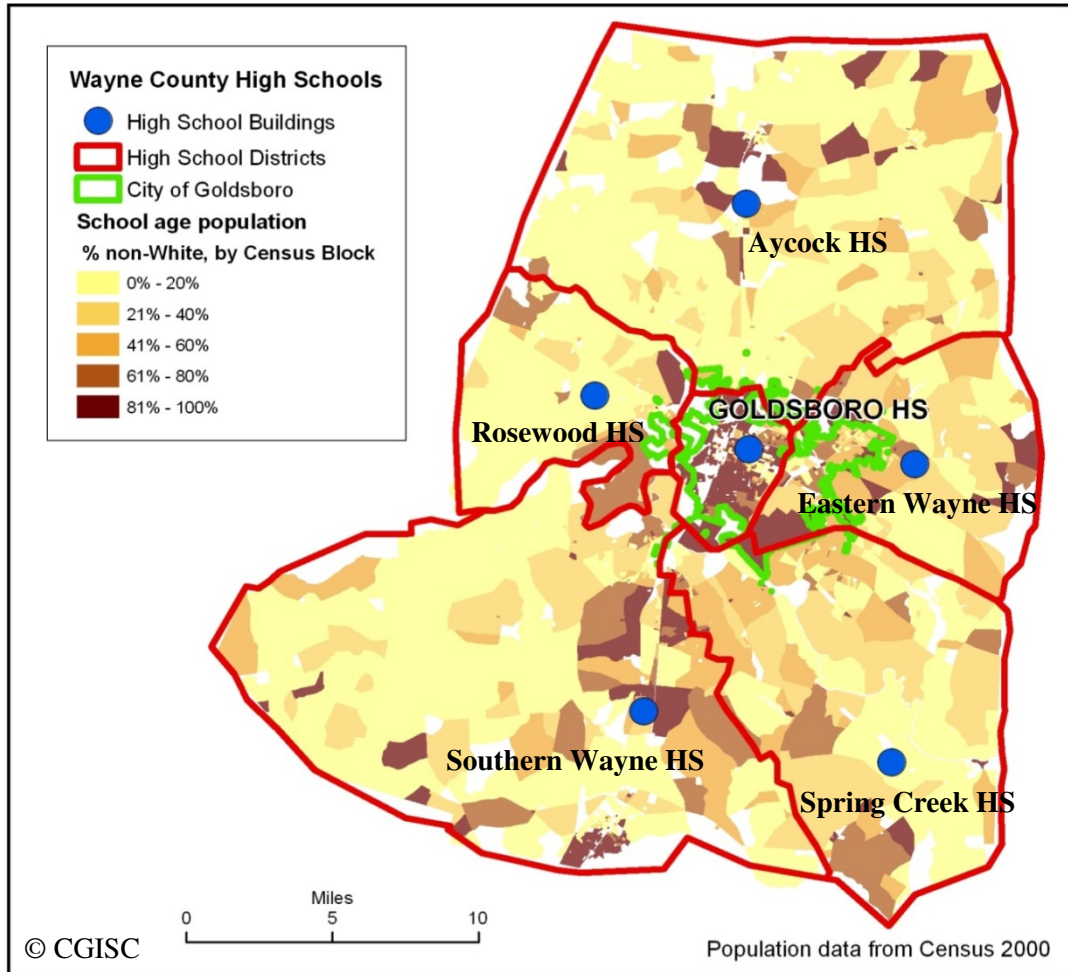
This study was not conducted for the express purpose of academic publication. Rather, we received funding from the Paul Green Foundation to pursue the project and the resulting report was subsequently used by the North

Carolina NAACP as the basis of a Title VI Complaint, which is currently being investigated by the Office of Civil Rights of the U.S. Department of Education and by the U.S. Justice Department.

