



# ELEMENTARY AND MIDDLE SCHOOL START TIMES

## Introduction

In this report, Hanover Research (Hanover) reviews the available secondary literature on elementary and middle school start times. This research is intended to support Mountain View Whisman School District's (MVWSD) leaders in upcoming planning conversations about elementary and middle school start times.

This research brief begins with a review of the research on academic and behavioral effects of delayed start times in the elementary and middle grades before discussing potential stakeholder impacts of delayed start times and strategies to engage stakeholders in the decision-making process. Because research directly examining delayed start times in the elementary grades is limited, this research brief includes sources examining stakeholder impacts and engagement across grade levels.

## Recommendations

- MVWSD should consider a start time of 8:30 a.m. or later in middle schools and 7:30 – 8:00 a.m. in elementary schools.
- MVWSD should prioritize later school start times for middle schools, as the research indicates more positive effects on students' physical and emotional health at this age.
- MVWSD should partner with Hanover to facilitate primary and qualitative research to solicit stakeholder perceptions and to include members of the school community in the decision-making process with any changes to school start times.

## Key Findings

- **The evidence base for delayed start times is stronger in the middle grades than in the elementary grades.** Many students in the middle grades experience the same adolescence-related sleep challenges as high school students, and delaying middle school start times has demonstrated positive effects on both self-reported sleep and academic outcomes. In contrast, few studies examine the impact of school

start times on elementary school students, and these studies present mixed results.

- **The American Academy of Pediatrics recommends that both middle and high schools start at 8:30 a.m. or later.** This start time accommodates changes in sleep patterns among adolescents. However, a 2007 study comparing middle schools with varying start times recommends an optimal start time of 9:15 a.m. Most experts agree that 8:00 a.m. start times are appropriate for the elementary grades.
- **Although later start times yield academic and behavioral advantages, changes to school schedules may pose challenges for other stakeholders.** Teachers and families may face disruptions to their schedules as a result of changes to school start times, and delayed start times may create challenges related to childcare. Delayed start times may also reduce the amount of time students have available for athletics and other after-school activities and to access community resources such as libraries. Other members of the community may be affected by changes to traffic congestion as a result of new start times in addition to access to youth activities and libraries in school buildings.
- **Districts can address stakeholder concerns through a systematic engagement strategy that incorporates stakeholder input into decision-making.** Districts should develop multiple plans for start time changes and revise plans in response to stakeholder input while conducting outreach to educate stakeholders about the benefits of delayed start times. Districts should also plan to evaluate the results of start time changes after implementation.
- **Districts can use stakeholder surveys to solicit stakeholder input regarding scheduling changes.** For example, Long Beach Unified School District (USD) in California used stakeholder surveys to identify teachers' concerns regarding schedule changes and worked with the district's teachers' union to address these concerns. Phoenixville Area School District in Pennsylvania surveyed students to evaluate the impact of existing start times on student sleep, while Needham Public School

District in Massachusetts surveyed teachers to measure the impact of existing start times on students' alertness in class.

- **Districts should also conduct in-person outreach to stakeholders. In-person meetings can help districts build trust and open dialogue with stakeholders.** For example, Phoenixville Area School District hosted multiple community forums and solicited stakeholder input via phone and email to supplement a stakeholder survey in support of its start time changes. Likewise, Seattle Public Schools combined surveys with volunteer-facilitated community forums to solicit stakeholder input on school start times.

## Research on Start Times in the Elementary and Middle Grades

**Few studies examine the impact of school start times on elementary students.** A 2015 study of school start times in Kentucky elementary schools notes that "very little research has examined the impact of start times for elementary school students."<sup>1</sup> This study examines academic outcomes for all elementary schools in Kentucky and finds a modest correlation between later school start times and student achievement for schools serving low populations of students who qualify for free or reduced-price lunches, but no correlation in schools with higher numbers of low-income students.<sup>2</sup>

