

WELLS + ASSOCIATES

MEMORANDUM



1420 Spring Hill Road,
Suite 610,
Tysons, VA 22102
703-917-6620
WellsandAssociates.com

To: Donavan Corum
Robert Mochi
CBM Consulting

From: Michael J. Workosky, PTP, TOPS, TSOS
William L. Zeid, P.E.
Wells + Associates, Inc.

Date: December 21, 2020

Re: 105/113 W. Main Street
Traffic Assessment;
New Market, Maryland

Introduction

This memorandum summarizes a traffic assessment for the 105/113 W. Main Street property. The site is located on the north side of Main Street, between the New Market elementary and middle school driveways in the Town of New Market, Maryland as shown on Figure 1.

The site is currently occupied by the following uses:

- One Single Family Home
- 3,712 SF Arts and Crafts business
- 7,520 SF Tractor Supply and Repair business
- Eight Mobile Homes

The site is proposed to be redeveloped with the following uses and removal of all existing uses:

- 27 residential townhouses
- 3,270 S.F. Retail Use
- 4,105 S.F. Restaurant Use (Without Drive Through)
- 1,540 S.F. Small Office Use

Access to the redeveloped site would be consolidated to a single driveway located between the existing site driveways that would be removed. For purposes of this assessment, a buildout year of 2023 was selected. The proposed site plan is shown on Figure 2.