Segregation in Wayne County Schools

One might assume that the Goldsboro High School (GHS) attendance zone boundaries coincide with Goldsboro city boundaries, but this is not the case. While the city is 52% Black, GHS is nearly 100% Black. Figure 1 illustrates the 2006-07 school attendance zones and city limits, as well as the race and ethnicity

Figure 1. Goldsboro and Wayne County Public High Schools Attendance Zones 2006-07



Source: Cedar Grove Institute for Sustainable Communities (CGISC), digitized from attendance zone maps, provided by Wayne County Schools, dated September 25, 2006

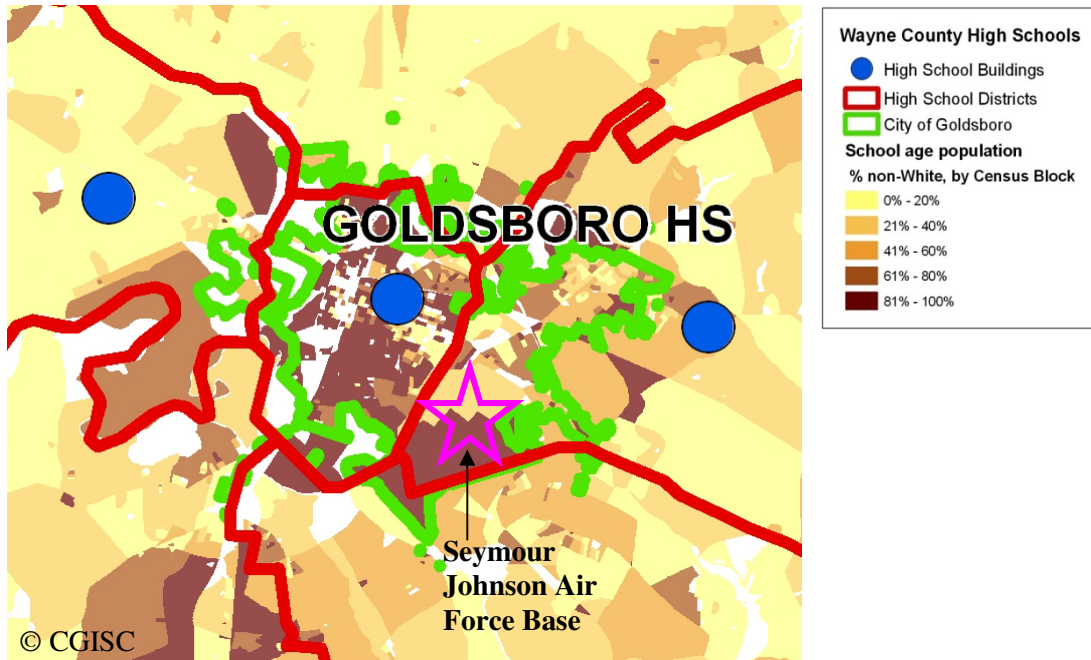
of school-age children. Although the map does not reflect density, the predominantly minority status of Goldsboro High's attendance zone is clear.

Wayne County has six high school attendance zones—each with one high school—and three alternative schools. The school system's policy is to allow transfers between zones (with administrative approval), but students must provide their own transportation if they transfer. This policy is more of a hardship for low-wealth students who are almost four times more likely to be minority in Wayne County. In this paper, we are primarily concerned with the schools that have attendance zones and how the boundaries for these zones are drawn to further segregation and create an all-minority school. Students are theoretically required to attend the high school in their attendance zone, although if a school is declared to be "failing" two years in succession, No Child Left Behind (NCLB) regulations allow students from the failing schools to transfer—assuming that there are "better" schools which have openings and that the student has transportation to the school in the other attendance zone. Using GIS allows us to overlay a school's attendance zone with census data to compare who lives in the zone with the school's actual enrollment to assess the effect of such transfer policies.

Today, Wayne County's school system is one of the state's most segregated in terms of intra-district disparities (Clotfelter, Ladd, & Vigdor, 2002). Wayne County has only one school district and can draw its school assignment areas virtually at will. Non-White residents in the county are concentrated in the center and distributed throughout (Figure 1). Yet racial isolation as measured by the standard index of isolation for high school students within the county is 56%, which is similar to central cities in the United States (57%). Isolation indices measure "the extent to which minority members are exposed only to one another" (Massey & Denton, 1988, p. 288).

