

**REPORT ON  
DELAYING THE START OF THE SCHOOL DAY**

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**INSTRUCTIONAL AND ACCOUNTABILITY SERVICES  
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EVALUATION SECTION**

## Introduction

### *Two goals of delaying start times for older students:*

- deter risk behavior
- enhance learning

This report summarizes issues related to the feasibility and advisability of delaying the start of the school day in order to provide students with constructive projects and tasks during the late afternoon hours of the school week, in response to the provisions of Session Law 1998-202, Senate Bill 1260, Part XI, Section 20(a).

This legislative charge speaks to the desire to provide children with constructive activities during the after-school hours. The anticipated benefit of such a policy would be to reduce the likelihood of students engaging in criminal and other high-risk activities during the late afternoon hours on school days. However, there is a second goal most often intended by schools and districts that have considered a delay in the start of the school day – to enhance students’ attention and learning. This goal derives from the recent research on sleep deprivation and sleep patterns for adolescents.

The issues involved in implementing such a policy depend to a great extent on which of these two outcomes the policy is trying to achieve. Although both outcomes may possibly result from a delayed start to the school day, a delay intended to prevent risk behaviors would likely involve many more logistical difficulties than a delay for the purpose of maximizing students’ learning opportunities. In order

*Delayed start times for older students may be a viable strategy to enhance learning*

to implement a delay that would have any impact on deterring or reducing afternoon juvenile crime and other risk behaviors, the school day would require a lengthy adjustment. Such a lengthy delay would significantly affect the daily lives of children, families, and school personnel. However, while still requiring comprehensive changes, a delay targeted at improving students' learning may be more feasible, since the delay would involve less time and therefore relatively fewer and less intense changes.

## Overview

The first section of this report discusses the scientific rationale for delaying the start of the school day. The second section focuses on potential barriers to delaying the start of the school day, with particular emphasis of the experiences of school districts in Minnesota, Virginia, and Maryland that have adopted or considered adopting such policies. The third section contains a summary of data gathered from a focus group of and interviews with administrators, teachers and other public school officials in North Carolina on the potential impact of a delayed start to the school day. The fourth and final section contains conclusions and recommendations as to the feasibility and advisability of delaying the start of the school day in North Carolina, based on the available scientific evidence as well as the concomitant logistical issues.

## Research Evidence

There are essentially two main bodies of research that provide support for delaying the start of the school day. One is an emerging line of research on adolescent sleep patterns which suggests a fundamental incompatibility between high school schedules and the biological needs of teenage children. The other is focused on the prevalence of juvenile crime and other risk behaviors, along with the effects of educational programs in preventing those behaviors. Taken together, the findings in these two areas point toward the potential positive effects of delaying the start of the school day. It is also important to note that the research that informs this issue focuses almost exclusively on the benefits of a delayed start for adolescents, not younger children.

*Adolescents need more sleep than they usually get*

**Sleep Deprivation and Sleep Cycles.** In recent years, there has been a surge of interest in the sleeping habits of adolescents and how disruptions in biologically optimal sleep patterns may be associated with a variety of negative behavioral and cognitive outcomes. Some initial studies to examine this phenomenon have shown that teenagers typically need around nine hours of sleep per night (Carskadon, 1999; Carskadon, Harvey, Duke, Anders, & Dement, 1980), and that they usually get much less (Allen & Mirabile, 1989). In addition, sleep deficits have been associated with adolescents' behavior and ability to learn during the day.

***Lack of sleep affects students' behavior and ability to learn***

Specifically, studies have shown that sleep deprivation is associated with:

- falling asleep in class (Epstein, Chillag, & Lavie, 1995)
- depressive mood (Wolfson & Carskadon, 1998)
- greater risk for automobile accidents (Fairfax County Public Schools, 1998)
- decreased ability to engage in complex, abstract thinking (Horne, 1993; Koulack, 1997; Randazzo, Muehlbach, Schweitzer, & Walsh, 1998)
- decreased memory ability (Dinges & Kribbs, 1991; Nilsson, Backman, & Karlsson, 1989; Li, Wu, Shao, & Liu, 1991)
- poorer grades (Wolfson & Carskadon, 1998)

