

Appendix A. FCPS Adjusted Transportation Expenditures (FY 2004-2005)

| Description | ALLOCATED AMOUNTS | | | BY OPERATIONS TYPE | | BY TRANSPORTATION TYPE | |
|---------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | | | 70% | 30% | 65% | 35% |
| | Sub-Total by Object | Excluded Amounts | Adjusted Total | Transportation | | | |
| | | | Operations | Fleet Operations | Regular Education | Special Education | |
| Director | \$ 90,834.48 | | \$ 90,834.48 | \$ 90,834.48 | | \$ 84,592.55 | \$ 6,241.93 |
| Coordinator | \$ 407,354.70 | | \$ 407,354.70 | \$ 325,883.76 | \$ 81,470.94 | \$ 379,362.26 | \$ 27,992.44 |
| Business Specialist | \$ 815,222.66 | | \$ 815,222.66 | \$ 815,222.66 | | \$ 575,535.72 | \$ 239,686.94 |
| Technician | \$ 399,524.62 | | \$ 399,524.62 | \$ 399,524.62 | | \$ 282,058.75 | \$ 117,465.87 |
| Office Assist Dept | \$ 738,223.45 | | \$ 738,223.45 | \$ 738,223.45 | | \$ 521,175.36 | \$ 217,048.09 |
| Route Supervisor | \$ 1,652,066.56 | | \$ 1,652,066.56 | \$ 1,652,066.56 | | \$ 1,166,335.72 | \$ 485,730.84 |
| Overtime | \$ 939,581.15 | \$ 160,421.45 | \$ 779,159.70 | \$ 779,159.70 | | \$ 535,178.24 | \$ 243,981.46 |
| Overbase Salaries | \$ 2,970,254.63 | \$ 504,733.15 | \$ 2,465,521.48 | \$ 2,465,521.48 | | \$ 1,693,482.67 | \$ 772,038.81 |
| Bus Driver | \$ 31,529,407.16 | \$ 971,464.41 | \$ 30,557,942.75 | \$ 30,557,942.75 | | \$ 21,573,477.19 | \$ 8,984,465.56 |
| Hourly Office Assist | \$ 9,351.64 | | \$ 9,351.64 | \$ 9,351.64 | | \$ 8,709.02 | \$ 642.62 |
| Outstand Perf Award | \$ - | | \$ - | \$ - | | \$ - | \$ - |
| VRS State Retirement | \$ 57,867.19 | | \$ 57,867.19 | \$ 57,751.56 | \$ 115.63 | \$ 40,853.42 | \$ 17,013.77 |
| ERFC Retirement | \$ 19,798.28 | | \$ 19,798.28 | \$ 19,758.72 | \$ 39.56 | \$ 13,977.31 | \$ 5,820.97 |
| FCSRS Cnty Retirement | \$ 3,682,006.54 | \$ 208,115.86 | \$ 3,473,890.68 | \$ 3,466,949.42 | \$ 6,941.26 | \$ 2,452,517.89 | \$ 1,021,372.79 |
| VRS - Health - ER | \$ 3,489.34 | | \$ 3,489.34 | \$ 3,482.37 | \$ 6.97 | \$ 2,463.42 | \$ 1,025.92 |
| Social Security | \$ 3,544,691.90 | \$ 205,237.95 | \$ 3,339,453.95 | \$ 3,332,781.31 | \$ 6,672.64 | \$ 2,357,607.45 | \$ 981,846.50 |
| Cnty Life Insurance | \$ 142,355.62 | \$ 3,292.99 | \$ 139,062.63 | \$ 138,784.77 | \$ 277.86 | \$ 98,176.26 | \$ 40,886.37 |
| Health Choice | \$ 1,971,258.80 | \$ 50,230.28 | \$ 1,921,028.52 | \$ 1,917,190.07 | \$ 3,838.45 | \$ 1,356,219.08 | \$ 564,809.44 |
| Kaiser | \$ 3,185,731.57 | \$ 74,334.83 | \$ 3,111,396.74 | \$ 3,105,179.79 | \$ 6,216.95 | \$ 2,196,602.28 | \$ 914,794.46 |
| Aetna Medical | \$ 3,247,847.86 | \$ 73,011.15 | \$ 3,174,836.71 | \$ 3,168,493.00 | \$ 6,343.71 | \$ 2,241,390.00 | \$ 933,446.71 |
| Aetna Dental | \$ 528,897.66 | \$ 12,805.25 | \$ 516,092.41 | \$ 515,061.19 | \$ 1,031.22 | \$ 364,353.97 | \$ 151,738.44 |
| Instructl Supplies | \$ 2,311.71 | | \$ 2,311.71 | \$ 2,311.71 | \$ 4.62 | \$ 2,152.85 | \$ 158.86 |
| General Office Supp | \$ 72,638.64 | | \$ 72,638.64 | \$ 72,493.50 | \$ 145.14 | \$ 67,647.09 | \$ 4,991.55 |
| Postal Service | \$ 131.50 | | \$ 131.50 | \$ 131.24 | \$ 0.26 | \$ 122.46 | \$ 9.04 |
