

STUDENT IMPACT COMMITTEE: SAFETY

Executive Summary

Topic:	Safety Impact												
Description:	<p>72,000 Secondary Students enrolled in FCPS grades 7-12 includes Mason District Middle Schools include 6th grade Glasgow, Poe, Holmes)</p> <p>84,000 Elementary Students K-6th , minus 6th graders at Glasgow, Poe, and Holmes)</p> <p style="text-align: right;">(enrollment approximate: based on 12,000/grade)</p> <p style="text-align: center;"><u>SAFETY IMPACT SUMMARY</u></p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px auto;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 25%;">High School</th> <th style="width: 25%;">Middle School</th> <th style="width: 35%;">Elementary School</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Better Scenario</td> <td style="text-align: center;">2nd/3rd tier A, B, C, D, E</td> <td style="text-align: center;">3rd tier C, D,</td> <td style="text-align: center;">Late 1st tier A,C or 2nd/3rd tier</td> </tr> <tr> <td style="text-align: center;">Worse Scenario</td> <td style="text-align: center;">1st tier <i>Current</i></td> <td style="text-align: center;">1st tier E, <i>current</i></td> <td style="text-align: center;">Early 1st tier B, D, E</td> </tr> </tbody> </table>		High School	Middle School	Elementary School	Better Scenario	2 nd /3 rd tier A, B, C, D, E	3 rd tier C, D,	Late 1 st tier A,C or 2 nd /3 rd tier	Worse Scenario	1 st tier <i>Current</i>	1 st tier E, <i>current</i>	Early 1 st tier B, D, E
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Potential Impacts:	<p>The potential impacts of safety issues and school bell schedules include the following:</p> <ol style="list-style-type: none"> 1.Car accidents <ul style="list-style-type: none"> ○The number 1 killer of teens ○Drowsy driving is a major contributing factor 2.Crime and Gang Activity during unsupervised hours after school <ul style="list-style-type: none"> ○Later HS and MS start times mean reduced opportunity for youth crime victimization & juvenile crime including gang-related crime, all of which peak during after-school hours ○These problems will not shift to before-school hours 3.Students walking to or from school or arriving at bus stops in the dark <p>FCPS Student Achievement Goals:</p> <ol style="list-style-type: none"> 2.1. Demonstrate sound moral character and ethical judgment: <ol style="list-style-type: none"> 2.1.6. Protect others' health and safety. 2.8. Make healthy and safe life choices. 												

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Transition Requirements:	Civil twilight parameters as voted on by the TTF need to be followed during implementation. The safety of Elementary Students is dependent on enforcing the limits (earliest pickup of 7:00AM for base school and special education students) recommended by the Task Force.
Majority and Minority Opinions:	
TTF Student Representative Comments:	<ul style="list-style-type: none"> ■ Do not want to compromise the safety of elementary students. ■ More sleep would have a positive impact on health, safety and learning—too tired to drive some mornings, but has to anyway. ■ Chantilly has started late (on Fridays) for the past 2 years now. During the early stages last year (first 3 quarters), there was a large problem with traffic. The neighboring middle school starts at the same time as Chantilly does on Friday resulting in massive amounts of traffic. The solution was community outreach. The high school and middle school worked together, along with the parents, to devise a plan to lower the traveling time. Shifting lanes and changing traffic patterns had an immediate effect, and there is no longer an issue.
Conclusion:	<p>Recommend: Option C</p> <p>Based on safety, A and C are better for elementary students. C and D do the most to reduce unsupervised time for middle school students in the afternoon. All options improve driving safety for high school students by reducing drowsy driving and increasing their driving during daylight hours.</p>

