

School Transit and Accessing Public School in Detroit

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### **Abstract**

Students in the Detroit Public Community Schools District (DPSCD) have the highest rate of chronic absence (missing 10% or more of school days) among large districts in the United States. Additionally, students in DPSCD are among the poorest students in the country, often lacking access to reliable personal transportation or public transit to facilitate getting to school. Although DPSCD offers school-sponsored transit, only 30% of K-8 students were eligible for such transit in 2018-19. Through the use of multilevel modeling, we sought to identify the association between eligibility for school-sponsored transit and attendance. Our findings indicated that there was a negative association of small magnitude between eligibility for school sponsored transit and school attendance. This counterintuitive finding may highlight the fact that transit eligibility is not sufficient to mediate the negative relationship between student poverty and attendance, and transit eligibility does not guarantee regular use of school-sponsored transit.

### **School Transit and Accessing Public School in Detroit**

Public education in Detroit is marked by high levels of choice, with approximately 47% of resident Detroit students attending the Detroit Public Schools Community District, 31% attending school in one of the nearly 90 charter schools operating within the city, and 22% attending either a traditional public school or charter school in the suburbs across Metro Detroit. In this high choice system of education, in 2017-18, only 18% of resident Detroit students attended the school nearest their home residence, and even within the DPSCD system, only 45% of students attended their designated neighborhood school (Lenhoff & Pogodzinski, 2018). In 2017-18, the average elementary student in Detroit was traveling 2.47 miles to attend school, while the average high school student was traveling 3.97 miles (Lenhoff & Pogodzinski, 2018).

Having a patchwork system of education and long commutes to school may not be a problem for some families, but in a city with substandard public transportation (Sattin-Bajaj, 2018) and high levels of poverty impacting personal transportation options (Gerber, Morenoff, & Smith, 2017), consistently getting to school can be problematic. Additionally, the provision of school sponsored transportation (i.e., a school bus or subsidized public transportation) within DPSCD and across charter schools is limited for many students, with varying eligibility requirements and access (Singer et al., 2020). Access to transportation to and from school has important implications for student attendance (Gottfried, 2017), and Detroit has the highest rate of student chronic absence (i.e., missing 10% or more days) among large cities (over 500,000 residents) (Singer et al., in press). In 2017-18, 69% of students in DPSCD and 38% of students in city charter schools were chronically absent (Lenhoff & Pogodzinski, 2018).

Therefore, we sought to answer the following research questions: a) What percentage of DPSCD elementary students were eligible for school sponsored transportation? and b) What was

the association between eligibility for school sponsored transportation and student attendance? To answer these questions, we drew on student-level administrative data from DPSCD for the 2018-19 school year; we restricted the analysis to only students within the DPSCD system because the district had a uniform transportation policy, and information on transportation across the charter schools was not consistently available. All DPSCD high school students were eligible to ride public transportation for free (thus excluded from the analysis), while elementary students (K-8) were eligible to ride the school bus if they attended their zoned school and lived more than three-quarters of a mile away from that school.

### **Transit and Student Attendance**

Student attendance is influenced by a host of factors across home, community, and school environments (Balfanz & Byrnes, 2012; Gottfried & Gee, 2017; Lenhoff & Pogodzinski, 2018; Singer et al., in press). The work presented here has a specific focus on the contextual nature of school sponsored transportation and its potential association with student attendance.

Specifically, we frame this work in an understanding that school sponsored transportation intersects with other factors which may impact school attendance, including community safety, family resources, and school choice. In other words, school sponsored transportation may impact student attendance, but the effectiveness of such services are potentially mediated by other community and family factors which influence regular use of provided services.

### **Transportation and Student Attendance**

Sugrue and colleagues (2016) identify transportation as a critical variable for understanding chronic absenteeism, specifically identifying access to reliable transportation as an important determinant for regular school attendance. They drew from an ecological frame to highlight how individualized circumstances (e.g., income level and access to personal

transportation) interact with school-level factors to influence student attendance. As such, school policies and practices related to transportation often emerge from the needs and circumstances of the population of students who are being served. This may include factors such as density of the student population and school zoning policies, average and range of family resources, availability of robust and safe public transportation, and consideration of specific populations (e.g., elementary versus secondary students).