| Addl Equip <\$5000 | \$ 1,660,946.70 | \$ 1,653,946.70 | \$ 7,000.00 | \$ 6,986.01 | \$ 13.99 | \$ 6,518.98 | \$ 481.02 |
| Special Functions | \$ 4,085.64 | | \$ 4,085.64 | \$ 4,077.48 | \$ 8.16 | \$ 2,806.29 | \$ 1,279.35 |
| Professional Develo | \$ 15,706.90 | | \$ 15,706.90 | \$ 15,675.52 | \$ 31.38 | \$ 14,627.56 | \$ 1,079.34 |
| Awards / Banquets | \$ 17,452.55 | | \$ 17,452.55 | \$ 17,452.55 | | \$ 12,321.25 | \$ 5,131.30 |
| Membership Fees | \$ 150.00 | | \$ 150.00 | \$ 150.00 | | \$ 139.69 | \$ 10.31 |
| Other Svcs Contract | \$ 852,342.00 | | \$ 852,342.00 | \$ 748,000.00 | \$ 104,342.00 | \$ 601,741.45 | \$ 250,600.55 |
| Printing | \$ 7,469.59 | | \$ 7,469.59 | \$ 7,454.66 | \$ 14.93 | \$ 6,956.30 | \$ 513.29 |
| Facility Modificati | \$ 7,713.23 | | \$ 7,713.23 | \$ 7,697.82 | \$ 15.41 | \$ 5,445.43 | \$ 2,267.80 |
| Field Trip General | \$ 1,113,831.73 | \$ 1,113,831.73 | \$ - | \$ - | | \$ - | \$ - |
| Work Performed For | \$ (645,409.80) | \$ (645,409.80) | \$ - | \$ - | | \$ - | \$ - |
| WPFO Materials | \$ (266,010.50) | \$ (266,010.50) | \$ - | \$ - | | \$ - | \$ - |
| Custodian | \$ 47,353.49 | | \$ 47,353.49 | \$ 47,258.87 | \$ 94.62 | \$ 44,099.47 | \$ 3,254.02 |
| Bus Attendant | \$ 6,146,693.59 | | \$ 6,146,693.59 | \$ 6,146,693.59 | | \$ - | \$ 6,146,693.59 |
| Recruitment Bonus | \$ 100,150.00 | | \$ 100,150.00 | \$ 100,150.00 | | \$ 70,704.49 | \$ 29,445.51 |
| Signing Bonus | \$ 52,500.00 | | \$ 52,500.00 | \$ 52,500.00 | | \$ 37,064.26 | \$ 15,435.74 |
| Professional Develo | \$ - | | \$ - | \$ - | | \$ - | \$ - |
| Vehicle Fuel | \$ 4,123,458.54 | \$ 424,408.40 | \$ 3,699,050.14 | \$ - | \$ 3,699,050.14 | \$ 2,540,751.47 | \$ 1,158,298.67 |
| Labor | \$ 8,603,186.90 | \$ 100,225.94 | \$ 8,502,960.96 | \$ 8,502,960.96 | | \$ 5,840,394.08 | \$ 2,662,566.88 |
| Vehicle Parts | \$ 4,160,939.06 | \$ 34,557.23 | \$ 4,126,381.83 | \$ 4,126,381.83 | | \$ 2,834,271.04 | \$ 1,292,110.79 |
| Replacement Buses | \$ 8,831,294.69 | | \$ 8,831,294.69 | \$ 8,831,294.69 | | \$ 6,234,769.67 | \$ 2,596,525.02 |
| Repl Buses - Deprec | \$ 85,665.00 | | \$ 85,665.00 | \$ 85,665.00 | | \$ 60,478.28 | \$ 25,186.72 |
| Replace Buses Lease | \$ 769,907.80 | | \$ 769,907.80 | \$ 769,907.80 | | \$ 543,544.06 | \$ 226,363.74 |
| Replacement Vehicles | \$ 1,454,337.52 | \$ 1,381,620.64 | \$ 72,716.88 | \$ 72,716.88 | | \$ 51,337.09 | \$ 21,379.79 |
| Additional Vehicles | \$ 15,250.00 | \$ 14,487.50 | \$ 762.50 | \$ 762.50 | | \$ 538.31 | \$ 224.19 |
| Replacement Vehicle Lease | \$ 62,079.73 | \$ 58,975.74 | \$ 3,103.99 | \$ 3,103.99 | | \$ 2,191.37 | \$ 912.62 |
| | \$ 93,231,942.02 | \$ 6,134,280.91 | \$ 87,097,661.11 | \$ 60,788,196.25 | \$ 26,309,469.48 | \$ 56,924,691.51 | \$ 30,172,969.60 |
| Vehicle Equivalents | | | \$ 12,710,814 | | | | |
| M&R Costs | | | \$ 2,033 | | | | |
| M&R Cost per VE | | | \$ 743.68 | | | \$ 521.91 | \$ 3,749.13 |
| Annual Cost per Student | | | \$ 76,670.48 | | | \$ 70,978.42 | \$ 90,338.23 |
| Annual Cost per Run | | | \$ 11,941.00 | | | \$ 11,362.21 | \$ 13,210.58 |