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Potential Impacts:	<p>The major issues with safety and school bell schedules include the following:</p> <ul style="list-style-type: none"> ■ Car accidents ■ Crime and Gang Activity during unsupervised hours after school ■ Students walking to or from school or arriving at bus stops in the dark
	<p>Car Accidents</p> <p>Driving accident rates are a key component of the safety factor because a high percentage of Fairfax County high school students drive to school each day. In conversations with parents, a high percentage expressed their concern about their children driving to school, especially in the winter when it is still dark and roads can be hazardous.</p>
Car Accident Research	<p>What research is there about student driving accidents and safety?</p> <p>Car crashes are the No. 1 killer of teens, according to the National Highway Traffic Safety Administration (NHTSA).</p> <ul style="list-style-type: none"> ■ Experts attribute the high rate of car crashes to many factors, including inexperience, speed, risk-taking, use of drugs and alcohol, as well as drowsy driving. ■ According to the U.S. Department of Transportation National Highway Traffic Safety Administration, there were 269 reported deaths in 1996 for drivers between the ages of 15 to 19 in which the factors of drowsiness, sleepiness, asleep at the wheel or fatigue were involved. <p>The Arlington Advisory Council on Instruction Research Report included information that the worst time for these incidents is early in the morning.</p> <p>The 1998 FCPS Task Force, included the following information about student driving in their report:</p> <ul style="list-style-type: none"> ■ “A higher risk of morbidity and mortality is associated with chronic sleep deprivation in that most common of adolescent preoccupations - driving. In a study of driving behavior, Dr. David Brown, Director of the Center of Sleep Evaluation at Optima Health in Manchester, NH reported that 17percent of 166 high school drivers reported having fallen asleep at the wheel at least once. Some 64 percent of students surveyed believed that sleep deprivation worsened their school performance, but only 35 percent felt that sleep deprivation impaired their ability to drive. This is a potentially life threatening misconception according to Dr. Brown. It may not be until a student experiences a close call or accident that the danger of sleepiness will be appreciated.

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<p>Car accident research (cont)</p>	<ul style="list-style-type: none"> ■ In the study, "Characteristics of Crashes Attributed To The Driver Having Fallen Asleep," 55 percent of these accidents were with drivers 25 years of age or younger, and the peak age was 20 years old. There were almost an equal number of accidents for those 18 and 19 years of age. The study notes that the "high rate of fall-asleep crashes in young drivers is probably the result of them being excessively sleepy due to sleep deprivation secondary to lifestyle." The study goes on to note that sleepiness in the driver, even if the driver does not fall asleep, "degrades performance with reduced vigilance, slowed reaction times and attention deficits." The result is that there may be even more accidents where sleepiness has played a role than the actual number of fall-asleep crashes. This study was conducted in the state of North Carolina where police officers note the physical condition of the driver in an accident report. The codes include "fatigued" and "asleep" (Pack et.al., 1994). 1998 Task Force, pp 24-26): <p>Other studies show the following:</p> <ul style="list-style-type: none"> ■ More than half (55%) of all asleep-at-the-wheel car crashes involve drivers 25 and younger, according to a North Carolina study. ■ A National Sleep Foundation 2006 poll of teens found that 51 percent said they have driven drowsy in the past year, and 15 percent at least once a week. (This rose to 68 percent and 20 percent, respectively, by 12th grade.) In addition, 9 percent of 12th-graders said they have actually fallen asleep at the wheel in the past year. ■ According to a 2007 Children's Hospital of Philadelphia/State Farm study of teen driving habits, based on a survey of 5,665 students: Taking the wheel without having enough sleep is not often considered to be as much of a risk as driving after drinking. However, the consequences are certainly as great for teens, who are often challenged by academic pressures, multiple extracurricular activities and early school start times. The majority of drowsy driving-related crashes are caused by drivers who are younger than 25 years. ■ RISKY DRIVING BEHAVIORS – Although only half of teens report seeing drunk driving by teen drivers at least sometimes, three-fourths of respondents report seeing fatigued driving by teens. http://stokes.chop.edu/programs/injury/files/PCPS_Reports/1289teen.pdf ■ According to the NHTSA expert panel on Driver Fatigue and Sleepiness "Young people, and males in particular, were the most likely to be involved in fall asleep crashes" (Pack et al, 1995). The same study reported sleepiness-related crashes are most common in drivers age 16 to 25. ■ "Fall asleep crashes may kill more young Americans than alcohol related crashes."(Mark Mahowald, M.D. in the quarterly <i>Sleep Medicine Alert</i>, Summer 1999, published by the National Sleep Foundation.)
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	<ul style="list-style-type: none"> ■ The National Highway Traffic Safety Administration, for example, drowsiness and fatigue cause more than 100,000 traffic accidents each year--and young drivers are at the wheel in more than half of these crashes.
<p>Car Accidents Other Jurisdictions</p>	<p>Were other jurisdictions concerned about student accident rates?</p> <p>Minnesota: One reason cited for switching to later start times was to lower risk of teen auto accidents.</p> <p>Have other jurisdictions studied crash rates after shifting to later high school bell schedules?</p> <p>Fayette, Ky: This study also looked at the rate of traffic accidents in the school system before and after the change to a later start. While the statewide rate of crashes increased 8% over the two years after the change, Fayette County, which was previously one of the counties with the highest crash rates, reduced its crashes by over 15%. See the following summary from study accepted for publication in Adolescent and Family Health (courtesy of Dr. Fred Danner, U. of Ky.):</p> <ul style="list-style-type: none"> ■ Moving the school start time one hour later for all of the adolescents in one large county school district (the only county to do so during the period of this study) resulted in meaningful increases in sleep time, an increase in the percentage of students who got an adequate amount of sleep (8-9 hours cf., Carskadon, 1999) and a decrease in catch-up sleep on weekends. It was also associated with a significant drop in auto collision rates for high school aged drivers in that county, while crash rates increased in the rest of the state during the same time period. These findings are not necessarily causal since they are not the result of a direct assessment of the sleep habits of drivers who did and did not have accidents. However, these data are consistent with the idea that allowing adolescents to sleep more on school nights by delaying the start of school not only results in them sleeping more but also may have a measurable positive effect on their driving safety. <i>Fred Danner, Ph.D, Department of Educational and Counseling Psychology, 243 Dickey Hall, University of Kentucky, Lexington, KY, 40506. USA; Barbara Phillips, M.D, Department of Internal Medicine, MN618 Medical Science Building, University of Kentucky, Lexington, KY, 40506. USA.</i>

