

ATTACHMENT “A”

Exhibit 27 (a)
OZAH Case No: CU 23-11



December 29, 2023

Ms. Kathleen Byrne, Esq.
Hearing Examiner
Montgomery County Office of Zoning and Administrative Hearings
100 Maryland Avenue, Room 200
Rockville, Maryland 20850

RE: Supplemental Analysis – Worldshine Ruby Senior Living – Conditional Use No. 23-11
West Old Baltimore Avenue, Montgomery County, Maryland

Dear Ms. Byrne:

In order to provide information typically requested by the Zoning Hearing Examiner in advance of the Conditional Use hearing, Wells + Associates conducted an access analysis for the Worldshine Assisted Living project for you and your staff's review. This updated analysis reflects the change in access and the increase in dwelling units as reflected in the update project design, which responds to comments received from Park and Planning Staff and other reviewing agencies. Our analysis includes a review of intersection queues, and crash data at the intersections of West Old Baltimore Road/Ruby Drive and MD 355/West Old Baltimore Road.

The subject site is located on the north side of West Old Baltimore Road, west side Ruby Drive and east of Ivy Leaf Drive in the Clarksburg Policy Area of Montgomery County, Maryland. The Applicant has revised the application to incorporate the additional parcel located in the northwest quadrant of West Old Baltimore Road and Ruby Drive. This additional land area allowed the Applicant to provide access to the project off of West Old Baltimore Road, and also resulted in an increase in beds from 90 beds to 120 beds.

The proposed development will generate less than 50 person trips and therefore an LATR study is not required. The attached Table 1 shows the trip generation anticipated for an assisted living facility with up to 120 beds. An exemption letter dated October 3, 2023, was submitted with the application package.

Queue Analysis

Although not required by LATR, counts were conducted at the Ruby Drive/W. Old Baltimore Road, and MD 355 (Frederick Road)/West Old Baltimore Road intersections on December 13, 2021, from 6:30 to 9:30 AM and 4:00 to 7:00 PM. The peak hours on Ruby Drive/W. Old Baltimore Road occurred from 7:30 to 8:30 AM and from 4:45 to 5:45 PM, and on MD 355

(Frederick Road)/W. Old Baltimore Road occurred from 7:15 to 8:15 AM and from 4:00 to 5:00 PM.

The site trip distribution assumed for this analysis is based on the MNCPPC trip distribution tables as follows: 100 percent of site vehicles headed to/from the east via Ruby Drive to W. Old Baltimore Road, with 10 percent of vehicle trips to the north on MD 355 and 90 percent south on MD 355.

HCM 2000 method in Synchro was used to calculate the queues. The Synchro analysis provides the calculation of queues as well as intersection capacity. Table 2 summarizes the results of the queue analysis. Three queuing scenarios were analyzed: 1) existing conditions, 2) background conditions, and 3) future conditions (with the proposed 120 bed assisted living development).

Under each of the study conditions, both study intersections are well within the MNCPPC capacity standards (51 seconds of delay or less) and no queue exceeds the available storage length. A summary of the intersection results is shown on Table 3.

Copies of the forecast worksheets, queue reports, and intersection capacity analysis for both intersections are attached to this letter in the Attachment A.

Crash Evaluation

The crash history at both study intersections and the roadway link between the intersections was updated to include accident data reported from January 1, 2019, through the mid-year 2023. There were no additional crashes reported for 2022 or 2023. All reported crashes occurred at or near MD 355 (Frederick Road)/West Old Baltimore Road intersection. A summary of the crashes is shown in Table 4 and the detailed crash report for each is provided in Attachment A.

In 2019, the intersection of W. Old Baltimore Road/MD 355 was under construction to provide turn lanes, channelization, and install a new signal. Most of the crashes (5 of the 7) occurred in 2019-2020 before or during the construction which was completed in 2020. Since the completion of the intersection improvements, the number of accidents has declined and no accidents were reported in 2022 or 2023. Based on the accident data, the intersection improvements have improved the safety at this intersection. No accidents were reported during the study period from 2019 through 2023 at the intersection of W. Old Baltimore Road and Ruby Drive or along W. Old Baltimore Road from the site access to MD 355.

Based on the analysis summarized in this letter and the attached documents, it is our professional opinion that the proposed development of Worldshine assisted living will not adversely impact the area road network.

WELLS + ASSOCIATES

If you have any questions regarding this analysis, please call me at (410) 353-7340 or email me at amrandall@wellsandassociates.com.

Sincerely,



Nancy Randall, AICP

Table 1
Worldshine Ruby Drive
Site Trip Generation

Land Use	LU Code	Amount	Unit	AM Peak Hour		PM Peak Hour		AM Peak Hour				PM Peak Hour											
				In	Out	In	Out	Total	Auto Driver (Vehicle Trips)	Auto Passenger	Transit Trips	Non-Motorized	Total Person Trips	Auto Driver (Vehicle Trips)	Auto Passenger	Transit Trips	Non-Motorized	Total Person Trips					
Assisted Living	254	120	BEDS	13	9	22	11	18	29	22	9	1	1	1	22	9	1	1	29	12	1	3	45

Note: Trip Generation Rates based ITE 11th Generation, Mode Split is based on 2021 LATR Guidelines (Clarksburg Policy Area)

Table 2
 Worldshine Ruby Drive
 Intersection Queuing Summary ⁽¹⁾⁽²⁾

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage (ft)	Existing Condition		Background Future		Total Future	
					AM	PM	AM	PM	AM	PM
1. Frederick Road (Route 355)/W. Old Baltimore Road	Signalized	W. Old Baltimore Road W. Old Baltimore Road Frederick Road (Route 335) Frederick Road (Route 335)	EBL	209	103	76	107	80	107	81
			EBR	free right	0	0	0	0	0	0
			NBL	650	92	61	147	80	179	88
			SBR	415	8	9	9	14	10	14
2. W. Old Baltimore Road/Site Access	STOP	W. Old Baltimore Road W. Old Baltimore Road Site Access	EBLT	765	Total Future Only Intersection	Total Future Only Intersection	Total Future Only Intersection	Total Future Only Intersection	0	0
			WBTR	440					0	0
			SBLR	site interior					2	3

Notes : (1) Queue length in feet is based on the 95th percentile queue as reported by Synchro, Version 11.

(2) Roadway names in bold are considered north/south for purposes of this analysis.

