Perceived Barriers and Facilitating Factors in Implementing Delayed School Start Times to Improve Adolescent Sleep Patterns

ABSTRACT

Background: Most adolescents in the United States do not obtain sufficient sleep. Early school start times play a significant role in adolescent sleep deprivation. Most primary and secondary schools begin classes earlier than the 8:30 a.m. Perceived barriers to implementing a delayed school start time have been suggested in the literature but have not been quantified. This study explored perceived barriers and facilitating factors for implementing delayed high-school start times.

Methods: A cross-sectional study. School administrators that had delayed their school start times were invited to complete an online questionnaire ranking the perceived barriers and facilitating factors for implementing the delayed start times.

Results: Most commonly cited perceived barriers were lack of a tiered bus system, school athletes missing more afternoon classes, and less time after school for athletics. Most commonly cited facilitating factors were school-administrator involvement in the decision-making process and sleep education for family members and school administrators.

Conclusions: Participants found that providing sleep education to fellow administrators, teachers, school staff members, families, and students and including them in the decision-making process positively facilitated the implementation of delayed school start times. Perceived barriers to implementation may be overcome with support from stakeholders and planning committees.

Keywords: Adolescence; sleep; school start times; school health policy

The National Sleep Foundation (NSF) recommends that adolescents obtain 8-10 hours of sleep at night.[1, 2] However, studies continue to report the average sleep duration for adolescents is less than these recommended amounts. A recent meta-analysis in which sleep behavior was measured using actigraphy reported that pooled mean estimates for overnight sleep duration varied from 9.68 hours for children 3–5 years age range to 7.4 hours for age 15–18 years.[3] Increasing the number of students who obtain a minimum of 8 hours of sleep each night was identified as a goal of Healthy People 2020.[4]

Sleep deprivation has a negative impact on adolescent health. Poor sleep patterns in adolescence have been linked to social and mental health problems, such as increased risk of suicide, depression, and behavioral problems[5-7] and an increase in risk-taking activities, such as the use of nicotine, alcohol, and marijuana.[8-10] Additionally, chronic sleep deprivation has been linked to a decreased resistance to common infections,[11] an increase in body mass index during early adolescence,[12-14] and an increase in cardiometabolic risk.[15] In contrast, healthy sleep patterns in adolescents are associated with a balanced healthy diet, an increased amount of overall physical activity, and an awareness of personal responsibility towards one's health.[16, 17]

The ability to obtain enough sleep each night is influenced by many factors, such as television screen time, electronic use, social media use, after-school activity commitments, homework requirements, and family unit sleep norms.[18, 19] Changes in the brain during adolescence delays sleep by signaling students to be alert later in the evening and to begin feeling sleepy at approximately 11 p.m.; thus, they awaken later in the morning.[20] Delaying school start times addresses the delayed sleep phase by aligning students' day activities with their natural biological rhythms.

Delayed school start times are important for improving adolescent sleep. Delaying middle- and high-school start times until after 8:30 a.m. has been recommended by the American Academy of Pediatrics in an effort to improve the number of hours that adolescents sleep each night.[21] Studies support delaying school start times to increase the amount of sleep that adolescents obtain each night.[22] In addition to improving the amount of sleep each night, delayed school start times decrease daytime sleepiness, reduce sleeping during classes, reduce school tardiness, lower rates of caffeine use, and decrease depression rates in adolescents.[22-25] Public safety may be affected as well; researchers noted a decrease in motor vehicle accidents involving adolescents after delayed start times were adopted.[26]

Although research reports benefits of delayed school start times for adolescents, less than 18% of high schools across the United States start classes after 8:30 a.m.[27] School administrators may have reservations about changing to later start times.[23] This hesitancy may be due to lack of knowledge on the perceived barriers and facilitating factors inherent in making this change as well as angst regarding possible community backlash from interrupting current household routines. Although several publications have identified the benefits of delayed school start times,[22, 23, 28] few studies evaluated perceived barriers and facilitating factors for implementing a delayed high-school start time. Wheaton, et al.[29] completed a literature review on outcomes associated with delayed school start time. They found that qualitative research regarding barriers on implementing delayed school start times is lacking in the literature. Commonly proposed perceived barriers to delaying start times include increased transportation costs, increased traffic congestion, and lack of community education regarding adolescent sleep need.[30-33] This paper seeks to identify perceived barriers as well as facilitating factors in implementing a delayed school start time for adolescents.

