Transit and Parking Problems of American Public Schools: Observations from Arkansas

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Public and parochial schools across the United States are struggling to keep pace with increasing parking demands and escalating transportation costs. School districts spend enormous sums of money acquiring and maintaining buses and parking infrastructure. Parents who drive their children to school and those high school students who drive daily exacerbate the problems by generating massive amounts of traffic. Multiple data sets were collected from the Arkansas Department of Education and several individual school districts. At the state-level these data highlight the amount of money spent on transportation and the expected increases in fuel consumption and overall transit expenditures due to the consolidation of small districts into fewer but larger schools. The metropolitan-level data collectively highlight transportation inefficiencies—the amount of fuel consumed, the number of vehicle trips, and time wasted—created by widespread consolidation, public policies that discourage pedestrian activity, and the cultural preference for automobiles. A series of recommendations is offered to alleviate some of the parking and transportation concerns—many healthy and sustainable options exist to support smaller urban neighborhood schools and rural districts. *Key Words: Consolidation, Parking, and Transportation.*

Introduction

Public and parochial schools across the United States are struggling to keep pace with increasing parking demands and escalating transportation costs. Coles (1999, 7) points out that the "problem is not rising enrollments . . . but the fact that virtually every student feels the need to have his or her own car." Many parents are supportive of their teenage children driving to school due to its *perceived* convenience. For instance, Gross (2003) states "You've been driving them for so long—to soccer, dance, what have you. When they turn 16, you're thanking whatever gods there are not to have to do this anymore."

The number of students and parents who drive to school daily, along with each district's fleet of buses, is generating several transportation concerns, such as increased fuel expenditures and traffic congestion.[1] Additionally, many students live within safe walking distance of a neighborhood school but are discouraged to do so by public policies that emphasize motorized transporta-

Southwestern Geographer, Vol. 13, 2009, pp. 63-88.
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tion and a lack of pedestrian infrastructure (Kay 1997; Turley 2005). These issues are not only the result of poor planning but also the current economy of scale mentality in education. Because of consolidation many students are now faced with long and costly bus rides or lengthy commutes to distant mega-schools.

This research examines a number of geographical issues—school location and transportation—in the United States, and uses the state of Arkansas (450,000 students) and the Jonesboro, Arkansas metropolitan area (approximately 12,000 pupils) for two different levels of analysis. At the state-level, the Arkansas Department of Education (2006a; 2006b; 2006c) provided a series of *Financial Analysis and Accountability Reports*, 211 fuel surveys, and data regarding public school debt. The data highlight the role of rising transportation expenditures in the substantial increase in the state's education budget. As a result of consolidating small districts into fewer but larger schools, Arkansas has witnessed a dramatic increase in fuel consumption, per pupil transportation expenses, and an expanding transportation budget.

At the metropolitan-level, administrators from ten districts and/or schools provided a breakdown of transit patterns for each campus. Most students (90+ percent) in this particular case study are either bus riders, car riders, or drive themselves to school, while only 5 percent walk to school and *none* ride bikes. A number of cultural issues (car ownership rates and the amount of parking, for instance) help explain the existing transportation problems.

Additionally, observations were conducted at six elementary schools to generate an estimate for the amount of time wasted. Most studies that discuss the amount of time squandered are referring to time "stuck in traffic" (Downs 1992; Downs 2004; Schrank and Lomax 2005). This analysis, on the other hand, highlights the amount of time parents voluntarily waste sitting in parked cars waiting for dismissal time. Furthermore, transit problems are not limited to financial constraints. A recent survey revealed that many children in Arkansas are critically overweight—a trend found in many areas across the United States—and research has demonstrated that obesity rates are highly correlated to the built environment and transportation choices (Ewing, Brownson, and Berrigan 2006; Frank, Andresen, and Schmid 2004). Body Mass Index (BMI) reports for the entire state are examined as is the connection between pedestrian activity and the built environment at the metropolitan-level.

The state-level and metropolitan-level data sets collectively highlight the transportation inefficiencies—the amount of fuel consumed, the number of vehicle trips, and time wasted—created by widespread consolidation, public policies that discourage pedestrian activity, and the cultural preference for automobiles. This project offers a series of recommendations to alleviate some of the parking and transportation concerns. Many healthy and sustainable options exist to support smaller urban neighborhood schools and rural districts.

Spatial Requirements and School Consolidation

Many state and local public policies inadvertently encourage and promote poor school locations which significantly impact transportation options because minimum site standards typically work against older urban areas and traditional planning ideas (Vincent 2006). The *North Carolina Public School Facilities Guidelines* (2003, 3) states, for example, that a high school facility located in a rural or suburban area needs a minimum of 30 acres of land plus an additional acre for every 100 faculty, staff, and/or students, and that a "high school may need an additional area of 10 acres or more if a stadium and spectator parking are anticipated."[2] In Illinois, the Champaign Unit 4 School District is anticipating the need for new elementary, middle and high schools in the Northwest Growth Area and the "acreage requirements for each are as follows: 12 to 15 acres for an elementary school, 25 to 35 acres for a middle school, and 45 acres for a high school, for a total requirement of between 82 and 95 acres" (City of Champaign 2007). In Arizona, the state school facilities board requires a number of "square footage standards" for school buildings and an "all weather surfaced area" for parking that is "large enough to accommodate one parking space per staff FTE [full-time equivalent] and one visitor parking space per 100 students" (Arizona School Facilities Board 2002). In general, facility appraisers recommend that "school parking lots should be large enough to accommodate at least 50 percent of a school's 11th and 12th graders" (Coles 1999, 7). Building and parking policies and regulations, such as the previous examples, often work against centralized and/or urban locations due to the lack of available land or the exorbitant purchase price for large tracts in built-out areas. As a result, districts frequently target less expensive peripheral destinations which are often "donated" by developers who use the new school facilities to promote their own suburban subdivisions to the detriment of older urban neighborhoods and established public schools.

