

2007



SCHOOL BUS

Transportation Optimization
pilot study



Delaware Valley
Regional Planning
Commission



2007



SCHOOL BUS

Transportation Optimization

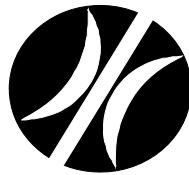
pilot study



Delaware Valley
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Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.



Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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Executive Summary

Voters are defeating school budgets and putting pressure on school districts to cut costs. Student transportation has become a target. There is a perception that New Jersey spends far more on student transportation than other states. In addition, the costs associated with getting New Jersey children to and from school continue to increase annually. Against this backdrop, DVRPC was asked to study the efficiency of student transportation in Camden County and recommend strategies for improving it. Lindenwold Borough became the subject of the study.

Camden County has 37 school districts. More than half of the school districts have fewer than 1,000 students. Lindenwold ranks ninth overall with approximately 2,500 students.

The total budget of the Lindenwold school district for the 2004-2005 school year was approximately \$25.4 million; the transportation budget that year was approximately \$1.3 million, five percent of the total. But the transportation percentage is misleading. Much of the district's budget is fixed and only a small fraction of it is discretionary. A large share of the discretionary budget goes to fund transportation. The competition for scarce discretionary funds sets up a tradeoff between transportation spending and the educational programs of the school district, and it explains why there is so much pressure to reduce transportation spending.

School districts can improve their efficiency by adopting any of a number of best practices identified by the Department of Education. Most best practices are effective because they facilitate tiering bus routes, loading full buses, or both.

Due to budget shortfalls, school districts are under pressure to eliminate courtesy busing. But eliminating courtesy busing has potentially negative consequences for student safety and for traffic congestion on local roads. Therefore, a successful courtesy busing strategy should reduce the transportation costs of the school district, while still providing transportation to students with the most need.

Two strategies that accomplish both of these goals are busing for hazard and subscription busing.

Some district-owned transportation operations are highly efficient. There appear to be three factors that explain their success: First, they run a high-value, rather than a low-cost, operation. Second, they contract selectively when it is cheaper to do so. And third, they have strong incentives to implement joint transportation agreements because they run the operations themselves.

Chapter 1 – Introduction

The New Jersey property tax revolt has landed at the front door of the schoolhouse. Voters are defeating school budgets and putting pressure on school districts to cut costs. Student transportation has become a target. There is a perception, probably based on a well-publicized survey that first appeared in *School Bus Fleet* magazine, that New Jersey spends far more on student transportation than other states. Although some critics argue that the study did not offer a fair comparison, the costs associated with getting New Jersey children to and from school continue to increase annually, while school districts face budget shortfalls.

It was against this backdrop that DVRPC was asked to study the efficiency of student transportation in Camden County and recommend strategies for improving it. At the request of Camden County, Lindenwold Borough became the subject of the study. A formal kick-off meeting in Lindenwold was followed by data collection, including detailed records of school bus routes and costs.

After a review of the data and further informal meetings with the school district business administrator, one conclusion became obvious: Lindenwold's staff was highly professional, with a strong command of local circumstances. They rely on up-to-date software to optimize their school bus routes. They also enjoy some natural advantages. The presence of multifamily housing in the school district promotes efficient school bus routes.

As this study documents, Lindenwold's student transportation operation is highly efficient. However, the high cost of student transportation is about more than efficiency; larger policy issues also impact it. Two trends, both advertised as ways for school districts to save money, stood out: The push to eliminate courtesy busing and, a more long-term proposition, the abandonment of district-owned transportation in favor of contracting out student transportation.

The consequences of these trends did not appear to have been fully thought out. If courtesy busing were eliminated, would students be able to walk to school safely? And what would be the impact on local roads near schools if more

parents had to drive their children to school? And why should some school districts be unable to outperform contractors?

In response to these questions, DVRPC reached out to school districts and student transportation professionals across the state of New Jersey. The foundation of this report is a series of conversations with student transportation professionals. They include staff at the New Jersey Department of Education, the School Transportation Superintendents of New Jersey, several New Jersey educational service commissions, individual school districts, and also private sector companies that supply services to support student transportation. The study then identified a small number of school districts that were going against the trends and being successful. Staff from these school districts were also interviewed. The result is this report, which presents best practice in student transportation as applied to courtesy busing and district-owned transportation.

Chapter 2 of the study provides a summary of student transportation in Camden County. It describes the baseline conditions faced by Camden County school districts. Where possible, data from the Lindenwold school district or other Camden County school districts are used to add context. Chapter 3 is an assessment of the efficiency of student transportation in the Lindenwold school district. The current practice of the school district is also compared against best practice as defined by the New Jersey Department of Education. Chapter 4 discusses the consequences of eliminating courtesy busing and describes two alternative strategies: busing for hazard and subscription busing. Chapter 5 discusses district-owned transportation as an alternative to contracting out transportation; it analyzes two highly efficient district-owned school districts: Mendham Township and Medford Township. Chapter 6 presents the study recommendations.

Chapter 2 – Student Transportation in Camden County

This chapter provides a summary of student transportation in Camden County. It describes the school districts, the state mandates under which they operate, the students they transport and their destinations, the service providers with whom they contract, and the financing of student transportation. Where possible, data from the Lindenwold school district or other Camden County school districts is used to add context. Figure 1 on page 6 shows the Lindenwold school district.

School Districts

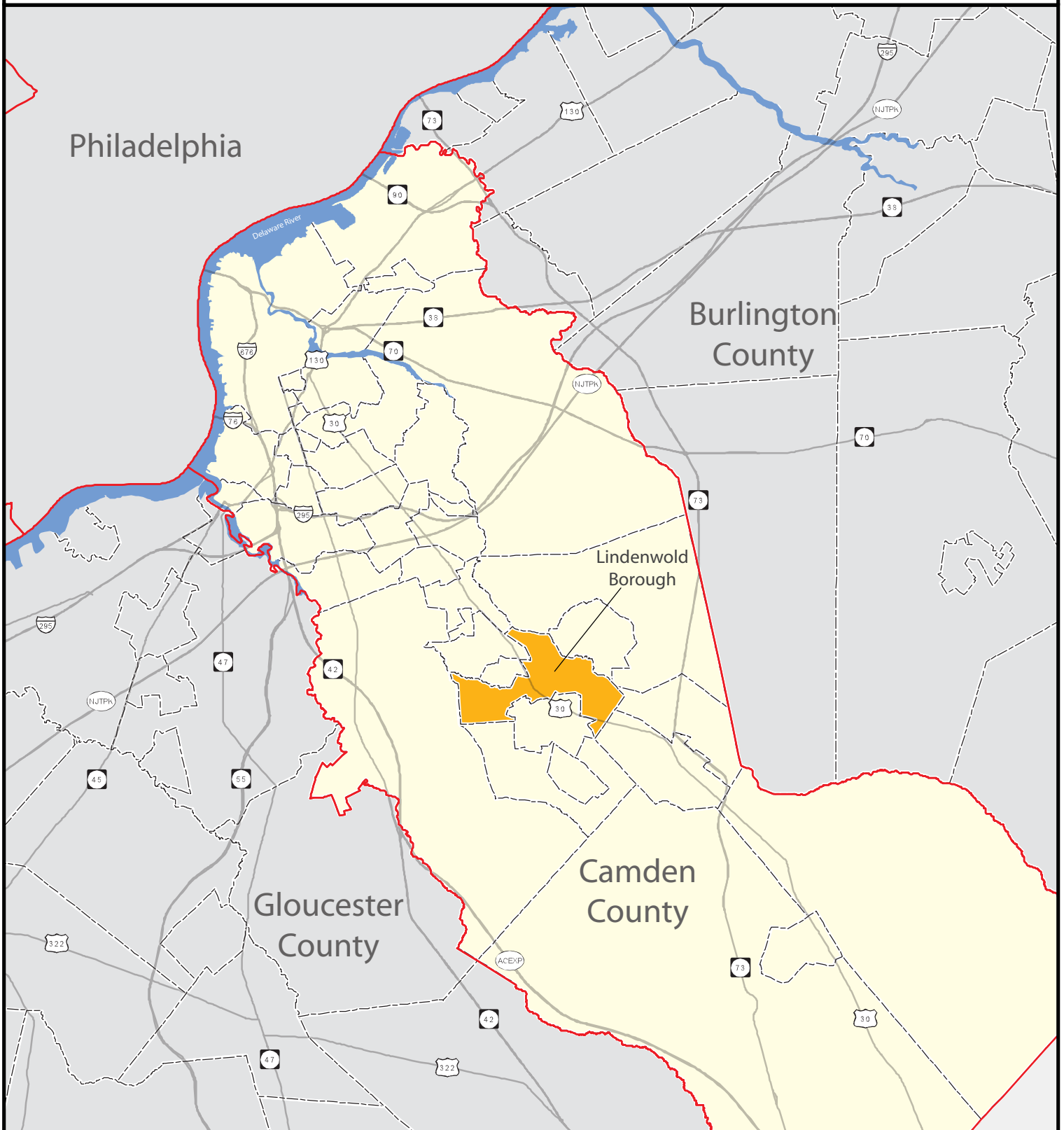
Camden County has 37 school districts, including a vocational-technical school and three regional high schools. There are five school districts with more than 5,000 students, and Camden City and Cherry Hill have more than 10,000, but these are the exceptions. More than half of the school districts have fewer than 1,000 students. Lindenwold ranks ninth overall with approximately 2,500 students. Table 1 lists enrollment by school district.

