



MEMORANDUM

TO: Frederick County Public Schools

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FROM: Nicole White, P.E., PTOE Symmetra Design
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DATE: February 29, 2024

RE: FCPS Middletown Elementary and Middle School Replacement - Schematic Design
Transportation Assessment



1 INTRODUCTION

The following memorandum evaluates transportation issues and opportunities associated with the March 1, 2024, Schematic Design for the Middletown Elementary School and Middletown Middle School replacement. This memorandum is an update to the December 1, 2023, Transportation Assessment. Included in this revision are responses to comments received by the Town (*December 13, 2023, PC Workshop Agenda*), located in the “Response to Comments” section.

2 BACKGROUND

In February 2023, the Board of Education of Frederick County (BOE) approved the feasibility study and recommendation to replace the elementary school and middle school as separate schools within a single co-located building. The existing State Rated Capacity (SRC) of each school is 480 elementary students and 1,052 middle school students. The projected SRC would accommodate 523 elementary students and 839 middle school students, resulting in a potential net decrease of 170 students.

The existing Middletown Elementary School (MES) is located at the southwest corner of the campus at 201 E. Green St, Middletown, MD 21769. MES serves students in grades three through five and will continue to do so in the future.

The existing Middletown Middle School (MMS) is located at the southeast corner of the campus at 100 Martha Mason St, Middletown, MD 21769. MMS serves students in grades six through eight.

The existing Middletown High School (MHS) is located at the north end of the campus and will be replaced as part of a future design phase. Existing traffic and potential circulation associated with the high school were considered as part of this transportation assessment. However, transportation will need to be reevaluated as part of a future design phase. Currently, the schedule for the high school replacement has not been finalized.

Students currently attending MES and MMS will remain in the existing buildings while the replacement building is constructed. Following construction of the new building, the old Middletown ES and MS buildings will be demolished as part of this project.

The development is exempt from requiring a Traffic Impact Study as it generates less than 50 net peak hour trips.¹ However, traffic analysis was conducted at campus access points where redistribution of traffic could have an impact on operations. Data collection and observations were made on Thursday, September 28, 2023. Additional observations were made on Thursday January 25, 2024.

3 EXISTING CONDITIONS

The existing site circulation plan is shown in **Figure 1**.

¹ The State Rated Capacity of MES and MMS will decrease by 170 students in the future. The reduction in potential student enrollment equates to less than 50 net peak hour trips (i.e. existing compared to future site trips).

