FINAL REPORT

OF THE STUDY GROUP ON

LATER SCHOOL START TIMES

April 2017

State of New Jersey
DEPARTMENT OF EDUCATION
PO BOX 500
TRENTON, NJ 08625-0500

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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Acting Commissioner

April 25, 2017

The Honorable Chris Christie
Governor, State of New Jersey

The Honorable Stephen Sweeney
President of the New Jersey Senate

The Honorable Vincent Prieto
Speaker of the New Jersey General Assembly
State of New Jersey
125 West State Street
P.O. Box 001
Trenton, NJ 08625-0001

Dear Sirs:

On behalf of our colleagues who served on the Study Group on Later School Start Times (Study Group), I am pleased to present you with their final report.

In accordance with P.L. 2015, Chapter 96, the New Jersey Department of Education (NJDOE) was charged with studying the issues, benefits, and options for instituting a later start time to the school day in middle schools and high schools. The purpose of the study was to determine the advisability of conducting a pilot program to test later school start times in selected schools that are interested in participating. In order to accomplish this goal, a study group of stakeholders was convened. The Study Group met seven times to discuss the important issues identified in the charge. It reviewed the scholarly literature, surveyed district and school administrators regarding their preferences for changes to school start times for middle schools and high schools, and conducted public outreach sessions and activities to elicit feedback from members of the general public, including students. Finally, the Study Group members engaged in robust discussions and deliberations regarding the issues, providing the perspectives of their organizations and the constituents they represent.

In the enclosed final report, the Study Group has summarized the relevant literature and has presented the findings of its own research and discussions. Further, consistent with the charge, the Study Group has presented for your consideration recommendations regarding next steps to assist districts in consideration of later start times.

Sincerely,

Kimberley Harrington

Kimberley Harrington
Acting Commissioner

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Executive Summary

Summary of Major Study Group Findings

In response to its charge outlined in P.L. 2015, Chapter 96, a Study Group was organized by the New Jersey Department of Education (NJDOE) to investigate the issue of later school start times for middle schools and high schools in the state. Consistent with its charge, the Study Group examined the current scholarly research and literature regarding adolescent sleep deprivation, including its causes and contributing factors, negative outcomes, and potential solutions to those outcomes. In addition, the Study Group surveyed district and school administrators regarding their perceptions of and experiences with later school start times; conducted outreach efforts in the form of public hearings and an email campaign to gauge public interest for later school start times; and engaged in robust discussions and deliberations regarding the issues attendant to adolescent sleep deprivation and later school start times[1]. A brief executive summary of the findings of the Study Group's efforts follows immediately, and a more detailed discussion of these findings is presented in the body of this report.

Brief Review of the Scholarly Research and Literature

There is a substantial body of research, including a report published by the American Academy of Pediatrics (AAP), clearly indicating that adolescents need, but are not getting, sufficient sleep. The research further suggests that adolescent sleep deprivation is a critical problem, which has numerous negative academic, health, safety, and well-being outcomes. One factor contributing to the lack of sleep is the start times for schools. Delaying the start times for schools has been shown to have significant advantages. However, changing the start times of most middle schools and high schools is also fraught with obstacles and challenges, primarily regarding transportation and after-school activities, including athletics and childcare.

District Survey

A survey, completed by 93% of the 428 targeted school district and charter school administrators, found that approximately 14% had middle schools or high schools with start times of 8:30 a.m. or later. Of the remaining districts with start times earlier than 8:30 a.m., approximately 91% reported that they were not considering any changes to their schedules -- half of which had not discussed any change and nearly half of which saw no need to change. Only 21 districts (6%) among the respondents without a later start time reported that they had previously considered a change in their schools' start times, but ultimately did not change. Nine schools with a start time before 8:30 a.m. reported that they were currently considering such a change. Among respondents who identified issues preventing them from having later school start times, transportation coordination/cost was the most frequently reported preventive factor, followed closely by athletic event conflicts. Other preventive factors that were identified included childcare issues and other parent concerns.

Among respondents to the district survey, the typical middle school and high school start time in districts without later start times was between 7:30 a.m. and 8:29 a.m. Most district administrators (78%) reported satisfaction (i.e., current start times were "just right") with their

[1] For the purpose of this report, the term *later school start times* refers to start times of 8:30 a.m. or later.

current start times, although some administrators (22%) reported that school start times before 8:30 a.m. were too early. Among districts with later start times for middle schools and/or high schools, most (75%) reported that they were unable to identify any changes attributable to the later school start time due to the lengthy amount of time the later school start times had been in effect. However, among the 14 districts that reported on the impact of the school start time changes, all but one of the districts considered the changes to be responsible for either *much improved* or *somewhat improved* student academic performance, student attendance, teacher and parent satisfaction, child care coordination, and transportation.

All respondents were asked whether they thought the NJDOE should establish a pilot program to test later school start times. Responses were mixed: 36% reported that there should be a pilot program, 30% reported that there should not be a pilot program, and the remaining 34% were unsure about a pilot program.

Finally, in response to an open-ended question about what the NJDOE might do to support districts' efforts to change school start times, respondents reported that the NJDOE could: (a) undertake and/or disseminate research about relevant topics associated with school start times (24%); (b) consider providing funding to support start time changes (10%); (c) help to solicit community input as a component of the decision-making process regarding start times changes (5%); (d) enact mandatory legislation requiring changes in school start times (4%); and, if changes in start times were mandatory, they should be statewide or regional in order to work (6%). Some respondents (6%) reported that they did not believe that current school start times constituted a problem, and a small percentage (2%) urged the NJDOE not to change school start times.

<u>School Survey</u>

Of the 847 middle schools and high schools in the state, only 80 (9%) were identified as having a start time of 8:30 a.m. or later. The NJDOE conducted a second survey of the principals of those 80 schools, and 52 (65%) responded. The findings from the 52 surveys that were returned are as follows:

- Nearly all (96%) of responding principals reported start times between 8:30 a.m. and 8:59 a.m. The remaining 4% started between 9:00 a.m. and 9:29 a.m.
- Nine respondents (17%) reported that a change to the current start time had occurred within the past five years.
- Among those schools with recent changes in the start times (to 8:30 a.m. or later), principals' opinions were generally split between those who saw *some* or *much* improvement and those for whom the change produced no difference. Among principals who reported that the impact tended to be positive, the most positive changes were reported in the areas of teacher satisfaction and student engagement and attentiveness. A substantial majority (78%) of responding principals reported that their current start times were "just right," although 20% reported they were "too late," and 2% reported "too early."
- Some disagreement was noted among responding principals regarding a possible NJDOE-sponsored pilot program to test later start times in middle schools and high schools in New Jersey: 44% were in favor of a pilot, 34% were not in favor, and 22% were uncertain.

Stakeholder Positions

Study Group members submitted statements of the positions of their organizations for consideration. All of the organizations represented in the Study Group were in favor of an NJDOE-sponsored pilot program to test the concept of later school start times, except for the New Jersey State Interscholastic Athletic Association (NJSIAA), which was not in favor of a pilot program, and the New Jersey Association of School Administrators (NJASA), which decided to remain neutral on the issue of a pilot, but did support the need for the NJDOE to promote the importance of sleep among adolescents to avoid the negative effects of chronic sleep deprivation.

In offering their organizational position statements, the Study Group members acknowledged the abundance of scholarly literature on the problem of sleep deprivation among adolescents. It documents the factors that contribute to sleep deprivation, as well as the potential benefits of, and negative outcomes and obstacles associated with, changing school start times as a way to counter chronic sleep deprivation. Several stakeholders acknowledged that a pilot program could be beneficial in educating and informing the public about the issues related to adolescent sleep deprivation, as well as the impact of later school start times. Several Study Group members further recommended that the pilot study be predicated upon a local decision to participate. Finally, the New Jersey Education Association (NJEA) and the New Jersey Association of School Psychologists (NJASP) offered some valuable recommendations regarding the process and procedures for implementing a pilot study.

Study Group members were in agreement that the recommended pilot should be designed to include only districts/schools that are currently implementing later school start times and should collect information from those districts/schools about how they successfully changed the school start times and measured the impact of the change. Study Group members also agreed that the pilot should identify those districts/schools that are willing to serve as mentors to other interested schools. The members recommended that all of the information should be made available on the NJDOE website.

Other agencies not represented in the Study Group suggested caution about changing school start times in light of different factors (e.g., busing/transportation and shared high school programs) that need to be considered in deliberations about the issue.

Public Hearings

Three public hearings were held to elicit feedback from the public regarding the work of the Study Group.

Blackwood (May 2, 2016) – No individuals offered public testimony at this site.

Monroe Twp. (May 4, 2016) – Nine individuals offered testimony, including one school principal, three former or present members of district boards of education, and five parents.

In feedback from the May 4 hearing, all spoke in favor of delaying the start of school for their middle school or high school children. All were also in favor of having the NJDOE conduct a pilot study. During their testimonies, the presenters spoke to the issues of the need for children to

get adequate sleep. They further addressed both the advantages (e.g., more efficient learning, less student depression, increased driver safety, improved personal relationships) and the obstacles and challenges to be faced in changing the school start times, including transportation and athletics.

Jersey City (May 10, 2016) – Only one individual offered public testimony at this site, former Governor Richard Codey, who spoke in favor of delaying the start times of schools.

Governor Codey, also a current member of the New Jersey Senate and a sponsor of the legislation authoring the Study Group's charge, cited recent research by the American Academy of Pediatrics and the importance of adequate sleep among adolescents. He suggested that, given what is known about the biological time clocks of elementary-aged children and adolescents, perhaps the current practice of earlier school start times for middle school and high school students and later school start times for elementary school students should be reversed. He further cited the advantages in terms of student learning, health, safety, and well-being of adequate sleep, as well as the negative outcomes associated with chronic sleep deprivation. He also pointed out that the current research suggests that changing school start times will not produce the negative effects predicted by opponents to the plan. Rather, he suggested that adolescents would retain their present sleep habits and patterns but, with the advent of later school start times, they would gain the opportunity for at least one additional hour of sleep per night. Finally, Governor Codey suggested that current school start times may be driven by what adults, including teachers and parents, perceive as what is best for them. In fact, he posited, the basic premise of when the school day should start should be driven by what is best for the children.

Email Analysis

An email campaign was launched to elicit feedback from individuals, including students, who might have been unable to attend any of the public hearings. It is clear from the findings of the email content analysis that the 553 respondents were overwhelmingly in favor of later school start times for middle schools and high schools, as evidenced by the nearly 4:1 response rate – 437 (79%) in favor and 113 (21%) not in favor. The analysis suggests further that the need for increased sleep among adolescents was the most frequently cited reason for starting schools later. Clear majorities of respondents (parents, 84%; students, 68%; teachers, 69%; district and building administrators, 73%; board of education members, 50%; and others, 90%) favored starting middle schools and high schools later in the day.

Among the most frequently reported reasons that respondents provided for favoring later school start times, parents (67%), students (76%), and district and building administrators (63%) all cited the need for increased sleep. Teachers (53%) cited the opportunity for increased learning as the most frequently reported reason, and board of education members emphasized both the need for increased sleep (33%) and the opportunity for increased learning (33%).