Consolidation, which has a tremendous impact on transportation, is another issue facing many school districts across the United States. Lay (2007, 792) notes that for "much of the 20th century, scholars believed that larger schools, especially high schools, would benefit everyone. Resources could be combined from several smaller schools into one large school, creating an economy of scale." The push for consolidation has greatly impacted rural areas, where many administrators and public officials have called for regional "mega-schools" to create a so-called more efficient education system. An editorial published in *The Des Moines Register* (2003) highlights the call for rural consolidation: "where it is geographically feasible, four or five districts could pool their resources and offer students so much more."

Although it is typically cited as a justification for consolidation, the economy of scale mentality does not translate into savings. Howley (1997, 24) states that many education leaders today were trained at a time when "big schools were regarded unquestionably as superior to small ones." However, current research confirms that the pervasive idea in older literature that "bigger schools save money" is in fact a myth and that "consolidation actually squanders money" (Howley 1997, 25, 28).

Consolidation in Arkansas

In Arkansas, a study analyzed school consolidation from 1965 to 1995 (218 districts were consolidated during this time) and found that school expenditures increased dramatically after districts were combined (Goatcher 1999). More recently, dozens of districts have been consolidated and/or reorganized yet costs continue to escalate. According to the Arkansas Department of Education (2006a), state-wide education expenditures jumped from $2.88 billion in 2003 to $3.44 billion in 2005, an increase of 19.6 percent in only two years. Additionally, the total Arkansas public school debt has risen from $1.53 billion in 2002 to $2.45 billion in 2006, a 60.1 percent increase in five fiscal years (Arkansas Department of Education 2006b).[3]

Goatcher (1999) contends that savings in one area as a result of consolidation is typically offset by increased expenditures in other areas and transportation costs dramatically increase, especially in rural areas. Kenny (1982, 4) agrees and adds that as the "numbers of students rise, the average distance spent commuting to school increases, and transportation expenditures increase. Included in these expenditures are the value of parental and student time in going to and from school, automobile expenses, or bus costs." This appears to be the situation in Arkansas. In one Arkansas example, a superintendent of two consolidated districts (the Huttig and Strong systems) commented that "our transportation budget for fuel costs…has literally tripled" (Zeman 2006a). In another case, the Carthage, Arkansas district joined the adjacent Malvern system. As a result, Malvern's district grew in size from 232 square miles to 443 square miles and added just 9.1 percent to its student population but fuel expenditures jumped 185 percent, from $42,000 to $120,000 (Rousseau 2005). And these are not isolated or unique cases. From 2003 to 2005, the state's transportation budget increased from $103 million to $122 million (+19.4 percent) and the per pupil rate went from $229.13 to $269.70 (+17.7 percent) (Arkansas Department of Education 2006a).

Even though the evidence against economies of scale continues to mount, state officials in Arkansas support proposals for widespread consolidation to create more so-called efficient schools (Moritz 2006; Nelson and Wiese 2003; Zeman 2006b).[4] Former Governor Huckabee initially called for the consolida-

tion of all districts with fewer than 1,500 students, a policy supported by the Arkansas State Chamber of Commerce which "favors the 'economies of scale' that consolidation would bring" (Associated Press 2003). A compromise between the governor's office and the state legislature ultimately lowered the minimum number to 350 students. Districts below that threshold have been forced to either consolidate with another district(s) or be annexed with an existing district to reach the minimum number, and as a result, a "total of 106 school districts have been reorganized since 2003-2004 under Act 60" (Johnson 2006: 3; State of Arkansas 2003a).

Table 1 highlights the transportation budgets for fourteen districts consolidated between 2003 and 2005 (thirteen of the fourteen were consolidated by Act 60, the exception being the Parkin system which joined the Wynne District under the Omnibus Act).[5] Over this time period the entire state witnessed a rise in transportation expenses by 19.4 percent and the state-wide per student transportation costs increased by 17.7 percent (Arkansas Department of Education 2006a). In comparison, most of the consolidated districts (eleven of fourteen) far exceeded the state's averages for transportation increases and per student costs (Table 1). From 2003 to 2005, these fourteen districts' transportation budgets increased on average by 60.9 percent (three times the state average) and their per student expenditures increased on average by 31.6 percent, double the state average (Arkansas Department of Education 2006a).

Many parents are also opposed to the consolidation plan because of the amount of time students spend commuting back and forth from school.[6] In Phillips County, a group of parents and students filed a suit against consolidation and pointed out that the "merger would mean round-trip school bus rides for some students of about 150 miles a day and four hours long" (Associated Press 2006). In another case, involving Paron High School and Bryant High School, a circuit court judge recently ruled to temporarily halt consolidation citing the fact that in this particular case "students who spend up to four hours a day on a bus will have significantly less time to spend with their families, to do their homework, to hold after school jobs or to assist with the care of their siblings" (Zeman 2006b). Despite the nearly ubiquitous use of the word "efficiency" in articles dealing with school consolidation, most fail to address the enormous transportation burdens widespread consolidation creates. Any future discussions should include the true costs of consolidation, particularly transportation expenses.

