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ABSTRACT

This report provides the first detailed picture of the features of the rural school bus ride. Data were provided by principals in 696 rural elementary schools in Arkansas, Georgia, New Mexico, Pennsylvania, and Washington--states chosen to represent diversity in region, locale, and ethnic composition. The literature commonly cites 30 minutes as the standard for maximum duration of the one-way school bus ride for elementary children. Results indicate that the longest ride exceeded this standard at 85 percent of schools surveyed and exceeded 60 minutes at 25 percent of schools. Long bus rides were frequently compounded by other dangerous or unpleasant features: 100 percent of students double-routed, rough-ride index higher than average, emergency training not conducted regularly, and some or all buses without communication devices. However, differences among states in this regard were very large, with Arkansas having consistently higher prevalence of these features and Washington and New Mexico having lower prevalence than other states. Burdensome features of the school bus ride were also more common in rural schools with high poverty or low minority enrollment. As rural schools have consolidated, they have become more centrally located, enrolled more students, and increased their geographic domain. Correlations between longest ride and size of attendance area are substantial. It would be logical to speculate that rural school consolidation produces longer average bus rides. (Contains 18 references, statistical data tables, and the survey instrument.) (SV)

The Rural School Bus Ride in Five States
A Report to the Rural School and Community Trust

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EXECUTIVE SUMMARY

This report provides the first detailed picture of the features of the rural school bus ride. Data were provided by rural elementary school principals in Arkansas, Georgia, New Mexico, Pennsylvania, and Washington: states chosen to represent diversity in region, locale (rural and suburban), and ethnic composition. Schools were selected at random, and response rates varied between 52% and 71%.

Four conclusions define a set of key policy issues related to the rural bus ride[1]:

(1) longest rides at rural elementary schools widely violate professional norms;

(2) features of the rural school bus ride combine in ways that probably compound risks to the well-being of elementary children;

(3) hypothetical risk factors vary systematically by poverty and minority status (impacting rural white children, in fact, more strongly than rural children of color); and

(4) rural school consolidation prospectively shapes features of the ride and compounding hypothetical risk factors.

Longest Rides

A commonly cited standard for one-way length (duration) of school bus rides for elementary children is 30 minutes. In an appalling *85% of these rural elementary schools*, respondents reported that longest rides exceed this upper limit. Worse still, in 25% of these rural schools, longest rides reportedly exceed *60 minutes* (the suggested standard for *high school students*). It seems thoughtless that adults would so frequently impose long commutes on some

[1]Please see the full report for complete analyses and caveats.

rural children, a reflection underlined by the finding that, in the most impoverished schools, longest rides are *substantially* longer than in other rural schools. The average commuting time for adult Americans is just 22.4 minutes, and even in Los Angeles, the land of congested freeways, it is only 26.5 minutes. Apparently being rural and poor is sufficient justification, in practice, to impose long rides on some young children.

Compounded Risks

Leading scholars (e.g., Bronfenbrenner, 2000) have reflected on the extraordinary degree of separation from children that modern society and its practices have imposed on families and communities. Challenging features of children's commute to school compound and reinforce this separation. Analyzed in the report, these compounded features of the ride are as follows:

- longest ride of 30 minutes or more at school,
- longest ride of 60 minutes or more at school,
- 100% of students double-routed,
- rough ride index higher than average,
- emergency training not regularly conducted, and
- some or all of buses without communication devices.

Illustrative results appear in Table 5 for combinations of two to four features simultaneously encountered at a given rural elementary school. The report shows that combinations of these features of the rural bus ride are *prevalent* among rural elementary schools. Differences between states in this regard, moreover, are sharp and reach very high levels of statistical significance; state of residence itself, then, appears to be a risk factor.

Inequalities on the Ride

Potential risks are compounded by poverty and minority status. Most succinctly, in highest-poverty rural elementary schools as compared to lowest-poverty rural elementary schools:

- longest rides of 60 minutes or longer are *three-quarters* more common,
- double-routing rates are almost *one-third* higher,
- the proportion of mileage over mountainous terrain is almost *double*,
- the proportion of mileage over unpaved roads is nearly *one-third* higher,
- full-time bus supervision is about *one-third* less common, and
- *half* as many children (eligible to ride a bus) are optionally driven to school.

Similarly, in lowest-minority rural schools as compared to highest-minority rural schools:

- longest rides of 60 minutes or longer are *twice* as common,
- the rough ride index value is nearly *three-quarters* higher,
- the proportion of mileage over mountainous terrain is about *three times* as high,
- the proportion of mileage over hilly terrain is about *twice* as high,
- the proportion of mileage over unpaved roads is nearly *50 percent* higher,
- the proportion of mileage over level terrain is about *half* as high, and
- closures of 6 or more days for inclement weather are *three-fifths* more common.

These findings indicate that riding the rural school bus is as much a part of inequity in the U.S. as living in a particular neighborhood or holding a particular job. It is as characteristic of educational inequity as unequal school funding, unequal access to fabulous teachers, and differential achievement levels.

Consolidation

As rural schools have consolidated, they have become more centrally located and have enrolled more and more students. As a result, the geographic domain served by them has also expanded. Correlations between longest ride and size of attendance area are substantial. In all likelihood, size of the school attendance area most strongly influences the average length of the bus ride in rural schools. All else equal, it would be logical to speculate that rural school consolidation *produces* longer average bus rides.[2]

Implications

The finding that poverty is consistently associated with the burdens of the rural bus ride strengthens the logical argument for sustaining and restoring smaller schools in rural areas of the United States. Instead of focusing policy efforts only or principally on mitigating burdensome features of the rural school bus ride, educators and policy makers can more effectively foil the burdens of the ride by ensuring the existence of small rural schools, especially ones that serve impoverished rural communities.

[2]This hypothesis has not been adequately studied to date, but it is clear that longer rides increase the separation of students from rural communities and families.

The Rural School Bus Ride in Five States

Introduction

From Fall 2000 to Spring 2001, the author and two colleagues collected information[3] about the nature and experience of the school bus ride from representative samples of rural and suburban elementary school principals in five states (Arkansas, Georgia, New Mexico, Pennsylvania, and Washington, using a survey instrument devised by the researchers). Survey response rates varied by state from a low of 52% (Georgia) to a high of 71% (Arkansas), though rural principals were slightly more responsive than suburban principals. In April 2001, the research team presented a report about rural and suburban differences in the school bus ride, based on the data gathered (Howley, Howley, & Shamblen, 2001).[4] This second report, by contrast, provides a more detailed picture of the *rural school bus ride.*

The first report showed that the rural school bus ride was *markedly* different from the suburban ride. In comparison to suburban schools, rural schools were:

(1) more likely to have longest rides of 30 minutes or more,

(2) more likely to have attendance areas greater than 10 square miles,

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[3]The data-gathering effort that produced the data on which this report is based was supported by the Policy Program of the Rural School and Community Trust and by AEL, Inc., the latter under contract from the U.S. Department of Education, Office of Educational Research and Improvement (OERI). The interpretations developed and the positions taken are those of the author alone and not of either sponsor, OERI, or the U.S. Department of Education. The author regrets any errors of omission or commission.

[4]Presented at the annual meeting of the American Educational Research Association, Seattle, WA. The full paper, which has been submitted for journal publication and submitted to ERIC, is available online at: http://oak.cats.ohiou.edu/ ~howleyc/howleyc.htm, and the results were summarized in the May 2001 issue of *Rural Policy Matters* (summary also available on line at: http://www.ruralchallengepolicy.org/rpm/RPM3_5.html).

(3) more likely to have bus routes with rougher rides,

(4) less likely to be located in districts that employ a full-time bus supervisor; and

(5) more likely to include secondary students on the same bus runs as elementary students.

Additional rural-suburban differences were statistically significant in one to three states. These differences are all summarized in the first paper, which, in fact, suggested a real basis for the concerns typically expressed by parents and communities about the length and potential dangers of rural as opposed to suburban bus rides.

Because it aimed to compare rural and suburban bus rides, the first paper could not supply the detailed information about the nature and experience of the *rural* bus ride.[5] This follow up report, therefore, provides a detailed record and analysis of the survey data gathered from *rural* elementary school principals (n=696) in the five states studied. According to principals' reports, these rural schools enrolled 267,031 students; the rural schools were located in districts with as few as 15 and as many as 110,000 students.

This second report includes (1) extensive state-by-state descriptive statistics about (i) the demography of rural schools and (ii) features of the bus ride; (2) a state-by-state correlational analysis of the relationships of features of the rural bus ride with two salient demographic variables (i.e., poverty and proportion of the student population that belongs to ethnic minorities); and (3) an analysis of differences according to within-state poverty and minority

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[5]"Rural" schools are those identified by locale code 7 ("rural") in the *Common Core of Data*, the annual census of schools and districts prepared by the National Center for Education Statistics of the U.S. Department of Education. Rural schools may, however, be located in comparatively urbanized *districts*.

status. The final section of this report discusses the findings and considers the implications and caveats related to the findings. Ancillary analyses have also been conducted as necessary to help clarify issues that emerge as a result of examining the main results.

For the applicable literature review and details about survey construction and administration, readers are referred to the earlier paper (available at the author's web site and in the ERIC microfiche collection). The text of the survey instrument appears in Appendix A.

The Nature and Experience of the Rural School Bus Ride

Readers can consult Table 1 for relevant descriptive information about the nature and experience of the rural school bus ride. Here, key findings will be presented narratively. Findings appear in five categories: (1) demographics; (2) transportation (i.e., proportions of students bused, walking, or driven, and so forth); (3) students' experience of the ride; (4) roads and terrain; and (5) the bus system (that is, selected features of the bus system related to students' experience of the ride).

Demographics

The first paper reported that the geographic area (extent) of the school attendance region exerted a significant influence on the duration of the longest ride at a school. This second report provides greater detail: among the reporting rural schools, those in New Mexico (nearly 60%) have the greatest proportion of attendance areas of 25 or more square miles, while those in Georgia (about 25%) have the fewest.

Other demographic information (consistent with nationally available data) shows that rural school and district enrollments are largest in Georgia (540 and 7,540, respectively), whereas rural *school* enrollment are smallest in New Mexico (225) and Arkansas (319), and rural *district* enrollments are smallest in Arkansas (923) and Washington (1,313).

Across all these rural schools, subsidized meal rates average 49%, but the range of variation is substantial within all five states. Further, New Mexico has the highest rate (a mean of about 79% of students receiving subsidized meals) and Pennsylvania the lowest (about 32%). In 20% of the schools in the sample, subsidized meal rates are 70% or higher. Such results indicate that, on average, these randomly selected rural schools serve impoverished communities.

Across all these rural schools, an average of 18% of students belong to ethnic minorities. The variability between states, however, is quite large. In New Mexico, rural schools enroll nearly 70% minority students on average (ranging from 25% to 100%). In Pennsylvania, however, the average is just 2.5% (ranging from 0% to 35%). The other three states are closer to the whole-sample average percentage, though in them the values vary widely, from 0 to 100%. Across the entire sample, one-fifth of these rural schools enroll 30% or more minority students. Just 9% (n=65) of these 696 schools enrolled no minority students at all (57 of these schools were located in Arkansas and Pennsylvania, representing 19% and 13% of the schools in those states, respectively). Ethnicity, in short, is a manifest issue in *most* rural schools in the sample.