Table 3

Worldshine Ruby Drive
Intersection Delay Summary⁽¹⁾

Intersection	Operating Condition	Existing Condition		Background Future		Total Future	
		AM	PM	AM	PM	AM	PM
1 Frederick Road (Route 355)/W. Old Baltimore Road	Signalized	17.2	8.1	20.2	9.5	22.5	9.8
2 W. Old Baltimore Road/Site Access	STOP	Total Future Only Intersection		Total Future Only Intersection		0.2	0.4

Notes : (1) Roadway names in bold are considered north/south for purposes of this analysis



Table 4
Accident Data Summary

Category	Subcategory	Number of Crashes	Number of Crashes	Number of Crashes	Number of Crashes	Number of Crashes	Number of Crashes
	Year	2019	2020	2021	2022	2023	Total of 4 +1/2 years
Light Condition	Daylight	2	1	1	0	0	4
	Dark Lights On	2	1	0	0	0	3
Surface Condition	Dry	4	1	1	0	0	6
	Wet	0	1	0	0	0	1
Severity	Property Damage	2	1	0	0	0	3
	Injury Crash	2	1	1	0	0	4
Driver Substance Abuse	None Detected	3	2	1	0	0	6
	Alcohol Present	1	0	0	0	0	1
	N/A	0	0	0	0	0	0
Collision Type	Single Vehicle	2	1	0	0	0	3
	Same Direction Rear End	2	1	0	0	0	3
	Head on Left Turn	0	0	1	0	0	1
Intersection Related	Yes	2	2	1	0	0	5
	No	2	0	0	0	0	2
Day of Week	Weekday	3	2	1	0	0	6
	Weekend	1	0	0	0	0	1
Time of Day	AM Peak (6:30-9:30 AM)	1	1	1	0	0	3
	PM Peak (4:00-7:00 PM)	1	0	0	0	0	1
	Other	2	1	0	0	0	3
Direction	NB	4	2	1	0	0	7
	SB	0	0	0	0	0	0

**ATTACHMENT A
HCM REPORTS
FORCASTS,COUNTS,
ACCIDENT DETAILS**

Queues

EX

1: MD 355 & W Old Baltimore Rd/Driveway

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	59	315	130	532	1239	34
v/c Ratio	0.46	0.20	0.56	0.33	0.88	0.03
Control Delay	75.4	0.3	21.3	3.3	25.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.4	0.3	21.3	3.3	25.4	1.3
Queue Length 50th (ft)	56	0	17	94	854	0
Queue Length 95th (ft)	103	0	92	159	#1525	8
Internal Link Dist (ft)				511	894	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	423	1583	253	1611	1406	1206
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.20	0.51	0.33	0.88	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

EX
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	290	0	0	0	120	489	0	0	1140	31
Future Volume (vph)	54	0	290	0	0	0	120	489	0	0	1140	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.07	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				131	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	0	315	0	0	0	130	532	0	0	1239	34
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	9
Lane Group Flow (vph)	59	0	315	0	0	0	130	532	0	0	1239	25
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	11.9		150.0				127.6	127.6			112.2	112.2
Effective Green, g (s)	11.9		150.0				127.6	127.6			112.2	112.2
Actuated g/C Ratio	0.08		1.00				0.85	0.85			0.75	0.75
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	111		1583				230	1584			1393	1184
v/s Ratio Prot							c0.04	0.29			c0.67	
v/s Ratio Perm	c0.04		0.20				0.44					0.02
v/c Ratio	0.53		0.20				0.57	0.34			0.89	0.02
Uniform Delay, d1	66.4		0.0				33.8	2.3			14.2	4.8
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	8.7		0.3				3.2	0.6			8.8	0.0
Delay (s)	75.0		0.3				36.9	2.9			23.1	4.9
Level of Service	E		A				D	A			C	A
Approach Delay (s)		12.1			0.0			9.6			22.6	
Approach LOS		B			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			17.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			101.6%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

Queues

1: MD 355 & W Old Baltimore Rd/Driveway

EX

PM Peak Hour






















Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	39	180	274	1141	837	37
v/c Ratio	0.36	0.11	0.53	0.70	0.58	0.03
Control Delay	74.1	0.1	5.6	7.0	11.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	0.1	5.6	7.0	11.0	1.4
Queue Length 50th (ft)	37	0	34	328	315	0
Queue Length 95th (ft)	76	0	61	558	589	9
Internal Link Dist (ft)				519	899	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	178	1583	647	1634	1434	1230
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.11	0.42	0.70	0.58	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

EX
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	166	0	0	0	252	1050	0	0	770	34
Future Volume (vph)	36	0	166	0	0	0	252	1050	0	0	770	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.26	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				490	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	0	180	0	0	0	274	1141	0	0	837	37
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	9
Lane Group Flow (vph)	39	0	180	0	0	0	274	1141	0	0	837	28
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	10.0		150.0				129.5	129.5			114.5	114.5
Effective Green, g (s)	10.0		150.0				129.5	129.5			114.5	114.5
Actuated g/C Ratio	0.07		1.00				0.86	0.86			0.76	0.76
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	94		1583				512	1608			1422	1208
v/s Ratio Prot							0.04	c0.61			0.45	
v/s Ratio Perm	c0.03		0.11				0.42					0.02
v/c Ratio	0.41		0.11				0.54	0.71			0.59	0.02
Uniform Delay, d1	67.2		0.0				6.8	3.6			7.6	4.3
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	6.1		0.1				1.1	2.7			1.8	0.0
Delay (s)	73.3		0.1				7.9	6.3			9.4	4.3
Level of Service	E		A				A	A			A	A
Approach Delay (s)		13.2			0.0			6.6			9.2	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.1				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)				15.0	
Intersection Capacity Utilization			111.6%				ICU Level of Service				H	
Analysis Period (min)			15									

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	62	377	154	532	1239	35
v/c Ratio	0.48	0.24	0.66	0.33	0.90	0.03
Control Delay	75.6	0.4	39.5	3.4	29.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	0.4	39.5	3.4	29.3	1.5
Queue Length 50th (ft)	59	0	68	95	943	0
Queue Length 95th (ft)	107	0	147	163	#1564	9
Internal Link Dist (ft)				511	894	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	423	1583	246	1607	1371	1177
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.24	0.63	0.33	0.90	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

