Driven to School:
Factors Affecting Mode Choice and the Amount of Parent-driven Trips

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Abstract

While children are increasingly being driven to and from schools, it is important to identify the factors that have contributed to this trend. Such information will be helpful for reducing the negative effects of excessive automobile use on the environment, local traffic and public health. This study has collected primary data from three Vermont school districts and used the data to identify the factors that may determine the probability for a student to be dropped off in the morning and the probability for a student to be picked up in the afternoon. The data are also used to examine the impact of alternative factors on the frequency of a student being dropped off in the morning and the frequency of a student being picked up in the afternoon. The research methods used in this study include mail and web-based surveys and a double-hurdle model that uses a binary logit model for the probability of being driven by parents and a linear regression model for the frequency of being driven by parents. The models indicate that convenience is the greatest factor affecting the choice of automobile mode and the amount of weekly parent-driven trips to school. Parent work commutes and perceptions regarding inconveniences of the school bus contribute to the automobile mode being used for school transportation. Ratings of modal safety and environmental opinions about modes are also factors in parent's decisions to drive their children to school.

INTRODUCTION

The purpose of this paper is to investigate the reasons why parents drive their children to and from school. Considering the impacts of increased vehicle miles traveled, such as traffic congestion, air pollution, greenhouse gas emissions, and road infrastructure burden, it is important to examine the reasons why parents are choosing to drive their children instead of relying on alternative modes. Because there are many reasons why children do not walk or bike to school, including the impracticality imposed by some distances between home and school, it would be appropriate to consider increasing school bus ridership in areas that have current service. If the reasons why parents choose to chauffeur their children over walking, biking, school bus or carpool are better understood, then programs may be developed that encourage these alternative modes and decrease the percentage of parent-driven school trips.

In the state of Vermont, about 1,800 school busses provided an average of 102,000 daily rides for K-12 students in the 2004-2005 school-year (1). A larger percentage of students in the northern regions such as the Northeastern U.S. are transported by school buses as compared to their counterpart students in other regions. For example, the ratio of average daily rides provided by school buses to the number of enrolled K-12 students in Vermont was 0.97 in 2004-2005 as compared to the national average of 0.52 in the same school year. Although school bus transport is comparatively high in Vermont to that of the nation, there has been a significant decrease in school bus trips over the past decade (1).

School transportation has changed dramatically over the past few decades. The automobile has become the predominant mode of travel to and from schools, even for distances of less than a mile (2), while bicycling and walking to school have decreased (3). In 1969, almost half (48%) of children walked or biked to school (4,5). The last few decades have seen a shift in these trends, with less than 15% of students reported walking to school, and only 1% biking (6). Today, school bus transportation accounts for the largest component of public transportation in the country. In spite of this fact, school bus trips only make up 25% of all school-related trips (7,8).

The increase of parent-driven school transportation may be evidence of America's "car culture." Convenience has been cited as a major reason for choice of travel mode. (8). While automobile travel is more expensive for families than any other mode (considering the school bus, walking and biking are essentially either absorbed into taxes or free) it would seem unlikely that parents would choose to drive their children to and from school. Yet the many conveniences that auto travel provides are a large factor in decision making. School bus inconveniences such as arrival time and behavioral concerns have been shown to have the largest affects on mode choice (8). One study, by Black, Collins and Snell (2001), focused on the psychological and sociological factors influencing modal choice for school transport. The authors claim that there is a resistance to choosing other mode over cars and that this resistance to change is "imbedded in various psycho-social obstacles which are not readily teased out in orthodox econometric studies" (9).

Children's travel behavior has been traditionally difficult to model because they are dependent on parents' mode choices and availability. Most of the focus of activity-based travel research has been almost exclusively on the travel patterns of adults (10). With school

transportation, it is the child's activity— attending school—that is the cause of the trip. It is the child's activity and the school's location, rather than the parent's activity, which determines the temporal and special dimensions of the trip (11,12).

RESEARCH OVERVIEW

Survey Design

The objective for this research is to examine the factors that contribute to mode choice for school transport and further examine the factors that affect the number of days children are driven to and from school. A household survey was designed and sent to parents and guardians from three school districts in Vermont. Seven modes were considered in the survey: walk, bike, bus, driven in family vehicle, carpool with children from multiple families, drives self or other children, and other mode. This paper looks exclusively at the mode where a child is driven in the family vehicle to and/or from school.