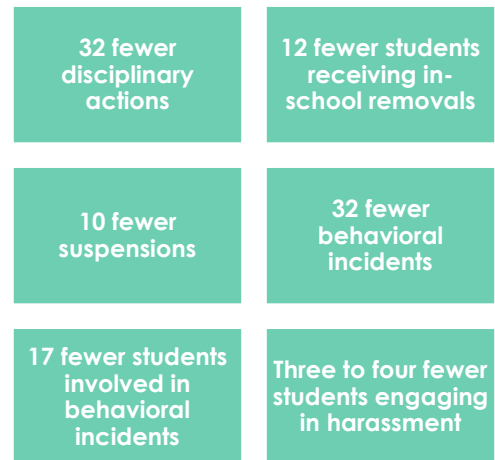
Some research suggests a limited impact of start times on student achievement in the elementary and middle grades. A 2015 study examines school start times at Wayzata Public Schools in Minnesota, where start times vary across elementary schools. This study finds no consistent association between school start times and student achievement as measured by state assessments cores. When controlling for demographic factors, school start times appear to have no significant impact on student achievement in Wayzata Public Schools.<sup>3</sup>

The impact of start times on students' self-reported sleep time in the elementary grades is limited. A survey of students in Grades 3-5 at a school district that moved start times forward from 8:20 a.m. to 7:45 a.m. finds that self-reported sleep times decreased by an average of four minutes for students in Grade 4 and nine minutes in Grade 5. Self-reported sleep times for students in Grade 3 increased by 24 minutes, although the schedule transition for these students was larger due to the transition to a new school building.<sup>4</sup>

However, delaying start times appears to have a more positive impact on behavioral outcomes in the elementary grades. A follow-up to the 2015 study of start times in Kentucky examines the impact of later start times on behavioral outcomes. The authors find

that earlier school start times are associated with more total disciplinary events, out-of-school suspensions, expulsions with services, and behavioral problems.<sup>5</sup>

Figure 1: Behavioral Outcomes Associated with a One-Hour Delay in Elementary School Start Times



Source: Sleep Health<sup>6</sup>

Research also suggests that most students in the elementary grades do not receive the amount of sleep recommended to promote optimal health. The American Academy of Sleep Medicine recommends that children between the ages of six and 12 years receive between nine and 12 hours of sleep in every 24 hours.<sup>7</sup> Although national professional associations do not appear to recommend specific start times for elementary schools, the Florida Medical Association recommends that all K-12 schools start at 8:00 a.m. or later.<sup>8</sup> Individual medical professionals suggest a 7:30-8:00 a.m. range as appropriate for elementary school start times.<sup>9</sup>

## Research on Start Times in Middle Schools

The research base for later school start times is stronger in the middle grades. Because changes in adolescent sleep patterns begin with the onset of puberty, many middle school students will experience the same sleep challenges as high school students. **Therefore, the American Academy of Pediatrics recommends that both middle and high schools avoid start times before 8:30 a.m.**<sup>10</sup>

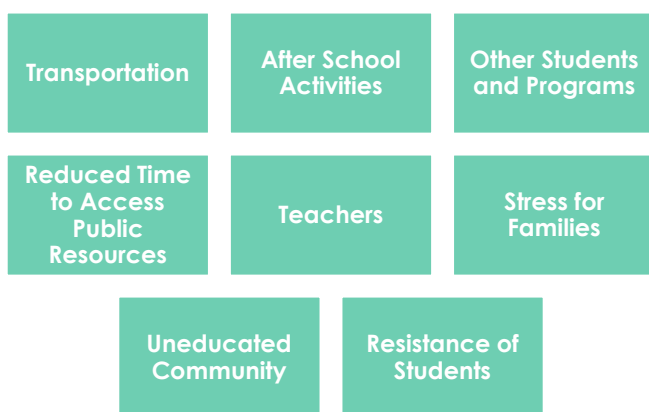
Delaying middle school start times increases students' self-reported sleep and improves academic achievement. A 2007 survey of students across two middle schools finds that students attending a school with an 8:37 a.m. start time reported an average of 50 minutes of sleep per night more than students attending a school with a 7:15 a.m. start time.<sup>11</sup> A more recent study examines academic outcomes for students attending Grades 7-8 across schools with varying start times in an anonymous school district. This

study finds that a 37-minute difference in start times across schools in the district was associated with an average of 17 additional minutes of sleep per night. Based on this finding, the authors recommend a 9:15 a.m. start time for middle schools, later than the 8:30 a.m. start time recommended by the American Academy of Pediatrics.<sup>12</sup> A 2012 study of middle schools in Wake County, North Carolina finds that delaying school start times from 7:30 a.m. to 8:30 a.m. increases standardized achievement test scores by an average of one percentile point in reading and two percentile points in math. This study also finds that the effect of delayed start times on academic achievement is strongest for students with low initial levels of achievement, suggesting that delaying start times can reduce achievement gaps in middle schools.<sup>13</sup>