In addition to the research on lack of sleep, the *timing* of adolescents' sleep/wake cycles has also been linked to learning and behavior. Studies have demonstrated that as children progress through adolescence, they may experience a biological shift in sleep/wake cycles, favoring a later bedtime and a later morning wake-up time (Carskadon, Acebo, Richardson, Tate, & Seifer, 1997; Carskadon, Vieira, & Acebo, 1993). Therefore, the typical early starting times for high schools may conflict significantly with adolescents' optimal sleep patterns. This disruption results in teenagers having to wake up at a time when their bodies are better suited to be sleeping, potentially

*Student performance  
may fluctuate between  
morning and afternoon*

resulting in drowsiness and impaired learning ability. In fact, adolescents report that they are most alert after 3 P.M. (Allen & Mirabile, 1989).

Studies of academic performance also provide some evidence that students' performance varies by time of day, although it is not conclusive as to which time of day is better. For example, Davis (1988) found that 8<sup>th</sup> grade students who took English in the afternoon showed superior achievement in English compared to students who took English in the morning. Female students have also shown higher performance in the afternoon on a variety of academic tasks (Andrade & Menna-Barreto, 1996). Students' spelling and memory abilities also appear to vary according to the time of day. However, these studies have shown that some types of errors occur more often in the morning, while other types occur more often in the late afternoon/evening (e.g., Dunne, Roche, & Hartley, 1990; Folkard, Monk, Bradbury, & Rosenthal, 1977; Morton & Diubaldo, 1995). Other research has indicated that nonmedicated students with attention deficits have better problem-solving abilities and engage in less off-task behavior in the morning (Zagar & Bowers, 1983).

In summary, the research on sleep deprivation indicates that lack of sleep has many consequences for children's learning and behavior during the day. Studies of delayed start times have shown that adolescents who start school later in the day do in fact get more

*With later start times,  
students do get more  
sleep*

sleep per night (Carskadon, Wolfson, Acebo, Tzischinsky, & Seifer, 1998; Kowalski & Allen, 1995). Therefore, a delay in the start of the school day may result in children getting more sleep per night, potentially guarding against the effects of sleep deprivation. The research on the *timing* of adolescents' sleep and how it may affect learning, however, is not quite as clear.

*Afternoon and early  
evening hours are the  
"peak time" for  
weekday juvenile  
crime*

**Risk Behaviors.** In addition to data on students' school day performance, recent data on juvenile crime also has raised awareness of the need for children to be engaged in productive activities during the afternoon and early evening hours after school. Data collected by the Federal Bureau of Investigation estimate that 47 percent of all weekday violent juvenile crime is committed between the hours of 2 P.M. and 8 P.M., with the peak time occurring from 3 P.M. to 5 P.M. (Sickmund, Snyder, & Poe-Yamagata, 1997). The prevalence of other adolescent risk behaviors, such as suicide attempts (Nakamura, McLeod, & McDermott, 1994; Rosenkrantz, 1978), also have been noted to be highest during the late afternoon/evening hours.

Given current trends in the U.S. workforce, these data are particularly troubling. The percentage of families in which both parents work full-time outside the home has been rising steadily in recent years, making it even more likely that adolescents and even young children will go unsupervised after school. In fact, between 1970 and 1992, the percentage of families whose children lacked full-

*Students need constructive after-school activities*

### Potential Barriers to Delayed Start Times

time adult supervision during the day rose from 37 to 57 percent (Fox, 1996). Delaying the *end* of the school day (by delaying the start of the school day) may provide children with some of this missing supervision, especially during the times during which they are most likely to engage in behaviors that are harmful to themselves and others.

Although delaying the start of the school day might result in some of the aforementioned benefits, several logistical barriers would have to be overcome in order to implement such a program. Some are related to a delayed start time, while others are a function of the later dismissal time that necessarily accompanies such a delay. The experiences of school districts in Minnesota, Virginia, and Maryland that have implemented or considered implementing such programs shed light on some of these barriers, which include transportation problems, extracurricular activity schedules, student employment, and changes in family routines. The barriers discussed here are based primarily on information gathered from these districts.