The survey asked parents to provide information for each school-age child. Morning and afternoon trips were considered separately, due to previous research that found that morning and afternoon modal choices are different (8). The survey collected household demographic data, child characteristics, average weekly trips for various modes, and attitudes toward school transportation. The survey also gathered information on activities such as the work commute and afterschool activities.

Parents and guardians were surveyed rather than children to determine mode choice. This method has limitations because children's preferences certainly affect mode choice. Children contribute to household decision making that result in joint travel arrangements (13). That children's travel behavior could strongly influence their parents' travel behavior is a variable that has only recently been taken into account in research studies (14). Unfortunately, our survey design could not directly account for children preferences or attitudes, such as their perceptions about riding the bus. By asking the parents or guardians about how they felt about certain factors such as behavior problems on the school bus and whether the school bus stop is too far from home, the researchers were hoping to capture household opinions that include the preferences of the child. The survey was also designed to take into account the children's before school or afterschool involvement in programs.

Data Collection

Data for the study was collected in three school districts in Vermont. District 1 (Addison Northeast School District) is a rural school district composed of six towns and seven schools. District 2 (Waterbury-Duxbury School District) consists of two towns and three schools and is a rural area with a village. Two of the three schools in this district are located within one mile from the village. District 3 (South Burlington School District) is located in the largest urban area of Vermont and has 5 schools located in one town. Each participant school had school bus service available to every student, even for the children that lived within close proximity to school.

A total of 497 household surveys were completed that gathered travel information on 860 students. A household travel survey was sent to select schools within the three school districts. For District 1, a total of 850 surveys were sent to all households for one elementary school and the combined middle/high school. A link was also placed on the district website

that was referenced in the mail-out-mail-back survey as an alternative method for completing the survey. A total of 277 surveys were completed for a response rate of 33%. For District 2, all households in two out of the three schools received surveys. Two hundred and fifty parents were sent web-based surveys to complete, as this district had a comprehensive e-mail parental address list. An additional 71 households were sent a mail-out-mail-back survey. A total of 136 surveys were completed for District 2, providing a 42% response rate. District 3 had a link to the survey placed in the regularly e-mailed school newsletter. This district had only 84 surveys returned. The actual response rate is also unknown because the number of recipients was unavailable to the researchers.

Survey Results

Demographics

According to the household survey, the average distance that a child was reported to live from school for all three school districts was 4.38 miles, reflecting the rural nature of Vermont. The students were in grades pre-kindergarten through grade twelve; the average grade from the survey was grade six. The average reported student age from the survey was twelve years old.

The majority of the respondents were mothers (82%). Fathers represented 13% of the sample; 1% were grandparents or guardians; and 4% of the respondents did not answer the question. Forty-two of respondents reported to have less than a Bachelor's Degree. Thirty-two percent (32%) of the sample reported to have a Bachelor's Degree and 20% claimed to have a professional or graduate degree.

The stated household annual income before taxes was also high, yet there were 14% of the respondents who did not answer the question. Only 19% of survey respondents claimed to make less than $49,000 per household. The majority of the respondents reported that they made between $50,000 and $99,999 per year.

Parental Activity Route

Two questions in the household survey asked parents and guardians about their usual driving route to school. Parents were asked about their “usual” driving route to drop and pick their children up at school. They were also allowed to respond that they did not drop off or pick up their children. A significant percentage of parents drop off and pick up their children on the work commute. Below are the results from the survey:

TABLE 1 Parent Activity Route for Driving Child to or From School

Driving Route	**Parent drives child on way to work**	**Parent drives child and returns home**	**Parent drives child and does errands/activities**
Morning	35%	11%	4%
Afternoon	23%	15%	7%

n=850

Parental Motivation

There were several survey questions about opinions on school transport. In general, parents felt fairly good about school bus service, as all averages are above 2.5. Below are the results from the survey for both morning and afternoon trips.