Study Group Conclusions and Recommendations

Conclusions

Based on the research, discussions, and deliberations as presented and discussed in the above summary of major findings, the Study Group has arrived at the following conclusions:

1. The scholarly research, including that by the AAP, is resolute in its identification of chronic adolescent sleep deprivation as a serious endangerment to adolescents' health, safety, well-being, and academic performance. Moreover, the research strongly supports the many advantages and benefits of adequate sleep for adolescents.

2. Delaying school start times is fraught with obstacles and challenges, as it will undoubtedly affect not only middle schools and high schools, but elementary schools, as well. Chief among these obstacles and challenges are those associated with student transportation; after-school activities, including athletics, and childcare. The Study Group acknowledges these impediments to change; however, it also acknowledges that some school districts have chosen pathways that have enabled them to minimize such impediments.

3. A sustained public campaign about both the importance of adequate sleep for adolescents, as well as the serious negative outcomes associated with chronic sleep deprivation among adolescents, is necessary and beneficial.

4 Delaying the start of school times for middle schools and high schools, even for a short period of time, offers significant positive benefits and outcomes, including those attendant to students' health, safety, well-being, and academic performance; however, it would be difficult to determine the impact of such delays in isolation of other factors.

Recommendations

1. School start times should not be mandated by the New Jersey Legislature or the NJDOE. Any decision to pursue later school start times must be determined solely by local school districts and must be driven by locally determined situations, conditions, and needs. Given the myriad characteristics, factors, and variables that distinguish school districts and schools from one another, communities should not be confronted with a "one-size fits all" school start time mandate. The Study Group does, however, strongly recommend that school districts carefully review the issues attendant to later start times for middle schools and high schools.

2. The Study Group has determined that there is a sufficient number of middle schools and high schools currently implementing a later start time for the NJDOE to obtain ample implementation information without conducting a formal pilot study. New Jersey students would be better served if the NJDOE spent its time and resources on gathering and providing information from districts/schools already implementing later start times and providing it to educators and families to guide their decision-making and implementation.

3. The NJDOE should publicize both this report, as well as its accompanying research on its website, so that parents and educators are informed about the negative impact of chronic

sleep deprivation on adolescents. Furthermore, the NJDOE should notify schools about this report via communication directly from the NJDOE, through statewide associations and through the organizations represented in the Study Group.

Scope of the Study Group's Work and Methodology

Study Group Membership

The Study Group was co-chaired by the Assistant Commissioner of the Division of Learning Supports and Specialized Services and the Deputy Chief Learning Supports and Specialized Services Officer and included staff members at the New Jersey Department of Education. In addition, the Study Group comprised representatives of several of the major educational stakeholder organizations in the state (see Appendix 2).

Organizational Structure and Meetings

The Study Group met seven times from March 2016 through early June 2016. In addition, the Study Group co-chairpersons convened bi-weekly staff meetings (both in-person and telephone conferencing) during the same period of time to discuss project management issues, scheduling, agendas, and progress. During its meetings, the Study Group reviewed the extant research literature and discussed the underlying causes of, as well as the negative outcomes associated with, chronic sleep deprivation among adolescents. The Study Group discussed the issues, considerations, and challenges to be faced by delaying school start times for middle schools and high schools and administered two surveys to district and school administrators to learn more about the experiences of districts and schools regarding school start times. The Study Group discussed the findings and implications of that research. Each stakeholder organization represented in the Study Group consulted with its constituency membership and made a brief presentation to the Study Group regarding the issues, concerns, and challenges for later school start times that were raised from its particular perspective. Three public meetings were held in northern, central, and southern New Jersey in May 2016, at which time the Study Group elicited comments from the public. Input was also received from more than 550 citizens, including students, who provided comments via the Study Group's email site. (For a complete list of locations and dates for Study Group meetings and public hearings, see Appendices 3-4.)

At the conclusion of the data collection effort, the Study Group engaged in robust discussion regarding the conclusions that had been reached based on its research and deliberations, and agreed upon its recommendation regarding a pilot project to test later school starting times in willing districts and schools.

Study Group Work and Findings

Summary of Selected Relevant Research and Literature

The Study Group has benefited from the abundance of scholarly research that has been generated in the past two decades regarding the importance of sleep and the impact of chronic sleep deprivation among adolescents, and especially its relationship to the start times of middle schools and high schools. Accordingly, the Study Group acknowledges the contribution of this research in its presentation of the following brief summary, which is intended to be neither comprehensive nor exhaustive. Material in the following summary has been drawn from the papers and articles of this body of research[2] and often includes verbatim passages.

What is Known about Sleep and Adolescents

A substantial body of recent research has reported that adolescents are not getting sufficient sleep. For example, a recent National Sleep Foundation poll (National Sleep Foundation, 2006) found that 59% of sixth- through eighth-graders and 87% of high school students in the U.S. were getting less than the recommended 8.5 to 9.5 hours of sleep on school nights. In fact, according to a study by the American Academy of Pediatrics (AAP), 75% of twelfth-grade students self-reported sleep durations of less than eight hours of sleep per night compared with 16% of sixth-graders (Owens et al., 2014a, p. 922). In addition, a National Sleep Foundation study found that the average amount of school night sleep obtained by high school seniors was less than seven hours (Owens et al., 2014b, p. 643).

It is also worth noting that, among the National Sleep Foundation study respondents, 71% of parents believed that their adolescent children were obtaining sufficient sleep on school nights (Owens et al., 2014b, p. 643).

Factors Influencing the Quantity and Quality of Adolescent Sleep

The following factors have been cited in research conducted by, among others, Wahlstrom et al., 2014, Owens et al., 2014a, and Wolfson & Carskadon, 2005 as influencing both the quantity and quality of adolescent sleep.

Biological Changes at Puberty – Aside from the physiological changes associated with puberty, changes in natural sleep time preference also occurs during adolescence (Crowley et al., 2007; Hagenauer et al., 2009). As children reach more advanced stages of physical puberty, changes in their sleep patterns become more pronounced (Carskadon, 1999; Wahlstrom et al., 2014). Two principal biological changes in sleep regulation are thought to be responsible for this phenomenon (Frey et al., 2009; Carskadon et al., 2004). One factor is delayed timing of nocturnal melatonin secretion across adolescence (Carskadon et al., 2004; Crowley et al., 2007;

[1] Many of the references and statements cited in this summary have previously been cited and presented in other sources including, but not limited to, the following: (1) *School Start Time Change: An In-depth Examination of School Districts in the United States* (Owens et al., 2014), (2) *Examining the Impact of Later School Start Times on the Health and Academic Performance of High School Students* (Wahlstrom et al., 2014), (3) *Insufficient Sleep in Adolescents and Young Adults: An Update on Causes and Consequences* (Owens et al., 2014a), (4) School *Start Times for Adolescents* (Owens et al., 2014b), and (5) *A Survey of Factors Influencing High School Start Times* (Wolfson & Carskadon, 2005). A complete list of research reviewed and other selected relevant resources can be found at the end of this report.

Carskadon et al. 1998) that parallels a shift in an adolescent's circadian phase preference from more "morning" type to more "evening" type, which consequently results in difficulty falling asleep at an earlier bedtime (Frey et al., 2009). The second biological factor is an altered "sleep drive" across adolescence, in which the pressure to fall asleep accumulates more slowly, as demonstrated by the adolescent brain's response to sleep loss (Jenni et al., 2005).

Use of Technology – In addition to increased availability of technology (National Sleep Foundation, 2006), in adolescence there is increased reliance on technology for social interactions. Negative effects of nighttime use of computers or watching TV, such as difficulty falling asleep and problems with mood, behavior, and daytime cognitive functioning, have been reported. Many students with technology in their bedrooms report frequent awakenings at night due to receiving text messages, phone calls, or emails (Harvey et al., 2013; Wahlstrom et al., 2014.)

Light exposure – The circadian rhythm is influenced in part by exposure to light, which can be either natural, as from the sun, or artificial, as from electronics such as a computer or TV. Thus, adolescents who report using an electronic device that emits light, in particular blue light, shortly before bed may be artificially affecting their bodies' natural sleep rhythms (Calamaro et al., 2009; Carskadon, 2013). While light exposure in the morning helps adults to awaken more easily, there is some evidence that this facilitating factor is diminished in adolescence (Hansen et al., 2005), while the effect of evening light exposure inhibiting sleep may be enhanced (Carskadon et al., 2004).

Use of Stimulants – Another known inhibiter of sleep is the consumption of caffeine. Not only is drinking soda prevalent in adolescence, energy drinks high in caffeine content, as well as coffee and tea, are also consumed (Calamaro et al., 2009; Ludden & Wolfson, 2009; Pollak & Bright, 2003). Because caffeine is known to reduce sleep pressure, it is no surprise that studies looking at adolescent consumption find that students who have more caffeinated drinks slept less overall (Ludden & Wolfson, 2009; Pollak & Bright, 2003) and tended to have a harder time staying awake at school (Calamaro et al., 2009; Ludden & Wolfson, 2009).

School Start Time – In the United States, as students get older, school start times tend to be earlier (Wolfson & Carskadon, 2005). However, this pattern of earlier morning obligations seems to be in direct opposition to the students' natural sleep patterns. It has repeatedly been shown that when middle school or high school start times are pushed back (i.e., to a later start time), students still tend to go to bed about the same time, but, due to waking up later, they increase their sleep time (Carskadon et al., 1998; Vedaa et al., 2012; Lamberg, 2015).

A number of researchers have suggested that many schools start too early in the morning for adolescents to get adequate sleep, not only in the U.S. but also in other countries, such as Canada, Israel, Brazil, and Italy (Andrade et al., 1993; Carskadon & Acebo, 1997; Epstein et al., 1998; Giannotti & Cortesi, 2002; Wahlstrom, 2003). This suggests that the issue of sleep deprivation and its effects on adolescents may be universally physiological and not culturally induced.

Consequences of Insufficient Sleep among Adolescents

Sleep plays an important role in all aspects of an adolescent's life. Wahlstrom et al. (2014) have reported that chronic insufficient sleep can be related to mental health and behavioral outcomes, including lack of emotional regulation and mood disorders; engaging in risky behaviors; impaired driving safety; attention problems both in and out of school; and negative academic outcomes.

Mental health and behavioral outcomes - Sleep problems in childhood are known to be predictive of the development of anxiety and depressive symptoms as children mature (Beebe, 2011). This negative effect of sleep deprivation appears to extend into adolescence, where teens are more likely to have lower self-esteem (Fredriksen et al., 2004), have a more negative attitude toward life (Perkinson-Gloor et al., 2013), experience more problems regulating their emotions (Dahl, 1999; Dahl & Lewin, 2002), have higher rates of mood disorders (Harvey et al., 2013), and thoughts of suicide (Fitzgerald et al., 2011).

High-risk behaviors - Many people who have mood disorders such as depression also tend to use drugs and alcohol more (Harvey et al., 2013). Teens who report having insufficient sleep have been found to be more likely to smoke cigarettes, use marijuana and alcohol, engage in sexual activity (McKnight-Eily et al., 2011; Dahl & Lewin, 2002), drink while driving, ride with a driver who has been drinking, and not wear seatbelts or safety helmets (Wallace, 2016; Wheaton et al., 2016). Furthermore, older adolescents and college students who are at the late end of the morningness-eveningness continuum are more likely to habitually use drugs and alcohol (Gau et al., 2007; Onyper et al., 2012).