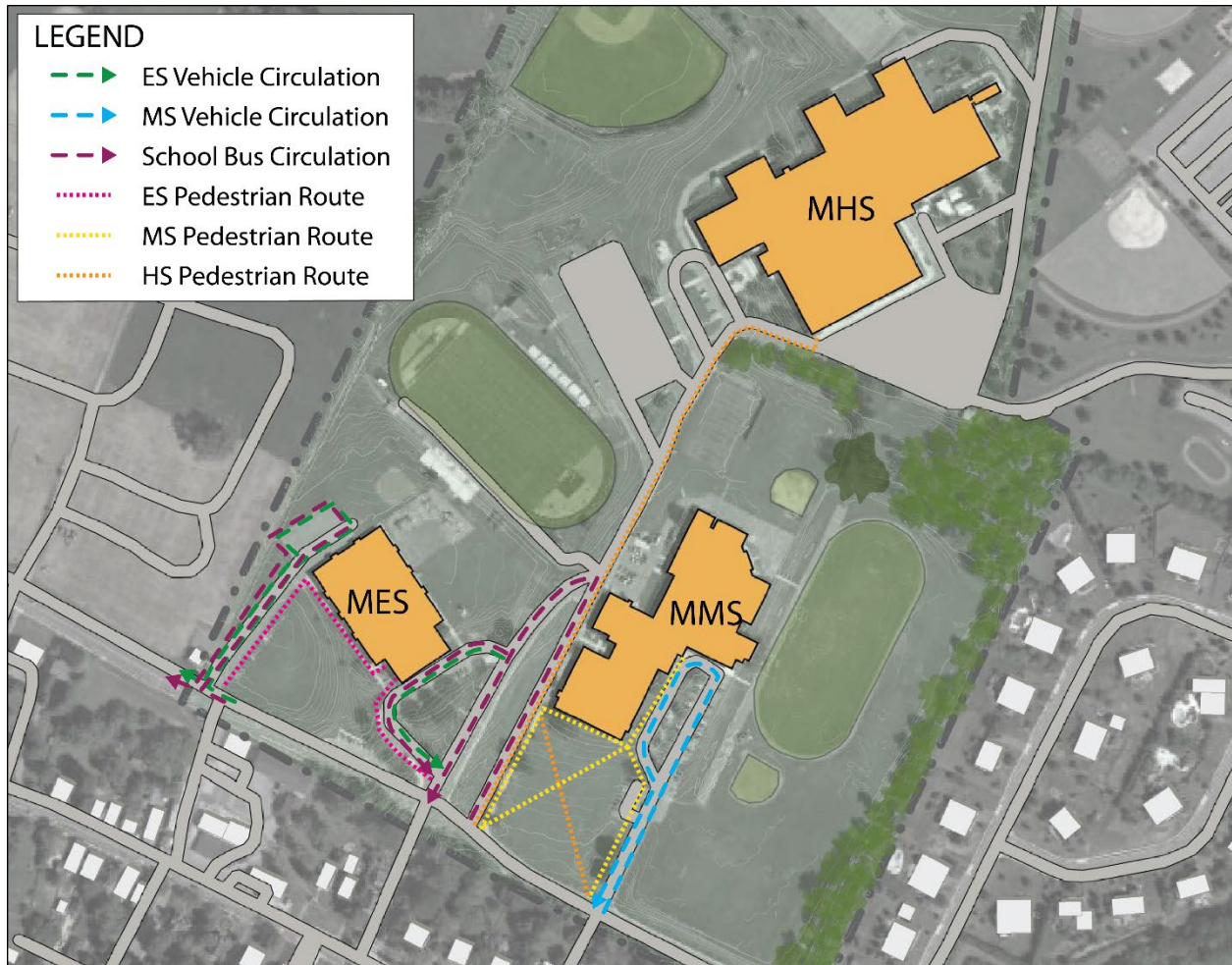


Figure 1: Existing Site Plan

Elementary School

Access to the elementary school is provided from Schoolhouse Drive and E. Green Street. Parent pickup/drop-off occurs behind the school accessed from E. Green Street. Parents also use the bus loop for pickup/drop-off. School bus pickup/drop-off primarily occurs at the one-way counterclockwise loop in front of the school accessed from Schoolhouse Drive. School buses² also use the parking lot in the rear of the school for pickup/drop-off.

Currently, 66% of students take the school bus. There are ten regular and three special needs school buses serving the elementary school currently. All other students either walk, bike, or get picked-up/dropped-off.

MES starts at 8:55AM and dismisses at 3:25PM. Traffic data showed 121 inbound/120 outbound AM peak hour vehicle trips (8-9AM) and 79 inbound/92 outbound PM peak hour vehicle trips (3-4PM).

² Five school buses were observed using the rear lot on Thursday, September 28, 2023.

During the morning drop-off period the maximum queue was 21 vehicles (approximately 460 feet). Of the maximum queue, six vehicles spilled back to Schoolhouse Drive along E. Green Street. The queue on E. Green Street lasted for a few minutes starting at 8:30AM.

During the afternoon, vehicles started to arrive for pick-up at 2:30PM, approximately an hour before scheduled dismissal time. The maximum queue was 39 vehicles (approximately 860 feet). Of the maximum queue, 14 vehicles spilled back to Schoolhouse Drive along E. Green Street. The queue on E. Green Street lasted for twelve minutes from 3:26 PM to 3:38PM.

Middle School

Access to the middle school is provided on Schoolhouse Drive and via Martha Mason Street. Parent pickup/drop-off occurs at the school entrance via Martha Mason Street. School bus pickup/drop-off occurs at the one-way driveway from Green Street east of Schoolhouse Drive.