Appendix B. Projected Transportation Costs: High School Late Start (Scenarios D & E)

1,136 Current number of active buses
 579 Estimated additional buses required
 1,715 Estimate new system buses required
 51% Percentage increase in number of active buses system-wide

| <i>Description</i> | <i>Adjusted Total</i> | <i>Marginal Cost Analysis</i> | <i>Notes</i> |
|--------------------------------------|-------------------------|-------------------------------|--|
| Director | \$ 90,834.48 | \$ 90,834.48 | Assumes no change; one Director required under all scenarios |
| Coordinator | \$ 407,354.70 | \$ 611,032.05 | 0-25%, no impact; 25-50%, 1.25x; 51 and up, 1.5x |
| Business Specialist | \$ 815,222.66 | \$ 1,222,833.99 | 0-25%, no impact; 25-50%, 1.25x; 51 and up, 1.5x |
| Technician | \$ 399,524.62 | \$ 603,282.18 | Proportional increase |
| Office Assist Dept | \$ 738,223.45 | \$ 1,107,335.18 | 0-25%, no impact; 25-50%, 1.25x; 51 and up, 1.5x |
| Route Supervisor | \$ 1,652,066.56 | \$ 2,478,099.84 | 0-25%, no impact; 25-50%, 1.25x; 51 and up, 1.5x |
| Overtime | \$ 779,159.70 | \$ 1,176,531.15 | Proportional increase |
| Overbase Salaries | \$ 2,465,521.48 | \$ 3,722,937.43 | Proportional increase |
| Bus Driver | \$ 30,557,942.75 | \$ 46,142,493.55 | Proportional increase |
| Hourly Office Assist | \$ 9,351.64 | \$ 14,120.98 | Proportional increase |
| Outstand Perf Award | \$ - | \$ - | Proportional increase |
| VRS State Retirement | \$ 57,867.19 | \$ 87,379.46 | Proportional increase |
| ERFC Retirement | \$ 19,798.28 | \$ 29,895.40 | Proportional increase |
| FCSRS Cnty Retiremt | \$ 3,473,890.68 | \$ 5,245,574.93 | Proportional increase |
| VRS - Health - ER | \$ 3,489.34 | \$ 5,268.90 | Proportional increase |
| Social Security | \$ 3,339,453.95 | \$ 5,042,575.46 | Proportional increase |
| Cnty Life Insurance | \$ 139,062.63 | \$ 209,984.57 | Proportional increase |
| Health Choice | \$ 1,921,028.52 | \$ 2,900,753.07 | Proportional increase |
| Kaiser | \$ 3,111,396.74 | \$ 4,698,209.08 | Proportional increase |
| Aetna Medical | \$ 3,174,836.71 | \$ 4,794,003.43 | Proportional increase |
| Aetna Dental | \$ 516,092.41 | \$ 779,299.54 | Proportional increase |
| Instructl Supplies | \$ 2,311.71 | \$ 2,311.71 | No impact |
| General Office Supp | \$ 72,638.64 | \$ 72,638.64 | No impact |
| Postal Service | \$ 131.50 | \$ 131.50 | No impact |
| Addl Equip <\$5000 | \$ 7,000.00 | \$ 7,000.00 | No impact |
| Special Functions | \$ 4,085.64 | \$ 4,085.64 | No impact |
| Professional Develo | \$ 15,706.90 | \$ 23,717.42 | Proportional increase |
| Awards / Banquets | \$ 17,452.55 | \$ 17,452.55 | No impact |
| Membership Fees | \$ 150.00 | \$ 150.00 | No impact |
| Other Svcs Contract | \$ 852,342.00 | \$ 1,287,036.42 | Proportional increase |
| Printing | \$ 7,469.59 | \$ 7,469.59 | No impact |
| Facility Modificati | \$ 7,713.23 | \$ 7,713.23 | No impact |
| Field Trip General | \$ - | \$ - | No impact |
| Work Performed For | \$ - | \$ - | No impact |
| WPFO Materials | \$ - | \$ - | No impact |
| Custodian | \$ 47,353.49 | \$ 47,353.49 | No impact |
| Bus Attendant | \$ 6,146,693.59 | \$ 9,281,507.32 | Proportional increase |
| Recruitment Bonus | \$ 100,150.00 | \$ 151,226.50 | Proportional increase |
| Signing Bonus | \$ 52,500.00 | \$ 79,275.00 | Proportional increase |
| Professional Develo | \$ - | \$ - | No impact |
| Vehicle Fuel | \$ 3,699,050.14 | \$ 5,585,565.71 | Proportional increase |
| Labor | \$ 8,502,960.96 | \$ 12,839,471.05 | Proportional increase |
| Vehicle Parts | \$ 4,126,381.83 | \$ 6,230,836.57 | Proportional increase |
| Replacement Buses | \$ 8,831,294.69 | \$ 13,335,254.98 | Proportional increase |
| Repl Buses - Deprec | \$ 85,665.00 | \$ 129,354.15 | Proportional increase |
| Replace Buses Lease | \$ 769,907.80 | \$ 1,162,560.78 | Proportional increase |
| Replacement Vehicles | \$ 72,716.88 | \$ 72,716.88 | No Impact |
| Additional Vehicles | \$ 762.50 | \$ 762.50 | No Impact |
| Replacement Vehicle Lease | \$ 3,103.99 | \$ 3,103.99 | No Impact |
| | \$ 87,097,661.11 | \$ 131,311,140.26 | |
| Increase/ (Decrease) in Costs | | \$ 44,213,479.15 | |
| Annual Cost per Student | \$ 743.68 | \$ 1,121.20 | |
| Annual cost per Bus | \$ 76,670.48 | \$ 76,550.19 | |

Appendix C. Original Model Assumptions

Description

1. High schools should optimally start between 8:00 AM – 8:30 AM.
 2. Schools' start and dismissal times will generally be clustered within 10 minutes +/- of the primary tier time
 3. High schools and middle schools do not have to be transported on common bus routes
 4. There will be no change in the length of the instructional day
 5. There will be no change in the length of the teacher service day
 6. Staff loading zone supervision at the high schools is not required in the morning
 7. Staff loading zone supervision at the middle and elementary schools is required in the morning and afternoon
 8. Special education students are transported from residence and can therefore be picked up earlier/ later than students attending traditional programs.
 9. All students are to be transported by yellow bus
 10. Drivers are paid guaranteed minimum of 25 hours per week
 11. Early Monday dismissals for elementary schools will be maintained as is
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Appendix D. Original Model Constraints

| Parameter Description | Baseline (Current) |
|---|--|
| 1. Length of instructional day for high schools will remain @ 6 hours and 50 minutes | Some schools vary from this parameter |
| 2. Middle Schools will continue with a 6 hour and 50 minute instructional day | Operate within constraint |
| 3. Elementary Schools will continue with a 6:30 to 6:35 instructional day - 30:30/ hrs. per week with Monday early dismissal | Operate within constraint |
| 4. Elementary afternoon arrival windows within 10 minutes of dismissal | Operate within restraint |
| 5. High school morning drop off window of 20 minutes | Operate within restraint |
| 6. Routes do not conflict with scheduled time for athletics | Some bus runs are currently scheduled to end later |
| 7. Routes do not conflict with scheduled time for student activities | Operate within constraint |
| 8. Vocational Ed. cooperative work programs not compromised | Operate within constraint |
| 9. Breakfast programs remain under current configuration | Operate within constraint |
| 10. Regular education ride times 1 hour maximum. Most routes are between 35-40 minutes duration. | Some buses exceed this parameter |
| 11. Loading maximums 2x seat for secondary; 3x for elementary | Some secondary buses exceed this parameter |
| 12. Secondary students can get to part time jobs, volunteer programs, or to provide child care for younger siblings in late afternoon | Some buses exceed this parameter |
| 13. Community use of facilities can be scheduled in late afternoon and evening after student sports and activities | Some secondary buses exceed this parameter |
| 14. Primary age students are not waiting at stops or walking to school in darkness. (Civil Twilight) | Operate within constraint |
| 15. Schools' start and dismissal times clustered within 10 minutes +/- of the primary tier time | Operate within constraint |