BG
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	0	347	0	0	0	142	489	0	0	1140	32
Future Volume (vph)	57	0	347	0	0	0	142	489	0	0	1140	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.05	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				99	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	377	0	0	0	154	532	0	0	1239	35
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	9
Lane Group Flow (vph)	62	0	377	0	0	0	154	532	0	0	1239	26
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	12.2		150.0				127.3	127.3			109.4	109.4
Effective Green, g (s)	12.2		150.0				127.3	127.3			109.4	109.4
Actuated g/C Ratio	0.08		1.00				0.85	0.85			0.73	0.73
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	114		1583				233	1581			1358	1154
v/s Ratio Prot							c0.06	0.29			c0.67	
v/s Ratio Perm	c0.04		0.24				0.50					0.02
v/c Ratio	0.54		0.24				0.66	0.34			0.91	0.02
Uniform Delay, d1	66.2		0.0				46.2	2.4			16.4	5.6
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	9.0		0.4				6.9	0.6			10.8	0.0
Delay (s)	75.2		0.4				53.1	3.0			27.2	5.6
Level of Service	E		A				D	A			C	A
Approach Delay (s)		10.9			0.0			14.2			26.7	
Approach LOS		B			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.2				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			101.6%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

Queues

1: MD 355 & W Old Baltimore Rd/Driveway

BG

PM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	41	226	347	1141	837	41
v/c Ratio	0.38	0.14	0.65	0.70	0.61	0.03
Control Delay	74.3	0.2	8.1	7.1	14.6	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.3	0.2	8.1	7.1	14.6	2.3
Queue Length 50th (ft)	39	0	46	332	368	0
Queue Length 95th (ft)	80	0	80	567	714	14
Internal Link Dist (ft)				519	899	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	178	1583	627	1632	1376	1182
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.14	0.55	0.70	0.61	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

BG
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	0	208	0	0	0	319	1050	0	0	770	38
Future Volume (vph)	38	0	208	0	0	0	319	1050	0	0	770	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.25	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				460	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	0	226	0	0	0	347	1141	0	0	837	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	11
Lane Group Flow (vph)	41	0	226	0	0	0	347	1141	0	0	837	30
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	10.2		150.0				129.3	129.3			109.8	109.8
Effective Green, g (s)	10.2		150.0				129.3	129.3			109.8	109.8
Actuated g/C Ratio	0.07		1.00				0.86	0.86			0.73	0.73
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	95		1583				527	1605			1363	1158
v/s Ratio Prot							0.07	c0.61			0.45	
v/s Ratio Perm	c0.03		0.14				0.50					0.02
v/c Ratio	0.43		0.14				0.66	0.71			0.61	0.03
Uniform Delay, d1	67.1		0.0				10.0	3.7			9.8	5.5
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	6.5		0.2				3.0	2.7			2.1	0.0
Delay (s)	73.6		0.2				12.9	6.4			11.9	5.5
Level of Service	E		A				B	A			B	A
Approach Delay (s)		11.5			0.0			7.9			11.6	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.5				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)				15.0	
Intersection Capacity Utilization			111.6%				ICU Level of Service				H	
Analysis Period (min)			15									

c Critical Lane Group

Queues

TF

1: MD 355 & W Old Baltimore Rd/Driveway

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	63	386	167	532	1239	36
v/c Ratio	0.48	0.24	0.70	0.33	0.92	0.03
Control Delay	75.6	0.4	51.0	3.5	32.1	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	0.4	51.0	3.5	32.1	1.8
Queue Length 50th (ft)	60	0	98	96	998	0
Queue Length 95th (ft)	107	0	179	164	#1584	10
Internal Link Dist (ft)				511	894	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	423	1583	245	1606	1348	1159
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.24	0.68	0.33	0.92	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

TF
 AM Peak Hour

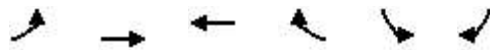
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	355	0	0	0	154	489	0	0	1140	33
Future Volume (vph)	58	0	355	0	0	0	154	489	0	0	1140	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.04	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				78	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	0	386	0	0	0	167	532	0	0	1239	36
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	10
Lane Group Flow (vph)	63	0	386	0	0	0	167	532	0	0	1239	26
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	12.3		150.0				127.2	127.2			107.6	107.6
Effective Green, g (s)	12.3		150.0				127.2	127.2			107.6	107.6
Actuated g/C Ratio	0.08		1.00				0.85	0.85			0.72	0.72
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	115		1583				236	1579			1336	1135
v/s Ratio Prot							c0.07	0.29			c0.67	
v/s Ratio Perm	c0.04		0.24				0.53					0.02
v/c Ratio	0.55		0.24				0.71	0.34			0.93	0.02
Uniform Delay, d1	66.2		0.0				51.7	2.4			17.9	6.1
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	9.1		0.4				9.3	0.6			12.5	0.0
Delay (s)	75.3		0.4				61.0	3.0			30.4	6.1
Level of Service	E		A				E	A			C	A
Approach Delay (s)		10.9			0.0			16.9			29.7	
Approach LOS		B			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			101.6%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

2: W Old Baltimore Rd & Site Access

TF
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	411	162	13	9	0
Future Volume (Veh/h)	0	411	162	13	9	0
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)	0	447	176	14	10	0
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	190			630	183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	190			630	183	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			98	100	
cM capacity (veh/h)	1384			446	859	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	447	190	10			
Volume Left	0	0	10			
Volume Right	0	14	0			
cSH	1384	1700	446			
Volume to Capacity	0.00	0.11	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	13.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	13.3			
Approach LOS			B			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			31.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

1: MD 355 & W Old Baltimore Rd/Driveway

TF

PM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	43	243	358	1141	837	42
v/c Ratio	0.39	0.15	0.67	0.70	0.61	0.04
Control Delay	74.5	0.2	9.1	7.3	15.3	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.5	0.2	9.1	7.3	15.3	2.6
Queue Length 50th (ft)	41	0	48	336	382	0
Queue Length 95th (ft)	81	0	88	575	736	14
Internal Link Dist (ft)				519	899	
Turn Bay Length (ft)		155				415
Base Capacity (vph)	178	1583	625	1630	1364	1171
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.15	0.57	0.70	0.61	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: MD 355 & W Old Baltimore Rd/Driveway

