

School Start Times: Review of Recent Literature

In this report, Hanover Research explores effective school start times for elementary, middle and high school students. We review the most recent literature and pilot studies, providing profiles of schools that have implemented new start times through a variety of means and overcoming a wide range of obstacles.

Introduction

In this report, Hanover Research expands on previous research on the topic of effective school start times by compiling new information on the benefits and consequences associated with changing school start times. This document serves as an update to past Hanover Research reports on school start times, including the May 2010 report *The Effect of School Start Time on Academic Achievement*. We particularly focus on the middle school and high school levels, as the main benefits and challenges of shifting start times appear to relate specifically to older age groups rather than elementary school students. The recent body of research suggests that later start times for middle and high school students can improve academic performance as well as out-of-school behavior. It also appears that “with adequate planning and preparation, school boards have been able to delay school start times at acceptable monetary cost (given the enormous potential payoff) and tolerable disruption of community functioning.”¹ We have organized this report into three main sections:

- ❖ **Section I:** Background and Potential Benefits
- ❖ **Section II:** Obstacles to Implementation
- ❖ **Section III:** Implementing Change: Guidelines and Models

We summarize the conclusions of our research below.

Key Findings

- ❖ **Elementary school students do not benefit from a later start time**, though many schools change their start times when making the shift to accommodate bus transportation and minimize additional costs.
- ❖ While long seen as a cultural and psychosocial preference, later bedtimes among adolescents are now understood to be a biological response to puberty, the onset of which **results in a two-hour sleep-wake phase delay** without lessening total sleep requirements. Therefore, adolescents have a biological need to be able to sleep later in the morning.
- ❖ Studies have cited benefits ranging from **mood** and **alertness** to **fewer automobile accidents** and **less engagement in high-risk behavior** among middle and high school students who get more sleep.

¹ Kirby, M., Maggi, S., and D’Angiulli, A. “School Start Times and the Sleep-Wake Cycle of Adolescents: A Review and Critical Evaluation of Available Evidence.” *Educational Researcher*, 40.2, pp. 56-61. 2011: 60. http://www.aera.net/uploadedFiles/Publications/Journals/Educational_Researcher/4002/56-61_03EdR11.pdf

- ❖ Researchers have shown that **even a modest delay in school start time** (30 minutes) produces improvements in measures of student mood, alertness, and health.
- ❖ Many middle and high schools hesitate to implement a later start time because of **obstacles such as financial constraints, after-school athletic activities, family schedules, and stakeholder opposition.**
- ❖ Because the costs and logistical challenges of implementing a later start time vary widely from district to district, experts recommend the following measures before deciding on whether and how to make a change:
 - **Survey students** to assess tiredness levels and interest in a later start time as well as **stakeholders** to gauge interest and support for the proposed change;
 - **Organize a task force or committee** dedicated to advocating for the shift and exploring the issue, its challenges, and potential benefits; and
 - **Conduct a pilot study** within a smaller group of students in order to experience real-time results without implementing the change at full scale.
- ❖ Even when schools and districts use various planning methods to more efficiently implement a later start time, **our research reveals that not all committees formed to explore the benefits of a later start time decide to move forward with the shift.**
- ❖ **One school cited in our report simply shortened the length of the school day by 30 minutes to avoid logistical issues** with afterschool commitments, childcare of younger siblings, and teachers' schedules. This indicates that **flexibility with scheduling** may be crucial for bringing about change.

Section I: Background and Potential Benefits

Increasingly busy schedules over the past few decades have led to lifestyles in which America's youth get about an hour less sleep each night today than they did in 1980.² Extracurricular activities, ever-heavy homework burdens, television and cell phone use, and a lack of family-instituted bedtimes have all contributed to a world where sleep schedules take a back burner after a child reaches school age: *New York Magazine* reports that “even kindergartners” sleep less than they used to, averaging a comparative deficit of a half hour each night.³

Biological Changes in Adolescence

Despite the overall decrease in sleep times among children and teens over the past few decades, studies show that not only do adolescents continue to function optimally after approximately nine hours of sleep each night, but also that **delaying the time at which adolescents must wake up (and subsequently attend class) yields significant returns in alertness, mood, and physical health.**⁴ The preference for a later bedtime among teens has long been considered a cultural and psychosocial change, rather than one which is due to “specific biological processes.”⁵ However, according to a July 2010 report in the *Archives of Pediatrics and Adolescent Medicine*, the **onset of puberty results in “adolescents [developing] as much as a two-hour sleep-wake phase delay (later sleep onset and wake times) relative to sleep-wake cycles in middle childhood.”**⁶

