

Memorandum

To: Michael Johnston
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From: Benjamin Reim, P.E.
Kimley-Horn

Date: May 13, 2022

Subject: Hampton Industrial Development on Aberdeen Road TIA Update

Introduction

In 2016, the *Hampton Industrial Development on Aberdeen Road TIA* was completed by Kimley-Horn and approved by the City of Hampton. The traffic impact analysis (TIA) evaluated the potential impacts of a proposed industrial development consisting of approximately 700,000 square feet (sf) of general light industrial, manufacturing, or general/high cube warehousing space. Since completion of the 2016 TIA, the proposed development intensity has increased to 833,000 sf (i.e., an approximate 133,000 sf increase). As part of a current site rezoning application, the traffic analyses from the 2016 TIA have been updated to reflect the currently proposed land use intensity. **Attachment A** includes the proposed site plan with the 833,000-sf development.

This technical memorandum is an addendum to the 2016 *Hampton Industrial Development on Aberdeen Road TIA* (referred to as “2016 TIA” in this document). The memorandum summarizes the anticipated change in trip generation potential for the proposed development, presents updated operational traffic analysis results under future Build conditions, and confirms the validity of previously proposed recommendations and if any additional need to be proposed.

Trip Generation

The 2016 TIA trip generation analysis referenced the *Trip Generation Manual*, 9th Edition; however, the most current version is now the 11th Edition. Therefore, the 11th Edition was used in estimating trip generation potential for the newly proposed 833,000 sf development. The currently proposed development will consist of uses consistent with ITE Land Use Codes (LUC) 155 (“High Cube -Sort”) and 110 (Light Industrial). **Table 1** summarizes the trip generation potential from the 2016 TIA (i.e., 700,000 sf Manufacturing based on the 9th Edition *Trip Generation Manual*) along with trip generation potential for the currently proposed 833,000 sf development using the 11th Edition *Trip Generation Manual*.

Table 1 – Trip Generation Comparison (2016 TIA versus 2022 TIA Addendum)

ITE Land Use Description (TIA Date)	ITE Code	Size	Unit (sf)	Projected Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Manufacturing (2016)	140	700	1,000	2,696	551	430	121	530	191	339
Total (2016)				2,696	551	430	121	530	191	339
Light Industrial (2022)	155	565	1,000	3,381	519	439	80	462	154	308
High Cube – Sort (2022)	110	268	1,000	1,030	139	129	10	192	75	117
Total (2022)				4,411	658	568	90	654	229	425
Total Change (2022 – 2016)				+1,715	+107	+138	-31	+124	+38	+86

Compared to the 2016 TIA trip generation, the currently proposed 833,000 sf development has the potential of generating 1,715 additional daily trips, with 107 additional trips during the AM peak hour and 124 additional trips during the PM peak hour. The proposed trip generation potential was assigned with the same distributions that were approved in the 2016 TIA.

Future Build Volumes

The 2016 TIA included two future Build years – 2018 (Opening Year) and 2034 (Horizon Year). Since 2018 would no longer reflect a future condition to 2022, traffic volumes for a new opening year were developed based on the same assumption of the existing year plus 2 years (i.e., 2024). Consistent with the 2016 TIA, the 2034 Horizon Year was maintained. The newly developed 2024 Opening Year volumes were developed with the same future volume development assumptions from the 2016 TIA. Updated opening and horizon year Build volumes included updated trip generation potential for the 833,000-sf development. **Attachment B** includes updated traffic volume figures for both 2024 Opening Year and 2034 Horizon year conditions.

Intersection Control and Turn Lane Warrant Analyses

Traffic signal and turn lane warrant analyses were previously conducted in the 2016 TIA at the intersection of Aberdeen Road and Site Driveway under 2034 Build conditions. The analyses used methodologies set forth in the *Manual on Uniform Traffic Control Devices*, 2009 Edition (MUTCD). The 2016 TIA traffic signal warrant analyses concluded that Warrant 1 (8-hour) and Warrant 2 (4-hour) were not met; however, Warrant 3 (Peak Hour) did meet warrant thresholds. The 2016 TIA recommended that a traffic signal be installed given the proposed development will generate a high percentage of heavy vehicle traffic at the intersection. With the newly proposed development intensity of 833,000 sf, Warrant 1B, Warrant 2, and Warrant 3 thresholds are all met, and the initial recommendation for a traffic signal installation is validated. **Table 2** summarizes the traffic signal warrant results from the 2016 TIA, as well as with the updated 2022 TIA Addendum analyses.

Table 2 – Traffic Signal Warrant Results (2016 TIA versus 2022 TIA Addendum)

Development Scenario	Warrant 1A (Met/Needed)	Warrant 1B (Met/Needed)	Warrant 1 Combination (Met/Needed)	Warrant 2 (Met/Needed)	Warrant 3 (Met/Needed)
2016 TIA (700,000 sf)	Not Met (1/8)	Not Met (7/8)	Not Met (2/8, 10/8)	Not Met (3/4)	Met (1/1)
2022 Addendum (833,000 sf)	Not Met (1/8)	Met (10/8)	Not Met (6/8, 10/8)	Met (7/4)	Met (2/1)

In the 2016 TIA, southbound left-turn and northbound right-turn lane warrant analyses were conducted at the intersection of Aberdeen Road and Site Driveway. Both warrant analyses were updated in this TIA Addendum to reflect the currently proposed development intensity. The turn lane warrant analyses were conducted under 2034 Build conditions and utilized methodologies contained in Appendix F of VDOT's *Road Design Manual*. Detailed summaries of the updated turn lane warrant worksheets are included in **Attachment C**. The updated analysis results indicate that the northbound right-turn could increase by 8 vehicles, leading to borderlines warrant results. Due to there only being a minor increase in vehicles from the 2016 TIA, the 2016 TIA recommendation is maintained (i.e., a northbound right turn lane is not recommended). The southbound left-turn lane is still warranted and is still being recommended.

Updated Future Build Analysis

Future Build operational analyses were verified under 2024 Opening Year and 2034 Horizon Year conditions assuming an updated 833,000 sf development. The analyses were conducted using 2000 *Highway Capacity Manual* (HCM) methodologies contained in *Synchro Professional* (Version 11.0). While *Synchro Professional* (Version 9.0) was used in the 2016 TIA, identical HCM methodologies have been maintained. Traffic signal timings were revalidated in the updated Build analyses to account for the increase in potential trips.