However, there is relatively limited extant research on the more nuanced relationships specifically between transportation and student attendance, particularly related to school-sponsored transportation. One such study, Gottfried (2017), utilized the ECLS-K:2011 dataset to find that kindergarteners who rode the school bus were less likely to be chronically absent than students who used alternative modes of transit. Gottfried (2017) offered several possible explanations for the link between school sponsored busing and student attendance, including the possibility that adequate school sponsored bus services help establish routines that aid regular attendance, as well as aid in the logistics of getting multiple children from the same family to different schools in a district (e.g., an elementary school and a middle school). This may be particularly helpful for families who do not have access to personal transportation or those with inflexible schedules. Furthermore, Gottfried (2017) posited that offering effective school sponsored transportation may increase positive perceptions of the school, which may indirectly influence regular school attendance. Yet, he concluded that future research needs to consider specific school bus policies as part of the analytic strategy to better understand the intersection between provision of busing and its relation to student attendance.

Qualitative research of the topic includes Wallace (2017), who conducted interviews with 22 families with chronically absent students, and many identified not having reliable and safe

transportation as one important barrier to attendance. One specific issue that was reported related to accessing school sponsored transportation when a student changed schools during the school year. This finding reflected findings reported in the work of Deitrick and colleagues (2015), who reported that the decentralized school bus system (which included contracting with over 20 private bus providers) contributed to student absences, specifically for students who changed schools during the school year. Additionally, Wallace (2017) indicated that student discipline policies associated with riding the bus lead to some students missing school when they were suspended from riding the bus. For some students, being barred from riding the school bus left them with no other option to get to school.

For families who do not live within walking distance to school, access to transportation is a necessary condition for school attendance, yet several factors influence the mode of transportation used to get to school. Choice sets vary across districts and families (e.g., the provision of school sponsored transportation, access to public transportation, and access to personal transportation), which interact with other factors which influence parents' choice of transportation when options are available. For example, in a survey of nearly 800 families with children in K-8 in Wake County, North Carolina, Rhoulac (2005) reported that parents had significantly more favorable views regarding the safety of personal transportation (65% viewed it as "very safe") compared to safety of school bus ridership (only 35% viewed it as "very safe"). Furthermore, Burdick-Will and colleagues (2019) examined middle and high school students' usage of public transit in Baltimore, MD and found that having to walk to and wait at bus stops for city buses with high levels of crime was associated with higher absenteeism. These findings suggest that parents not only evaluate the mode of transportation, but also the context within which the mode is offered. For example, it is likely that parents evaluate the safety of school

sponsored bus stops, and the walk to and from such stops, when deciding whether or not to allow their child to ride the school bus. For families without access to personal transportation, they are often faced with options that they deem less than safe, which may impact regular attendance.

### **Detroit Context**

Understanding this relationship between attendance and transportation is particularly important in Detroit, where school, community, and family conditions may be particularly problematic for promoting regular school attendance. For example, in the neighborhoods of Detroit with the highest levels of poverty, more than a quarter of families do not own a car (Sattin-Bajaj, 2018). Furthermore, although there have been some recent modest improvements in public transit (Mondry, 2019), public transit in the geographic sprawling city of Detroit has been routinely criticized as being inadequate (e.g., Derrigner, 2016; Felton, 2014; Graber, 2016). Comparing the efficiency of public transit in New York City to that in Detroit, Sattin-Bajaj (2018) reported that a 10-minute car drive in New York would take 20 minutes by public transit. Conversely, a 10-minute car drive in Detroit would take over 30 minutes by public transit, which is limited to bus service and two small rail systems that largely serve the downtown area, where fewer students live compared to other neighborhoods.

Regarding school sponsored transportation, the provision of transportation is disparate as there is no uniform policy across DPSCD and the charter schools in the city (Singer et al., 2020). There is only one centralized coordinated school bus system that serves both DPSCD and charter school students, a pilot busing program (GOAL Line) in Northwest Detroit which picks students up at bus depot stops and drops them off at their respective schools along a loop route; in the afternoon it shuttles students from their schools to the Northwest Activities Center for after school activities. According to Edwards et al. (2019), Detroit families who were provided with

morning and afternoon transportation used the option in the afternoon to attend the after school programs, but the majority did not use it in the morning with regularity. This would suggest that on average, the provision of the GOAL Line likely had limited impact on student attendance, though the program and study of the program are still in the early stages.