Dr. Richard Schwab at the University of Pennsylvania states that the resulting “ideal” bedtime for teens of midnight or 1:00am makes waking up in time for school a significant challenge, and one that trades logistical convenience for student achievement.⁷ He posits that the **status quo must be “reversed” in order to achieve optimal results for students** of all levels, from elementary school through secondary:⁸

Right now, high schools usually start earlier in the morning than elementary schools. But if school start times were based on sleep cycles, **elementary schools should start at 7:30 and high schools at 8:30 or 8:45**—right now

² Bronson, P. “Snooze or Lose.” *New York Magazine*. October 7, 2007.
<http://nymag.com/news/features/38951/>

³ Ibid.

⁴ “Delayed School Start Time Associated With Improvements in Adolescent Behaviors.” *ScienceDaily*. July 8, 2010. <http://www.sciencedaily.com/releases/2010/07/100705190532.htm>

⁵ Kirby, M., et al. “School Start...Evidence.” Op cit, 56.

⁶ ScienceDaily. “Delayed School...Behaviors.” Op cit.

⁷ “Start School Later in the Morning, Say Sleepy Teens.” American Thoracic Society. May 20, 2007.
<http://www-archive.thoracic.org/sections/publications/press-releases/conference/articles/2007/press-releases/start-school-later-in-the-morning-say-sleepy-teens.html>

⁸ Ibid.

it's the reverse. School systems should be thinking about changing their start times. It would not be easy...but it would increase their students' sleep time and likely improve their school performance.

Institutional Responses

Alongside scientific findings proving the importance of sleep, especially in adolescence, education experts are beginning to focus more on the effect of insufficient sleep on middle and high school students' academic performance, behavior, and reported moods. This renewed emphasis has led to the shift in many middle and high schools to later start times that allow students to sleep later, accommodating the sleep-wake phase delay and ensuring better rested students for first period. A 2010 article in the *Los Angeles Times* states that no one has kept track of how many schools have changed their start times, which is consistent with the research conducted for this report.⁹ However, the article also noted that at the time of writing, "since the discussion on school start times began more than a decade ago, not a single district that has made the change has decided to change back."¹⁰

This shift, adopted by a growing number of schools over the last decade,¹¹ suggests that not only does a later start time benefit teens and demonstrably improve their ability to come to class prepared to learn, but it also suggests that **implementation is relatively easy and, most importantly, sustainable in the long term**. Indeed, a report by the Brookings Institution released last month notes that emerging evidence suggests that "mundane reforms" like altering start times are less politically controversial than other, more unwieldy systemic policy changes and that these simpler shifts have the potential to "**produce substantial achievement gains at relatively low cost**."¹²

Wide-Ranging Benefits

Research in the last two years has consistently demonstrated that pushing back the start times of morning classes results in "**improved mood, attention and learning for students**."¹³ The U.S. National Library of Medicine published a study in April 2011 that tested the effects on attention levels in adolescents of delaying school start

⁹ Sohn, E. "Later School Start Times and Zzzs to A's." *Los Angeles Times*. August 23, 2010, 3. <http://articles.latimes.com/print/2010/aug/23/health/la-he-school-time-20100823>

¹⁰ Ibid.

¹¹ Dooren, J.C. "Later Start to School Boosts Teens' Health." *The Wall Street Journal*. July 6, 2010. <http://online.wsj.com/article/SB10001424052748704535004575349182901006438.html>

¹² Jacob, B.A. and Rockoff, J.E. "Organizing Schools to Improve Student Achievement: Start Times, Grade Configurations, and Teacher Assignments." *The Brookings Institution: The Hamilton Project*. September, 2011. http://www.brookings.edu/~media/Files/rc/papers/2011/09_organize_jacob_rockoff/092011_organize_jacob_rockoff_paper.pdf

¹³ Cline, J., PhD. "Sleepless in America: Latest Findings on Later School Start Times." *Psychology Today*. May 9, 2011. <http://www.psychologytoday.com/blog/sleepless-in-america/201105/latest-findings-later-school-start-times>

times by one hour. Results demonstrated that “in the first week, the experimental group slept an average of 55 minutes longer each night, for five nights.”¹⁴ These same students **performed better when tested for attention** by the “Mathematics Continuous Performance Test” and the “d2 Test of Attention.”¹⁵ The study concluded with a strong recommendation that **middle schools consider delaying class start times by at least one hour.**¹⁶