TF
 PM Peak Hour

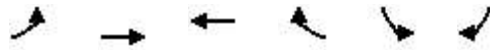
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	224	0	0	0	329	1050	0	0	770	39
Future Volume (vph)	40	0	224	0	0	0	329	1050	0	0	770	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0				4.5	5.5			5.5	5.5
Lane Util. Factor	1.00		1.00				1.00	1.00			1.00	1.00
Frt	1.00		0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1583				1770	1863			1863	1583
Flt Permitted	0.76		1.00				0.24	1.00			1.00	1.00
Satd. Flow (perm)	1410		1583				454	1863			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	0	243	0	0	0	358	1141	0	0	837	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	12
Lane Group Flow (vph)	43	0	243	0	0	0	358	1141	0	0	837	30
Turn Type	Perm		Free				pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases	4		Free	8			2			6		6
Actuated Green, G (s)	10.3		150.0				129.2	129.2			108.9	108.9
Effective Green, g (s)	10.3		150.0				129.2	129.2			108.9	108.9
Actuated g/C Ratio	0.07		1.00				0.86	0.86			0.73	0.73
Clearance Time (s)	5.0						4.5	5.5			5.5	5.5
Vehicle Extension (s)	5.0						3.0	0.2			0.2	0.2
Lane Grp Cap (vph)	96		1583				529	1604			1352	1149
v/s Ratio Prot							0.07	c0.61			0.45	
v/s Ratio Perm	c0.03		0.15				0.51					0.02
v/c Ratio	0.45		0.15				0.68	0.71			0.62	0.03
Uniform Delay, d1	67.1		0.0				10.7	3.7			10.2	5.7
Progression Factor	1.00		1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2	6.8		0.2				3.4	2.7			2.1	0.0
Delay (s)	73.9		0.2				14.1	6.4			12.4	5.8
Level of Service	E		A				B	A			B	A
Approach Delay (s)		11.3			0.0			8.3			12.1	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.8				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)				15.0	
Intersection Capacity Utilization			111.6%				ICU Level of Service				H	
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

2: W Old Baltimore Rd & Site Access

TF
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	208	344	11	18	0
Future Volume (Veh/h)	0	208	344	11	18	0
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)	0	226	374	12	20	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)	1316					
pX, platoon unblocked						
vC, conflicting volume	386			606	380	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386			606	380	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			96	100	
cM capacity (veh/h)	1172			460	667	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	226	386	20			
Volume Left	0	0	20			
Volume Right	0	12	0			
cSH	1172	1700	460			
Volume to Capacity	0.00	0.23	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	13.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			28.8%	ICU Level of Service	A	
Analysis Period (min)			15			

1: Frederick Rd (MD 355)/W. Old Baltimore Rd
AM Peak Hour

Worldshine Ruby Drive

Traffic Component	Southbound Frederick Rd (MD 355)		Westbound Off-Site Driveway		Northbound Frederick Rd (MD 355)		Eastbound W. Old Baltimore Rd	
	Right	Left	Right	Left	Right	Left	Right	Left
Existing Volume	31	1,140	-	-	-	489	290	54
Growth	-	-	-	-	-	-	-	-
Pipeline Developments	IN	OUT						
Tapestry by Miller & Smith		12						
Cabin Branch		38						
Linthicum West		43						
Ten-Mile Creek		39						
Subtotal	132	327				22	57	3
Background	32	1,140	-	-	-	489	347	57
Site Trips	1					12	8	1
Total Future	33	1,140	-	-	-	489	355	58

1: Frederick Rd (MD 355)/W. Old Baltimore Rd
PM Peak Hour

Traffic Component	Southbound Frederick Rd (MD 355)		Westbound Off-Site Driveway		Northbound Frederick Rd (MD 355)		Eastbound W. Old Baltimore Rd	
	Right	Left	Right	Left	Right	Left	Right	Left
Existing Volume	34	770	-	-	-	1,050	166	36
Growth	-	-	-	-	-	-	-	-
Pipeline Developments	IN	OUT						
Tapestry by Miller & Smith		39						
Cabin Branch		89						
Linthicum West		139						
Ten-Mile Creek		129						
Subtotal	396	253				67	42	2
Background	38	770	-	-	-	1,050	208	38
Site Trips	1					10	16	2
Total Future	39	770	-	-	-	1,050	224	40

2: Site Entrance (Future)/W. Old Baltimore Rd
AM Peak Hour

Worldshine Ruby Drive

Traffic Component	Southbound Site Entrance (Future)		Westbound W. Old Baltimore Rd		Northbound N/A		Eastbound W. Old Baltimore Rd	
	Right	Left	Right	Left	Right	Left	Right	Left
Existing Volume								
Growth	-	-	151	-	-	-	385	-
Pipeline Developments								
Tapestry by Miller & Smith								
Cabin Branch								
Linthicum West								
Ten-Mile Creek								
Subtotal								
	132	327	11				26	
Background								
Site Trips	13	9	13				411	
Total Future								
	9	9	13				411	

2: Site Entrance (Future)/W. Old Baltimore Rd
PM Peak Hour

Traffic Component	Southbound Site Entrance (Future)		Westbound W. Old Baltimore Rd		Northbound N/A		Eastbound W. Old Baltimore Rd	
	Right	Left	Right	Left	Right	Left	Right	Left
Existing Volume								
Growth	-	-	312	-	-	-	187	-
Pipeline Developments								
Tapestry by Miller & Smith								
Cabin Branch								
Linthicum West								
Ten-Mile Creek								
Subtotal								
	396	253	32				21	
Background								
Site Trips	11	18	11				208	
Total Future								
	18	18	11				208	