Currently, 66% of students take the school bus. There are 23 regular and three special needs school buses serving the middle school currently. All other students either walk, bike, or get picked-up/dropped-off.

MMS starts at 8:00 AM and dismisses at 3:00PM. Traffic data showed 328 inbound/262 outbound AM peak hour vehicle trips (7-8AM) and 82 inbound/138 outbound PM peak hour vehicle trips (2:45-3:45PM).

During the morning drop-off period the maximum queue was 46 vehicles (approximately 1,010 feet). The queue extended (approximately seven total vehicles) off-site onto Martha Mason and E. Green Street for approximately three minutes from 7:50-7:53AM.

During the afternoon, vehicles started to arrive for pick-up at 2PM, approximately an hour before scheduled dismissal time. The maximum queue was 65³ vehicles (approximately 1,430 feet). The queue began at the pick-up location on-site and spilled back to E. Green Street. The queue on E. Green Street lasted for 21 minutes from 2:45-3:06PM. Vehicles were also parked on the north side of E. Green Street and Woodmere Circle for pickup. On-street parking is currently permitted on E. Green Street.

Pedestrian Conditions

The majority of pedestrians currently cross E. Green Street at Schoolhouse Drive and Martha Mason Street on the west crosswalks where pavement markings exist. MS and HS students also use the field between Martha Mason Street and MS bus lane to reach their destination, as shown in **Figure 1**. This is supported by peak hour pedestrian data collected on Thursday, September 28, 2023, shown in **Figure 2**.

³ Including vehicles in the drop-off line and vehicles parked in spaces on E. Green Street.

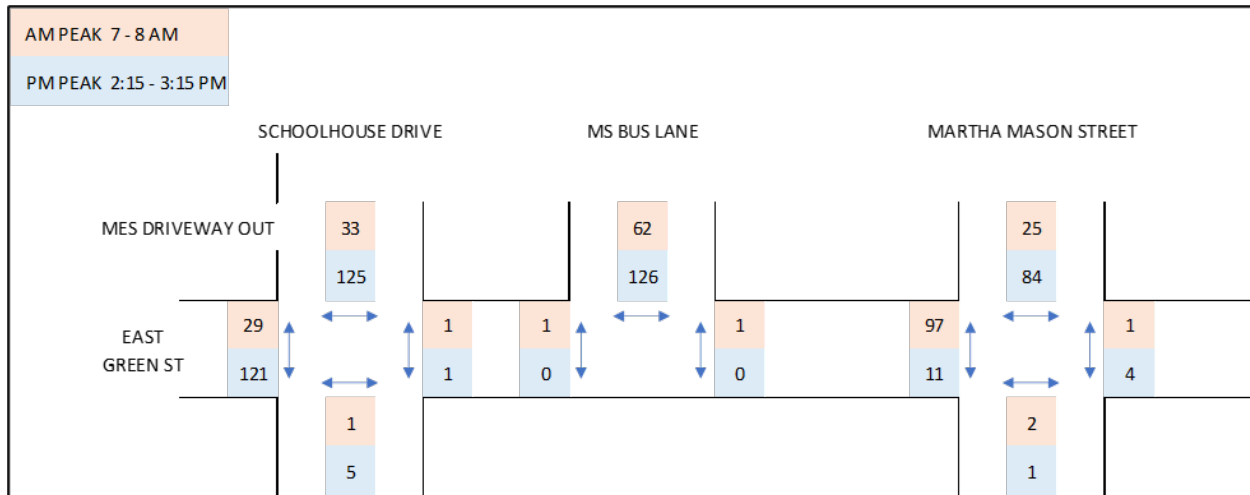


Figure 2: Existing Pedestrian Movements

The figure above shows pedestrians crossing at the various crosswalks during the peak morning and afternoon hours. The hours are in the legend on the top left of the figure.