Fuel Surveys at the State-Level

Due to escalating fuel consumption and transportation costs, the Arkansas Department of Education (2006c) recently required each school district to complete a fuel transportation survey. The main impetus behind the survey was to

Table 1. Transportation Budget Increases for Recently Consolidated Districts, 2003-2005

District	Percent Change in Transportation Budget	Percent Change in Per Student Transportation Expenses	Size of District in Square Miles
Augusta	45.1	18.5	221
Clarendon	102.1	49.4	184
Clinton	51.8	35.6	239
Concord	148.0	91.2	136
Corning	28.3	10.7	316
Dewitt	31.8	-6.6	597
Dumas	39.2	29.1	262
Fouke	46.6	26.1	123
Greenland	79.6	44.9	77
Marion	60.8	42.5	100
McGeehee	70.2	33.1	140
Star City	45.7	27.9	310
Stephens	73.7	11.0	160
Wynne	29.0	28.4	212
Averages	60.9	31.6	219.8
State of Arkansas	19.4	17.7	172

Source: Arkansas Department of Education, 2005; Arkansas Department of Education, 2006a.

explore the possibility of shifting the responsibility of purchasing fuel from individual districts to the state, with the hopes that buying-in-bulk would cut back on fuel costs (the shift never occurred, individual districts still buy fuel independently). Out of a total of 310 districts in Arkansas, 211 responded to the request (Table 2). These 211 districts collectively maintain 5,374 school buses which traveled over forty-six million miles during the 2005-2006 academic year. During that academic year, those districts consumed nearly seven million gallons of fuel which cost just under $16 million dollars—fuel prices have since risen by more than $1.00 per gallon. Moreover, a conservative esti-

Table 2. Arkansas Fuel Survey Data

Number of Districts Reporting = 211	
# of Buses	5,374
Cost of Buses	$134,350,000*
Annual Mileage	46,024,537
2005-06 Fuel Consumed (Gallons)	6,685,767
2005-06 Fuel Cost	$15,721,599.87
Projected 2006-07 Fuel Demands (Gallons)	8,203,926
Estimated Numbers Based on Total Number of Districts (310)	
# of Buses	7,895
Cost of Buses	$197,375,000*
Annual Mileage	67,618,988
2005-06 Fuel Consumed (Gallons)	9,822,690
2005-06 Fuel Cost	$23,098,083.11
Projected 2006-07 Fuel Consumed (Gallons)	12,053,161

* = Estimated based on the conservative average of $25,000 per bus.
Source: Arkansas Department of Education, 2006c.

mate for the purchase price for the buses is well over $100 million dollars (Table 2). Finally, it is also important to note the projected increase in fuel costs and the anticipated rise in fuel consumption because of consolidation. As a result of geographically combining districts more buses will be traveling more miles and the number of gallons of fuel consumed annually is expected to increase by 22.7 percent (Table 2).

Estimates for the entire state based on the averages for the 211 responding districts have also been calculated (Table 2). The entire state has well over 7,000 school buses which travel approximately 67,000,000 miles on an annual basis. Moreover, the calculated purchase price for the state's bus fleet is a conservative $197,375,000 and an estimated $23 million was spent on fuel during the 2005-2006 academic year.[7]

Surveys from three local districts and interviews with administrators provide a more in-depth analysis of fuel costs, fuel consumed, miles traveled, and the total costs of busing (Appendix A) (Table 3). Administrators at the Nettleton School District, located in Jonesboro, Arkansas, calculated the total costs (fuel, insurance, maintenance, and bus driver salary) for each mile traveled at $2.91. Using that formula, three of the four Jonesboro districts analyzed—with 88 buses that traveled 854,580 miles—spent approximately $2,486,827.80

Table 3. Local Districts' Fuel Consumption and Annual Number of Miles Traveled

District	Buses	Miles Traveled	Fuel Consumed*	Costs	Square Miles
Jonesboro	41	276,060	32,142**	803,334.60	38
Nettleton	26	378,560	38,000	1,101,609.60	42
Valley View	21	199,960	26,500	581,883.60	106
Westside	NA	NA	NA	NA	210
Sample Totals	88	854,580	96,642	$2,486,827.80	99.0

* = In gallons.
** = Estimated based on consumption rates at Nettleton and Valley View.
Source: Arkansas Department of Education, 2005; Greer, 2006; Kieffer, 2006; and Salmons, 2006.

for transportation last year (2004-2005). Applying the $2.91 cost per mile for the entire state (67,618,988 miles @ $2.91 = $196,771,255.10) provides a more accurate picture of the true annual transportation costs at the state-level—Nettleton's per pupil transportation cost in 2005 was $251.33, slightly lower than the state-wide average. Even those numbers, however, fail to capture the additional hundreds of millions of dollars spent on building the infrastructure required to support the current transportation system (Figures 1 & 2).

Transportation Options at the Metropolitan-Level

Transportation at area schools in northeast Arkansas is so inefficient that a recently published article discussing the Arkansas Virtual School, a program for parents who home-school their children, cited not having to drive as one of the major benefits. The *Northeast Arkansas Parent* (2004, 4) states "Reba has not waited in a long line of cars to drop her girls off at school. . . . Giving up the traditional rush of the ordinary hurried and harried school morning is just one perk for this family utilizing the Arkansas Virtual School." District transportation directors and/or staff members from ten Jonesboro area schools provided the number of bike, bus, and car riders in each district in addition to the number of high school students who drive to school daily and the number of children who walk to school (Table 4). The collected data highlight the lack of bicyclists and walkers and the amount of automobile and bus traffic at area schools.

