



Shrewsbury Public Schools Sleep Health Advisory Committee

Report of School Start Time Options

December 9, 2022

I. Introduction

Over the past 30 years, the topic of sleep health has received much attention by sleep researchers. Study after study has returned data that clearly shows the importance of sleep as an essential pillar of human health, and from this finding has emerged the recommendation for later school start times, especially at the high school level. The consensus recommendation driven by expert physicians on the American Academy for Sleep Medicine, the National Sleep Foundation, and the American Academy for Pediatrics supports 8 to 10 hours of sleep each night for youth in the 13 to 18-year age range (Wise ML, et al. *J Clin Sleep Med* 2017). Yet data from multiple, large observational studies indicate that less than half of teenagers currently capture the requisite sleep time (Widome R, et al. *JAMA Pediatrics* 2020).

Evidence strongly implicates early school start times as a key modifiable contributor to insufficient sleep during adolescence. A growing body of evidence has shown that delaying school start times is an effective countermeasure to chronic sleep deprivation and has a wide range of potential benefits to students with respect to physical and mental health, safety, and academic achievement.

In response to such compelling evidence that adequate sleep for teenagers supports their physical, mental, and emotional development and performance, many school districts across the United States have examined and adopted later start times. In fact, many towns right here in Massachusetts, including Shrewsbury's neighboring towns of Northborough and Westborough, have successfully worked toward this goal.

II. Sleep Health Advisory Committee and Task Groups

The Sleep Health Advisory Committee was initially formed a few years ago to work on ways to improve student sleep health, which has been a goal in the Shrewsbury Public School (SPS) district's 2018-2022 strategic priorities and goals under the category of "enhanced well-being of all." Work on this endeavor was postponed due to the Covid-19 pandemic, and a new Sleep Health Advisory Committee was organized in September 2022 to address the stated five-year goal under this strategic priority, which is to investigate, recommend, and plan for potential changes to school start times to better align with adolescent health needs for adequate sleep.

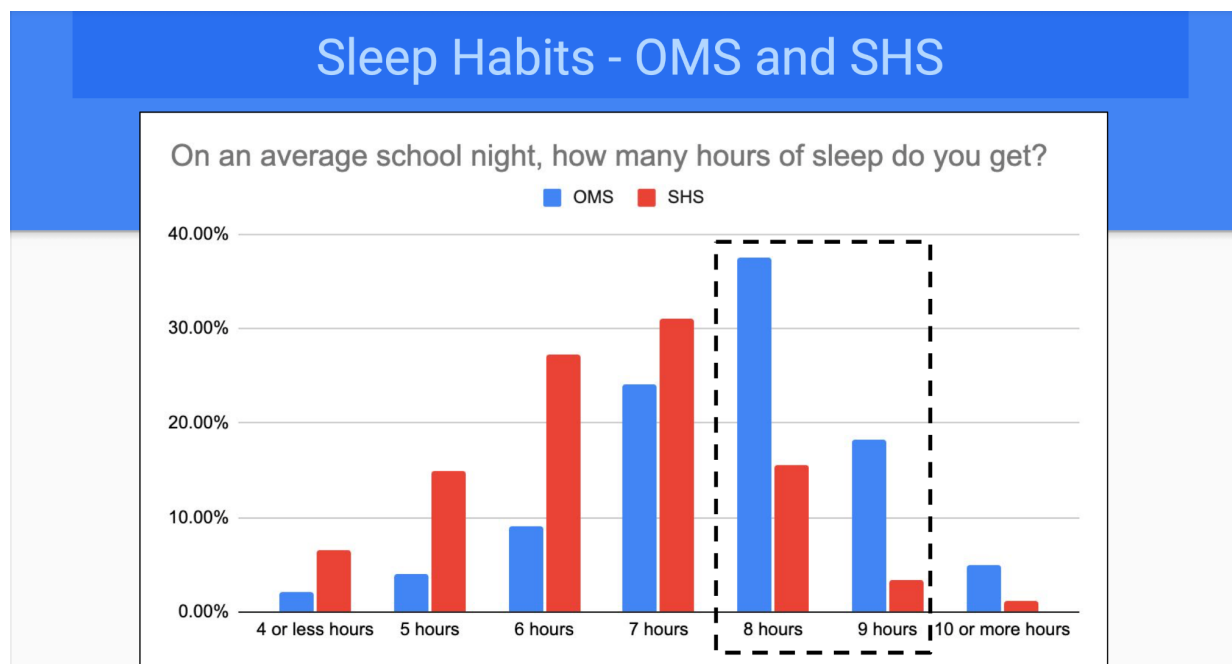
This Advisory Committee was subdivided into five task groups: Research Task Group, Feedback Task Group, Child Care Task Group, Practices in Other Districts Task Group, and Logistics Task Group. The Advisory Committee has convened six times between September and December 2022, to study the latest research on sleep health for children and adolescents, work toward task group-specific goals, share task group findings with the larger committee, and to consider potential options for adjusting school start times for the 2023-2024 school year.