METHODS

Participants

This is a cross-sectional study. Eligible respondents were school administrators (superintendents, assistant superintendents, principals, assistant principals, counselors, and school board members) who, at the time of this study (2017), worked in a high school that was identified as having undergone a delayed school start time. A total of 1,601 potential respondents were identified. An email was sent to each potential respondent with a link to the web-based questionnaire, and a reminder email with the link was sent once a week for a total of 4 weeks. A convenience sample of 116 respondents participated in the survey with a response rate of 7.2%.

The participants' job titles included superintendents (7.8%; N = 9), assistant superintendents (16.4%; N = 19), principals (20.7%; N = 24), assistant principals (42.2%; N = 49), counselors (11.2%; N = 13), and school board members (1.7%; N = 2). These participants were employed in schools in the United States with no noted geographical clustering. The principals, assistant principals, and counselors were from separate public or private high schools; whereas, the superintendents, assistant superintendents, and school board members were associated with a public or private school district that included at least one high school.

Instrumentation

This study utilized a questionnaire developed by the authors, which contained Likert-type items and multiple-choice questions and provided three areas for free text, if a participant wished to elaborate upon an answer. The items and questions were based on questionnaires used in previous studies[32, 34, 35] as well as input from sleep researchers (SQ and PH). In the questionnaire, 31 items addressed perceived barriers, and 27 items addressed facilitating factors (see Tables 1 and 2). Participants could skip answers to items and questions if they did not wish to answer.

Participants were asked if they considered each question as *significant, moderate, minor barrier*, or *not a barrier/not applicable*. The barrier statements referred to transportation issues, extracurricular considerations, stakeholder groups who were resistant to change, and additional items, such as enough time for homework or amount of time waiting for the bus. Participants also were asked if each statement was a *significant*, *moderate*, *minor facilitating factor*, or *not a facilitating factor/not applicable*. The facilitating factor statements addressed stakeholder involvement and education, scheduling alternatives, transportation, and other statements, such as spending less unsupervised time at home. The questionnaire contained the following open-response questions: *Do you offer classes that students can elect to take that start prior to the delayed school start time?* (sometimes, called 'zero hour' classes), *Did your district 'flip' elementary and high school start times?* and *Would you recommend that other districts pursue delaying a school start time?*

Procedure

An electronic list of schools that have undergone a delay in school start times in each state is maintained by the nonprofit group, Start School Later (startschoollater.net). This list was used to collect high-school district names. An internet search was done for these school district websites to collect the email addresses of high-school and school district administrators. Participants were invited to complete a web-based questionnaire, which was available over a period of 4 weeks.

Data Analysis

Descriptive statistics, utilizing IBM SPSS Statistics for Windows (Version 26.0. Armonk, NY: IBM Corp.), were used to assess the frequency and percentage of each perceived barrier and each facilitating factor, persons who would recommend a delayed start time, and perceived improvements related to delayed high-school start times. In addition to analyzing which

perceived barrier was most commonly marked as *significant*, a calculated combined score was computed that added the frequencies of *significant*, *moderate*, and *minor* responses into one overall perceived barrier category, *combined perceived barrier*, because personal definitions of *significant*, *moderate*, and *minor* may vary between participants. A similar statistical plan was devised to determine the *combined facilitating factor*.

RESULTS

Perceived Barriers

The most commonly cited significant perceived barrier (37.7%; N = 43) was *school-based athletes missing more afternoon classes to attend to or travel to games* (see Table 3). This primary perceived barrier was followed by other significant perceived barriers, in order of frequency: *use of a tiered school bus transportation system* (busses for the early and later pick-up times; 32.5%; N = 37), *less after school time for athletic activities* (28.8%; N = 34), *family members resistant to change schedule* (21.1%; N = 34), and *elementary students would be waiting for bus pick-up in the early morning, in the dark* (18.8%; N = 21). This last statement referred to an event that may occur during certain seasons of the year. *Teachers resistant to change schedule* was a frequently cited barrier (74.8%; N = 86). For the combined perceived barrier category, *school-based athletes missing more afternoon classes to attend or travel to games* was cited as the most frequent barrier (84.2%; *N* = 96), followed by *less after school time for athletic activities* (80.7%; N = 92), and *family members resistant to change schedule* (78.9%; N = 90).