Psychology Today emphasizes the significance of these results, revealing that “students actually use the [extra hour in the morning] for sleeping and are not spending another hour on the computer, watching TV, socializing or doing home work.”¹⁷ Studies in Minnesota also have confirmed these findings.¹⁸ In addition, students who began school at the later time showed “**significantly better performance**” in **concentration levels and their ability to pay attention.**¹⁹

Studies also indicate that that **later start times result in better driving and subsequently fewer accidents.** A recent study compared car accident statistics in two Virginia cities with school start times that were 75 to 80 minutes apart from one another to determine if there were any differences that could be attributable to insufficient sleep among teenagers. Motor vehicle accident rates in the first town, where 16- to 18-year-olds attended school at the traditional start time, occurred at a rate of 65.8 per 1,000 in 2008 and 71.2 per 1,000 in 2007. In comparison, accident rates within the community in which schools began later in the day stood at 46.6 per 1,000 in 2008 and 55.6 per 1,000 in 2007, demonstrating a difference that was statistically significant.²⁰ The study notes that traffic congestion was taken into account when comparing these figures and “did not account for the difference in crash rates.”²¹ Findings in Fayette County, Kentucky, were similar: after the start times in high schools were delayed to 8:30am, “the number of teenagers involved in car crashes dropped, even as they rose in the state.”²²

Behavioral factors are also important to consider. According to a study by the Center for Disease Control released in September 2011, insufficient sleep among high school

¹⁴ Lufi, D., Tzischinsky, O., and Hadar, S. “Delaying school starting time by one hour; some effects on attention levels in adolescents.” U.S. National Library of Medicine, National Institutes of Health. April 15, 2011. <http://www.ncbi.nlm.nih.gov/pubmed/21509327>

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Cline, J. *Psychology Today*. Op cit.

¹⁸ Heurich, A. “Summary of Research on School Start Time & Adolescent Sleep Trends.” October 18, 2005. <http://www.icsd.k12.ny.us/redistricting/startend/starttimesummary.pdf>, 2.

¹⁹ Cline, J. *Psychology Today*. Op cit.

²⁰ Vorona, R.D. et al. “Dissimilar Teen Crash Rates in Two Neighboring Southeastern Virginia Cities with Different High School Start Times.” *Journal of Clinical Sleep Medicine*, 7.2. 2011: 149. <http://www.sleepeducation.com/resources/lessons/teensdrowsydriving/teencrashrates.pdf>

²¹ Cline, J. *Psychology Today*. Op cit.

²² Kalish, N. “The Early Bird Gets the Bad Grade.” *New York Times*. January 14, 2008. <http://www.nytimes.com/2008/01/14/opinion/14kalish.html>

students is associated with a wide range of what are deemed “health-risk behaviors,” including:²³

- ❖ Lack of exercise
- ❖ Poor diet
- ❖ Use of computers for three or more hours each day
- ❖ Physical fighting
- ❖ Cigarette, alcohol, and marijuana use
- ❖ Sexual activity
- ❖ Depression
- ❖ Suicidal tendencies

One of the supervisors of the study further explained that “public health intervention is greatly needed” as a result of these findings, “and the consideration of delayed school start times may hold promise as one effective step in a comprehensive approach to address this problem.”²⁴

²³ “Media Advisory: Insufficient sleep among high school students associated with a variety of health-risk factors.” Center for Disease Control and Prevention. September 26, 2011.
http://www.cdc.gov/media/releases/2011/a0926_insufficient_sleep.html

²⁴ Ibid.

Section II: Obstacles to Implementation

Building on past research on changing school start times, Kyla Wahlstrom of the Center for Applied Research and Educational Improvement points out that aggregating the “mountain of studies”²⁵ supporting the efficacy of later start times beginning in adolescence “is only one piece of the puzzle in actually implementing later school day starts for teens.”²⁶ Wahlstrom argues that **community and institutional support of a revised schedule is crucial** if students are going to be able to logistically shift their commutes, afterschool activities, childcare and other plans that revolve around the times they arrive at and leave school.