III. Task Group Considerations for Developing New Start Time Options

In completing their work, the members of each task group have done extensive research, considered many variables, and developed in-depth reports which were presented to the School Committee on November 9, 2022 and November 30, 2022. The work of each task group has provided integral information that has been used to develop what this committee regards as viable options for adjustments to school start times and scheduling operations.

Research Task Group: This task group studied research from reputable, science-based sources regarding the sleep health of children and adolescents. Conclusions from their work indicated that extant data from the peer reviewed literature on school start times show clear signals that sleep debt coupled with the shift to evening chronotype (biological tendency for late bedtimes and later wake times) adversely impact high school students' mental well-being (higher incidence of depression, anxiety, suicidal ideation), physical disease (e.g. risk of obesity, diabetes), and neurodevelopmental conditions (exacerbates existing conditions including ADHD, ASD). Trends in the data also suggest negative impact / increased risk in other areas, including academic performance, general safety (e.g. automotive accidents), and long-term health sequelae that negatively affect quality of life over time. This is of the utmost relevance to

Shrewsbury students and families as the results of a health and wellness survey administered in December 2021 to students at Oak Middle School and Shrewsbury High School illustrated the following sleep data:



Taken with permission from the 5/4/2022 School Committee Slides

With the current high school start time of 7:35am, only **20% of high school students report getting the recommended 8 to 10 hours of sleep per night**, approximately 30% report getting 7 hours of sleep per night, and **50% report getting 6 or fewer hours of sleep per night**. The number of students reporting 8 to 10 hours of sleep per night increases to 58% and the number of students reporting 6 or fewer hours of sleep decreases to approximately 17% at Oak Middle School, which has a start time of 8:00am.

“Won’t high school students just stay up later if their school start time is later, resulting in the same amount of sleep?” This is a logical question that was asked by this Advisory Committee in its initial meeting, and was echoed by some participants of the ThoughtExchange survey completed by community stakeholders last month. The short answer is, not significantly. Research has found that students don’t stay up much later as a result of later school start times. For example, a study conducted by Meltzer et al. (2021) found that in the diverse Cherry Creek School District of about 55,000 students near Denver, Colorado, a 70 minute delay in high school start time (8:20am) resulted in an average wake time that was 45 minutes later, and an average bedtime that was 14 minutes later, for a total of 3.8 hours of additional sleep per week. Results were similar

at the middle school age level. Research shows that student bedtimes are not significantly or proportionately delayed with later start times, yet weekday wake times are significantly later. The experiences of districts who have made a change to later start times has been that students reported feeling more rested than they had prior to the change. For further details related to this and other studies, as well as complete findings of the Research Task Group, you can read their full report [here](#) and view their slide presentation [here](#).

Feedback Task Group: To gain insight from SPS stakeholders this task group sought feedback from students, families, and staff via the administration of a ThoughtExchange survey during the month of November 2022. The information shared from all 3,947 stakeholders who participated in the survey includes 3,126 individual thoughts, perspectives, and questions, and 67,161 ratings, as those relate to students' sleep health and the potential benefits and challenges of changing school start and end times.