Tables 3 – 8 summarize 2024 and 2034 Build condition analysis results. In each table, 2018 Build and 2034 Build analysis results from the 2016 TIA have been included for reference and comparison purposes. Per discussions with City of Hampton Public Works, Existing and No Build condition analyses from the 2016 TIA were not revised nor have been included in the tables in this memorandum.

Aluminum Avenue/50th Street and Aberdeen Road

Table 3 summarizes Build analysis results for the Aluminum Avenue/50th Street and Aberdeen Road intersection.

Table 3: LOS & Control Delay Results – Aluminum Avenue/50th Street and Aberdeen Road

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)						
		Aluminum Avenue		50 th Street	Aberdeen Road			
		Eastbound		Westbound	Northbound		Southbound	
		LT / TH	RT	LT / TH / RT	LT	TH / RT	LT	TH / RT
AM Peak Hour								
2018 Build (2016 TIA)	B (12.4)	D (39.2)	D (37.5)	D (38.5)	D (35.7)	A (4.5)	A (5.5)	A (7.8)
		D (37.8)		D (38.5)	B (10.6)		A (7.7)	
2024 Build	B (13.4)	D (39.2)	D (37.4)	D (38.4)	D (41.1)	A (2.5)	A (7.5)	B (11.3)
		D (37.7)		D (38.4)	B (10.1)		B (11.3)	
2034 Build (2016 TIA)	B (13.3)	D (39.3)	D (37.2)	D (38.3)	C (34.4)	A (4.5)	A (7.7)	B (10.9)
		D (37.6)		D (38.3)	B (10.3)		B (10.9)	
2034 Build	B (14.1)	D (39.3)	D (37.3)	D (38.3)	D (42.7)	A (2.3)	A (9.1)	B (13.1)
		D (37.7)		D (38.3)	B (10.2)		B (13.1)	
PM Peak Hour								
2018 Build (2016 TIA)	B (13.6)	D (38.3)	D (35.4)	D (36.5)	E (61.3)	A (1.0)	A (6.6)	A (9.5)
		D (36.0)		D (36.5)	A (7.4)		A (9.4)	
2024 Build	B (14.2)	D (38.2)	D (35.2)	D (36.2)	E (55.5)	A (1.4)	A (8.2)	B (11.8)
		D (35.8)		D (36.2)	A (7.2)		B (11.7)	
2034 Build (2016 TIA)	B (14.4)	D (40.0)	D (35.2)	D (36.4)	D (51.2)	A (1.3)	A (9.2)	B (13.0)
		D (36.3)		D (36.4)	A (6.5)		B (12.9)	
2034 Build	B (14.7)	D (42.6)	D (35.9)	D (37.3)	D (51.8)	A (1.4)	A (9.0)	B (13.0)
		D (37.4)		D (37.3)	A (6.7)		B (12.9D)	

Under 2024 conditions, all movements are expected to operate at LOS D or better or are consistent with anticipated Opening Year conditions from the 2016 TIA. Under 2034 Build, AM peak hour conditions are expected to be maintained from the 2016 TIA with exception to the northbound left-turn which was previously 0.6 seconds per vehicle from a LOS D (i.e., 35 seconds per vehicle threshold for LOS C/D). Under 2034 Build PM peak hour conditions, all LOS are expected to be maintained from the 2016 TIA.

I-664 SB Off-Ramp and Aberdeen Road

Table 4 summarizes Build analysis results for the I-664 SB Off-Ramp and Aberdeen Road intersection.

Table 4: LOS & Control Delay Results – I-664 SB Off-Ramp and Aberdeen Road

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)					
		I-664 SB Off-Ramp		Aberdeen Road			
		Westbound		Northbound		Southbound	
		LT	RT	LT	TH	TH	RT
AM Peak Hour							
2018 Build (2016 TIA)	C (23.7)	C (21.4)	D (36.4)	A (2.9)	B (11.3)	B (16.9)	D (50.2)
		C (31.6)		B (10.1)		C (27.9)	
2024 Build	B (18.5)	B (18.7)	C (32.6)	C (29.5)	C (21.6)	A (8.0)	A (1.7)
		C (27.9)		C (22.7)		A (6.0)	
2034 Build (2016 TIA)	C (27.6)	B (17.1)	D (35.1)	A (6.5)	B (15.5)	C (21.9)	E (67.9)
		C (29.7)		B (14.2)		D (37.3)	
2034 Build	C (21.3)	B (17.3)	D (34.9)	C (34.5)	C (25.2)	B (10.3)	A (7.2)
		C (29.1)		C (26.4)		A (9.3)	
PM Peak Hour							
2018 Build (2016 TIA)	B (10.3)	D (35.3)	D (40.1)	B (12.6)	A (5.3)	A (2.7)	A (1.5)
		D (37.8)		A (6.4)		A (2.4)	
2024 Build	B (10.2)	C (33.6)	D (42.4)	B (12.5)	A (2.9)	A (4.2)	A (2.0)
		D (38.1)		A (4.4)		A (3.8)	
2034 Build (2016 TIA)	B (11.8)	C (31.5)	D (44.7)	C (20.4)	A (6.9)	A (3.9)	A (1.3)
		D (38.4)		A (8.7)		A (3.4)	
2034 Build	B (11.4)	C (31.4)	D (45.4)	C (20.8)	A (3.6)	A (5.1)	A (2.7)
		D (38.6)		A (6.2)		A (4.7)	

Under 2024 and 2034 conditions, all movements (under AM and PM peak hour conditions) are expected to operate at LOS D or better with increases or decreases in delays being attributed to updated traffic signal timings.

I-664 NB Off-Ramp and Aberdeen Road

Table 5 summarizes Build analysis results for the I-664 NB Off-Ramp and Aberdeen Road intersection.