Some participants (17.2 %; N = 19) chose to provide additional comments in the free-text box for barriers. One participant noted that the school district's athletic conference delayed the start of games to coincide better with the school's delayed release time; this decision was found

to be disruptive by the other schools in the same athletic conference. Another participant noted that the subsequent delay in athletic practices resulted in team members in some outdoor sports, like golf, tennis, or junior varsity field hockey, completing games or practices in the dark during some seasons of the year. Additional comments in the barrier free text-box included: *surrounding communities not on the same schedule* and *not educating the community about the pros of a late start time.*

Facilitating Factors

The facilitating factors were examined in a similar fashion. The facilitating factors were ranked by how many times they were rated as *significant*. The most commonly cited *significant* facilitating factor was *involvement of school administrators in the decision-making* process (47.7%; N = 52), followed by *providing education on adolescent sleep patterns for family members* (40.1%; N = 44), and *providing education on adolescent sleep for school administrators* (34.9%; N = 38; see Table 4). *Involvement of teachers* (84.5%; N = 93) and *school administrators* (84.4%; N = 92) *in the decision-making process* followed by *providing education on adolescent sleep patterns for students* (83.5%; N = 91) were the most frequently cited for combined facilitating factors.

Several novel facilitating factors were noted by participants using the free text-box. One participant noted that the school involved healthcare professionals, as well as experts, from a local university in providing education regarding changes in school start times to the community. Another participant stated that the school day-schedule was redesigned to provide a block of time in the middle of the day for club meetings or student tutoring. Another participant stated that the drivers' overall salaries were increased due to the increased need for additional routes and times, which resulted in the district's improved ability to attract more qualified drivers. One participant

noted that flipping the elementary and high-school start times was beneficial for parents of elementary students. This participant noted that many elementary students no longer had to attend daycare prior to starting their school day, because the earlier elementary start time better coincided with parents' work schedules. Additionally, educating the school board members and sharing data collected after the delayed start time implementation with the stakeholders were important facilitating factors noted in the analysis of the free text section.

Traffic Concerns

Traffic was not cited as a significant barrier or significant facilitating factor (see Table 5). Over 50% of participants responded that traffic was neither a barrier nor facilitating factor, or *not applicable*. Using the free-text box, one participant considered traffic a barrier, because a sport team bus driver had to leave school earlier in the afternoon to avoid rush hour and student athletes were missing more class time.

Early Morning Activities and Classes

Moving activities before school, whether athletic, school-sponsored, or other activities, was not found to be a common facilitating factor on this survey. Approximately 55% (N = 60) of participants indicated that they did not move athletic practices before school, and 50% (N = 55) of participants indicated that they did not move school-sponsored extracurricular or club (nonathletic) activities before school. Additionally, a question was included on the questionnaire that asked if the school or district had an optional 'zero hour' or early morning class that started prior to the school day in which students could enroll. A total of 46.4% (N = 52) of respondents indicated that they offer such an option, while 53.6% (N = 60) of respondents indicated that they did not offer elective classes that start prior to the new delayed start time.

Flipping School Start Times

"Flipping" elementary and high-school start times may be an option for districts that encompass a Kindergarten through Grade 12 (K-12) population. Flipping involves scheduling middle-school and high-school start times at the previous start time for elementary schools, which is usually later in the morning. Then, elementary school start times are moved earlier in the morning. With this option, schools usually can maintain their same tiered bus route in which buses pick up elementary students first and then return to pick up high-school students, reducing the number of buses and bus drivers needed. This study found that 49.1% (N = 54) of participants indicated that their schools "flipped" elementary and high-school start times, 36.4% (N = 40) of participants noted that their schools did not flip elementary or high-school start times, and 14.5% (N = 16) chose *not applicable*.

Recommendations for Delayed Start Times

When 116 participants were asked if they would recommend a delayed school start time, 79.1% (N = 80) of participants would recommend that other districts pursue a delayed start time, 20.9% (N = 23) of participants would not recommend a delayed start time, and 11.2% (N = 13) of participants provided no answer.

DISCUSSION

This study examined the perceived barriers and facilitating factors that exist among schools that have transitioned to a delayed school start time. The two most commonly cited combined perceived barriers to implementing a delayed start time, as suggested by the questionnaire, involved athletic concerns: 1) that school-based athletes were missing more afternoon classes to attend or travel to games and 2) that there was less after school time for athletic activities. We assessed the combined scores, because some of the factors with high

combined scores may be as central in influencing community decisions as those with the high significant scores.