4 SCHEMATIC PLAN

The March 1, 2024, Schematic Plan responds to Town and community concerns of the Friday December 1, 2023, schematic submittal. Similar to the previous plan, bus traffic and parent traffic would be separated. The plan includes adequate space to accommodate traffic from queuing on Green Street. All school buses will enter and leave the Campus from Schoolhouse Drive. Elementary and middle school vehicle traffic will use Martha Mason Street. Drop-offs for Middle School and Elementary School would also be separated. Designated pedestrian pathways, as well as a courtyard providing pedestrian access to the south side of the building, are also included in the design. The schematic plan is shown in **Figure 3**.

Future trip generation associated with the new school was projected based on existing school trip generation. The net increase in site trips was calculated using the growth in student enrollment.

MMS and MES start times will remain staggered in the future: 8:00 AM for MMS and 8:55 AM for MES.

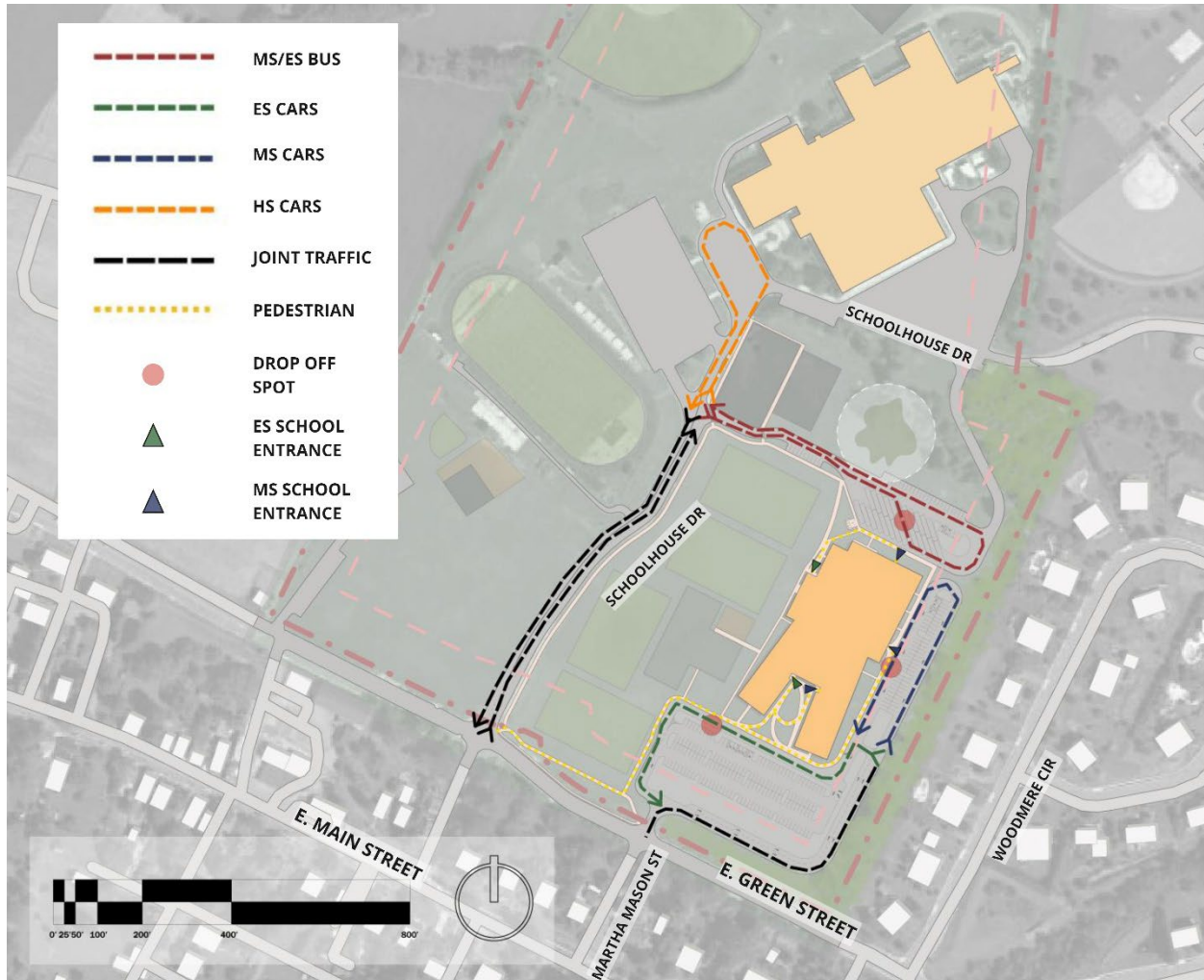