Appendix E. Constraints & Assumptions: Stakeholder Input (October 14, 2005)

| Area | Suggestions or Recommendations | Stakeholder | Issues / Discussion |
|-----------------------|---|---|---|
| HS Start Times | Prefer school to start 1 hour to 1:15 later. Suggest start time between 8:15 and 8:35. | School Board | See <i>Scenario B</i> (Marshall) and <i>Scenario C</i> (Chantilly) |
| HS Start Times | Establish a second Tier consisting of high schools and secondary schools to begin 8:35-8:45 am | SLEEP | Not modeled in original scenarios; Scenario C (Chantilly) came closest with 8:25 AM HS start time. |
| HS Start Times | General consensus is that the Tier 2 start times (8:10 - 8:15) is doable. | Administration – High School Principals Assoc | See <i>Scenario B</i> |
| HS Start Times | Review other school district programs to comment on the concept of having the first, second and third classes of the day staggered at different times for different classes | Federation Education Committee | Start times for specific classes not part of project scope. |
| MS Start Times | Difficult supporting middle schools start time earlier than present. Where middle schools currently start later than high schools, the time differential should remain constant with any high school change. Those with combination bus runs/ shuttles should offset around 20 to 30 minutes. | School Board | (1) May impact resource requirements because of necessity to balance fleet deployment among 3 tiers. (2) Modifies Assumption #2 re: high schools and middle schools on common routes |
| MS Start Times | Fairfax County Council of PTAs has a position strongly in favor of the later start times for teens. Feel that it is just as important for middle school students to get the extra time in the morning, as it is for the high school students. | Federation of Civic Associations | Restricting middle schools from earlier tier may create fleet resource imbalance among tiers and result in higher costs. This was not defined as an assumption or constraint during first phase of project, although was mentioned as a concern by several committee members at that time. |
| ES Start Times | Concern for elementary students waiting for buses or being dropped off in the dark. If twilight times constraint cannot be met, later high school start time option is unacceptable. | Elementary Principals | Original scenarios assume this constraint. Elementary bus routes that exceed time constraint are assumed to be “split” (adding an additional bus and segmenting one route into two routes) in order to shorten route times to meet this constraint. Earliest ES pick-up time was assumed to be 7:00 AM. |
| ES Start Times | Consensus that elementary students should not be waiting at stops before 7:15 AM, and schools not before 7:35 AM. Board prefers elementary schools start closer to 8 AM. | School Board | Changed constraint will have significant impact on final scenario models. Initial models assumed earliest pick-up to be 7:00 AM, which is the approximate latest civil twilight for the year. |
| ES Start Times | Establish a first ES Tier consisting of 2/3 of the elementary schools to begin 7:50-8 am Establish a third Tier consisting of 1/3 of the elementary schools and middle schools, to begin 9:10-9:20 am | SLEEP | Actual number of schools in any given tier dependent upon number of buses deployed to each school in that tier. 3 tiers should be balanced to achieve maximum efficiency. |
| Transportation System | Establish a start time window of 7:50 to 9:20 am; 45 minutes between three tiers. | SLEEP | 7:50 “floor” may have significant impact on fleet resources needed in last two tiers, given the number of bus routes that exceed 40 – 45 minutes |
| Transportation System | As part of Phase II, strategically reengineer bus schedules start around core, general education programs. Special programs then could be added on in the most efficient manner possible. Due to major rearrangement of bell times, simply shifting the bus routes from the old system to the new bell times would lead to transportation chaos and inefficiency. | SLEEP | Assuming viable alternative is selected in current project, next step requires system-wide bus route reengineering in simulation module of <i>MapNet</i> routing & planning software. |
| Transportation System | Revise the entire transportation system and education programs to meet the needs of everyone. For example, use school-based programs for Gifted & Talented students to reduce the number bused students. | Federation Education Committee | Resource impact of additional programs and/ educational staff beyond scope of this study. |

Appendix E. Constraints & Assumptions: Stakeholder Input (October 14, 2005)

| Area | Suggestions or Recommendations | Stakeholder | Issues / Discussion |
|-----------------------|---|----------------------------------|---|
| Transportation System | Consider pairing adjacent elementary schools to offset tiers. Additional benefit: parents with acute need can enroll student at a nearby school (without transportation provided) | SLEEP | Logistical feeder structures will be factored into the final bell time scenarios. |
| Other/ Misc. | Evaluate service impact of later start times at neighboring school districts | Federation of Civic Associations | Detailed review of other districts not within scope of this review. To be meaningful, any comparison should consider changes in resources and costs <i>after</i> new bell times were implemented. |
| Other/ Misc. | Hold pubic hearings/ countywide survey before selecting final plan | SLEEP | Board/ administrative action? |
| Other/ Misc. | Conduct county wide surveys and public hearings on advisability of later high school start times | Federation of Civic Associations | Board/ administrative action? |

Summation and Amalgamation of Key Desired Parameters:

- High Schools should start between 8:15 a.m. to 8:30 a.m.
- Middle Schools should start in same tier or after high schools.
- Elementary Schools should start around 7:50 a.m. to 8:00 a.m.; but in no case before 7:35 a.m.
- Elementary students should not be at their stops before civil twilight, which is:
 - Latest Start of Civil Twilight: October 31 @ 7:08 AM EDT
 - Earliest End of Civil Twilight: December 12 @ 5:17 PM EST.