**Transportation.** Perhaps the most obvious and most significant economic issue in changing school start times has to do with school bus operations. School districts often operate on a “tiered” bus system, in which the same buses are used to transport elementary, middle, and high school children by staggering the pick up/drop off

times for each level. This strategy saves districts millions of dollars by not requiring each school to have its own buses and bus drivers, all running at the same time. Cost savings are realized in a tiered busing system mainly through purchasing and maintaining fewer buses and hiring fewer drivers. Experiments with later school start times in Minnesota, Maryland, and Virginia have all noted busing issues as a major consideration in the implementation of such a policy.

***A delayed start time for some schools means others must start earlier due to the sharing of buses***

If tiered busing systems are to be maintained, then decisions must be made about which schools start later and which start earlier. Assuming that a later start time would be implemented primarily for adolescents (which is consistent with the research base), a later start time for older children would have to be countered by an earlier start time for younger children in order to avoid severe increases in transportation costs for a school system. Given that many school systems already operate on such a schedule, this may not be a problem.

***May be unsafe for younger children***

This decision is not without its disadvantages, however. If the start time for elementary children is *too* early in the day, young children may have to wait in the dark at bus stops to get picked up before school during the winter, which presents a safety hazard. Transportation issues may be more or less problematic for different districts, depending on the distances buses must travel and the number of children who ride the bus. Parents who provide their own transportation may also have to readjust their work schedules in order

*May be difficult for  
working parents*

to take children to school at a different time. The importance of transportation issues may also depend on the demographics of the families in a district. For example, the juggling of work schedules in order to pick up or drop off children would probably be more difficult for families where both parents must work outside the home, or for parents whose jobs require them to be at work at a specific time each day (i.e., shift work).

*Less time for sports  
and other after-school  
activities*

**Extracurricular Activities.** Athletics and other after-school activities may also be affected by a later start time. If children are in school later in the day, then athletic events, practices and other events occurring after school must therefore also shift to later in the day. This becomes particularly problematic for outdoor activities. The need for lighted athletic fields would become more acute due to fewer hours of daylight for practices and games. In addition, the scheduling of activities in facilities that are commonly shared by the school and the larger community (gyms, pools, etc.) would become more difficult. Events for schoolchildren would have to be scheduled later, potentially encroaching on the time normally set aside for other community events at that same facility. Clearly, the later the school day runs, the greater the impact on these activities. The general consensus among districts who have implemented or considered a delayed start time is that a small change (e.g., 30-45 minutes) may be manageable. Yet such a

*A delayed start may affect students who have after-school jobs*

small change will not have the desired effect of engaging adolescents for many more afternoon hours.

**Student Employment.** Particularly for high school students, after-school jobs are an issue to consider. Getting out of school later in the day leaves students fewer hours to work. Students who need to work to help provide for their families may be particularly affected, as the number of hours that they could work would decrease. This may have financial consequences for these students and their families. With respect to the opinions of employers, the consensus among other school districts that have studied this issue is that area businesses would accommodate students' arriving later at work on weekdays, as long as the change is not too drastic.

**Family Routines.** Other possible impacts of delaying the start of the school day involve family routines and responsibilities (Wrobel, 1999). For example, if parents rely on older children to care for their younger siblings between the time they arrive home from school and the time parents return from work, then a later dismissal time for adolescents may require parents to seek after-school child care. This may result in a significant expense for families, particularly those at lower income levels. Family routines such as preparation and sharing of meals or the carrying out of other household duties may also be

*Daily family routines  
may be upset by a  
change in their child's  
school schedule*

adversely impacted if older children were to come home later from school. Many of the previously discussed issues also may have an impact on families, especially transportation issues if families normally drive their own children to and from school.

**Student and Teacher Satisfaction.** Data reported from high schools in Minneapolis which actually implemented a later start time (moved from 7:15 A.M. to 8:40 A.M.) have indicated mixed reactions from students, teachers and parents (Kubow, Wahlstrom, & Bemis, 1999). In this study, data collected from focus groups of urban students indicated that they felt like they had less time for homework, athletics, and other after-school activities. Students from suburban schools, however, were more satisfied and reported feeling more rested for school. Both urban and suburban students also reported that some athletic practices had been moved to the early morning in response to the later start time, effectively negating some students' ability to get more sleep.