The highest rated thoughts for the parent and caretaker group support later school start times, while the highest rated thoughts for staff expressed concerns about child care. The highest rated thoughts for students included the need for additional sleep in order to focus better, while feeling more energized, motivated, and ready to learn. Complete details and the full report can be accessed [here](#) and to view the task group's slide presentation, click [here](#). All survey comments and ratings from each stakeholder group can be viewed at the following links: 1) [student feedback](#), 2) [parents/caretakers feedback](#), 3) [staff feedback](#), and 4) [all groups' combined feedback](#).

Additional surveys will be sent on December 15, 2022 so that students, families, and staff can provide feedback on each of the two potential change options.

Child Care Task Group: The Child Care Task Group provided a general study of the child care landscape in Shrewsbury and nearby towns, and examined potential child care issues for SPS families, staff, and the district itself should changes be made to school start times. Their full report is available [here](#) and their slide presentation, [here](#).

Notable findings from this group's research included decreased enrollment in the Extended School Care (ESC) program offered at the elementary schools and at Sherwood Middle School, when compared with enrollment trends prior to the Covid-19 pandemic. Openings for care are available for all morning programs at all schools and all afternoon programs at all schools, except for Beal Elementary School.

Additional findings indicated that many local child care providers have hours of operation that frequently begin prior to 8:00 am and end 5:00 pm or later, generally require same-day to 30-day notice for changes made to a child's care schedule (e.g.:

change in pick-up/drop-off time, adding/subtracting days, etc.), and are most likely to have openings for new enrollment when contacted well in advance of the need for care. Specific effects on any individual SPS family or staff member are expected to vary based on several factors, including: grade span of student or staff, number of caregivers and/or children in a given family, access to and availability of alternative family caregivers including older siblings, flexibility of caregiver work schedules, family finances, and family preferences and priorities.

Further child care considerations will be discussed later in this report, relative to the school start time options considered and presented.

Practices in Other Districts Task Group: This task group investigated the practices in other school districts regarding sleep health and school start times, both in Massachusetts and elsewhere. After reaching out to many school districts, the task group received responses from 29 school districts that had considered adopting later high school start times. Survey responses from administrators and educators in these districts were reviewed and analyzed for common themes. Their full report is available [here](#) and their slide presentation, [here](#).

- **Districts that Adopted Later High School Start Times** (Westborough, Northborough/Southborough, Marlborough, Newton, Ashland, and Barrington, R.I.): What emerged from districts that shifted high school start times later was that the change was viewed favorably and that they had “no regrets” as students appeared to be more awake and alert, less stressed, better rested, and were more engaged in their learning, which was a change that fit with the district’s focus on social and emotional learning. Additionally, the frequency of tardy arrivals decreased at the high school level. There were some stakeholder complaints with respect to the late end time for high school, especially in relation to how the later end time impacted student work schedules and opportunities, as well as a shift in the athletics schedule. Also noted was an increase in athlete early dismissals, a reduction in participation in after-school activities, increased transportation cost and logistical challenges, an increase in discipline issues because of more students riding the bus, and less bus availability for extracurricular activities.
- **Districts that Considered Adopting Later High School Start Times but Did Not** (Grafton, Franklin, and Hamden, CT): For districts that considered shifting high school start times later, but did not ultimately do so, the three common themes for not adopting the change were busing costs and logistics, financial impact on families, and impact on athletics and extracurricular activities.

- Districts that Adopted Later High School Start Times but then Reverted Back** (Newport R.I., and Norwalk CT): In these districts, a later high school start time was adopted, but then after a period of implementation, reverted back to their original start times due to negative impacts to parent work schedules, sports, students' jobs, student and faculty/staff transportation efficiency due to traffic flow, as well as lack of initial support from students for such change, and faculty dissatisfaction with the new schedule. Additionally, in Newport, R.I., communication of the change in start times was noted to be problematic as the district reported a sizable Spanish-speaking population, and most communication concerning the start time change was via email, to which many parents in the district did not have access.