Even within DPSCD, for students in grades K-8 (the focus of this study), the general policy restricts school bus transit eligibility to students who were attending their neighborhood zoned school and lived more than 0.75 miles from that school. At the same time, the district makes several exceptions to this policy for students who attend their neighborhood school as well as those who attend another school within the district. Although some of these exceptions are structural in nature (e.g., transportation provided to students who are not able to attend their zoned school due to over-enrollment or for homeless students), many are individualized exceptions arranged between the district and a family. As a result of the policy, large percentages of students are excluded from eligibility for school sponsored transportation because they live too close to their zoned school or because they exercised the school of choice option to attend a non-zoned school.

The transportation policies and infrastructure are layered on the community characteristics of Detroit. In addition to having high rates of school choice, out of cities with over 500,000 residents, Detroit has the highest rates of poverty, violent crime, unemployment, and residential vacancy (Singer et al., in press). These factors not only operationalize in individual households (e.g., poverty effects on car ownership), but also at the community level. For example, this relates to the relative safety of getting to and from school, either through walking or by school or public transportation. Collectively, this context has the potential to mediate the impact that school sponsored bus service has on student attendance.



Overall, following our framing of student attendance related to transportation and access, we propose that the provision of school-sponsored transportation has the potential to positively influence student attendance rates by reducing barriers to access to school. At the same time, the effectiveness of such transportation in improving attendance is likely mediated by other community factors, such as student distribution across school systems and community safety (real or perceived). School sponsored transportation represents a potentially important factor which relates to student absences and intersects with home, community, and school conditions, and may be particularly important in a city like Detroit with extremely high rates of student poverty and inadequate public transit.

### **Data and Methods of Analysis**

To answer the research questions, we draw from student-level administrative data for the 2018-19 school year granted through a data sharing agreement with DPSCD. The data set included data for all students in grades K-12, but because district transit policies differ between primary schools (largely K-8 schools in Detroit) and secondary schools (serving grades 9-12), we focused this analysis solely on students in grades K-8 for which we had attendance data. We further reduced the sample to only include students who did not transfer between schools during the school year, were not dual enrolled in multiple schools, and were enrolled in a school for at least 30 days. These exclusions were made to account for stability of a child's educational experience within a given year, particularly in a city like Detroit where there is considerable student mobility (Pogodzinski et al., 2019). Additionally, we excluded students who attended center based programs for special education students, attended virtual schools, attended alternative schools, and magnet schools. With regard to magnet schools, this included schools where there was not a catchment zone and/or no students eligible for transportation. Finally, we

excluded outliers who attended their zoned neighborhood school, but lived more than five miles from the school (characterizing these individuals as outliers and/or administrative data entry errors). There were 30,718 students in the final sample, though this was further reduced due to missing data in the regression analysis.

Therefore, to address the first research question, we examined descriptive statistics for transit eligibility across various specifications. Specifically, in addition to the overall level of transit eligibility, we looked at how eligibility varied based on attendance in a zoned neighborhood school, as well as student special education status (where transit eligibility may be dictated by a student's Individualized Education Program). We also examined average transit eligibility at the school-level, and identified the average distance-to-school for students who attended their zoned school and those who attended a non-zoned school.

To address the second research question, we estimated a series of hierarchical linear models to identify the association between transit eligibility and student attendance. We estimated the models to examine variation in student attendance among students and between schools, thus accounting for students being grouped in specific schools. For each set of models, we first estimated unconditional models to identify the parameter variance in the outcome variable, specifically identifying the extent to which student attendance varied among students and between schools. In all models, error terms were assumed to be normally distributed at the two levels:  $r_{ij} \sim N(0, \sigma^2)$ ,  $u_{0j} \sim N(0, \tau_\pi)$ .