	<p>Juvenile Crime</p> <p>The peak time for both juvenile crime and victimization are the afternoon hours after school.</p>
<p>Juvenile Crime Research</p>	<p>A 2006 report from the U.S. Department of Justice Office of Juvenile Justice and Delinquency Prevention shows that both juvenile violent crime and juvenile victimization peak in the afternoon hours after school. Concludes there is more potential to filling 3-7 pm time than in juvenile curfews (go to beginning of Chapter 3). http://www.ojjdp.ncjrs.gov/ojstatbb/nr2006/downloads/chapter3.pdf http://www.ojjdp.ncjrs.gov/ojstatbb/nr2006/index.html</p> <p>In the 1999 National Report Series <i>Juvenile Justice Bulletin entitled Violence After School</i> the hours after school are identified as critical: http://www.ncjrs.gov/pdffiles1/ojjdp/178992.pdf (located through www.fcps.edu/HerndonHS/Coalition/ResourceCenter.htm and http://www.iir.nycg/publicatons.htm)</p> <ul style="list-style-type: none"> ■ “The real problem area is not the school itself but the world our children return to after the dismissal bell rings. In today’s society, fewer and fewer children have a parent waiting for them at home when school lets out. As a result, youth often supervise themselves and younger siblings after school with varying degrees of oversight by parents and guardians. Most juveniles are responsibly engaged in an array of positive activities, such as sports, clubs, or homework, or they “hang out” harmlessly with friends. However, for youth who have few activities available, whose friends are prone to negative behavior, or who experience other risk factors, the unsupervised hours between school and dinnertime offer ample opportunity to go astray. Statistics show that serious violent crime committed by juveniles peaks in the hours immediately after the close of school.p.1 ■ At the same time, we should not fail to recognize that during these afterschool hours, juveniles are most likely to become victims of crime, including violent crimes such as robberies and aggravated assaults. In this unsupervised time, youth are more vulnerable and more likely to be exploited, injured, and even killed.p.1 ■ Youth also are at much greater risk of crime victimization in the hours immediately following school dismissal. Youth victimization of violent crimes (murder, assault, robbery, rape, sexual abuse) increases dramatically at 3:00 pm, and nearly half of all violent crime against youth occurs between 3:00 pm and 8:00 pm on school days. Office of Juvenile Justice and Delinquency Prevention, <i>Juvenile Offenders and Victims: A National Report</i>. Washington, D.C.: U.S. Department of Justice, 1995. ■ Therefore, the rate of juvenile violence in the afterschool period is four times the rate in the juvenile curfew period. This analysis suggests that the potential for reducing a community’s juvenile violent crime rate is greater for efforts to reduce juvenile crime after school than for juvenile curfews.p3 <p>Baltimore saw a 44% drop in youth victimization by violent crimes after opening after school programs in a high crime area. Juvenile arrests dropped 10% and the number of armed robberies dropped in half. Baltimore Police Department Division of Planning and Research, <i>Juvenile Victimization Comparison for Goodnow PAL Center Area</i>. Baltimore, MD: Baltimore Police Athletic League, 1998.</p>