Logistics Task Group: The logistics task group gathered and analyzed data regarding school schedules, bus transportation, co-curricular activities, and financial impact. You can view their slide presentation [here](#). Some of the information discussed is illuminated the chart below:

Current Timetable and Specifics

| Tier | School(s) | Start/End Times | Length of School Day | Time Between Tiers (Morning/Afternoon) |
|--------|--------------------|-----------------|----------------------|--|
| Tier 1 | High School | 7:35 am-2:00 pm | 6hr 25 min | Morning bus pick-up begins at 6:19am |
| Tier 2 | Middle Schools | 8:00am-2:35pm | 6hr 35 min | (25 min/35 min) |
| Tier 3 | Elementary Schools | 9:00am-3:15pm | 6hr 15 min | (60 min/40 min) |

- Student School Schedules:** Each grade span (elementary schools, middle schools, high school) has a slightly different length of student school day: 6 hours 15 minutes for elementary schools, 6 hours 25 minutes for high school, and 6 hours 35 minutes for middle schools. The start times refer to the time in the morning when the instructional day begins, with students generally allowed to arrive on campus up to 30 minutes in advance of that time. The end times refer to when the instructional day ends and dismissal begins, with the process generally taking 15 to 20 minutes.

- **Required Time on Campus for Educators:** The largest group of district staff members is the professional educator group, consisting of teachers, counselors, psychologists, nurses, and other professional-level educator roles. In order to meet the demands of their jobs (including planning, grading, communicating, etc.), these educators work many hours outside of the time they are required to be on campus. The requirement for the hours they must be present at school is governed by the collective bargaining agreement (i.e., contract), which requires high school and middle school educators to arrive on campus at least 15 minutes prior to the start of the student day and for elementary educators to arrive at least 30 minutes prior. At the end of the day, high school educators are required to remain at least 30 minutes after student dismissal, and elementary educators at least 15 minutes. Middle school educators are currently required to remain 20 minutes after student dismissal because of the 10-minute longer student day at that level; if the student day is reduced at the middle level, the contract specifies that they will then be required to remain for 30 minutes. District staff who work on an hourly basis in the district have various assigned work days, and administrators have no specific start/end times in their contracts given their job expectations.
- **Transportation:** There are 4,128 registered bus riders across the various schools in the SPS district. To maximize use and minimize cost, SPS contracts with AA Transportation to operate a three-tiered busing system comprised of 48 buses that complete a total of 247 bus routes per day. We estimate that each additional bus would cost \$87,000 annually to add to the system.
- **There is insufficient time between the busing tiers to allow the buses to complete their routes**, especially between high school and middle school routes. This results in the need to pick up high school students as early as 6:19am, more than one hour before the school start time of 7:35 am and drop them off at the high school earlier than necessary, to achieve timely pick-up and drop-off of middle school students for their 8:00 am start time. Consequently, some students are arriving at the high school a few minutes **before** 7:00am.
- **Athletics and Co-Curricular Activities:** “Co-curricular” refers to activities, programs, and learning experiences that complement what students are learning in school. A survey conducted by the SPS athletic director indicated that athletic departments in nearby districts with later high school times (Westborough, Concord-Carlisle, Algonquin, Lincoln-Sudbury, Newton South, Wayland, Weston) reported a correlation between shifting their start time later and the possibility and likelihood of encountering more conflicts and obstacles to success. As start

time progresses later, it is predicted that the number and significance of conflicts increase.

IV. Options For School Start Times

The Sleep Health Advisory Committee has come to a consensus that two new options that would move start times later are viable and deserve strong consideration. A third option is also available, and that is to make no change, and keep the start times as they are currently. This Advisory Committee is **not** recommending any particular option at this time, but is rather bringing forward highly feasible possibilities and presenting their forecasted benefits and challenges.