The first set of models included all students in the analytic sample and were estimated to identify the association between two key variables and the percentage of days absent: a) attendance in a neighborhood zoned school, and b) transit eligibility. Therefore, the following model details the approach taken:

$$Y_{ij} = \gamma_{00} + \gamma_{10}A + \gamma_{20}T + \gamma_{30}\mathbf{S} + \gamma_{01}C + u_{0j} + r_{ij} \quad (1).$$

The model predicts the percentage of days absent for student  $i$  in school  $j$  ( $Y_{ij}$ ) during the 2018-19 school year, as a function of attendance in their zoned school ( $A$ ), their eligibility for school sponsored transit ( $T$ ), a set of student characteristics ( $\mathbf{S}$ ) (e.g., race/ethnicity, economic disadvantage, grade-level band, etc), and a group-centered school-level measure of school climate ( $C$ ). The school climate variable is a measure based on school-level data gathered from the Panorama survey, which DPSCD administered to all of their students as part of their accountability protocol. The Panorama survey assesses a school based on its climate and culture, positive relationships, and school safety (Panorama, n.d.). Specifically, we took the average score (0-100 scale) across the four domains (school engagement, rigorous expectation, student-teacher relationship, and students' perceptions about teachers) to create a school-level composite (Cronbach  $\alpha = 0.95$ ).

We estimated a second model to include an interaction variable for attendance at zoned school and transit eligibility to identify the extent to which the association between transit eligibility and percentage of days absent varied by type of school attended (i.e., zoned school or non-zoned school). See Table 1 for descriptive information for variables included in the models.

A second set of models were estimated that only included students who attended their neighborhood zoned school. This was done specifically to further investigate the primary transit eligibility policy related to zoned school attendance. The first model in this set is represented by the following:

$$Y_{ij} = \gamma_{00} + \gamma_{10}I + \gamma_{20}O + \gamma_{30}\mathbf{S} + \gamma_{01}C + u_{0j} + r_{ij} \quad (2),$$

where percentage of days absent was modeled as a function of transit eligibility within policy ( $I$ ), transit eligibility out of policy ( $O$ ), student characteristics, and school climate. In other words, we

sought to identify any difference in the association between transit eligibility and attendance for those who lived further than 0.75 miles from the school (in policy) and those that lived 0.75 miles or closer to the zoned school (out of policy), relative to students who were not transit eligible.

Finally, we estimated a model that only included students who attended their neighborhood school and were eligible for transit “in policy” to investigate the relationship between accessing transit safely and student attendance. Specifically, we estimated the following model:

$$Y_{ij} = \gamma_{00} + \gamma_{10}Z + \gamma_{30}S + \gamma_{01}C + u_{0j} + r_{ij} \quad (3),$$

where the percentage of days absent was modeled as a function of a transit safety index (Z), student characteristics, and school climate. The transit safety index was created by summing standardized measures of the following variables: a) distance from home to bus stop, b) percentage of days bus pickup occurred before sunrise, c) percent of vacant homes at residential block level, and d) number of violent crimes per 1000 residents at the residential tract level. We included this model to explore the possibility that certain aspects of accessing transit in a safe environment may mediate the relationship between transit eligibility and percentage of days missed.

[insert Table 1 about here]

## **Findings**

### **Access to School Sponsored Transit**

Table 2 shows information on transit eligibility across various circumstances. Overall, 30% of K-8 students in this DPSCD sample were eligible for transit (see Table 1), with approximately 30% of special education students eligible and 30% of general education students

eligible. It should be noted that center-based programs for special education students were excluded from this analysis, most of whom would be eligible for transit. Following the general DPSCD policy for transit eligibility focused on zoned school attendance, it was not surprising that a much larger proportion of students who attended their neighborhood school were eligible for transit compared to those who attended a school outside of their neighborhood zone. At the same time, the findings highlight that even among students attending their assigned school, the majority are not transit-eligible. In addition, the findings indicate there was significant variation from the primary transit policy, allowing some students attending non-zoned schools to access school sponsored transit. About 43% of students in this analytic sample did not attend their neighborhood school. Finally, the school-average for transit eligibility was approximately 29%, but that varied considerably across schools.