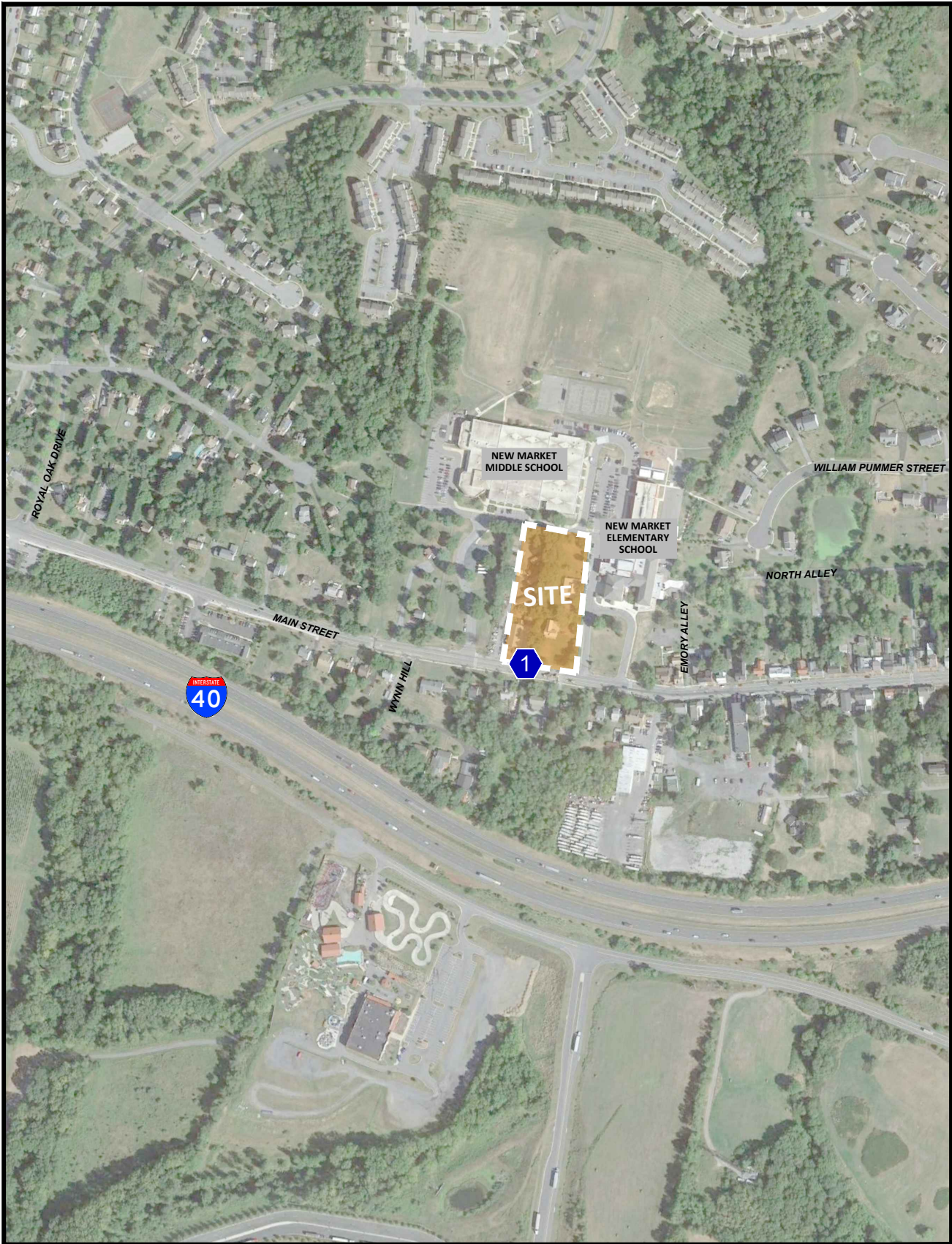



Figure 1
Site Location

 Study Intersection



NORTH

105/113 W. Main Street
Town of New Market, Maryland

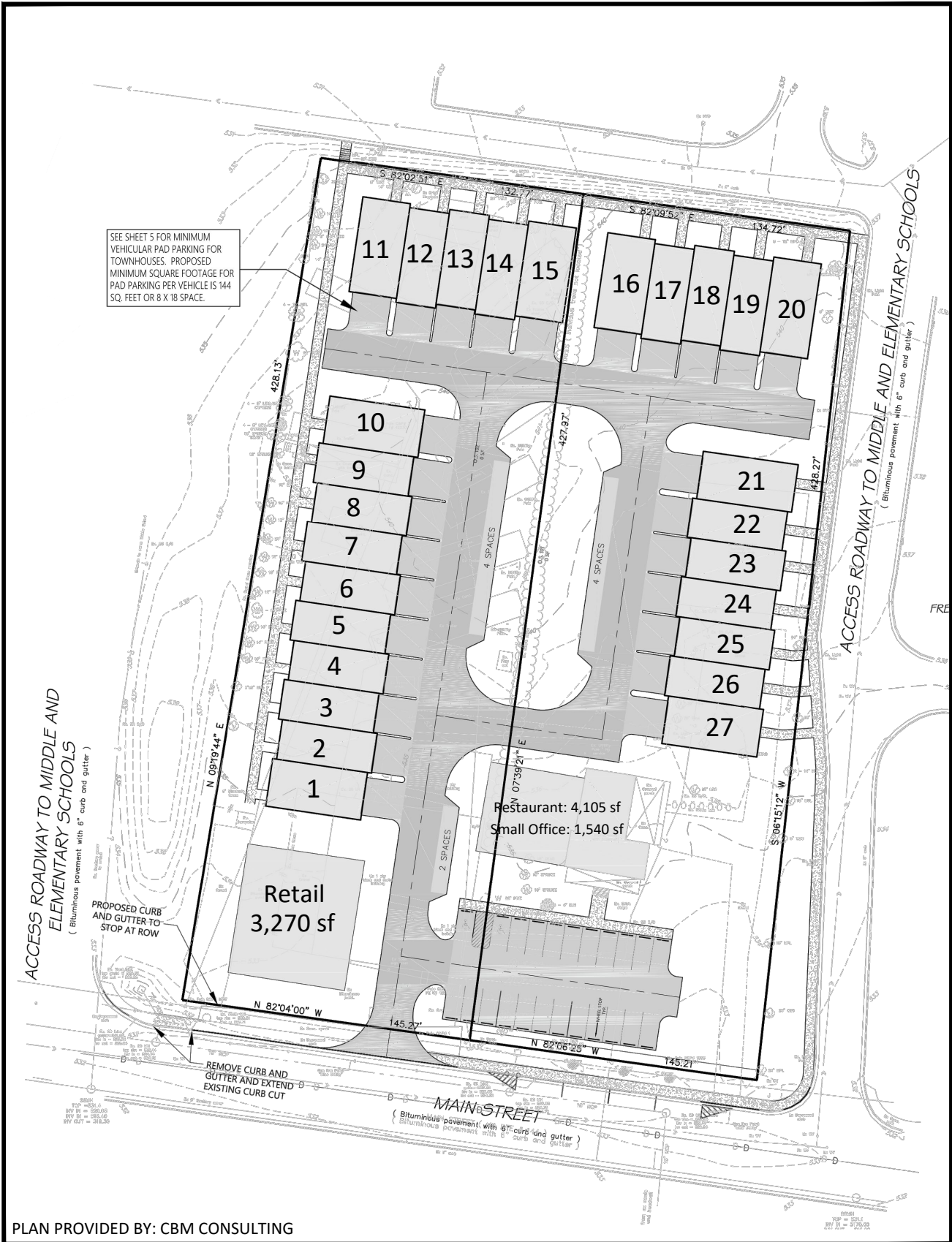


Figure 2
Site Plan



105/113 W. Main Street
Town of New Market, Maryland

MEMORANDUM

The purpose of this assessment is to review the proposed access scheme, estimate the number of new peak hour vehicle trips expected to be generated by the site, and evaluate the site driveway under future traffic conditions with the proposed redevelopment.

Roadway Network and Site Access

The proposed development is located along Main Street in the Town of New Market. Main Street is a two-lane local street with a posted speed limit of 30 miles per hour. The west Middle School driveway (located west of the subject property) operates under stop sign control and a pedestrian crosswalk is provided on Main Street on the east side of the intersection connecting to a paved trail located on the south side of Main Street. The center driveway (located east of the subject property) that serves both the elementary and middle schools operates under stop control and serves as part of the drop-off/pick-up loop for elementary school students.

Two (2) existing driveways currently exist on Main Street that serve the uses occupying the subject property. These access points will be eliminated with the redevelopment of the site and consolidated to a single driveway located approximately 175 feet east of the west Middle School driveway. In addition, the site frontage will be upgraded to include a sidewalk and four (4) curb parking spaces.

The driveway serving the site would provide access to a dedicated parking area for the commercial uses, curb parking spaces, and a loop that will serve the townhouses. No vehicular connections to the elementary or middle school driveways are proposed. Single lanes for inbound and outbound traffic will be provided.

School Operations

Since traffic counts and observations could not be conducted under existing conditions, information was provided by Frederick County Public Schools (FCPS) regarding operations at each school. The following summarizes the school operations:

Elementary School:

- Drop-off occurs from 8:30 to 9:00 AM and pick-up occurs from 3:00 to 3:45 PM.
- Mode split: 69 percent bus, 12 percent drop-off, 19 percent walk.
- Elementary school buses and vehicles enter the drop-off/pick-up loop east of the site and exit via the East School Driveway on the east side of the subject property.
- Crossing Guards are not currently utilized at the Elementary School Crosswalk.

Middle School:

- Drop-off occurs from 7:30 to 8:00 AM and pick-up occurs from 2:45 to 3:15 PM.

WELLS + ASSOCIATES

MEMORANDUM

- Mode split: 68 percent bus, 12 percent drop-off, 20 percent walk.
- Buses and vehicles serving the Middle School enter using the east driveway and exit via the West School Driveway.
- Crossing Guards are not currently utilized at the Middle School Crosswalk.

A total of 19 buses are provided for each school. Based on information provided by FCPS, congestion occurs at the west Middle School driveway for traffic exiting the Middle School. In addition, the traffic data indicates that the schools generate traffic during the PM commuter peak hour generally consistent with the afternoon school pick-up period, likely resulting from after school activities.

Site Trip Generation

The number of AM and PM peak hour vehicle trips expected to be generated by the site for both approved and proposed conditions were calculated based on the standard rates and equations published in the Institute of Transportation Engineers' (ITE) *Trip Generation, 10th Edition*. The results are summarized on Table 1 and indicate that the approved uses on site could generate up to approximately 32 AM peak hour trips and 40 PM peak hour trips as a combination of inbound and outbound vehicles based on the most recent use categories. These potential site trips for existing approved uses are shown on Figure 3 at the existing site driveways. Further, the proposed redevelopment is expected to generate 62 AM peak hour trips (30 in and 32 out) and 108 PM peak hour trips (59 in and 49 out) subsequent to full buildout and occupancy. This represents an overall potential net change of 30 additional trips during the AM peak hour and 68 additional trips during the PM peak hour as a result of the redevelopment.