Safety – Both lower quantity and quality of sleep have been shown to be associated with a higher prevalence of self-reported accidents among teen drivers (Pizza et al., 2010). A Virginia study that used state Department of Motor Vehicles records of teen automobile accidents found that adolescent automobile accidents occurred at a higher rate in a city that had an earlier high school start time than its neighboring, but demographically similar, city (Vorona et al., 2011). Because of the extensive research indicating that students who start school later get more sleep, it may be reasonable to assume that this difference in crash rates is due, at least in part, to differences in sleep amounts for teens in the two Virginia cities. In another study in Kentucky, Danner and Phillips (2008) showed that, within two years of changing the school start times in one Kentucky county, there was a statistically significant decrease (16.5%) in the number of car crashes in one identified county, while over the same period of time, there was a statistically significant increase (7.8%) in the rest of the state.

Attention problems – The ability to focus is important not only for learning new information, but also for the safe completion of activities such as driving. The level of inattentive behavior has been found to be higher among students who have had less sleep than recommended (Beebe et al., 2010; Lufi et al., 2011). Additionally, reaction times improve in students who have had more sleep (Lufi et al., 2011; Vedaa et al., 2012).

Academics - While the evidence pertaining to consequences of insufficient sleep in adolescents as related to academic outcomes (grades, test scores, attendance) is still emerging, the general consensus of research suggests that good sleep quantity and quality has a positive relationship

with academic outcomes for students in middle school all the way through college (Wolfson & Carskadon, 2003; Edwards & Ridell, 2012; Wahlstrom, 2002; Carrell et al., 2011; Hanover Research, 2013). Studies at the University of Minnesota (Wahlstrom et al., 2014) and elsewhere (Wallace, 2016) have shown that students who achieved the recommended amount of sleep showed improvement in core areas of English, math, science, and social studies, as well as improved scores on state and national achievement tests. Additionally, if students do not obtain enough sleep before beginning their school day, they are more likely to experience difficulty understanding material taught that day and struggle to complete an assignment or test, regardless of the amount of time spent studying (Gillen-O'Neel et al., 2013). Studies have shown that when school start times are pushed back, increases in amount of sleep, academic performance, and attendance, as well as decreases in tardiness to first period classes are observed (Drake et al., 2003; Wahlstrom, 2002, Wallace, 2016). While some studies do not report a significant relationship between grade point average (GPA) and amount of sleep (Eliasson et al., 2002; Wahlstrom, 2002; Fredriksen et al., 2004), studies where the variables in the methodology could be adequately controlled do show a positive relationship between amount of sleep and GPA (Carrell et al., 2011; Perkinson-Gloor et al., 2013). In studies that examined subject areas independently, mathematics grades appear to be more related to amount of sleep obtained than other core courses (Ng, Ng, & Chan, 2009). As with grades, there are inconsistent results in studies that examined changes in test scores related to more sleep, with some reporting a positive effect (Edwards & Ridell, 2012; Carrell et al., 2011) and others reporting no effect (Hinrichs, 2012). However, as with the studies looking at grades, those that found significant, positive relationships used stronger and more valid methodologies to assess the relationship between sleep and test scores. Edwards and Ridell (2012) have even suggested that later school start times may even prove to be a more cost-effective method of increasing student achievement than other common educational interventions, such as reducing class size.

What is Known about School Start Times in the U.S. and in New Jersey

A growing body of research has also now demonstrated that delaying school start times is an effective countermeasure to chronic sleep loss and has a wide range of potential benefits to students with regard to physical and mental health, safety, and academic achievement (Owens et al., 2014b, p.642). A study conducted by the National Center for Education Statistics (NCES) reports that the average school start time in 2011-12 among nearly 40,000 elementary, middle, and high schools in the U.S. was 8:03 a.m., while in New Jersey, it was slightly earlier at 8:00 a.m. The NCES study also reports that more than 61% of schools in the U.S., and 56% in New Jersey, start after 8:00 a.m. However, only slightly less than 18% of schools in the U.S. and slightly less than 15% of schools in New Jersey start at 8:30 a.m. or later (see Table 1). Moreover, the Study Group's superintendent survey suggests that in 2015-16 about 9% of middle schools and high schools in New Jersey started at 8:30 a.m. or later.

Table 1: Average Start Times Among Schools in the U.S. and New Jersey

	Average Start Time	Percentage Starting Before 7:30 a.m.	Percentage Starting Between 7:30 a.m. and 7:59 a.m.	Percentage Starting Between 8:00 a.m. and 8:29 a.m.	Percentage Starting at 8:30 a.m. or later
U.S.	8:03 a.m.	6.7%	31.9%	43.7%	17.7%
N.J.	8:00 a.m.	6.7%	37.2%	41.2%	14.9%

Source: National Center for Education Statistics. *Schools and Staffing Survey: Public School Data File 2011-12, p.*810.

Note: Demographics in 2011-12: 39,700 elementary, middle, and high schools in the U.S. with approximately 26.3 million students. In New Jersey: 870 middle schools and high schools with 698,000 students.

Positive Outcomes Associated with Later School Start Time in Middle and High Schools

Although a number of factors (including biological changes in sleep associated with puberty, lifestyle choices, and academic demands) negatively affect middle and high school students' ability to get sufficient sleep, the evidence strongly implicates earlier school start times (i.e., before 8:30 a.m.) as a key modifiable contributor to insufficient sleep, as well as circadian rhythm disruption, among adolescents. Furthermore, a substantial body of research has now demonstrated that delaying school start times is an effective countermeasure to chronic sleep loss and has a wide range of potential benefits to students with regard to physical and mental health, safety, and academic achievement (Owens et al., 2014b, p.642). Among these benefits that have been cited by a number of different studies (e.g., Owens et al., 2014a; 2014b; Wahlstrom 2014; Wolfson & Carskadon, 2005) are: increased sleep duration (at least one additional hour of sleep); improved academic performance (as measured primarily by regular classroom grades); improved health and well-being (as evidenced by fewer visits to school nurses and health centers); reduced absenteeism, tardiness, and dropout rates; improved alertness, attentiveness, and student engagement; and fewer accidents caused by drowsy driving. Other positive outcomes are happier kids with more positive moods and personal behaviors; decreased depressive symptoms and ideas of suicide; increased continuous enrollment in the same school from one year to the next; and decreased risk of alcohol, drug, and tobacco abuse.

One research study did, however, identify some potential negative outcomes associated with a delayed school start time. The study, entitled *A Survey of Factors Influencing High School Start Times* by Wolfson and Carskadon (2005, p.56), identified a small number of negative outcomes possibly associated with delaying school start times, including decreased teacher satisfaction (13%), poorer athletic performance (4%), lower student grades (4%), moodier students (2%), increased tardiness (3%), increased absenteeism (3%), and reduced parental involvement (1%).

Obstacles and Challenges to Later School Start Times in Middle Schools and High Schools

The following have been cited in the research (e.g., Owens et al., 2014; Owens et al., 2014b; Wolfson & Carskadon, 2005; Sleep Foundation, 2016) as obstacles and challenges to later start times in middle and high schools.

Increased Transportation Costs - The specific circumstances regarding busing costs in each district have been shown to vary, but problems that normally arise have included, among others, costs associated with redesigning the routes, maintaining efficiency, recruiting and retaining drivers, and, in places, purchasing additional buses. Some communities face another problem,

which is that shifting start times impacts traffic congestion and commuting times for the general public, including teachers and students.

Difficulty in Scheduling After-School Activities, Especially Sports Programs - Any delay in the start of school will most likely result in a later release time, which may reduce time available for athletic and club practices and games and will almost certainly impact scheduling of interscholastic sports games, matches, and meets. There is also likely to be increased competition for athletic venues and other school properties and facilities. Some schools may face other costs associated with sports, including the installation of lights on outside playing fields. The delay in release time for students also means that students with after-school jobs may be affected. This issue is important for certain students and their families who rely on the extra income to supplement family resources. Therefore, the change may disproportionately affect low-income families. Finally, participation in other activities such as after-school tutorials, religious classes, community service, or clubs may also be jeopardized by a later release time.

Unintended Impact on Other Students and Programs - Any change in the school schedule for middle school or high school students will usually result in a corresponding change for elementary level students. If elementary students have the earliest start times, they may be waiting for the bus in the dark on fall and winter mornings, or waiting at home alone after school. A change in transportation can be especially difficult for special education populations and programs.

Traffic Congestion for Students, Faculty, and the Community-at-Large - Changes in school start times may increase traffic congestion at "rush hour" times that could have an adverse effect on students and faculty, as well as on the community-at-large.

Reduced Time for Community Access and Use of School Resources - Any change in school start times for middle school or high school students may also result in increased competition among community and civic groups for access to and use of school facilities for events that benefit the community-at-large.

Stress on Families and Home Life Issues - Many families have a highly coordinated schedule worked out in advance to balance the many activities of each of its members. A revised school start time can cause stress on families and home life and disrupt family meal times, bedtimes (especially for younger elementary school-age children), student household chores and other responsibilities (e.g., caring for younger siblings), parent employment, and student employment. These disruptions and stresses can be more pronounced in low-income families, who may not have access to all the support mechanisms and resources afforded to families with higher incomes.

Lack of Information Dissemination - One of the biggest obstacles in any campaign for a change in school start times is a community that has not been informed about the advantages and benefits that might accrue to children's education, health, and safety as a result of increased sleep duration.

Natural Resistance to Change - Many living beings are naturally resistant to change. For nearly everyone, change creates confusion and conflict. People enjoy living within their respective "comfort zones," and they resist attempts to force them to change. Too often, people approach change with a powerful double standard. They acknowledge the value of change, but primarily when the change is made *by other people.* Most people understand the changes they seek from others in positive terms usually associated with growth and progress, but changes that others seek from them are often experienced in negative terms associated with loss, confusion, and conflict. People readily make the case for change on the part of others, but when called upon to change themselves, they resist it strongly.

Summary

In summary, there is abundant research that shows that adolescents need, but are not getting, sufficient sleep for their health and well-being. The research further suggests that one of the reasons for this lack of sleep is the starting times for school. Delaying the start times for schools has been shown to have significant advantages and few disadvantages. Changing the start times of most middle schools and high schools is also fraught with obstacles and challenges, not the least of which is the natural human resistance to change.

Summary Findings of District Superintendent Survey

In the state of New Jersey during the 2015-16 school year, there were 655 school districts and charter schools that served students in grade 6 or higher, and 428 were identified as having at least one middle school or high school. Online surveys were administered to the superintendents/chief school administrators/charter school lead persons of those districts and charter schools, and of the 428 who were identified as having at least one middle school or high school, 400 responded to the survey for a response rate of 93%. Among those responding districts, 57 (14%) reported having a school that serves students in grade 6 or higher with a start time of 8:30 a.m. or later ("later school start time").