Goldsboro High's attendance zone is, for the most part, a subset of the city; though, there is no requirement that it be bounded by the city in any way. The GHS attendance zone is much smaller, poorer, and Blacker than the city, and it includes almost all of the city's neighborhoods which are both Black and poor. The American Community Survey (2008) estimates that there are 1,523 residents of high school age (grades 9-12) in the city of Goldsboro, yet GHS's student population was only 645 in 2006-07. Figure 2 shows the difference between the town and GHS's attendance zone. Note that there are predominantly Black communities within Goldsboro city that are not part of GHS's attendance zone. The major difference between these communities and those that are included in the GHS attendance zone is economic. The presence of Seymour Johnson Air Base, the county's largest employer, provides a large group of middle-class Black students attending public schools and living in the center of Wayne County, but these students do not attend GHS.

Figure 2. Goldsboro City Limits vs. Goldsboro High School Attendance Zone by Race



Source: Close-up of Figure 1

According to Orfield and Lee (2005), segregation by race usually accompanies economic segregation, and this appears to be the case in Wayne County. Table 1 shows that Wayne County schools are, in reality, three distinct school systems masquerading as one: one rich and White, one balanced both racially and economically, and one poor and predominantly minority. The School Board has allowed high school attendance zones that are segregated both by race and income. William Barber, president of the North Carolina NAACP (and resident of Goldsboro) stated that GHS

exists in a pre-1954 reality. Not because of White flight. But because of reverse social engineering by school board policies, many of which we believe violate equal protection rights. This has created an attendance area with nearly 100% segregation in 2006—52 years after Brown. This has created a high poverty, low-performing high school.... This has been created in a city that is 50-50 Black-White, with an integrated Air Force base, integrated banks, integrated malls, integrated school board, and integrated city council. (Barber, 2006, p. 2)

As shown in Table 1, GHS has substantially more minority and economically disadvantaged students than any other high school in the county.

Table 1. Wayne County High Schools: Race and Socioeconomic Conditions 2006-07

High School	Minority	Economically Disadvantaged*	
		NCES	NCDPI
<u>Low-Poverty Schools</u>			
Rosewood	22.9%	31.1%	34.9%
Charles B. Aycock	27.8%	28.3%	34.9%
Eastern Wayne	50.0%	25.0%	33.1%
<u>Balanced Schools</u>			
Spring Creek	48.0%	51.6%	59.7%
Southern Wayne	56.9%	53.0%	59.8%
<u>High-Poverty School</u>			
Goldsboro	98.9%	76.4%	96.4%

*As the values for Economically Disadvantaged (ED) vary by source and as that variance increases as the percentage ED increases, the figures from NCES and NCDPI are included here.

The minority figures are from NCES.

Source: NCES. (2010). Public Elementary/Secondary School Universe Survey 2006-07 and NCDPI. (2010d). Child Nutrition Services

The state of North Carolina requires students enrolled in English I and Algebra I to complete standardized End of Course (EOC) proficiency tests. Data from the 2006-07 NC School Report Cards (NCDPI, 2010b) suggest there is

Table 2. EOC Performance at Wayne County High Schools 2006-07

High School	EOC English 1 proficiency	EOC Algebra 1 proficiency	All EOC Tests
<u>Low-Poverty Schools</u>			
Charles B. Aycock	83.0%	73.0%	77.5%
Eastern Wayne	81.0%	86.0%	79.7%
Rosewood	76.0%	62.0%	64.3%
<u>Balanced Schools</u>			
Spring Creek	67.0%	69.0%	65.4%
Southern Wayne	61.0%	60.0%	60.4%
<u>High-Poverty School</u>			
Goldsboro	50.0%	26.0%	42.2%

Source: NCDPI. (2010b). 2006-07 NC School Report Cards

evidence of disparities in achievement among the three groups of schools (Table 2). English I proficiency for GHS (high-poverty school) was 33 percentage points lower than the highest performing low-poverty school (Charles B. Aycock). For Algebra I, there was a 60 percentage point difference between GHS and the highest performing low-poverty school (Eastern Wayne). While nearly 65-80% of students in the low-poverty schools scored at or above grade level on EOC tests, just over 40% of GHS students did.

Studies show that qualified teachers can affect academic performance (Marzano, 2003; Scheerens & Bosker, 1997), yet Wayne County’s low-poverty schools have a higher percentage of fully licensed and board certified teachers than GHS (Table 3). Based on these numbers, GHS mirrors the situation in the worst of North Carolina’s schools. In North Carolina, the 44 worst high schools have average lower percentages of licensed teachers, lower percentages of fully-qualified teachers, lower percentages of National Board Certified Teachers, lower percentages of teachers with graduate degrees, and higher teacher turnover. Forty of these schools are predominantly minority (Barber, 2006).