Because of the many variables described thus far, the guiding principles this committee sought to follow while forming goal-specific and viable start time options were:

- 1) Provide a longer, biologically necessary and well-timed sleep opportunity for high school students.
- 2) Maintain or increase the length of sleep opportunities afforded to students at the middle and elementary school levels.
- 3) Maintain the general pattern of three busing tiers, without additional buses, to avoid major cost increases.
- 4) Equalize time between all busing tiers to provide at least 40 minutes between tiers for buses to complete their routes on time, and eliminate the need for excessively early bus pick-up of high school students.
- 5) Standardize the length of the school day across all schools to ensure 40 minutes between busing tiers and simplify operations.
- 6) Recognize and consider the impact that significant school schedule changes can have on family and staff child care.
- 7) Avoid having the high school end their school day so late that it significantly impacts co-curricular activities, after school employment, or sibling care.
- 8) Avoid having students, especially those in elementary school, waiting for the bus or getting dropped off in the dark. Sunrise in late December and early January is approximately 7:15am and sunsets are at approximately 4:15pm.

OPTION A:

| Tier | School(s) | Start/ End Times for Students | Educator Time on Campus |
|-------------|--------------------|--------------------------------------|--------------------------------|
| Tier 1 | High School | 7:55am – 2:20pm | 7:40am – 2:50pm |
| Tier 2 | Middle Schools | 8:35am – 3:00pm | 8:20am – 3:30pm |
| Tier 3 | Elementary Schools | 9:15am – 3:40pm | 8:45am – 3:55pm |

Benefits of Option A:

- By standardizing the length of school day among schools and equalizing length of busing tiers, many high school students who take the bus will lengthen their morning sleep opportunity by 35 minutes (15 minutes for decreased need for early bus pick-up due to insufficient route time allocation plus 20 minutes in delayed start time from current time of 7:35am). Those who arrive by car will lengthen their sleep opportunity by 20 minutes.
- Middle school start time shifts 35 minutes later, increasing the length of sleep opportunity for students in the 10-13 year age range, which helps to support their biological sleep needs of 9 to 11 hours of sleep per night.
- Maintains the order of the current school start time schedule, which confers efficiency benefits for adherence to the afternoon busing timetable for all schools due to the ability to promptly load and dismiss all buses at once from the high school.
- High school students will be dismissed before middle and elementary school students, allowing high schoolers to provide child care at home for families who use older siblings for afternoon care.
- Staff may be less likely to require morning child care for their own children.
- Minimal impact to afternoon activities for all grade spans, including extra help, athletics, clubs, performing arts, and employment.

- Most, if not all morning bus pick-ups and afternoon drop-offs are likely to take place during adequate daylight, regardless of time of year.

Challenges of Option A:

- Other than the “no change” choice, this option provides the smallest increase in length of sleep opportunity for high school students.
- SPS staff with children may incur greater need for childcare in the afternoon, particularly those who work at the elementary level.
- Addition of Extended School Care morning program may be necessary at Sherwood Middle School.
- As part of standardizing the length of the school day, elementary teachers’ required time at school may increase from 7 hours, to 7 hours and 10 minutes.

OPTION B:

| Tier | School(s) | Start/End Times for Students | Educator Time on Campus |
|-------------|--------------------|-------------------------------------|--------------------------------|
| Tier 1 | Middle Schools | 7:55am-2:20pm | 7:40am – 2:50pm |
| Tier 2 | High School | 8:35am-3:00pm | 8:20am – 3:30pm |
| Tier 3 | Elementary Schools | 9:15am-3:40pm | 8:45am – 3:55pm |

Benefits of Option B:

- By standardizing the length of school day among schools and equalizing length of busing tiers, high school students who take the bus will lengthen their morning sleep opportunity by 1 hour and 15 minutes (15 minutes for decreased need for early bus pick-up due to insufficient route time allocation plus 60 minutes in delayed start time from current time of 7:35am). Those who arrive by car will lengthen their sleep opportunity by 60 minutes.