Finally, it's of interest to note the prevalence of "unit" (or "union") schools, which house all grades, K- or pre-K-12 in one building. Across this rural sample, 95 schools (14%) take this form. In two states (Arkansas and Washington), this uniquely rural organizational form

constitutes a sizable minority (about 25%) of reporting schools. About 15% of the rural schools reporting from New Mexico had this grade span configuration, as well. In both Georgia and Pennsylvania fewer than 7.5% of the reporting schools were of this sort.

Transportation

Virtually all schools in the sample provide free transportation to students. Only two of the responding schools reportedly did not (one in New Mexico and one in Washington). Across the entire sample, an average of 88% of students in a rural school are *eligible* to ride the bus, varying from about 78% (New Mexico) to 94% (Pennsylvania). Approximately 6% of students walk and 6% are driven to these rural schools. The variability by state, however, is great, with about 1% of students walking in Georgia and about 13% in Washington. Variability in the percent driven because they are ineligible to ride the bus is somewhat less, varying from about 2% in Pennsylvania to about 11% in New Mexico.

Among those eligible to ride the bus, however, some proportion are nonetheless routinely transported to school privately (usually by parents). Across the entire sample, about 11% of all students belong to this category. Variability by state, however, is substantial, ranging from about 8% in Pennsylvania to about 20% in Georgia. Subtracting such students from the percentage eligible to be bused, therefore, yields a *net percentage of students bused.* Across the entire sample, this figure is about 77%, which varies somewhat from state to state (a low of about 70% in New Mexico to a high of about 86% in Pennsylvania).

Students' Experience of Riding the Bus

One state's suggested standard for transportation of elementary schools is that one-way rides not exceed 30 minutes (Spence, 2000a).[6] School bus rides at rural schools in these five states evidently do exceed this limit by a wide margin. The questionnaire asked respondents to categorize "the longest ride" in their schools, one way.[7] *Across the entire sample, the longest ride in 85% of schools was 30 minutes or longer.* Also, across the entire sample, approximately 25% of these rural elementary schools reported having longest rides of *more than 60 minutes one way.* The percentage of schools with longest rides in this category, however, varies substantially by state: from about 28% and 33% in Washington and Arkansas, respectively, to a low of about 17% in Pennsylvania. At 5%, New Mexico principals reported one-way rides of *90 minutes or longer* (for *elementary* students) most frequently. Pennsylvania and Washington principals, by contrast, reported *no* rides this long.

In states with strong open-enrollment or charter-school policies, long bus rides can be an incentive to attend another school—just as a long commute can be an incentive for an employee to relocate a household. In 4 of these 5 states, some respondents reported that 5%-10% (i.e., a notable minority) of their students attend other schools for this reason. New Mexico has the

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[6]West Virginia guidelines suggest a maximum one-way ride of 30 minutes for elementary, 45 minutes for middle, and 60 minutes for high school students. Many West Virginia districts ignore the guidelines, and the state itself does not intend that the guidelines *be* enforced (Spence, 2000a). As noted later in this report, however, the average commute for adult Americans is about 22 minutes; thus, West Virginia's "guideline" standard seems quite reasonable.

[7]The questionnaire did not require principals to estimate *how many children had rides of what length,* since the question would have imposed an unreasonable information-gathering burden on respondents.

strongest such laws, and in that state about 9% of the respondents reported that more than 5% of their students attend other schools due to the length of rides. One might predict that stronger parental choice options in the other states would have resulted in principals' reporting higher proportions of "defectors" as well.

Across the sample, respondents reported that approximately 60% of their students rode the same bus as older (that is, secondary-level) students.[8] Variability by state, however, is considerable, with a low of about 40% in Pennsylvania and a high of about 87% in Arkansas. In each state, the variation ranged from 0 to 100%. Across the full sample, 312 principals reported that *all their students* (100%) experience this feature of the ride. The proportion of schools double-routing all students, however, varies at a highly significant level ($p<.001$) by state (ancillary analysis not reported in Tables 1-5), with a high of 74% of schools in Arkansas double-routing all students, about 51% in Washington, 43% in Georgia, 36% in New Mexico, and 30% in Pennsylvania.

In some states (Pennsylvania in particular among these 5 states), transferring from bus to bus en route is a feature that distinguishes the rural from the suburban experience of riding the school bus (Howley et al., 2001). Across the entire five-state sample, approximately 4% of a school's students have this experience, varying from about 5.5% in Pennsylvania to about 3.5% in Washington and Arkansas. Across the entire sample, however, about 7% of schools reportedly transfer 20% or more of their students.

Waiting is part of the experience of taking the bus to and from school. On average across

[8]This practice is sometimes known as "double-routing"—picking up elementary and secondary students on the same bus run (two routes in one).

the sample, approximately 32% of students experience morning waits (at school, before classes begin) of 5 minutes or more.[9] Based on the categories of data (for waits of 5 minutes or more), we estimated average wait times by taking the midpoint of each category (see Appendix A). This calculation suggests that the average morning wait (for students waiting five minutes or more) is about 14 minutes. The wait is longest in New Mexico (17 minutes) and shortest in Pennsylvania (about 12 minutes).

Afternoon waits (after school is dismissed, but before boarding the bus) are somewhat shorter: on average 13 minutes across the entire sample, varying from about 12 minutes in Pennsylvania and Washington, to about 15 minutes in Georgia (again, for students waiting longer than 5 minutes). Across the entire sample, 15% of students reportedly experience waits of 5 minutes or more in the afternoon, varying from 8% (New Mexico) and 9% (Washington) to 18% (Georgia) and 19% (Pennsylvania).

Most respondents (about 78% across the entire sample) reported that incidents of illness and discomfort attributable to the bus ride are "uncommon" (the lowest category). Only about 3% of respondents indicated that such incidents were "frequent," and less than 1% called them "common." The rate at which respondents called such reports "infrequent" (one category more frequent than "uncommon"), however, varied from 10% in New Mexico to nearly 23% in Georgia (see Appendix A for the way in which these terms were defined on the questionnaire).

The average number of days lost to bad weather varied by state, with respondents in Pennsylvania and Arkansas reporting substantially more missed days than in the other states

[9]In essence, the 5-minute threshold implements the view that "waiting" less than 5 minutes is not really *waiting*.

(59% and 68% of respondents, respectively, reported missing 3 or more days per year). Several schools in Arkansas and one school in Pennsylvania reported missing 10-12 days per year on average. No schools in Georgia, New Mexico, or Washington reported missing more than 5 days per year on average. In an ancillary analysis (not reported in Tables 1-5), the correlation between the rough ride index and the "days lost" variable was about +.44.[10] Logically, poorer roads and steeper terrain would be expected to influence decisions to close school during inclement weather.

Roads and Terrain

One of the most consistent findings in the earlier report comparing rural and suburban bus rides concerned the character of roads and terrain: rural students were shown to experience rougher rides than suburban students. Considerable variability, as one would expect, also characterizes the roads and terrain of the *rural* ride from state to state. Rural Pennsylvania schools clearly encounter the greatest proportion of hilly and mountainous terrain compared to the other four states (Pennsylvania respondents reported an average of 71% of mileage traversing hilly and mountainous terrain). By contrast, the comparable figure in Georgia is about 34%. The variability is more substantial still, however. For each of the three listed terrain types (level, hilly, mountainous), values ranged from 0 to 100% in all states.

This translates into dramatic differences even within individual states. For instance, New

[10] A correlation of +.44 indicates that about 20% of the variability in "days lost" is attributable to roughness of the ride. This figure, however, is probably a low estimate of the true correlation since it associates interval-level data for the index with six ordinal categories of days lots, rather than the underlying interval-level values for days lost.

Mexico respondents reported the greatest average proportion of mountainous terrain (at about 16%), but with a standard deviation of nearly 25%, this means that in 15% of the reporting schools in New Mexico schools, more than 45% of the bus mileage traverses mountainous terrain; the situation is nearly the same in Arkansas. Across the entire sample, the coefficient of variation (ratio of standard deviation to the mean) is a very high 2.07 for this variable, and this fact indicates that in 15% of all these rural schools, at least 30% of mileage traverses mountainous terrain (ancillary analyses discussed in this paragraph not reported in Tables 1-5).

The quality of roads also influences the experience of the bus ride. Across the entire sample, respondents reported that approximately 36% of mileage, on average, in their rural schools consisted of paved major roads, about 43% of paved minor roads, and about 20% of unpaved minor roads. Here, too, however, the variability between states and within each state is substantial. The average percentage of *unpaved* mileage traversed by buses at a school, for instance, varies from a low of about 10% in Pennsylvania to a high of about 40% in Arkansas. But within each state, the range of variation around the reported averages is large. New Mexico, for instance, is most variable in the percentage of mileage over minor paved roads and minor unpaved roads. This means that although New Mexico has a lower *average mileage* than Arkansas traversing unpaved roads (about 29% compared to Arkansas's 40%), 20% of principals in New Mexico nonetheless reported that at least 60% of their mileage traverses unpaved minor roads, nearly the same as in Arkansas, and far exceeding the situation in the other states (ancillary analyses not reported in Tables 1-5).

In order to gauge the roughness of rides experienced by students, we created a "rough ride

index," which is simply the sum of percentages for hilly mileage, mountainous mileage, and unpaved minor mileage. Across the entire sample the standard deviation is about 45 and the mean is about 75; 15% of schools across the sample exhibit values of 120 or higher. The theoretical minimum is 0 and the theoretical maximum is 200 (i.e., 100% of mileage traversing mountainous or hilly terrain and 100% traversing unpaved roads).[11]

According to the "rough ride" metric, Arkansas students experience the roughest rides (the maximum value was, however, realized in one of the other states). The Arkansas mean of about 90 is higher than the other means at a statistically significant level, but New Mexico and Pennsylvania rural students also experience very rough rides (their index values, about 80, are not statistically different from one another). Rural Georgia and Washington students, on average, experience significantly less rough rides (index mean values of 49 and 61, respectively). Finally, variability in the roughness of the rural bus ride is greatest in Arkansas and New Mexico, and substantially less (standard deviations about 34) in Georgia and Pennsylvania. This means that the rural school bus ride is rather *consistently rough* in Pennsylvania and rather *consistently less* rough in Georgia.

Bus System

The questionnaire asked about a number of features related to the operation of the bus system. These were not the usual questions about capital expense and operating efficiency, but

[11]Perhaps surprisingly, this theoretical range *is* realized in the actual data. The single school in the data set for which this value exists serves a 100% minority population, 100% of whom received subsidized meals.

pertained to features more pertinent to the experience of the bus ride for children (and of concern to rural families and communities): the extent to which districts employed full- or part-time transportation supervisors; whether or not the school principal was responsible for scheduling buses; two questions relating to special education students; frequency of emergency first-aid training; the presence of communication devices on buses; existence of school and district bus discipline policies; and reasons (in respondents' judgement) why parents choose to transport children privately.

Across the entire sample, about 50% of these rural schools were located in districts that employed a full-time transportation supervisor, varying from a low of about 37% in Arkansas to a high of 80% in Georgia. Recall that Georgia districts enroll far more students than other districts, according to the demographic data. Larger enrollments would likely justify employment of a full-time supervisor.

Variability in whether or not principals schedule buses is substantial, from a low of 3% in Georgia to a high of 17% in Washington. Across the sample, the average is about 9%. In general, however, supervising transportation is not a common role for elementary school principals. For some principals, it would apparently not be a welcome role, either. Respondents more often wrote comments next to this item than on any other items, for instance, "Are you kidding?" Nonetheless, 59 of 687 respondents to this question indicated that they do indeed schedule the buses at their school.