## Challenges for Stakeholders

Although research firmly establishes the academic and behavioral benefits of delayed start times, especially for middle school students, stakeholders may find the transition to a new schedule challenging. These challenges may cause stakeholders to oppose changes to school start times.<sup>14</sup> The impacts of delaying school start times vary substantially across district contexts, but some challenges are common across districts.<sup>15</sup> Figure 2 lists stakeholder issues identified by the National Sleep Foundation as potential obstacles to delaying school start times.<sup>16</sup>

Figure 2: Stakeholder-Related Obstacles to Changing School Start Times



Source National Sleep Foundation<sup>17</sup>

## Challenges for Teachers

Teachers may find the transition to a new start time challenging. In particular, schedule changes that extend the end of the school day may leave teachers with less time after school for family activities. However, teachers will receive a corresponding amount of time without supervisory duties in the morning. Teachers can use this time to plan lessons and grade student

work, which will reduce the planning time needed after school. Teachers can also use additional morning time to spend time with their families or sleep. The National Sleep Foundation suggests that increasing sleep time for teachers will provide similar benefits to increased student sleep time, including increased alertness and ability to address classroom discipline challenges.<sup>18</sup>

## Challenges for Families

Like teachers, families will face changes in their schedules as a result of school start time changes. Changing schedules will be stressful for many families, particularly those with multiple children. In order to minimize stress, districts should provide families with detailed information on schedule changes as early as possible. Districts should also incorporate strategies to address families' concerns into their stakeholder engagement efforts.<sup>19</sup>

These changes may impact families' ability to provide childcare for younger children or leave children unattended after school. The National Sleep Foundation suggests that districts work with community organizations to provide additional childcare options.<sup>20</sup> Long Beach Unified School District in California required schools to develop plans to supervise students before school in support of its start time changes.<sup>21</sup> Likewise, Milford Public Schools in Delaware addressed childcare concerns by opening libraries to students who arrived at school before the start of the school day.<sup>22</sup>

## Challenges for Students

Districts may also face concerns regarding opportunities for after-school athletic activities and other extracurricular activities such as clubs or community service.<sup>23</sup> However, districts that implement start time changes typically adjust to new athletic schedules with little difficulty.<sup>24</sup> Districts can support later athletic schedules by rescheduling matches and installing lights at playing fields.<sup>25</sup>

Start time changes may also reduce the time students have after school to participate in other extracurricular activities such as community service or after school clubs and to access community resources such as libraries.<sup>26</sup> Districts can address these concerns by collaborating with libraries and afterschool programs to adjust their schedules in response to new start times.<sup>27</sup>

Schools can build student support for schedule changes by educating students about the importance of sleep. The National Sleep Foundation suggests incorporating information about sleep health into the following subjects across Grades K-12:<sup>28</sup>

- Science,
- Psychology,
- Health,
- Math,
- Social Studies,
- Geography, and
- English language arts.

## Challenges for Community Members

In addition to changing commute patterns for students and teachers, new bus schedules may affect traffic congestion in the community.<sup>29</sup> Community members may also be affected by changes related to youth activities and libraries.<sup>30</sup>

Districts should conduct outreach to as many community members as possible to build support for delayed start times. The National Sleep Foundation recommends that districts develop a standard presentation for community groups highlighting the benefits of delayed start times.<sup>31</sup> These presentations should refute common misconceptions about school start times, such as the belief that delaying school start times will result in a corresponding delay of students' bedtimes with no net gain in sleep.<sup>32</sup>

## Strategies to Engage Stakeholders

Districts can address stakeholder concerns through a systematic engagement process that incorporates stakeholder concerns into decisions. School districts should engage the entire community in conversations around start times. Changes to start times will affect a variety of community stakeholders in addition to students, teachers, and families.<sup>33</sup> Figure 3 presents Start School Later's recommendations for stakeholder engagement to support changes to school start times. These recommendations incorporate visible leadership from senior district administrators as well as problem-solving and evaluation strategies that incorporate community input.<sup>34</sup>

Figure 3: Recommendations for Stakeholder Engagement to Support School Start Time Changes

### Communication

- Focus on increasing awareness among stakeholders to ensure that the community is aware of the benefits of this change

### Time

- Lead time is important to a smooth transition

### Options

- Bring more than one potential plan to the community and to incorporate community input and suggestions along the way and to revise the options to attempt to address concerns

### Problem-Solving

- Identify concerns and investigate potential solutions

### Plans to Study the Results

- Helpful because then there is feedback about what is working well and what could be improved.