Table 1: CAMDEN COUNTY ENROLLMENT BY SCHOOL DISTRICT (2004-2005)

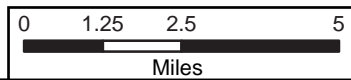
School District	Enrollment	School District	Enrollment
Audubon Borough	1,640	Haddonfield Borough	2,403
Barrington Borough	581	Laurel Springs Borough	213
Bellmawr Borough	1,091	Lawnside Borough	326
Berlin Borough	834	Lindenwold Borough	2,501
Berlin Township	685	Magnolia Borough	498
Black Horse Pike Reg S.D.	4,366	Merchantville Borough	338
Brooklawn Borough	349	Mount Ephraim Borough	496
Camden City	18,016	Oaklyn Borough	454
Camden County Vocational	3,000	Pennsauken Township	5,905
Cherry Hill Township	11,500	Pine Hill Borough	2,216
Chesilhurst Borough	135	Runnemede Borough	800
Clementon Borough	603	Somerdale Borough	477
Collingswood Borough	1,895	Sterling High School	999
Eastern Camden Cnty Reg S.D.	2,226	Stratford Borough	862
Gibbsboro Borough	281	Voorhees Township	3,408
Gloucester City	2,320	Waterford Township	947
Gloucester Township	7,973	Winslow Township	6,547
Haddon Heights Borough	1,270	Woodlynne Borough	506
Haddon Township	2,127		

Source: N.J. Department of Education - Comparative Spending Guide

Figure 1: REGIONAL SETTING



 Lindenwold School District



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State Mandates

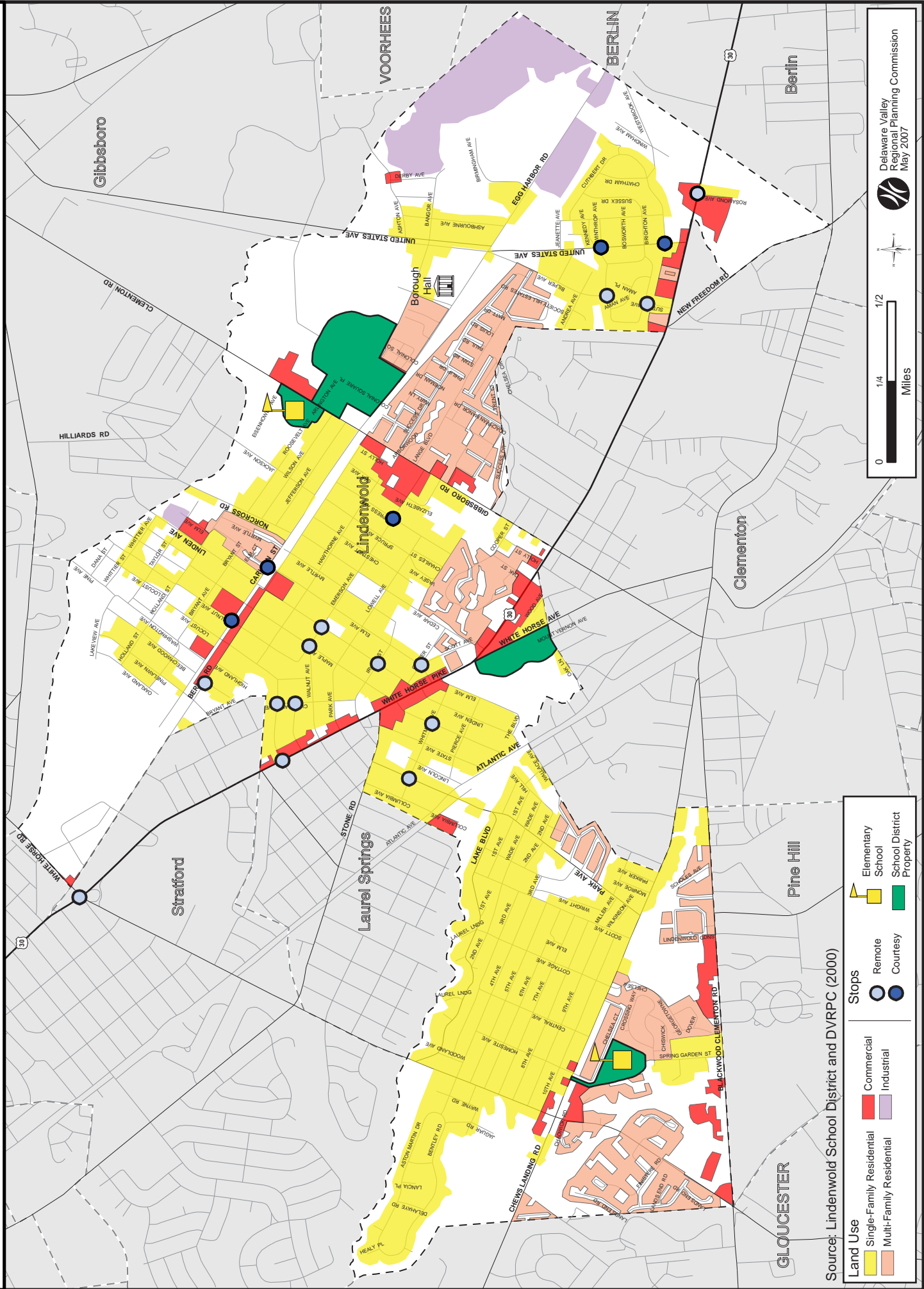
Under New Jersey law (N.J.S.A 18A:39-1), all public school students who reside remote from their schools are entitled to transportation. Remote is defined as greater than two miles for elementary school students (grades K-8) and greater than two and a half miles for high school students (grades 9-12). School districts must also coordinate transportation services or pay “aid-in-lieu of” services to nonpublic students living in the school district. The state has set a limit on how far nonpublic students can be transported; the limit in Camden County is 20 miles.