Table 5: LOS & Control Delay Results – I-664 NB Off-Ramp and Aberdeen Road

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)					
		I-664 NB Off-Ramp		Aberdeen Road			
		Eastbound		Northbound		Southbound	
		LT	RT	TH	RT	LT	TH
AM Peak Hour							
2018 Build (2016 TIA)	B (10.3)	D (38.7)	D (36.4)	A (6.5)	A (5.5)	A (7.3)	A (1.9)
		D (37.7)		A (6.2)		A (3.1)	
2024 Build	B (10.3)	D (38.4)	D (36.2)	A (7.9)	A (5.9)	A (1.4)	A (2.1)
		D (37.3)		A (7.3)		A (2.0)	
2034 Build (2016 TIA)	B (11.3)	D (38.7)	D (35.6)	A (6.9)	A (4.7)	B (12.7)	A (3.4)
		D (37.4)		A (6.2)		A (5.6)	
2034 Build	B (10.3)	D (38.7)	D (35.9)	A (7.9)	A (5.3)	A (2.0)	A (2.2)
		D (37.4)		A (7.1)		A (2.2)	
PM Peak Hour							
2018 Build (2016 TIA)	B (12.3)	D (39.1)	C (34.2)	A (8.8)	A (3.9)	B (11.9)	A (4.4)
		D (37.4)		A (7.7)		A (6.6)	
2024 Build	B (13.2)	D (39.5)	C (34.0)	A (9.6)	A (2.8)	B (16.0)	A (5.2)
		D (37.6)		A (8.0)		A (8.4)	
2034 Build (2016 TIA)	B (13.8)	D (40.2)	C (33.5)	B (10.9)	A (4.1)	B (14.9)	A (6.1)
		D (38.0)		A (9.3)		A (8.4)	
2034 Build	B (14.7)	D (43.2)	C (34.3)	B (12.0)	A (2.8)	B (17.8)	A (5.6)
		D (40.1)		A (9.8)		B (9.2)	

Under 2024 and 2034 conditions, all movements (under AM and PM peak hour conditions) are expected to operate at LOS D or better with increases or decreases in delays being attributed to updated traffic signal timings.

Pembroke Avenue and Aberdeen Road

Table 6 summarizes Build analysis results for the Pembroke Avenue and Aberdeen Road intersection.

Table 6: LOS & Control Delay Results – Pembroke Avenue and Aberdeen Road

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)								
		Pembroke Avenue					Aberdeen Road			
		Eastbound			Westbound		Northbound		Southbound	
		LT	TH	RT	LT	TH / RT	LT	TH / RT	LT	TH / RT
AM Peak Hour										
2018 Build (2016 TIA)	C (20.2)	D (45.7)	C (27.4)	C (26.2)	C (30.9)	C (22.1)	C (27.3)	B (10.3)	D (38.3)	B (17.1)
		C (29.8)			C (23.1)		C (11.8)		C (20.9)	
2024 Build	C (24.0)	D (47.1)	C (27.2)	C (26.1)	D (41.0)	D (39.6)	C (25.6)	B (9.4)	D (48.8)	B (17.4)
		C (29.7)			D (39.8)		B (10.8)		C (22.5)	
2034 Build (2016 TIA)	C (20.4)	D (41.3)	C (26.0)	C (24.8)	C (28.9)	C (20.2)	C (28.4)	B (12.2)	D (38.5)	B (17.7)
		C (28.0)			C (21.2)		B (13.5)		C (21.8)	
2034 Build	C (25.3)	D (41.3)	C (26.0)	C (24.9)	D (41.7)	D (40.6)	C (25.7)	B (11.2)	D (52.3)	B (19.2)
		C (27.9)			D (40.8)		B (12.4)		C (25.0)	
PM Peak Hour										
2018 Build (2016 TIA)	C (29.4)	D (45.6)	C (26.3)	C (22.8)	C (33.1)	C (34.9)	D (41.4)	C (29.5)	D (43.7)	B (18.5)
		C (29.0)			C (34.7)		C (31.0)		C (25.6)	
2024 Build	C (34.3)	D (47.6)	C (26.4)	C (22.7)	D (43.5)	D (47.6)	D (35.6)	D (36.0)	D (52.0)	C (21.7)
		C (29.4)			D (47.2)		D (35.9)		C (30.1)	
2034 Build (2016 TIA)	D (35.9)	D (52.9)	C (26.4)	C (22.1)	D (35.3)	D (43.3)	D (47.3)	D (43.8)	D (54.1)	B (19.6)
		C (30.2)			D (42.5)		D (44.2)		C (29.8)	
2034 Build	D (41.1)	D (48.3)	C (25.6)	C (21.6)	D (43.1)	D (48.8)	D (54.1)	E (56.4)	E (63.4)	C (21.2)
		C (28.7)			D (48.2)		E (56.1)		C (33.3)	

Under 2024 Build, AM and PM peak hour conditions are expected to operate at LOS D or better. Fluctuations in delays are due to additional site traffic and revised traffic signal timings. Under 2034 Build AM peak hour conditions, LOS is expected to be maintained (i.e., LOS D or better) for each movement, approach, and overall intersection when compared to both anticipated 2024 Build conditions and 2034 conditions included in the 2016 TIA.

Under 2034 Build PM peak hour conditions, all movements are expected to maintain LOS D or better conditions compared to both anticipated 2024 Build conditions and 2034 conditions included in the 2016 TIA, except for the southbound left-turn and northbound through/right movements. The southbound left-

turn movement is expected to deteriorate from a LOS D to LOS E and is partially due to revisions in traffic signal timing offsets along Aberdeen Road; however, another contributing reason is that the 2016 TIA had an expected control delay of 54.1 seconds per vehicle which is only 0.9 seconds per vehicle from the LOS D/LOS E threshold.

The northbound through/right-turn movement is expected to deteriorate from LOS D to LOS E and is attributed to the anticipated increase in site traffic. It is important to note that the updated operational analyses maintain 2016 TIA trip distributions, which do not assume site traffic accessing Pembroke Avenue from Shell Road. However, it is anticipated that some of the exiting traffic currently proposed at the Aberdeen Road driveway (i.e., 5% to/from the east along Pembroke Avenue) could be expected to access Pembroke Avenue directly from Shell Road. A potential diversion of traffic from the Aberdeen Road driveway to the Shell Road and Pembroke Avenue intersection would result in a volume reduction for the northbound right-turn movement at the Aberdeen Road and Pembroke Avenue intersection. While a separate operational analysis scenario with different trip distributions was not performed in this TIA update, an isolated HCM intersection analysis was conducted at the Aberdeen Road and Pembroke Avenue intersection to understand the potential reduction in delay for the northbound through/right-turn movement with reduced volume. A 5% reduction in site trips for the northbound through/right-turn (i.e., approximately 21 vehicles) would result in a LOS D (i.e., 50.5 seconds per vehicle of delay), which is comparable to the 2016 TIA results.

Pembroke Avenue and Old Aberdeen Road

Table 7 summarizes Build analysis results for the Pembroke Avenue and Old Aberdeen Road intersection.