[insert Table 2 about here]

### **Association between Transit Eligibility and Zoned School Attendance**

We began the regression analysis by estimating an unconditional model to identify the extent to which the percentage of days absent varied among students and between school. The variance components in model (1) in Table 3 indicate that the majority of variance in the outcome variable was among all students (93%) as opposed to between schools, though both were statistically significant ( $p < 0.01$ ). This suggests that a relatively small, yet statistically significant, amount of variance in the percentage of days missed was clustered between schools.

We then estimated a model to identify the association between the percentage of days absent and attendance in zoned school and transit eligibility. As shown in model (2) of Table 3, the coefficient for “attend zoned school” was negative and statistically significant ( $p < 0.01$ ), indicating that on average students in this sample who attended their neighborhood school had

slightly better attendance than students who did not attend their neighborhood school, *ceteris paribus*. Conversely, and seemingly counterintuitively, the coefficient for transit eligibility was positive and statistically significant ( $p < 0.01$ ), indicating that on average students who were transit eligible had slightly higher rates of absence.

Regarding the control variables included in the model, they were generally in the expected direction. On average, Black students were more likely to have higher rates of absences compared to the control group “other race”, while Hispanic students on average had lower rates of absences. Students who qualified for special education services on average had higher rates of absences, while there was no statistically significant relationship identified between economic disadvantaged status and percentage of days absent. This may be the result of an overall lack of variation in economic disadvantage status among students, as over 85% qualified for free/reduced price lunch. With regard to grade level, the coefficients for upper elementary and junior high students were negative, indicating better attendance rates for older students at this level. Following the work of Snijders and Bosker (1999) for calculating variance explained, the model accounted for approximately 5% of the variance in the percentage of days absent among students, but approximately 62% of variance between schools. It should be noted that based on some additional analysis (not shown) the inclusion of the variables for attending zoned school and transit eligibility only accounted for a fraction of a percentage point of the variance explained at the student level and school levels.

[insert Table 3 about here]

We then estimated a third model in this set which included an interaction variable between zoned school attendance and transit eligibility. As shown in model (3), the coefficients for zoned school attendance and transit eligibility were in the same direction as in model (2) and

remained statistically significant ( $p < 0.01$ ), but the interaction term was not statistically significant, suggesting that the association between transit eligibility and the percentage of days absent did not significantly vary by zoned school attendance status. Specifically, the relationship between transit eligibility and attendance likely varied little for students based on whether they were eligible in policy (i.e., attended zoned school and lived further than 0.75 miles from school) or were eligible out of policy (i.e., attended zoned school and lived 0.75 miles or closer to school, or attended a non-zoned school). Additionally, as shown by the variance components in model (3), the inclusion of this interaction term did not account for any additional variance among students or between schools.

### **Transit Eligibility within Zoned School**

To more closely examine DPSCD policy related to transit eligibility, we then estimated a set of models that excluded students who did not attend their neighborhood zoned school. As shown by the variance components for the unconditional model (model (4)), approximately 91% of the variance was among students as opposed to between schools for this subset of students (similar to the previous models). Model (5) included binary variables for transit eligibility in policy and out of policy; as shown the coefficients for both were positive and statistically significant ( $p < 0.01$ ). This finding suggests that students who were eligible for transit on average had lower attendance, regardless of the distance of their residence to the school. Overall though, again following the formula proposed by Snijders and Bosker (1999), this conditional model accounted for approximately 5% of variation in percentage of days absent among students and approximately 56% of the variance between schools.

Lastly, we estimated two models (one unconditional and one conditional) that only included students who were eligible for transit in policy in order to identify any potential

mediating factor that accessing transit safely may play between transit eligibility and student attendance. Similar to the previous models, the variance components in model (6) indicated that the vast majority of variance (~89%) was among all students as opposed to between schools. Model (7) shows the results when the transit safety index was included along with other control variables. As shown, the coefficient for the safety index was positive and statistically significant ( $p < 0.05$ ), counter-intuitively indicating that on average the “safer” the access to transit (e.g., less crime/blight) the higher the percentage the days absent, *ceteris paribus*. Similar to the model (5), the overall model only accounted for approximately 5% of variance in percentage of days absent among students, and approximately 60% of the between school variance.