Many districts acknowledge the benefits of later start times but ultimately decide that logistical or financial constraints prevent them from making the shift. In 2009, for instance, students at Richard Montgomery High School requested that the board consider later start times, forcing the school to revisit an issue that had already been “studied twice by the school system within the last decade.”²⁷ While the board has agreed to “keep an open mind” when reviewing this proposal, they also warn that the challenges which prevented implementation a decade ago would remain, including parent opposition and “other complications” such as subsequent transportation costs and unattended younger siblings.²⁸ As of October 2011, Richard Montgomery High School’s warning bell to signal a five minute window before the start of first period still rings at 7:20am.²⁹

In addition to barriers resulting from community opposition, the National Sleep Foundation (NSF) lists the eight most significant obstacles to delaying start times of middle and high schools as follows:³⁰

- ❖ **Transportation:** altering what are often longtime-entrenched bus transportation schedules can have a real impact on districts’ abilities to deliver district-wide bus transportation systems efficiently and at lowest possible cost.
- ❖ **After-School Activities:** Athletics in particular can be affected by later start times, impeding a school’s ability to coordinate logistically with coaches and

²⁵ Bronson, P. “Snooze or Lose.” *New York Magazine*. Op cit.

²⁶ O’Callaghan, T. “Study: teens benefit from later school start.” TIME Healthland. July 6, 2010.
<http://healthland.time.com/2010/07/06/study-teens-benefit-from-later-school-start/>

²⁷ Brachfeld, M. J. “Students want school system to reconsider later start times.” Gazette.Net. August 19, 2009.
http://ww2.gazette.net/stories/08192009/olnnew204340_32525.shtml

²⁸ Ibid.

²⁹ “Regular Bell Schedule.” Richard Montgomery High School.
<http://www.montgomeryschoolsmd.org/uploadedFiles/schools/rmhs/students/Regular%20bell%20schedule.pdf>

³⁰ “Eight Major Obstacles to Delaying School Start Times.” National Sleep Foundation (NSF). 2011.
<http://www.sleepfoundation.org/article/hot-topics/eight-major-obstacles-delaying-school-start-times>

- other teams. The Brookings report notes that outdoor winter sports could be most affected given the early sunset during that season.³¹
- ❖ **Other Students and Programs:** An institutionalized shift in start times among older students could push elementary start times ahead, resulting in young students “waiting for the bus in the dark early mornings, or waiting at home alone after school.”³² In addition, implementing earlier start times for elementary schools just to satisfy logistical needs is difficult to justify when actual “research is lacking on the effect of school start times on younger students.”³³
 - ❖ **Reduced Time to Access Public Resources:** Libraries, supply stores and other community businesses are available to students for less time during the week if the end of the school day is pushed back into the afternoon.
 - ❖ **Teachers:** A later start and release time leave teachers to face the same scheduling concerns that students would have under the same circumstances. Less time with their families and other results of a changed schedule are some of their concerns.
 - ❖ **Stress for Families:** Altering a student’s schedule has implications for caregivers who are responsible for aiding in transportation, providing meals after school, and assisting with homework.
 - ❖ **Uneducated Community:** Resistance to change usually stems from a lack of education about the merits of a new plan, and communities may balk at the new change before learning more.
 - ❖ **Resistance of Students:** Students may resist changes that have the potential to affect participation in extra-curricular activities and limit the amount of time they have to complete homework in the evenings.

Cost of implementation is also a major concern. While a shift in start times is considered a low-cost systemic change,³⁴ **moving from a tiered system—where schools stagger start times across grades to maximize use of buses and other transportation equipment—to a single one would require increased spending to make up for the loss of overlap.**³⁵ A 2011 study of schools in Wake County, North Carolina estimates that the school would need to spend roughly \$150 per

³¹ Jacob and Rockoff. Op cit, 10.

³² “Eight Major...Times.” NSF. Op cit.

³³ Ibid.

³⁴ Jacob and Rockoff. Op cit, 5.