Table 1: Trip Generation Summary

Land Use	LUC	Amount	Unit	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
<u>Existing/Approved Uses</u>									
Single Family Home	210 ⁽²⁾	1	DU	0	1	1	1	0	1
Arts and Crafts Store	879	3712	SF	9	9	18	11	13	24
Tractor Supply Store	810	7,520	SF	7	3	10	5	6	11
<u>Mobile Homes</u>	<u>240</u>	<u>8</u>	<u>DU</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>4</u>
Subtotal				17	15	32	19	21	40
<u>Proposed Uses</u>									
Small Office Building	712	1,540	SF	2	1	3	1	3	4
Restaurant	932	4,105	SF	23	18	41	25	16	41
Retail ⁽⁴⁾	820	3,270	SF	2	2	4	21	23	44
<u>Townhomes</u>	<u>220</u>	<u>27</u>	<u>DU</u>	<u>3</u>	<u>11</u>	<u>14</u>	<u>12</u>	<u>7</u>	<u>19</u>
Subtotal				30	32	62	59	49	108
Net Difference - Approved vs Proposed				13	17	30	40	28	68

Note:

1. Trip generation based on ITE Trip Generation Manual 10th Edition
2. Given the small size of units, the rates for all peak periods were used.
3. No AM data published, therefore, the ratio of PM:AM peak hour trips for Auto Parts Sales and Service (LUC 943) was used to estimate AM peak hour using the PM peak hour estimate.
4. Given the small size of the retail use in comparison to the average size for LUC 820, the AM rate was used.