The number of Jonesboro students who bike or walk to school is well behind the national average and far behind the rates found in other countries.

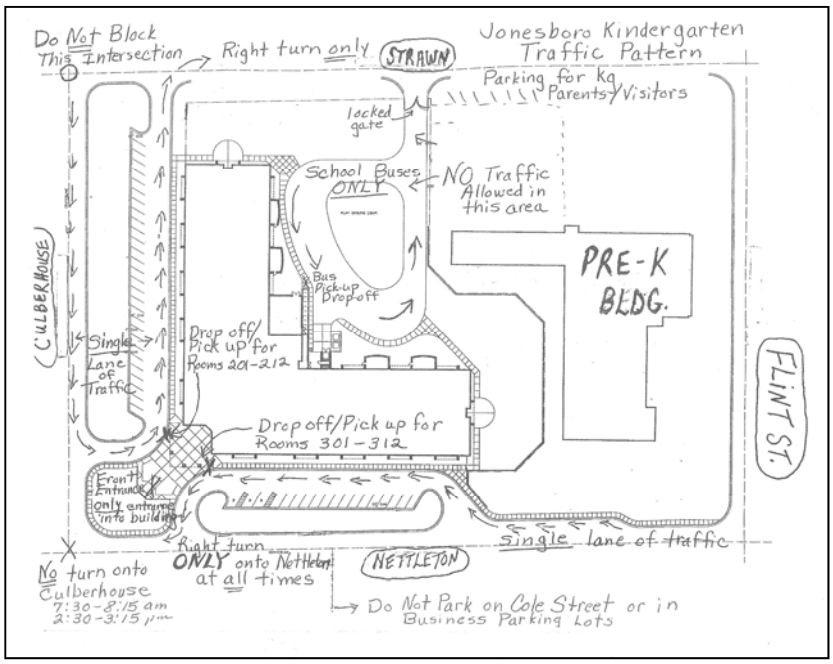

Figure 1. Jonesboro Kindergarten Center's Traffic Plan. *Source*: Russell, 2005.

Internationally, more than twenty years ago Denmark established the Safe Routes to School Program. Odense, Denmark's third largest city with a population of approximately 150,000, currently has more than 60 percent of its school children biking to school (Toor and Havlick 2004, 268). In comparison, Toor and Havlick (2004, 130) write that in the United States over the "last twenty years, trips to school by walking and biking decreased by 40 percent. Among children aged 5 to 15, nearly half are driven to school in cars, another third take a bus, about 13 percent bike to school, and only 10 percent walk to school." In Jonesboro, the ten area schools surveyed have an enrollment of 12,179 students and of that number 94.8 percent are either bus/car riders or drive themselves to school. Only 629 (5.2 percent) students walk to school and *zero* bike to school.

Of the four districts analyzed, Jonesboro has the greatest number of walkers—albeit quite small compared to national and international averages—and the lowest per student transportation budget. In 2005, Jonesboro spent $172.04 on transportation per pupil and registered 466 walkers. On the other hand, Westside, spatially the largest of the four local districts studied at 210 square

Figure 2. Jonesboro High School Parking Lot. *Source*: Photo by author, May 2007.

miles, spent $343.61 per student on transportation—nearly double Jonesboro's rate—and recorded zero walkers (Arkansas Department of Education 2006a).

In regard to efficiency, or lack thereof, consider the number of students who either drive to school or are car riders (Table 4). Those two categories equal half of the sample population (50.5 percent) and generate approximately 12,298 vehicle trips per day. Over the course of one week the number of trips increases to almost 62,000 and over the duration of a 15-week semester those 6,149 students generate an estimated 922,350 vehicle trips—just over 6,000 students create nearly one million vehicle trips each semester.

Cultural Transportation Issues at the Metropolitan-Level

Not only is there a lack of pedestrian-friendly infrastructure but local school policies do not support walking or biking. Consider the action taken after a fatal accident at an elementary school in the Jonesboro district and the response by parents. After the incident, the Jonesboro School District banned bicycles at all elementary schools and added a number of "crosswalks to nowhere" (Figure 3).[8] In response to the bicycle ban, one parent stated "I agree. I feel that children through the fifth grade are too young to know the hazards of

Table 4. Number of Bikers, Bus Riders, Car Riders, Drivers, and Walkers at Area Schools

School	Bikers	Bus Riders	Car Riders	Drivers	Walkers
Blessed Sacrament*	0	0	135	0	0
Concordia*	0	0	47	0	0
First Presbyterian*	0	0	100	0	0
Jonesboro	0	2,284**	1,819	418***	466
Montessori*	0	0	84	0	1
Nettleton	0	1,166	1,650	221	113
Ridgefield	0	0	280	27	2
St. Marks*	0	0	96	0	0
Valley View	0	891**	425	257	47
Westside	0	1,060	431	159	0
Total	0	5,401	5,067	1,082	629

* = Elementary and/or pre-school only.
** = Total includes bus riders and day care van riders (124 of the 5,401 are van riders).
*** = Total includes three motorcycle riders.
Source: Appendix A.

the road," and another parent added "If they feel a ban on bikes or skateboards will help make the campuses safer, I'm all for it" (Pruitt 2004). Instead of raising concerns about the lack of sidewalks or the fact that area schools are inundated with bus and car traffic, parents spoke out in favor of the bicycle ban. Many administrators and parents unfortunately fail to see the importance of pedestrian-friendly infrastructure in regard to providing children safe access to neighborhood schools.