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<p>Juvenile Crime Other Jurisdictions</p>	<p>What is the experience of other jurisdictions which switched to later start times?</p> <p>Arlington (from Advisory Council on Instruction report)</p> <ul style="list-style-type: none"> ■ The opportunity that early dismissal present for anti-social, criminal and high-risk behavior has also been cited as a concern. According to Arlington County Deputy Police chief John Haas, “We would love to see down time between high school dismissal time and the start time for extracurricular activities eliminated entirely, thus eliminating opportunities for mischief and criminal activity. <p>Minnesota:</p> <ul style="list-style-type: none"> ■ found fewer referrals for disciplinary action at schools ■ Minnesota stated the following in Consequences of Unmet Sleep Needs (from Final Report Summary): Risks for adolescents lacking sleep include daytime sleepiness, vulnerability to catastrophic accidents (echoed by Dr. Mark Mahowald, director of the Minnesota Regional Sleep Disorders Center at Hennepin County Medical Center in Minneapolis), mood and behavior problems, increased vulnerability to drugs and alcohol, and development of major sleep disorders (Carskadon, 1990).
	<p>Gang Activity</p> <p>Students are vulnerable to gang violence and recruitment during unsupervised hours after school.</p>
<p>Gang Activity Research</p>	<p>The Fairfax County Coordinating Council on Gang prevention lists the following as one of its five major areas of focus: “Bridging the gap – Identifying and coordinating after-school services for youth, a prime recruitment time for gangs.” http://www.co.fairfax.va.us/gangprevention/council/</p> <p>The Virginia Gang Investigators Associations website Tips for Parents indicates “the early adolescent years (12-14 years of age) are a crucial time when youths are exposed to joining a gang.” http://www.vgia.org/Tips for Parents.pdf</p> <ul style="list-style-type: none"> ■ Nearly 60% of all youth gang-related crime occurs on school days and almost all of that in the hours immediately after school dismissal. The hour between 3:00 pm and 4:00 pm is the worst for gang crime and violence. H. Snyder and M. Sickmund, Juvenile Offenders and Victims: 1997 Update on Violence. Washington, D.C.: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention, 1997.

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	<p>Civil Twilight</p> <p>It is only logical that students are safer if they are not walking to school or waiting at the bus stop in the dark.</p> <p>Civil twilight has been adopted as a reasonable definition for determining whether it is too dark for students to be walking to school. The term is not used in any FCPS regulations or policies, but is one that is defined by the US Naval Observatory as follows:</p> <ul style="list-style-type: none"> ■ Twilight: Before sunrise and again after sunset there are intervals of time, twilight, during which there is natural light provided by the upper atmosphere, which does receive direct sunlight and reflects part of it toward the Earth's surface. Some outdoor activities may be conducted without artificial illumination during these intervals, and it is useful to have some means to set limits beyond which a certain activity should be assisted by artificial lighting. ■ Civil Twilight is defined to begin in the morning, and to end in the evening when the center of the Sun is geometrically 6 degrees below the horizon. This is the limit at which twilight illumination is sufficient, under good weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under good atmospheric conditions in the absence of moonlight or other illumination. In the morning before the beginning of civil twilight and in the evening after the end of civil twilight, artificial illumination is normally required to carry on ordinary outdoor activities. Complete darkness, however, ends sometime prior to the beginning of morning civil twilight and begins sometime after the end of evening civil twilight. http://aa.usno.navy.mil/faq/docs/RST_defs.php#top ■ The latest morning civil twilight for Fairfax County is approximately 7:10am ■ The earliest evening civil twilight for Fairfax County is approximately 5:17pm
Civil Twilight and The Current Bell Schedule	<p>In order to assess the impact of the proposed bell schedule changes, one needs to understand the current bell schedule's impact on students traveling to school in the dark.</p> <ul style="list-style-type: none"> ■ Based on current start time information, all high schools have a start time of 7:20-7:30am, except for TJHSST. With travel times of up to 1 hour and buses arriving by 7:00am at most of these schools, many students are leaving home at 6:00am, which is before civil twilight for 142 of the 183 school days. ■ Currently, middle schools have more staggered start times. Only 5 middle schools have start times of 7:20 with only 2 schools having buses arrive beginning at or before 7:00am. With a median bus arrival time of 7:25, students with a travel time to school of one hour are leaving home at 6:25, which is before civil twilight for 106 of the 183 school days. ■ Based on the Counts by AM pick up time, over 1,008 bus routes violate civil twilight to some extent. If each of those buses routes carries 25 students, over 25,200 students ride buses that violate civil twilight. Of these, 35 are elementary school routes carrying 875 students.