Report Number	MCP2586004L	MCP11510097	MCP00360080	MCP2898002Y	MCP3126001X	MCP102200F8	MCP263900D4
Local Case Number	190002579	1900027056	190054218	200007413	200036564	210043056	210043056
Agency Name	Montgomery County Police	Montgomery County Police	Montgomery County Police	Montgomery County Police	Montgomery County Police	Montgomery County Police	Montgomery County Police
ACRS Report Type	Injury Crash	Property Damage Crash	Property Damage Crash	Property Damage Crash	Property Damage Crash	Injury Crash	Injury Crash
Crash Date/Time	1/16/2019 19:18	6/7/2019 13:44	11/10/2019 17:30	2/13/2019 19:30	9/18/2020 7:16	10/26/2021 8:55	
Hit/Run	No	No	No	No	No	No	No
Route Type	Maryland (State)	Maryland (State)	Maryland (State)	Maryland (State)	Maryland (State)	Maryland (State)	Maryland (State)
Mile Point	20.57	20.57	20.57	20.57	20.57	20.57	20.57
Mile Point Direction	North	North	North	North	North	North	North
Lane Direction	North	South	South	South	North	North	North
Lane Number	1	0	1	1	1	0	0
Lane Type	SHOULDER AREA	OFF ROAD	OFF ROAD	OFF ROAD	LEFT TURN LANE	LEFT TURN LANE	LEFT TURN LANE
Direction	1	2	2	2	2	3	3
Distance	South	South	North	North	South	North	North
Distance 500	500	0	40	0	20	0	0
Distance Unit	FEET	FEET	FEET	FEET	FEET	FEET	FEET
Road Grade	LEVEL	LEVEL	LEVEL	LEVEL	HILL UPHILL	LEVEL	LEVEL
NonTraffic	No	No	No	No	No	No	No
Road Name	FREDERICK RD	FREDERICK RD	FREDERICK RD	FREDERICK RD	FREDERICK RD	FREDERICK RD	FREDERICK RD
Cross-Street Name	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD	WEST OLD BALTIMORE RD
Off-Road Description							
Municipality	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Related Non-Motorist	DRIVER	DRIVER	DRIVER	DRIVER	DRIVER	DRIVER	DRIVER
At Fault	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLOUDY
Weather	DRY	DRY	DRY	DRY	WET	DRY	DRY
Surface Condition	DARK LIGHTS ON	DAYLIGHT	DARK LIGHTS ON	DARK LIGHTS ON	DAYLIGHT	DAYLIGHT	DAYLIGHT
Light	TRAFFIC SIGNAL	TRAFFIC SIGNAL	TRAFFIC SIGNAL	TRAFFIC SIGNAL	TRAFFIC SIGNAL	TRAFFIC SIGNAL	TRAFFIC SIGNAL
Traffic Control	NONE DETECTED	NONE DETECTED	NONE DETECTED	ALCOHOL PRESENT, N/A	NONE DETECTED	NONE DETECTED	NONE DETECTED
Driver Substance Abuse	OTHER VEHICLE	FIXED OBJECT	OTHER VEHICLE	OTHER VEHICLE	OTHER VEHICLE	OTHER VEHICLE	OTHER VEHICLE
Non-Motorist Substance Abuse	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Harmful Event	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Second Harmful Event	N/A	CONSTRUCTION BARRIER	CONSTRUCTION BARRIER	NON INTERSECTION	GUARDRAIL OR BARRIER	N/A	N/A
Fixed Object Struck	NON INTERSECTION	INTERSECTION RELATED	INTERSECTION RELATED	NON INTERSECTION	INTERSECTION	INTERSECTION RELATED	INTERSECTION
Junction	N/A	Y-INTERSECTION	T-INTERSECTION	N/A	T-INTERSECTION	Y-INTERSECTION	T-INTERSECTION
Intersection Type	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Intersection Area	STRAIGHT	STRAIGHT	STRAIGHT	STRAIGHT	STRAIGHT	STRAIGHT	STRAIGHT
Road Alignment	NO DEFECTS	NO DEFECTS	NO DEFECTS	NO DEFECTS	HOLES RUTS ETC	NO DEFECTS	NO DEFECTS
Road Condition	TWO-WAY, NOT DIVIDED	TWO-WAY, NOT DIVIDED	TWO-WAY, NOT DIVIDED	TWO-WAY, NOT DIVIDED	TWO-WAY, DIVIDED, UNPROTECTED	TWO-WAY, NOT DIVIDED	TWO-WAY, NOT DIVIDED
Road Division	39.21521603	39.215515	39.215515	39.21524167	39.21546364	39.21555333	39.21575833
Latitude	-77.25160234	-77.25282233	-77.25256667	-77.25177167	-77.2528169	-77.25214333	-77.252615
Longitude	(39.21521603, -77.25160234)	(39.215527, -77.25282233)	(39.215515, -77.25256667)	(39.21524167, -77.25177167)	(39.21546364, -77.2528169)	(39.21555333, -77.25214333)	(39.21575833, -77.252615)
Location							

ATTACHMENT “B”

RESUME

12. NAME Kevin Huang, PE	13. ROLE Senior Engineer	14. YEARS EXPERIENCE	
		a. TOTAL 30	b. WITH CURRENT FIRM 15

15. FIRM NAME AND LOCATION *(City and State)*
ENDESCO, INC. (Rockville, Maryland)

16. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> MS/1995/Highway Engineering BS/1991/Water Resources Engineering	17. CURRENT PROFESSIONAL REGISTRATION <i>(STATE AND DISCIPLINE)</i> 1998/ Maryland Registered # 23093 2010/ Virginia Registered # 0402 047388 2010/ DC Registered # PE905896 MD Erosion & Sediment Control Certification # 06-805 MDE Green Card Certification # 34167 MDE Certified Stormwater Management and Erosion and Sediment Control Plan Reviewer
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18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
 Mr. Huang has 30 years of experience in water resources and transportation projects with expertise in hydrology/hydraulics. His responsibilities include drainage design, stormwater management design (SWM), erosion and sediment control design (E&SC), highway hydraulics and culvert analysis, inspection and certification of drainage and stormwater management facilities and erosion and sediment control practices, roadway design, and MOT. He is a Certified Stormwater Management and Erosion and Sediment Control Plan Reviewer for MDE and a certified Stormwater Management Plan Reviewer for the Commonwealth of Virginia.

19. RELEVANT PROJECTS

(1) TITLE AND LOCATION <i>(City and State)</i>		(2) YEAR COMPLETED	
a.	The Maryland-National Capital Purple Line Project Montgomery and Prince George's Counties, Maryland	PROFESSIONAL SERVICES 2016-2022	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i> <input checked="" type="checkbox"/> Check if project performed with current firm Stormwater Management and Erosion and Sediment Control Lead, responsible for all drainage related aspects of the project, including the requirements for open/closed storm drain design, erosion and sediment control, SWM facilities, and site civil grading for this 16-mile light rail line extension project from Bethesda in Montgomery County to New Carrollton in Prince George's County. Work with different design disciplines and contractors for this complex Public-Private Partnership project during the design phase and construction phase. The project is divided into eight (8) segments and each segment has multiple phases of construction. Work closely with MOT team to ensure the traffic flows and drainage patterns are properly managed. Provide input for the contractor on the construction schedule and sequences. Attend field meetings with contractors during the construction as needed. Provide alternative design timely as needed when field condition changed. Prepare as-built plans for all stormwater management facilities.		
b.	InterCounty Connector Project, Contracts "A" and "B" Montgomery County, Maryland	PROFESSIONAL SERVICES 2007-2010	CONSTRUCTION (If applicable) 2008-2011
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i> <input checked="" type="checkbox"/> Check if project performed with current firm Lead Drainage Engineer responsible for the drainage design, SWM and E&SC support, and supervising development of the watershed model using ArcView, ArcInfo and ArcGIS for the 16 miles of this major D/B project with five interchanges connecting I-270 to MD-29. Also performed As-Built plans and calculations for all SWM facilities for these two projects. In addition, performed two BMP retrofit designs and provided As-Built plans for Montgomery County under these contracts.		
c.	MDSHA, I-95/I-495/MD Route 210 Interchange Reconstruction (Woodrow Wilson Bridge), Maryland	PROFESSIONAL SERVICES 1998-2006	CONSTRUCTION (If applicable) 2010
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i> <input type="checkbox"/> Check if project performed with current firm Drainage Task Manager responsible for all drainage related aspects of the project, including the requirements for open/closed storm drain design, erosion and sediment control, and SWM facilities for the interchange reconstruction and each of the four (4) construction contracts in Maryland. Coordinated the design of the total project to separate the drainage into four (4) separate construction contracts, and determined how the drainage patterns could be incorporated into multi-phases for construction.		
d.	MDSHA, I-95/MD 24 Interchange Improvements, Maryland	PROFESSIONAL SERVICES 2004-2006	CONSTRUCTION (If applicable) 2010
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i> <input type="checkbox"/> Check if project performed with current firm Drainage Task Manager responsible for all drainage related aspects of the project, including open/closed storm drain design, SWM and facility design, E&SC, flood plain study, and culvert analysis. Supervised development of mapping utilizing ArcInfo for spatial analysis and the creation of presentation quality maps for the report.		