### Leadership

- From the superintendent, the school board, and sometimes help from champions within the community

Source: Start School Later<sup>35</sup>

A study prepared by the Children's National Medical Center to support a proposal to change high school start times at Fairfax County Public Schools in Virginia reviews strategies to support delayed start times at 38 school districts across the United States.<sup>36</sup> This review confirms the need for senior district leaders to visibly support start time changes and the need to conduct outreach to all stakeholders. The Children's National Medical Center recommends that community outreach emphasize the research base for delayed start times and address common misconceptions about sleep needs.<sup>37</sup>

Districts should begin the stakeholder outreach process by working with leaders of key internal stakeholder groups to identify potential logistical challenges and strategies to address them.<sup>38</sup> Districts should begin this process well in advance of planned start time changes to ensure that stakeholders have sufficient advance notice of scheduling changes, and that district leaders have time to conduct sustained engagement.<sup>39</sup>

Community leaders with expertise on student sleep needs, such as local physicians, can assist districts in

building stakeholder support for delayed start times. For example, Wilton Public Schools in Connecticut collaborated with the Connecticut Thoracic Society to develop guidelines for start times.<sup>40</sup> Likewise, a coalition of physicians, school administrators, and parents led stakeholder outreach to delay school start times at four school districts in Southern Maine.<sup>41</sup> Pediatricians supported start time changes by presenting information on students' sleep needs to school boards.<sup>42</sup>

## Engagement Methods

The Children's National Medical Center recommends that districts hold in-person meetings with leaders of community organizations to build trust and open dialogue before engaging in detailed problem-solving. After establishing trust, districts can create task forces or working groups to address specific challenges related to school start times. The Children's National Medical Center recommends establishing task-specific working groups rather than a single working group to maximize productivity.<sup>43</sup>

**Districts can also use stakeholder surveys to solicit stakeholder input regarding start time changes.** For example, Long Beach USD surveyed stakeholders to identify concerns about school start time changes. These surveys identified concerns among school staff that start time changes would impact teacher contracts and afterschool activities. Long Beach USD was able to address these concerns by collaborating with the district's teachers' union, ultimately gaining the support of teachers.<sup>44</sup>

Districts should continue to monitor the implementation of new start times after schedule changes to identify unforeseen challenges in need of mitigation and successes that can be communicated to stakeholders. Districts should administer surveys before and after implementing new start times to measure the impact of schedule changes on academic achievement and student well-being.<sup>45</sup>

## Profile – Needham Public School District

Needham Public School District in Massachusetts provides an example of a district which conducted an extended community engagement process before revising school start times. The district commissioned a School Starting Time Advisory Committee consisting of the stakeholders listed in Figure 4 to begin studying school start times in 2002.<sup>46</sup>

Figure 4: Needham Public School District School Starting Time Advisory Committee Members

- **One teacher**
- **One administrator**
- **One parent representative from the elementary, middle, and high school levels**
- **One representative of the school board**
- **One school nurse**
- **One representative of the transportation department**
- **Two high school students**
- **The director of the art department**

Source: Children's National Medical Center<sup>47</sup>

The School Starting Time Advisory Committee engaged in an intensive review of the available research examining the impact of student sleep on educational outcomes and conducted outreach to other school districts that had changed start times as well as experts on sleep needs and the National Institutes of Health. In addition to conducting external research, the School Starting Time Advisory Committee conducted surveys of high school teachers to assess students' alertness during class and conducted interviews with a sample of students regarding their preferences related to start times.<sup>48</sup>

After reviewing the impact of start times on athletic, extracurricular, and religious activities, the School Starting Time Advisory Committee presented five scheduling options to the school board in 2003. Each option delayed high school start times from 7:40 a.m. to 8:05 a.m. Scheduling options either maintained existing starting times for elementary and middle schools or moved these schools' start times to 8:05 a.m.<sup>49</sup>