For nonathletic activities, such as philanthropic, spiritual-sponsored, and non-athletic school sponsored activities, having less time available to them were not considered to be barriers that were significant to overcome. That athletic concerns are a primary perceived barrier in the delaying of school start times is slightly concerning. While missing more classes to attend games may be a scheduling problem that can be overcome with working with other schools, the concern that there is less time after school for athletic activities but not a concern that a delayed start time cut into other extracurricular activities does re-enforce the idea that as a culture we have a tendency to allow athletic concerns to rule. While involvement in athletics has a role in the high school experience, many can argue that decisions for the entire student body, such as start time, should not defer to the preferences of a single extra-curricular activity.

The three most commonly cited combined facilitating factors included the involvement of school administrators and teachers and providing education on adolescent sleep to family members and school administrators. Administrators can ask local healthcare providers and researchers to support the delayed start for adolescents by providing education on adolescent sleep and sleep deprivation. Teacher involvement is essential in the decision-making process, because teachers are resistant to changing the schedule. Sustained and consistent education on the benefits of longer sleep durations and alignment with adolescent's circadian rhythms may encourage community stakeholders' positive perceptions of the benefits of delayed school start times regardless of disruptions to individual schedules. Some participants moved extracurricular activities prior to school and added a 'zero hour' class; these activities undermine efforts to align the school day with adolescents' natural circadian rhythms. If 'zero hour' classes are considered,

there should be options to have the same course offered during normal school hours so that adolescents are not forced to choose between academic topics and sufficient sleep.

The literature suggested that transportation logistics, budgets, traffic congestion, time constraints on extracurricular scheduling, and a lack of community education[32] were primary barriers in implementing a delayed school start time. In this study, transportation logistics and time constraints on extracurricular activities were commonly cited barriers; however, traffic congestion was not seen as a primary barrier. Most of the participants would recommend that other school districts start delayed school times for adolescents and flipped the school times for elementary and high-school students.

Providing education to family members could help them overcome a resistance to change their personal schedules. Providing education to family members ideally would be multifaceted involving social media, emails and or letters home, handouts and brochures, and formal events for the community to learn about adolescent sleep and the role school start times play. Educating the students themselves also may help educate the entire family through informal discussions in the household.

The strengths of this study are eliciting facilitating factors and perceived barriers to implementing delayed school start times for adolescents from administrators who chose to implement this strategy and recruiting input across the United States. This study adds to the knowledge of the impact of this intervention in a variety of communities. The additional knowledge may be useful in guiding school administrators toward facilitating factors that can help address both perceived and real challenges to delaying start times.

Limitations

The limitations of this study include a low response rate to the (7%), which resulted in reduced ability to categorize the types of schools and districts that chose to delay in start times for adolescents. Similarly, data regarding socioeconomic status and regional differences that may have impacted the perceived barriers and facilitating factors were not obtained. This questionnaire was available to select school district employees at the administrative level. Additional perceived barriers and facilitating factors may be found if teachers, students and their families, and additional school staff members completed the questionnaire. We recommend exploring the impact of daylight savings time on perceived facilitating factors and perceived barriers.

Conclusions

Delaying school start times to improve adolescents' sleep and, therefore, their overall health is supported increasingly in the literature; although, school administrators and other stakeholders have identified athletics as an important perceived barrier, several of the perceived barriers identified by school administrators ultimately could be demonstrated to be manageable. Most participants in this survey stated that changes were worth making despite cited barriers; however, these findings should be confirmed with larger studies representing a diverse group of districts. Future studies should investigate the effect of daylight savings time on stakeholders' views on early start times.

IMPLICATIONS FOR SCHOOL HEALTH

Results from this study suggest that school districts will need to focus on addressing the following barriers when planning to implement a delay in school start times: transportation concerns, less time for athletic practices after school, athletes potentially missing more afternoon classes to travel to games, and family members being resistant to changing their schedules.

Results also showed that the most important facilitating factors in implementing this change was involving the varied stakeholders in the decision -making process as well as providing education to these groups. Therefore, it is suggested that a working team of champions should be assembled in the district to facilitate the transition which ideally should include: superintendents or assistant superintendents; local principals or vice-principals from each participating school; teacher representative(s); athletic department representative(s); parent/caregiver representative(s); student representative(s); transportation representatives; and school board representatives.