TABLE 2 Opinions on Morning School Transport

	Bus ride is too long	**Bus arrival time inconsistent**	**Bus stop too far from home**	**Bus pick up time too early**	**Bus not safe**	**Bus behavior is not monitored well enough**	**Child has before-school activities**
n	760	752	752	762	770	776	714
Mean	2.96	3.47	3.80	3.17	3.23	2.76	2.97

1=Strongly agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree

TABLE 3 Opinions on Afternoon School Transport

	Bus Ride is too long	**Bus drop-off time is inconsistent**	**Bus stop too far from home**	**Bus drop off time is too late**	**Bus not safe**	**Bus behavior is not monitored well enough**	**Child has after-school activities**
n	761	752	754	756	773	773	740
	2.97	3.58	3.69	3.38	3.21	2.74	2.23

1=Strongly agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree

Parents were also asked about their perception of whether taking a bus or car for transport to and from school was better for the environment, or whether there weren't any differences between the two modes. Fifty-three percent (53%) thought that the taking the school bus was better for the environment, 3.4% thought car was better, and 33% thought that there was no environmental difference between the two modes.

MODEL DEVELOPMENT

Transportation modeling often uses consumer choice theory based on the economic principle of utility to model mode choice. The travelers, each with different characteristics, choose a mode based on factors that affect their preference. The determinants of travel behavior are referred to as journey attributes. A journey attribute is a feature of a journey that causes disutility for the traveler, such as money costs, travel time, discomfort, or anxiety (15). This study suggests that the reasons for mode choice have to do with a variety of factors, including journey attributes and factors such as convenience.

Disaggregate models, or individual mode-choice models, are based on the theory of utility of a certain mode to a particular traveler (16). There are several models used for disaggregate travel data. Thomas Lisco (1967) and Charles Lave (1969) both used the binary probit choice model, the probability of choosing one choice over another using a marginal rate of substitution. Other models have been developed to understand mode choice,

including the multinomial logit model and the nested logit model. McFadden's multinomial logit model (MNL) explains choice made among alternatives when attributes of the alternatives and the decision makers influence outcomes (17). The nested logit model structures the joint choice model in terms of groups of possible outcomes. Disaggregate models can be problematic because of their property of the independence of irrelevant alternatives (IAA). Yet, there are many advantages to disaggregate choice models, including the model's ability to explain the cause for mode choice behavior for individuals, the fact that they only require a small data base for calibration, and that they can be employed to compare several alternatives in a simple model (16).

While alternative econometric models such as binary logit, multinomial, and linear regression have been used in analyzing school travel mode choices (4,8), this study uses a double-hurdle framework to identify the factors that contributing to the probability for a student to be dropped off in the morning (or picked up in the afternoon) and the factors that determine the number of times a student is dropped off in the morning (or picked up in the afternoon) per week. Each double-hurdle model includes a binary logit model for the first stage (hurdle) and a linear regression model for the second stage (hurdle). While the binary logistic model for the first hurdle will identify the factors that contribute to the probability for a student to be dropped off or picked up at least once a week, the linear regression model for the second hurdle will address the research question: "for students who are dropped off in the morning (or picked up in the afternoon) at least once a week, what are the factors that contribute to the variation in the frequency of being dropped off to school (or picked up from school) each week?"

Most of the models that have been used in travel choice studies can be classified as "limited-dependent variable models" (i.e., the dependent variables are not continuous variables). These models are developed to deal with problems frequently associated with cross-sectional survey data. For example, in modeling the behavior of being dropped off by a family car or not, the observation from each student is either "dropped off by a family car" or "went to school via another transportation mode" and this dependent variable (Y) is limited to only two possibilities (Y=1 for using a family car and Y=0 otherwise). In this case, a binary logit model is generally used to examine the impacts of a set of independent variables (X_1, X_2, …, X_n) on the logit function of the probability for being dropped off to school by a family car (i.e., P is the probability for Y = 1). Estimation results of a logit model can be used to identify factors that significantly contribute to the probability of being dropped off to school by parents and examine the marginal impact of each significant independent variable on the odds ratio of being dropped off by parents. A binary logit model can be represented by the following function:

$$\textbf{Logit (P)} = \ln\{P/(1-P)\} = a + b_1 X_1 + b_2 X_2 + \ldots + b_n X_n + e \quad (1)$$

where P, X_1, X_2, …, and X_n are as defined above, a, b_1, b_2, …, b_n are the coefficients to be estimated, and e is the error term.

In this study, the binary logit model will be used to identify the factors that contribute to "the probability of being dropped off to school by parents in the morning" and "the probability of being picked up by parents in the afternoon", respectively, and to examine the marginal impacts of each significant independent variable on the odds ratio for each binary dependent variable to be 1.