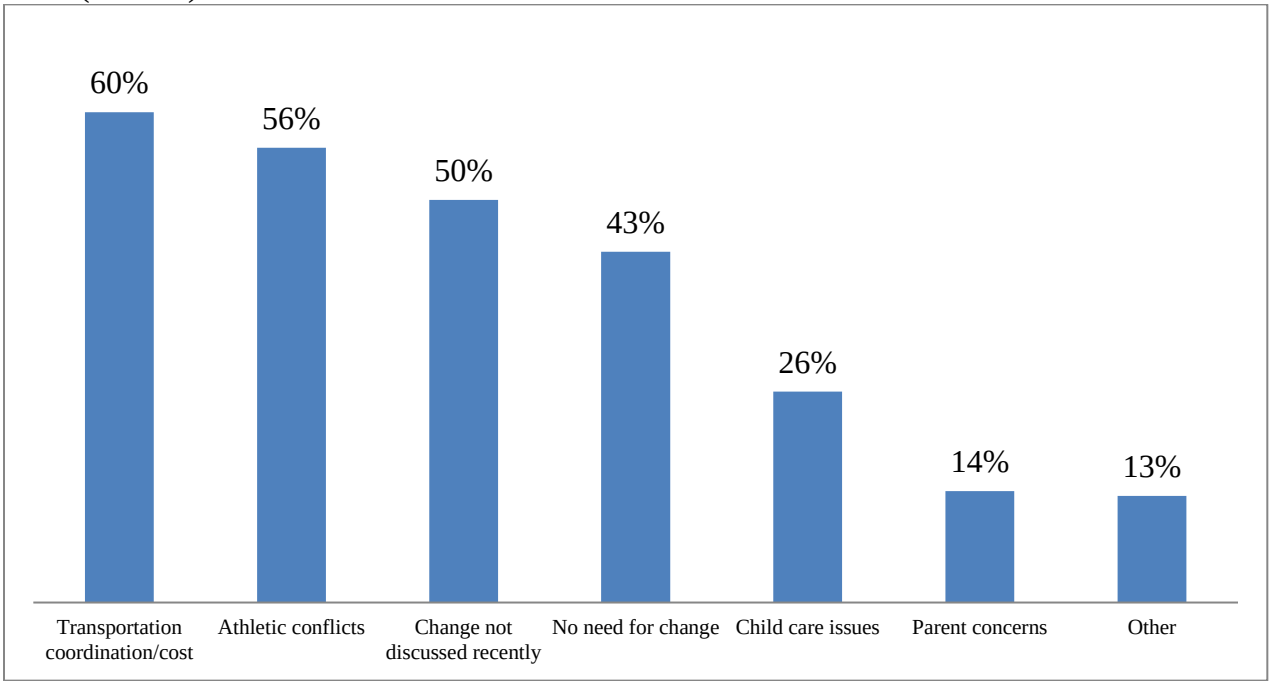
In addition, 144 administrators in districts that had a school with sixth grade or higher, but which did not include a stand-alone middle school or high school, also responded to the survey. While the responses from this latter group have not been included in this analysis which focuses primarily on stand-alone middle schools and high schools, the comments they have offered to the open-ended questions in the survey were determined to be informative and useful and, therefore, have been included in the qualitative analysis.

Administrators from 50 (13%) districts reported that *some* of their students started school at 8:30 a.m. or later. Included in that group were those students attending a school's alternative education program, students receiving special education services in self-contained programs, high school students with study hall in the first block, high school seniors by request, students with certain medical conditions, and students taking college courses.

Of the 343 districts which reported in the survey that they did not have a later start time (i.e., 8:30 a.m. or later) in their middle schools or high schools, most (91%). are not currently considering any changes in start times. Half of the districts have not discussed the change recently, and nearly half (43%) see no need to change. Among those respondents who identified

issues preventing them from having start times of 8:30 a.m. or later, transportation coordination/cost was the most frequently reported preventive factor (60%), followed closely by athletic event conflicts (56%). Other preventive factors that were identified included childcare issues (26%), general parent concerns (14%), and other concerns (13%). Respondents could identify more than one reason for preventing a later school start time (see Figure 1).

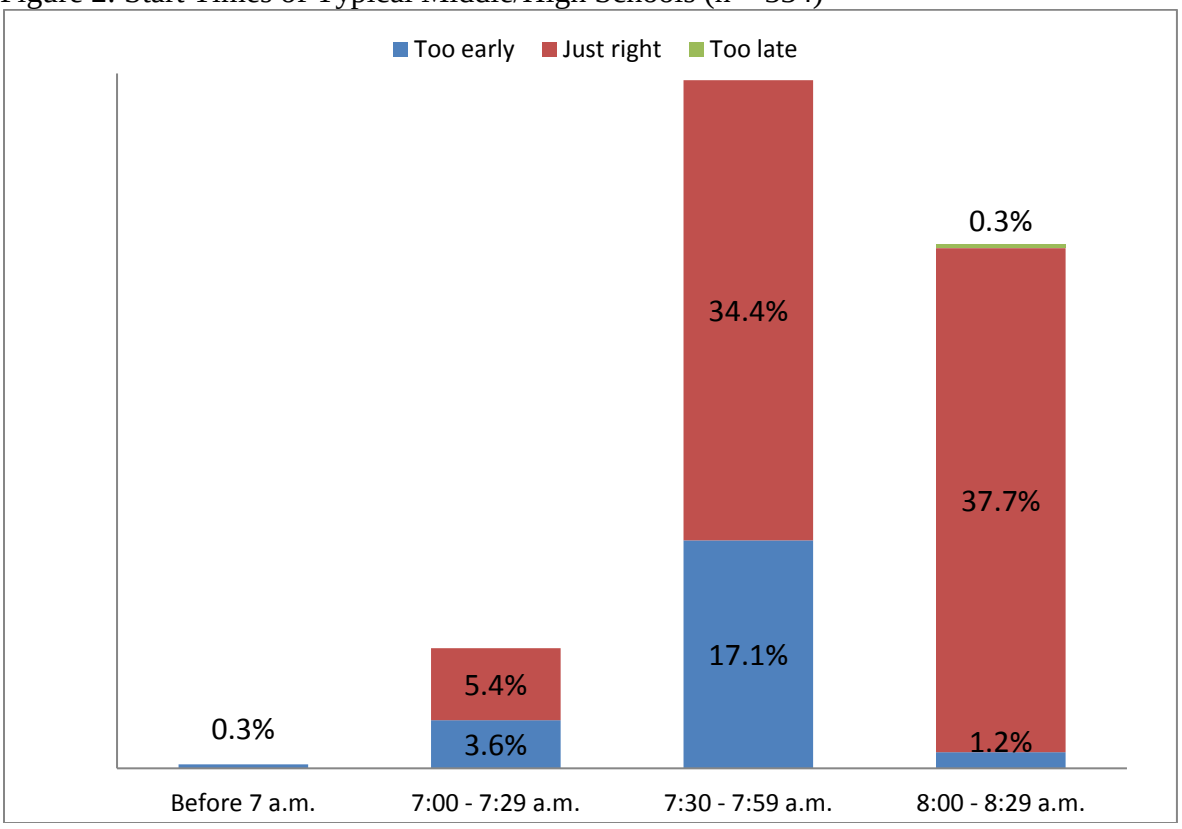
Figure 1: Factors that Prevent Middle/High Schools from Having Start Times of 8:30 a.m. or Later (n = 343)



Only 21 districts (6%) among the respondents without a start time of 8:30 a.m. or later reported that they had previously considered a change in their schools' start times, but ultimately did not change. Nine schools with a start time before 8:30 a.m. reported that they are currently considering making a change.

Among the survey respondents, the typical middle school and high school start time in districts without later start times (i.e., 8:30 a.m. or later) are between 7:30 a.m. and 8:29 a.m. (see Figure 2). Most district administrators (78%) reported satisfaction (i.e., "just right") with their current start times, although some administrators (22%) reported that they believed the school start times before 8:30 a.m. were too early.

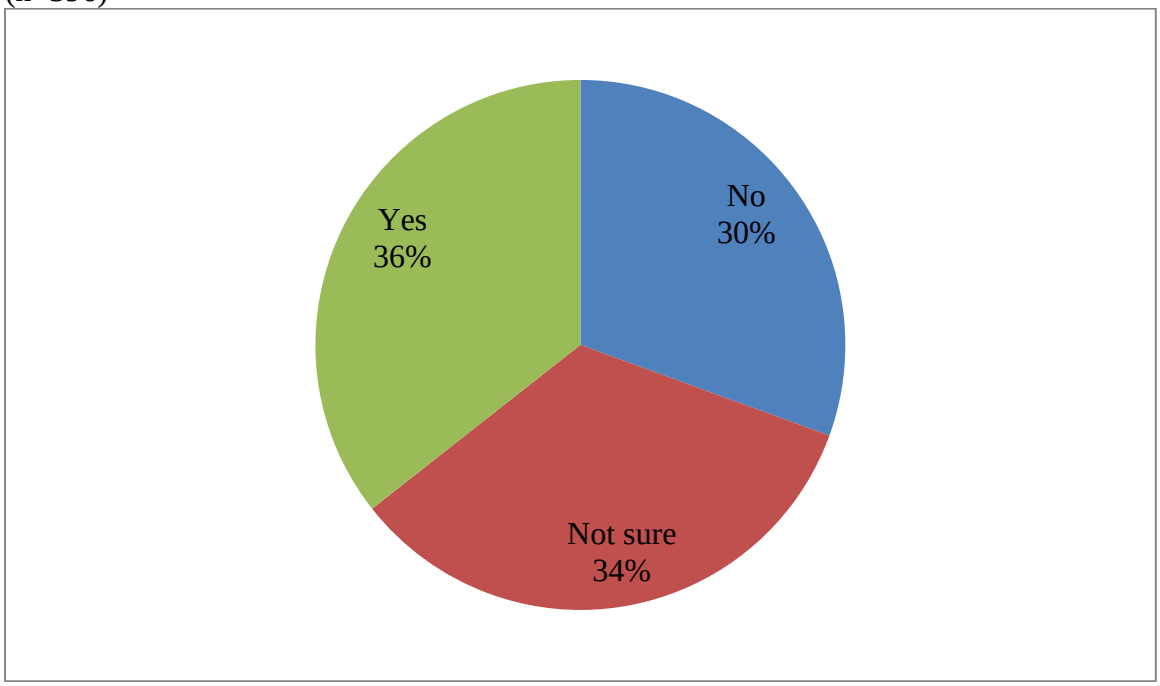
Figure 2: Start Times of Typical Middle/High Schools (n = 334)



Among the 57 districts with later start times for middle schools and/or high schools (i.e., 8:30 a.m. or later), most (75%) reported that they were unable to discern any changes due to the later school start time, because in many cases the start time has been established for many years. Among the 14 (15%) districts that reported the impact of the changes due to a later school start time, all but one of the districts considered the changes to have either *much improved* or *somewhat improved* student academic performance (e.g., test scores, grades), student attendance, teacher and parent satisfaction, child care coordination, and/or transportation efficiency. One district considered the changes to have made things worse than before in all categories.

Finally, at the end of the survey, all respondents were asked whether they thought the New Jersey Department of Education should establish a pilot program to test later school start times in select middle schools and high schools that may be interested in participating in the program. Responses were mixed: 36% reported that there should be a pilot program, 30% reported that there should not be one, and the remaining 34% were unsure (see Figure 3).

Figure 3: Should the NJDOE Establish a Pilot Program to Test Later School Start Times? (n=396)



Respondents to the survey were also asked two open-ended questions that required narrative responses:

Question 1: "How could the New Jersey Department of Education support districts in efforts to change school start times?"