Table 3. Teacher Resources at Wayne County High Schools 2006-07

School Category	Low-poverty	Balanced	High-poverty
Fully licensed teachers	93%	93%	81%
Teachers with advanced degrees	21%	17%	7%
National board certified teachers	14%	15%	5%
Inexperienced teachers (0-3 yrs)	23%	20%	37%
Teacher turnover rate	10%	11%	22%

Source: NCDPI. (2010b). 2006-07 NC School Report Cards

Alongside the public high schools, there are three alternative schools that serve high school students in Wayne County, and all are high-poverty schools (Table 4). The alternative schools have no dedicated attendance zones, or their attendance zones overlap other high schools’ zones. These schools are for students with learning disabilities or disciplinary problems. The students enrolled at these schools are predominantly minority and economically disadvantaged. All of these schools have a substantially higher percentage of economically disadvantaged students than the other six high schools. Their numbers of economically disadvantaged students are also higher than their numbers of minority students. In fact, Southern Academy, which is 81% minority, is 99% economically disadvantaged. Southern Academy is an alternative school for children with behavioral problems and serves the entire southern half of Wayne

County (D. Evans, personal communication, September 6, 2007). All of these alternative schools were small, with just 80-137 students.

Table 4. Alternative Schools in Wayne County 2006-07

School	Minority	Economically Disadvantaged	
		NCES	NCDPI
Edgewood Community Developmental School (special education)	59.1%	51.8%	94.0%
Belfast Academy (alternative school)	72.2%	45.6%	90.7%
Southern Academy (behavioral school)	81.3%	52.5%	98.7%

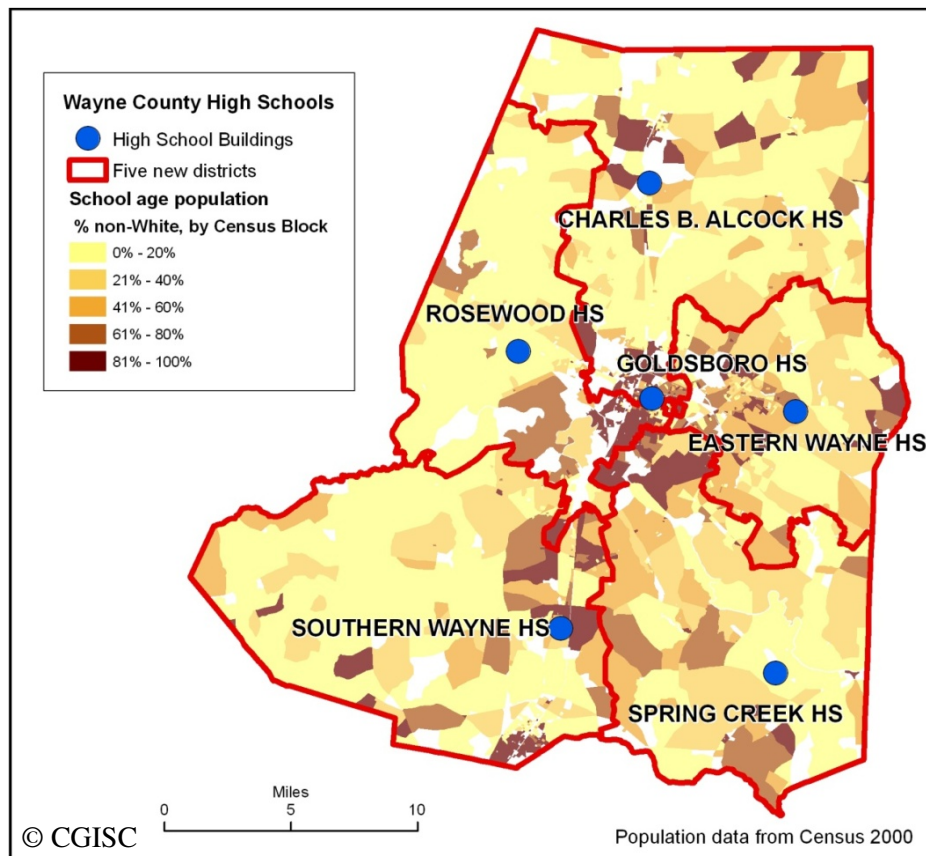
Source: NCES. (2010). Public Elementary/Secondary School Universe Survey 2006-07 and NCDPI. (2010d). Child Nutrition Services

Is Segregation in Wayne County a Necessary Result of “Neighborhood Schools”?