In addition to the results from the two binary logit models (one for being dropped off in the morning and one for being picked up in the afternoon), we are also interested in identifying the factors that contribute to the number of times a student is driven to school per week and the number of times a student is picked up from school per week. Note that the analysis about the variation in the number of times being dropped off applies to only the students who are dropped off at least once a week (i.e., Y=1 in the binary logit analysis). This analysis is generally handled by a linear regression model:

$$Z = c + \mathbf{d_1 K_1} + \mathbf{d_2 K_2} + \ldots + \mathbf{d_n K_n} + s \quad \textbf{(2)}$$

where Z is the dependent variable (i.e., number of times being dropped off (picked up) per week), K_1, K_2, …, and K_n are the independent variables, c, d_1, d_2, …, d_n are the coefficients to be estimated, and s is the error term.

Models (1) and (2) together form a simple double hurdle model. In this study, (1) and (2) will be estimated for modeling the drop offs in the morning and pick ups in the afternoon, respectively. The empirical models and estimation results will be presented in the next section.

There is a rich literature on double-hurdle models that includes a wide range of applications. For example, Cragg (18) developed a double-hurdle model to study the demand for durable goods, Jones (19) used a double-hurdle model to examine the behavior of cigarette consumption, and Yen (20) developed a multivariate sample-selection model to estimate cigarette and alcohol demand in the United States. The second author of this paper and his co-authors used a double-hurdle model to examine the impact of cholesterol information on egg consumption in the United States (20).

While alternative double-hurdle models have been widely used in consumer demand and behavior studies, it is believed that this paper presents one of the first applications of this approach to modeling in transportation studies. The idea and framework of alternative double-hurdle models are similar but the variation in model specification and estimation methods is very significant. For example, some studies used the same set of independent variables in the first hurdle and second hurdle but other studies used two different set of variables. Also, the models for the two hurdles can be estimated separately or simultaneously with different assumptions about the distribution of the error terms in the two models. As an exploratory study, this study will use the same set of independent variables in the binary logit and linear regression models and the two models will be estimated separately. This can be considered as a limitation of our empirical estimation and will be examined in the next stage of our study.

Defining Variables

The following variables were formulated from the household survey data and considered in the model development:

AM Dependent Variables:

First Hurdle Model: DrivenAM—a binary variable representing transport to school (1=Driven in family vehicle, 0=Other mode)

Second Hurdle Model: Y=number of times child is dropped off by family vehicle per week

PM Dependent Variables:

First Hurdle Model: DrivenPM—a binary variable representing transport from school (1=Driven in family vehicle, 0=Other mode)

Second Hurdle Model: Y=number of times child is picked up by family vehicle per week

Independent Variables in both AM and PM models:

- district1—Addison Northeast School District
- district2—Waterbury-Duxbury School District
- Age—Age of student
- Grade—Grade of student 0-12, 0=Kindergarten or Pre-Kindergarten
- Gender—1=Female, 0=Male
  School District—School district 1, 2, or 3
- Distance—The reported distance that a child lives from the school
- CloseDistance—Child lives within 1 mile from school
- Education—Reported level of education
- Income—Reported household income before taxes for 2006
- Busnotsafe—Rated bus as Unsafe or very unsafe
- SafeCAR—Rated family vehicle with adult driver as very safe or safe
- WALKnosafe—Rated walking as very unsafe or unsafe
- AutoOwn—Number of automobiles reported for each household
- AutoBetterSame—Auto is the same as or better for the environment than bus

Independent Variables in the AM models only:

- agreeAMLong—Strongly agreed or agreed that bus travel time is too long in the morning
- agreeamearly—Strongly agreed or agreed that bus comes too early in the morning
- agreeamarrival—Strongly agreed or agreed that bus arrival time is inconsistent
- agreeambehavior—Strongly agreed or agreed that bus is not monitored well enough for behavior problems in the morning
- agreeamfar—Strongly agreed or agreed that bus stop was too far from home
- agreeambusnotsafe—Strongly agreed or agreed that school bus operations are not safe in the morning
- agreeamwalk—Strongly agreed or agreed that walking and biking are not safe in the morning
- agreeamactivity—Child has activities before school
- commutetowork—Parents drop off child on the way to work

Independent Variables in the PM models only:

- agreePMlong—Strongly agreed or agreed that bus travel time is too long in the afternoon
- agreePMlate—Strongly agreed or agreed that bus drops off children too late in the afternoon
- agreePMarrival—Strongly agreed or agreed that bus drop off time is inconsistent
- agreePMbehavior—Strongly agreed or agreed that bus is not monitored well enough for behavior problems in the afternoons
- agreePMfar—Strongly agreed or agreed that bus stop was too far from home
- agreePMbusnotsafe— Strongly agreed or agreed that school bus operations are not safe in the afternoon
- agreePMwalk— Strongly agreed or agreed that walking and biking are not safe in the morning
- agreePMactivity—Child has activities after school
- commutefromwork—Parents pick up child on the way home from work

Model Results

Morning Results

TABLE 4 Estimation results of the double-hurdle AM models

Variable Name	B Binomial Logit	Exp (B)	B Multiple Regression
district1	** .334	1.397	**.806
district2	-.156	.856	.207
gender1	.046	1.047	.222
AutoBetterSame	***.913	2.492	*.373
SafeCAR	***2.079	7.997	*-1.540
Busnotsafe	***3.124	22.733	-.274
WALKnosafe	-.088	.915	.086
AutoOwn	0.34	1.035	.026
AGE	**-.075	.928	**.069
DISTANCE	-.050	.952	***-.129
Education	**.315	1.370	**-.257
Income	.005	1.005	.078
Adultlicense	.185	1.203	*.491
commutetowork	***1.569	4.803	**.570
agreeAMlong	1.68	1.183	.290
agreeAMarrival	.457	1.580	-.311
agreeAMfar	***2.335	10.330	.196
agreeAMearly	**.635	1.888	-.038
agreeAMbusnotsafe	***-.916	.400	-.065

agreeAMbehavior	.092	1.096	*.731
agreeAMwalk	-.018	.982	.252
agreeAMactivity	-.239	.787	-.090
Constant	-4.546	.011	-.065
Number of Observations (n)	589	589	259

*significant at 90%, **significant at 95%, ***significant at 99%

For morning school transport, several variables were significant in the binomial logit model. In determining whether parents choose to drive their children to school, education was a predictor of the dependent variable. The higher the reported education level, the more likely the parents were to make the choice to drop off their children. Age of the child was also significant; the older the child the less likely she or he is to be dropped off at school. This is probably due to the fact that many high school age children drive themselves to school, and this was not included in the model. District 1 was also more likely to have parents dropping off children to school.

Several variables about parental attitudes and activities were significant. Several variables about parental attitudes and activities were significant. The variable AutoBetterSame was significant with an exp (B) value of 2.492. In other words, parents who consider auto to be a better or same mode as compared to school bus are more likely to drop their children off at school.

Safety was a factor in morning mode choice decisions; SafeCAR was significant with a exp (B) value of 7.997. Busnotsafe was also significant; parents who responded that they felt the school bus operations were unsafe were more likely to choose driving their children to school.

Attitudes about the school bus were also significant variables. The bus coming too early in the morning affected the decision to chauffer children to school, as did the factor of the bus stop being too far away.

The multiple regression model used the same independent variables, but to predict the number of parent-driven trips per week for students who are dropped by parents at least once a week. The same variables that were significant and also had the same direction of the coefficient were Distict1, AutoBetterSame and Commutetowork. All other significant variables had inconsistencies, suggesting that the choice of whether or not to drive a child to school at least one a week does not have the same impacts on the number of days a child is driven to school.

Factors that were significant in the number of parent-driven trips per week that were not significant in the logit model were Distance, Adultlicense and AgreeAMbehavior. The longer distance a child lives from school, the less likely the parents were to make more trips to school. The number of household licenses was also positively correlated with the dependent variable. The perception that the bus is not monitored well enough for behavior problems also affected the number of days a child was driven to school.

Not significant for these models were automobile ownership, income, the bus ride is too long, the bus arrival time is inconsistent, and perceptions of walk safety.