Lindenwold public school students attend two elementary schools, one middle school, and one high school, all located in the school district. Figures 2, 3, and 4 on pages 8-10 show Lindenwold public schools, including bus stops of students residing remote and receiving courtesy busing. Nonpublic schools attended by Lindenwold students have a wide spatial distribution. A majority of the nonpublic schools are located in Camden County, but a significant number are located in Burlington County or Gloucester County. Many students attending these schools travel five to ten miles each way. The trips may take an hour or more because the school bus has to pick up or drop off students from several school districts along the way. Traffic congestion on major arterials may add further delays. Figure 5 on page 11 shows nonpublic schools attended by Lindenwold students.

Special education students are also entitled to transportation. Some special education students ride a school bus and attend school in the district. Others with special needs attend school outside the district. They ride lift-equipped vans, which provide door-to-door service. The vans that carry Lindenwold special education students have a driver and an aide. Having an aide in the van is a common, but not universal, procedure.

Students who attend one of two Camden County vocational-technical schools must also be transported by the school district. The schools are located in Gloucester Township and Pennsauken.

Figure 2: LINDENWOLD PUBLIC ELEMENTARY SCHOOLS, WITH BUS STOPS FOR STUDENTS RESIDING REMOTE AND COURTESY BUSING



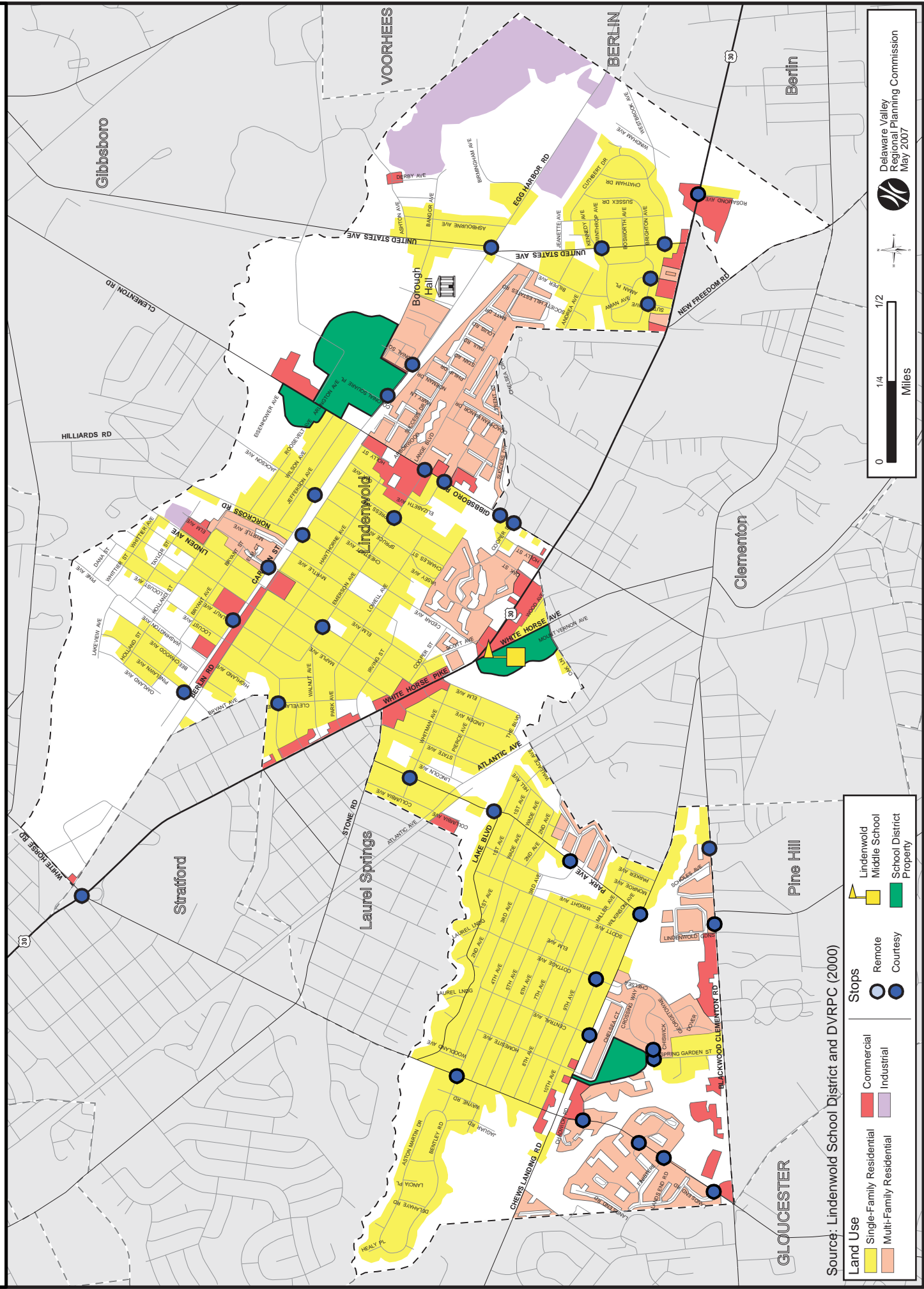
Source: Lindenwold School District and DVRPC (2000)

Land Use		Stops	
	Single-Family Residential		Elementary School
	Multi-Family Residential		School District Property
	Commercial		Remote
	Industrial		Courtesy