Variability in the practice of providing special education documentation (copies of IEPs or 504 modifications) to bus drivers was substantial. Only in Pennsylvania did a majority (57%)

of respondents indicate that such documentation was provided. The practice is, by contrast, comparatively uncommon in New Mexico (10% of respondents so indicated). Across the entire sample, about 39% of respondents indicated that special education documentation is provided to bus drivers.

The questionnaire also asked how commonly bus drivers participated in special education IEP meetings. Across the entire sample, about 55% of respondents indicated that bus drivers *never* take part in IEP meetings. Another 34% indicated that the practice is rare in their schools. Thus about 11% of respondents indicated that such participation occurs "sometimes" or "often." Variability in such "sometime or often" participation is substantial across the five states, with fully 35% of New Mexico principals so indicating. Pennsylvania respondents, by contrast, reported the lowest level of "sometime or often" involvement in IEP meetings—about 4%. Apparently, both New Mexico and Pennsylvania do involve bus drivers more than in the other states, but in quite different ways. In New Mexico drivers are more likely than in any of the other states studied to be directly involved in *making transportation decisions* related to students at their schools, whereas in Pennsylvania drivers are kept better informed *about decisions made by others* than in the other states studied.

The preparedness of bus drivers to provide emergency first aid varies *dramatically* from state to state, with about 69% of all respondents indicating that such training takes place regularly ("yearly or every other year"). In fact, in both New Mexico and Washington, better than 93% of respondents indicated that "regular" training was provided. *None* of the respondents in those two states indicated that training *never* takes place or is *infrequent*. Pennsylvania respondents, by

contrast, reported least frequently (41%) that training is regularly conducted. Not surprisingly, given this low rate of regular training, Pennsylvania reportedly offers the *least frequent* emergency first-aid training: about 19% of respondents indicated training is *rarely or never* provided.

Equipping buses with communication devices has become easier in recent decades with the commercial ubiquity of CB radios and cellular telephones. To what extent do rural school bus systems equip their vehicles with such devices? Again, variability from state to state is substantial, though overall about 77% of respondents reported that *all* their buses are so equipped. This usage ranged from a low of 53% in Arkansas to over 94% in both Georgia and Washington. Arkansas respondents reported the greatest proportion of buses *without any* such devices ("none" or "none, but planned"), with about 34% of respondents indicating that this is the situation at their schools.

District- and school-level policies to handle disciplinary infractions on the bus were, by contrast with other features of the bus system, very common across all states in the sample, with about 95% of respondents indicating the existence of a district policy and about 92% indicating the existence of a school policy.

When parents opt to transport their children privately, they are responding to a wide range of features of the bus system, including the experiences of their own children with the system. Since that is the case, the reasons that parents make this choice are considered in this section. The questionnaire asked respondents to nominate the top 3 reasons parents make this choice, but also provided an open-ended option (see Appendix A and the notes to Table 1 for this series of

items). Across the entire sample the top rankings vary little from state to state: as a whole group, these rural elementary principals believe that the top three reasons parents choose to transport their children privately are, in rank order of importance: (1) family convenience, (2) preference of the child, and (3) behavior of other children on the bus. This order varied only in New Mexico, where open enrollment was the second most commonly cited reason, and in Georgia, where reasons (2) and (3) reversed rank order.

The open-ended item elicited responses from 97 principals. Readers should note that the questionnaire *did not* list "ride too long" as one of its 8 predetermined options. Among the open-ended responses, however, "ride too long" was the first-ranked reason, constituting 38% of such responses. Interestingly, *short* distance to school was given as the second most common open-ended response (14% of responses). This makes sense because when bus service is not provided and children must walk, about half of the parents opt to drive their children to school (see "Transportation," above).[12]

Among reasons that parents choose to transport students privately, the most variable response by state, however, was "open enrollment", with a mere 2% of respondents nominating it as one of the top three options in Pennsylvania, and about 49% in New Mexico making that nomination (where, as noted previously, it ranked as the second most common reason). In Washington "open enrollment" was the fourth most commonly cited reason, with about 35% of respondents listing it among the top three reasons.

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[12]An additional 11.2% of respondents indicated "bus service not provided" as a reason children were transported privately, and some unknown proportion of these responses probably entail the transportation of children who would otherwise walk to school.

Relationships Among Features of the Ride and School Context

As part of a descriptive study, the information gathered offers comparatively limited opportunities for establishing conclusive relationships among the various features of the ride or between features of the ride and key features of the school context. Key features of school context in our data set, however, notably include subsidized meal rate (POV) and the proportion of the school who are members of ethnic minorities (MIN). Both contextual features have shown substantial relationships — across a wide range of variables; in a large number of studies measuring school inputs, processes, and outcomes; and for a long time — so it makes sense to entertain the possibility that they might also systematically be related to features of the rural school bus ride.

In order to examine possible differences related to these contextual features from state to state, therefore, we computed the correlations of POV and MIN with features of the rural school bus ride. The results are reported in Table 2. Variables representing features of the ride are the same as the ones given in Table 1, with a few exceptions. Correlations with "highest grade" were omitted as not germane; also omitted were "free transportation," "principal schedules buses," and the two discipline policy variables: the limited variability in these three measures renders them unsuitable for correlational analysis. Among the demographic variables examined in Table 2, however, two new variables appear: student density measures for school and district (possible proxies for *comparative* rurality, with higher densities representing a "more populous" rurality[13]).

[13]Recall that all these schools are CCD locale code 7 schools — located in open country or in places with populations less than 2,500; to the extent that zip code classification is accurate,

Table 2 displays only correlations of magnitude .20 or greater (i.e., $r \leq -.20$ or $r \geq +.20$). Correlations of about this magnitude arguably represent relationships with *practical* (not just statistical) significance.[14] Excluding the very strong correlations between MIN and POV (as high as +.77 across the five states), the correlations in Table 2 range in magnitude from -.52 (rough ride index with MIN in Arkansas) to +.48 (percentage level miles with MIN in Arkansas). Across the five states, 85 correlations with magnitudes of .20 or more exist, and an additional 10 correlations of this magnitude or greater occur across all cases in the rural sample.[15]

Two overarching conclusions follow from these observations. First, *poverty* and *ethnicity* are pervasively related to features of the rural bus ride. Second, *state context* clearly makes a difference.

Given the pervasive influence of POV and MIN among features of the rural school bus ride and the importance of state context, two new variables were created, as described next. Within each state, and for both POV and MIN, cut points were established for the 25th, 50th, and 75th percentiles and by recoding the original variables accordingly created two new variables. For each new variable, this yielded 4 groups with equal numbers of cases in each state, based on

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all these schools can be considered as located on *extremely* rural sites.

[14]Some of the correlations of this magnitude, as noted in Table 2, do not achieve statistical significance due to small sample sizes, particularly in New Mexico.

[15]*Directionality* (i.e, positive or negative) of the reported relationships, however, varies somewhat from state to state (see Table 2). In rural areas of New Mexico, for instance, an increase in the proportion of school enrollment who are members of ethnic minority groups (largely Chicanos and American Indians) is associated with an *increase* in the proportion of hilly bus miles and days lost to bad weather. Increase in the proportional minority population, by contrast, is associated with a *decrease* in days lost to bad weather and proportion of hilly miles in Arkansas and Georgia.

the characteristics of poverty and ethnicity *for that state's schools*. This recoding enabled analyses that use the *state contexts* of poverty and minority status to test for significant differences in specified features of the rural bus ride. In effect, this third set of analyses asks if the *comparative poverty or minority status of schools within states* has an influence on various features of the rural school bus ride.[16]

The third set of analyses in this report, therefore, examined all features of the ride (i.e., demographic differences are not investigated) in which *two or more states* exhibited "practically significant" correlations with POV or MIN.

The data set includes both continuously measured variables and categorical variables. With continuous variables, the analyses use t-tests to compare the means of the first (most affluent or lowest proportion of minority students, within state) to the fourth quartile (poorest or highest proportion of minority students, within state) of our two contextual variables (POV and MIN).[17] For categorical variables, the analyses use χ^2 (chi-squared) tests of significance to determine the likelihood that observed frequencies in cross-tabulations of cases by pertinent variables are the result of chance.

The following list (based on information in Table 2) specifies the statistical tests

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[16]The assumption here is that the effect of attending a school with a free lunch rate of 40% or a school with a minority enrollment of 10% differs by state. According to this assumption, the comparative within-state standing of schools on such measures is more salient than absolute measures of poverty and minority enrollment on the basis of the finding that state context matters.

[17]The presence of unequal variances violates the assumption of equal variance on which ANOVA comparisons rest; conducting multiple t-tests among all four quartiles artificially inflates the likelihood of discovering a statistically significant difference. Thus, comparison of extreme quartiles is the most parsimonious option.

employed in the third set of analyses, the features of the ride under scrutiny, and, in parentheses, the pattern of correlation accepted as warrant for conducting these further analyses:

- independent samples t-test of the difference in the mean percentage walkers for the first and fourth quartile of MIN (AR+, GA+)
- t-test of the mean percent of students eligible to ride, but driven instead for the first and fourth quartile of POV (GA-, NM-, WA-)
- chi-square test of the frequencies within categories of "longest ride at school" across the four quartiles of POV (GA+, NM-)
- chi-square test of longest ride at school across the four quartiles of MIN (AR-, NM-)
- t-test of the mean percentage of elementary students riding with older students for the first and fourth quartile of POV (AR-, PA+, WA+)
- t-test of the mean average morning wait time for the first and fourth quartile of MIN (AR+, NM+)
- chi-square test of days lost to bad weather across the fourth quartiles of MIN (AR-, GA-, NM+)
- t-test of the mean percentage level miles for the first and fourth quartiles of POV (GA+, PA-)
- t-test of the mean percentage level miles for the first and fourth quartiles of MIN (AR+, GA+)
- t-test of the mean percentage hilly miles for the first and fourth quartiles of MIN (AR-, GA-, NM+)
- t-test of the mean percentage mountainous miles for the first and fourth quartiles of POV (NM-, WA+)
- t-test of the mean percentage mountainous miles for the first and fourth quartiles of MIN (AR-, GA-, NM-)
- t-test of the mean percentage minor paved miles for the first and fourth quartiles of MIN (AR+, GA-)

- t-test of the mean rough ride index for the first and fourth quartiles of MIN (AR-, GA-, PA-)
- chi-square test of full-time bus supervisor across the four quartiles of POV (GA-, NM+, PA-)
- chi-square test of full-time bus supervisor across the four quartiles of MIN (GA-, NM+, PA-)

Differences in Means and Frequencies by Quartiles of POV and MIN

Results of all t-test analyses of mean differences are given together in Table 3, and results of all χ^2 analyses of differences between observed and expected frequencies are given together in Table 4. Of the 18 specified analyses, 12 prove to be statistically significant: 6 features of the ride vary significantly across the five states by POV, and 6 vary significantly by MIN.

Poverty-influenced Features of the Rural Bus Ride

Schools with the highest within-state proportions of poor children ("highest-poverty schools" hereafter) operate the longest rides across all five states ($p<.05$). For instance, in highest-poverty schools, about 27% of respondents report longest rides of 60 minutes or more, whereas in the lowest-poverty schools, about 16% of respondents reported longest rides of 60 minutes or more. This comparison with the most affluent quartile, in fact, holds (in this case) for *all three* less affluent quartiles (see Table 4, panel 1, first block). As a "least affluent" rural child, your chances of attending a school with longest rides of 60 minutes or longer are about *twice* what they would be as compared to those encountered by more affluent rural children.[18]

[18]Across the entire sample, school sizes do not differ at a statistically significant level (i.e., $p > .05$) by quartiles of POV and MIN. This means that school-level representations can be

Highest-poverty rural schools are less likely ($p<.01$) to be located in districts that employ a full-time bus supervisor than are lowest-poverty rural schools (see Table 4, panel 3, block 1). For instance, about 64% of lowest-poverty schools are located in districts with a full-time bus supervisor, but only 43% of the highest-poverty schools are.