Appendix F. Bell Times: Scenario D

Mt. Vernon Pyramid

| School Name | Type | Current Start | Inst Day | New Start | New End | Tier |
|-------------------------------|------|---------------|----------|-----------|---------|------|
| FORT BELVOIR ELEMENTARY | E | 9:20 AM | 6:30 | 7:45 AM | 2:15 PM | 1 |
| GUNSTON ELEMENTARY | E | 8:20 AM | 6:40 | 7:45 AM | 2:25 PM | 1 |
| RIVERSIDE ELEMENTARY | E | 8:50 AM | 6:30 | 7:45 AM | 2:15 PM | 1 |
| WASHINGTON MILL ELEMENTARY | E | 8:35 AM | 6:35 | 7:45 AM | 2:20 PM | 1 |
| WOODLEY HILLS ELEMENTARY | E | 8:40 AM | 6:30 | 7:45 AM | 2:15 PM | 1 |
| MOUNT VERNON HIGH | H | 7:20 AM | 6:45 | 8:30 AM | 3:15 PM | 2 |
| WHITMAN MIDDLE | M | 7:45 AM | 6:55 | 8:55 AM | 3:50 PM | 2 |
| GUNSTON ALTERNATIVE SCHOOL | A | 8:00 AM | 5:00 | 9:05 AM | 2:05 PM | 3 |
| MOUNT VERNON WOODS ELEMENTARY | E | 8:10 AM | 6:30 | 9:15 AM | 3:45 PM | 3 |
| WOODLAWN ELEMENTARY | E | 8:40 AM | 6:30 | 9:15 AM | 3:45 PM | 3 |

Woodson Pyramid

| School Name | Type | Current Start | Inst. Day | New Start | New End | Tier |
|-----------------------------|------|---------------|-----------|-----------|----------|------|
| CANTERBURY WOODS ELEMENTARY | E | 9:05 AM | 6:30 | 7:45 | 2:15 PM | 1 |
| LITTLE RUN EL | P | 9:00 AM | 3:15 | 7:50 | 11:05 AM | 1 |
| LITTLE RUN ELEMENTARY | E | 8:35 AM | 6:30 | 7:50 | 2:20 PM | 1 |
| OLD CREEK ELEMENTARY /CTR | E | 7:50 AM | 6:30 | 7:50 | 2:20 PM | 1 |
| WAKEFIELD FOREST ELEMENTARY | E | 9:05 AM | 6:30 | 7:45 | 2:15 PM | 1 |
| WOODSON HIGH | H | 7:20 AM | 6:50 | 8:30 | 3:20 PM | 2 |
| FROST MIDDLE | M | 7:25 AM | 6:50 | 8:35 | 3:25 PM | 2 |
| MANTUA ELEMENTARY /CTR | E | 9:00 AM | 6:30 | 9:15 | 3:45 PM | 3 |
| MANTUA EL 2/3 YR OLDS | P | 9:00 AM | 3:20 | 9:15 | 12:35 PM | 3 |
| MANTUA EL 4/5 YR OLDS | P | 9:00 AM | 4:30 | 9:15 | 1:45 PM | 3 |
| RAVENSWORTH ELEMENTARY | E | 9:05 AM | 6:30 | 9:15 | 3:45 PM | 3 |

Appendix G. Bell Times: Scenario E

Mt. Vernon Pyramid

| School Name | Type | Current Start | Inst Day | New Start | New End | Tier |
|----------------------------------|------|---------------|----------|-----------|---------|------|
| FORT BELVOIR ELEMENTARY | E | 9:20 AM | 6:30 | 7:50 AM | 2:20 PM | 1 |
| RIVERSIDE ELEMENTARY | E | 8:50 AM | 6:30 | 7:50 AM | 2:20 PM | 1 |
| WASHINGTON MILL ELEMENTARY | E | 8:35 AM | 6:35 | 7:50 AM | 2:25 PM | 1 |
| WOODLEY HILLS ELEMENTARY | E | 8:40 AM | 6:30 | 7:50 AM | 2:20 PM | 1 |
| GUNSTON ELEMENTARY | E | 8:20 AM | 6:40 | 7:50 AM | 2:30 PM | 1 |
| GUNSTON ALTERNATIVE SCHOOL | A | 8:00 AM | 5:00 | 8:00 AM | 1:00 PM | 1 |
| WOODLAWN ELEMENTARY | E | 8:40 AM | 6:30 | 8:15 AM | 2:45 PM | 2 |
| MOUNT VERNON HIGH | H | 7:20 AM | 6:45 | 8:30 AM | 3:15 PM | 2 |
| MOUNT VERNON WOODS ELEMENTARY | E | 8:10 AM | 6:30 | 9:10 AM | 3:40 PM | 3 |
| WHITMAN MIDDLE | M | 7:45 AM | 6:55 | 9:15 AM | 4:10 PM | 3 |

Woodson Pyramid

| School Name | Type | Current Start | Inst. Day | New Start | New End | Tier |
|-----------------------------|------|---------------|-----------|-----------|----------|------|
| CANTERBURY WOODS ELEMENTARY | E | 9:05 AM | 6:30 | 7:45 | 2:15 PM | 1 |
| LITTLE RUN EL | P | 9:00 AM | 3:15 | 7:50 | 11:05 AM | 1 |
| LITTLE RUN ELEMENTARY | E | 8:35 AM | 6:30 | 7:50 | 2:20 PM | 1 |
| OLD CREEK ELEMENTARY /CTR | E | 7:50 AM | 6:30 | 7:50 | 2:20 PM | 1 |
| WAKEFIELD FOREST ELEMENTARY | E | 9:05 AM | 6:30 | 7:45 | 2:15 PM | 1 |
| WOODSON HIGH | H | 7:20 AM | 6:50 | 8:30 | 3:20 PM | 2 |
| FROST MIDDLE | M | 7:25 AM | 6:50 | 8:35 | 3:25 PM | 2 |
| MANTUA ELEMENTARY /CTR | E | 9:00 AM | 6:30 | 9:15 | 3:45 PM | 3 |
| MANTUA EL 2/3 YR OLDS | P | 9:00 AM | 3:20 | 9:15 | 12:35 PM | 3 |
| MANTUA EL 4/5 YR OLDS | P | 9:00 AM | 4:30 | 9:15 | 1:45 PM | 3 |
| RAVENSWORTH ELEMENTARY | E | 9:05 AM | 6:30 | 9:15 | 3:45 PM | 3 |