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Frederick Road Bike Path (SP-72) Montgomery County DOT Montgomery County, Maryland	PROFESSIONAL SERVICES 2011-2014	CONSTRUCTION (If applicable)
e.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	The project proposed a 2.5-mile long bike path along Frederick Road (MD-355) in the cities of Clarksburg and Germantown, MD Task Manager responsible for Hydrologic and Hydraulics Engineering Services and Stormwater Management using MDE 2010 Environmental Site Design criteria.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	SWM Facility Retrofit Projects, MC DEP Montgomery County, Maryland	PROFESSIONAL SERVICES 2013-2014	CONSTRUCTION (If applicable)
f.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Task Manager responsible for performing site assessments, inspection of existing stormwater management facilities, alternative studies, drainage comps, hydrologic and hydraulic analysis, dam breach analysis, plan specification and estimates for seven BMP retrofit design for this Montgomery County contract.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Montgomery County Green Street Design Project Montgomery County, Maryland	PROFESSIONAL SERVICES 2015	CONSTRUCTION (If applicable)
g.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Task Manager responsible for providing permit plan submission and final plan submission included in the design for 58 ESD Facilities for this project.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Montgomery County DOT Engineering Services Montgomery County, Maryland	PROFESSIONAL SERVICES 2009-2012	CONSTRUCTION (If applicable)
h.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	<p>Manager responsible for preparing Hydrologic & Hydraulic analysis and Scour studies for the following projects.</p> <ul style="list-style-type: none"> • Dry Seneca Creek for the rehabilitation of culvert at Jerusalem Road and Tributary to Reddy Branch for the rehabilitation of culvert at Brookeville Road, both in Montgomery County, MD. • The replacement of two bridges M-0187B and M-0189B along Whites Ferry Road, Montgomery County, MD. • The replacement of the existing private owned bridge over Broad Run Tributary at 20715 Whites Ferry Road. 		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Annapolis Road / Waterview Avenue Project City of Baltimore, Maryland	PROFESSIONAL SERVICES 2008-2016	CONSTRUCTION (If applicable)
i.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Task manager responsible for drainage design, development of stormwater management facilities, phased erosion & sediment control plans to match the phased construction program, and obtained the necessary approvals for this project. Also responsible for the designed relocation of waterlines for the project.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Deer Manor Subdivision on Riffle Ford Road Montgomery County, Maryland	PROFESSIONAL SERVICES 2015-2019	CONSTRUCTION (If applicable)
j.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Project manager and lead designer for project plans including civil site, demolition, utility, roadway, grading/drainage, E&SC, and SWM. Also responsible for subdivision, permitting applications (MNCPPC, MCDPS, MCDOT, WSSC) and post design construction services.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Rockville Evangelical Mission (REM) Church Montgomery County, Maryland	PROFESSIONAL SERVICES 2012-2016	CONSTRUCTION (If applicable)
k.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Project manager and lead designer for PS&E including sitecivil, demolition, grading/drainage, E&SC, SWM, parking design. Also responsible for permitting applications (MNCPPC, MCDPS, MCDOT, WSSC) and post design construction services.		
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Bridge Scour Analysis and retrofit measures for CONSPAN bridges in MD and VA using HEC-18, HEC-23, MDSHA ABSCOUR programs and VDOT Drainage Manual	PROFESSIONAL SERVICES 2009-2013	CONSTRUCTION (If applicable)
l.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	

Task Manager responsible for eight different tasks.

- Monocacy Boulevard Bridge over Carroll Creek, City of Frederick, MD.
- CONSPAN Bridge in Turf Valley II, Howard County, MD.
- Crossroads at Leesburg, Loudon County, VA
- Tuscarora High School (HS-5) BEAM/SPAN Bridge, Loudoun County, VA.
- Tuscarora High School (HS-5) CON/SPAN Bridge, Loudoun County, VA.
- Hi-Rock Ridge Road CON/SPAN Bridge Jamison Farm, Section 3, off Lee Highway (Route 29), Fauquier County, VA.
- Arcola I CON/SPAN Bridge Section 1B & 2- The Grange at Willowsford, Loudon County, VA.
- HA-2, Mine Road, BEBO Bridge Crossing Stafford, Prince William County, VA.



Joshua Sloan, RLA, ASLA, AICP

Vice President / Director of Planning and Landscape Architecture

Josh Sloan is a respected, seasoned professional with over 25 years of experience in project design and oversight. He began his career in the design/build arena of the private sector on landscape crews, as a designer, and business owner. This experience provided him with a strong background in the construction and permitting processes, project management, and business practices. He then spent seven years with the Montgomery Planning Department of the Maryland-National Capital Park and Planning Commission (M-NCPPC), rising to the level Planning Supervisor. During his tenure at the

Commission, he participated directly in development review, master planning, zoning, and community relations. Josh has presented at the USGBC Greenbuild Conference, the National APA Conference, and the ASLA Conference on Landscape Architecture, as well as serving on various committees for APA, ASLA, and local jurisdictions. He has been qualified as an expert witness in Planning and Landscape Architecture in Montgomery County, MD and provided expert testimony to the State of Maryland.