Not surprisingly, children in highest-poverty rural schools who are eligible to ride the bus, are less likely ($p<.001$) nonetheless to be driven to school than are bus-eligible students in the most affluent quartile of schools. That is, the option to forego bus service to which one is entitled is a luxury that less affluent families predictably can't afford (see Table 3, "opt driven").

Children attending highest-poverty rural elementary schools are more likely ($p<.01$) to ride the bus with older (usually high school) students than their counterparts in lowest-poverty rural schools. Approximately 48% of students in the "most affluent" rural schools experience double-routing, but about 62% of students in the least affluent rural schools have this experience. In other words, a child's risk of being "double-routed" is about 30% greater if attending the poorest quartile of rural schools in these states as compared to the most affluent quartile (see Table 3, "older").

Children in highest-poverty rural elementary schools in these states are more likely ($p<.001$) to experience rides over mountainous terrain than children in lowest-poverty rural elementary schools. The odds of experiencing such a ride are about 50% higher in the poorest as compared to the most affluent schools (see Table 3, "mountain").

In the highest-poverty schools, rides take place more frequently ($p<.05$) over unpaved

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restated as *approximate* representations of individual-level odds.

roads than do rides in the lowest-poverty affluent schools. Approximately 18% of bus miles in the highest quartile of schools in these states traverse unpaved minor roads, whereas about 23% of bus miles in the poorest quartile of schools do. A rural child's risk of riding over unpaved roads is about *one-third greater* in the poorest rural schools of these states, as compared to the most affluent (see Table 3, "unpaved").

Features of the Rural Bus Ride Influenced by Ethnicity

Rural schools with the *lowest* proportions of students who belong to ethnic minorities (lowest-minority schools hereafter) have longer "longest rides" ($p<.05$) than rural schools with the highest proportions of students who belong to ethnic minorities (highest-minority schools hereafter). In lowest-minority schools, for instance, about 33% of respondents reported their longest rides were 60 minutes or more; in highest-minority schools, by contrast, just 16% of respondents reported "longest" rides of this length. That is, as a student your chances of attending a school with rides of 60 minutes or more are doubled by attending a lowest-minority rural school in these five states (see Table 4, panel 1, block 2).

All three features of the rural bus ride related to terrain differ systematically between the first and fourth quartiles of MIN. The marked pattern is for highest-minority schools to have bus routes over more level and less hilly or mountainous terrain. In an ancillary analysis (not reported in Tables 1-5), the first and fourth quartiles on MIN had significantly ($p<.01$) different school area density indices, but did not have statistically significant district area density indices. Details about these three very highly significant differences are considered separately in the

following three paragraphs.

In rural lowest-minority schools, rides less frequently ($p<.001$) traverse *level terrain* than in rural highest-minority schools. In lowest-minority rural schools across these states, approximately 34% of miles, on average, traverse level terrain, as compared to about 62% in highest-minority rural schools. In other words, children in lowest-minority rural schools are half as likely to experience rides over level terrain (see Table 3, "level").

In rural lowest-minority schools, rides more frequently ($p<.001$) traverse *hilly terrain* than in rural highest-minority schools. In lowest-minority schools across these states, approximately 49% of miles traverse hilly terrain, as compared to an estimated 33% of miles in highest-minority rural schools. That is, a student's odds of experiencing rides over hilly terrain are about 50% higher in rural lowest-minority schools as compared to rural highest-minority schools (see Table, 3, "hilly").

In rural lowest-minority schools, rides more frequently ($p<.001$) traverse *mountainous terrain* than in rural highest-minority schools. In lowest-minority schools across these states, approximately 17% of miles traverse hilly terrain, as compared to an estimated 5% of miles in highest-minority rural schools. On this basis, a student's odds of riding over mountainous terrain are about 300% higher in rural lowest-minority schools as compared to rural highest-minority schools (see Table, 3, "mountain").

The terrain patterns with respect to MIN are repeated for the proportion of the bus miles traversing unpaved minor roads and for the "rough ride index" (the sum of percentage of hilly, mountainous, and unpaved bus miles). Lowest-minority rural schools reported that about 23% of

their bus miles traverse unpaved minor roads as compared to about 15% in rural highest-minority schools ($p<.01$; see Table 3, "unpaved). This would seem to indicate that children attending lowest-minority schools are about 50% more likely to have rides over unpaved minor roads.

The rough ride index in rural lowest-minority schools is almost a full standard deviation higher than in rural highest-minority schools ($p<.001$). The index value for the former schools is about 89 and for the latter about 52 (the standard deviation for both groups is about 40). This indicates that 18% of rural highest-minority schools have rides as rough as those experienced by 50% of the rural lowest-minority schools (ancillary analysis not reported in Tables 1-5).

Conclusions and Discussion

The analyses presented above make it possible to derive a set of policy issues relevant to the rural school bus ride. Within-state poverty and ethnic status (operationalized in this study as within-state quartiles) operate widely to differentiate features of the rural bus system, so far as can be judged from the five states from which this study gathered data.

Four conclusions define a set of key policy issues related to the rural bus ride:

(1) longest rides widely violate professional norms;

(2) features of the rural school bus ride combine to in ways that probably compound risks to the well-being of elementary children;

(3) hypothetical risk factors vary systematically by poverty and minority status (impacting rural white children, in fact, more strongly than rural children of color); and

(4) rural school consolidation prospectively shapes features of the ride, especially length of ride and compounding hypothetical risk factors.

Longest Rides

Although at least one preponderantly rural state (West Virginia, see Spence, 2000a) has adopted a one-way ride of 30 minutes as the maximum duration for elementary students, this standard is *commonly violated* in the rural schools surveyed for this study. In an appalling 85% of these rural elementary schools, respondents reported that longest rides exceed this upper limit. Worse still, in 25% of these rural schools, longest rides reportedly exceed *60 minutes* (the suggested upper limit for *high school students* in the same preponderantly rural state).

Most *adult* Americans consider a commuting drive of one hour very long; indeed, for many adults a commute this long is considered *too long*. In the *most densely populated metropolitan areas* of the United State, commuting times for *adults* varies around a mean that is *less* than the upper limit (i.e., 30 minutes) set for elementary children. The average one-way commute in Los Angeles, California, for example, is reportedly 26.5 minutes, and in New York City it is 36.5 minutes (Monster Moving, 2001; information based on Census data). According to the Bureau of the Census, the average one-way commute to work in the U.S. as a whole was 22.4 minutes (Bureau of the Census, 1998, p. 635).

One of the common reasons given by adults for choosing to relocate their residence is "to be closer to work/easier commute" (Bureau of the Census, 2001, p. 2). Families and communities, unfortunately, do not have the option of relocating distant rural schools as they can households. State policies foil such choices by requiring the construction of large schools (which produce large attendance areas in rural places) and by ignoring issues of fiscal equity related to

capital expenditures (e.g., Earthman, 1997).

In this light, the practice of so routinely imposing long commutes on some children should at least seem *thoughtless* to objective observers. The seriousness of this assertion is underlined by the finding that, in the least affluent within-state quartile of schools, longest rides are *substantially* longer than in other rural schools. Lowest-minority rural schools within each state, as well, are more likely to operate longer "longest rides" than in highest-minority schools.

Compounding the Risks

Contemporary schooling and employment regimens separate children and parents more stringently than ever. Some astute observers argue that this separation is, in fact, more stringent than is healthy or natural (e.g., Bronfenbrenner, 2000).[19] Perhaps it is for such deeply embedded reasons that rural parents and community members voice misgivings about long rides. Long bus rides compound this separation for many rural elementary school children.[20]

For the first time, the *coincidence of circumstances* that make rural rides more

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[19]Addressing the Penn State graduation in 2000, the celebrated developmental psychologist remarked: "From the perspective of my own field of scientific study... I...quote one of the principal discoveries made in that domain.... 'The human family is the most powerful, the most humane, and by far the most economical system known for making and keeping human beings human.' Alas...some unwelcome research findings...have been gradually increasing since the 1970s. What these unwelcome findings show is that the family is becoming less and less able to perform effectively the roles mentioned." Bronfenbrenner concludes by advising the graduates to devote their futures to their families and communities.

[20]Risk of death or injury, however, are perhaps not parents' major concerns, except in the case of very treacherous travel. More pressing concerns would include the toll that long rides impose on sleep, on playtime, and on family time (Fox, 1995; Spence, 2000a) — and the possible victimization of young children by older children (in the case of double-routing).

burdensome, challenging, or risky can be examined with the data gathered for this project. Such coincident features of the ride need to be quantified as somehow troublesome, and, for this report, the following standards have been established to enable an illustrative set of calculations:

- longest ride of 30 minutes or more at school,
- longest ride of 60 minutes or more at school,
- 100% of students double routed,
- rough ride index higher than average (greater than 74.17),
- emergency training not regularly conducted, and
- some or all of buses without communication devices.

Altogether, 50 combinations of 2 or more features of the ride (from the preceding list) exist as uniquely coincident circumstances confronting rural children, families, and communities. Table 5 illustrates the prevalence of a selected set of such coincident features of the ride that would seem to compound the burden, challenge, or risk of the rural school bus ride.[21]

Several patterns in Table 5 deserve comment. First, and most obviously, the incidence of the combinations of these risk factors diminishes as the *number of coincident risks* increases (2 factors affect many schools; 4 factors fewer schools).

Second, the findings reported in Table 5 show that combinations of features of the bus ride, hypothetically related to increased threats to children's security and well-being, *prevail* among rural schools. The variety of combinations of these possible threats is merely illustrated

[21]Differing combinations of features and different thresholds for characterizing hypothetical risk factors, of course, would produce different results. Table 5 is included principally as an illustration, not as a definitive demonstration.

in Table 5. Many other combinations exist, affecting children (and families and communities) differently across the entire sample and across the 5 states studied.

Third, differences among the states in the extent of possible risk are, in every case, very highly significant ($p<.0001$ or $p<.001$). Apparently, residence in one state as compared to another is itself a probable risk factor. The prevalence of risk factors in Arkansas is consistently higher (with four exceptions in 64 comparisons) than in the other states, and both Arkansas and Pennsylvania have schools represented in *all 16 sets* of coincident risks. By contrast, in 8 and 6 cases, respectively, no New Mexico or Washington schools exhibit the specified combinations of coincident risks.

Influence of Poverty and Ethnicity

In addition to possible risks to security or well-being, risk can be considered as the disparate odds that students will attend a school exhibiting particular features of the ride. The analyses presented in Tables 3 and 4 show that these odds vary systematically based on the proportion of impoverished students or minority students attending a school.

Most succinctly, in highest-poverty rural elementary schools (top quartile of POV within states), in comparison to lowest-poverty rural elementary schools (bottom quartile of POV within states):

- longest rides of 60 minutes or longer are *three-quarters* more common,
- double-routing rates are almost *one-third* higher,
- the proportion of mileage over mountainous terrain is almost *double*,

- the proportion of mileage over unpaved roads is nearly *one-third* higher,
- full-time bus supervision is about *one-third* less common, and
- *half* as many children (eligible to ride a bus) are optionally driven to school.