Appendix H. Comparative Service Impact Matrix: Scenarios D & E

| Constraint | <u>Baseline (Current)</u> | <u>Scenario D:</u> High Schools in Tier 2, Middle Schools +20-30 min. offset with HS. Elementary Schools Tier 1 & 3 | <u>Scenario E:</u> High Schools in Tier 2, Middle School Tier 3. Elementary Schools Tier 1, 2 & 3 |
|---|--|---|--|
| 1. Length of instructional day for high schools will remain @ 6:50. ¹ | Some schools vary from this parameter (see note) | Instructional; day remains 6:45 at Mt. Vernon & Woodson HS | Instructional; day remains 6:45 at Mt. Vernon & Woodson HS |
| 2. Middle Schools will continue with a 6:50 instructional day | Operate within constraint | Whitman and Frost MS remain at 6:50 | Whitman and Frost MS remain at 6:50 |
| 3. Elementary Schools will continue with a 6:30 – 6:35 instructional day - 30:30/ hrs. per week with Monday early dismissal | Operate within constraint | All elementary schools in pyramid remain with current instructional day from 6:30 to 6:40 in length. | All elementary schools in pyramid remain with current instructional day from 6:30 to 6:40 in length. |
| 4. Elementary afternoon arrival windows within 10 minutes of dismissal | Some buses exceed this parameter | Maintained constraint, except as noted: <ul style="list-style-type: none"> ▪ Elementary: 11 runs early AM arrival, 7 late PM arrivals ▪ High/ Middle: 2 runs early AM arrival, 3 late PM arrivals | Maintained constraint, except as noted: <ul style="list-style-type: none"> ▪ Elementary: 13 runs early AM arrival, 7 late PM arrivals ▪ High/ Middle: 6 runs early AM arrival, late PM arrivals ▪ 7 elementary buses arrive 24 – 28 min. before AM start time |
| 5. High school morning drop off window of 20 minutes | Some buses exceed this parameter | All current run arrival windows remain unchanged | All current run arrival windows remain unchanged |
| 6. Routes do not conflict with scheduled time for athletics | Operate within constraint | Depends on bell changes to other high schools & middle schools; Current dismiss times range from 2:00 PM to 2:15 PM. No change to peer high schools would put Mt. Vernon & Woodson HS 60 - 75 minutes later than other high schools in FCPS. | Depends on bell changes to other high schools & middle schools; Current dismiss times range from 2:00 PM to 2:15 PM. No change to peer high schools would put Mt. Vernon & Woodson HS 60 - 75 minutes later than other high schools in FCPS. Whitman MS starts 90 minutes later. |
| 7. Routes do not conflict with scheduled time for student activities | Operate within constraint | Possible impact to elementary schools starting 50 to 95 min. earlier and 30 to 65 minutes later than present. Late runs shifted to earlier/ later operating times along with bell time changes. Impact on secondary schools dependent upon consistency of time changes across district. | As in “D” elementary schools starting 50 to 95 min. earlier and 30 to 65 minutes later than present. Late runs shifted to earlier/ later operating times along with bell time changes. Activities at Whitman MS after 4:10 PM dismissal. |

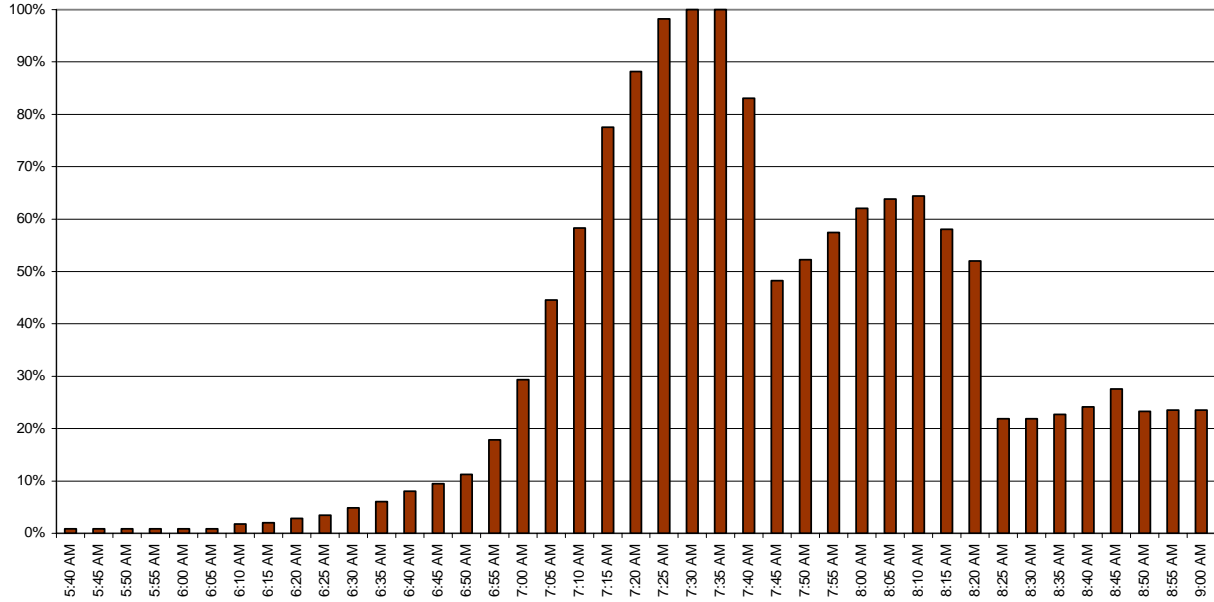
¹ Some schools have reduced the length of the instructional day by 5- 10 minutes from 6 hours and 50 minutes to accommodate individual circumstances.