Teachers in these later-starting schools felt that students were much more alert during the first two periods, but they also reported that some students appeared tired at the end of the day. Among teachers who were also coaches, concerns were expressed about the number of times student-athletes had to be excused from last-period classes in order to get to events on time. Teachers were very happy with the extra time in the morning, either to better prepare for their

*Reactions from students and teachers in schools that have implemented delayed start times are mixed*

classes or to enjoy some personal time before work, but some were also unhappy about having to drive in heavier traffic in the afternoon due to the change in schedule.

In the Minneapolis experiment, middle school start times were also delayed, from 7:40 A.M. to 9:40 A.M. Although data from students were not reported, school personnel were largely unhappy with the later start time, citing fatigue late in the day (among students and teachers), as well as students often having to leave before the end of the day for various reasons. The authors of this “satisfaction study” concluded that optimal start times may vary according to a variety of factors, including the age groups involved and socioeconomic factors.

**North Carolina Perspectives**

A few school districts were identified through an email query, as well as other less formal methods, in order to identify school districts which had either considered or implemented a delayed start to the school day. Only one district was identified that had actually implemented a delayed start time of their own volition. In order to obtain more detailed information, a focus group of teachers, local administrators, and state officials was convened. Participants were asked to discuss their experiences with and/or reasons for considering a delayed start time for high schools, with particular emphasis on the advantages and disadvantages they perceived to be associated with such a policy. Phone interviews were conducted with other school

*The concerns expressed by districts in other states were echoed by North Carolina educators*

personnel who were unable to attend the focus group.

Overall, the participants raised the same issues that had been raised by the school districts in other states. Transportation officials at the local and state level spoke to the need to “stagger” start times in order to make efficient use of bus resources. They also stated, however, that this is already being done in many systems in North Carolina. Concerns were also raised about teenage drivers having to drive home from school during “rush hour”, especially in urban areas, if the school day ended later in the day.

Concerns regarding extracurricular activities were spoken to as well. One athletic coach echoed the sentiments of the coaches interviewed in the Minneapolis study, saying that a small change would not have much impact on athletics, but that a substantial change that required students to be in class until late afternoon/early evening might seriously disrupt scheduling for practices and games. One administrator whose district had recently moved high school start times from 7:35 A.M. to 8:40 A.M. commented that the later-running school day did not pose a problem for athletics, mainly because their school day schedule was still fairly compatible with the other schools in the same athletic conference.

There was not consensus with respect to the issue of athletics, however. Principals from two large high schools spoke out strongly against later start times because of students’ leaving school in order to

get to athletic contests. One principal even expressed the desire for an earlier time than their current 7:30 A.M. start to avoid such problems.

With respect to effects on the learning environment, the district that had already adopted later start times reported that the number of students coming late to school dropped significantly. The later start time also was perceived to significantly enhance the learning environment during the early periods of the day, with students and teachers being more awake and alert. This observation also was shared by the teachers in the group, as well as some district-level administrators who had prior experience with later start times. A group of high school teachers who had petitioned their local board for permission to change their school's start time stated that their request was based largely on the research on adolescent sleep habits. The teachers felt that by moving their school's start time from 7:30 A.M. to 8 or 8:30 A.M., they would reap the benefits of fewer tardy students, more attentive students, and a school day which matched students' biological predisposition for efficient learning in the afternoon (although the actual research on afternoon learning is very sketchy).

*There were mixed views on the effect later start times might have on instruction and learning*

Some potential negative impacts on instruction also were mentioned. One principal stated that the hours immediately after school currently were being used for tutoring sessions and for making up missed tests, and that a later start would push these activities even later into the afternoon. This individual also mentioned the potential

## Conclusions & Recommendations

impact that a later start time would have on teachers who either work second jobs (e.g., teaching at the local community college) at night, or who are pursuing advanced degrees through evening classes at universities.