After conducting an initial review of scheduling options, the school board decided to delay a final decision to avoid imposing new schedules at the same time as planned attendance zone changes. Needham Public School District used the additional time to conduct further stakeholder engagement and education. In 2004, the school board voted to adopt the start times shown in Figure 5.<sup>50</sup>

Figure 5: Needham Public School District Start Times Adopted in 2004

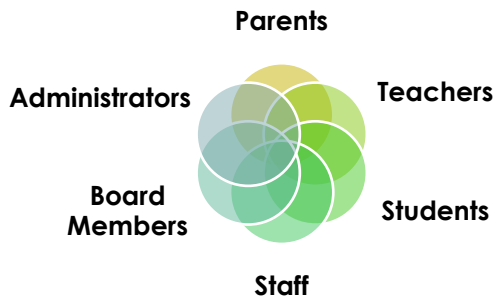
School Level	Student Day Begins
<b>High School</b>	8:05 a.m.
<b>Middle School</b>	7:50 a.m.
<b>Elementary School</b>	8:35 a.m.

Source: Children's National Medical Center<sup>51</sup>

## Profile – Phoenixville Area School District

Phoenixville Area School District (PASD) in Pennsylvania provides an example of a school district with an intensive engagement strategy to support start time changes. The school board established a committee to study start times 18 months before voting to change start times. The start times committee included representatives of the stakeholder groups listed in Figure 6.<sup>52</sup>

Figure 6: PASD Start Times Committee Representatives



Source: Phoenixville Area School District<sup>53</sup>

The school start time committee hosted three public forums at which all members of the community could discuss proposed changes to start times and solicited additional input via telephone and email. PASD also commissioned a survey of student sleep patterns. PASD also published links to local news articles discussing the benefits of later school start times to build stakeholder support.<sup>54</sup>

PASD's school board voted to implement new start times in January of 2019. Under the new schedule, each school's start time would be delayed by between 30 and 45 minutes to the times shown in Figure 7.

Figure 7: PASD Start Times, 2019-2020

School Level	Student Day Begins
High School	8:05 a.m.
Middle School	8:05 a.m.
Elementary School	8:55 a.m.

Source: Phoenixville Area School District<sup>55</sup>

PASD also developed an implementation plan to support the new schedules taking effect for the 2019-2020 school year. This implementation plan includes the action items listed in Figure 8.<sup>56</sup>

Figure 8: PASD Implementation Plan Action Items

### Communications

- eNotifications sent and website updated
- Basic FAQ developed for parent conferences
- Staff progress updates
- Community informational sessions
- Daycare partners identified and information posted on website
- eNotifications, social media, Phantom News updates

### Schedules

- Principals develop schedule guidelines
- Principals work with teacher association on schedule development
- Director of Activities identifies extra-curricular schedules and coordinates with building schedules
- Communicate new building schedules with staff
- Student services notified

### Transportation

- Develop routes with new timeline
- Conduct ghost runs to determine efficiency
- Prepare and send bus mailings
- Narrow cost estimates
- Coordinate with private schools and TCHS

### Staffing

- Analyze hourly staffing needs
- Coordinate staffing schedules with daily schedules
- Adjust instructional and non-instructional hours as needed
- Communicate schedule changes to employees
- Evaluate staff coverage and adjust as needed

### Facilities/Operations

- Update HVAC and building access schedules
- Analyze need for outdoor field lighting
- Identify facility use and rental impact
- Evaluate effectiveness of facilities staff coverage and facility maintenance