According to Wayne County’s School Board Chair, the racial makeup of Wayne County’s schools indicates a high rate of residential segregation (Dewitt, 2010). The attendance zones currently in place suggest that Wayne County has chosen to maintain its segregated school system to the detriment of its students. Under the guise of a “neighborhood schools” strategy, the School Board has sustained a racially- and economically-segregated school, with a high concentration of economically disadvantaged students and families that goes far beyond the residential segregation of the city and county. According to Saporito and Sohoni (2006), when a school attendance area is concentrated racially and economically in this way (predominantly minority and high poverty) while others are equally concentrated but composed of the opposite extreme (predominantly White and/or low poverty), a tipping point occurs and those with the means exercise their choices by one way or another (private school, charter schools, or obtaining transfers). The result is that the racially- and economically-isolated school becomes more and more segregated; GHS is an excellent example of this process. Rather than addressing the problems behind low-performing schools, the NCLB transfer provision may have exacerbated this problem as GHS has lost 31% of its student body over the past decade. Those who remain after all others have fled have fewer and fewer options. Currently, the only two schools with open spaces available for students who want to transfer under the NCLB Act are GHS and Southern Wayne, which has the second largest population of poor and minority students.

However, the distribution of White students and Black students across the county suggests that school segregation was not a necessary result of neighborhood schools. Using GIS, we have created attendance zones based upon two possible alternatives: A) Turn GHS into a magnet school and create five new, larger attendance zones; or B) Keep the same number of attendance zones but reassign students by drawing new boundaries, splitting predominantly-Black GHS among six attendance zones, none of which are magnet schools. The second alternative recognizes the 1998 Public Agenda poll result, which found substantial support for racial integration combined with choice even while strong opposition to busing existed (Kahlenberg, 2001). We derived the predicted minority and economically disadvantaged values using attendance zone census data (minority and income values for the school-age population). We used linear regression to estimate the number of economically disadvantaged students for the new zones. We obtained the percentage of the affected income group for the new student

Figure 3. Option A: Five Alternative Attendance Zones with Goldsboro High as a Magnet School



Note: The correct spelling of the school is Charles B. Aycock.

population directly from the census. We then plotted economically disadvantaged rates reported by the schools against the percent-below-poverty-level from the U.S. census for the same area and fit a straight-line best-fit curve to the distribution. Figure 3 represents the boundaries of option A and Table 5 shows the predicted percentages of minority and economically disadvantaged students.

As shown in Table 5, the magnet approach does appear to reduce racial and economic disparities, but the degree to which balance would actually occur would depend upon the success of a magnet school located at GHS in attracting both Black and White students. In 2007, the School Board did create a magnet school, Wayne School of Engineering, and even located it on the GHS campus. Rather than taking this opportunity to improve GHS and create a more racially- and economically-balanced attendance zone, however, the Board created a completely new school, located physically adjacent to GHS (see discussion in the next section), leaving GHS to continue to wither (attendance at GHS has declined by 31% in less than a decade).

Table 5. Option A: Five Alternative Attendance Zones with Goldsboro High as a Magnet School