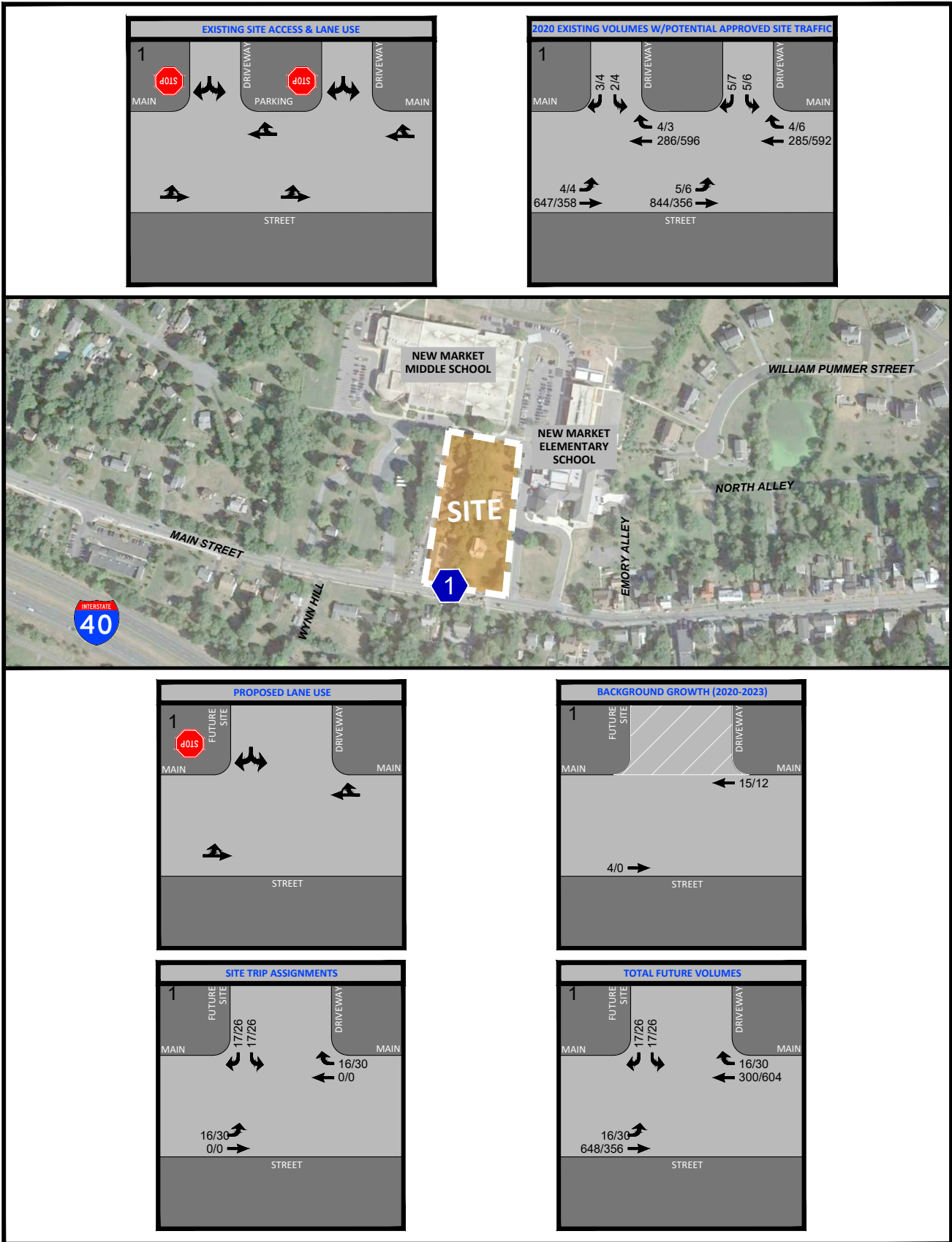


Figure 3
 Existing Lane Use, 2020 Existing Volumes, Proposed Lane Use,
 Background Growth 2020-2023, Site Trip Assignments,
 Total Future Volumes

AM PEAK HOUR
 000 / 000
 PM PEAK HOUR



105/113 W. Main Street
 Town of New Market, Maryland



MEMORANDUM

Future Conditions Traffic Assessment

An assessment of future traffic conditions was prepared based on existing traffic volumes (pre-pandemic), growth expected along Main Street, and the site generated trips. Future traffic forecasts were prepared for the site driveway and capacity analyses were prepared for the site buildout. Supporting information is contained in the Appendix and a summary of lane use and volumes for existing and future conditions are provided on Figure 3.

The results and conclusions of the analysis are summarized below:

1. The results of the future capacity analyses at the site driveway indicate that all of the turning movements would operate at acceptable levels of service during both the AM and PM peak hours (see Table 2). The critical southbound approach would operate at LOS “C” during each period studied with minimal queuing. This indicates that the site development would have only a minor impact to the roadway network.

Table 2: Capacity & Queue Analyses Summary

Intersection	Traffic Control	Future Lane Group/Approach	2023 Total Future Build Conditions					
			HCM Delay Analyses ⁽¹⁾				HCM Queue Analyses ⁽¹⁾	
			AM Peak Hour		PM Peak Hour		AM Peak	PM Peak
			LOS	Delay (veh/s)	LOS	Delay (veh/s)	95th %-ile Queue	
1. Main Street / Future Site Driveway	Unsignalized	EB Left-Through Lane	A	0.4	A	1.1	<1 veh	<1 veh
		WB Through-Right Lane	A	0.0	A	0.0	0 veh	0 veh
		SB Left-Right Lane	C	16.1	C	20.0	<1 veh	<1 veh
		Overall	B	0.8	A	1.4		

Notes: 1. 2000 HCM capacity analysis based on Highway Capacity Manual methodology, using Synchro 10.

2. The AM commuter peak hour generally coincides with the AM peak hour of the Middle School. During this period, the commercial uses on the site generate fewer trips that will reduce potential conflicts with school buses and student drop-off trips that exit via the west Middle School driveway. The site would generate minimal trips during the early afternoon school peaks.
3. Consolidating the existing driveways to a single entrance should provide an improvement over current conditions by reducing turning movement conflicts along Main Street as well as providing additional separation between the west Middle School driveway and the site entrance that would allow for improved sight distance.

Questions regarding this document should be directed to Wells + Associates.