³⁵ Ibid, 9.

student per year to have all grades district-wide begin class at 9:15am.³⁶ The Brookings Institution report points out that “if we aggregate [those costs] over the thirteen years a student is in a K-12 system, we arrive at an increase in transportation costs of \$1,950 over the student’s school career.”³⁷ However, the report concludes that despite these figures, many schools have taken steps in recent years to reduce transportation services for secondary school students, making the financial cost of shifting the school day ultimately “negligible.”³⁸

The *Education Researcher* report also notes that “the most commonly cited monetary expense associated with changing school start times is the cost of changing bus schedules; however...these costs can vary significantly from district to district,”³⁹ indicating that **districts should examine the potential costs required within their own circumstances before deciding against the implementation of a new schedule.**

In the case of insurmountable obstacles, experts in the field point out that other steps can be taken to mitigate inimical effects of the “misalignment between the typical adolescent circadian rhythm and early classes” when later start times are not an option.⁴⁰ Kirby, Maggi and D’Angiulli’s 2011 report suggests that “memory task performance” is done best by adolescents at the “nonpeak” time of the day; therefore, when start times cannot be delayed for middle and high school students, “**a restructuring of class schedules so that adolescents are practicing fluency-based skills—such as reading aloud or rehearsing music—in the morning may be more beneficial than trying to have them assimilate new knowledge early in the day.**”⁴¹ The report notes that such claims have yet to be proven, but that a change like this would still be “most effective” if used in combination with a delayed start time. Used alone, only partially addresses issues related to sleep deprivation experienced “as a result of early start times.”⁴²

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Kirby, M., et al. “School Start...Evidence.” Op cit, 58.

⁴⁰ Ibid., 60.

⁴¹ Ibid.

⁴² Ibid.

Section III: Implementing Change: Guidelines and Models

The NSF recommends education of stakeholders early in the planning process, community engagement, clarity of goals, and flexibility when trying to implement later start times.⁴³ Hanover Research's exploration of the topic and the most current trends suggests that conducting **pilot studies** and **forming committees** made up of stakeholders are two primary modes of achieving sustainable implementation. By forming "start time committees" and conducting surveys, schools can examine the potential costs of implementing a delayed start time and explore the details of what such a change would entail. Pilot studies, too, allow schools to experience in real time how these changes would affect the school or district without having to implement a full-scale change all at once.

In the next few pages, we review examples of schools and districts that have used committees and pilot studies to evaluate stakeholder opinions and compose final recommendations for full-scale implementation. Some of these examples demonstrate instances in which research and preparation helped to successfully change school start times; others serve as examples in which stakeholders ultimately chose to keep the original schedule after reviewing the preliminary findings.

Start Time Committees

Many schools and districts have organized study groups and committees to discuss the possibility and explore its implications. For example, the superintendent of Canton High School in Canton, Massachusetts formed such a group in late September 2011, noting that research supports the shift despite the possible disruption to sports practice. He also cited several local communities that had already pushed their start times back significantly later than 7:20am, which is when Canton High School currently begins class each morning.⁴⁴

The School District of River Falls in River Falls, Wisconsin, provided a PowerPoint presentation to stakeholders that reviewed the school's overall mission, research on later start times, and "school start time proposals for 2012-13."⁴⁵ The committee comprised 20 staff members, parents, students, community members and administrators who met every two to four weeks during the fall of 2010 to research, gather information, compare different school districts, and explore options for

⁴³ "General Advocacy Tips for Changing School Start Times." NSF.

<http://www.sleepfoundation.org/article/hot-topics/general-advocacy-tips-changing-school-start-times>

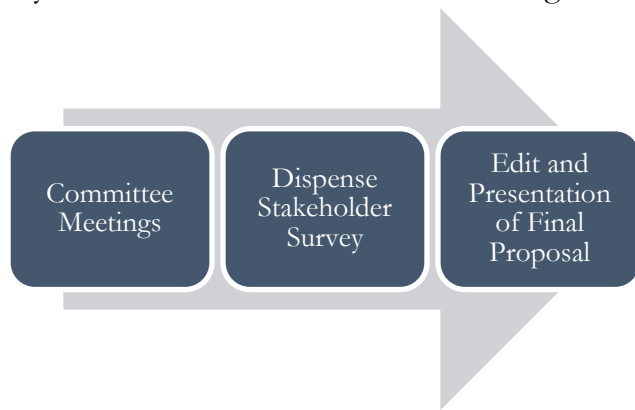
⁴⁴ Berger, M. "Superintendent considering later start time for CHS." *Canton Citizen*. September 21, 2011.

<http://www.thecantoncitizen.com/2011/09/21/school-committee-4/>

⁴⁵ Westerhaus, T., Cleveland, G., and Baumann, E. "A Presentation of School Start Time Proposals for 2012-13." School District of River Falls.