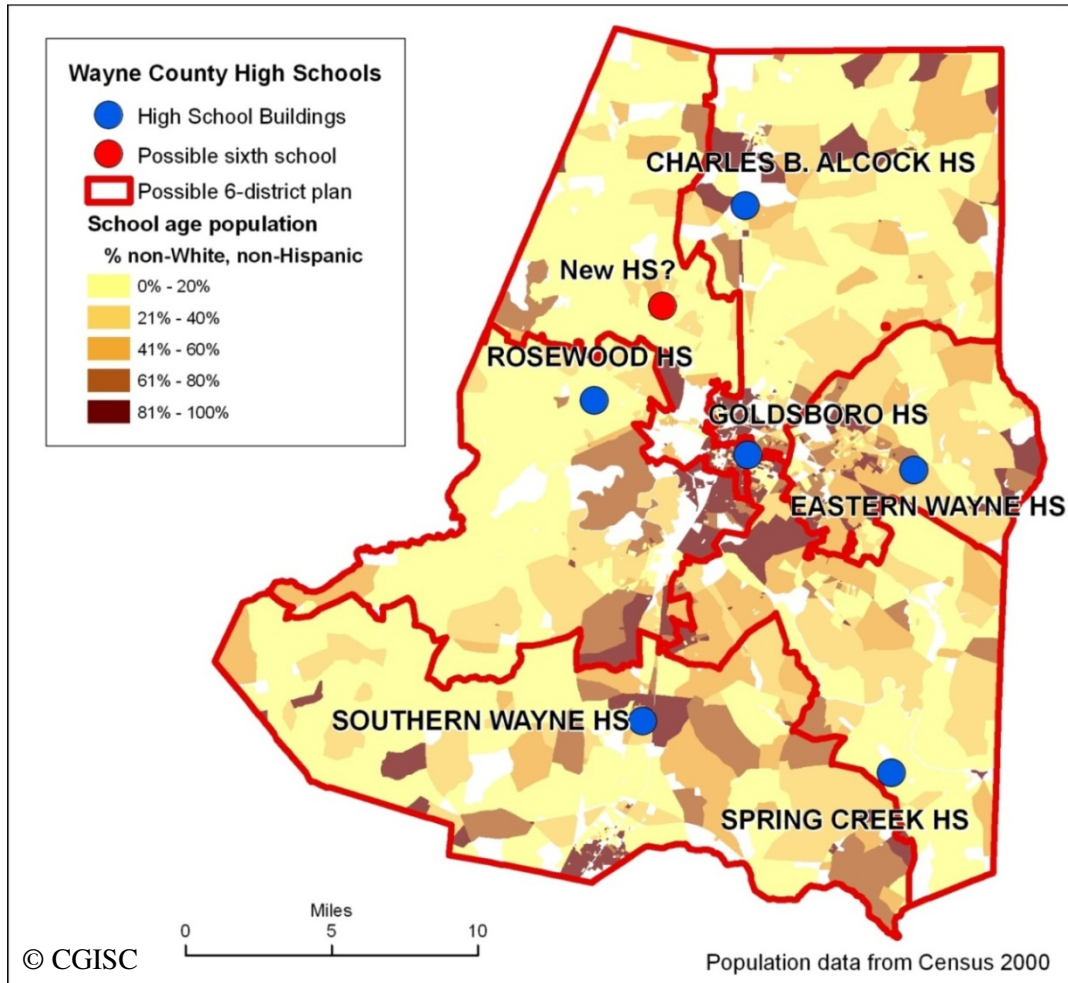
School	2006-07 Minority*	Predicted Five-Plus Magnet Minority	2006-07 Economically Disadvantaged*	Predicted Five-Plus Magnet Economically Disadvantaged
Rosewood	22.9%	47%	31.1%	54%
Aycock	27.8%	50%	28.3%	46%
Spring Creek	48.0%	44%	51.6%	60%
Eastern	50.0%	46%	25.0%	31%
Southern	56.9%	45%	53.0%	54%
Goldsboro	98.9%	47%	76.4%	38%

*Source: NCES. (2010). Public Elementary/Secondary School Universe Survey 2006-07

Another way that Wayne County might achieve racial and economic balance in all its high schools is to re-draw all of its high school attendance zones (Figure 4). This might require replacing GHS with a new, non-magnet school in a new location. This alternative could be more politically palatable as a new school would not be associated with the historically Black GHS. The Wayne School of Engineering could then use the current GHS facilities. However, we are not suggesting that a new school replacing GHS is necessary to achieve racial and economic balance. Figure 4 and Table 6 illustrate how the current attendance zones can be re-drawn to achieve racial and economic balance without investing

in a new facility.

Figure 4. Option B: Six Alternative Attendance Zones



Note: The correct spelling of the school is Charles B. Aycock.

The two options we present serve as an illustrative starting point for creating attendance zones centered around the schools that are an improvement over the current system. Each of the two alternatives we offer maintains the idea of neighborhood schools while also promoting racial and economic balance, thereby providing improved educational opportunities to all of Wayne County's students.