Table 7 LOS & Control Delay Results – Pembroke Avenue and Old Aberdeen Road

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)										
		Pembroke Avenue						Old Aberdeen Road				
		Eastbound			Westbound			Northbound		Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH/RT	LT	TH	RT
AM Peak Hour												
2018 Build (2016 TIA)	B (13.0)	F (126.3)	A (5.6)	A (5.0)	A (8.3)	A (9.3)	A (8.2)	D (42.0)	A (0.0)	D (42.1)	D (40.7)	D (40.8)
		B (10.3)			A (9.3)			D (42.0)		D (41.1)		
2024 Build	A (1.4)	A (8.9)	A (0.0)	A (0.0)	A (8.0)	A (0.0)	A (0.0)	B (13.0)	A (9.4)	B (13.4)	A (0.0)	A (9.6)
		A (0.4)			A (0.1)			B (12.9)		B (10.6)		
2034 Build (2016 TIA)	B (15.1)	E (58.2)	A (6.2)	D (36.1)	A (9.1)	B (10.4)	A (9.0)	D (42.2)	D (40.7)	D (42.4)	D (40.6)	D (40.7)
		B (13.4)			B (10.4)			D (42.1)		D (41.1)		
2034 Build	A (1.5)	A (9.1)	A (0.0)	A (0.0)	A (8.1)	A (0.0)	A (0.0)	B (13.6)	A (9.4)	B (13.9)	A (0.0)	A (9.8)
		A (0.4)			A (0.1)			B (13.4)		B(10.8)		
PM Peak Hour												
2018 Build (2016 TIA)	B (10.2)	D (48.9)	A (5.5)	A (7.8)	A (9.1)	B (10.2)	A (8.8)	D (40.7)	A (0.0)	D (42.6)	A (0.0)	D (42.4)
		A (6.8)			B (10.2)			D (40.7)		D (42.4)		
2024 Build	A (1.3)	A (8.5)	A (0.0)	A (0.0)	A (9.1)	A (0.0)	A (0.0)	C (17.7)	A (9.0)	B (12.9)	A (0.0)	B (10.1)
		A (0.2)			A (0.3)			C (17.6)		B(10.4)		
2034 Build (2016 TIA)	B (10.5)	D (48.3)	A (5.4)	A (7.8)	A (9.4)	B (10.7)	A (9.0)	D (40.7)	D (38.8)	D (42.6)	A (0.0)	D (42.4)
		A (6.9)			B (10.7)			D (40.7)		D (42.4)		
2034 Build	A (1.5)	A (8.6)	A (0.0)	A (0.0)	A (9.4)	A (0.0)	A (0.0)	C (19.9)	A (9.0)	B (13.4)	A (0.0)	B (10.3)
		A (0.2)			A (0.3)			C (19.6)		B (10.6)		

Since completion of the 2016 TIA, this intersection has been converted from signalized intersection control to two-way-stop-control (TWSC) with the northbound and southbound approaches (i.e., Old Aberdeen Road) being stop-controlled. Additionally, the northbound approach has been reconfigured to include one left-turn lane as compared to two when the 2016 TIA was conducted. The 2024 and 2034 Build conditions have been updated to include these changes in intersection control and northbound lane configuration. Under TWSC conditions, 2024 and 2034 Build conditions are expected to operate at LOS C or better for all movements during both peak hours.

Aberdeen Road and Site Driveway

Table 8 summarizes Build analysis results for the proposed Aberdeen Road and Proposed Site Driveway intersection. Under 2024 and 2034 Build conditions, AM and PM peak hour conditions are expected to operate at LOS D or better.

Table 8 LOS & Control Delay Results – Aberdeen Road and Site Driveway

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)				
		Site Driveway		Aberdeen Road		
		Westbound		Northbound	Southbound	
		LT	RT	TH/RT	LT	TH
AM Peak Hour						
2024 Build	B (18.1)	D (48.7)	B (15.0)	C (24.8)	B (22.4)	A (0.8)
		B (16.4)		C (24.8)	B (14.7)	
2034 Build	B (18.1)	D (48.7)	B (15.1)	C (25.3)	C (23.6)	A (0.8)
		C (16.5)		C (25.3)	B (15.0)	
PM Peak Hour						
2024 Build	B (16.9)	D (47.9)	C (25.2)	C (22.7)	B (14.6)	A (5.0)
		C (26.3)		C (22.7)	A (7.8)	
2034 Build	C (17.2)	D (47.9)	C (26.0)	C (23.0)	B (15.3)	A (5.4)
		C (27.1)		C (23.0)	A (8.1)	

Conclusions

Since completion of the 2016 *Hampton Industrial Development on Aberdeen Road* TIA, the proposed development intensity has increased to 833,000 sf of high cube/light industrial uses. As part of a current site rezoning application, the traffic analyses from the 2016 TIA have been updated to reflect the currently proposed land use intensity.

The increased development intensity will result in an overall increase in site trips from the 2016 TIA. The AM peak hour is expected to experience an increase of 107 trips, while the PM peak hour is expected to experience an increase of 124 trips in comparison to the 2016 TIA. Recommendations from the 2016 TIA at the proposed site driveway and Aberdeen Road intersection are still valid and are summarized below. No additional recommendations are proposed at the other study area intersections, which is consistent with the 2016 TIA:

Aberdeen Road/Proposed Site Driveway

- Install traffic signal and coordinate with Aberdeen Road signal system
- Intersection geometrics should accommodate heavy vehicle turning movements

Northbound Aberdeen Road

- Maintain existing lane configuration (i.e., one exclusive through lane, and one shared through/right-turn lane)

Southbound Aberdeen Road

- Restripe the existing inside through lane to an exclusive left-turn lane
- Install advance notification including pavement markings and “Left Lane Must Turn Left” signs (R3-7) prior to the intersection

Westbound Proposed Site Driveway

- Construct one exclusive left-turn lane continuous out of the site
- Construct one exclusive right-turn lane continuous out of the site
- Construct one inbound lane to enter the site

Shell Road

- Construct an access point along Shell Road
- Cul-de-sac Shell Road approximately 300-feet west of Old Pembroke Road while maintaining all access to the auto repair store located on the southwest corner of the Pembroke Road/Old Aberdeen Road intersection.

Pine Avenue

- Cul-de-sac Pine Avenue approximately 300-feet north of 5th Street while maintaining access to the existing residential homes.
