<http://www.rfsd.k12.wi.us/OurDistrict/sp/sst/Documents/Start%20Time%20Powerpoint.pdf>

schedules and alternatives to the current transportation schedule.⁴⁶ The district noted that the parameters affecting the start time of implementation included transportation constraints, ensuring the best interests of all students, and preventing any increase to the school budget. The committee offered four different start time options and noted that at the time of presenting, they planned to dispense a survey in late September or early October. The committee acknowledged the constraints that would result from a



new schedule and asked for creative input on the part of the community.⁴⁷

At North Andover Public Schools in North Andover, Massachusetts, a survey was taken by members of the community in the spring of 2010 to “determine initial preferences” for school start times.⁴⁸ During

the following November, an initial proposal to push back school start times for all grades (K-12) was adjusted a month later in order to address concerns of the parents of elementary school students, 90.5 percent of whom stated in a survey that they were in favor of keeping the start time close to where it had always been.⁴⁹

In response, the district agreed to a 20-minute delay at the elementary level while start times for middle and high schools were pushed back by 35 minutes. While the district did not plan to implement later start times until the 2011-2012 academic year, meetings held by the School Committee began in January 2010 to address the issue and brainstorm implementation ideas.⁵⁰ The following resources regarding the planned change are made available by the district on its website for the benefit of parents and other community stakeholders:⁵¹

- ❖ Frequently asked questions about school start times
- ❖ School Committee presentation on possible changes in start times
- ❖ Advisory Committee’s final report
- ❖ Elementary start time survey results
- ❖ Initial presentation in the spring of 2010
- ❖ Presentation on research regarding sleep and adolescent development

⁴⁶ Ibid., 4.

⁴⁷ Ibid., 10.

⁴⁸ “Superintendent’s Advisory Committee on School Start Times.” North Andover Public Schools. <http://www.northandoverpublicschools.com/starttimes.cfm>

⁴⁹ “Start Time Survey- NA Elementary Schools. Survey Results.” North Andover Public Schools. http://www.northandoverpublicschools.com/cms_files/resources/elemSurvey.pdf

⁵⁰ “Superintendent’s Advisory...Start Times.” Op cit.

⁵¹ Ibid.

- ❖ Spring 2010 survey for the community
- ❖ Interim draft report completed during the winter and spring of 2010

In the spring of 2011, Amherst Regional Public Schools in Amherst, Massachusetts issued a “Report of the Later Start Times Task Force.” The report outlined the district’s reasons for pushing back the start times of secondary schools, which include efforts to improve students’ “academic performance, attendance, mental health, and overall health.”⁵² While the committee has yet to decide how these changes will be implemented (the report outlines five possible options), the survey of secondary students in the district revealed that 51 percent fall asleep in class “occasionally,” and “nearly 80 percent of secondary students, parents and teachers thought a later start time would “positively affect [student] achievement.”⁵³ In response to these findings, the report comprehensively outlines five possible options, including:⁵⁴

- ❖ No change
- ❖ Switch start times for secondary and elementary school
- ❖ Shift everything a half-hour later
- ❖ Put the middle school on the elementary schedule
- ❖ Put K-12 all on the elementary schedule

For each option, the committee notes the probable effects on sleep, transportation issues, sports schedules, and disruption to the schedules of elementary school students. Later on, the report raises concerns about the impacts of various possible options, focusing on the following facets:⁵⁵

- ❖ **Financial** impacts of higher transportation costs and more crossing guards to account for a possible earlier start time for elementary school students
- ❖ **Labor contract** impacts, since changing the daily schedule is an “impact bargaining” item for the local union
- ❖ **Transportation** issues, since the current schedule allows for the same buses to be used for elementary and secondary school students
- ❖ Impact on the **athletic schedule**, and possible subsequent **community opposition**, since “later sports practices and home games would also conflict with town programs during all three seasons, as the high school and middle school share facilities with town sports programs.”

⁵² “Report of the Later Start Times Task Force.” Amherst Regional Public Schools. April 15, 2011: 2.
<http://www.arps.org/files/LaterStartReport.pdf>

⁵³ Ibid.

⁵⁴ Ibid, 4.

⁵⁵ Ibid, 6-8.

- ❖ **Elementary school impacts**, since “different start times have no inherent value” for these students and would only disrupt their current schedule and family routines.