Areas of Professional Expertise:

- Master Planning
- Landscape Architecture
- Urban Design
- Entitlement Plans
- Zoning & Regulatory Review
- Land Use Planning
- Environmental Planning
- Concept & Feasibility Studies
- Construction Documents & Administration

Professional Experience:

- Tower Oaks, Rockville, MD
- Montgomery Row, Bethesda, MD
- Pike and Rose, North Bethesda, MD
- Park Potomac, Potomac, MD
- Brandywine Senior Living At Potomac, Potomac, MD
- The Neighborhoods of Crown, Gaithersburg, MD
- Greater Cheverly Sector Plan, Cheverly, MD
- 4910/4920 Strathmore Avenue, North Bethesda, MD
- Preston Place and Lake Apartments, Chevy Chase, MD
- Swann Road, Prince George's County, MD
- Fort-Washington Multifamily, Prince George's County, MD

Professional Degrees and Registrations:

- Master of Landscape Architecture, Graduate Studies in Philosophy, State University of New York College of Environmental Science and Forestry & Syracuse University
- Bachelor of Arts in Biology, St. Mary's College of Maryland
- Maryland: Registered Landscape Architect, 2014
- Virginia: Registered Landscape Architect, 2000
- Co-Chair, Sustainable Design & Development PPN, ASLA, 2020-2022
- Treasurer, National Capital Area Chapter of the American Planning Association, 2015-2018
- American Institute of Certified Planners, 2015



EDUCATION:

- **Ph.D.** in Environmental Design & Planning, 2003
Virginia Tech, Blacksburg, VA
- **M. ARCH.** , 1999
Virginia Tech, Blacksburg, VA
- **B. S.** in Architecture, 1990
Tongji University, Shanghai, China

CERTIFICATION:

- Registered architect in DC, MD, VA, and FL
- USGBC LEEP AP

EXPERIENCES:

Adjunct Professor, August 2021 – current

University of Maryland, College Park, MD

- Teach two courses: Material and Methods; and Environmental Systems in Architecture
- Committee member for Learning Outcomes Assessment Review
- Committee member for UMD Honor College Scholarship

Principal/President, October 2015 – current

Prime Planning Intl. PLLC, McLean, VA

- Overseeing plan, design and construction residential and commercial projects, including residential development, multi-family condo, senior living community, and interior renovations for private universities.



- **NOVA Adult Daycare | Sterling, VA**
Project Manager for a 7,800 sf interior renovation/conversion project. Facility includes one main multifunction room; 4 activity rooms, and other supporting spaces.



- **Ruby Senior Homes | Boyds, MD**
Project Manager/architect for a new 120-unit assisted living community, including a formal dining room, salon, library, and wellness suite.

- Other commercial projects in Maryland:

- *Rockville Pike, Rockville, MD - Retail*
- *Jefferson St, Rockville, MD – Church/Temple*
- *Hungerford Dr, Rockville, MD – Fruit tea*
- *Dulaney Valley Dr, Towson, MD – Bubble tea*
- *Annapolis Mall, Annapolis, MD – Bubble tea*
- *Democracy Blvd, Bethesda, MD – Bubble tea*

- *Wisconsin Ave, Bethesda, MD – Massage shop*
- *Deereco Rd, Timonium, MD – Office*
- *Little Patuxent Pkwy, Columbia, MD – Bubble tea*
- *New Hampshire Ave, Silver Spring, MD – Daycare center*
- *PATASCO Ave, Baltimore, MD – Retail*
- *61st Ave, Fairmount Heights, MD – Community Center*

Project Manager, September 2011- July 2019

Arlington Public Schools, Arlington, VA

- Managing new construction project from \$15,000,000 to \$110,000,000.
- Oversee sustainability practices including two net-zero elementary schools.

Project Manager, February 2006 – August 2011

Perkins Eastman, Washington, DC



- *Clayton on the Park | Clayton, MO*
Project Architect/Manager for programming and repositioning the public spaces for a 23-story rental independent living community from an extended stay hotel. The adaptation of the three lower floors includes a media center, formal dining venue, salon, library, and wellness suite.
- *Sunrise Sterling at Woodlands | Woodlands, TX*
Project Architect for a 10-story aging-in-place community including 133 resident units, dining and recreation facilities, health care component, and a parking garage. The project was published at AIA Design for Aging 2007.



- *Hebrew Senior Life | Dedham, MA*
Project architect responsible for design of the assisted living facility within 162-acre inter-generational Hebrew Senior Life campus. The expansive 1,000,000 GSF complex provides a broad range of housing choices for senior citizens. The project included New England's largest closed-loop geothermal heating and cooling system. LEED® Certified equivalent.
- *Nations Academy | Bethesda, MD*
Project architect responsible for design of a \$87 million facility for this network of schools that will have more than 60 campuses in the world's leading cities. The 270,000 SF Bethesda building will include state-of-the-art K-12 academic spaces, fully equipped athletic facilities, performing arts center, early childhood center, dormitory, and other support spaces.

Project Architect, August 2004 – February 2006

Einhorn Yaffee Prescott Architecture & Engineering P.C., Washington, DC

Intern Architect, October 2003 - August 2004

Kishimoto.Gordon.Dalaya PC, Rosslyn, VA

Student Team Leader, April 2001 – October 2002

Virginia Tech Solar Decathlon Team, Virginia Tech, Blacksburg, VA

Intern Architect, July 1990- August 1997

The 9th Design & Research Institute, Shanghai, PRC

AWARDS:

- Project selected for publication: *Sunrise Sterling at Woodlands*, AIA Design for Aging 2007, Washington, DC 2007
- First Prize in the Presentation and Simulation Contest of the Solar Decathlon, the Department of Energy, Washington, DC 2002
- Travel Fund, Virginia Tech, Blacksburg, VA 2002
- Graduate Research Development Project Fund, Virginia Tech, Blacksburg, VA 2001
- First Prize in the virtual reality category of 16th Annual Research Symposium, Virginia Tech, Blacksburg, VA 2000

ACTIVITIES:

- Instructor for Halfmoon Education Inc, October 27. 2023: ***Maryland Adoption of 2021 International Building Code***
- Judge for ABC Construction Awards (Virginia Chapter) 2010-2023
- Guest speaker at AIA Asian American Designers Union, AIA DC chapter, December 10, 2018
- CO-founder of Greater Washington Asian-American Architects and Engineers Association (GWAAEA)
 - Currently 100+ members.
 - Organize quarterly meetings for members since 2008.
- Promote building information management in design and construction.
 - Presented at Arch Exchange East, Richmond, VA, 2010: ***Building Information Management for Master Planning and Facility Management.***
 - Presented at Project Management Symposium at University of Maryland, College Park, MD, 2010: ***Building Information Management: a Tool towards Sustainability***
 - Presented at Virginia Community College System, Richmond, VA, 2009: ***Building Information Management for Space Inventory and Utilization Study***

SUMMARY OF SKILLS:

- Oversee small to large scale construction projects from feasibility study, design, construction to post occupancy.
- Organize community meetings related to facility planning, design and construction.
- Supervise junior project manager and interns.
- Oversee RFP and interviews for design and construction services.
- Fluent in Autocad, Revit, Photoshop, MS Project, Powerpoint, Word, Excel.