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	<ul style="list-style-type: none"> ■ Based on the Counts by PM drop off time, assuming the times in the chart are the last drop off, the 53 buses in the 5:15pm+ column are in jeopardy of violating evening civil twilight. The majority of these buses are TJ (48), 4 are from other high schools and 1 from an elementary school.
<p>Civil Twilight and Later Start Times</p> <p>Comments</p>	<p>Do any of the scenarios increase the number of elementary school students going to and from school in the dark?</p> <p>By establishing parameters for civil twilight, the TTF has given the transportation department guidelines that avoid civil twilight violations for base school students. The TTF has voted that no elementary students will be picked up before 7am to avoid violating civil twilight except for approximately 11 days per school year.</p> <p>These parameters become a driver of the cost of the various options. The number of civil twilight violations is fixed and is no longer a variable to consider for impacts.</p> <p>When Linda Farbry provided cost data for the TTF at the 1/8/08 meeting, the costs were driven in part by the expected number of buses that were needed to avoid civil twilight violations except as allowed by the TTF's votes on parameters (no pick ups before 7am for base school elementary students). She reported the highest costs for the 7:30AM start times in options B, D, and E, which placed some elementary schools in the first tier with these early start times.</p>

SOURCES:

- Fairfax County Public Schools, Transportation Task Force 2007/2008, website <http://www.fcps.edu/fts/taskforce07/documents/index.htm>
 - Arlington Advisory Council on Instruction, Research Report
 - 1998 FCPS Task Force Report, pp 24-26.
 - Counts by AM pick up time
 - Counts by PM drop off time
- Dr. Jane Stutts, Principal Investigator, The University of North Carolina Highway Safety Research Center, Drowsy Driving Crash Study. CB# 3430, Chapel Hill, NC 27599, Phone: 919-962-2202 or (in NC) 800-672-4527 Fax: 919-962-8710. http://www.hsrc.unc.edu/news_room/1999-12-21_drowsy_driving_crash_study.cfm
- National Sleep Foundation, 2006 Sleep in America Poll. http://www.sleepfoundation.org/site/c.huIXKjM0Ix/b.2419167/k.14D6/2006_Sleep_in_America_Poll.htm

SOURCES: (cont)

- Children's Hospital of Philadelphia and State Farm, the Center for Injury Research and Prevention. Driving: Through the Eyes of Teens. 2007.
http://stokes.chop.edu/programs/injury/files/PCPS_Reports/1289teen.pdf
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- Baltimore Police Department Division of Planning and Research, Juvenile Victimization Comparison for Goodnow PAL Center Area, Baltimore, MD: Baltimore Police Athletic League, 1998.
- Fairfax County Coordinating Council on Gang Prevention.
<http://www.co.fairfax.va.us/gangprevention/council/>
- Virginia Gang Investigators Associations, Tips for Parents, [http://www.vgia.org/Tips for Parents.pdf](http://www.vgia.org/Tips%20for%20Parents.pdf)
- US Naval Observatory, "Rise, Set, and Twilight Definitions",
http://aa.usno.navy.mil/faq/docs/RST_defs.php#top, February, 2008.