Attachment A



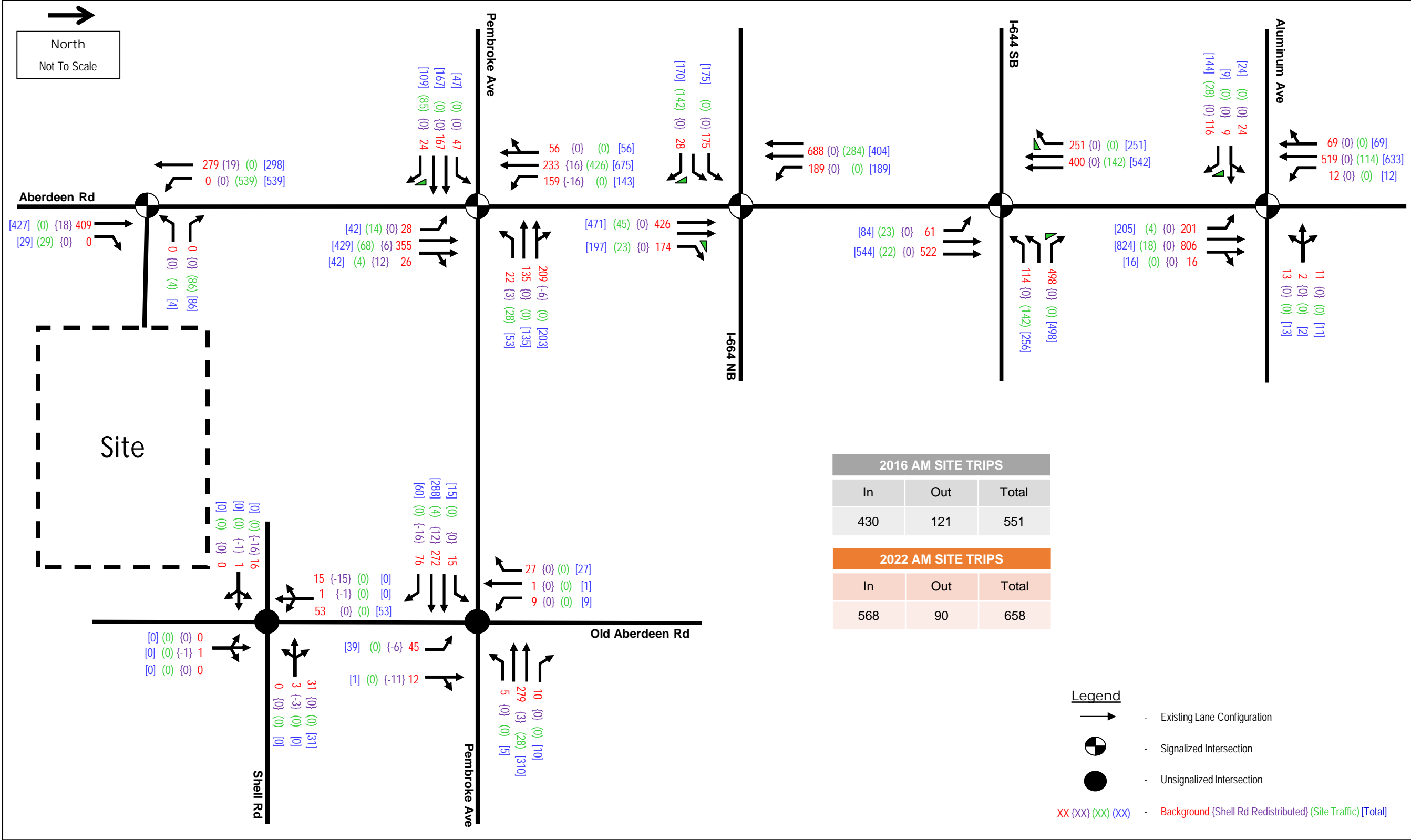
SITE DEVELOPMENT DATA TABLE		
SITE AREA (GROSS)(1):	62.28 ACRES	
RIGHT-OF-WAY TO BE DEDICATED:	0.32 ACRES	
LOT A SITE AREA (NET):	32.80 ACRES	
LOT B SITE AREA (NET):	29.18 ACRES	
TOTAL BUILDING AREA:	833,000 SF	
TOTAL BUILDING COVERAGE:	30.70%	
CITY OF HAMPTON, VA REQUIREMENTS		
CURRENT ZONING:	ONE FAMILY RESIDENTIAL (R-13)	
PROPOSED ZONING:	LIGHT MANUFACTURING (M-2)	
PROPOSED USES:	WAREHOUSE/MANUFACTURING	
SETBACKS:		
BUILDING SETBACKS:	REQUIRED	PROVIDED
FRONT (ABERDEEN ROAD):	0'	294'
SIDE (SHELL ROAD):	0'	163'
SIDE (ADJACENT TO RESIDENTIAL):	55'	124'
15' ADDITIONAL BUILDING HEIGHT SETBACK:	(10' + 45')	
REAR:	80'	171'
15' ADDITIONAL BUILDING HEIGHT SETBACK:	(45' + 35')	
PARKING SETBACKS:		
FRONT/RIGHT OF WAY:	10'	195'
LOADING SETBACK (ROW):	10'	20'
LOADING SETBACK (RESIDENTIAL):	20'	50'
DATA:		
BUILDING		
BUILDING SQUARE FOOTAGE (SF):		833,000 SF
LOT AREA (MIN.):	NONE	62.3 Ac.
BUILDING HEIGHT:	35'	50' (ADDITIONAL SETBACK PROVIDED)
GREEN SPACE:	TOTAL	
GREEN SPACE:	10%	25%
GREEN SPACE - DETENTION NOT INCLUDED (SF):	269,985	679,475
GREEN SPACE - IN FRONT YARD:	50%	80%
GREEN SPACE - IN FRONT YARD (DETENTION NOT INCLUDED):	140,499	225,181
GREEN SPACE - 20% MIN IN EACH FRONT YARD (ABERDEEN ROAD):	20%	57%
GREEN SPACE - ABERDEEN ROAD (SF):	56,200	160,995
GREEN SPACE - 20% MIN IN EACH FRONT YARD (SHELL ROAD):	20%	23%
GREEN SPACE - SHELL ROAD (SF):	58,200	64,187
PARKING:	TOTAL	
WAREHOUSING REQUIRED (2):	104 STALLS	
MANUFACTURING REQUIRED (3):	119 STALLS	
OFFICE REQUIRED (4):	99 STALLS	
NORTHPOINT STANDARD (6):	356 STALLS	
TOTAL PARKING REQUIRED CALCULATION:	678 STALLS	
PROVIDED:		744 STALLS
ADA STALLS:		16 STALLS
TRAILER STALLS:		240 STALLS
PARKING DIMENSIONS:	9'X18'	9'X18'
DRIVE AISLE WIDTH (MIN):	24'	VARIABLE 24' - 30'
(1) PLAN BOUNDARY INCLUDES EXISTING RW		
(2) CITY PARKING REQUIREMENT FOR WAREHOUSE (ASSUMED 70% OF THE BLDG):	1 STALL PER 2000 SF MINIMUM AND 1 STALL PER 1500 SF MAXIMUM OF GROSS FLOOR AREA (GFA)	
(3) CITY PARKING REQUIREMENT FOR MANUFACTURING (ASSUMED 20% OF THE BLDG):	1 STALL PER 500 SF MINIMUM AND 1 STALL PER 400 SF MAXIMUM OF GROSS FLOOR AREA (GFA)	
(4) CITY PARKING REQUIREMENT FOR OFFICE SPACE (ASSUMED 10% OF THE BLDG):	1 STALL PER 300 SF MINIMUM AND 1 STALL PER 250 SF MAXIMUM OF GROSS FLOOR AREA (GFA)	
(5) NORTHPOINT STANDARD REQUIREMENT:	1 STALL PER 1500 SF OF GROSS FLOOR AREA (GFA)	