A detailed examination of the five pre-school and/or elementary schools sampled support the notion that culture, and in this case "car culture," is a learned behavior (Balsas 2003; Carney 1995; Raitz 1995). These five schools have 463 students and of that number 462 are car riders (Table 4). It would not be wise to allow many of these young children to walk to school alone but it is significant that besides automobiles there are no other transportation choices. In traditionally planned neighborhoods, parents and children have the option of safely walking to school. That alternative does not exist in areas where schools are segregated from the communities and there are no sidewalks (www.cdc.gov 2007). Reversing the current trend will be difficult since most parents today cannot conceptualize any other form of transportation.

Figure 3. Pedestrian Crosswalk at South Elementary School. *Source*: Photo by author, May 2007.

The low bus patronage rate (approximately 20 percent of Jonesboro's high school students ride the bus while over 50 percent drive each day) is explained by car ownership rates, the amount of parking, and the cultural preference and importance of automobiles. Nationally, there is one car for every 1.29 people in the United States—in comparison the world average is one car for every 11.2 individuals (Shoup 2005). Pisarski (1996) adds that over the past few decades the United States has been adding more cars than people and a recent *National Household Travel Survey* found that the typical American family now has more vehicles in the garage (1.9 vehicles) than licensed drivers in the household (1.8 drivers) (U.S. Department of Transportation 2003). In Jonesboro, census data reveal that the total population over eighteen years of age is 42,790 and there are 37,215 registered vehicles—one car for every 1.15 residents over eighteen (www.aiea.ualr.edu 2007).

Several scholars (Rubenstein 2004; Turley 2005) have noted that automobile ownership has changed urban design and form. Jakle (1994, 293, 295) contends, for example, that "no other technological innovation has so transformed the geography of the United States as the automobile" and that the "scale of things [has] changed to accommodate the speed, flexibility, and bulk of the automobile." In Jonesboro, mass car ownership has significantly im-

pacted the cultural landscape, particularly residential and commercial areas, and public school campuses. School districts have accommodated the number of commuters by providing an abundance of subsidized parking. The four local districts (Jonesboro, Nettleton, Valley View, and Westside) provide a total of 3,954 paved parking spaces. Individual campus totals range from twenty-five stalls to well over seven hundred paved spaces. In comparison, the fourteen campuses combined have only nine bicycle racks and seven of the campuses currently do not have bicycle storage equipment of any kind.

In addition to the amount of parking and mass car ownership, the overall lack of bus ridership by American high school students is partially explained by culture. Toor and Havlick (2004, 248) state that "high school social mores tend to elevate those who own a car, or are friends with someone who does, far above those students who must rely on the yellow school bus." In another article, one school administrator stated "'it's not cool to ride the bus, and that's sad . . . students call it the 'loser cruiser'" (Coles 1999, 7). Gross (2003) adds that "getting a license has always been a rite of passage, and the proper car a badge of honor. But nowadays, the make-or-break status symbol is less the license or the car than the parking permit, an increasingly scarce resource." Gross (2003) continues, at Greenwich High in Greenwich, Connecticut, it is "socially acceptable only for freshman" to ride the bus, and "affluent families see a third car as a necessity, since working parents are not available to chauffer children."

Stuck in Traffic or Just Wasting Time?

Various organizations have provided estimates for the amount of time Americans spend stuck in traffic and some of the related costs (Downs 1992; Downs 2004; Schrank and Lomax 2005). A recent *USA Today* editorial by U.S. Representative Petri (2005) states that "America's economy and standard of living depend on efficient transportation," and that in 2003 the "cost of traffic congestion nationwide was over $68 billion, resulting from 3.7 billion hours of extra travel time and 2.3 billion gallons of fuel wasted while sitting in traffic."

In contrast to the studies which have evaluated commuters who are "stuck in traffic," this analysis examines a trend at schools across the country where parents and/or guardians of school-aged children voluntarily waste exorbitant amounts of time and energy sitting in parked cars. I studied six elementary schools in the Jonesboro metropolitan area and counted the number of vehicles in line 30 minutes and 15 minutes before dismissal (Table 5). There were 259 automobiles waiting at those six schools at least 15 minutes before dismissal, and of that number 117 were in line at least 30 minutes prior to school ending for the day. Those waiting in line collectively wasted 5,640 minutes or ninety-

Table 5. Daily Amount of Time Wasted at Six Public Schools in Jonesboro, Arkansas

School	# of Cars, 30 Minutes	# of Cars, 15 Minutes	Minutes Wasted
Fox Meadow	23	52	1,125
Hillcrest & Douglas MacArthur (Jr. High)	9	29	570
Kindergarten Center	35	42	1,155
Nettleton Intermediate & Elementary	7	40	705
South	30	52	1,230
University Heights	13	44	855
Sample Total	117	259	5,640

Source: Data collected by author.

four hours on the sample day. Over the course of one week the amount of time squandered increases to approximately 470 hours, and for an entire academic year the amount of time lost would be in the tens of thousands of hours.

The above figures represent the number of vehicles waiting at 15- and 30-minute increments; however, the numbers increase dramatically as school dismissal time approaches. At South School (first through fifth grades) in addition to multiple school buses, a total of 209 vehicles were in an approximately half-mile long line at 3:00 p.m. and by 3:30 more than 300 vehicles had picked up children at the "loading area" (Figure 4). These data represent an enormous waste of both time and energy—most of the vehicles sit idling with air conditioners running during the summer months and heaters in operation during the colder months.