0 1/4 1/2 Miles

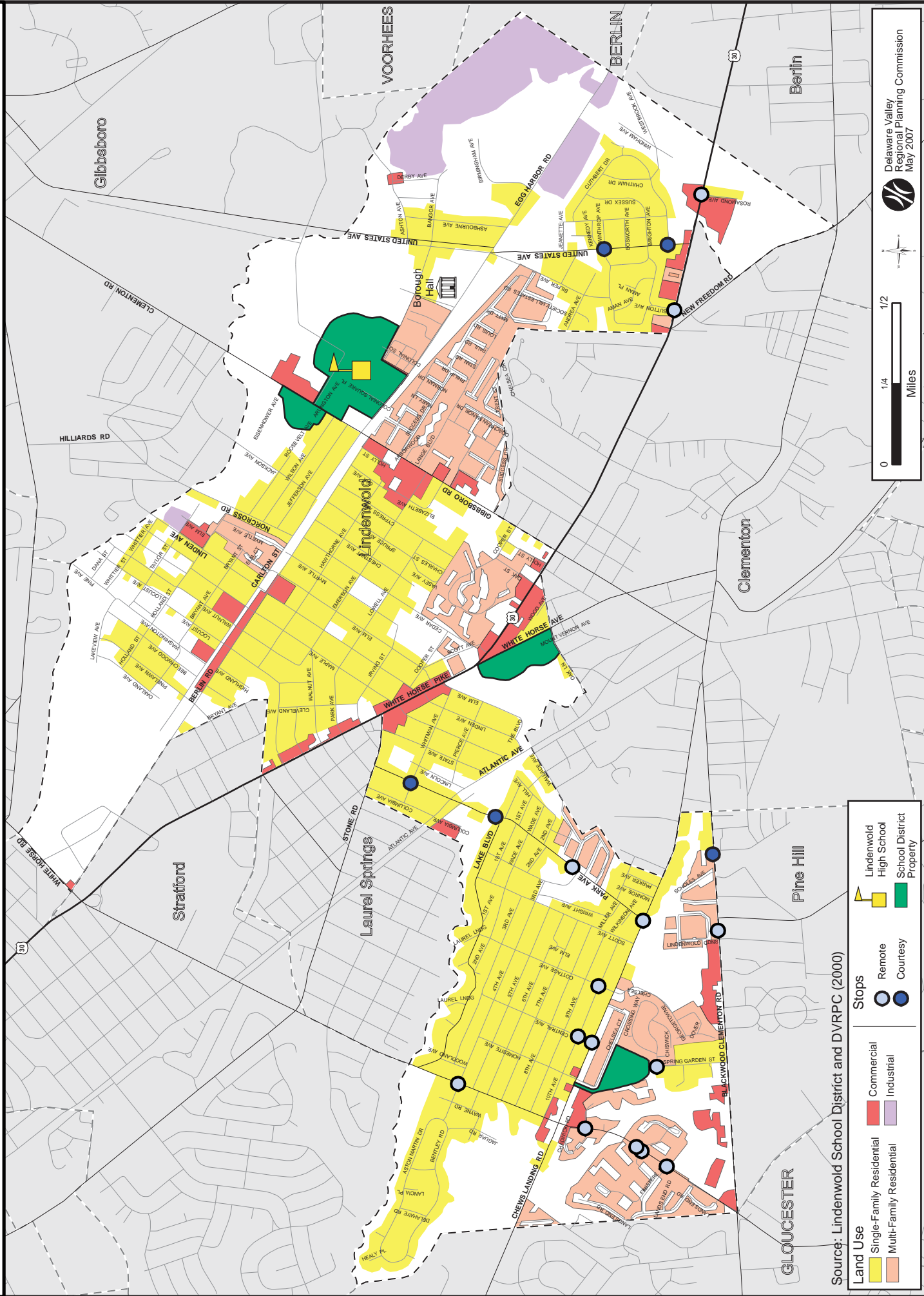


Figure 3: LINDENWOLD PUBLIC MIDDLE SCHOOL, WITH BUS STOPS FOR STUDENTS RESIDING REMOTE AND COURTESY BUSING



Source: Lindenwold School District and DVRPC (2000)

Figure 4: LINDENWOLD PUBLIC HIGH SCHOOL, WITH BUS STOPS FOR STUDENTS RESIDING REMOTE AND COURTESY BUSING



Source: Lindenwold School District and DVRPC (2000)

Land Use

- Single-Family Residential
- Multi-Family Residential
- Commercial
- Industrial
- Lindenwold High School
- School District Property

Stops

- Remote
- Courtesy

0 1/4 1/2 Miles

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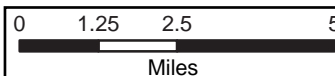
Figure 5: NON-PUBLIC SCHOOLS ATTENDED BY LINDENWOLD STUDENTS



Non-Public School



Lindenwold School District



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Courtesy Busing

Transportation for public school students who reside less than remote from their schools is called courtesy busing. Most school districts provide courtesy busing, but with school budgets tight and pressure mounting to cut costs, some school districts have looked at eliminating it. Parents, who have come to expect courtesy busing as a right, have opposed the changes. Chapter 4 discusses the courtesy busing issue and describes strategies that have been used successfully in other school districts to deal with it.

Walking

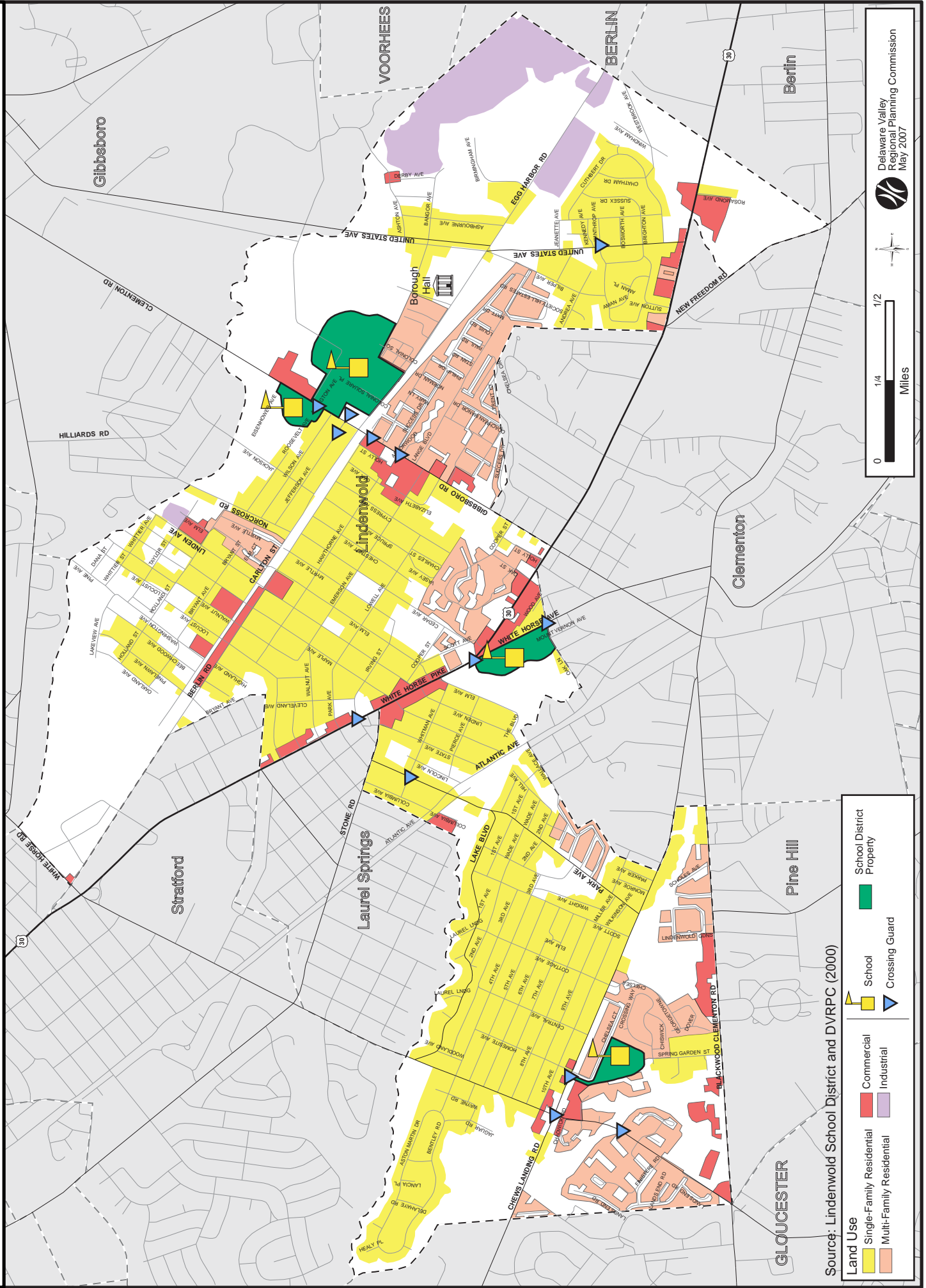
More than 1,000 Lindenwold students walk to school. These include approximately 70 percent of elementary school students and approximately 45 percent of high school students. The municipality, not the school district, is responsible for the safety of students who walk to school. Lindenwold Borough provides and pays for crossing guards. A police safety officer works with the school district to coordinate the crossing guards and other student safety issues. Crossing guards are clustered around the busy Berlin Road / Egg Harbor Road / Gibbsboro Road intersection at the rail underpass, and also around the US 30 / White Horse Avenue intersection. Figure 6 on page 13 shows Lindenwold crossing guard posts.