A substantial percentage (24%) of respondents reported that the NJDOE could undertake and/or disseminate research about relevant topics associated with school start times, e.g., chronic sleep deprivation among adolescents, the causes and contributing factors to chronic sleep deprivation, potential solutions (including later school start times), and insights, processes, and procedures that may prove helpful to districts and schools considering changes in their school start times. Among other things that were reported that the NJDOE might consider included funding to support school start time changes (10%); enacting mandatory legislation requiring changes in school start times (4%) and, if changes in school start times were to be mandatory, they should be statewide or regional if they were to work (6%); and helping to solicit community input (5%) as a component of the decision-making process regarding changes in school start times. Some respondents (6%) reported that they did not believe that school start times were a problem, and a small percentage (2%) urged the NJDOE not to change school start times.

Question 2: "Please share any additional comments you have concerning later school start times for middle/high schools in New Jersey, including any comments regarding the practicality, advantages, or shortcomings you may have previously experienced with the implementation of later school start times in this or other school districts in which you have worked."

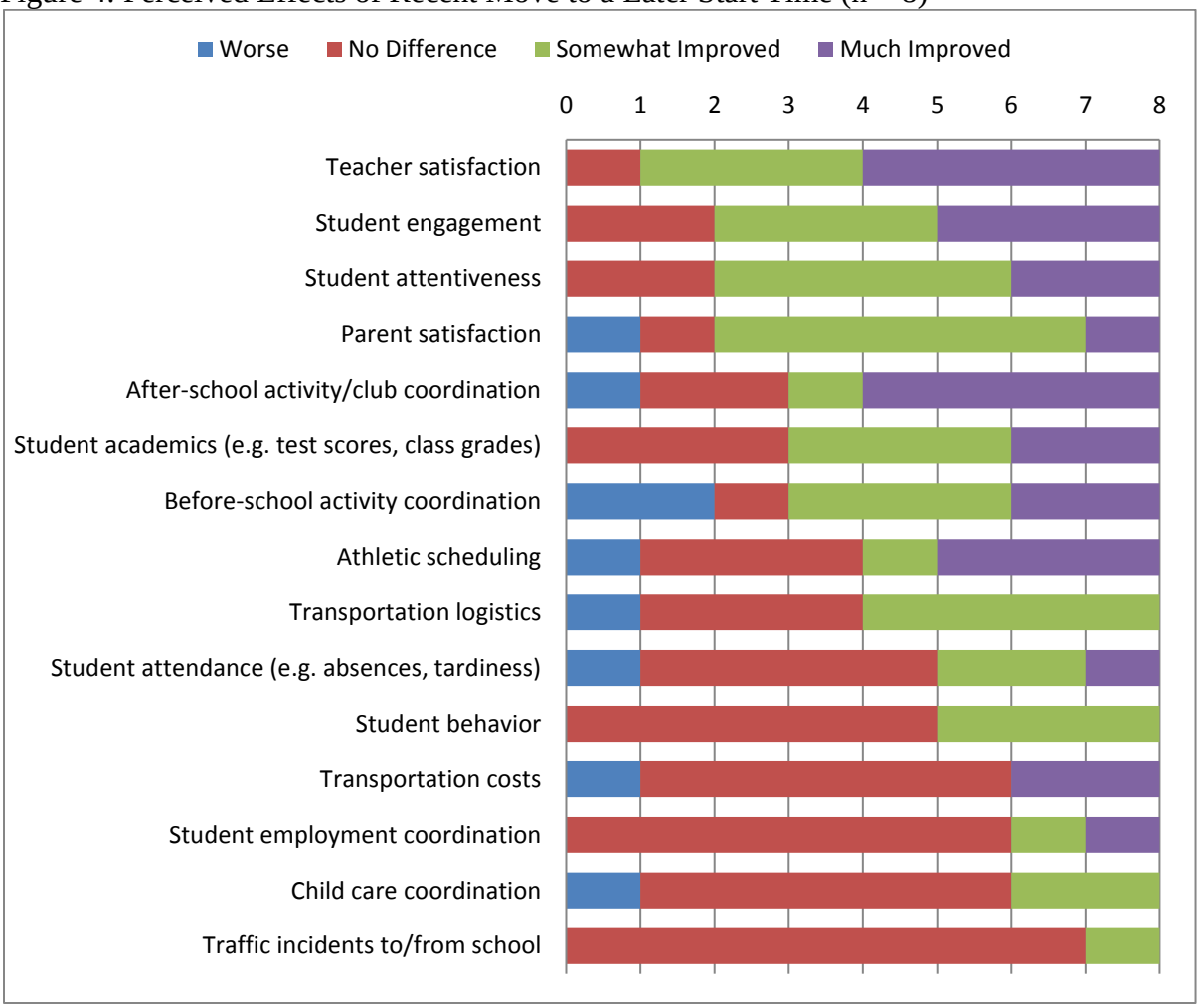
A total of 35% of the respondents reported that transportation, with all of its tangential issues, was a major concern. Other respondents (18%) reported that any decision to change a school's start times must be made locally and should be predicated on the unique needs of the district and school. The impact of a later school start time on after-school activities was also raised as a significant concern. Among the issues raised were the following: athletic timing might impede the ability of schools to start later (22%); concerns about after-school childcare (10%); limitations on time for extra-curricular activities (5%), student employment (3%), and homework (1%); and other general concerns (11%). Other issues that were reported are as follows: teacher contract concerns (5%); student health (i.e., need for adequate sleep) concerns (4%); and the impact of school start time changes on instructional time (3%), attendance (1%), and breakfast (1%). Some of the respondents (1%) reported that the later start times had made a positive difference in their districts. Other respondents reported that schools with multiple elementary and middle school grades should not have multiple start times (3%) and that the focus of changes in school start times should be at the high school level and not in the earlier grades (1%).

Summary Findings of School Principal Survey

During the 2015-2016 school year, there were 847 middle schools and high schools in the state. Among those schools, 80 (approximately 9%) were reported by their superintendents to have a starting time of 8:30 a.m. or later. A brief survey regarding their start times was sent to those 80 middle schools and high schools, and principals in 52 schools responded for a response rate of 65%. Most schools (50 out of 52, or 96%) start between 8:30 a.m. and 8:59 a.m.

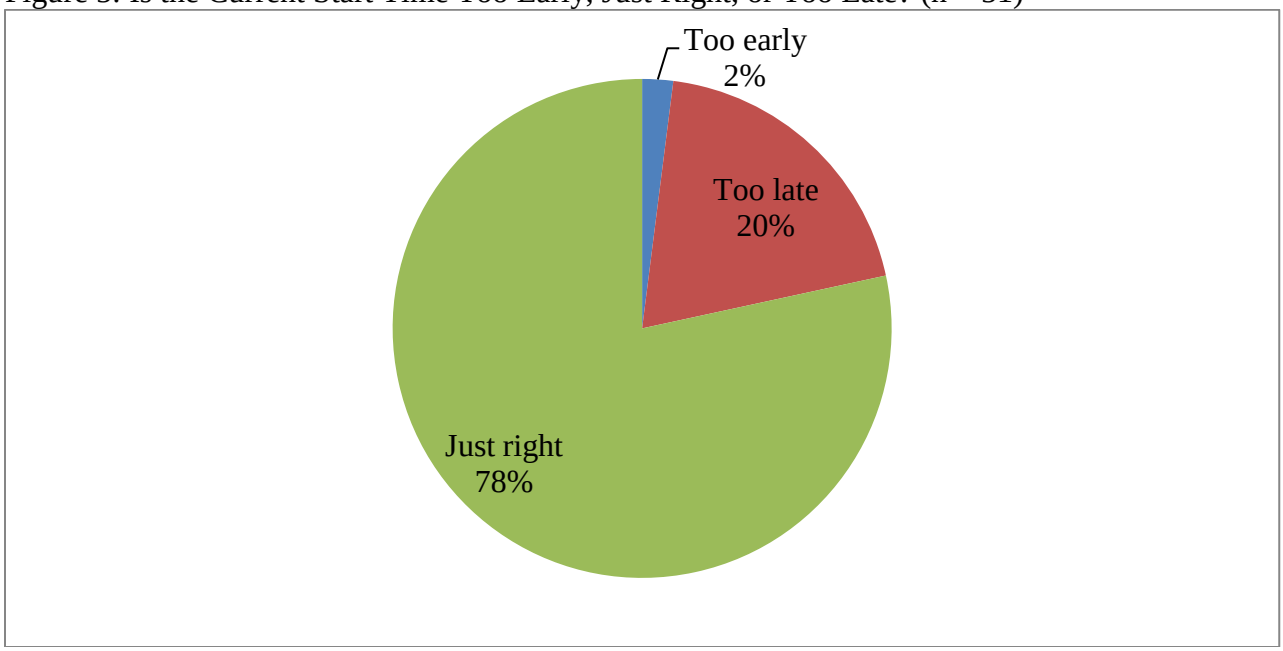
A total of nine (18%) responding schools that start at 8:30 a.m. or later made the change to a later start time within the past five years. Among the nine schools with later start times, eight principals responded to a question regarding specific outcomes experienced as a result of the later start time. Among this small group, the impact of the changes was generally split between those who experienced *some* or *much* improvement and those for whom there was no difference. The most positive outcomes were reported for the areas of teacher satisfaction and student engagement and attentiveness (see Figure 4.)

Figure 4: Perceived Effects of Recent Move to a Later Start Time (n = 8)



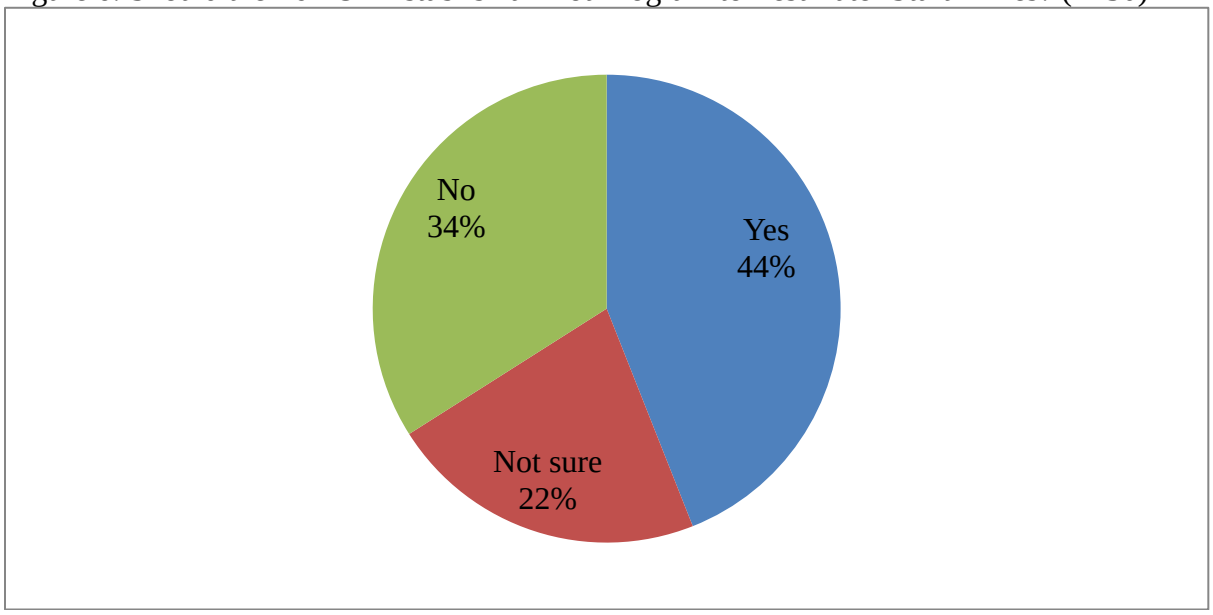
Most (78%) of the principals in schools that start at 8:30 a.m. or later are satisfied ("just right") with the start times of their schools, although 10 (20%) reported that their start time is too late and a very small percentage (2%) reported that their current start time is too early (see figure 5).