Afternoon Results

TABLE 5 Estimation results of the PM double-hurdle model

Variable Name	B Binomial Logit	Exp (B)	B Multiple Regression
district1	-.023	.977	-.235
district2	**-.892	.410	-.574
gender1	***.639	1.895	**-.474
AutoBetterSame	.105	1.111	***.576
SafeCAR	***2.673	14.485	1.414
Busnotsafe	***2.506	12.251	.548
WALKnosafe	**-.525	.591	*.469
AutoOwn	-.133	.875	**-.307
AGE	***-.185	.831	-.052
DISTANCE	.055	1.056	-.002
Education	.187	1.205	-.031
Income	.105	1.110	.032
Adultlicense	-.031	.969	.871
commutefromwork	***1.677	5.350	***1.008
AgreePMarrival	-.054	.947	-2.84
AgreePMlong	.744	2.104	*.600
AgreePMlate	**.798	2.222	**.600
AgreePMbusnotsafe	.224	1.250	-.269
AgreePMbehavior	-.369	.691	.383
AgreePMactivity	***.885	2.432	**-.593
AgreePMwalk	.098	.138	-.145
Constant	-2.964	.052	1.296
Number of Observations (n)	587	587	231

*significant at 90%, **significant at 95%, ***significant at 99%

The results for the afternoon also revealed several variables that are significant in predicting the parent-driven (DrivePM) mode. District 2 was less likely to pick up their children than the other districts. Gender became significant for the afternoons; girls were more likely to be picked up at school than boys. Safety was again an issue, as both SafeCAR and Busnotsafe both had high odds ratios of predicting the dependent variable. Age was significant in with the similar results from the morning. Commutefromwork was also a significant variable wit a high explanation of the coefficient (5.350). Whether the school bus came late in the afternoon also was significant in the logit model.

Unlike the morning, children's activities affected the dependent variable. If children had afterschool activities they are more likely to be picked up by their parents. This would make sense, considering afterschool programs, sports, and classes that are often held at school.

The multiple regression model for the number of parent-driven afternoon trips had some differing results from the logit model. Gender was significant but had an opposite coefficient sign; girls were driven less trips per week than boys. The environmental opinion about mode was significant; like the morning trip, parents more apt to chauffer children in they felt that automobiles are better or the same as bus for the environment. The perceptions of auto and bus safety were not significant, but perceptions about walk safety were. If parents

felt that walking was not safe, then they picked up their children from school more often. Both commutefromwork and agreePMlate were significant in the multiple regression model like in the logit model.

There were several variables not significant in both models. Distance, Education, Income and the number of adult licenses were not significant. The distance a child lives from school does not appear to be a strong predictor of whether or not or how often children are chauffeured to school. This may be due to the rural nature of Vermont, with a larger average distance to school.

CONCLUSIONS AND RECOMMENDATIONS

There are many factors that affect mode choice in school transport. This study looked only at the mode of parent-driven trips. There were differences and even inconsistencies between the factors that contribute to the choice of taking this particular mode at least once a week and the factors that contribute to the number of days per week that the mode is used. This could be due to weaknesses in the models. Differences also reflect the distinction between the two models and the differences between choosing to drive a child at least one day a week and the number of parent-driven trips per week.

There were, however, several similarities between the models. Parents commute to work was the most consistent variable in both models. Parents are much more likely to drop off and pick up their parents if they do so via their work commute route. This supports the literature of the research studies of mode choice for school transport (8).
Other consistent factors were parents' perceptions about the environment. Parents were more likely to drive their children if they felt that driving an automobile for school transport was better or the same for the environment as the school bus. This may be because they are justifying their choice, yet it may be worth further investigation into this issue. An education component about the differences between transit and automobile may be useful if schools are interested in promoting bus ridership.

Safety ratings of the modes for school transport also had some weight as an effective predictor. Overall, if parents felt that the car was safer than bus or walking, they were more likely to drive their children to and from school.

Perceptions of the school bus affected parents' choice to drive and the number of days children are driven. The perception that the bus stop is too far from home is a factor in school transport. The bus coming either too early in the morning or too late in the afternoon was another factor affecting parent-driven trips. With busy morning schedules, having a bus pick up time that is too early may be a deterrent in using alternative modes to an automobile. This leads to the conclusion that it is the convenience of the automobile more than any other factor that is induces the mode of parent-driven trips to school. In the case of school transport, convenience entails several factors including parent commute trips, valuable morning time, and long walks to the bus stop that take extra time.

If communities are interested in decreasing the amount of school-related traffic for reasons of traffic congestion or the environment, it may be beneficial to consider programs that are aimed at promoting alternative modes such as school bus, walking, biking, and carpooling. Educating parents about the trade-offs between the environment or traffic congestion and convenience may prove useful in decreasing the parent-driven trip for school transport.

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