Table 6. Option B: Six Alternative Attendance Zones

School	2006-07 Minority*	Predicted Six Zones Minority	2006-07 Economically Disadvantaged*	Predicted Six Zones Economically Disadvantaged
Rosewood	22.9%	45%	31.1%	50%
Aycock	27.8%	45%	28.3%	42%
Spring Creek	48.0%	49%	51.6%	48%
Eastern	50.0%	41%	25.0%	27%
Southern	56.9%	47%	53.0%	65%
Goldsboro	98.9%	51%	76.4%	65%

*Source: NCES. (2010). Public Elementary/Secondary School Universe Survey 2006-07

New Magnet School to Achieve Socioeconomic Diversity

The first alternative option we propose involves reducing Wayne County from six to five attendance zones and transforming GHS into a magnet school. It is interesting to note that several years ago, Wayne County was offered federal dollars to set up a magnet program on the campus of GHS. However, there were strings attached—if the county failed to increase diversity by a certain time, those funds would have to be returned. The county turned down the funds (A. McSurely, personal communication, January 18, 2010).

Not knowing that discussions to create a magnet program were afoot when we embarked on this study, we decided ourselves to propose an option that included the creation of a magnet school on the GHS campus. While we were in the midst of our study, Wayne County developed the Wayne School of Engineering (WSE) on the GHS campus. According to the WSE website (<http://www.waynecountyschools.org/wse/>), attendance is by application and interview. This school differs markedly from the magnet suggested in our first option in that it is *in addition to* GHS, and leaves GHS and its attendance zone intact.

WSE opened August 8, 2007. The curriculum focuses on science, technology, engineering, and mathematics, including courses in robotics, biomechanics, and solid modeling. The school features project-based learning and requires at least 15 hours of college credit and an internship. The school year is longer than normal and the school day begins later than normal at 10:30 a.m. In this effort, the county has partnered with a variety of entities around the nation, including the New Schools Project (for staff development), the Boston Museum

of Science, Wayne Community College, and East Carolina University. According to their website, this partnership also includes GHS.

The “Innovator,” produced by the North Carolina New Schools Project, an initiative of the Office of the Governor and the Education Cabinet with the support of the Bill and Melinda Gates Foundation and others, describes the school:

The Wayne School of Engineering opened in early August at Goldsboro High School, where test scores have lagged. The new school, which this year includes about 85 9th graders, draws students from across Wayne County. (NC New Schools Project, 2007, p. 4)

This seems to imply that WSE will help Goldsboro High’s performance, which is somewhat misleading, as is a more overt statement by Dr. Steven D. Taylor, Superintendent of the Wayne County Public Schools. When Taylor reviewed the proposed expansion budget for 2007-08, he listed the partial funding/startup cost of \$500,000 for the School of Engineering on the GHS campus under the goal of “Socio-Economic Diversity” (Wayne County Board of County Commissioners, 2007). However, it seems any diversity achieved is most likely to be limited to the student population within WSE. While WSE and GHS share the same campus, the engineering school is located in a separate building from GHS, its starting and ending times are different, and its student body and staff are different and separate. In fact, GHS lost its competent and well-liked assistant principal to WSE, and GHS enrollment declined by 57 students after WSE opened (2008-09 compared to 2007-08). As admission to the new school is by application only, it is likely to attract the best students away from GHS. Given these facts, WSE is unlikely to affect GHS students in any way except as a brain drain and another psychological signal that they are “less than” other schools. In addition, WSE could pull the more advantaged students from other county high schools, leaving those schools even more segregated.

The Bill and Melinda Gates Foundation committed \$30 million to support the creation of 40-45 new and redesigned high schools through the North Carolina New Schools Project. The Wayne School of Engineering is part of the program, which seeks to impact African American and Hispanic students. However, this method of addressing educational disparities also has the potential to exacerbate the problem it was designed to address, without accurate evaluation of the schools’ impact on the intended beneficiaries. Saporito and Sohoni (2006) found that private, magnet, and charter schools exacerbate segregation within school districts, with the exception of neighborhood-based magnet schools designed for the purposes of racial integration. By creating WSE as a stand-alone magnet school on the GHS campus and leaving GHS largely untouched, the Gates Foundation, the Wayne County School Board, and the students of Wayne County

may have missed an opportunity to create greater diversity and improve the school experience for the county's minority students. If, instead, the School Board had elected to transform GHS into a magnet school and distribute GHS students to other high schools, the entire district could have been made more diverse, with the concomitant advantages that diversity brings to all students.