Similarly, in lowest-minority rural schools (bottom quartile of MIN within states), in comparison to highest-minority rural schools (top quartile of MIN within states):

- longest rides of 60 minutes or longer are *twice* as common,
- the rough ride index value is nearly *three-quarters* higher,
- the proportion of mileage over mountainous terrain is about *three times* as high,
- the proportion of mileage over hilly terrain is about *twice* as high,
- the proportion of mileage over unpaved roads is nearly *50 percent* higher,
- the proportion of mileage over level terrain is about *half* as high, and
- closures of 6 or more days for inclement weather are *three-fifths* more common.

These findings provide substantial evidence that features of the rural school bus ride exhibit the systematic inequities of social class and "minority" status that so broadly afflict the U.S. educational system in other (more frequently studied) domains.

School Consolidation

The issue of school closures and consolidations is an historical and contemporary companion to any study of rural school bus rides. Providing access to formal schooling was a major challenge for the 19th and 20th centuries. Initially, before the advent of the fossil-fuel powered vehicle, schools had to be sited within walking distance of students' homes for

maximum accessibility. This was a standard difficult to meet, according to one interpretation of the record of case law on school consolidation (Howley, 1993).

Motorized transportation was seen as a way around the dilemmas of accessibility by such early administrative "visionaries" as Ellwood Cubberley (see Cubberley, 1922). Not only would motorized transport (and improved roads) eliminate the need to maintain smaller ("less efficient") rural schools near students' homes, it could, leaders like Cubberley thought, make possible the creation of larger, more centrally located[22] schools (again, see Cubberley, 1922).

As rural schools did become "more centrally located," the geographic extent of areas served by them were substantially enlarged. Across this sample, "very large" (25 square miles or more) school attendance areas constitute the modal category (47% of all schools report attendance areas in this category). The correlation between this variable (measured in 4 ordinal categories from very small to very large; see Appendix A) and "longest ride" is +.39 among these rural schools.[23] Among all schools, rural and suburban in the complete data set, the correlation is +.47. These are quite substantial correlations, given the fact that both "longest ride" and "school

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[22]That is, "central" in the sense of location in administrative centers--towns, villages, and county seats. In consolidated county districts throughout the rural southeast, for instance, consolidated schools are today often located in or near county seats. Newer sprawl schools (see Beaumont & Pianca, 2000), however, often locate a large campus adjacent to, rather than exactly *in*, the county seat.

[23]Attendance area alone accounts for about 16% of the variability in the 4 categories of "longest ride." The following variables jointly predict length of rural ride across this sample (in order of decreasing magnitude of influence), each at a statistically significant level and in a positive direction: (1) attendance area, (2) rough ride, (3) double-routing, (4) existence of breakfast program, and (5) percentage of riders that transfer en route. The multiple correlation produced by this combination of 5 variables is .59, accounting jointly for 35% of variation (adjusted R-square) in the 4 categories of "longest ride" (ancillary regression analysis not reported in Tables 1-5).

attendance area" are measured ordinally (in 4 categories only) rather than in the underlying interval-level data (i.e., rather than in actual square miles or minutes of ride duration).

Among the variables in the data set, then, size of the school attendance area most strongly influences ride length. All else equal, it would be logical to speculate that rural school consolidation *produces* longer bus rides. This hypothesis has not been adequately studied, but it is clear that longer rides increase the separation of students from rural communities and families (see Peshkin, 1982, for a relevant ethnographic account).

Implications and Caveats

In the past decade, a substantial research literature has emerged on school and district size. Much of this literature concerns the development of a "small schools reform movement" in urban areas (e.g., Fine & Somerville, 1998). Less attention is consistently paid the damage done by consolidation to rural communities and to the quality of formal education in impoverished rural communities (Howley, 2001). This report and its predecessor show rather conclusively that long bus rides and a multitude of conditions related to the ride constitute additional burdens to rural elementary children, families, and communities. In this light, these two studies provide additional evidence that consolidation not only does not benefit impoverished rural communities, but, arguably, imposes additional harm. The data in Table 5 clearly indicate that the extremity of this harm varies widely, and in some rural places is likely to be quite sharp.

In effect, professional and cultural norms ("bigger is better") interacting with political compromise (and deal-making) have produced a system of rural schooling that — in order to

adhere to a cosmopolitan image of the good school — separate schools and children from rural communities and families, quite stringently in some states and localities. Uninvolved and dispassionate observers are most likely to advise rural families that confront such stringency to do just what adult rural workers unhappy with lengthy commutes do: *move*. Many of course do just that.

Lest this assertion sound extreme or unkind, the scholar David Whisnant (1980), in a comprehensive historical account of economic development planning in Appalachia, reported that the Appalachia Regional Commission actually pursued a formal policy of encouraging rural people to relocate to the region's population centers. De facto "policies" of rural relocation, however, are ubiquitous and longstanding (Jacobs, 1984; Williams, 1973). Economic practices and policies have made rural survival a challenging task for a very long time. Rural populations have powered urbanization for centuries, and in the 20th century the need for this power has nearly emptied the US countryside in many regions (Berry, 1990).

Whatever the persistent force of such de facto policies, recent research on the academic benefits of small schools for impoverished communities really means that policymakers should start moving schools closer to rural communities and families. This observation is the principal implication, in the author's view, to be drawn from these two studies. Instead of focusing policy efforts only or principally on mitigating burdensome features of the rural school bus ride, educators and policy makers can more effectively foil the burdens of the ride by ensuring the existence of small rural schools to serve impoverished communities. The finding that poverty is consistently associated with the burdens of the rural bus ride strengthens the logical argument for

sustaining and restoring smaller schools. Political will, as always, is another matter.

Caveats. The findings about the influence of within-state minority status might appear in some measure to reflect a possible tendency of ethnic minority groups to find residence in more densely populated rural settings, and there is a small and statistically significant ($r=+.10$, $p<.01$) correlation between within-state minority quartile and density of the school attendance area (see note on this measure in Table 2). Nonetheless, relationships of within-state minority status with school and district enrollment and density measures are highly variable among the states. In Arkansas, relationships are *negative* (the higher the proportion of minority students, the smaller the school and the smaller the attendance area). In New Mexico and Pennsylvania, however, the relationships are positive, and are significant (for Pennsylvania, $p< .001$; for New Mexico, $p<.05$) for district as well as school measures.[24] In both Georgia and Washington, all such relationships are statistically (and practically) nonsignificant. Understanding better the interaction between poverty and minority status is a worthy topic for future investigations.

Finally, readers need to recall that the information analyzed in this report was provided by elementary school principals. Error is built into their estimates, and the questionnaire was designed not to press respondents for information burdensome to gather. This effort, for that reason, has been unable to provide estimates of average ride length and the variation in length of ride. Instead, it elicited information about length of "longest ride." This information, however, is somewhat useful in light of extant guidelines on ride length, and the findings show that such

[24]In these states, the higher the proportion of minority students, the higher school enrollment, district enrollment, and school area density. In Pennsylvania, district area density is also positively related to within-state minority status. Correlations are consistently about +.30 in these two states (varying from +.19 to +.45).

guidelines are more commonly violated than followed.

References

Beaumont, C., & Pianca, E. (2000). *Historic neighborhood schools in the age of sprawl.* Washington, DC: National Trust for Historic Preservation. (Available World Wide Web: http://www.nthp.org/main/abouttrust/schoolshome.htm)

Berry, W. (1990). *Unsettling America* (3rd. ed.). San Francisco: Sierra Club Books.

Bronfenbrenner, U. (2000). [Commencement Address at Pennsylvania State University]. Retrieved August 18, 2001 from: http://www.people.cornell.edu/pages/ub11/penndraft4.html

Bureau of the Census. (2001). *Why people move: Exploring the March 2000 Current Population Survey.* Washington, DC: Author. (Retrieved August 3, 2001, from: http://www.census.gov/prod/2001pubs/p23-204.pdf)

Bureau of the Census. (1998). *Statistical abstract of the United States.* Washington, DC: Author. (Retrieved August 3, 2001, from: http://www.census.gov/prod/1/gen/catalog/95/p205-256.pdf)

Cubberley, E. (1922). *Rural life and education: A study of the rural-school problem as a phase of the rural-life problem.* New York: Houghton-Mifflin. (ERIC Document Reproduction Service No. ED 392 559.)

Earthman, G. (1997). The best possible environment for the most productive learning. *School Business Affairs, 63*(7), 21-24.

Fine, M., & Somerville, J. (Eds.). (1998). *Small Schools, Big Imaginations: A Creative Look at Urban Public Schools.* Chicago: Cross City Campaign for Urban School Reform. (ERIC Document Reproduction Service No. ED 427 127)

Fox, M. (1996). Rural transportation as a daily constraint in students' lives. *Rural Educator, 17*(2), 22-27.

Howley, C. (1993). A territorial imperative: The authority of the state to reorganize public schools and districts. *Journal of Research in Rural Education, 9*(2), 74-83.

Howley, C., Howley, A., & Shamblen, S. (2001, April). *The experience of rural school bus rides.* Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA. (ERIC Document Reproduction Service Number pending).

Jacobs, J. (1984). *Cities and the wealth of nations: Principles of economic life.* New York: Random House.

Monster Moving. (2001). Information retrieved August 10, 2001, from http://www.monstermoving.com/Find_a_Place/

Peshkin, A. (1982). *The imperfect union: School consolidation and community conflict.* Chicago: University of Chicago Press.

Spence, B. (2000a). *Long school bus rides: Stealing the joy of childhood.* Charleston, WV: Challenge West Virginia. (Available World Wide Web: http://www.wvcovenanthouse.org/challengewv/)

Whisnant, D. (1980). *Modernizing the mountaineer.* Boone, NC: Appalachian Consortium Press.

Williams, R. (1973). *The country and the city.* New York: Oxford University Press.