Teaming with local researchers as well as a local health professionals such as pediatric providers or sleep health providers would prove beneficial in the initial assessments and education of the school district. Ideally, a researcher could conduct an initial assessment of the students that would include school night bedtime and wake time, weekend bedtime and wake time, and their perceived sleepiness in school. There are a number of validated sleepiness assessments for adolescent populations such as the School Sleep Habits Survey[36], the Pediatric Daytime Sleepiness Scale[37], and the Epworth Sleepiness Scale for Children and Adolescents.[38] Teachers could be surveyed to assess their perception of how often students fall asleep in morning classes versus afternoon classes. Data should also be collected from administrators regarding current tardiness rates and absentee rates. This data can then be used to inform stakeholders: students, teachers, parents, administrators, and school board members and further used to assess progress made after making such a change. After initial data has been shared, a survey of the above stakeholders is recommended to assess the initial support for delaying school start time to after 8:30am. This information can be further used to target education for groups that are initially hesitant to endorse a later start time.

The local health professional can assist in developing educational resources for the stakeholders, if one is not available, the non-profit website www.startschoollater.net has multiple resources that districts can utilize. Education should be shared with stakeholders in multiple ways including but not limited to: mailings, social media postings if this is utilized by the district, and contacting local media outlets such as television and newspapers to highlight the positive effects of delaying a school start time. Additional education to teachers and athletic staff can be provided by proponents requesting being allowed to attend staff meetings, which will also allow feedback and concerns for staff to be answered directly.

Results from this study also found that schools that implemented "zero hour" classes did so as optional classes are were held prior to the delayed start time. However, this may not be recommended as it is counter-productive in the effort to allow all students to benefit from a longer sleep time. Similarly, several school districts "flip" elementary and high school start times. This could be a benefit to many working parents as the elementary school starting time would more closely align with the traditional working day, but may require additional consideration as the students may need additional time after school with a caregiver. This survey did not assess middle school stakeholders. Research on middle school students is limited but early studies are suggesting that this group also would benefit from a delay in school start time to 8:30am.[39] Therefore, the authors do not recommend school districts alter middle school start times to earlier than this in an effort to balance transportation needs. Delaying school start times is a feasible change that districts can make to improve student health and wellness. This research can help districts in making decisions to implement a change to earlier school start time by understanding the barriers in making such a change as well as the strategies that other districts utilized to make the change easier on their stakeholders.

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Human Subjects Approval Statement

This study was approved by the Institutional Review Board of the University of Arizona.

Conflict of Interest Disclosure Statement

All authors of this article declare they have no conflicts of interest

Table 1. Questions Regarding Perceived Barriers	
Transportation Barriers	Use of a tiered school bus system
	Increased transportation costs
	No organized transportation to transport athletes' home after athletic activities
	(*Adolescents, Staff, Bus Drivers*) commuting to school at peak traffic times
	(*Adolescents, Staff, Bus Drivers*) commuting from school at peak traffic times
Extracurricular Barriers	Less after-school time for athletic activities
	(*School-based athletes, Club/community team athletes*) missing more afternoon classes to attend or travel to games
	Less time for other school sponsored extra-curricular activities (nonathletic)
	Less time for after-school based tutoring
	Less time for (*community, spiritual, philanthropic*) extracurricular activities
	Less time for adolescents to work
Resistance to Change	(*Family Members, Students, Teachers, Teachers' Union, Administrators, Support Staff, Bus Drivers, Childcare Providers, Community, Spiritual Community)* resistant to change their schedule
Other	Less time for homework
	Elementary Students would be waiting for bus pick up in the early morning, in the dark
	Unavailability of adolescents to provide after-school care for siblings

Table 2. Questions Regarding Facilitating Factors	
Stakeholders	Involvement of the (*family members, students, teachers, teachers' union, administrators, support staff, bus drivers, childcare providers, community, spiritual organizations*) in the decision-making process
	Providing education on adolescent sleep patterns for (*family members, students, teachers, school administrators, support staff, childcare providers, bus drivers*)
	Teachers' union agreeable to delayed school start time
Scheduling	Moving (*athletic practices, nonathletic extracurricular activities, school sponsored tutoring, student meetings with teachers, community sponsored events, spiritual sponsored events, philanthropic events*) to before school
	Ability to schedule elementary start time to maintain a tiered bus system
	More time for teacher meetings or prep time before school
Transportation	(*Adolescents, Staff, Bus Drivers*) commuting (*to school, from school*) at off-peak traffic times
Other	Less unsupervised time in the evening for students at home
	Providing a hotline or dedicating person to answer questions about the delay

Table 3. Distribution of Top 10 Perceived Barriers for School Start Time Delay as Combined, Significant, Moderate, or Minor.