Figure 5: Is the Current Start Time Too Early, Just Right, or Too Late? (n = 51)



Principals of schools with start times of 8:30 a.m. or later are divided about whether the NJDOE should establish a pilot program to test later school start times. While 44% agreed that the NJDOE should establish a pilot program, another 34% are against it. The remaining 22% of schools are not sure (see Figure 6).

Figure 6: Should the NJDOE Establish a Pilot Program to Test Later Start Times? (n=50)



Respondents to the survey were also asked two open-ended questions that required narrative responses. The first was what the NJDOE might do to support districts in their efforts to change school start times, and the second asked for any comments they might have concerning later start times for middle schools and/or high schools in the state.

Thirty-six principals responded to the first open-ended question. Among those respondents, the following suggestions were offered: provide a campaign for education, information, and/or communication about start times (25%); consider providing funding or incentives for districts and schools willing to undertake a change (17%); and launch pilot programs (8%). Slightly less than one third of the respondents (28%), however, reported that any change in school start times should be a local decision.

Twenty-nine principals offered other comments on the issue of later school start times, including those that were generally in favor of the idea (14%) or opposed to the idea (17%). Other comments included the following: principals were satisfied with their current start times (17%); transportation (10%) and athletics (7%) were important considerations among a lot of others (14%); and changing school start times is difficult to achieve because "one size does not fit all."

Summary of Presentations by Study Group Members and Other Stakeholders

Stakeholder Organizations Represented in the Study Group

Each stakeholder organization represented in the Study Group was asked to make a statement regarding the issue of later school start times from its particular perspective. In doing so, they were asked to focus on three questions:

1. What is your organization's perspective on the issue of later school start times at middle schools and high schools? Discuss the pros and cons.

2. What are the 3-5 issues that seem to be the most important in helping your organization to frame your position?

3. Given the potential benefits of a later start time for middle school and high school ages and weighing the primary issues and considerations, is your organization in support of a recommendation for a pilot study for interested middle schools and high schools?

<u>New Jersey Education Association (NJEA)</u>

The NJEA has accepted the research that identifies chronic sleep deprivation as an important obstacle to maintaining adolescents' physical and mental health, safety, and well-being. Further, NJEA has acknowledged that current school start times often represent one of the contributing factors to the problem of chronic adolescent sleep deprivation. In doing so, however, NJEA has also identified a number of issues that must be taken into account when considering a change in a school's start time, including transportation, care of younger siblings, family circumstances, after-school activities, teachers' workday, and the impact of the change on other school employees.

Specifically, NJEA has identified the following issues as the most important in framing its organizational position:

- impact on bus schedules and after-school programs;
- buy-in from educators, parents, and the community;
- how changing the school schedule affects all stakeholders, not just students; and
- monetary impact of the change.

The NJEA's position is that "a pilot study for interested middle and high schools would be acceptable as long as the decision to participate was made at the local level. Participation in and the results of a pilot may influence the educational community to see positive aspects of this issue. A well-run pilot might be an opportunity to build community awareness and strengthen key partnerships, which may be important and helpful for possible full-scale implementation and future sustainability of the project."

Furthermore, the NJEA has recommended that, "the pilot should begin with a list of objectives…and documentation of how it will be implemented. The documentation should provide a time-line for the pilot and the metrics for how it will be evaluated. The performance criteria have to be established prior to the pilot in order to determine the program's success or failure. Establishing the criteria prior to the pilot increases the chances of getting clear results, and [the criteria] should be objective, unambiguous, and relevant to the program's goals. It must be determined at the outset of the pilot if it will be acceptable to make moderate/minor adjustments. Sweeping predictions or assumptions about possible full-scale implementation based on major changes or early findings is unacceptable. In addition, an adequate timeframe to observe outcomes is essential to obtaining meaningful data. An effective pilot can help catch potential problems and prevent them from escalating as well as determine any pitfalls before possible full implementation. An effective pilot [should also] focus initially on a set number of sites. The program should not include any additional State funding or State support that would not be able to be sustained nor offered to other districts if later school start time becomes a State mandate. It might be fairly easy for the NJDOE to find money to fund a pilot program; however, will the implementation of later school start time be affordable if it is offered to the entire state?"

<u>New Jersey School Boards Association (NJSBA)</u>
The NJSBA, a federation of local boards of education, has taken the position that the authority for the management of public schools should rest with the local districts. The state's authority over local public school districts must be limited to the scope necessary to fulfill its constitutional mandate for a thorough and efficient system of free public education. NJSBA believes that the state should not mandate school start times; rather they should be determined by local school boards in response to local needs, conditions, and community input.

The NJSBA stated that all students deserve a high-quality education. With the two percent levy cap, local boards of education must always be mindful of the need to wisely manage federal, state, and local revenues. Local boards should carefully consider the impact of adjusting school start times on the various programs of the district.

It is NJSBA's position to support a pilot study, because a study could give local boards of education additional information on how later school start times impact their students, staff, and community. This information would help inform local district decision-making concerning later school start times.

<u>New Jersey Association of School Administrators (NJASA)</u>
While acknowledging the research supporting later school start times, NJASA identified transportation, athletic event conflict, and childcare issues as significant obstacles that must be considered in decisions regarding adjusting school start times. Specifically, NJASA identified

the following questions and considerations as the most important in framing its organizational position:

- How will all stakeholders be educated and informed about the benefits delineated in the research, and what will the timeline be to garner understanding of the research findings?

- What will be the impact on adult family member schedules; [what will be] the economic impact on families as a whole?

- What will be the community buy-in to precipitate a change in school start time? Are children on board (i.e., agreeable) with [school start time] changes?

- What is the current reality? Is the community content with the current reality? NJASA also pointed out that a community is more than just a local school district (i.e., it also includes county/state athletic and co-curricular events).

After a review and internal dialogue of the literature and other information in their final review, the NJASA maintained a neutral stance on conducting a pilot study.

<u>New Jersey Principals and Supervisors Association (NJPSA)</u>
The NJPSA has accepted the considerable research that shows that sleep deprivation among adolescents negatively affects their heath and success in school. Such research further shows that modifying school start times provides benefits to adolescents' physical and mental health, safety, and academic achievement. Nevertheless, NJPSA has also recognized that modifying school start times is not without its obstacles, many of which affect the students, families, school district, and the community. Examples of these obstacles include child care issues, extra-curricular activities, community access to local school facilities, and impact on school staffing, scheduling, and facilities. NJPSA has further recognized that the impact of these obstacles may be more prevalent in districts that utilize busing to transport children to and from school.

Specifically, NJPSA has identified the following issues as the most important in framing its organizational position:

- Determining the true benefits of modifying start times, including assessing how such a change may have modified teaching and learning in jurisdictions that have implemented a change in scheduling;
- Addressing the potential barriers to implementation that are identified by stakeholders; and
- Assessing the holistic impact of modifications and changes in school start times on students, parents, teachers, school leaders, and the community.

The NJPSA supports a pilot study, "assuming that it is a local decision...to participate. Providing unique evidence to districts about the benefits and/or impact of implementing such a change may be essential to affording 'buy-in' by local communities. A pilot may be the best way to obtain first-hand information."

<u>New Jersey Parent Teacher Association (NJPTA)</u>
The NJPTA conducted several lengthy discussions in which some members expressed that

imposing a certain start time would not be a good idea because of local control. Some schools would like to retain flexibility to determine their own start time instead of receiving a mandate. While some members suggested that starting the school day before 7:45 a.m. was not a good idea, some members suggested that a longer school day should be explored insofar as it could offer a longer homeroom which could, in turn, provide more time for children to eat breakfast and prepare for the school day. In the final analysis, NJPTA proposed that the NJDOE continue to review data and work with organizations across the state to provide resources for the success of students, teachers, and parents.

During their discussions, NJPTA identified several advantages of later school start times including the following: students getting more sleep, better grades, and better test scores; safer driving for students; increased physical and mental health among students; and reliable child care for younger siblings. The NJPTA also identified some challenges or obstacles to later school start times, including (a) schools with block schedules, where first block classes experience high rates of absenteeism and tardiness, (b) some students would be unable to participate in early school breakfast programs; (c) some families may not be able to rely on children for younger sibling child care, (d) later school start times may have an adverse effect on after-school student employment (and school work might suffer), (e) already overwhelming amounts of homework may be further exacerbated (thus defeating the original purpose of the later school start time), (f) student athletes may regularly miss class time in order to accommodate schedules of schools without later start times, and (g) potential adverse effects on recruiting and retaining bus drivers.

Specifically, the NJPTA identified the following issues as the most important in framing its organizational position:

- physical and mental health of students;
- time for breakfast for students; and
- student achievement and performance; preparation for college and careers.

<u>New Jersey Association of School Psychologists (NJASP)</u>

The NJASP is in favor of later school start times at middle schools and high schools. However, due to the complexity of the issue with regard to feasibility and implementation, NJASP has cautioned that any adjustments to the school day need to be carefully considered within the needs of the particular school community and in collaboration with all stakeholders.

The NJASP has further identified the positive and negative aspects of later school start times. Among the positive aspects of a later time are the following: research supports the facts regarding chronic sleep deprivation among adolescents and that later start times can address the problem; persistent drowsiness and lack of alertness can be reduced and engagement can be increased; and reduced absenteeism and tardiness, higher grades, fewer student-reported depressive symptoms, increased alertness and attention, safer driving and reduced numbers of auto accidents, and reduced parent-child conflict.

Among the negative aspects of a later start time were the following: negative impact on after-school activities; potential disruption to family schedules and routines; and stress associated with change.

Specifically, the NJASP has identified the following issues as the most important in framing its organizational position:

- impact of chronic sleep deprivation on students' academic performance;
- mental health impact of chronic sleep deprivation including emotional liability, depressive symptoms, increased irritability, anxiety, and lowered frustration tolerance; and
- changes in attention span and executive functions associated with chronic sleep deprivation.

"NJASP supports further exploration of later school times at middle and high schools. A well-designed pilot program will assist in better determining the feasibility of this initiative. However, NJASP also recognizes the importance of considering systemic factors, at all levels, in determining the need for a pilot at a particular school with collaborative buy-in from relevant stakeholders. Schools that have already been identified with existing data as "at-risk" might benefit from a system-based initiative that could improve the learning and emotional well-being of vulnerable students. Further, NJASP suggests that a pilot should be integrated within a framework of multi-tiered supports [MTSS] that is designed to promote learning and well-being, rather than initiation of a pilot as a 'stand-alone' initiative. Integration within an MTSS framework will also promote a comprehensive system of data collection, progress monitoring, and program evaluation. While a pilot integrated within a total school initiative may not be 'pure' in the experimental sense (i.e., it may not be completely clear if it was the later start that produced change), the reality is that often it is the integration of initiatives that produce the most positive results. There can also be flexibility in a pilot program. For example, there may be some schools where, although the entire school body does not have a later start time, it might be an option for a select group of students who are more vulnerable to the effects of sleep deprivation."