Public Health and the Built Environment

Public policies that influence transportation choices and impact the built environment also have a substantial impact on human health. Frank, Andresen, and Schmid (2004, 88) note, for instance, that an "increasing body of evidence shows that the physical design of the places where people live and work affects their overall travel choices and how much they walk or bike for utilitarian travel." Frank, Andresen, and Schmid (2004, 94) continue, "increased time spent driving, a sedentary form of behavior associated with other environmental and economic costs, is associated with increased odds of being obese." Poor planning and transportation choices have contributed to obesity concerns for many students not just in Arkansas but across the nation and the problem is particularly acute in the southern United States (Arkansas Center for Health

Figure 4. Line of Automobiles at South School's "Loading Area." *Source*: Photo by author, May 2007.

Improvement (ACHI) 2005; Ewing, Brownson, and Berrigan 2006; Toor and Havlick 2004). Over the past twenty years childhood, adolescent, and adult obesity has become a national epidemic and a recent study found that ten of the fifteen states with the highest rates of adult obesity and eight of the ten states with the highest childhood obesity rates are in the South (Trust for America's Health 2007).[9]

In the case of Arkansas, a recent Body Mass Index survey found that "21 percent of the state's public school students met or exceeded the Centers for Disease Control and Prevention's criteria for being overweight, while 17 percent of the students were at risk for overweight" (ACHI 2005, 1). The overweight and at-risk categories equal nearly 40 percent of all public school children in Arkansas. Table 6 highlights the assessments of the four local school districts analyzed in this project. At two of the four schools less than 2.0 percent of the students were listed as "underweight" while more than 30 percent of both male and female students were in the at-risk and overweight categories. At the other two schools more than 40 percent of the students were in those categories.

Table 6. Percent of Obese and At-Risk Students in Four Northeast Arkansas Schools

School	% Male Underweight	% Male at Risk	% Male Overweight
Jonesboro	1.3	18.5	25.6
Nettleton	1.8	16.4	21.8
Valley View	2.6	16.6	18.2
Westside	NA	16.9	25.1
School	% Female Underweight	% Female at Risk	% Female Overweight
Jonesboro	2.0	18.6	22.7
Nettleton	1.3	20.1	19.8
Valley View	1.3	15.8	14.8
Westside	NA	16.5	23.9

Source: Arkansas Center for Health Improvement, 2005.

Despite the fact that few students in any of the analyzed metropolitan-level districts walk to school, it should be pointed out that the Jonesboro and Nettleton Districts have the majority of walkers (579 of 629) (Figure 5). The built environment does influence transportation choices (Ewing and Cervero 2001) and the Jonesboro and Nettleton systems are the only districts that have neighborhood locations.[10] The Valley View and Westside campuses are both located on the suburban fringe where biking and walking are not viable options.

To combat childhood obesity in Arkansas the state legislature passed Act 1220 of the 2003 legislative session (State of Arkansas 2003b). Act 1220 has a number of stated goals, for instance, removing vending machines from elementary schools, replacing fried foods with healthier choices, and establishing a litany of health advisory committees. All are worthwhile endeavors, but Act 1220 fails to mention transportation and the importance of location and urban planning. Furthermore, legislation calling for widespread consolidation will offset any advantages of the recommended menu changes due to the fact that public school students will have longer commutes to new mega-schools and fewer opportunities to bike or walk to school.

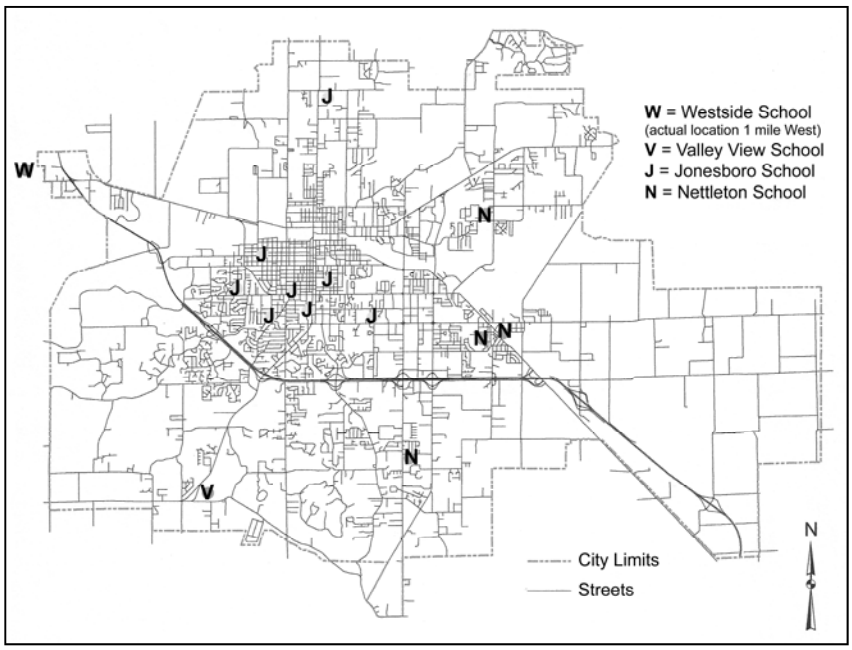

Figure 5. Jonesboro, Arkansas' Area Schools. *Source*: Map by author, 2007.