### **Discussion**

The initial descriptive analysis highlights that the majority of DPSCD students were not eligible for transit by policy design. This is in part due to the fact that over 40% of students did not attend their neighborhood zoned school, excluding most of them from transit eligibility. Of those that did attend their zoned school, fewer than half were eligible for transit because they lived too close to their school. Changing the “distance to school” restrictions for students attending their zoned school could significantly increase access to transit and have the potential to improve students’ access to school. For example, if the distance eligibility was moved from more than 0.75 miles to more than 0.50 miles for this analytical sample, the percentage of transit eligible students who attended their zoned school would increase by approximately 17 percentage points (nearly 2,600 students). Although this could pose a significant increase in costs to the district to provide transportation to an increased number of students, it has the potential to improve student attendance, though our regression analysis may suggest that increasing access to transportation alone will not necessarily result in improved student attendance.



## **Transit Eligibility and Student Attendance**

Somewhat surprisingly, in our regression analysis, transit eligibility was associated with higher rates of days absent. Although a relatively small effect, it held across multiple specifications of models. Given the nature of the data and analysis, we cannot draw definitive conclusions, but there are several possible explanations for this counterintuitive finding. On one hand, for those attending their zoned school, it could be that transit eligibility could have been picking up an association between distance to school and attendance. In other words, it is likely that the further a student lives from their school, the higher likelihood of absences, particularly for low-income students who do not have access to reliable transportation. Students who are transit eligible may therefore be more vulnerable to missing school when they miss the school bus, since they may live too far from school to find alternative routes to school, via walking or personal transit. We did estimate a multi-level model that only included students who attended their zoned school to test this assumption (see Appendix A), and as expected, there was a positive relationship ( $p < 0.01$ ) between distance to school and percent days absent.

There are several reasons why distance to school may be a deterrent to regular school attendance. Even for those who live relatively close to school, walking to school may be challenging. For example, compared to other large U.S. cities, Detroit has the highest violent crime rate and residency vacancy rate, which may make walking to school or a bus stop a potentially dangerous endeavor (Burdick-Will et al., 2019; Singer et al., in press). Furthermore, Detroit has one of the lowest average temperatures among large cities (Singer et al., in press), therefore walking to school in the cold months may be particularly challenging for low income families who may lack access to adequate clothing.

For those who were eligible for the bus (i.e., lived further than 0.75 miles from the school), there is some evidence from other research that students are less likely to use busing to get to school in the morning and more likely to use it in the afternoon (Edwards et al., 2019). Intuitively, the relationship between bus ridership and attendance rests more heavily on use of the service in the morning, in that if a student is not able to get to school on time, they may be more likely to remain at home that day. Additionally, following the work of Burdick-Will and colleagues (2019), community factors related to blight and crime may dissuade the use of school-sponsored transportation, even when it is offered. In other words, if the walk to the bus stop or the wait for the bus is deemed not safe (especially in the morning), then use of the service would likely decrease. Therefore, there may be additional barriers that need to be addressed to improve the efficacy of school sponsored transportation as it relates to decreasing student absences.

It should be noted though that our analysis identified an unexpected relationship between safety and student absences, specifically we found that students who were bus eligible and lived in relatively safer neighborhoods were on average more likely to have higher rates of absences. Although a small association in this analysis, it challenges some of the assumptions regarding safe routes to bus stops and parents' calculation of whether or not to use bus services. It could also be that the safety index measure did not vary significantly across the city, or that parental perceptions of safety are misaligned with specific measures of safety. Further research would need to be conducted to fully assess parents' assessment about the safety and convenience of school sponsored transit.