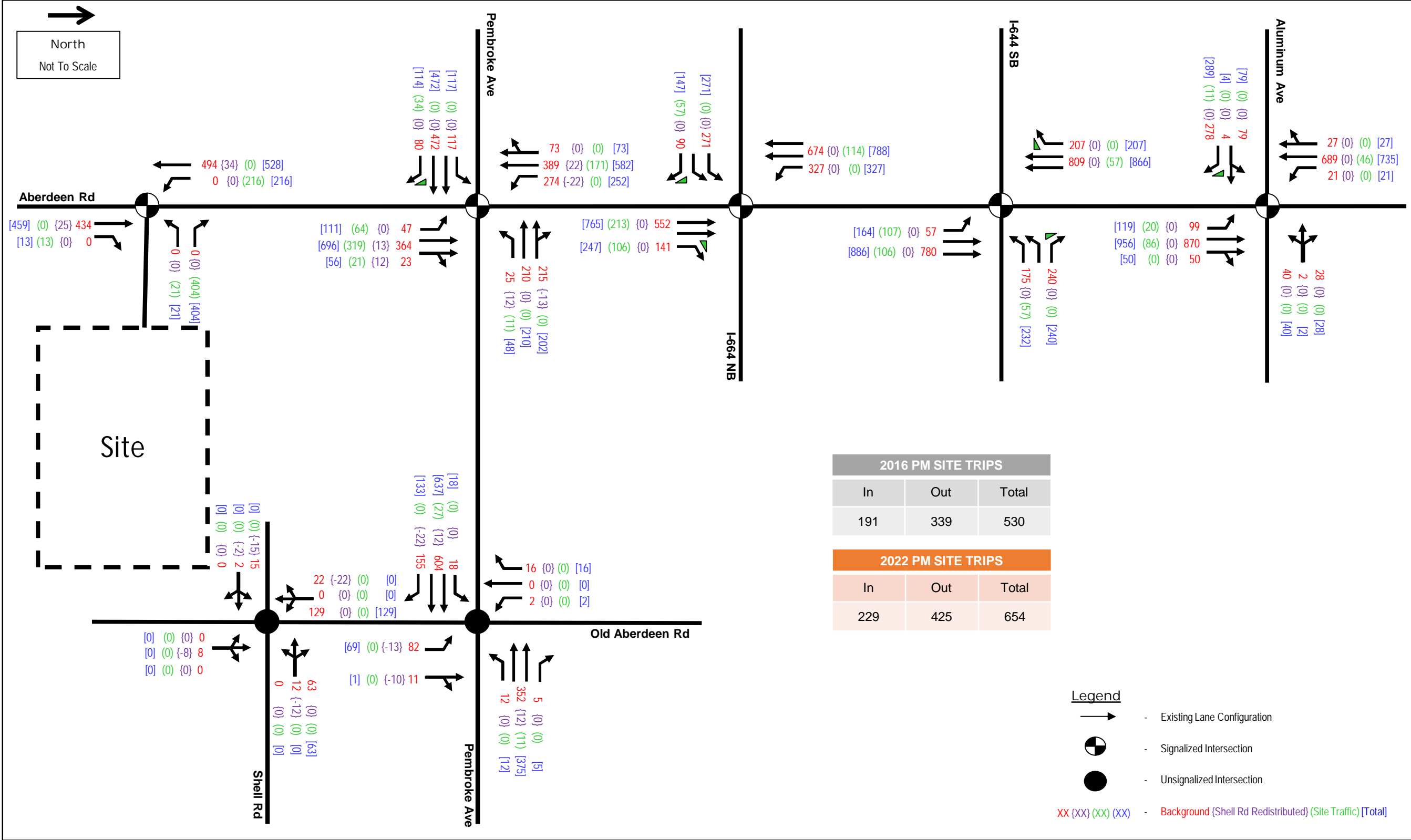
1. GAS TRANSMISSION PIPELINE
2. 10' LOADING SETBACK TO RIGHT OF WAY
3. 20' LOADING SETBACK TO RESIDENTIAL
4. 80' REAR BUILDING SETBACK ADJACENT TO RESIDENTIAL
5. 55' SIDE BUILDING SETBACK ADJACENT TO RESIDENTIAL
6. 50' LANDSCAPE BUFFER
7. 200' LANDSCAPE BUFFER (183' PROVIDED IN SOUTHEAST CORNER)
8. 20' LANDSCAPE BUFFER
9. WETLAND/DITCH IMPACT (1.52 ACRES TOTAL)
10. PROPOSED HAMMER-HEAD DEAD END
11. SHELL ROAD RIGHT-OF-WAY TO BE VACATED
12. PROPOSED CUL-DE-SAC DEAD END
13. PROPOSED TRAFFIC SIGNAL (FULL ACCESS)
14. EXISTING FIRE HYDRANT
15. PROPOSED MONUMENT SIGN
16. PROPOSED ACCESS EASEMENT
17. PINE LANE REMOVAL OF EXISTING ASPHALT
18. PROPOSED MULTI-USE PATH, USE EXISTING ASPHALT IN PINE LANE
19. FEWA FLOOD ZONE X
20. FEWA FLOOD ZONE AE
21. PROPOSED PAVEMENT MARKINGS
22. PROPOSED SOUND WALL