ANNE (NANCY) M. RANDALL, AICP
Consultant

PROFILE: Ms. Randall has over 40 years of experience in the traffic and transportation planning fields for both private and public-sector clients. This experience includes conducting and overseeing the preparation of traffic impact studies, corridor studies, signal warrant analyses, Traffic Demand Management programs, site circulation reviews, parking policy and needs studies, and feasibility analyses.

EXPERIENCE:

Traffic Impact Studies. Conducted numerous traffic impact studies for residential, retail, commercial, industrial, institutional, and mixed-use properties in Maryland, Virginia, and Washington D.C. This includes analysis of data, preparation of reports, and expert testimony in support of rezoning, special exception/use permits, and site plan/subdivision plat approvals.

Large Scale Mixed-Use & Multi-Modal Developments. Conducted multi-modal transportation studies for a number of large residential, office, and retail projects, including: North Bethesda Town Center (White Flint Metro Station), White Flint Mall, and Mid-Pike Plaza in White Flint, Maryland; Twinbrook Commons and Twinbrook Station at the Twinbrook Metro Station in Rockville, Maryland; Geico Headquarters in Friendship Heights, Maryland; Bethesda Theater in Bethesda, Maryland; Riverdale Park Station-Cafritz, Riverdale Park Maryland; West Hyattsville Metro Station, Largo Town Center at the Largo Metro Station, Town Center at Camp Springs at the Branch Avenue Metro Station, and Fairwood in Prince George's County, Maryland; and Russett Center, Parole Town Center and Anne Arundel Medical Center in Anne Arundel County, Maryland.

Transportation Master Plans and Corridor Studies. Preparation of Transportation Master Plans for the City of Annapolis and Anne Arundel County Maryland. Preparation of the transportation elements for several Sector Plan and Sectional Map Amendment Plans for several sub-region zones within Prince George's County Maryland, including: Sub-Region I Route I Corridor Master Plan, Bladensburg Master Plan, Branch Avenue Master Plan and Port Towns Master Plan. Provided the analysis

and recommendations for the Transportation Master Plan for Fort Meade, Maryland. Conducted corridor studies in the city of Annapolis, Prince George's County, Historic District of the City of Fairfax, Virginia and MD Route 32/NSA for the MD State Highway Administration.

Feasibility Analysis. Prepared site assessments for projects in Montgomery, Anne Arundel, Prince George's, Howard, Charles, Calvert, Kent, St. Mary's, Allegany, Frederick, Carroll, Talbot and Baltimore Counties, Maryland and the City of Alexandria and Fairfax County, Virginia.

Parking Studies. Conducted parking policy, size requirements, needs, feasibility, and shared-use studies for private developers and for public agencies, including the City of Annapolis, Anne Arundel County, Anne Arundel Medical Center, Centex, CentreMark Properties, Lerner Enterprises, LCOR, Federal Realty Investment Trust and Archstone Smith.

Expert Witness Testimony. Qualified as an expert witness in Federal District Court, and Circuit Court in Anne Arundel County in Maryland; Qualified in Maryland before District Council, MNCPPC Planning Board and Zoning Hearing Officer in both Montgomery County and Prince Georges County; Planning Board and City Council in City of Rockville: Hearing Officer/Zoning Hearing Commissioner in Baltimore County; Zoning Hearing Officer and Board of Appeals in Anne Arundel County: Planning Board, Board of Appeals and City Council in City of Annapolis; Board of Appeals in Charles County; Anne Arundel County Board of Appeals, County Commissioner and Planning Commission in St. Mary's and Calvert Counties; City Council in the City of Greenbelt; Planning Board in the City of Laurel; Planning Advisory Board, and the City Council of Bowie; and the Planning Commission in Carroll County.

Special Event Transportation Planning. Designed and coordinated traffic operations for special events in the City of Annapolis, Maryland, including U.S. Boat Shows, 1984 Summer Olympic Trials and NATO conferences.

EDUCATION: Bachelor of Arts, Behavioral and Social Sciences, University of Maryland, College Park, 1975.

AFFILIATIONS: Member of the Institute of Transportation Engineers
American Planning Association
Member of the American Institute of Certified Planners (AICP)

EMPLOYMENT HISTORY:

- 1995 – Present** **Wells + Associates, Inc.**
McLean, Virginia
Principal
Branch Manager of Wells & Associates, Inc. Silver Spring Office, responsible for business development, management of professional, technical, and clerical staff, project management for transportation planning studies, including technical analysis, report preparation, public presentation, and expert testimony.
- 1989-1995** **The Traffic Group, Inc.**
Towson, Maryland
Senior Associate
Responsible for the transportation planning studies, project management, technical analysis, management of technical staff, business development, documentation, and expert testimony.
- 1986-1989** **Greenhorn & O'Mara, Inc.**
Greenbelt, Maryland
Responsibilities included transportation planning studies, technical analysis, documentation, business development, administration, and management of technical staff, and expert testimony.
- 1981-1986** **City of Annapolis**
Department of Public Works
Annapolis, Maryland
Engineering Analyst
Provided transportation planning and traffic engineering services for the City of Annapolis, including; review of subdivision, zoning, and development plans for compliance with the City Code, review of traffic impact studies, special event planning, technical review of transportation plans, city wide traffic control design and implementation.
- 1979-1980** **Development Facilitators, Inc.**
Severna Park, Maryland
Engineering Analyst
Responsible for business development, management of technical staff, technical analysis, and preparation of traffic engineering reports and plans.
- 1976-1979** **Anne Arundel County**
Department of Public Works
Traffic Engineering Division

Traffic Analyst

Responsible for review of subdivision zoning and development plans for compliance with County Code requirements, parking lot layout, street design and street lighting. Review of impact studies submitted for subdivision and rezoning applications. Prepared and drafted portions of the 1978 transportation text of the Adequate Public Facilities Ordinance for Anne Arundel County, Maryland.