### **Transit Eligibility and School Choice**

The interpretation of the association between transit eligibility and student attendance in the Detroit context may be further grounded in issues of school choice. Embedded in the

relatively low number of students who were eligible for transportation in DPSCD is the relatively high number of students who did not attend their neighborhood zoned school. It could be that the most disadvantaged students in DPSCD attend their zoned school because they do not have means (e.g., personal transportation) to attend another school further from their home. Because of the crude measures of family socio-economic status included in the data set (eligibility for free/reduced priced lunch), it is difficult to test this assumption (the vast majority of students who attended and did not attend their neighborhood school qualified for free/reduced priced lunch). This type of measure does not detect likely subtle differences between means and networks of families across the schools and neighborhoods which either aids or impedes regular school attendance. For students who attended their neighborhood school, those that are most disadvantaged likely have more barriers to overcome to get to school on a regular basis, including accessing transportation. Although DPSCD transportation policy is aimed at ensuring that those who live furthest from their school can get to school, the relationship between transit eligibility and student absences may be overshadowed by other factors which impact student attendance.

### **Limitations and Conclusions**

A significant limitation of this work is the fact that transit eligibility is not the same as transit use. We continue to work with DPSCD to better identify transit uptake across different criteria, particularly those who fall within the stated DPSCD eligibility policy as well as those who fall outside of this policy. This speaks to a further limitation of this study, as the exceptions that were made for transit eligibility were not particularly clear. Those who were eligible through exception may be “exceptional” in other ways which may be associated with their attendance rates.

Although the data did not allow us to identify actual uptake of transportation services, the initial findings suggest that the provision of transportation services may not be sufficient to negate the negative association between distance to school and student absence (Author, 2018). Furthermore, since many students were picked up at “bus stops”, student safety concerns, bus reliability, and weather may have influenced accessing school transportation even when it was provided. As previously stated, we are currently working with the DPSCD administration to identify transportation usage rates at the school level and school bus stop locations to be used in additional analysis to investigate the relationship between distance to school/bus stop, eligibility for transportation, time from bus pick up to school start time, and chronic absence.

Even though there are limitations to this analysis (e.g., the exclusion of students attending charter schools), it has important implications for how district leaders design their transportation policies, including the direct provision of school buses as well as coordination with public transportation providers. Our continuing work will help illuminate the broader context within which transportation policy is situated, including how access to transportation intersects with individual, school, and neighborhood characteristics to more comprehensively identify barriers to consistent student attendance.

Finally, although not the specific focus of this research, the issue of school choice cannot be separated from discussions of school sponsored transportation in the Detroit context. A majority of Detroit students do not attend a DPSCD school; they are spread across a myriad of charter schools and suburban traditional school districts who have their own transportation policies (if they offer transit at all). With the exception of the GOAL Line city-sponsored transportation loop in the northwest section of Detroit, there is no coordination of school transportation across systems serving Detroit students. As students move in and out of school

systems, a lack of access to transportation may undermine regular school attendance.

Additionally, transportation policies and options may influence parents' choice of school as choice of school is often mediated by access. We suggest that the intersection of choice policy and transit policy deserves further attention and analysis.

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## Tables

Table 1

### *Descriptive Information*

Variable	N	Mean	Std Dev	Min	Max
Percent days absent	27,117	0.15	0.11	0.00	0.95
Attend zoned school	27,117	0.57	0.50	0.00	1.00
Transit eligible	27,117	0.30	0.46	0.00	1.00
Safety index	4,772	0.00	2.11	-5.43	17.86
Distance home to stop (miles)	4,772	0.11	0.06	0.00	1.10
Pct days pickup before sunrise	4,772	0.40	0.32	0.00	0.81
Pct vacant houses	4,772	0.29	0.12	0.01	0.67
Violent crimes per 1000 people	4,772	38.08	15.04	5.80	102.27
Black	27,117	0.83	0.37	0.00	1.00
Hispanic/Latino(a)	27,117	0.12	0.32	0.00	1.00
Other race	27,117	0.05	0.21	0.00	1.00
Special education	27,117	0.11	0.31	0.00	1.00
Free/Reduced priced lunch	27,117	0.86	0.34	0.00	1.00
Lower elementary (K-2)	27,117	0.38	0.49	0.00	1.00
Upper elementary (3-5)	27,117	0.34	0.47	0.00	1.00
Junior high (6-8)	27,117	0.28	0.45	0.00	1.00
School Climate	27,117	62.45	7.82	48.09	85.27