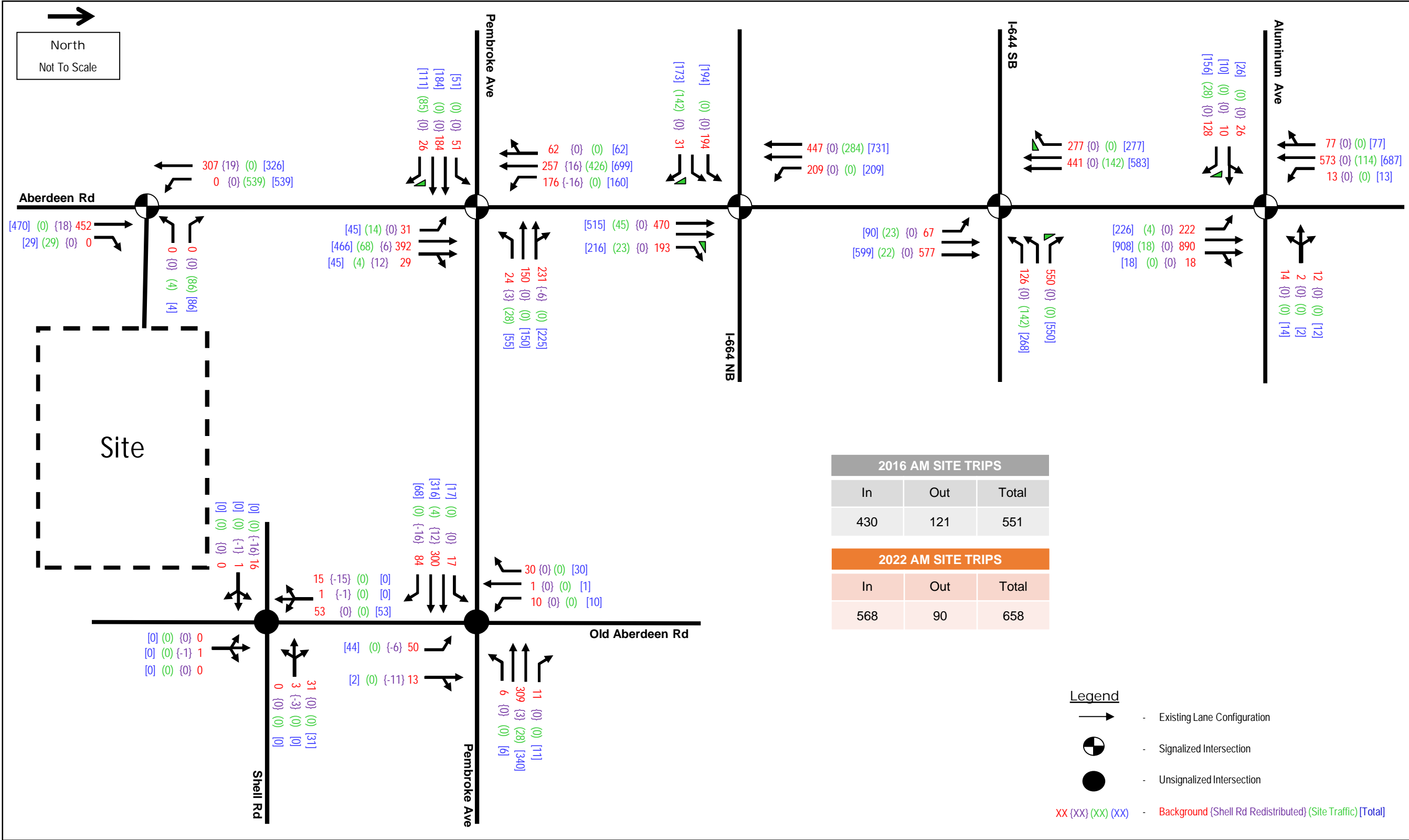
- NOTES:**
1. PROPERTY BOUNDARY: 2019 STATE OF VA GIS
 2. TOPOGRAPHY: USGS
 3. BUILDING FOOTPRINT: NONE
 4. WETLAND & WATERS DELINEATION: 2021 KIMLEY-HORN
 5. FIRE HYDRANTS SPACING WILL COMPLY WITH 2018 VIRGINIA STATEWIDE FIRE PREVENTION CODE AND HAMPTON FIRE CODE
 6. THE SITE LAYOUT INCORPORATES COPELAND DESIGN GUIDELINES.
 7. BUILDING AND SITE LIGHTING WILL BE DOWNWARD AND INWARD FACING AND SHIELDED FROM SPILLOVER INTO ADJACENT PROPERTIES AND/OR RIGHT-OF-WAYS.