Service Providers

A school district can transport all of its students using school buses it has purchased and drivers it has hired, or it can contract out transportation to another entity. As a rule, it is only the public school students that it considers transporting itself. The majority of school districts contract out for those students as well. Nonpublic, vocational, and special education school bus routes are almost always contracted out.

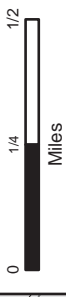
School bus routes are put out for bid individually; contractors, who must be credentialed by the state, bid on the routes. Before a route is put out for bid, it must be packaged or put together. The specifications include the locations of school bus stops and the number of students boarding at each stop. The school district itself usually packages and puts out for bid public school routes. In

Figure 6: LINDENWOLD CROSSING GUARD POSTS (2004-2005)



Source: Lindenwold School District and DVRPC (2000)

- | | | | |
|---------------------------|------------|-----------------|-----------------|
| Single-Family Residential | Commercial | School District | School Property |
| Multi-Family Residential | Industrial | School | Crossing Guard |



contrast, nonpublic school routes are brokered by an educational service commission (ESC).

ESCs were established by the state; their primary source of income is fees for service. They reduce the cost of purchasing supplies and services by acting as an agent for their member school districts. Camden County school districts belong to the Camden County ESC. The Camden County ESC is able to transport nonpublic students more cheaply than Lindenwold could because it is able to combine students from several school districts on the same bus route, which is then put out for bid.

The ESC also brokers vocational and special education routes. The Camden County ESC charges a three percent fee for its transportation services, while most other ESCs charge six percent.

Table 2 lists Camden County public school contract rates by school district.

Table 2: SELECTED CAMDEN COUNTY PUBLIC SCHOOL CONTRACTOR RATES BY SCHOOL DISTRICT (2004-2005)

Contract Rate (per day per route)

School District	Elementary		Middle		High School	
	Min (\$)	Max (\$)	Min (\$)	Max (\$)	Min (\$)	Max (\$)
Barrington Borough	46	172	-	-	71	-
Bellmawr Borough	61	61	-	-	-	-
Eastern Camden Cnty Reg S.D.	-	-	-	-	51	120
Gloucester City	51	95	-	-	95	95
Gloucester Township	94	94	-	-	48	48
Haddon Township	85	85	-	-	85	97
Lindenwold Borough	39	48	41	48	41	48
Merchantville Borough	-	-	-	-	36	93
Pine Hill Borough	52	62	52	53	52	85
Runnemede Borough	56	120	-	-	-	-
Stratford Borough	83	224	-	-	-	-
Voorhees Township	51	193	53	108	-	-
Winslow Township	68	83	68	68	68	68

Source: N.J. Department of Education, Camden County Office

Although contracting out student transportation has been the trend, district-owned transportation can be a viable alternative. Chapter 5 describes some of the benefits of district-owned transportation.

Finance

Revenue The total budget of the Lindenwold school district for the 2004-2005 school year was approximately \$25.4 million; the transportation budget that year was approximately \$1.3 million, or five percent of the total. But the transportation percentage is misleading. Much of the district's budget is fixed and only a small fraction of it is discretionary. A large share of the discretionary budget goes to fund transportation. The competition for scarce discretionary funds sets up a tradeoff between transportation spending and the educational programs of the school district, and it explains why there is so much pressure to reduce transportation spending.

However, not all of the district transportation budget is taken from the general school district budget. There are also two state monies that are provided to the district: one to fund regular education transportation and one to fund special education transportation. Aid for regular education transportation is based on a formula that includes the number of students the district transports and the average distance between home and school.

Table 3 on page 16 lists the transportation budget, the state share of the transportation budget, and the state share percentage, of Camden County school districts. The state share percentage appears to vary widely. Lindenwold's state share percentage, at 82 percent, is unusually high. That may be due to local factors.

Many Lindenwold students reside in multifamily housing, making it possible to create compact bus routes with few stops and large numbers of students at each stop. Lindenwold also reports that it has low contractor rates from the past "locked in," with only modest annual increases allowed to the contractor under state law. Yet despite the large state share, Lindenwold must come up with several hundred thousand dollars each year to fund student transportation. Conversations with Lindenwold staff suggest that the budget process results in difficult choices.

Table 3: STATE SHARE OF DISTRICT TRANSPORTATION BUDGET (2004-2005)

School District	Student Transportation Services (\$)	New Jersey State Transportation Aid (\$)	NJ State Trans. Aid Pct.
Audubon Borough	225,500	57,489	25%
Barrington Borough	465,300	155,437	33%
Bellmawr Borough	303,751	90,717	30%
Berlin Township	438,445	408,283	93%
Brooklawn Borough	134,069	30,915	23%
Cherry Hill Township	8,154,322	1,403,468	17%
Chesilhurst Borough	203,925	126,584	62%
Clementon Borough	331,362	226,197	68%
Collingswood Borough	533,123	282,528	53%
Eastern Camden Cnty Reg S.D.	1,441,275	768,362	53%
Gibbsboro Borough	65,427	30,191	46%
Gloucester Township	5,300,330	1,530,367	29%
Haddon Heights Borough	399,931	139,736	35%
Haddon Township	562,126	266,525	47%
Laurel Springs Borough	73,350	20,349	28%
Lawnside Borough	338,688	133,933	40%
Lindenwold Borough	1,271,430	1,037,586	82%
Magnolia Borough	94,000	55,984	60%
Merchantville Borough	318,914	154,491	48%
Mount Ephraim Borough	186,488	50,599	27%
Oaklyn Borough	173,448	64,993	37%
Pennsauken Township	3,192,909	2,589,163	81%
Pine Hill Borough	969,442	657,159	68%
Runnemede Borough	399,873	112,994	28%
Somerdale Borough	77,400	36,262	47%
Sterling High School	274,827	45,126	16%
Stratford Borough	187,942	92,565	49%
Voorhees Township	1,976,451	847,363	43%
Winslow Township	4,870,065	3,942,621	81%
Woodlynne Borough	222,480	116,080	52%

Source: N.J. Department of Education, Camden County Office

Expenditures To provide transportation to public school regular education students, Lindenwold spends on average almost \$200 per student per year. To provide transportation to nonpublic students, it spends three or four times as much, as nonpublic bus routes are longer and have fewer students. Lindenwold also spends almost \$550 per student per year to transport vocational-technical students.

To provide transportation to special education students who require a lift-equipped van and an aide, the cost is more than \$6,000 per student per year. Lindenwold estimates that special education transportation accounts for half of its

student transportation budget. Student transportation professionals interviewed for this study say that Lindenwold's experience is common. In New Jersey, special education is centralized; students travel to a small number of large facilities. The system promotes efficiency for instruction, but it leads to higher costs for transportation.

Table 4 lists student transportation costs by student category, the number of students in each category, and the average number of students on each bus route, a measure of efficiency.

**Table 4: LINDENWOLD STUDENT TRANSPORTATION COSTS
BY STUDENT CATEGORY (2004-2005)**

Category	Students	Students/Bus	Cost/Student/Year
Public - Regular Education	1,390	41	\$196
<u>Nonpublic</u>			
School Bus	86	33	\$581
Aid-in-Lieu	96	NA	\$771
Vocational-Technical	66	36	\$543
<u>Special Education</u>			
School Bus	63	7	\$2,311
Special Transportation	83	6	\$6,091

Source: N.J. Department of Education and Lindenwold School District

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Chapter 3 – Improving the Efficiency of Student Transportation

Background

The student transportation professionals interviewed for this study believe that much of the high cost of student transportation in New Jersey can be traced to inefficiency. The last major study on the subject, *Analysis of New Jersey's Pupil Transportation Policy* (November, 1995), by Deloitte & Touche Consulting Group, identifies fragmentation of responsibility as the primary source of inefficiency. The study notes that control of student transportation in New Jersey is divided among nearly 600 school districts. In general, small school districts forfeit economies of scale. They have higher administrative costs for each child transported and they are unable to run full buses. Collaboration between school districts could mitigate some of the inefficiency, but in New Jersey, collaboration tends to be the exception rather than the rule.