Pennsylvania’s Derry Township District is an example of an unsuccessfully attempt to change start times despite the district’s best planning efforts. In March 2011, the district formed a task force to examine research on adolescent sleep behavior in order to make a decision about how to proceed with start times for the township’s schools.⁵⁶ Six months later, the group announced that the 7:38am high school start time would not be moved, instead recommending that the “district reinforce the importance of regular sleep habits and the detrimental effects on adolescent health and well-being cause by continuous late-night activities during the school year.”⁵⁷

The district argued that a shift from the current schedule would be disruptive, require more money, complicate bus schedules, and affect the schedules of parents who rely on their older children to help babysit younger ones. However, the biggest issue was that a later start time would “take too much time away from school for teachers who are coaches and student athletes.”⁵⁸ The committee chairman noted that “if Derry Township decided to start secondary [school] later, the district would only have control of athletic start times for approximately 50 percent of the games, since the home team sets start times. Students and coaches would need to be pulled from classes for larger amounts of time than now.”⁵⁹

Pilot Studies

Pilot studies have the potential to bolster stakeholder support by providing concrete evidence of the benefits of any proposed changes. A 2010 pilot study conducted in a Rhode Island private high school supports this statement: at the beginning of the study, “teachers, coaches and administrators all resisted the later start,” of the school day, which pushed the start time from 8:00am to 8:30am. However, demonstrable outcomes over the course of the pilot study were able to convince stakeholders to support and uphold the change, and **after evaluating the effects of the delayed opening, nearly all stakeholders supported the 8:30 start time.**⁶⁰ Two months after the change, students at St. George’s School were getting an average of 45 minutes more sleep on school nights, or “nearly eight hours in all” of extra sleep per

⁵⁶ Malawskey, N. “Hershey study asks: Should the high school day start later?” PennLive.com, The Patriot News. March 20, 1011.

http://www.pennlive.com/midstate/index.ssf/2011/03/high_school_students_sleep.html

⁵⁷ Shade, M. “Derry Township School Board panel favors retaining Hershey High School’s start time.” The Patriot News. September 25, 2011.

http://www.pennlive.com/midstate/index.ssf/2011/09/hershey_high_school_panel_favo.html

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Graber, C. “Later School Start Time Leads to Better Students.” *Scientific American*. July 5, 2010.

<http://www.scientificamerican.com/podcast/episode.cfm?id=later-school-start-time-leads-to-be-10-07-05>

week, a significant change from their previous schedule and the control group benchmarked against them. Further, the percentage of students who reported getting at least eight hours of sleep each night skyrocketed from 16 to 55 percent; class attendance also improved, and reported feelings of unhappiness, depression, and irritability significantly declined.⁶¹

The pilot study also revealed that these **students were going to bed an average of eighteen minutes earlier than they had before the start time was moved**, “presumably because [being well-rested] felt so good.”⁶² As one student put it, the 8:30am start time demonstrated the benefits of an extra half hour of sleep, motivating him to aim for additional half hour on the other side of his sleep time. This study, which was the first to compare “the same students at the same school,” ultimately convinced students and faculty alike to vote for a permanent change to a later start time. It should also be noted that the school **did not extend the school day beyond its original end time; instead, classes were shortened by five or ten minutes to minimize complications resulting from pushing back the end of the school day.**⁶³

St. George’s School avoided complications with after-school activities and teachers’ evening commitments by delaying the start time by 30 minutes and thus shortening the school day.

Recommendations from the Brookings report include a suggestion that “districts conduct pilot studies to determine the benefits of moving to a later start time and assess the feasibility of various ways to implement this change.”⁶⁴ The report notes that schools could approach the study from many different angles, either by splitting a schedule in districts with just one high school or choosing one high school in a group of several to start later. The report notes that “piloting of later start times should be done first in those areas with the highest expected net benefit... **schools that should pilot first are those with more disadvantaged students for whom the benefits will be greater.**”⁶⁵ Brookings also points out that the state and federal government could encourage these studies by sponsoring grant competitions to provide funding “on a trial basis” and other initiatives to encourage schools to explore the benefits of later start times.

⁶¹ Ibid.

⁶² Burns, M. “Findings: No More Dozing Off in First Period.” *Miller-McCune*. August 1, 2010.
<http://www.miller-mccune.com/health/no-more-dozing-off-in-first-period-19579/>

⁶³ Ibid.

⁶⁴ Jacob and Rockoff. Op cit, 11.

⁶⁵ Ibid.

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