Table 2

*Average Transit Eligibility by Category*

Category	N	Mean	Std Dev	Min	Max
Special education students	2,904	0.30	0.46	0.00	1.00
Non-special education students	24,213	0.30	0.46	0.00	1.00
Students attending zoned school	15,383	0.45	0.50	0.00	1.00
Students attending non-zoned school	11,734	0.10	0.30	0.00	1.00
School-average	63	0.15	0.04	0.08	0.23

Table 3

*Estimated Effects on Percent of Days Absent (All Students)*

Variable	(1)	(2)	(3)
Intercept	0.1462** (0.0045)	0.1411** (0.0054)	0.1414** (0.0054)
Attend zoned school		-0.0075** (0.0015)	-0.0080** (0.0016)
Transit eligible		0.0102** (0.0016)	0.0083** (0.0033)
Zoned sch x Transit eligible			0.0026 (0.0038)
Black		0.0231** (0.0038)	0.0230** (0.0038)
Hispanic/Latino(a)		-0.0186** (0.0042)	-0.0187** (0.0042)
Special education		0.0085** (0.0021)	0.0086** (0.0021)
Free/Reduced priced lunch		-0.0013 (0.0019)	-0.0013 (0.0019)
Upper elementary (3-5)		-0.0221** (0.0015)	-0.0221** (0.0015)
Junior high (6-8)		-0.0165** (0.0017)	-0.0165** (0.0017)

School Climate		-0.0144**	-0.0144**
		(0.0036)	(0.0036)
$\sigma^2$	0.0116**	0.0114**	0.0114**
$\tau_\pi$	0.0012**	0.0007**	0.0007**
-2 Res log likelihood	-43,667.8	-44,002.7	-43,993.9
AIC	-43,663.8	-43,998.7	-43,989.9
n	27,117	27,117	27,117
* $p < 0.05$ , ** $p < 0.01$ .			

Table 4

*Estimated Effects on Percent of Days Absent (Neighborhood Zone School Only)*

Variable	(4)	(5)	(6)	(7)
Intercept	0.1437** (0.0043)	0.1409** (0.0063)	0.1510** (0.0055)	0.1635** (0.0116)
Transit eligible in policy		0.0082** (0.0020)		
Transit eligible out of policy		0.0093** (0.0032)		
Safety index				0.0025* (0.0010)
Black		0.0264** (0.0051)		0.0077** (0.0105)
Hispanic/Latino(a)		-0.0175** (0.0056)		-0.0315** (0.0127)
Special education		0.0064* (0.0029)		0.0176** (0.0054)
Free/Reduced priced lunch		-0.0089** (0.0026)		-0.0079 (0.0048)
Upper elementary (3-5)		-0.0249** (0.0020)		-0.0193** (0.0040)
Junior high (6-8)		-0.0226** (0.0023)		-0.0193** (0.0042)

School climate		-0.0122**		-0.0192**
		(0.0034)		(0.0046)
$\sigma^2$	0.0113**	0.0112**	0.0125**	0.0124**
$\tau_\pi$	0.0011**	0.0006**	0.0015**	0.0009**
-2 log likelihood	-24,840.7	-25,047.1	-7,238.8	-7,247.1
AIC	-24,836.7	-25,043.1	-7,234.8	-7,243.1
n	15,260	15,260	4,772	4,772

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\*  $p < 0.05$ , \*\*  $p < 0.01$ .

## Appendix

Table A1

*Estimated Effects on Percent of Days Absent (Neighborhood Zone School Only)*

Variable	(4)	(5)
Intercept	0.1445** (0.0043)	0.2413** (0.0275)
Distance to school		0.0122** (0.0019)
Black		0.0223** (0.0051)
Hispanic/Latino(a)		-0.0142* (0.0056)
Special education		0.0075* (0.0029)
Free/Reduced priced lunch		-0.0146** (0.0025)
Upper elementary (3-5)		-0.0257** (0.0020)
Junior high (6-8)		-0.0230** (0.0023)
School climate		-0.0015 (0.0042)
$\sigma^2$	0.0116**	0.0114**



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	(0.0001)	(0.0001)
$\tau_\pi$	0.0011**	0.0007**
	(0.0002)	(0.0001)
-2 log likelihood	-24,718.4	-24,964.8
AIC	-24,718.4	-24,960.8
n	15,420	15,420

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