Zars, B. (1998). *Long rides, tough hides: Enduring long school bus rides.* (ERIC Reproduction Document No.: ED 432419). Also: [On-line]. Available: http://www.ruralchallengepolicy.org.zars_busing.htm

Table 1
Descriptive Statistics for Rural Schools by State and for All Rural Cases (n= 696)
(40 Variables in five categories: Demography, Transportation, Kids' Experience of the Ride, Roads and Terrain, Bus System)

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Demographic							
school enrollment	mean	318.82	537.12	225.06	446.91	318.47	387.56
	SEM	12.59	18.59	17.34	17.82	28.73	9.77
	SD	160.70	203.63	136.52	258.81	331.31	256.54
	minimum	53	93	17	70	7	7
	maximum	850	1108	499	1750	3450	3450
subsidized meal rate	mean	57.66	50.31	78.57	32.39	46.72	49.04
	SEM	1.34	2.11	2.87	1.20	2.09	.94
	SD	16.88	23.02	22.23	16.09	23.94	23.98
	minimum	20	5	25	4	0	0
	maximum	100	100	100	80	100	100
minority percent	mean	14.03	22.59	68.96	2.51	20.01	18.00
	SEM	1.80	2.15	3.75	0.26	2.00	1.02
	SD	23.03	23.60	29.51	3.86	23.24	26.81
	minimum	0	0	3.6	0	0	0
	maximum	100	97.8	100	35.1	97.4	100
district enrollment	mean	922.73	7538.26	3262.02	2748.72	1313.38	2894.04
	SEM	106.77	1095.88	669.20	131.52	179.76	223.77
	SD	1354.81	11752.0	5226.61	1855.27	2073.11	5787.78
	minimum	71	375	93	280	15	15
	maximum	11000	110000	25000	10500	16000	110000

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Demographic (cont')							
area[1] (school) small	% < 2 mi^2	3.0	1.7	6.5	0.5	0.7	1.9
medium	%< 10 mi^2	14	29.1	14.5	16.7	14.8	17.6
large	%< 25 mi^2	34.8	44.4	19.4	31.9	31.9	33.6
very large	% > 25 mi2	48.2	24.8	59.7	51.0	52.6	46.9
	valid N	164	117	62	210	135	688
area[2] (district) small	% < 4 mi^2	2.5	3.4	3.3	0	1.5	1.8
medium	%< 25 mi^2	22.6	14.5	9.8	13.4	20	16.7
large	%<100 mi^2	44.0	60.7	37.7	40.2	44.4	45.2
very large	%> 100 mi^2	30.8	21.4	49.2	46.4	34.1	36.3
	valid N	159	117	61	209	135	681
highest grade	% first	0	1.7	0	0.5	0	0.4
	% second	1.2	6.8	0	0.9	4.4	2.6
	% third	1.9	3.4	0	2.8	3.7	2.6
	% fourth	14.2	0	4.8	13.2	5.9	9.0
	% fifth	5.6	75.4	30.6	30.2	20.0	30.2
	% sixth	51.2	2.5	40.3	42.5	27.4	34.5
	% seventh	0	0.8	1.6	0	0.7	0.4
	% eighth	0.6	5.1	8.1	3.3	13.3	5.4
	% ninth	0	0	0	0	0.7	0.1
	% twelfth	25.3	4.2	14.5	6.6	23.7	14.7
	valid N	162	118	62	212	135	689

[1] Categories are not cumulative, they are mutually exclusive (percent with areas < 2 mi^2, percent with areas > 2mi^2 but less than 10 mi^2, etc.)

[2] Categories are mutually exclusive, (percent with areas < 4 mi^2, percent with areas > 4 mi^2 but less than 25 mi^2, etc.)

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Transportation							
free transportation	% no	0	0	1.6	0	0.7	0.3
	% yes	100	100	98.4	100	99.3	99.7
	valid N	164	120	61	212	135	692
percent bus eligible	mean	86.62	93.53	78.05	94.00	79.82	88.01
	SEM	11.34	0.94	3.24	0.77	1.93	0.68
	SD	17.05	10.22	25.12	11.07	22.15	17.67
	minimum	10	50	10	2	5	2
	maximum	100	100	100	100	100	100
percent walking	mean	4.40	0.93	9.85	3.82	13.26	5.80
	SEM	0.74	0.28	1.68	0.64	1.64	0.47
	SD	9.24	2.89	12.59	9.28	18.36	12.00
	minimum	0	0	0	0	0	0
	maximum	90.00	22.50	48.40	98.00	90.00	98.00
% driven privately[3]	mean	9.03	5.42	11.20	2.07	5.88	5.81
	SEM	0.95	0.92	2.00	0.32	0.80	0.39
	SD	11.81	9.56	14.97	4.61	8.91	9.93
	minimum	0	0	0	0	0	0
	maximum	59.50	50.00	80.10	28.80	40.00	80.10

[3] Percent ineligible to ride the bus and transported privately instead. Product of midpoint value of a categorical variable (% of those ineligible in 5 categories by 10% intervals) and a continuous variable (% of those ineligible transported privately).

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Transportation (con't)							
% drivn optionally[4]	mean	10.30	20.31	9.31	7.82	9.18	10.98
	SEM	0.78	1.61	1.62	0.52	1.04	0.48
	SD	9.95	17.41	12.23	7.46	11.80	12.32
	minimum	1.13	3.15	0.45	0.09	0.23	0.09
	maximum	76.95	91.63	75.50	71.78	81.83	91.63
net percent bused[5]	mean	76.79	73.17	69.55	86.15	70.86	77.27
	SEM	1.39	1.65	3.50	0.92	1.95	0.75
	SD	17.63	17.87	26.39	13.22	22.21	19.40
	minimum	13.05	6.37	9.55	1.91	4.78	1.91
	maximum	95.50	95.50	95.50	95.50	95.50	95.50
Kids' Experience							
longest ride[6]	% < 30 min	11.0	17.8	15.0	19.5	10.4	15.0
	% 30-59 min	53.7	59.3	61.7	63.8	61.2	59.9
	% 60-90 min	34.1	21.2	18.3	16.7	28.4	24.1
	% >90 min	1.2	1.7	5.0	0	0	1.0
	valid N	164	118	60	210	134	686
other schools[7]	% < 5%	98.8	99.1	91.1	99.0	98.5	98.2
	% 5-10%	1.2	0	3.6	1.0	1.5	1.2
	% > 10%	0	0.9	5.4	0	0	0.6
	valid N	161	116	56	195	132	660

[4] Percent eligible to ride but nonetheless routinely transported privately. Product of midpoint value of a categorical variable (% of those eligible in 5 categories by 10% intervals) and a continuous variable (% of those eligible but nonetheless transported privately).

[5] Percent eligible to ride the bus minus percent nonetheless routinely transported privately.

[6] Longest ride one way.

[7] Percent attending other schools because ride too long in these three categories (i.e., percent of principals in each state estimating less than 5%, between 5 and 10%, or more than 10% of students attend other schools due to long rides). "Less than 5%" includes "none."

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Kids' Exper. (cont)							
% riding with older	mean	87.33	58.88	52.38	40.03	63.91	60.33
	SEM	2.03	4.28	5.89	3.18	3.90	1.74
	SD	25.64	45.85	44.86	45.34	43.90	43.90
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% who transfer	mean	3.42	5.01	4.53	5.48	3.36	4.40
	SEM	0.79	1.48	2.10	0.85	0.94	0.49
	SD	10.08	16.08	16.01	12.15	10.83	12.62
	minimum	0	0	0	0	0	0
	maximum	50	95	80	80	80	95
% AM waits > 5 min	mean	36.41	29.51	45.34	24.12	36.80	32.23
	SEM	3.43	3.42	6.21	2.31	3.79	1.55
	SD	43.20	37.31	47.29	33.35	42.92	40.13
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% PM waits > 5 min	mean	12.96	18.07	8.34	18.80	9.32	14.51
	SEM	2.08	2.60	2.49	1.98	1.96	1.01
	SD	26.60	28.02	19.47	28.69	22.50	26.48
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
parent involvement[8]	doesn't	39.5	35.9	30.5	34.3	32.8	35.2
	a little	40.1	29.9	20.3	41.5	38.8	36.8
	> a little	11.7	17.9	18.6	16.9	12.7	15.2
	a lot	8.6	16.2	30.5	7.2	15.7	12.8
	Valid N	162	117	59	207	134	679

[8]Extent to which respondent estimates that duration of ride reduces parental involvement; "> a little" = more than a little.

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Kids' Exper. (cont)							
average AM wait[9]	mean	13.89	16.28	16.89	11.83	12.98	13.65
	SEM	0.79	1.13	1.49	0.52	0.68	0.37
	SD	6.92	8.35	7.76	5.55	5.40	6.77
	minimum	7.50	7.50	7.50	7.50	7.50	7.50
	maximum	39.50	44.50	42.00	34.50	29.80	44.50
	valid N	76	55	27	115	60	333
average PM wait[8]	mean	12.84	15.35	13.94	12.15	12.27	13.07
	SEM	0.96	1.39	2.24	0.73	1.32	0.51
	SD	6.50	9.86	8.95	7.14	7.92	7.93
	minimum	7.50	7.50	7.50	7.50	7.50	7.50
	maximum	36.20	44.50	42.00	36.50	34.50	44.50
	valid N	46	50	16	97	36	245
illness, discomfort[10]	%uncommon	76.1	72.3	86.7	75.0	84.1	77.6
	% infrequent	20.2	22.7	10.0	22.1	13.6	19.1
	% frequent	3.1	3.4	3.3	1.9	2.3	2.6
	% common	0.6	1.7	0	1.0	0	0.7
	valid N	163	119	60	208	132	682
days lost to weather	% 0-2 day/yr	41.1	83.3	80.0	31.9	91.8	59.1
	% 3-5 days	47.2	16.7	20.0	58.5	8.2	35.2
	% 6-9 days	9.2	0	0	9.2	0	5.0
	%10-12 days	2.5	0	0	0.5	0	0.7
	valid N	163	120	60	207	134	684

[9]Subgroup analyses (see "valid N") for schools with students waiting more than 5 minutes; times (in minutes) interpolated from categorical variable; values weighted for percent waiting and school enrollment.

[10] Uncommon = a few each year; infrequent=monthly; frequent=weekly; common=daily.

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Roads & Terrain							
% level	mean	50.33	68.09	54.75	28.97	51.50	46.39
	SEM	3.24	3.24	5.51	1.98	3.03	1.46
	SD	38.55	31.74	38.15	28.47	31.37	35.65
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% hilly	mean	36.69	28.01	29.52	57.50	40.16	42.42
	SEM	2.75	2.83	4.52	2.26	2.53	1.33
	SD	32.98	27.98	31.29	32.37	26.56	32.77
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% mountainous	mean	13.35	5.55	16.43	13.52	8.83	11.59
	SEM	2.75	1.72	3.51	1.87	1.77	0.98
	SD	26.37	16.94	24.58	26.82	18.43	23.96
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% major paved	mean	31.15	41.22	37.85	33.50	43.17	36.37
	SEM	1.94	2.85	5.33	1.94	2.91	1.16
	SD	24.27	29.34	38.83	27.92	32.05	29.48
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100
% minor paved	mean	28.55	42.44	33.38	56.22	45.21	43.24
	SEM	1.77	2.54	4.64	1.97	2.61	1.15
	SD	22.17	26.14	33.77	28.25	28.72	29.12
	minimum	0	0	0	0	0	0
	maximum	100	100	100	100	100	100

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Roads/Terrain (con't)							
% unpaved	mean	40.38	16.64	28.77	9.78	11.62	20.28
	SEM	2.11	1.44	4.25	0.99	1.55	0.93
	SD	26.40	15.01	30.95	14.26	17.02	23.63
	minimum	0	0	0	0	0	0
	maximum	95	60	100	80	80	100
rough ride index[11]	mean	90.06	48.85	76.56	80.68	60.77	74.17
	SEM	4.6	3.61	7.06	2.32	3.83	1.82
	SD	54.73	34.03	48.88	33.12	39.09	43.99
	minimum	0	0	2.00	0	0	0
	maximum	193.00	150.00	200.00	175.00	170.00	200.00
Bus System							
bus supervisor[12]	% full-time	36.6	80.0	39.0	43.1	54.1	49.8
	% parttime	47.0	17.5	52.5	52.1	42.1	42.9
	% not assign	16.5	2.5	8.5	4.7	3.8	7.3
	valid N	164	120	59	211	133	687
principal schedules[13]	% yes	11.0	3.3	6.7	5.2	16.8	8.6
	% no	89.0	96.7	93.3	94.8	83.2	91.4
	valid N	164	120	60	212	131	687

[11] % hilly + % mountainous + % unpaved

[12]Questionnaire stem for role not assigned = "role not formally assigned".

[13] Asked respondents if they personally "schedule and determine bus routes for [their] students."