- Middle school start time shifts only 5 minutes earlier, generally maintaining the current length of sleep opportunity for students in the 10-13 year age range.
- High school students will still be dismissed before elementary school students, allowing them to provide child care at home for families who use older siblings for afternoon care of elementary school students.
- SPS staff may be less likely to require morning child care for their own children.
- No impact to afternoon activities for middle school students, and mild impact for elementary school students.
- Most, if not all morning bus pick-ups and afternoon drop-offs are likely to take place during adequate daylight, regardless of time of year.

Challenges of Option B:

- Changes the order of the school start time schedule among grade spans, which challenges adherence to the afternoon busing timetable for all schools. Due to the physical layout, there is an inability to promptly load and dismiss all buses at once from the middle school campuses.
- This option has the potential to necessitate reconfiguration of dismissal traffic patterns at the middle schools to accommodate the need for buses to begin afternoon routes in a timely manner, such that they arrive at subsequent school campuses on time.
- Increased potential for impact to afternoon activities for high school students, including extra help, athletics, clubs, performing arts, and employment. Co-curriculars would begin at approximately 3:30pm, to allow for a 30 minute extra-help window immediately after school.
- SPS staff with children may incur greater need for childcare in the afternoon, particularly those who work at the high school and elementary grade levels.
- As part of standardizing the length of the school day, elementary teachers' required time at school may increase from 7 hours, to 7 hours and 10 minutes.

Additional Considerations:

The Sleep Health Advisory Committee strongly considered an additional option, which involved starting the elementary schools in the first tier at 7:55am, followed by the middle and high schools. While this option aligned well with biological sleep needs and rhythms for all student age groups, it was ultimately not deemed to be a viable alternative based on feedback received from the ThoughtExchange survey and lessons considered from other districts who swapped elementary and high school start times. This option posed the most significant impact to family and staff schedules and child care needs, had the greatest likelihood of negatively affecting high school student participation in after-school athletics, co-curriculars, employment, and sibling child care, necessitated the addition of a morning ESC program at Sherwood Middle School, and would have required lengthening the afternoon elementary ESC programs, increasing their cost.

Preschool Schedules:

The schedules for preschool classes currently housed at Parker Road Preschool, Beal School, and Shrewsbury High School (Little Colonials) have not been part of the work of the Sleep Health Advisory Committee. If the high school schedule changes, the Little Colonials schedule will need some adjustments due to the fact that SHS students who take child development classes are part of that program. Similarly, there could possibly be slight adjustments to Parker Road and Beal preschool schedules if changes are made at the other levels, but it is not anticipated that schedule adjustments would be substantial at the preschool level. This is a topic that the Advisory Committee will review as it continues its work in the coming weeks.

V. Summary

Over the past 30 years, countless research studies have clearly shown the essential nature of adequate sleep for the healthy development and maintenance of physical and mental health, emotional regulation, safety, and academic achievement. Evidence strongly implicates early school start times as a key modifiable contributor to insufficient sleep during adolescence. A growing body of evidence has shown that delaying school start times is an effective countermeasure to chronic sleep deprivation. In turn, this Sleep Health Advisory Committee was formed to investigate, recommend, and plan for potential changes to school start times to better align with adolescent health needs for adequate sleep, which has been a goal in the SPS district's 2018-2022 strategic priorities and goals under the category of "enhanced well-being of all." In completing their work, Sleep Health Advisory Committee members have done extensive research, considered many variables, and developed in-depth reports that have provided integral information that has been used to develop two viable options for adjustments to school start times and scheduling operations:

Option A

| Tier 1 | Tier 2 | Tier 3 |
|---------------------------|------------------------------|----------------------------------|
| <u>High School</u> | <u>Middle Schools</u> | <u>Elementary Schools</u> |
| 7:55am - 2:20pm | 8:35am - 3:00pm | 9:15am - 3:40pm |

Option B

| Tier 1 | Tier 2 | Tier 3 |
|------------------------------|---------------------------|----------------------------------|
| <u>Middle Schools</u> | <u>High School</u> | <u>Elementary Schools</u> |
| 7:55am - 2:20pm | 8:35am - 3:00pm | 9:15am - 3:40pm |

The table below illustrates a comparison of start/end times, length of student day, and length of staff day on campus between the current schedule and the schedule proposed by each potential option.