Appendix A

1: Royal Oak Drive/Main Street Trip Distribution												
Traffic Component	Southbound Royal Oak Drive			Westbound Main Street			Northbound Post Office			Eastbound Main Street		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Site Developments												
Site 1: Small Office	Inbound											
	Outbound				50%							50%
Site 2: Retail	Inbound											
	Outbound				50%							50%
Site 3: Residential	Inbound											
	Outbound				50%							50%

1: Royal Oak Drive/Main Street AM Peak Hour														
Traffic Component		Southbound			Westbound			Northbound			Eastbound			
		Royal Oak Drive			Main Street			Post Office			Main Street			
		Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	
2007 Traffic Data		AM	48	6	116	30	133	12	10	1	9	11	466	3
		PM	35	0	57	97	428	18	18	2	15	10	310	67
October 2019 Traffic Data		AM	56	1	115	28	162	6	6	0	3	9	477	13
		PM	30	0	58	78	462	16	15	3	16	19	238	69
Growth		AM	8	-5	-1	-2	29	-6	-4	-1	-6	-2	11	10
		PM	-5	0	1	-19	34	-2	-3	1	1	9	-72	2
East-West Through Movement Growth Compounded annually		AM				1.7%						0.2%		
		PM				0.6%								
2020 Estimated Traffic Volume		AM	56	1	115	28	165	6	6	0	3	9	478	13
		PM	30	0	58	78	465	16	15	3	16	19	238	69
2023 Buildout Year with Traffic Growth		AM				174						481		
	2,023	PM				474						238		
Background Future		AM	8	(5)	(1)	(2)	29	(6)	(4)	(1)	(6)	(2)	11	10
		PM	(5)	-	1	(19)	34	(2)	(3)	1	1	9	(72)	2
Proposed Site Development														
Site 1: Small Office	IN	AM	2	1	-	-	-	-	-	-	-	-	1	-
	OUT	PM	1	3	-	-	-	-	-	-	-	-	1	-
Site 2: Retail	IN	AM	25	20	-	-	-	-	-	-	-	-	13	-
	OUT	PM	46	39	-	-	-	-	-	-	-	-	23	-
Site 3: Residential	IN	AM	3	11	-	-	-	-	-	-	-	-	2	-
	OUT	PM	12	7	-	-	-	-	-	-	-	-	6	-
Subtotal Proposed Site Development		AM	30	32	-	-	-	-	-	-	-	-	16	-
		PM	59	49	-	-	-	-	-	-	-	-	30	-
Proposed Total Future Build Scenario		AM	8	(5)	(1)	(2)	46	(6)	(4)	(1)	(6)	(2)	27	10
		PM	(5)	-	1	(19)	60	(2)	(3)	1	1	9	(42)	2

Appendix A

2: Middle School West/Main Street Trip Distribution														
Traffic Component			Southbound Middle School West			Westbound Main Street			Northbound No Road			Eastbound Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Site Developments														
Site 1: Small Office	-	Inbound												
		Outbound					50%						50%	
Site 2: Retail	-	Inbound												
		Outbound					50%						50%	
Site 3: Residential	-	Inbound												
		Outbound					50%						50%	

2: Middle School West/Main Street AM Peak Hour															
Traffic Component			Southbound			Westbound			Northbound			Eastbound			
			Middle School West			Main Street			No Road			Main Street			
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	
2007 Traffic Data			AM	21	0	25	34	130	0	0	0	0	0	539	29
		PM	19	0	24	47	468	0	0	0	0	0	292	69	
Growth rate from Main Street/Royal Oak Drive Data			AM				1.7%							0.2%	
		PM					0.6%								
2020 Estimated Traffic Volume			AM	21	0	25	34	161	0	0	0	0	0	553	29
		PM	19	0	24	47	509	0	0	0	0	0	292	69	
2023 Buildout Year with Traffic Growth			AM				170							557	
	2,023	PM					519							292	
Background Future			AM	-	-	-	-	0	-	-	-	-	-	0	-
		PM	-	-	-	-	0	-	-	-	-	-	-	-	-
Proposed Site Development				IN	OUT										
Site 1: Small Office	AM		2	1	-	-	-	1	-	-	-	-	-	1	-
	PM		1	3	-	-	-	2	-	-	-	-	-	1	-
Site 2: Retail	AM		25	20	-	-	-	10	-	-	-	-	-	13	-
	PM		46	39	-	-	-	20	-	-	-	-	-	23	-
Site 3: Residential	AM		3	11	-	-	-	6	-	-	-	-	-	2	-
	PM		12	7	-	-	-	4	-	-	-	-	-	6	-
Subtotal Proposed Site Development	AM		30	32	-	-	-	17	-	-	-	-	-	16	-
	PM		59	49	-	-	-	26	-	-	-	-	-	30	-
Proposed Total Future Build Scenario			AM					17	-	-	-	-	-	16	-
		PM						26	-	-	-	-	-	30	-