### Metrics

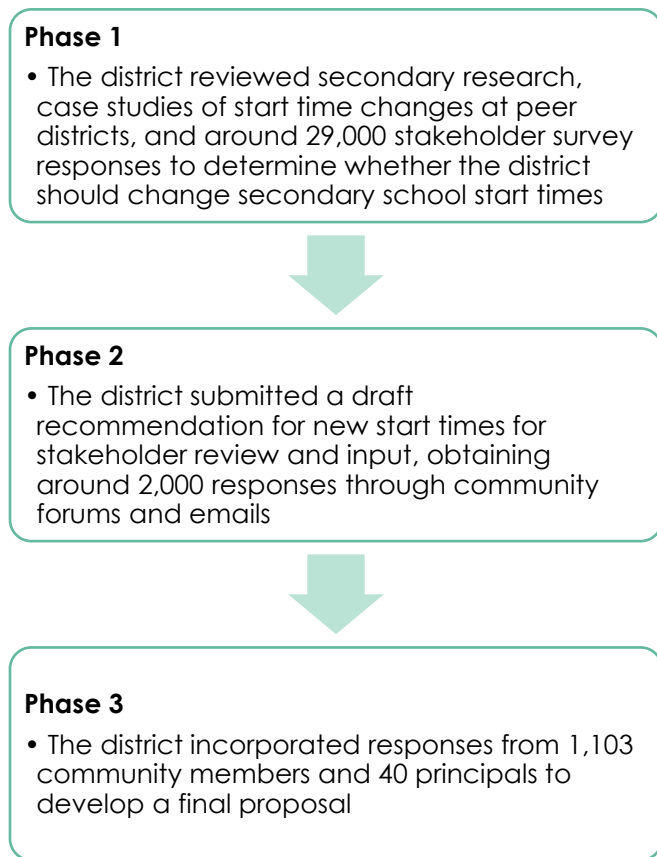
- Sleep study team to identify metrics
- Pre-implementation student survey
- Community/student/parent surveys pre and post surveys
- Identify/analyze relevant data
- Prepare report on metrics collected, survey results, and data analysis

Source: Phoenixville Area School District<sup>57</sup>

## Profile – Seattle Public Schools

Seattle Public Schools in Washington provides an example of a district which implemented strategies to mitigate stakeholder concerns regarding school start times and revised its initial scheduling plan in response to stakeholder feedback. Seattle Public Schools began conducting a feasibility study related to school start times in November 2014.<sup>58</sup> A bell time analysis followed the process outlined in Figure 9 and was completed in December of 2015.<sup>59</sup> Seattle Public Schools uses multiple strategies to solicit stakeholder input, including online surveys and small group discussions facilitated by volunteers.<sup>60</sup>

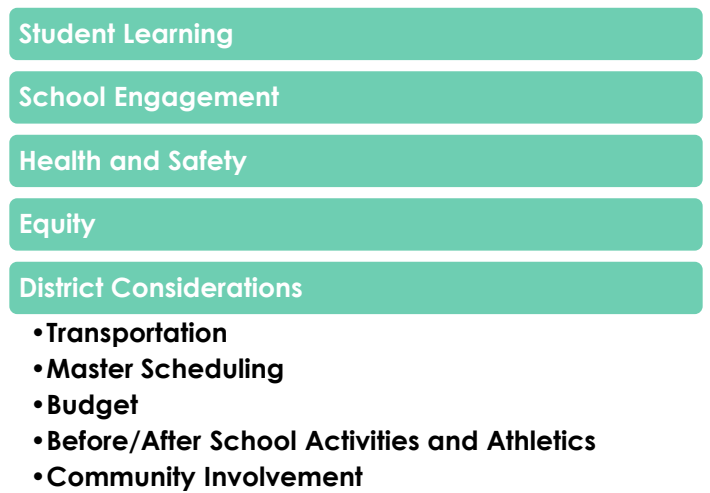
Figure 9: Seattle Public Schools Bell Time Analysis Process



Source: Seattle Public Schools<sup>61</sup>

The bell times analysis task force reviewed three scheduling options and recommended that Seattle Public Schools adopt a schedule in which high schools started at 8:50 a.m., middle schools started at 9:40 a.m. and elementary schools started at 8:00 a.m.<sup>62</sup> This recommendation reflected the criteria listed in Figure 10.