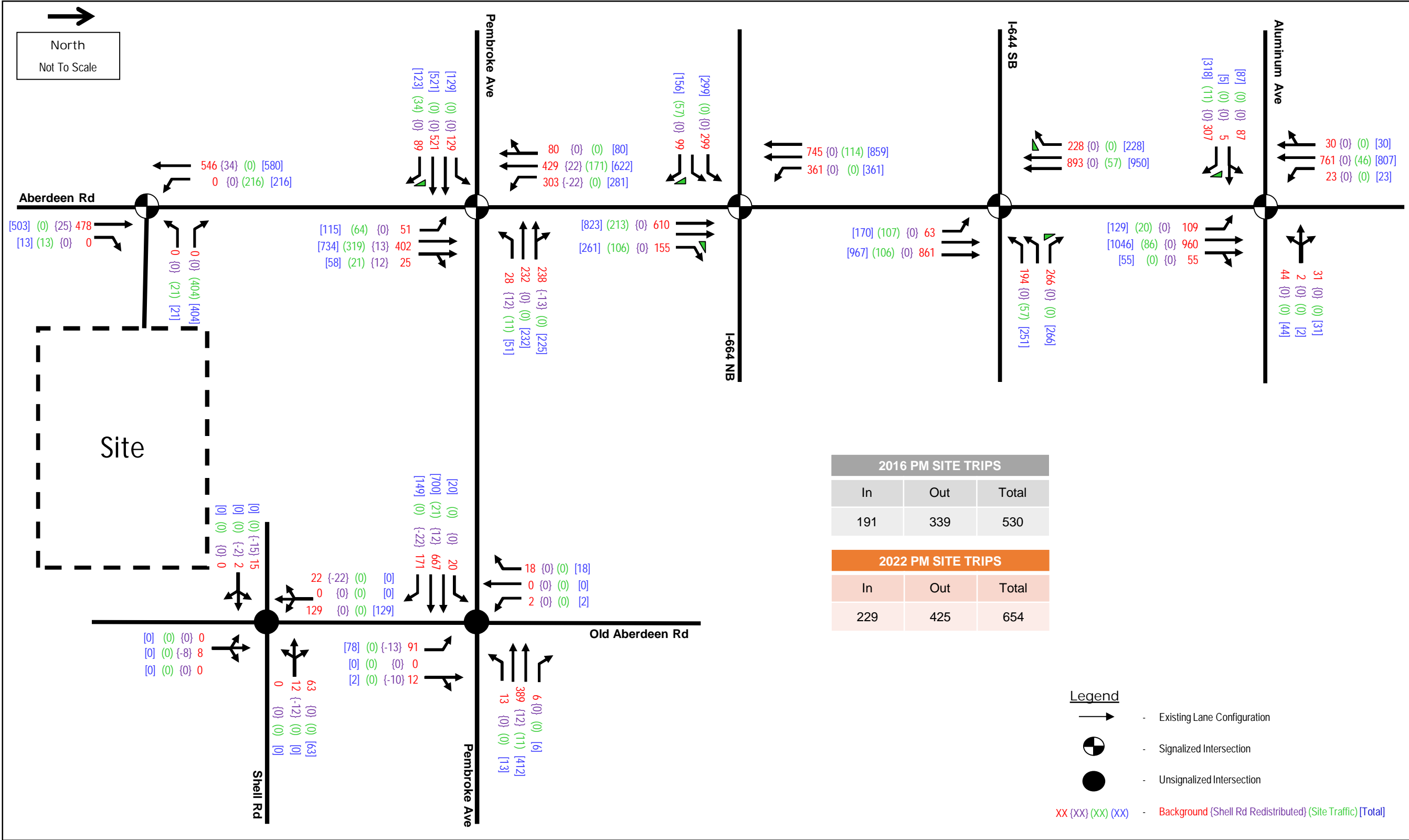
LEGEND	
GENERAL	
	DITCH
	CBPA BUFFER
	WETLANDS
	ROW ENTRANCE ONLY
	ROW VACATED
UTILITIES	
	NATURAL GAS LINE
	POWER/ELECTRIC LINE (SERVICE)
	SANITARY SEWER (GRAVITY-PRIVATE)
	SANITARY SEWER (FORCE MAIN-PRIVATE)
	SANITARY SEWER (GRAVITY-HAMPTON)
	SANITARY SEWER (GRAVITY-NEWPORT NEWS)
	SANITARY SEWER MANHOLE
	PUMP STATIONS (PRIVATE)
	STORM SEWER
	WATER MAINS

Attachment B

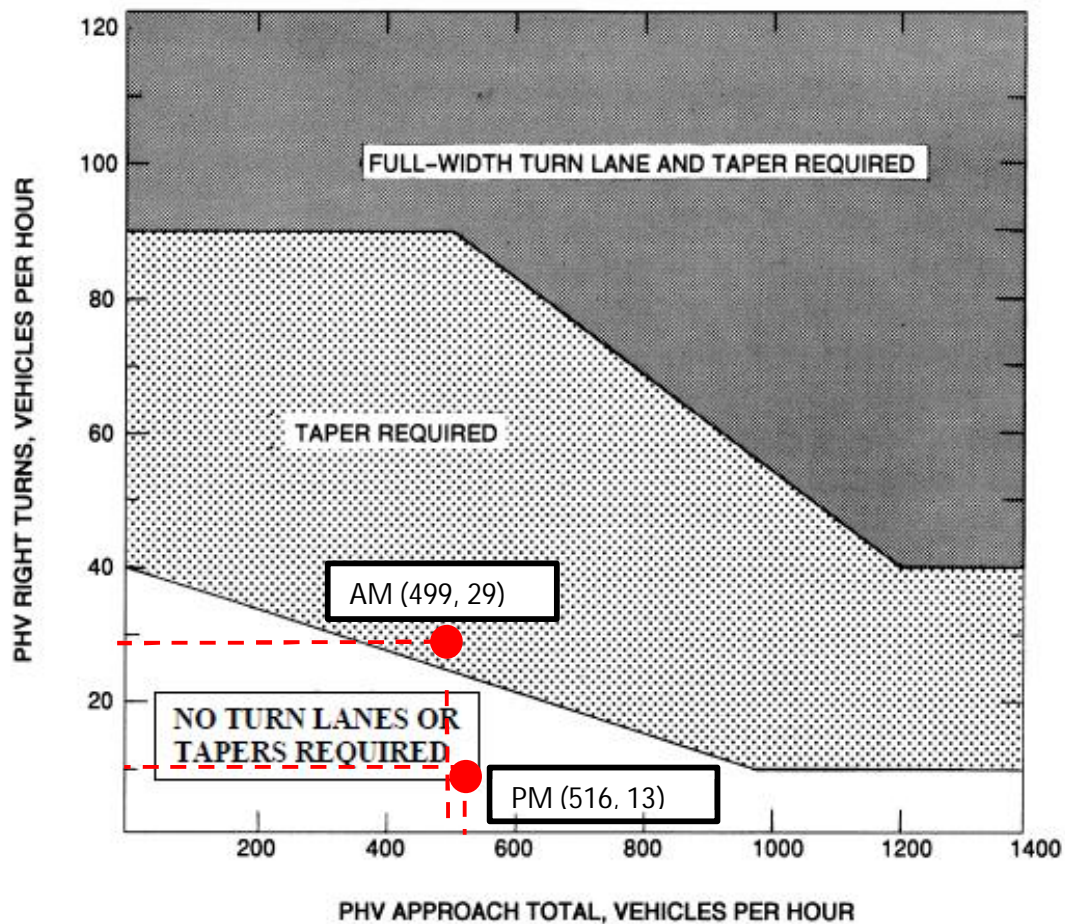








Attachment C



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

If PHV is not known use formula: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.

FIGURE 3-27 WARRANTS FOR RIGHT TURN TREATMENT (4-LANE HIGHWAY)

Aberdeen Road and Proposed Site Driveway Southbound Left (2034)

Warrants for Left Turn Storage Lanes on Four-Lane Highways