In response to the Deloitte & Touche study, the legislature directed the Department of Education to create a plan to motivate school districts to voluntarily make school bus transportation more efficient. The School Transportation Efficiency Plan established an efficiency standard based on vehicle utilization. In the 1996-97 school year, the initial efficiency standard, which has not been changed, was set at 120 percent vehicle utilization. Districts whose vehicle utilization falls below 75 percent must develop a corrective action plan outlining how they intend to improve. Since the inception of the School Transportation Efficiency Plan, the number of districts falling below the state standard of 120 percent vehicle utilization has decreased from 489 school districts to 140.

Vehicle Utilization

A school district's vehicle utilization is determined by the number of bus routes served by each school bus and the number of students who ride each bus. For example, 200 percent vehicle utilization could mean that each bus serves two routes and each bus is full; or it could mean that each bus serves four routes and each bus is half full. It should be obvious that to achieve 120 percent vehicle utilization, some buses must serve two routes.

Table 5 lists vehicle utilization scores for Lindenwold and other Camden County school districts. Just under two-thirds of the school districts meet or exceed the 120 percent standard. Of those that fail, some fall well short of the standard. Lindenwold, with 162 percent vehicle utilization, ranks tenth in Camden County.

Table 5: VEHICLE UTILIZATION, CAMDEN COUNTY SCHOOL DISTRICTS (2006-2007)

School District	Vehicle Utilization (%)	School District	Vehicle Utilization (%)
Barrington Borough	99	Haddon Township	91
Bellmawr Borough	210	Lawnside Borough	81
Berlin Borough	187	Lindenwold Borough	162
Berlin Township	116	Magnolia Borough	17
Black Horse Pike Reg S.D.	109	Merchantville Borough	58
Camden City	138	Pennsauken Township	242
Cherry Hill Township	187	Pine Hill Borough	141
Chesilhurst Borough	188	Runnemede Borough	192
Clementon Borough	66	Stratford Borough	78
Eastern Camden Cnty Reg S.D.	128	Voorhees Township	139
Gloucester City	139	Waterford Township	192
Gloucester Township	226	Winslow Township	232
Haddon Heights Borough	131		

Source: N.J. Department of Education - Comparative Spending Guide

Best Practice

School districts can improve their vehicle utilization score by adopting any of a number of best practices identified by the Department of Education. Most best practices are effective because they facilitate tiering bus routes, loading full buses, or both. If several bus routes are tiered, the same bus and driver can serve all the routes. Each best practice is listed below with a brief description and an assessment of current practice in Lindenwold.

Optimize route design The design of school bus routes is an iterative process. The goal is to load full buses while keeping the route lengths below some limit. If routes become too long, it is difficult to tier routes. The locations of individual bus stops, the number of bus stops on each route, and traffic congestion are all factors. Software that simplifies this complex procedure and determines optimal route design is available. Lindenwold uses a proprietary software program to optimize its routes.

Tier bell schedules Staggered start times permit the district to use the same vehicle and driver for multiple or consecutive runs. For example, a bus may be used to transport students to a secondary school and then to an elementary school. This same bus may be used during the day to conduct a midday kindergarten and an after-school activity run. Lindenwold has staggered the opening bells of its high school, middle school, and elementary schools, and it tiers its bus routes.

Mix public and nonpublic school students on the same routes Public and nonpublic students usually ride separate buses to different destinations. However, it may be more cost effective to mix them on the same routes if that facilitates loading full buses. Lindenwold does not mix public and nonpublic students. Mixing these students on the same routes would be a logistical challenge because many of the nonpublic schools that Lindenwold students attend are 5 to 10 miles from the school district. However, there are a small number of nonpublic schools in or near Lindenwold for which this could work.

Coordinate public and nonpublic school calendars and schedules

Coordinating calendars means public and nonpublic school calendars have the same starting dates, ending dates, vacations, and holidays. Coordinating schedules refers to staggering start times so that, for example, the same bus could drop off nonpublic high school students at 8:00 am and public high school students at 8:15 am. These steps are a prerequisite for the previous best practice: mixing public and nonpublic school students on the same routes. The large number of nonpublic schools that Lindenwold students attend probably precludes coordination.

Cooperate with other districts through joint transportation agreements

A joint transportation agreement is a contract between two or more boards of education providing for the transportation of students to schools within or outside their school districts. A school district may increase the use of its buses and drivers and add revenue by agreeing to transport students from a neighboring district. Although Lindenwold does not have transportation agreements with other school districts, it does use the Camden County Educational Services Commission (ESC) for out-of-district transportation. The ESC, in turn, can

combine students from several school districts on the same bus route and pass on the savings to Lindenwold.

Chapter 4 – Policy Issue I: Courtesy Busing

Background

Under New Jersey law (N.J.S.A 18A:39-1), all public school students who reside remote from their schools are entitled to transportation. Remote is defined as greater than two miles for elementary school students (grades K-8) and greater than two and a half miles for high school students (grades 9-12).

Courtesy busing is providing transportation to students who reside less than remote. It has always been optional. Recently, school districts have been reluctant to fund courtesy busing due to tight school budgets. Each dollar spent on transportation is a dollar taken from education. Some parents are fighting to save courtesy busing, citing the hazards their children would face if they had to walk to school. This chapter discusses the courtesy busing issue and describes two strategies that have been used successfully in other New Jersey school districts to deal with it.

Consequences of Eliminating Courtesy Busing

The minimal transportation that the school district is required to provide under the New Jersey state mandates fails to address student needs for two reasons. First, the state mandates do not account for the abilities of small children. Two miles, the outside boundary for elementary school students, is too far for most small children to walk. Second, the state mandates do not account for hazards that could exist on walking routes used by children to get to school. These hazards include crossings at high-speed or high-volume roadways, intersections with no traffic control devices, and walking routes on roads with no sidewalk or wide shoulder.

Given the shortcomings of the New Jersey state mandates, if courtesy busing were eliminated by the school district, the consequences could include the following:

- Increased traffic because more children would be driven to school.
- Local roads might not be able to accommodate additional traffic efficiently.
- More students would walk to school.
- Parents would complain about unsafe walking routes.

- Additional traffic would lead to more conflict with pedestrians.
- School traffic would block school buses and local traffic.

All of these problems would fall on the municipality, which would have to fund roadway and sidewalk improvements, and increase the number of crossing guards.

Simply eliminating courtesy busing may solve the funding issue, but it does not solve the underlying problem, which is safety. Instead, eliminating courtesy busing would expose safety problems, increase traffic congestion, and impose new costs on the municipality.

Therefore, an efficient courtesy busing strategy should reduce the transportation costs of the school district while providing transportation to students with the most need. Two strategies that accomplish both of these goals are discussed. The strategies are busing for hazard and subscription busing. The school districts whose programs are described represent best practice for these two types of programs.

Municipality Pays – Busing for Hazard

The following discussion is based on a conversation with the Bridgewater Township school district, in Somerset County.