Barrier	Combined Barrier % (n)	Significant Barrier % (n)	Moderate Barrier % (n)	Minor Barrier % (n)	Not a Barrier % (n)
School-based athletes missing more afternoon classes to attend or travel to games	84.2 (96)	37.7 (43)	26.3 (30)	20.2 (23)	15.8 (18)
Less after school time for athletic activities	80.7 (92)	29.8 (34)	26.3 (30)	24.6 (28)	19.3 (22)
Family members resistant to change schedule	78.9 (90)	21.1 (24)	32.5 (37)	25.4 (29)	21.1 (24)
Unavailability of adolescents to provide after school care for siblings	75.6 (87)	10.4 (12)	33.9 (39)	31.3 (36)	24.4 (28)
Use of a tiered school bus transportation system	71.1 (81)	32.5 (37)	23.7 (27)	14.9 (17)	28.9 (33)
Teachers resistant to change schedule	74.8 (86)	13.9 (16)	26.1 (30)	34.8 (40)	25.4 (29)
Elementary students would be waiting for bus pick up in the early morning	69.6 (78)	18.8 (21)	33.0 (37)	17.9 (20)	30.4 (34)
Students resistant to change their schedule	63.5 (73)	7.0 (8)	20.9 (24)	35.7 (41)	37.4 (42)
Less time for adolescents to work	65.8 (75)	10.5 (12)	26.3 (30)	29.0 (33)	34.2 (39)
Increased school transportation costs	58.4 (66)	18.6 (21)	18.6 (21)	21.2 (24)	41.6 (47)

Table 4. Distribution of the Top 10 Facilitating Factors for School Start Time Change as Combined, Significant, Moderate, or Minor.

Facilitating Factor	Combined Facilitating Factor % (n)	Significant Facilitating Factor % (n)	Moderate Facilitating Factor % (n)	Minor Facilitating Factor % (n)	Not a Barrier % (n)
Involvement of the teachers in the decision-making process	84.5 (93)	31.0 (34)	34.6 (38)	19.1 (21)	19.1 (21)
Involvement of school administrators in the decision-making process	84.4 (92)	47.7 (52)	23.9 (26)	12.8 (14)	15.6 (17)
Providing education on adolescent sleep patterns for students	83.5 (91)	31.2 (34)	32.1 (35)	21.2 (22)	16.5 (18)
Providing education on adolescent sleep patterns for family members	82.5 (90)	40.1 (44)	27.5 (30)	14.7 (16)	17.4 (19)
Providing education on adolescent sleep patterns for teachers	81.5 (88)	32.4 (35)	31.5 (34)	17.6 (19)	18.5 (20)
Involvement of the family members in the decision-making process	80.9 (89)	31.8 (35)	30.0 (33)	19.1 (21)	19.1 (21)
Involvement of students in the decision-making process	79.1 (87)	27.3 (30)	31.0 (34)	21.0 (23)	21.0 (23)
Providing education on adolescent sleep patterns for school administrators	77.1 (84)	34.9 (38)	31.5 (34)	17.6 (19)	22.9 (25)
Ability to schedule elementary start times to maintain bus tier system	74.5 (82)	30.0 (33)	26.9 (29)	18.5 (20)	23.6 (26)
Involvement of support staff in the decision-making process	70.4 (76)	16.7 (18)	23.2 (25)	30.6 (33)	29.6 (32)

Table 5. Assessment of Traffic Concerns as Perceived Barriers or a Facilitating Factors			
Barriers	Responding 'Not a barrier' or 'Not applicable' % (n)	Facilitating Factors	Responding 'Not a facilitating factor' or 'Not applicable % (n)
Bus drivers commuting to school during peak traffic times	59.8 (58)	Bus drivers driving to school at off-peak traffic times	65.7 (69)
Bus drivers commuting from school during peak traffic times	59.8 (58)	Bus drivers driving from school at off-peak traffic times	64.8 (68)
Staff commuting to school during peak traffic times	54.6 (53)	Staff commuting to school at off-peak traffic times	61.7 (66)
Staff commuting from school during peak traffic times	58.8 (57)	Staff commuting from school at off-peak traffic times	62.6 (67)
Adolescents commuting to school during peak traffic times	53.1 (51)	Adolescents commuting to school at off-peak traffic times	63.6 (68)
Adolescents commuting from school during peak traffic times	56.7 (55)	Adolescents commuting from school at off-peak traffic times	63.2 (67)

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