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Bus System (con't)							
IEP/504 document[14]	% yes	33.5	37.1	10.2	57.5	30.0	38.6
	% no	66.5	62.9	89.8	42.5	70.0	61.4
	valid N	161	116	59	200	130	666
drivers in IEP mtgs[15]	no	55.2	51.3	31.7	66.7	48.5	54.7
	rarely	37.4	35.3	33.3	29.0	37.3	34.1
	sometimes	6.7	12.6	25.0	3.8	12.7	9.6
	often	0.6	0.8	10.0	0.5	1.5	1.6
	valid N	163	119	60	210	134	686
emergency training[16]	% none	1.9	3.5	0	5.2	0	2.6
	% infrequent	8.2	1.8	0	13.4	0	6.3
	% some	19.0	22.1	6.7	40.7	3.8	21.8
	% regular	70.9	72.6	93.3	40.7	96.2	69.3
	valid N	158	113	60	194	130	655
communication dev[17]	none	24.7	0	5.0	6.3	1.5	8.5
	planned	9.3	1.7	6.7	1.0	0	3.4
	some	13.0	4.2	18.3	19.2	1.5	11.6
	all	53.1	94.1	70.0	73.6	97.0	76.5
	valid N	162	119	60	208	133	682

[14] Asked if bus drivers receive copies of IEPs or 504 modifications.

[15] Asked how frequently drivers were included in IEP meetings for special education students. "No" = "Not to my knowledge" on questionnaire.

[16] Frequency of drivers' first-aid training for use in bus emergencies. Infrequent= "infrequent and irregular (not planned)"; some="some training (some training within a five-year period)"; regular="regular training (yearly or every other year)."

[17] "How many buses are equipped with CB radios or other communication devices?" None="none of them, and no plans have been made"; planned="none of them, but plans have been made."

VARIABLES	STATISTIC	AR	GA	NM	PA	WA	TOTAL
Bus System (con't)							
district bus policy[18]	% yes	94.5	94.2	100	93.9	97.0	95.2
	% no	5.5	5.8	0	6.1	3.0	4.8
	valid N	164	120	61	212	134	691
school bus policy[19]	% yes	94.5	90.8	93.4	88.6	92.5	91.6
	% no	5.5	9.2	6.6	11.4	7.5	8.4
	valid N	163	120	61	211	134	689
why parents drive[20]	% behavior	53.4	73.3	23.0	53.3	36.1	50.8
	% child dis	22.7	20.0	9.8	29.0	12.0	21.0
	% child pref	73.6	64.2	41.0	58.6	51.1	60.1
	% fam. conv.	85.3	84.2	77.0	85.2	82.7	83.8
	% health/psy	8.6	4.2	9.8	11.0	5.3	8.0
	% driver	6.7	9.2	4.9	15.7	7.5	9.9
	% open enr.	8.6	10.8	49.2	1.9	34.6	15.6
	% other	5.5	10.0	21.3	19.0	24.1	15.4
	valid N	163	120	61	210	133	687

[18] " Does your district have a formal bus discipline policy?"

[19] "Does your school have a formal bus discipline policy?"

[20] Reasons parents chose to transport children privately (respondents asked to choose 3 reasons). Behavior=behavior of other students on bus; child dis=child is a discipline problem; child pref=preference of child; fam. conv.=family convenience; health/psy=health or psychological need of child; driver=dissatisfaction with driver; open enr.=open enrollment (transportation not provided for out-of-district children); other=anything else. Across all valid cases (n=687), 97 respondents (14.1%) provided "other" reasons. We categorized these responses as follows: ride too long (37.7%); short distance to school (14.3%); not eligible to ride the bus (11.2%); parental choice, convenience, etc. (10.2%); after school activities or appointments (9.2%); concern for safety (6.1%); miscellaneous (10.2%).

Table 2

Correlations of .20 or Greater: Key Features of the Bus Ride with *Meals Rate*, By State

	----------states---------- * p < .05; ** p < .01; *** p < .001 ns = p > .05; — = < .20	Full Sample

Variables By Category	correlate	AR	GA	NM	PA	WA	total
Demographic							
school enrollment	SES[21]	-.33***	—	—	—	—	-.21***
	MIN[22]	-.23**	—	+.27*	+.28***	—	—
percent minority	SES	+.47***	+.77***	+.69**	—	+.54***	+.65***
	MIN						
district enrollment	SES	—	-.34***	—	—	—	—
	MIN	—	—	+.28*	+.39***	—	—
school attendance area	SES	—	—	-.33**	—	+.25**	—
	MIN	-.21**	—	-.21ns	—	—	—
district attendance area	SES	—	—	-.21ns	+.23**	—	—
	MIN	—	—	—	—	—	—
school area density index[23]	SES	-.31**	—	+.22ns	-.24**	—	—
	MIN	—	—	+.29*	+.37***	—	—
district area density index[24]	SES	-.20ns	-.35**	—	-.29***	—	—
	MIN	—	—	+.25ns	+.45***	—	—

[21]SES = socioeconomic status (subsidized meal rate)

[22]MIN = percentage of students who belong to ethnic minorities ("percent minority")

[23] School enrollment divided by value of density variable (which varies from 1 to 4).

[24] District enrollment divided by value of density variable (which varies from 1 to 4).

Variables By Category	correlate	AR	GA	NM	PA	WA	total
Transportation							
perecentage eligible to ride bus	SES	—	—	—	—	—	—
	MIN	-.20**	—	—	—	—	—
percentage walkers	SES	—	+.36***	—	—	—	—
	MIN	+.36***	+.47***	—	—	—	—
percentage ineligible, driven	SES	—	—	—	—	—	—
	MIN	—	—	—	—	—	—
% eligible, but driven instead	SES	—	-.46***	-.20ns	—	-.29**	—
	MIN	—	-.39***	—	—	—	—
net percentage bused	SES	—	+.40***	—	—	—	—
	MIN	—	+.33***	—	—	—	—
Kids' Experience of the Ride							
longest ride at school	SES	—	+.22**	-.33*	—	—	—
	MIN	-.41***	—	-.26*	—	—	--
percent other, ride too long[25]	SES	—	—	—	—	—	—
	MIN	—	—	+.22ns	—	—	--
percentage riding with older	SES	-.22**	—	—	+.28***	+.20*	+.21***
	MIN	-.40***	—	—	—	—	—
percentage kids that transfer	SES	—	—	—	—	—	—
	MIN	—	—	—	—	—	—
wait longer than 5 min, AM	SES	—	—	—	—	+.35***	—
	MIN	—	—	—	—	+.32***	—
wait longer than 5 min, PM	SES	—	—	—	—	—	—
	MIN	—	—	+.24ns	—	—	—
ride reduces parent involv.	SES	—	—	—	—	—	—
	MIN	—	+.20*	—	—	—	—

[25] percentage of in-district students attending another school because the ride is too long

Variables By Category	correlate	AR	GA	NM	PA	WA	total
Kids' Experience (con't)							
average wait time, morning	SES	—	—	—	—	+.27*	—
	MIN	+.23*	—	+.41*	—	—	+.25***
average wait time, afternoon	SES	—	—	—	—	—	—
	MIN	+.22*	—	—	—	—	—
frequency of illness, discomfort	SES	—	—	—	—	—	—
	MIN	—	—	—	—	—	—
days lost to bad weather	SES	—	—	—	—	—	—
	MIN	-.30***	-.20*	+.20ns	—	—	-.28***
Roads and Terrain							
percentage level miles	SES	—	+.30**	—	-.24**	—	—
	MIN	+.48***	+.47***	—	—	—	+.33***
percentage hilly miles	SES	—	-.25*	—	—	—	—
	MIN	-.37***	-.33**	+.27ns	—	—	-.27***
percentage mountainous miles	SES	—	—	-.26ns	—	+.24*	—
	MIN	-.24**	-.28***	-.30*	—	—	—
percentage of major paved	SES	—	—	—	—	-.20*	—
	MIN	—	—	—	—	—	—
percentage of minor paved	SES	—	—	—	—	+.26**	—
	MIN	+.29***	-.24*	—	—	—	—
percentage of minor unpaved	SES	—	+.27**	—	+.22**	—	+.26***
	MIN	-.35***	+.27**	—	—	—	—
rough ride index	SES	—	—	—	+.29***	—	—
	MIN	-.52***	-.34**	—	-.20**	—	-.26***

Variables By Category	correlate	AR	GA	NM	PA	WA	total
Bus System							
full-time bus supervisor	SES	—	-.39***	+.32*	-.21**	—	—
	MIN	—	-.39***	+.42**	-.20**	—	—
IEP, 504 documents to drivers	SES	—	-.22*	—	—	—	—
	MIN	—	—	—	—	—	—
drivers in IEP meetings	SES	—	—	—	+.26***	—	—
	MIN	—	—	—	—	—	—
drivers' first-aid training	SES	—	—	—	—	—	—
	MIN	—	—	—	—	—	+.21***
buses with commun. devices	SES	—	—	—	—	—	—
	MIN	-.22**	—	—	—	—	—
N of correlations >= .20	SES[26]	5	11	7	8	8	3
	MIN[27]	16	11	13	6	1	6
	total	21	22	20	14	9	9

Correlations gauge strength of association, with values varying between -1.00, a perfect inverse relationship, to +1.00, a perfect direct relationship. A correlation of +/- .20 is accepted as having practical significance. Variables that are correlated to this extent share four percent of their variance (shared variance is the square of the correlation value). Cells with "—" contain values magnitudes greater than -.20 but smaller than +.20 and these values may or may not be statistically significant. Because New Mexico has the smallest school universe, it also has the smallest sample size, and therefore a larger number of statistically nonsignificant correlations with magnitudes greater than +/- .20.

[26] Does not include correlation with MIN.

[27] Does not include correlation with SES.

Table 3
Independent Sample t-tests of Mean Differences for Specified Comparisons

Variable	OT	POV					MIN				
		N	mean	SD	t	p	N	mean	SD	t	p
walkers	4						156	5.51	12.40	-1.280	ns
	4						170	7.39	14.03		
opt driven	1	162	14.47	14.59	5.208	.000					
	4	163	7.62	8.22							
older	1	160	48.05	47.26	-2.706	.007					
	4	161	61.68	42.89							
AM wait	1						80	13.80	7.22	-.600	ns
	4						85	14.46	6.91		
level	1	143	49.05	35.25	.656	ns	147	33.77	31.97	-7.316	.000
	4	146	46.23	37.78			158	62.11	35.66		
hilly	1						149	49.44	32.86	4.345	.000
	4						159	33.28	32.39		
mountain	1	145	7.82	18.48	-2.349	.000	148	17.25	29.65	4.375	.000
	4	146	14.41	28.38			157	5.14	16.62		
min paved	1						160	44.44	28.14	-.278	ns
	4						164	45.36	31.48		
unpaved	1	157	17.65	23.69	-2.043	.042	160	22.71	25.11	3.020	.003
	4	151	23.34	25.22			165	15.10	19.93		
rough ride	1						145	88.59	40.11	8.006	.000
	4						141	51.74	39.08		

Notes

Shaded blocks: comparison not indicated by correlational analysis (see Table 3 and related discussion).

Variable names: walkers: percentage of students who walk to school; opt driven: percentage of students who are eligible to ride the bus, but who are driven instead; older: percentage of elementary students riding with older (i.e., secondary) students; AM wait: average wait in the morning for those waiting longer than 5 minutes; level: percentage of bus miles that are over level terrain; hilly: percentage of bus miles over hilly terrain; mountain: percentage of bus miles over mountainous terrain; min paved: percentage of bus miles over minor, paved roads; unpaved: percentage of bus miles over minor, unpaved roads; rough ride: rough ride index (sum of hilly, mountain, unpaved).