Figure 3: Schematic Plan

Elementary School

After the new building is constructed, parent pick-up/drop-off for the elementary school will occur at the south end of the building. Vehicles will access the school via Martha Mason Street and queue in the parking lot as shown in **Figure 3**. The school bus zone is located on the north side of the new building. Buses will enter and leave the site from Schoolhouse Drive. Pedestrians will use the south school entrance.

The future ES queue is projected using the growth in student enrollment to be 47 vehicles (approximately 1,020 feet) during the afternoon pick-up period. The new site plan provides 1,273 feet of storage capacity on-site to accommodate the projected queue.

Middle School

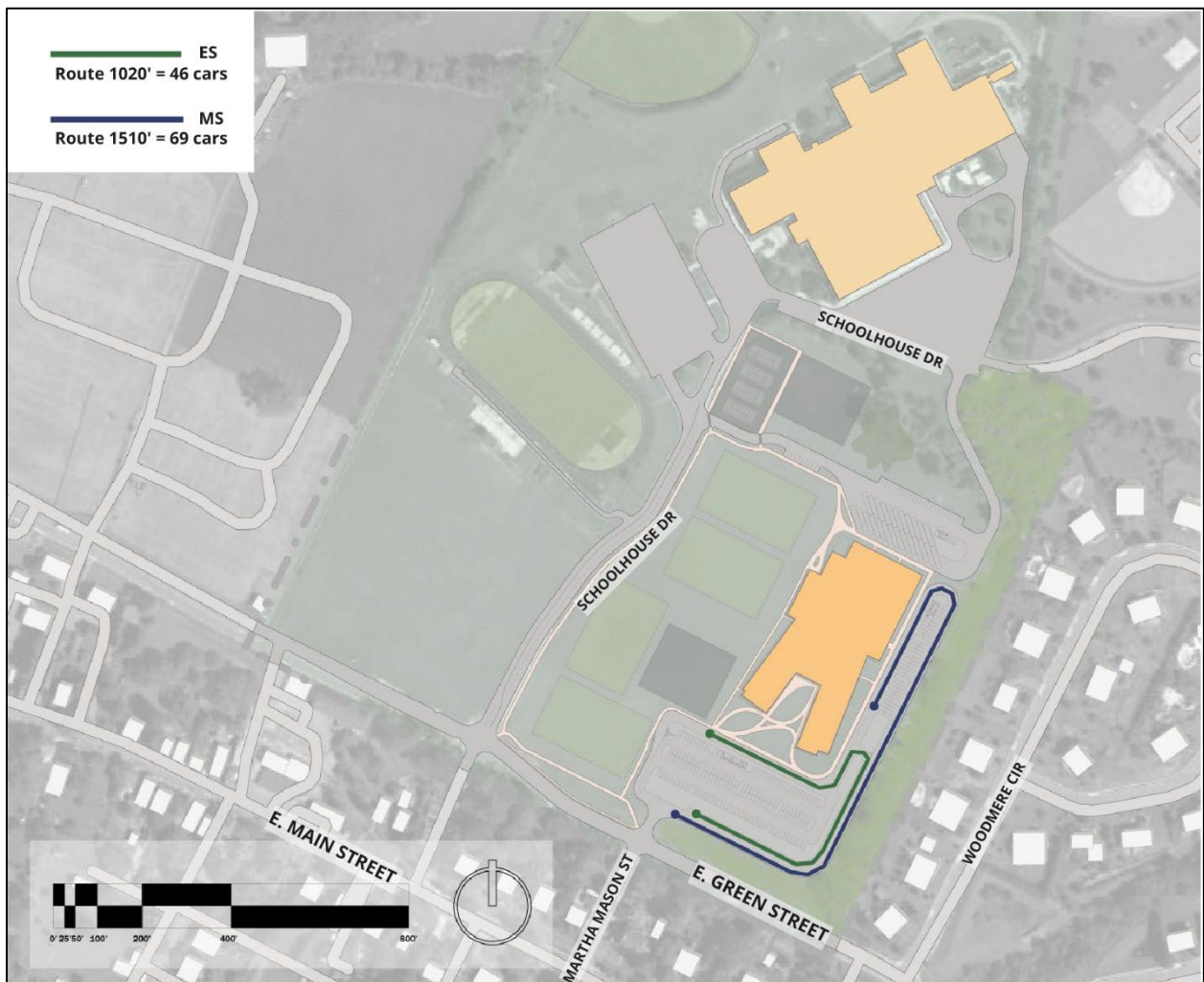
After the new building is constructed, parent pick-up/drop-off for the middle school will occur at the east end of the building. Vehicles will access the school via Martha Mason Street and queue in the parking lot as shown in **Figure 3**. The school bus zone is located on the north side of the new building