"Finally, whether a district chooses to participate in a pilot program or not, NJASP recommends improved education for school administrators, teachers, student support providers, other staff members, parents, and students about the importance of adequate sleep, the consequences of sleep deprivation, and the symptoms of sleep disorders. Staff should be aware of the symptoms of sleep problems that may mimic other academic, behavioral, or emotional problems and how to refer parents to additional community referral resources for more serious sleep concerns. Within the school setting, staff should be aware of appropriate accommodations that might be necessary for students with chronic sleep problems.

<u>New Jersey School Counselor Association (NJSCA)</u>

The NJSCA is in "complete support of a pilot study for interested middle schools and high schools." In doing so, NJSCA has acknowledged that later school start times work with teenagers' natural sleep rhythms, help students to get the sleep they need, and improve their performance in school. However, NJSCA also recognizes that changing to a later school start time has some downsides, including disruptions to parent work schedules, problems with transportation logistics, and negative impacts on extra-curricular school activities, especially sports.

The NJSCA further recognizes that the impact of changing school start times "would be huge for many school districts and cannot be ignored. Such a change would negatively affect family schedules, elementary schedules, and transportation concerns for districts that use their buses for multiple runs with multiple grade levels. These impacts, combined with the huge demand for

time that high school students face for after-school activities like sports, work, and family responsibilities to care for younger children, must be accounted for before a policy change could ever be considered."

New Jersey State School Nurses Association (NJSSNA)

The NJSSNA has accepted the research by the American Academy of Pediatrics, the Centers for Disease Control, and New Jersey Department of Health that demonstrates the benefits of quality sleep and how it affects optimal health and well-being in adolescents. NJSSNA has further accepted that later school start times can help to alleviate or ameliorate many of the negative effects associated with chronic sleep deprivation that have been identified in the research. Specifically, later school start times have the potential to "reduce early morning visits to the health office and complaints of fatigue, headache, abdominal [pain], and other complaints related to sleep deprivation." Later school start times may also reduce absenteeism, tardiness, and early-morning drowsiness. However, NJSSNA also recognizes that later school start times may result in later school dismissals and the effects such later end-of-school times may engender, including disruptions to family scheduling and routines, student employment, student sports and after-school activities, and homework completion time.

Specifically, NJSSNA has identified the following issues as the most important in framing its organizational position:

- research that chronicles the negative effects of chronic sleep deprivation, factors that contribute to sleep deprivation, actions that may improve the quantity and quality of sleep, and the benefits and obstacles of changing school start times;
- testimony from school nurses via surveys and other information gathering; and
- school health office documentation of student visits.

It is NJSSNA's position that "a pilot program needs to be initiated in order to demonstrate evidence-based results to support current research and provide input from parents [and] school communities and to remove barriers to a successful program implementation."

The NJSSNA also provided a statement from the National Association of School Nurses (NASN) corroborating the state organization's position.

New Jersey State Interscholastic Athletic Association (NJSIAA)

As the New Jersey Department of Education considers various issues related to shifting school start times to accommodate adolescent learners, the NJSIAA -- based on polls of its executive committee and league of conference presidents -- is not in favor of later school start times or of a pilot study to test the concept. Chief among the concerns of association leadership are issues with childcare (e.g., older siblings supervising younger siblings) and after-care costs for parents, transportation costs, athletic contests not being completed, and resultant limitations in terms of scheduling sub-varsity athletic contests.

The NJSIAA supports the need to improve adolescent learners' sleeping habits, but association members believe that the logistical challenges that would face students, parents, and entire school districts are too numerous and far-reaching to warrant even conducting a study.

Other Organizations Offering Input and Comments

In addition to the educational stakeholder organizations represented in the Study Group, input and comments were also received from other organizations, as well. Brief descriptions of their contributions are presented below.

New Jersey Council for American Private Education (NJ CAPE)

The NJ CAPE presented a statement in which it offered the following comment.

"Nonpublic school students who receive bussing are directly affected by the starting and closing times for public school students. In order to keep the contracts in the $884 per pupil amount, both districts and private bus contractors attempt to keep busses on the road continuously. Therefore, existing routes for nonpublic school students were, in large measure, created with starting times to accommodate the starting and ending times of public school students. To think that a change would have no effect on the nonpublic community would be to overlook this important detail."

New Jersey Council of County Vocational-Technical Schools

The council has offered the following statement:

"The county vocational-technical schools share the concerns raised by school districts across the state with regard to after-school activities and student employment logistics. However, vocational-technical schools have unique concerns as well.

"The shared-time programs operated by many county vocational-technical schools are the area of greatest concern. Currently, all students participating in a shared-time program arrive within a fairly limited window of time from the sending school districts. This allows the vocational programs to start at a consistent time that provides sufficient instruction for all students. If some districts were to participate in a pilot program and have a later start time, those students would arrive late and miss half or more of the instruction period.

"The inability to provide the necessary instruction in a program would exclude students from the pilot district from participating in a shared-time program. In addition, enrollment in county vocational-technical schools would be adversely impacted. Therefore, we respectfully request that pilot school districts are not selected from counties that have shared-time programs."

School Districts That Have Implemented Start Time Changes

The Study Group also reached out to two school districts known to have changed their school start times: the Seattle Public Schools (Seattle, WA) and the Fairfax County Public Schools (Fairfax, VA). A brief description of the findings of discussion with these districts is presented in the paragraphs that follow.

School District of Seattle, Washington

Seattle Public Schools will implement later school start times for high schools beginning in the 2016-17 school year. To achieve this change, they have flipped many of the elementary schools to start earlier, while the high schools will start later at 8:30 a.m. All of the middle schools, except one, will also start at 8:30 a.m.

The initiative for the change came from the surrounding community to change high schools to later start times. In response to community pressure, the Seattle Board of Education passed a resolution in July 2014 that directed the superintendent to analyze the school start systems currently in place to determine the feasibility and impact of a later start time for adolescents. The school board instructed the superintendent, as well as the community, that any change to transportation would have to be cost-neutral. The superintendent created a task force to conduct a feasibility analysis, which focused on the district's 3-tier[3] busing system, athletics, and childcare issues.

The feasibility analysis was conducted from November 2014 through November 2015 and was followed by a period of planning and mitigation that began in December 2015 and continued through September 2016. In the feasibility analysis, the following were considered: (a) the recommendations from the American Academy of Pediatrics, (b) new changes in transportation had to be cost-neutral, (c) Title 1 programs were prioritized to earlier tiers to support district equity considerations, and (d) new plans had to maximize the number of schools in Tiers 1 and 2.

The major hurdles that were encountered were analyzing the feasibility study data and soliciting and gaining community support. The task force spent six months informing and educating the community on issues related to later school start times. There was considerable back and forth discussion with the community regarding start time details, and some of the details in the proposed plan changed based on community feedback. If the task force were to undertake such an effort again, they would provide additional time for community meetings to discuss the changes the school board made to the plan.

As part of the feasibility and implementation processes, the task force ensured the following: Seattle public officials were included in all discussions and deliberations; the teachers' union was on board (written letters of support were obtained from union leaders); the community was kept well-informed of progress and strategies at each step in the process (community forums and a neighbor-to-neighbor program were used, in which individuals would host small meetings, watch a video, and then give feedback to the district after the meeting); the city government was solicited to assist in identifying childcare options; the use of district and publicly-owned land and facilities was negotiated (the school district uses some public parks for their athletics and city government uses some school fields for their programs); and the required environmental impact studies were conducted (according to the *Washington State Environmental Policy Act*, whenever a program is changed, an environmental study (SEPA) is required).

Upon implementation of the school start time changes in fall 2016, the school district will measure the efficiency and success of the program by analyzing standardized test scores, conducting school climate surveys, and working with the University of Washington to conduct other analyses. The district already has two high schools that begin in Tier 2, which will serve as a control group. In addition, there are two elementary schools that will not be changing their start times, and they also will be used as control groups.

[3] Tier 1 (start: 7:50 a.m., end: 2:20 p.m.) includes some high schools, middle schools, and one K-8 school. Tier 2 includes some elementary schools (start: 8:40 a.m., end: 2:50 p.m.) and two high schools and one K-8 school (start: 8:40 a.m., end 3:10 p.m.). Tier 3 includes some elementary schools (start: 9:30 a.m., end: 3:40 p.m.) and some K-8 schools (start: 9:30 a.m., end: 4:00 p.m.).

School District of Fairfax, Virginia
The Fairfax County School Board adopted a resolution in April 2012 to seek solutions that would establish high school start times at 8 a.m. or later. After adopting the resolution, the school board voted in March 2013 to award a contract to Children's National Medical Center (CNMC) to develop a proposal to achieve that goal.

Beginning in June 2012, the school board held six work sessions to discuss the issue. In addition, eight community meetings were held between May 19 and June 11, 2014, during which approximately 1,000 participants shared their opinions on four options. In conjunction with the community meetings, more than 2,000 comments were gathered through online feedback.

Working with a stakeholder committee, CNMC's Division of Sleep Medicine initiated a process to develop a *Blueprint for Change.* The committee studied several workable options to start high schools in Fairfax County after 8:00 a.m. to improve students' mental and physical health, academic performance, and safety. The options were presented to the school board at a work session in April 2013 and at community meetings and via an online form in May and June 2013. The district then spent three months identifying the impact of each of the options on students, district employees, and the greater Fairfax County community. After analyzing the feedback from the work sessions and meetings, CNMC made a final recommendation to the school board at its work session on July 2013.

Subsequently, after considerable research, deliberation, and planning, the district developed a plan to adjust the start time for high schools to between 8:00 and 8:10 a.m. for the 2014-15 school year. The change affected approximately 57000 students, roughly 30% of the student population, and required the addition of 27 buses at a cost of $4.9 million. Middle school start times remained at 7:30 a.m. and ended at 2:15 p.m. All elementary schools started between 8:00 a.m. and 9:20 a.m. and ended between 2:40 p.m. and 4:05 p.m. High schools started between 8:00 a.m. and 8:10 a.m. and ended between 2:40 p.m. and 2:55 p.m. The school board provided educators and families a full year prior to implementation to adjust to the change.

Summary of Public Outreach Efforts

Three public hearings were held to elicit comments from educational stakeholders and members of the public. The session sites were regionally distributed as follows:

Southern region: Camden County College, Blackwood, May 2, 2016, 4 p.m.–7 p.m.
Central region: New Jersey Principals and Supervisors Association, Monroe Twp., May 4, 2016, 11 a.m.–1:30 p.m.
Northern region: Franklin Williams Middle School, Jersey City, May 10, 2016, 4 p.m.–7 p.m.

Invitations were sent via email to all executive county superintendents, school district superintendents, charter school lead persons, renaissance school project lead persons, and other educational stakeholder organizations including NJEA, NJSBA, NJASA, NJPSA, NJSIAA, NJSSNA, NJASP, NJPTA, and NJSCA. Invitations were also sent to other state organizations including the NJ Association of School Resource Officers, NJ Chamber of Commerce, NJ State League of Municipalities, NJ Business and Industry Association, NJ Association of School

Business Officers, NJ School Transportation Association, NJ Student Council Association, and the Garden State School Bus Contractors Association.