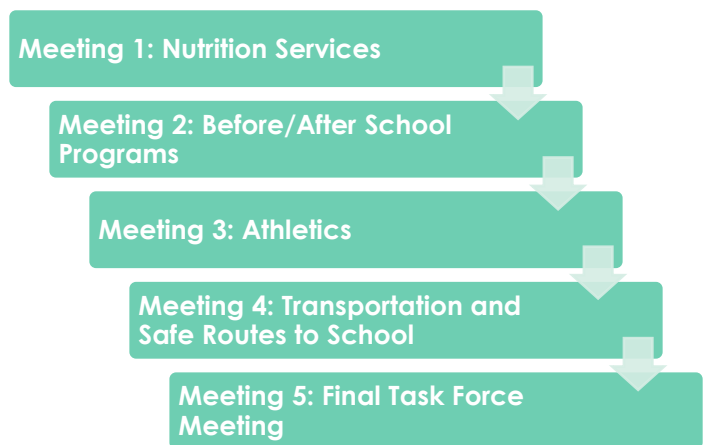
Figure 10: Seattle Public Schools Scheduling Criteria



Source: Seattle Public Schools<sup>63</sup>

After deciding to implement the analysis task force's recommendations, Seattle Public Schools commissioned a second implementation task force to develop mitigation strategies for the challenges posed by new schedules. This task force held five meetings to discuss the topics listed in Figure 11.

Figure 11: Seattle Public Schools Bell Time Implementation Task Force Meeting



Source: Seattle Public Schools<sup>64</sup>

After receiving further stakeholder input, the school board voted to adopt the start times listed [here](#) at the beginning of the 2017-2018 school year. This schedule provided an additional 20 minutes of instructional time for all students and eliminated start times after 9:00 a.m., which had created childcare challenges for some families.<sup>65</sup> Schools were divided into two tiers, with all elementary and middle schools starting at either 7:55 a.m. or 8:55 a.m.<sup>66</sup>

## Project Evaluation Form

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## Endnotes

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<sup>55</sup> Chart contents taken verbatim from: "Operational Times – 2019-20." Phoenixville Area School District. <http://www.pasd.com/common/pages/DisplayFile.aspx?itemId=79806878>

<sup>56</sup> "Sleep/School Start Time," Op. cit.

<sup>57</sup> Chart contents taken verbatim from: "New Start Times Implementation Plan." Phoenixville Area School District. <http://www.pasd.com/common/pages/DisplayFile.aspx?itemId=70179071>

<sup>58</sup> "Bell Time." Seattle Public Schools. [https://www.seattleschools.org/families\\_communities/committees/bell\\_time\\_analysis](https://www.seattleschools.org/families_communities/committees/bell_time_analysis)

<sup>59</sup> "Bell Time Analysis and Implementation Timeline." Seattle Public Schools. [https://www.seattleschools.org/families\\_communities/committees/bell\\_time\\_analysis/timeline](https://www.seattleschools.org/families_communities/committees/bell_time_analysis/timeline)

<sup>60</sup> "Public Outreach." Seattle Public Schools. [https://www.seattleschools.org/families\\_communities/committees/bell\\_time\\_analysis/timeline/public\\_outreach](https://www.seattleschools.org/families_communities/committees/bell_time_analysis/timeline/public_outreach)

[2] "Neighbor-to-Neighbor: Bell Time Analysis Review of Results from Questionnaires." Seattle Public Schools, August 11, 2015. p. 1. <https://www.seattleschools.org/common/pages/DisplayFile.aspx?itemId=1669118>

<sup>61</sup> Chart contents adapted from: "Bell Time Analysis and Implementation Timeline," Op. cit.

<sup>62</sup> "Bell Times Analysis Task Force Recommendation Report." Seattle Public Schools. p. 1. <https://www.seattleschools.org/common/pages/DisplayFile.aspx?itemId=806540>

<sup>63</sup> Chart contents taken verbatim from: Ibid., p. 3.

<sup>64</sup> Chart contents taken verbatim from: "Bell Time Implementation Task Force." Seattle Public Schools. [https://www.seattleschools.org/families\\_communities/committees/bell\\_time\\_analysis/task\\_force](https://www.seattleschools.org/families_communities/committees/bell_time_analysis/task_force)

<sup>65</sup> "Bell Times 2017-18." Seattle Public Schools. [https://www.seattleschools.org/district/calendars/news/what\\_s\\_new/school\\_calendar/school\\_calendar\\_2017-18/bell\\_times\\_2017-18](https://www.seattleschools.org/district/calendars/news/what_s_new/school_calendar/school_calendar_2017-18/bell_times_2017-18)

<sup>66</sup> "Bell Schedules." Seattle Public Schools. [https://www.seattleschools.org/district/calendars/school\\_year\\_dates/new\\_bell\\_schedules](https://www.seattleschools.org/district/calendars/school_year_dates/new_bell_schedules)