Comparison of Student Start/End Times and Educator Time on Campus

| Tier | <u>Current Student</u> | <u>Current Staff</u> | <u>Option A Student</u> | <u>Option A Staff</u> | <u>Option B Student</u> | <u>Option B Staff</u> |
|---------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Tier 1 | 7:35 am – 2:00 pm <i>6hr 25min</i> | 7:20 am – 2:30 pm <i>7hr 10min</i> | 7:55 am – 2:20 pm <i>6hr 25min</i> | 7:40 am – 2:50 pm <i>7hr 10min</i> | 7:55 am – 2:20 pm <i>6hr 25min</i> | 7:40 am – 2:50 pm <i>7hr 10min</i> |
| Tier 2 | 8:00 am – 2:35 pm <i>6hr 35min</i> | 7:45 am – 2:55pm <i>7hr 10min</i> | 8:35 am – 3:00 pm <i>6hr 25min</i> | 8:20 am – 3:30 pm <i>7hr 10min</i> | 8:35 am – 3:00 pm <i>6hr 25min</i> | 8:20 am – 3:30 pm <i>7hr 10min</i> |
| Tier 3 | 9:00 am – 3:15 pm <i>6hr 15min</i> | 8:30 am – 3:30 pm <i>7hr</i> | 9:15 am – 3:40 pm <i>6hr 25min</i> | 8:45 am – 3:55 pm <i>7hr 10min</i> | 9:15 am – 3:40 pm <i>6hr 25min</i> | 8:45 am – 3:55 pm <i>7hr 10min</i> |

Orange = High School

Green = Sherwood/ Oak

Purple = Elementary

Both Option A and Option B meet our guiding principles to:

- Provide a longer sleep opportunity for students at all ages
- Minimize or eliminate the need for additional district transportation expenditures
- Equalize the length of busing tiers to provide at least 40 minutes at each tier for buses to complete their routes on time
- Eliminate the need for excessively early bus pick-up of high school students
- Standardize the length of the school day across all schools to support bus schedule adherence
- Recognize and consider the impact that significant school schedule changes can have on family and staff child care
- Minimize significant impacts to after-school co-curricular activities, employment, or sibling care
- Raise the likelihood that students board and disembark from buses during daylight hours

While there are also challenges with each option, this Advisory Committee worked to create scenarios where these are minimized. And as always, there is an option to make no change.

At this time, the Sleep Health Advisory Committee is seeking valuable feedback from stakeholders regarding each option presented. We continue to engage in ongoing work to review the two approaches to see whether any adjustments or implementation strategies could further improve their effectiveness. This committee will convene in January to review feedback received from the school community, and will shortly thereafter recommend a favored option to the School Committee. Practices that can support improvements in sleep hygiene for students will also be recommended at that time.

VI. Timeline of Remaining Process

December 15, 2022: Survey of stakeholder groups initiated to get feedback on options

January 4, 2023: Public hearing at the School Committee meeting to listen to feedback from stakeholders

January 18, 2023: Discussion of options by the School Committee and potential vote

January 25, 2023: Potential additional School Committee meeting for discussion/vote (if necessary)

February 1, 2023: Last recommended School Committee meeting for discussion/vote to implement any change for the start of the 2023-2024 school year (if necessary)

Sleep Health Advisory Committee Members

Sarah Anane, Shrewsbury High School Student, Class of 2024
Todd Bazydlo, Principal, Shrewsbury High School
Erin Boucher, Parent; School Committee Liaison
Laura Braun-Lush, Psychologist, Spring Street School
Hallie Burak, Principal, Oak Middle School
Michael Cerio, Parent
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Kristin Combs, Parent
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Noelle Freeman, Director of School Nursing
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Scott Mulcahy, Principal, Paton Elementary School
Cynthia Murphy, Parent
Toral Parikh, Parent
Jennifer Parshall, Parent
Shane Quintard, Parent
Sara Russell, Parent
Rishi Vohora, Parent

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