Appendix A

3: Middle School East/Main Street Trip Distribution														
Traffic Component			Southbound Middle School East			Westbound Main Street			Northbound No Road			Eastbound Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Site Developments														
Site 1: Small Office	-	Inbound												
		Outbound					50%						50%	
Site 2: Retail	-	Inbound					50%						50%	
		Outbound												
Site 3: Residential	-	Inbound					50%						50%	
		Outbound											50%	

3: Middle School East/Main Street AM Peak Hour														
Traffic Component			Southbound			Westbound			Northbound			Eastbound		
			Middle School East			Main Street			No Road			Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
2007 Traffic Data														
	AM		16	0	45	100	217	0	0	0	0	0	568	61
	PM		8	0	19	53	537	0	0	0	0	0	327	29
Growth rate from Main Street/Royal Oak Drive Data														
	AM						1.7%						0.2%	
	PM						0.6%							
2020 Estimated Traffic Volume														
	AM		16	0	45	100	269	0	0	0	0	0	583	61
	PM		8	0	19	53	584	0	0	0	0	0	327	29
2023 Buildout Year with Traffic Growth														
	AM	2,023					283						587	
	PM						596						327	
Background Future														
	AM		-	-	-	-	0	-	-	-	-	-	0	-
	PM		-	-	-	-	0	-	-	-	-	-	-	-
Proposed Site Development														
				IN	OUT									
Site 1: Small Office	AM		2	1		-	-	-	-	1	-	-	-	1
	PM		1	3		-	-	-	-	1	-	-	-	2
Site 2: Retail	AM		25	20		-	-	-	-	13	-	-	-	10
	PM		46	39		-	-	-	-	23	-	-	-	20
Site 3: Residential	AM		3	11		-	-	-	-	2	-	-	-	6
	PM		12	7		-	-	-	-	6	-	-	-	4
Subtotal Proposed Site Development	AM		30	32		-	-	-	-	16	-	-	-	17
	PM		59	49		-	-	-	-	30	-	-	-	26
Proposed Total Future Build Scenario														
	AM		-	-	-	-	16	-	-	-	-	-	-	17
	PM		-	-	-	-	30	-	-	-	-	-	-	26

Appendix A

4: Elementary School East/Main Street Trip Distribution														
Traffic Component			Southbound Elementary School East			Westbound Main Street			Northbound No Road			Eastbound Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Site Developments														
Site 1: Small Office	-	Inbound												
		Outbound					50%						50%	
Site 2: Retail	-	Inbound					50%						50%	
		Outbound												
Site 3: Residential	-	Inbound					50%						50%	
		Outbound											50%	

4: Elementary School East/Main Street AM Peak Hour														
Traffic Component			Southbound Elementary School East			Westbound Main Street			Northbound No Road			Eastbound Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
2007 Traffic Data														
	AM		0	0	0	2	267	0	0	0	0	642	3	
	PM		0	0	0	30	556	0	0	0	0	378	1	
Growth rate from Main Street/Royal Oak Drive Data														
	AM						1.7%						0.2%	
	PM						0.6%							
2020 Estimated Traffic Volume														
	AM		0	0	0	2	331	0	0	0	0	659	3	
	PM		0	0	0	30	605	0	0	0	0	378	1	
2023 Buildout Year with Traffic Growth														
	AM	2,023					348					663		
	PM						617					378		
Background Future														
	AM		-	-	-	-	0	-	-	-	-	0	-	
	PM		-	-	-	-	0	-	-	-	-	-	-	
Proposed Site Development														
			IN	OUT										
Site 1: Small Office	AM		2	1	-	-	-	-	1	-	-	-	1	
	PM		1	3	-	-	-	-	1	-	-	-	2	
Site 2: Retail	AM		25	20	-	-	-	-	13	-	-	-	10	
	PM		46	39	-	-	-	-	23	-	-	-	20	
Site 3: Residential	AM		3	11	-	-	-	-	2	-	-	-	6	
	PM		12	7	-	-	-	-	6	-	-	-	4	
Subtotal Proposed Site Development	AM		30	32	-	-	-	-	16	-	-	-	17	
	PM		59	49	-	-	-	-	30	-	-	-	26	
Proposed Total Future Build Scenario														
	AM		-	-	-	-	16	-	-	-	-	17	-	
	PM		-	-	-	-	30	-	-	-	-	26	-	