and shared with the elementary school. Buses will enter and leave the site from Schoolhouse Drive. Pedestrians will use the east school entrance for access to and from the pick-up/drop-off area. Students who walk to school will access the building using an entrance located on the south side of the building.

The future queue is projected using the growth in student enrollment to be 69 vehicles (approximately 1,510 feet). The new site plan provides 1,627 feet of storage capacity on-site to accommodate the projected queue.

Approximately fifteen percent of families have students in both Middletown ES and MS.⁴ Pick-up and drop-off for these students would occur at the ES pickup area on the south side of the building.

The queuing storage capacity for both MES and MMS are shown in Figure 4.



⁴ Based on 2022-23 enrollment data.

Figure 4: Queuing Capacity

5 TRAFFIC ANALYSIS

The development is exempt from requiring a Traffic Impact Study as it generates less than 50 net peak hour trips. However, traffic analysis was conducted at campus access points where redistribution of traffic could have an impact on operations.

The following study intersections were analyzed.

- East Green Street/Schoolhouse Drive
- East Green Street/Martha Mason Street

Turning movement vehicle counts, pedestrian counts, and bicycle counts were conducted at the study intersections from 7:00-10:00AM and 2:00-7:00PM on Thursday, September 28, 2023. Additional observations were conducted on Thursday, January 25, 2024. Counts were used as the basis for traffic analysis and future traffic projections.

The AM peak hour is from 7:00-8:00AM, which overlaps with MMS/MHS traffic. MES morning traffic falls outside of this peak. The PM peak hour is from 2:15-3:15PM, which overlaps with all three schools.

Future traffic projections include the redistribution of elementary school traffic to the Martha Mason entrance. All school buses (26 total) would use Schoolhouse Drive.

Intersection capacity analyses were conducted utilizing the Highway Capacity Manual (HCM) methodology. LOS is a measure of the average control (i.e., signal or stop sign) delay experienced per vehicle and is designated using letters “A” through “F” with LOS “A” representing the best operating conditions and LOS “F” representing the worst. The Frederick County APFO guidelines consider an intersection to be adequate if a LOS “D” is maintained.

Analysis results show all intersections operate under adequate conditions, as depicted in Table 1. The letter corresponds to the Level of Service, and the number is the projected seconds of delay.

Table 1: Traffic Analysis Level of Service Summary

Intersection	Direction	Existing Conditions		Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak
1. Schoolhouse Drive @ Green Street	Eastbound	D/29.6	C/15.1	D/30.9	B/11.3
	Westbound	C/24.1	C/20.5	C/24.3	B/12.8
	Northbound	A/1.4	A/4.6	A/1.1	A/3.6
	Southbound	A/1.1	A/0.4	A/1.0	A/0.8
2. Green Street @ Martha Mason Street	Eastbound	B/11.5	A/7.6	B/12.5	B/11.7
	Westbound	A/10.0	A/7.5	B/10.7	B/11.7
	Northbound	B/11.3	A/7.5	B/12.6	B/11.6
	Southbound	B/13.9	A/7.8	C/15.7	C/18.0

6 SAFETY

The eastbound approach on E. Green Street at Schoolhouse Drive has limited sight distance, particularly on the southwest corner. The limited sight distance is associated with the fence and landscaping of the corner property. The Town should consider coordinating with the property owner to adjust the landscaping and improve sight distance at the intersection. No other safety issues were observed within the study area.