Conclusion

Studies show there are powerful benefits to integrated schools. In a statement directed to the nation's Supreme Court prior to its June 2007 integration decision, a group of 553 social scientists cited many benefits which accompany integration, including: cross-racial understanding, less prejudice, improved critical thinking skills and academic achievement, enhanced life opportunities for students of all races, reduced residential segregation, increased parental involvement in schools, and increased community stability (Garces, 2006). In addition, Orfield (2008) suggests that high school graduation rates are higher in schools that are less segregated. These are demonstrable benefits and yet students of color are increasingly consigned to highly segregated schools. According to a recent UCLA Civil Rights Project report, the huge gains in race relations achieved during the civil rights era are being lost—especially in the south and Border States (Orfield & Lee, 2007).

When Justice Kennedy wrote the June 2007 defining opinion in *Meredith v. Jefferson County Board of Education* (2005) and *Parents Involved in Community Schools v. Seattle School District No. 1*, he sided with the conservative majority in throwing out the schools' race-conscious school attendance plans. At the same time, however, he noted that race may sometimes be a component of school efforts to achieve diversity: "A district may consider it a compelling interest to achieve a diverse student population... Race may be one component of that diversity." Justice Kennedy pointed out the power of school attendance zone boundaries as one method that could be used to keep schools diverse without assigning individual students based on race:

School boards may pursue the goal of bringing together students of diverse backgrounds and races through other means, including strategic site selection of new schools; drawing attendance zones with general recognition of the demographics of neighborhoods; allocating resources for special programs; recruiting students and faculty in a targeted fashion; and tracking enrollments, performance, and other statistics by race. (Supreme Court of the United States, 2007, p. 8)

Notably, the Court's decision in the Louisville and Seattle cases has provided legal guidance that heretofore has been lacking, according to Ashley

Osment (personal communication, April 22, 2007), senior attorney with the Center for Civil Rights at the University of North Carolina at Chapel Hill. In this regard, Justice Kennedy agreed with the four justices who found that racial diversity and avoiding the harm of racial isolation are compelling governmental interests that school districts are authorized to pursue. In this study, we have used GIS to examine the claim that Goldsboro High School in Wayne County, North Carolina is hyper-segregated because of residential segregation patterns and the School Board's desire to maintain "neighborhood schools." Given sufficient support in the community or legal action, this re-segregation can be reversed. Using GIS, we have demonstrated that it is possible for Wayne County to achieve school attendance zones that provide greater racial and economic balance while maintaining "neighborhood schools." We believe that such methods meet Justice Kennedy's test for race-conscious means to achieve diverse public schools and can be implemented in many school districts across the South.

Follow-Up Note

Since the first draft of this paper was written in 2007, the North Carolina NAACP and the national NAACP Legal Defense Fund have filed a Title VI complaint with the U.S. Department of Education and the Educational Opportunities Section of the Justice Department's Civil Rights Division. Much of that original report, including a map, was used in that complaint, according to Allan McSurely, legal redress committee chairman of the NAACP of North Carolina (personal communication, December 2, 2009). In March of 2010, the U.S. Department of Education announced a new commitment to enforcing civil rights laws and agreed to investigate Wayne County's schools.

In an interview on National Public Radio, Chairman of the school board Rick Pridgen laughingly dismissed the charges of re-segregation: "I don't even know if that's a word in the dictionary, to be honest with you.... The schools have nothing to do with and can't change the demographics of the city; you know, the schools has [sic] absolutely nothing to do with where people chose to live" (Dewitt, 2010). He did not note that the GHS attendance area does not align with the city limits, nor did he mention that his School Board was responsible for creating the boundary lines of all attendance areas.

Note

¹ North Carolina's Hispanic population is growing rapidly, but the 2000 census reported only 6.6% in Wayne County and 3% in Goldsboro. Thus, they are not broken out as a group in this paper.

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