Busing for hazard is the term used to describe transportation services provided to students who live under the state mandated distances but must travel a pedestrian route deemed to be unsafe for walking. State statutes permit the municipal government to define hazard and to fund this service. In the absence of this action, a board of education may make policies to define hazardous conditions and fund the service.

School districts that bus for hazard are not uncommon, but Bridgewater Township is unusual because the municipality has taken a leadership role in the program. The school district and the municipality have developed an institutional arrangement that recognizes the connection between hazardous conditions on public walkways and the costs of courtesy busing.

Hazardous walking routes increase the cost of courtesy busing, but although public walkways are a municipal responsibility, it is the school district that usually ends up having to deal with the problem. However, school districts are severely constrained in what they can do. By law, funds can be spent only on education. For example, school districts are not allowed to hire crossing guards. The legal and practical limits of the school district contrast with those of the municipality.

The municipality not only has legal responsibility for hazardous walking routes, but it has the means to do something about them. The municipality is qualified to assess hazards or to hire professionals to do it. It is able to improve infrastructure, add traffic control devices, dispatch police patrols or additional crossing guards, or, finally, make the determination that the most cost-effective way to deal with a hazard is to request that the school district transport the affected students. The municipality also has access to funding that is not available to the school district.

The elements of the model institutional arrangement created in Bridgewater Township and the procedures developed to implement it are described below. A New Jersey DOT program that funds pedestrian and bicycle improvements is also described.

Institutional Agreement

The school district and the township each took legislative actions to address student transportation needs. The school district implemented a policy to transport students using its own distance parameters. The new distance parameters are more realistic about the abilities of small children than the New Jersey state mandates. Students in grades K through 6 living further than 1.25 miles from the elementary school are bused.

The township implemented a policy to bus for hazard. State Statute 18A:39-1.2 allows students who do not otherwise qualify for transportation to be transported or bused, “Whenever the governing body of the municipality...finds that for safety reasons, it is desirable to provide transportation...for students living in the municipality....” The Township instructed the Bridgewater Police Traffic Safety Unit to develop a set of standards or guidelines to determine when a student should be granted or denied transportation.

Procedures

In order to establish a “Hazardous Busing Program,” the Traffic Safety Unit utilized two publications as the foundation for its guidelines. The first publication was the *Manual of Uniform Traffic Control Devices for Streets and Highways*, which is approved by the U.S.D.O.T. and the Federal Highway Administration. The second publication was *The Program for School Crossing Protection*, by the Institute of Traffic Engineers.

To be relevant, the guidelines had to respond to local conditions. For example, although Bridgewater has grown quickly during the past decade, sidewalk construction has lagged behind. Therefore, the sidewalks received extra attention in the guidelines.

It was also necessary to decide whether the standards in the engineering publications should be followed, or whether something less strict was acceptable because of mitigating circumstances. For example, there were township roads with posted speed limits above 25 mph, the threshold for a more active response, but traffic on these roads was light. Bridgewater opted for the stricter guidelines.

The Traffic Safety Unit established the following criteria as guidelines for approving hazardous busing requests.

1. All routes must have sidewalks or off-road sidewalk areas.
2. Residential routes with limited traffic flow do not require crossing guards in 25 mph zones.
3. Students are not permitted to cross intersections with a posted speed limit above 25 mph unless a crossing guard is provided.
4. Students are not permitted to cross an interstate or state highway under any circumstances.
5. Sight line restrictions caused by curves and hill crests constitute a hazardous condition.
6. Children from K through 3rd grade, without adult or appropriate supervision, constitute a hazardous condition.

A complaint by the parents triggers an investigation of a hazardous condition. The complaint must be in writing. In the state of Pennsylvania, the Traffic Unit of the Pennsylvania DOT has a long history of conducting investigations of hazardous walking routes. They have created a request form for complaints.

Once the township receives a complaint, it investigates. If the hazardous condition meets the guidelines, the township performs a cost-benefit analysis. The township either fixes the problem, or it requests that the school district transport the affected students and bill it for the cost.

Funding

The municipality has access to funding that is not available to the school district. Safe Routes to School is a New Jersey Department of Transportation (NJDOT)

Local Aid program. It receives funding from the federal Transportation Enhancements program. The goal of the program is to eliminate the barriers that keep children from walking or bicycling to school. Grants can cover infrastructure projects or non-infrastructure activities. Eligible infrastructure projects include sidewalks, crosswalks, and traffic calming; eligible non-infrastructure activities include public awareness campaigns, traffic education, and enforcement.

In 2006, awards ranged from \$20,000 to \$200,000. The most common amount was \$100,000. Projects are selected annually by NJDOT, with input from DVRPC. The program is competitive due to limited funding. The existence of a legitimate problem does not guarantee receipt of an award. To apply for funding, school districts can go to the NJDOT website for application forms.

Parents Pay – Subscription Busing

The following discussion is based on conversations with the Piscataway Township school district, in Middlesex County, and the Somerset County Educational Services Commission, which administers the subscription busing program of the Basking Ridge School District.

Under subscription busing, the school district charges parents a fee for courtesy busing. Both Piscataway and Basking Ridge make empty seats available on a “first come, first served” basis. They send out a letter at the beginning of the summer telling parents that they are not eligible for busing, giving them 45 days to reply, and asking them to choose a bus stop. The openings are limited to empty seats available on existing bus routes for students who reside remote. Student arriving after the beginning of the school year may also be accommodated.

The premise of subscription busing is that it is the parents’ choice. If they feel that walking to school is dangerous for their child, they will seek out alternatives. Subscription busing gives them another choice. It also saves the school district and the municipality the time and expense involved in determining which students “deserve” courtesy busing. Such decisions can be politically charged. In addition, subscription busing generates revenue for the transportation budget, increasing the funds available for educational programs in the school district.

Subscription busing has two potential drawbacks. The number of seats available could be limited and there could be a question of equity for some families who cannot afford to participate.

There are three policy questions that school districts thinking about starting a subscription busing program should consider. They are:

- Scope of Program – How many seats is the district going to make available?
- Price of Service – What is the appropriate subscription fee?
- Administration – How will parents pay for the service?

The scope of the program and the price of the service are related questions because the amount of the subscription fee can influence the level of participation.

Scope of Program

The scope of the program is determined by how many seats the district makes available; there are two alternatives:

1. Fill empty seats only.
2. Add new bus routes.

Once students who reside remote have been assigned to their buses, the school district begins with a predetermined number of buses. Seats are limited to those available on these buses. The first alternative, filling empty seats only, is a good approach if the school district is unsure about interest in subscription busing because they only have to fill the empty seats they already have. The downside of this approach is that demand for seats is probably going to exceed supply. The second alternative, adding new bus routes, is somewhat ambitious because the school district is betting that it can cover the costs associated with operating additional buses. But to do that it has to know how many parents are willing to pay for subscription busing; that is, it has to know its market.

The first alternative should be the approach for the first few years of the program, when the school district has less information about the effect of the subscription fee on participation. Later, the second alternative offers the possibility of providing service to more students. Piscataway and Basking Ridge continue to use the conservative approach, filling empty seats only.

Price of Service

Piscataway Township parents pay a subscription fee of \$265 for each child. The school district estimates the cost of adding new bus routes at \$600 to \$700 per seat. Basking Ridge parents pay \$425 for each child. The Somerset County Educational Service Commission, which administers the program for the school district, states that the actual cost is \$770 per seat; Basking Ridge subsidizes the difference.

The amount of the subscription fee could influence the level of participation and determine the success of the subscription busing program. There are two alternatives for setting fees for subscription busing:

1. The fee is the actual cost of providing the service.
2. Part of the cost is subsidized.

Imposition of a fee for the provision of a public service is usually recommended because it promotes efficiency. Those who receive the most benefit are likely to pay the fee, and those who receive the least benefit are likely to forego it.