Recommendations

For decades schools have been neighborhood anchors—focal points for communities (Bryk, Lee, and Holland 1993; Duany, Plater-Zyberk, and Speck 2000; Kunstler 1993). Vincent (2006, 434) states, for example, that "public schools are a unique kind of infrastructure—both physical and social." Schools create pride in place and are a critical part of a community's social capital. Now, however, new suburban mega-schools, which are far removed from their constituents and act as catalysts for suburban sprawl, are replacing smaller neighborhood schools.[11] Beaumont and Pianca (2000, 11) refer to small neighborhood schools as an "important part of America" and effectively argue that "'school sprawl' is contributing to the dismemberment of communities around the country." Toor and Havlick (2004, 252) agree and state that the "public school system . . . is the most influential planning entity, either public or private, promoting the prototypical sprawl pattern of American cities."

The social impacts created by new schools are not confined to urban areas. Consolidation in rural areas generates similar problems to consider. Students and parents who attend and support rural districts are hubristically loyal to the local school and Howley (1997, 30) contends that "every time a small school is

closed" in a rural area "parental and community involvement suffers." Rural closures often leave a single high school to serve students from hundreds of square miles and as a result "such school districts run no activity buses for students" and because of the distances involved parents are less involved (Howley 1997, 30). The importance of well-planned schools in both urban and rural areas cannot be overstated and location and transportation issues should be central to the planning process. There is a strong connection between the built environment and the educational experience, and Kay (1997, 297) convincingly argues that "we must bring back . . . the walkable block, the next-door neighbor, the nearby library and school."

The disappearance of local and/or neighborhood schools in Arkansas is reflected in the increasing spatial extent of consolidated districts. In total, the 308 districts in Arkansas have an average size of 172.0 square miles. In comparison, the recently consolidated districts average 219.8 square miles in size (Table 1). Moreover, the twenty-seven districts consolidated between 1987 and 1998 average 266.7 square miles, nearly 100 square miles larger than the current state-wide average (Arkansas Department of Education 2002). A similar trend is found at the metropolitan-level. In Jonesboro, the two older districts located in or near the urban core average forty square miles in size which is much smaller than their suburban counterparts that average 158 square miles (Table 3).

In regard to transportation, biking and walking have to move from being viewed as recreational activities to utilitarian activities as well. Mumford (1963, 234, 237) noted decades ago that the "fatal mistake we have been making is to sacrifice every other form of transportation to the private motorcar." Or as Kunstler (2005, 115) observes, "instead of finding a new fuel to run suburbia, a far more sane and intelligent response might be for Americans to live in traditional walkable communities served by public transit." Biking and walking are legitimate transportation options in addition to leisure activities and part of the equation is placing pedestrian-friendly infrastructure on equal footing with highway and parking construction (Frank, Andresen, and Schmid 2004; Shoup 2005). Communities and neighborhoods should also emphasize sidewalk continuity to connect potential destinations (Ewing and Cervero 2001) and realize that subsidizing highway construction and cheap parking discourages "travel by foot, bicycle, and mass transit" (Shoup 1997, 15).[12]

There are also a number of cultural strategies to implement that would ameliorate part of the transportation and parking demands. At the high school-level, districts have attempted to keep pace with the growing demand for additional parking by constructing more parking. This failed strategy is not sustainable; therefore, discouraging single-occupancy vehicles is an obvious area to target (Balsas 2003). By providing discounted parking rates to those students who carpool is also an option, as is spatially prioritizing lots to allow

carpoolers to park in prime locations. However, many of the transportation and parking demands can be eliminated by altering transit patterns at an early age. Toor and Havlick (2004, 248) contend that "encouraging younger students to use alternate modes for traveling to and from school will result in a stronger inclination to consider universities and communities that provide pleasant and effective bus, bike, or pedestrian opportunities, helping develop lifetime habits." Changing culturally defined transportation patterns will not be accomplished without controversy. Few students in the current generation know any other form of transportation and many transportation directors and planners are "reluctant to change" because they "were trained when the 'automobile was king'" (Balsas 2003, 37). Constructing a comprehensive transportation and parking plan, one that recognizes and utilizes various transportation modes, is essential.

Conclusions

Public and parochial schools across the United States are faced with mounting parking demands and transportation costs. The number of students and parents who drive to school daily, along with each district's fleet of buses, is generating several transportation concerns. Many of these problems are compounded by public policies that promote consolidation and minimum site standards. In Arkansas, the anticipated savings associated with school consolidation have failed to materialize—state-wide education expenditures have increased nearly 20 percent in recent years. Additionally, the total Arkansas public school debt has risen 60.1 percent in just five years. In addition to the construction costs associated with consolidation, a part of the budget increases is related to transportation. From 2003 to 2005, the state's transportation budget expanded 19.4 percent and the per pupil rate increased by 17.7 percent. The state also anticipates a substantial increase (a 22.7 percent rise in one academic year) in fuel consumption due to consolidation. Furthermore, transit problems are not limited to financial issues. Regarding obesity, a recent BMI survey found that the overweight and at-risk categories combined total nearly 40 percent of all public school children in Arkansas and the metropolitan-level data highlight the built environment's influence on transportation.