Table 4
χ^2 Tests of Significance for Specified Categorical Variables

			POV quartiles				MIN quartiles			
			1	2	3	4	1	2	3	4
longest	<30 min	freq.	28	25	18	27	21	20	25	37
		% in 4-ile	16.9%	15.3%	11.3%	16.4%	12.9%	11.6%	14.2%	21.3%
	30-59 mi	f	112	84	99	94	88	109	105	109
		%	67.5%	51.5%	62.3%	57.0%	54.0%	63.0%	59.7%	62.6%
	60-90 min	f	25	51	42	41	52	43	42	28
		%	15.1%	31.3%	26.4%	24.8%	31.9%	24.9%	23.9%	16.1%
	>90 min	f	1	3	0	3	2	1	4	0
		%	0.6%	1.8%	0%	1.8%	1.2%	0.6%	2.3%	0%
statistical significance (longest)			**$\chi^2 = 19.13$, p = .024**				**$\chi^2 = 21.60$, p = .010**			
weather	0-2 days	f					88	99	101	116
		%					54.3%	57.2%	57.7%	66.7%
	3-5 days	f					62	63	66	50
		%					38.3%	36.4%	37.7%	28.7%
	6-9 days	f					10	8	8	8
		%					6.2%	4.6%	4.6%	4.6%
	10-12 days	f					2	3	0	0
		%					1.2%	1.7%	0%	0%
statistical significance (weather)							**$\chi^2 = 11.47$, p = ns**			
bus super	part-time	f	55	68	66	86	66	84	77	68
		%	36.4%	43.6%	45.5%	56.6%	44.0%	52.5%	47.0%	41.7%
	full-time	f	96	88	79	66	84	76	87	95
		%	63.6%	56.4%	54.5%	43.4%	56.0%	47.5%	53.0%	58.3%
statistical significance (bus super)			**$\chi^2 = 12.768$, p = .005**				**$\chi^2 = 4.197$, p = ns**			

Notes

Shaded block: comparison not indicated by correlational analysis (see Table 3 and related discussion).

Percentages in the table are within-quartile percentages (columns percents sum to 100%, with consideration for rounding).

Variable names: longest: longest ride at school; weather: number of days lost to bad weather per year; bus super: is bus supervison a part-time or full-time role.

Table 5

Coincidence of Circumstances ("Risks"):
Proportion of Schools Within States and for Total Sample for Each Combination

RISKS	p*	AR	GA	NM	PA	WA	total
L1, DR	.000	68.6%	35.2%	35.6%	27.5%	46.5%	43.1%
L2, DR	.000	29.6%	11.9%	11.5%	8.25%	18.9%	16.3%
L1, DR, TR	.000	20.6%	11.0%	0%	19.7%	1.5%	13.1%
L2, DR, TR	.001	10.4%	5.0%	0%	5.7%	0.8%	11.8%
L1, DR, COM	.000	27.7%	1.7%	5.0%	11.9%	1.5%	11.2%
L2, DR, COM	.001	10.4%	5.0%	0%	5.7%	0.8%	5.3%
L1, RR	.000	53.1%	22.0%	45.1%	58.6%	29.9%	45.4%
L2, RR	.000	27.8%	5.4%	12.1%	12.5%	10.3%	14.5%
L1, RR, DR	.000	43.2%	10.5%	16.1%	21.2%	15.1%	22.9%
L2, RR, DR	.000	23.4%	4.4%	4.9%	6.8%	8.5%	10.5%
L1, RR, COM	.000	17.8%	0%	10.5%	17.8%	0%	10.5%
L2, RR, COM	.000	10.6%	0%	0%	4.8%	0%	3.9%
L1, RR, TR	.000	14.4%	7.5%	0%	35.2%	0%	15.4%
L2, RR, TR	.001	8.7%	2.6%	0%	7.3%	0%	4.7%
L1, DR, RR, COM	.000	9.9%	0%	0%	2.8%	0%	3.2%
L1, DR, RR, TR	.000	12.8%	4.4%	0%	15.3%	0%	8.4%

Notes

L1 = longest ride at rural elementary school is 30 minutes or more
L2 = longest ride at rural elementary school is 60 minutes or more
DR = 100% of students at school double-routed
TR = emergency training not regular (more rare than every second year)
COM = some or none of buses have communication devices
RR = rough ride index greater than the mean (74.17)

* significance level of chi-square measure of between-state differences in frequencies for the relevant combination of risk factors (ns = $p > .05$)

Appendix A

Survey Instrument

Instructions: Please enter the information that, in your opinion, best answers the survey questions. If you serve as principal for more than one school, please select just one school to describe. "Length of bus ride" refers to *time* rather than *miles*, unless otherwise noted.

I. Basic Demographic Questions

A. What is the lowest grade **at your school**?

____ (low grade)

B. What is the highest grade **at your school**?

____ (high grade)

C. Approximately how many students are enrolled **at your school**?

____ (number of students in school)

D. In what sort of **place** is your school located?

___ mostly suburban
___ mostly urban
___ mostly rural

E. Is your **school's** attendance area (in square miles) small, medium, large, or very large?

___ small (less than 2 square miles)
___ medium (more than 2 sq. miles but less than 10 sq. miles)
___ large (more than 10 sq. miles but less than 25 sq. miles)
___ very large (more than 25 square miles)

F. What percentage of your students receives **free or reduced-price meals**?

___% (meals rate)

G. Does your school offer a **breakfast program**?

___ Yes
___ No

H. Approximately how many students are enrolled **in your district**?

____ (number of students in district)

I. Is your **district's** attendance area (in square miles) small, medium, large, or very large?

___ small (less than 4 square miles)
___ medium (more than 4 sq. miles but less than 25 sq. miles)
___ large (more than 25 sq. miles but less than 100 sq. miles)
___ very large (more than 100 square miles)

II. Characteristics of the Transportation System

1. Does your school provide free transportation?

___ Yes --> **proceed to item 2**

___ No --> Please return this survey; the remaining items will not apply in your case. The return of this survey is important to our study, and we thank you for your cooperation in returning it.

2. Approximately what percentage of your students is **eligible** to be bused to school?
___ % (percent eligible to ride bus)

3. How do those students **not eligible** to ride the bus get to school?
(*please estimate percentages below*)

___% that transported privately by parents or others
___% that walk to school
___% other _____ (please describe)
___% other _____ (please describe)

4. Does your school district have a full- or part-time **transportation coordinator** or supervisor?

___ full-time
___ part-time (role may be one of several assigned to a single individual)
___ role not formally assigned

5. If part-time person, into which other role is transportation supervision folded?

____ Superintendent
____ Assistant Superintendent
____ Principal of each school
____ Other _____
_____(please describe)

6. Do you, as building principal, schedule and determine bus routes for your students?

____ Yes
____ No

7. Are bus drivers provided documentation about modifications necessary for special-needs students (for instance: copies of IEPs or 504 modifications)?

____ Yes
____ No

8. How frequently are school bus drivers included in IEP meetings?

___ often
___ sometimes
___ rarely
___ not to my knowledge

9. To what extent do bus drivers receive training to provide first-aid in the event of a bus emergency?

____ regular training for this (yearly or every other year)
____ some training for this (some training within a 5-year period)
____ infrequent and irregular training (not planned)
____ none

10. How many buses are equipped with CB radios or other communication devises?

____ all of them
____ some of them
____ none of them, but plans have been made
____ none of them, and no plans have yet been made

11. Does your **district** have a formal bus discipline policy?

___ Yes
___ No

12. Does your **school** have a formal bus discipline policy?

___ Yes
___ No

III. Experience of Riding the Bus

13. What is the terrain traveled by school buses in your area? (*please give us a rough estimate of the percentage of* ***miles traveled*** over such terrain by buses serving your school)

____% Level
____% Hilly
____% Mountainous

14. What proportion of the following sorts of roads do the buses serving your school travel? (please *estimate* the percentage of miles traveled)

____% paved and major roads
____% paved minor roads
____% unpaved minor roads

15. What, in your estimation, are the **three most common reasons** most parents choose to transport their children privately? (*please check [/] the top three reasons*)

__ Concern of parents with behavior of older children riding the bus
__ Child presents discipline problems
__ Preference of child(for instance: conflicts with other children, boredom on ride)
__ Family convenience (for instance: parent work schedule, more family time)
__ Health or psychological condition of child (for instance: asthma)
__ Dissatisfaction with bus driver
__ Open enrollment (transportation not provided for out-of-district students)
__ Other (*please describe*) _____

16. Approximately what percentage of students must wait longer than 5 minutes to board a bus at the **end of the school day**?

___ % (percent waiting, end of day)

17. Approximately what percentage **of those students who wait** experience waits of the following lengths?

___ % less than 10 minutes
___ % 10 to 19 minutes
___ % 20 to 29 minutes
___ % 30 to 40 minutes
___ % longer than 40 minutes

18. Approximately what percentage of students must wait longer than 5 minutes before being allowed to enter classrooms after they arrive at school at the **beginning of the day**?

___ % (percent waiting, beginning of day)

19. Approximately what percentage **of those students who wait** experience waits of the following lengths?

___ % 5 to 10 minutes
___ % 10 to 19 minutes
___ % 20 to 29 minutes
___ % 30 to 39 minutes
___ % 40 minutes or longer

20. To the best of your knowledge, **how frequent** are reports of illness or discomfort associated with bus rides among your students?

__ common (daily or every several days)
__ frequent (weekly or every other week)
__ infrequent (monthly or every couple of months)
__ uncommon (perhaps a few each year)

21. To the best of your knowledge, approximately **how long (in minutes)** is the longest bus ride for any student at your school?

___ less than 30 minutes (one-way)
___ 30 to 59 minutes (one-way)
___ 60 to 90 minutes (one-way)
___ more than 90 minutes (one-way)

22. To the best of your knowledge, what percentage of students riding the bus at your school must transfer to one or more other buses in order to get from home to school?

___ % who transfer

23. Approximately what percentage of students who are eligible to ride the bus **are instead driven privately** to school most of the time?

___ less than 5%
___ 5-15%
___ more than 15%

24. To the best of your knowledge, among those students who are eligible to ride the bus, but are instead driven privately to school most of the time, what percentage would have bus rides of the following length?

___% short rides (under 30 minutes one-way)
___% long rides (more than 30 one-way)

25. On average in your experience (please estimate), how many school days are lost or rescheduled due to weather?

____ 0-2 days
____ 3-5 days
____ 6-9 days
____ 10-12 days
____ 12-15 days
____ 15 or more days

26. What percentage of students in your school attendance area actually attend **other schools** because of the length of the bus ride?

___ less than 5%
___ 5-10%
___ more than 10%

27. Of the students who display discipline problems on the bus, *please estimate* the percent of those whose rides are:

___% less than 30 minutes (one-way)
___% 30 to 60 minutes (one-way)
___% more than 60 minutes (one-way)

28. Please estimate the percentage of your students who ride the same bus as students **enrolled in grades higher** than those in your building.

___% (percent riding with older students)

29. In your view, to what extent does the distance between the child's home and school reduce the involvement of parents in activities at the school?

___ doesn't reduce it
___ reduces it a little
___ reduces it more than a little
___ reduces it a lot

Thank you very much for your help. This is one of the first national studies to document students' experience riding the bus.

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