But there could be a question of equity if the fee is set so high that some families cannot afford to participate in the program. Furthermore, there is a practical question of program viability if the fee is set so high that most families are priced out. The school district is constrained; it has to charge what parents can afford to pay. Otherwise, they would not be able to participate and the program would be unsuccessful.

Individual communities should conduct assessments to determine which alternative is appropriate for their transportation needs. Factors to consider include median income, home ownership, zero-vehicle households, and the ability of the school district to subsidize the program if required.

Administration

How parents pay for the service could influence the level of participation. This also determines the efficiency of program administration. There are two alternative payment methods identified:

1. Entire payment due up front.
2. Several smaller payments (for example a down payment before the school year with the balance due later).

It may be easier on the parents to select the second alternative: breaking up the payments. It could be a hardship for some families, especially those with more than one child, to pay the entire fee up front. However, experience has shown that this alternative is best. Under the second alternative, the school district must

track student accounts. Inevitably, it must become a collection agency. If the family cannot or will not pay, the school district is put in the difficult position of denying the child transportation.

Chapter 5 – Policy Issue II: District-Owned Transportation

The following discussion is based on conversations with the Mendham Township school district, in Morris County, and the Medford Township school district, in Burlington County.

In New Jersey, contractors transport most nonpublic, vocational, and special education students. This is also the case in Camden County, where the Camden County Educational Services Commission packages these routes and puts them out for bid. Recently, school districts have also begun to rely increasingly on contractors to transport their public school students. Student transportation professionals interviewed for this study agree that more school districts contract out for their public students than do not, and that the trend is away from district-owned operations.

Most school districts contract out student transportation to lower their personnel and infrastructure costs. However, Mendham Township and Medford Township are highly efficient, with vehicle utilization scores of 311 percent and 178 percent, respectively. There are three factors that explain their success: First, they run a high value, rather than a low cost, operation. Second, they contract selectively when it is cheaper to do so. And third, they have strong incentives to implement joint transportation agreements because they run the operations themselves.

Each factor is described in greater detail below. Most of the discussion is about the transportation of public school students, but it is noteworthy that both school districts also transport their special education students.

High Value

The focus of the high value strategy of Mendham and Medford is labor. They run their own operations to have control over the bus drivers they hire. They want to know their workers and have them feel like they are a part of the community. They both pay high wages because it allows them to be selective. In exchange, they get workers who show up on time, who have good communication skills, and who treat their students well.

Selective Contracting

A school bus operation has many different functions, such as purchasing and vehicle maintenance. For most functions, the school district can turn to contractors who are specialists in their field. Mendham and Medford contract selectively, only when it is cheaper to do so. But costs are going to be different for different school districts, which vary by size and by the assets they possess.

Size is important because there are economies of scale for each function. For example, vehicle maintenance on a fleet of 20 or 25 school buses typically requires one mechanic and one garage bay. For a fleet significantly smaller than that, it may be more efficient to contract out.

The decision to contract out also depends on the assets that the school district possesses. For example, if the school district owns a building that it could convert into a garage, it may be more efficient to perform vehicle maintenance in-house even though fleet size is less than the norm.

Selected school bus operation functions are listed below, with contact information for contractors who specialize in the function:

Purchasing/Finance The purchase price of a standard 54-passenger school bus is \$50,000 to \$60,000. The financing is typically three to five years. Financial advisors who specialize in school bus purchasing and finance are available. The Apris Group, Ltd. is one such firm.

Vehicle Maintenance Vehicle maintenance may be performed by the school district or it may be contracted out. If the school district decides to do the work in-house, there is a further decision of whether the garage should be leased or owned by the school district.

Most garages that repair large trucks also repair school buses. The website of the New Jersey Motor Truck Association, <http://www.njmta.org/>, lists garages.

Vehicle Parking A parking lot is difficult to find. It has to be secluded because school buses are considered an eyesore. It has to be fenced to protect the school buses from vandalism. There are two alternatives: public lots owned by

the school district or the municipality, and private lots, which may be leased or rented.

Substitute Vehicles It may not be efficient for a school bus operation with a small fleet to purchase a substitute vehicle as a backup. Instead, the best strategy may be to contract with a large school bus contractor.

Incentives

As previously noted, a joint transportation agreement is a contract between two or more boards of education providing for the transportation of students to schools within or outside their school districts. Mendham had joint transportation agreements with neighboring school districts during the 2004-2005 school year worth \$580,000. The explanation could be that they have strong financial incentives.

Once the bus is on the road, and has picked up and dropped off students from the school district, the marginal costs of further activity are low; they consist mostly of driver wages and fuel. On the other hand, marginal revenue is likely to be high. The rates cited elsewhere in this study (for example, under subscription busing) suggest as much.

District-owned operations are motivated to operate efficiently because they reap all the rewards.

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Chapter 6 – Study Recommendations

Courtesy Busing Due to budget shortfalls, school districts are under pressure to eliminate courtesy busing. Simply eliminating courtesy busing may solve the funding issue, but it does not solve the underlying problem. Eliminating courtesy busing would expose safety problems on walking routes used by children to get to school and increase traffic because more children would be driven to school. Therefore, an efficient courtesy busing strategy should reduce the transportation costs of the school district while providing transportation to students with the most need.

Two strategies that accomplish both of these goals are busing for hazard and subscription busing. The experience of Bridgewater Township, which is detailed in this study, suggests that municipal involvement in the busing for hazard program is an advantage. Under subscription busing, the fee charged may be the actual cost of providing the service, or it may be subsidized by the school district. Individual communities should conduct assessments to determine which alternative is appropriate for their transportation needs.

District-Owned School Bus Operations School districts should take a look at the benefits of district-owned operations. The trend has been to contract out for student transportation to cut costs, but some district-owned operations are highly efficient and add revenue by providing service to neighboring school districts. Another benefit of the district handling the transportation itself is the ability to know its workers and have control over quality. The most likely candidates for district-owned operations are larger school districts. The most likely service is regular education public school transportation.

Late Bus The late bus, or after-school activity bus, is a resource that should be protected. Instead, it is usually the first service to be cut in a budget crisis. Not only does it support the extracurricular programs of the school district, but it also reduces traffic congestion on local roads near the school by eliminating trips by parents to pick up their children. Before it cuts the late bus, the school district should poll the parents. It may find that they would be willing to pay for the convenience of having it.

Student Transportation Data School districts should be required to use a common format to store their school bus route and financial data. These records are currently stored in proprietary software. The file formats are not compatible with popular computer programs, such as Microsoft Office. As a result, school district data must be transmitted on paper. These limitations create a barrier between individual school districts, and between school districts and the public. To solve the problem, the State Department of Education should develop an application that would facilitate tracking, reporting, and retrieval of student transportation data; and it should mandate its use.

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ABSTRACT: This report documents a study of student transportation in Camden County, where the high cost of student transportation has become a political issue. The focus is on choices that are within the control of individual school districts. Methods of improving the efficiency of school bus operations are identified. Policy choices by school districts that also impact costs, specifically courtesy busing and contracting out service, are described. These have been addressed by an informal survey of student transportation professionals. Examples of best practice from school districts across the state of New Jersey are presented. These examples can serve as models for Camden County school districts. One Camden County school district is used as the subject of the study; statistical data from other Camden County school districts is also used. This work is intended to complement existing analyses on the high cost of student transportation in New Jersey. For example, allegations of collusion among New Jersey school bus contractors have been documented in at least one report by the state.

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