Appendix A

5: Future Site Driveway/Main Street Trip Distribution														
Traffic Component			Southbound Future Site Driveway			Westbound Main Street			Northbound No Road			Eastbound Main Street		
			Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Site Developments														
Site 1: Small Office	-	Inbound				50%							50%	
		Outbound	50%		50%									
Site 2: Retail	-	Inbound				50%							50%	
		Outbound	50%		50%									
Site 3: Residential	-	Inbound				50%							50%	
		Outbound	50%		50%									

5: Future Site Driveway/Main Street														
Traffic Component			Southbound			Westbound			Northbound			Eastbound		
			Future Site Driveway			Main Street			No Road			Main Street		
Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
2020 Estimated East-West Through Traffic from East			AM				285						644	
			PM				592						356	
2020 Estimated East-West Through Traffic from West			AM				195						578	
			PM				556						316	
Max Combination of the East or West Feeds			AM				285						644	
			PM				592						356	
Growth rate from Main Street/Royal Oak Drive Data			AM				1.7%						0.2%	
			PM				0.6%							
2023 Buildout Year with Traffic Growth			AM				300						648	
	2,023		PM				604						356	
Background Future			AM	-	-	-	-	300	-	-	-	-	648	-
			PM	-	-	-	-	604	-	-	-	-	356	-
Proposed Site Development														
				IN	OUT									
Site 1: Small Office	AM		2	1		1	-	1	1	-	-	-	-	1
	PM		1	3		2	-	2	1	-	-	-	-	1
Site 2: Retail	AM		25	20		10	-	10	13	-	-	-	-	13
	PM		46	39		20	-	20	23	-	-	-	-	23
Site 3: Residential	AM		3	11		6	-	6	2	-	-	-	-	2
	PM		12	7		4	-	4	6	-	-	-	-	6
Subtotal Proposed Site Development	AM		30	32		17	-	17	16	-	-	-	-	16
	PM		59	49		26	-	26	30	-	-	-	-	30
Proposed Total Future Build Scenario			AM			17	-	17	16	300	-	-	-	648
			PM			26	-	26	30	604	-	-	-	356

HCM Unsignalized Intersection Capacity Analysis

5: Main Street & Site Driveway

12/21/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	648	300	16	17	17
Future Volume (Veh/h)	16	648	300	16	17	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	704	326	17	18	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	343				1072	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343				1072	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	97
cM capacity (veh/h)	1216				241	707
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	721	343	36			
Volume Left	17	0	18			
Volume Right	0	17	18			
cSH	1216	1700	359			
Volume to Capacity	0.01	0.20	0.10			
Queue Length 95th (ft)	1	0	8			
Control Delay (s)	0.4	0.0	16.1			
Lane LOS	A		C			
Approach Delay (s)	0.4	0.0	16.1			
Approach LOS			C			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			57.0%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Main Street & Site Driveway

12/21/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	30	356	604	30	26	26
Future Volume (Veh/h)	30	356	604	30	26	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	387	657	33	28	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	690				1126	674
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690				1126	674
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				87	94
cM capacity (veh/h)	905				218	455
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	420	690	56			
Volume Left	33	0	28			
Volume Right	0	33	28			
cSH	905	1700	295			
Volume to Capacity	0.04	0.41	0.19			
Queue Length 95th (ft)	3	0	17			
Control Delay (s)	1.1	0.0	20.0			
Lane LOS	A		C			
Approach Delay (s)	1.1	0.0	20.0			
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			53.5%	ICU Level of Service		A
Analysis Period (min)			15			