At the metropolitan-level, administrators from ten districts and/or schools provided transit data for each campus. Most students (90+ percent) in this particular case study are either bus riders, car riders, or drive themselves to school, while only 5 percent walk to school and no students ride bikes. Much of the traffic congestion and lack of pedestrian activity is related to car ownership rates, the amount of parking, and the negative stigma attached to riding the bus. Even though only a small percentage of Jonesboro's students bike or walk, those who attend the neighborhood campuses are more likely to do so

than their suburban counterparts. Observations were also conducted at elementary schools to generate an estimate for the amount of time squandered waiting for dismissal (Table 5). Each day literally hundreds of automobiles wait in long lines at campuses in Jonesboro and over the course of an entire semester the collective time wasted is in the thousands of hours.

Realizing the importance of and correlation between geography and transportation is essential. Administrators and planners need to focus on sustainable long-term transportation solutions. Simple design standards that incorporate pedestrian infrastructure can create and foster life-long healthy habits. Rethinking the importance of smaller-scaled neighborhood schools can revitalize traditional planning methods that often use schools as community focal points.

Notes

1. The United States currently has 505,000 public school buses which travel an estimated 5.8 billion miles per year (Monahan 2006).
2. The regulations "assume a rural or suburban area with a one story building, room for expansion, desirable outdoor play areas and all parking, queuing and buses located on site. Urban sites and areas that follow the tenets of 'smart growth' may find creative solutions on substantially smaller sites" (Public Schools of North Carolina 2003).
3. Depending on the means of financing, purchasing new school buses is part of a district's indebtedness (Simmons 2007).
4. The state of Arkansas has a long history of school consolidation. In the 1920s, Arkansas had nearly 5,000 school districts and by the early 1940s the number had declined to approximately 3,000. With Amendment 40 to the Arkansas Constitution in 1948, the number of districts went from some 3,000 to fewer than 500 (Berry and Novak, 1997; Dougan, 1994).
5. These fourteen districts were selected because they have been truly consolidated by adjoining districts. Other districts were partially consolidated (just the elementary or high school) or in some cases multiple districts were geographically combined to create entirely new boundaries.
6. Fowler (1988) states that bus routes should be developed so that students have no more than a thirty minute ride one-way, and no more than sixty minutes of bus time per school day.
7. Wingerter (2006), who is the General Manager of Central States Bus Sales, states that new buses cost approximately $80,000 and leased buses with 15,000 miles are in the $65,000 range—a conservative figure of $25,000 was used in these calculations. Arkansas also has an aging bus fleet (the average public school bus is thirteen years old, four years above the national average). The state annually replaces just over 9 percent of its

bus fleet and effective July 1, 2010 no Arkansas school district may operate a bus more than twenty years old—older buses will face mandatory replacement (ADAFT 2005; Picus and Nelli 2006).

8. A number of crosswalks were added at local elementary schools after the fatal accident. Most come to an abrupt dead-end once across the street—either meeting fences or telephone poles, for instance. Additionally, the Jonesboro Public Schools (2006, 13) *Elementary Handbook* for the 2006-2007 academic year, states that the district "prohibits bicycles, scooters and skateboards on all K-5 campuses. . . . the guidelines have been developed by the principal or designee in conjunction with staff and neighborhood community members with full recognition that bike riding to and from school involves unavoidable danger in traffic which the district cannot prevent. The amount of danger for students, especially young students, is impacted by the location of the school."
9. Mississippi has the highest adult obesity rate at 30.6 percent followed by West Virginia, Alabama, Louisiana, South Carolina, Tennessee, Kentucky, and Arkansas. In regard to childhood obesity, the District of Columbia leads the nation with a 22.8 percent rate followed by West Virginia, Kentucky, Tennessee, North Carolina, Texas, South Carolina, Mississippi, and Louisiana (Trust for America's Health 2007).
10. Despite the presence of neighborhood schools there is little difference in the obesity rates of Jonesboro's four large districts because so few kids walk to and from any of the schools. Additionally, obesity rates are also impacted by several factors (ethnicity and income-levels, for instance) which are outside the scope of this study.
11. The Jonesboro School District for the 2007-2008 academic year is moving from a local/neighborhood elementary school plan to a magnet school system. Geography will play a much smaller role in determining where children go to school. Not only will this impact the neighborhood-school connection but transportation costs will likely increase. A flyer recently sent to parents states "if your child is currently eligible for busing, we will provide transportation for them next year. If your child is not currently eligible for busing, but your child is enrolled in a school other than your neighborhood school, shuttle transportation will be provided from the neighborhood school" (Jonesboro Public Schools 2007).
12. The Centers for Disease Control and Prevention and the Bikes Belong Coalition both have programs that promote bicycling and walking as viable transportation alternatives. The Bikes Belong Coalition has the Safe Routes to School plan and the KidsWalk-to-School program is sponsored by the Centers for Disease Control and Prevention (www.bikesbelong.org 2007; www.cdc.gov 2007).

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Appendix A. List of Transportation Data Providers

Mary Beth Chipman, Ridgefield Christian School
Russell Clark, SAC School
Charles Cobbs, Jonesboro High School
Michelle Curtis, Jonesboro Public Schools
Carolyn Duke, First Presbyterian
Ricky Greer, Hillcrest School
Lela Gremard, Valley View Public Schools
Paul House, Philadelphia School
Arthur Jackson, South School
Mike Johnson, Nettleton Schools
Eddie Mitchell, Westside Public Schools
Cathy Rapp, Blessed Sacrament
Bryan Russell, Kindergarten Center
Nancy Shewmaker, Concordia School
Greg Thielemier, Annie Camp School
Pat Vaughn, St. Marks School
Diana Way, Montessori School
Ronald Williams, West School
Carol Wright, MacArthur Junior High