Appendix H. Comparative Service Impact Matrix: Scenarios D & E

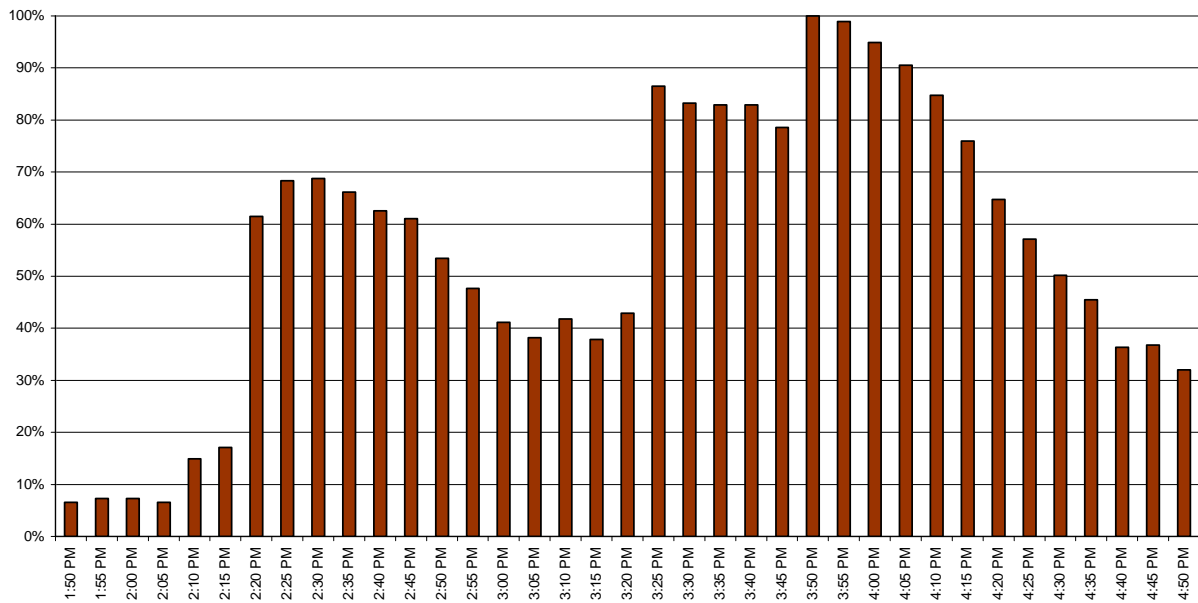
| Constraint | <u>Baseline (Current)</u> | <u>Scenario D</u> : High Schools in Tier 2, Middle Schools +20-30 min. offset with HS. Elementary Schools Tier 1 & 3 | <u>Scenario E</u> : High Schools in Tier 2, Middle School Tier 3. Elementary Schools Tier 1, 2 & 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---------------|---------------|---------------|---------------|----|---------|---------|---------|---------|----|---------|---------|---------|---------|----|---------|---------|---------|---------|---|-------------|---------------|---------------|---------------|---------------|----|---------|---------|---------|---------|----|---------|---------|---------|---------|----|---------|---------|---------|---------|
| 8. Vocational Ed. cooperative work programs not compromised | Operate within constraint | Depends on uniform HS changes and community adaptability. Mt. Vernon & Woodson HS hours would be 8:30 AM to 3:15/ 3:20 PM. All midday shuttle runs are assumed to change in step with bell time changes. | Same as Scenario "D" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. Breakfast programs remain under current configuration | Operate within constraint | Routes serving Tier 1 elementary schools may be further constrained due to early pickup conflict with twilight parameter | Same as Scenario "D" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. Regular education ride times 1 hour maximum. Most routes are between 35-40 minutes duration. | Some buses exceed this parameter | Some buses exceed this parameter, as at present. Model assumes a total of 40 routes in both pyramids will need to be split to correct pre-twilight morning pickup (see #14) | Some buses exceed this parameter, as at present. As in Scenario D, extensive splitting required at elementary level due tot twilight constraint. This will result in more trips of shorter duration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. Loading maximums 2x seat for secondary; 3x for elementary | Some secondary buses may exceed this parameter | No increase to current ride times, some secondary buses may continue to exceed this parameter | No increase to current ride times, some secondary buses may continue to exceed this parameter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. Secondary students can get to part time jobs, volunteer programs, or to provide child care for younger siblings in late afternoon | Operate within constraint | <p>Analysis of afternoon run end times are as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>School Type</th> <th>Max Reg. Runs</th> <th>Avg Reg. Runs</th> <th>Max Late Runs</th> <th>Avg Late Runs</th> </tr> </thead> <tbody> <tr> <td>HS</td> <td>5:25 PM</td> <td>4:35 PM</td> <td>9:09 PM</td> <td>7:27 PM</td> </tr> <tr> <td>MS</td> <td>5:55 PM</td> <td>4:12 PM</td> <td>6:34 PM</td> <td>6:20 PM</td> </tr> <tr> <td>ES</td> <td>6:08 PM</td> <td>3:35 PM</td> <td>7:24 PM</td> <td>5:08 PM</td> </tr> </tbody> </table> | School Type | Max Reg. Runs | Avg Reg. Runs | Max Late Runs | Avg Late Runs | HS | 5:25 PM | 4:35 PM | 9:09 PM | 7:27 PM | MS | 5:55 PM | 4:12 PM | 6:34 PM | 6:20 PM | ES | 6:08 PM | 3:35 PM | 7:24 PM | 5:08 PM | <p>Analysis of afternoon run end times are as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>School Type</th> <th>Max Reg. Runs</th> <th>Avg Reg. Runs</th> <th>Max Late Runs</th> <th>Avg Late Runs</th> </tr> </thead> <tbody> <tr> <td>HS</td> <td>6:05 PM</td> <td>4:35 PM</td> <td>9:09 PM</td> <td>7:27 PM</td> </tr> <tr> <td>MS</td> <td>6:53 PM</td> <td>4:50 PM</td> <td>7:02 PM</td> <td>6:20 PM</td> </tr> <tr> <td>ES</td> <td>5:50 PM</td> <td>3:35 PM</td> <td>6:24 PM</td> <td>5:17 PM</td> </tr> </tbody> </table> | School Type | Max Reg. Runs | Avg Reg. Runs | Max Late Runs | Avg Late Runs | HS | 6:05 PM | 4:35 PM | 9:09 PM | 7:27 PM | MS | 6:53 PM | 4:50 PM | 7:02 PM | 6:20 PM | ES | 5:50 PM | 3:35 PM | 6:24 PM | 5:17 PM |
| School Type | Max Reg. Runs | Avg Reg. Runs | Max Late Runs | Avg Late Runs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HS | 5:25 PM | 4:35 PM | 9:09 PM | 7:27 PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MS | 5:55 PM | 4:12 PM | 6:34 PM | 6:20 PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ES | 6:08 PM | 3:35 PM | 7:24 PM | 5:08 PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| School Type | Max Reg. Runs | Avg Reg. Runs | Max Late Runs | Avg Late Runs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HS | 6:05 PM | 4:35 PM | 9:09 PM | 7:27 PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ES | 5:50 PM | 3:35 PM | 6:24 PM | 5:17 PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13. Community use of facilities can be scheduled in late afternoon and evening after student sports and activities | Facilities available after 5:00PM / priority shift to community | Mt Vernon HS & Whitman MS – Activities will shift 1 hour later. 5 elementary schools in Mt. Vernon Pyramid start 30 – 65 dismiss later, 2 elementary schools in Woodson Pyramid dismiss 10-15 minutes later (minimal impact) | Mt Vernon HS & Whitman MS – Activities will shift 60 to 90 minutes later. No material change in elementary school impact. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14. Primary age students are not waiting at stops or walking to school in darkness. (Civil Twilight) | Operate within constraint | Model assumes 7 runs at Mt. Vernon and 33 in Woodson will be split to correct pre-twilight morning pickup. Earliest pickup in is 6:53 AM at Little Run ES | Model assumes 12 runs at Mt. Vernon and 33 in Woodson will be split to correct pre-twilight morning pickup. Earliest pickup in is 6:53 AM at Little Run ES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix I. Fleet Deployment by Tier: Scenario D (Combines Mt. Vernon & Woodson Pyramids)