**Implementing a delay which is long enough to deter crime may be too prohibitive; other efforts such as early intervention and after-school programs may be more effective.**

Despite the statistics on juvenile crime in the afternoon hours, there is no evidence at this point that delaying the start of the school day has any effect on crime (Wahlstrom, 1999). This conclusion is not due to inconclusive or contradictory research findings; it is due to the fact that no studies could be found which addressed the relationship between these two factors. In addition, a delayed start time intended to prevent juvenile crime assumes that the children who are committing crimes in the afternoon are *actually attending school in the first place*. Research indicates that students who are truant or who drop out of school are more likely to be delinquent (Chavez, Oetting, & Swaim, 1994; Ingersoll & LeBoeuf, 1997), raising the possibility that many afternoon juvenile crimes may be perpetuated by children who are not attending school, although this link has not been adequately studied.

Another potential problem with this approach is the amount of time that the school day would have to be delayed in order to have an

***A delay to deter crime would require moving the school day well into the evening hours***

impact on crime. As was noted in the section on potential barriers, many of the barriers to implementing delayed start times become more problematic as the amount of the delay increases. It would appear, based on the afternoon juvenile crime data, that a fairly significant delay would have to be implemented in order to cover the full range of hours during which juvenile crime is at its peak.

***Early intervention and after-school programs may be more efficient and effective ways to prevent crime and other risk behaviors***

There is evidence, however, in support of other school-related initiatives that have been shown to reduce juvenile delinquency. Early intervention programs for young at-risk children have been shown to be effective in reducing a variety of risk behaviors, including criminal activity. For example, several studies have demonstrated that at-risk children who receive high-quality education and intervention during early childhood are less likely to engage in criminal behavior during adolescence and adulthood (Coie, 1996; Greenwood, Model, Rydell, & Chiesa, 1998; Lally, Mangione, Honig, & Wittner, 1988; Schweinhart & Weikart, 1997). In addition to documented academic and social benefits, after-school programs also show promise with respect to reducing crime and other adolescent risk behaviors (Posner & Vandell, 1994; U.S. Department of Education, 1998). School-related policy initiatives intent on deterring juvenile crime or other risk behaviors may therefore yield better results if they take the form of early education/intervention programs or after-school programs, and also may have other positive social and educational effects. In fact,

preliminary results from the Support Our Students (SOS) Program, a state-level initiative which is currently operating in 76 counties across North Carolina, indicate potential benefits to students including better grades and increased school attendance (Division of Youth Services, 1998).

**A small delay in the start of the school day at the high school level may benefit learning, but the advisability and feasibility of such a change will vary greatly across different schools and districts.**

Based on the data collected from North Carolina as well as from school districts in other states, there are many issues which need to be considered in implementing a delayed start to the school day. Such a delay does show some promise, however, for increasing student learning. Perhaps the most important consideration in delaying the start of the school day is the consideration of local situational factors, including acceptance of such a change by the local community. The advisability and feasibility of delaying the start of the school day for the purpose of enhancing learning will vary considerably based on a host of factors which will be specific to individual schools and individual districts. In addition, the potential academic benefits of this delay appear to focus primarily on adolescents, suggesting that this change in start time is best suited to high schools.

*A small delay in the start of the school day may result in academic benefits for older students, but the advisability and feasibility of a delay will depend on local community factors*

Many of the potential barriers to implementing such a policy would appear to vary from location to location, including the number of students in the school system, the distribution of students across grade levels, the socioeconomic characteristics of the community, and the current times at which the school day begins. Small changes in start times (30-60 minutes) probably would be more feasible than significant shifts in the school day. Although delaying start times may be a viable strategy for improving students' learning, the myriad of factors which would be impacted by such a change, as well as the variance in these factors across different areas of the state, calls for careful and thoughtful consideration. Deliberations regarding local implementation need to include significant community input, including that of teachers, coaches, parents, transportation officials, and students.

In sum, the advisability of delaying school start times for purposes of enhancing learning for adolescents is a potentially fruitful, yet complex issue, requiring considerable input at the local level from a wide variety of constituents. Locally-implemented pilot programs at the district or school level may provide a good starting point for evaluating effectiveness, and would provide some valuable information as to the wisdom of expanding such programs to other schools and districts. Due to the preliminary and somewhat contradictory evidence as to its effectiveness, this issue also could benefit from further study. Such pilot programs may provide a

mechanism to better judge the utility of those programs in achieving better student outcomes.

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