In the correspondence, individuals were invited to offer oral and written comments that addressed two questions:

(1) Should the NJDOE establish a pilot program to examine later school start times in select middle schools and high schools that may be interested in participating in the program?

(2) How might a school start time of 8:30 a.m. or later in your district's middle school and/or high school affect you?

Those who were unable to attend the public hearings and provide oral testimony were invited to provide written comments to an NJDOE email address established for that specific purpose. All electronic and written correspondence to the NJDOE on this issue was considered in the development of the report.

Summary Findings of Public Hearings

Blackwood (May 2, 2016) – No individuals offered public testimony at this site.

Monroe Twp. (May 4, 2016) – Nine individuals offered testimony, including one school principal, three former or present members of district boards of education, and five parents. All spoke in favor of delaying the start of school for their middle school or high school children. All were also in favor of the NJDOE's conducting a pilot study. During their testimonies, the presenters spoke to the issues of the need for children to get adequate sleep. They further addressed both the advantages (e.g., more efficient learning, less student depression, increased driver safety, improved personal relationships) and obstacles and challenges to be faced in changing the school start times, including disruption to transportation and athletics.

Jersey City (May 10, 2016) – Only one individual offered public testimony at this site, former Governor Richard Codey, who spoke in favor of delaying the start times of schools. Governor Codey, also a current member of the New Jersey Senate and a sponsor of the legislation authoring the Study Group's charge, cited recent research by the American Academy of Pediatrics and the importance of adequate sleep among adolescents. He suggested that, given what is known about the biological time clocks of elementary-aged children and adolescents, perhaps the current practice of earlier school start times for middle school and high school students and later school start times for elementary school students should be reversed. He further cited the advantages (in terms of student learning, health, safety, and well-being) of adequate sleep, as well as the negative outcomes associated with chronic sleep deprivation. He also pointed out that the current research suggests that altering school start times will not produce the negative effects predicted by opponents to the change. Rather, he suggested that adolescents would retain their present sleep habits and patterns but, with the advent of later school start times, they would gain the opportunity for at least one additional hour of sleep per night. Finally, Governor Codey suggested that current school start times may be driven by what

adults, including teachers and parents, perceive as what is best for them. In fact, he posited, the basic premise of when the school day starts should be driven by what is best for the children.

Content Analysis of Email Outreach Effort

In order to determine the opinions of the general public on the issue of later school start times and the potential pilot project, a request for comments was posted on the NJDOE website. In addition, the Study Group encouraged the N.J. Association of Student Councils to advertise the call for public comment within the organization's student network. Finally, each of the stakeholder groups represented within the Study Group (e.g., NJEA, NJASA, NJPSA, and NJSBA as well as school and building administrators, classroom teachers, and PTA members) also communicated requests for public comment through various forums including email blasts and informal correspondence. Respondents were asked to comment on the following: whether or not they were in favor of later school start times in general; whether the NJDOE should undertake a pilot project assessing the feasibility or need for further legislative action regarding later school start times; and how later school start times might directly affect them. Over a period of approximately three weeks, 553 emails were received by the NJDOE. The major findings of these emails are summarized below. Many of the emails were focused on the single issue of later school start times and did not address the issue of the pilot program. A number of adults also spoke to the effects of current and later start times on children, rather than on the respondents themselves.

In presenting this analysis, it is important to note that the statistics presented below have not been assembled from a randomly selected sample of respondents, but rather from a self-selected group of individuals whose views may differ from larger populations of adults and students. In addition, the findings --including the percentages --have not been tested for statistical significance and, therefore, should not be considered statistically representative of any larger group with which respondents may be identified.

Findings

1. A total of 553 emails were received, which came from the following groups of respondents: 240 (43%) could reasonably be expected to have come from parents or grandparents of school-age children; 60 (11%) from students, presumably in middle school or high school; 52 (9%) from current or former teachers; 11 (2%) from district or building administrators; 6 (1%) from current or former members of local boards of education; and the remainder (184, 33%) from respondents who could not otherwise be categorized in one or more of the above-named groups.

2. Of the 553 emails received, 437 respondents (79%) were in favor of the concept of later school start times, while 113 (21%) were not in favor. The remaining three could not be determined.

3. The 437 (79%) respondents who expressed agreement for later school start times cited the following benefits: increased sleep for adolescents -- 251 (57%); better health, safety, and well-being for adolescents -- 179 (41%); and increased learning for adolescents-- 155 (39%). Seventeen (4%) respondents recommended the "typical" current start times (i.e., elementary schools first, followed by middle schools, followed by high schools) should be reversed.

4. The 113 (21%) respondents who expressed disagreement with later school start times cited the

following negative outcomes: a delayed end-of-school-day -- 51 (45%); the delay or limiting of after-school activities -- 50 (44%); children need to be more responsible and held more accountable for their own decisions regarding bedtimes and sleep-- 39 (35%); and unwanted effects on parent schedules and obligations such as employment -- 26 (23%). In addition, 23 (21%) reported that changing school start times won't matter because nothing will really change as a result, such as children's bedtime habits and patterns; 18 (16%) reported that enforcing bedtimes rules in the household was a parenting decision and should not be tampered with by state or district policy mandates; and 9 (8%) reported that changing school start times would be unnecessarily costly.

Study Group Conclusions and Recommendations

Conclusions

Based on the research, discussions, and deliberations as presented in the summary of major findings above, the Study Group has arrived at the following conclusions:

1. The scholarly research, including that by the American Academy of Pediatrics (AAP), is resolute in its identification of chronic adolescent sleep deprivation as a serious endangerment to adolescents' health, safety, well-being, and academic performance. Moreover, the research strongly supports the many advantages and benefits of adequate sleep for adolescents.

2. Delaying the start of school times for middle schools and high schools, even for a short period of time, offers significant positive benefits and outcomes, including those related to students' health, safety, well-being, and academic performance. However, it would be difficult to determine the impact of such delays in isolation of other factors.

3. Delaying school start times is fraught with obstacles and challenges, as it will undoubtedly affect not only middle schools and high schools, but elementary schools, as well. Chief among these obstacles and challenges are those associated with the potentially negative impact on student transportation; after-school activities, including athletics; and childcare. The Study Group acknowledges these impediments to change. However, it also recognizes that some school districts have chosen pathways that have enabled them to minimize such impediments.

4. A sustained public campaign about the importance of adequate sleep for adolescents, as well as the serious negative outcomes associated with chronic sleep deprivation among adolescents, is both necessary and beneficial.

Recommendations

1. School start times should not be mandated by the New Jersey Legislature or the NJDOE. Any decision to pursue later school start times must be determined solely by local school districts and must be driven by locally determined situations, conditions, and needs. Given the myriad of characteristics, factors, and variables that distinguish school districts and schools from one

another, communities should not be confronted with a "one-size fits all" school start time mandate. The Study Group does, however, strongly recommend that school districts carefully review the issues attendant to later start times for middle schools and high schools.

2. The Study Group has determined that there is a sufficient number of middle schools and high schools currently implementing a later start time for the NJDOE to obtain ample implementation information without conducting a formal pilot study. New Jersey students would be better served if the NJDOE spent its time and resources on gathering and providing information from these districts/schools already implementing later starting times to educators and families to help guide their decision-making and implementation.

3. The NJDOE should publicize both this report, as well as its accompanying research, on its website so that parents and educators are informed about the negative impact of chronic sleep deprivation on adolescents. Furthermore, the NJDOE should notify schools about this report directly from the Department, through statewide associations, and through the organizations represented in the study group.

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Appendix 1

Charge to the Later School Start Time Study Group

CHAPTER 96

AN ACT requiring the Department of Education to conduct a study on school start times.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1a. The Department of Education shall conduct a study on the issues, benefits, and options for instituting a later start time to the school day in middle school and high school. The study shall:

(1) consider the recent recommendations of the American Academy of Pediatrics on the establishment of later school start times;

(2) include an assessment of the health, academic, and safety benefits associated with establishing later start times in middle schools and high schools;

(3) evaluate any potential negative impacts on school districts and families that may be associated with a later start time and consider strategies for addressing potential problems; and

(4) review all available literature and data on the experiences of school districts in the nation that have instituted later start times.

b. The department shall submit a report on the study to the Governor, and to the Legislature pursuant to section 2 of P.L.1991, c.164 (C.52:14-19.1) that details the findings of the study. The report shall include a recommendation on the advisability of establishing a pilot program to test later school start times in select middle schools and high schools throughout the State that are interested in participating in the program.

2. This act shall take effect immediately.

Approved August 10, 2015.

Appendix 2

Later School Start Times Study Group Members

New Jersey Department of Education
Susan Martz, Asst. Commissioner, Learning Supports and Specialized Services (co-chair)
Peggy McDonald, Deputy Asst. Commissioner, Learning Supports and Specialized Services (co-chair)
Colleen Schulz-Eskow, Director, Office of Legislative and External Affairs
Mary McKillip, Ph.D., Office of Student Support Services
Amanda Schultz, Office of Student Support Services
Judy Alu, Office of ESEA Policy and Grant Development
Jesse Young, Office of Legislative and External Affairs
Thomas C. Monahan, Ed.D., Staff Consultant

New Jersey Education Association
Amy C. Fratz, Ed.D., Associate Director, Professional Development and Instructional Issues

New Jersey School Boards Association
John J. Burns, Esq., Counsel

New Jersey Association of School Administrators
Anthony Trongone, Superintendent, Pemberton Public Schools

New Jersey Principals and Supervisors Association
Jennifer Keyes-Maloney, Assistant Director for Government Relations

New Jersey Parent Teacher Association
Lynette Howard, Camden County PTA President

New Jersey School Counselor Association
James Lukach, Executive Director

New Jersey Association of School Psychologists
Terri Allen, Ph.D., Past-President

New Jersey State School Nurses Association
Judith Woop, M.Ed., RN, NJ-CSN, Executive Director

New Jersey State Interscholastic Athletic Association
Michael Zapicchi, Project Manager

Appendix 3

Dates and Locations of Study Group Meetings

March 14, 2016	1:00 p.m. - 4:00 p.m.	(NJDOE – 3rd Floor Conference Room)
March 28, 2016	1:00 p.m. - 4:00 p.m.	(NJDOE – 3rd Floor Conference Room)
April 12, 2016	9:30 a.m. - 12:30 p.m.	(NJPSA – Training Room A – 1st Floor)
April 26, 2016	9:30 a.m. - 12:30 p.m.	(NJPSA – Training Room A – 1st Floor)
May 10, 2016	9:30 a.m. - 12:30 p.m.	(NJSBA – 1st Floor Conference Room)
May 24, 2016	9:30 a.m. - 12:30 p.m.	(NJSIAA – Conference Room)
June 7, 2016	9:30 a.m. - 12:30 p.m.	(NJDOE – LRC Board Room – 1st Floor)

Appendix 4

Dates and Locations of Public Hearings

May 2, 2016	Camden County College Blackwood, NJ	4:00 p.m. – 7:00 p.m.
May 4, 2016	N.J. Principals and Supervisors Assn. Monroe, NJ	11:00 a.m. – 2:00 p.m.
May 10, 2016	Franklin Williams Middle School Jersey City, NJ	4:00 p.m. – 7:00 p.m.