Morning Deployment

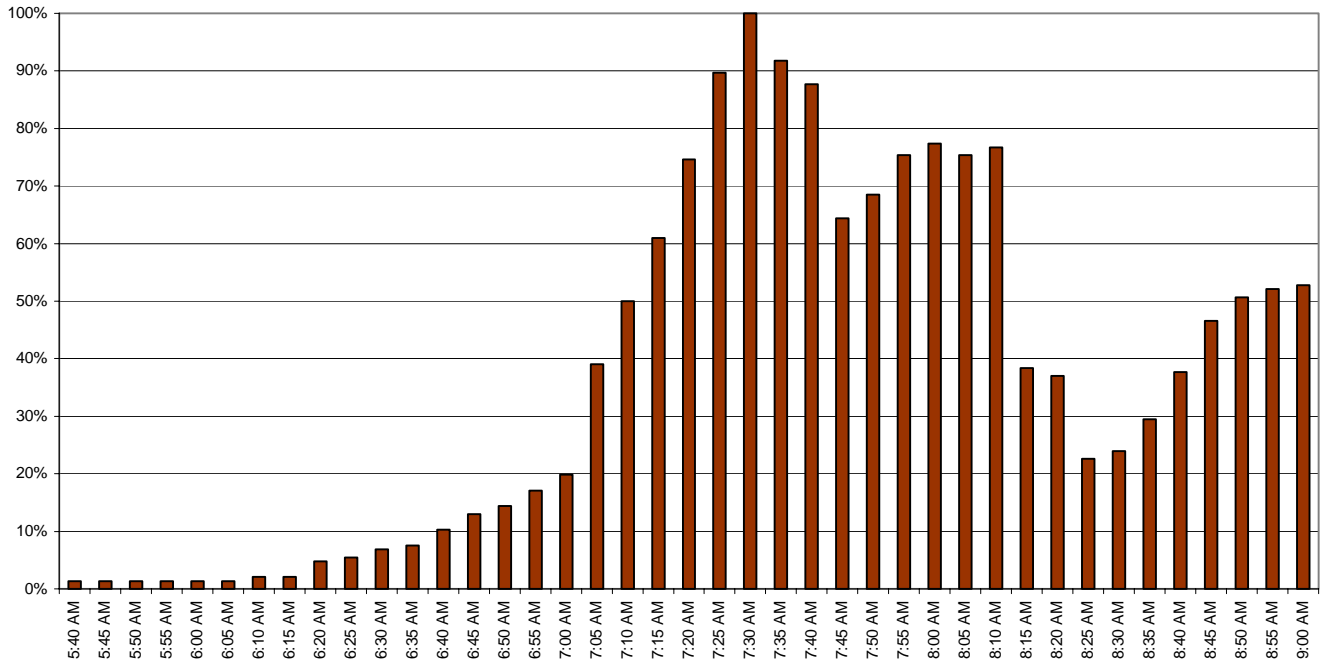


Afternoon Deployment



Appendix J. Fleet Deployment by Tier: Scenario E (Combines Mt. Vernon & Woodson Pyramids)

Morning Deployment



Afternoon Deployment