7 RECOMMENDATIONS

The redistribution of traffic associated with the new site plan is projected to result in adequate traffic conditions at the Green Street/Schoolhouse Drive and Green Street/Martha Mason Street intersections. No traffic mitigations are required.

Vehicles currently use the parking spaces on the north side of Green Street to pick up students during the PM pick-up period. It is recommended to restrict on-street parking on Green Street during the PM pick-up period (for FCPS to coordinate with the Town).

The eastbound approach on E. Green Street at Schoolhouse Drive has limited sight distance, particularly on the southwest corner. The limited sight distance is associated with the fence and landscaping of the corner property. The Town should consider coordinating with the property owner to adjust the landscaping and improve sight distance at the intersection. No other safety issues were observed within the study area.

8 RESPONSE TO COMMENTS

Transportation Assessment memorandum – Responses to previous transportation comments, *December 13, 2023, PC Workshop Agenda* are listed below:

- Top of page 2 - It is hard to understand how the development generates less than 50 net peak hour trips when other data in the report talks about hundreds of peak hour trips.
 - *The State Rated Capacity of MES and MMS will decrease by 170 students in the future. The reduction in potential student enrollment equates to less than 50 net peak hour trips (i.e. existing compared to future site trips). The peak hour trips mentioned later in the report are existing site trips, not net increase in trips.*
- Figure 1: Existing Site Plan - the figure shows a pedestrian path across the athletic field which is hard to imagine since there is fencing all along East Green Street in that location.
 - *The existing pedestrian paths are corrected as shown in revised Figure 1.*
- It is hard to believe that vehicles didn't start to arrive at MES in the afternoon for pick-up on the day observations were made until just 10 minutes before dismissal when vehicles started to arrive at MMS for afternoon pickup an hour before dismissal.
 - *The MES pick-up time started at 2:30PM. The report was updated on Page 3. The editorial error has no impact on analysis results.*

- It would be beneficial to observe traffic patterns on more than one occasion, and especially on a cold or rainy day when more parents would be dropping off and picking up students.
 - *An additional observation was conducted on Thursday, January 25, 2024. Queuing conditions were less than conditions observed on September 28, 2023.*
- In the third paragraph under Middle School on page 3, the first sentence should start as MMS, as opposed to MES.
 - *This has been updated in the revised memorandum.*
- On page 4 under Elementary School, should the last sentence state that pedestrians will use the north school entrance, as opposed to the south school entrance that is to be used by the middle school students?
 - *The pedestrians for the elementary school will access the building via the south building entrance and the courtyard as reflected on the revised site plan.*
- If the Schoolhouse Drive/East Green Street intersection were changed to an all-way stop, it would be exceedingly probable that the Alternate 40A/Schoolhouse Drive signaled intersection would deteriorate into a failing intersection. Without the ability for vehicles to traverse north bound through the Schoolhouse Drive/East Green Street intersection unimpeded, vehicles would become backed up on Alternate 40A.
 - *The previous traffic mitigation is no longer needed with the revised schematic plan.*

9 CONCLUSIONS

The March 1, 2024, Schematic Plan responds to Town and community concerns of the Friday December 1, 2023, schematic submittal. Similar to the previous plan, bus traffic and parent traffic would be separated. The plan includes adequate space to accommodate traffic from queuing on Green Street. All school buses will enter and leave the Campus from Schoolhouse Drive. Elementary and middle school vehicle traffic will use Martha Mason Street. Drop-offs for Middle School and Elementary School would also be separated. Designated pedestrian pathways, as well as a courtyard providing pedestrian access to the south side of the building, are also included in the design.

The redistribution of traffic associated with the new site plan is projected to result in adequate traffic conditions at the Green Street/Schoolhouse Drive and Green Street/Martha Mason Street intersections. No traffic mitigations are required.