



Technical Memorandum

TO: Sarah Coakley
DATE: February 26, 2025
FROM: Mir Wahed, Nate Rahaim
PROJECT: Henlopen TID
JMT Job No. 22-03011-501
SUBJECT: Henlopen TID 2022 Update
CC: Pam Steinebach, Sireen Muhtaseb, Joanne Arellano

This memorandum was developed to document the 2022 update to the Henlopen Transportation Improvement District (TID). This technical memorandum will discuss the background information associated with the TID, volume development methodology within the TID project area, and the capacity analysis conducted at the TID facilities as part of the 2022 update.

Background Information

The Henlopen TID project area encompasses approximately 24 square miles and is near the resort area in eastern Sussex County. The study area consists of 43 roadway segments and 62 intersections. Figure 1 displays the study area with the Henlopen TID boundary marked in red, the roadway segments highlighted in purple, the intersections within the TID boundary shown as green circles, and the intersections outside of the TID boundary shown as blue circles.

The Henlopen TID was originally evaluated in 2018 and a final report was developed in 2019, which provided transportation improvement recommendations throughout the project area based on the anticipated development known at that time. A figure has been included in Appendix A from the previous 2018 evaluation which displays the TID-identified recommendations. The TID was then re-evaluated in 2022 to determine if the improvements identified in 2018 were still valid based on new information being available. This memorandum was developed to document the update effort conducted in 2022.

Volume Development

For the 2018 TID evaluation, weekday morning and evening peak hour count data was used to create existing traffic volumes within the TID area. A horizon year of 2045 was utilized for the study with approximately 13,000 new dwelling units and 1.5 million square feet of commercial developments were accounted for when developing the future year traffic volumes. Two future year volume scenarios were developed, including a “Baseline” scenario and “All-Improvement” scenario. The “All-Improvement” scenario accounted for planned TID roadway connections including the Mulberry Knoll Road and Airport Road Extensions whereas the “Baseline” scenario did not. Despite two volume scenarios being developed, the 2018 evaluation utilized the “All-Improvement” scenario volumes to identify transportation improvements which included additional roadway extensions.

As part of the 2022 update to the TID, the effort was originally initiated in 2021. As such, it was agreed with DelDOT to re-use the existing traffic volumes collected as part of 2018 effort to avoid residual impacts from the COVID-19 pandemic. Reviewing the land use forecast originally developed by the 2018 effort, 16 developments were found to be proposing land uses that exceeded or were not included in the original forecast. A figure has been included in Appendix B showing the location of these developments.

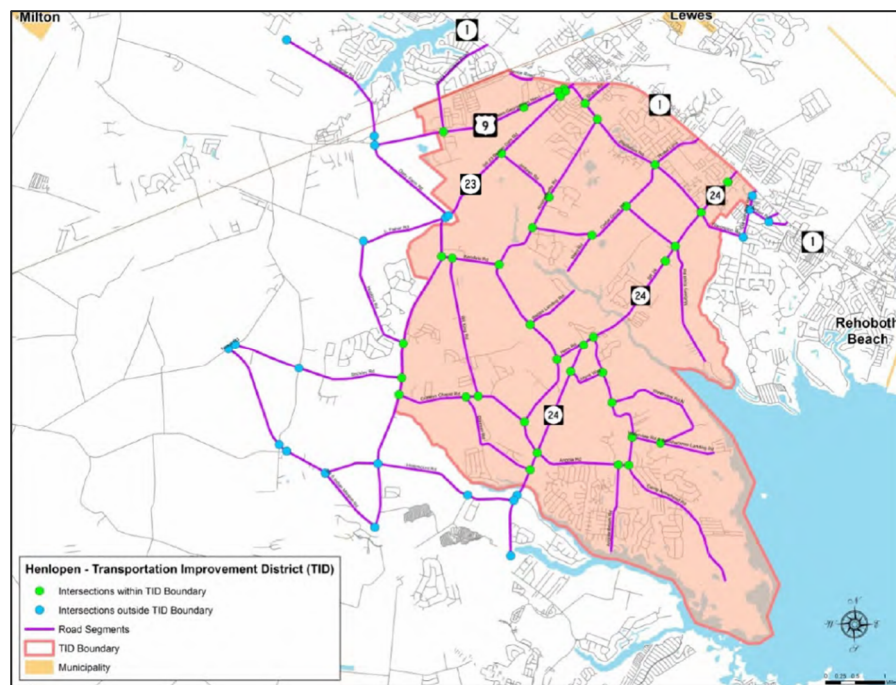


Figure 1 – Study Area

Updated trip generation values were calculated for these specific developments based on the difference in land use from the 2018 forecast and the developer's current proposals. These updated trip generation values were combined with Synchro Software's TIA module to develop updated trip distributions and trip assignments. These updated trip assignments were then combined with the previously developed "All-Improvement" scenario volumes from the 2018 evaluation to create the new 2045 AM and PM peak hour traffic volumes. A table summarizing the trip generation calculations for the 16 developments and the updated 2045 peak hour traffic volumes diagram have been included in Appendix B.

Capacity Analysis

Using the updated "All-Improvement" scenario traffic volumes, an updated 2045 capacity analysis was conducted in-house by DeIDOT using the HCS output from Synchro software. The analysis was conducted to determine if the previously identified improvements by the 2018 evaluation were able to maintain the needed TID Level of Service (LOS) service standard of LOS D or better. The detailed results of the analysis can be found in Appendix C.

It should be noted that for stop controlled intersections, the TID service standards recognized that traffic volumes along the stop-controlled minor streets may be too minor to warrant any improvement that would delay the through traffic along the major street to achieve an overall LOS D or better. These improvements may include the installation of an all-way stop, roundabout, or signal. As such, a combined peak hour left turn and through volume of 75 vehicles along the minor street was considered a minimum threshold for any additional improvements which is similar criteria as the *DEMUTCD's* Warrant #3 – Peak Hour Signal Justification Warrant.

Based on the capacity analysis conducted, the improvements previously identified by the 2018 evaluation are still able to maintain the current TID service standards at all locations except for the intersections of SR 24 & Plantation Road and the Airport Road Extension & Postal Lane. Discussing with DeIDOT, the cost to



implement a traffic signal at the Airport Road Extension & Postal Lane intersection was determined to be negligible compared to the overall cost of the TID to require any additional concept plans or estimates developed. In addition, it is anticipated that the proposed Belmeade development's additional TID fee based on the increased amount of land use at that site would account for the needed signal improvements. As such, no additional improvements are needed to be incorporated into the TID based on the 2022 update. The TID area will continue to be monitored as part of the TID monitoring program approximately every five years.



APPENDIX A

2018 TID Evaluation – Henlopen TID Improvements Map

Plotted By: NRAMHAM DATE: 8/30/2019
G:\2016\160643_000_Traffic_Impact_Study\CADD\10A - Henlopen TID Additional Tasks\2045 TID Ultimate Configurations.dgn



DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

HENLOPEN TID

COUNTY

SUSSEX

BRIDGE NO.

DESIGNED BY: SB/NR

CHECKED BY: MW

NA

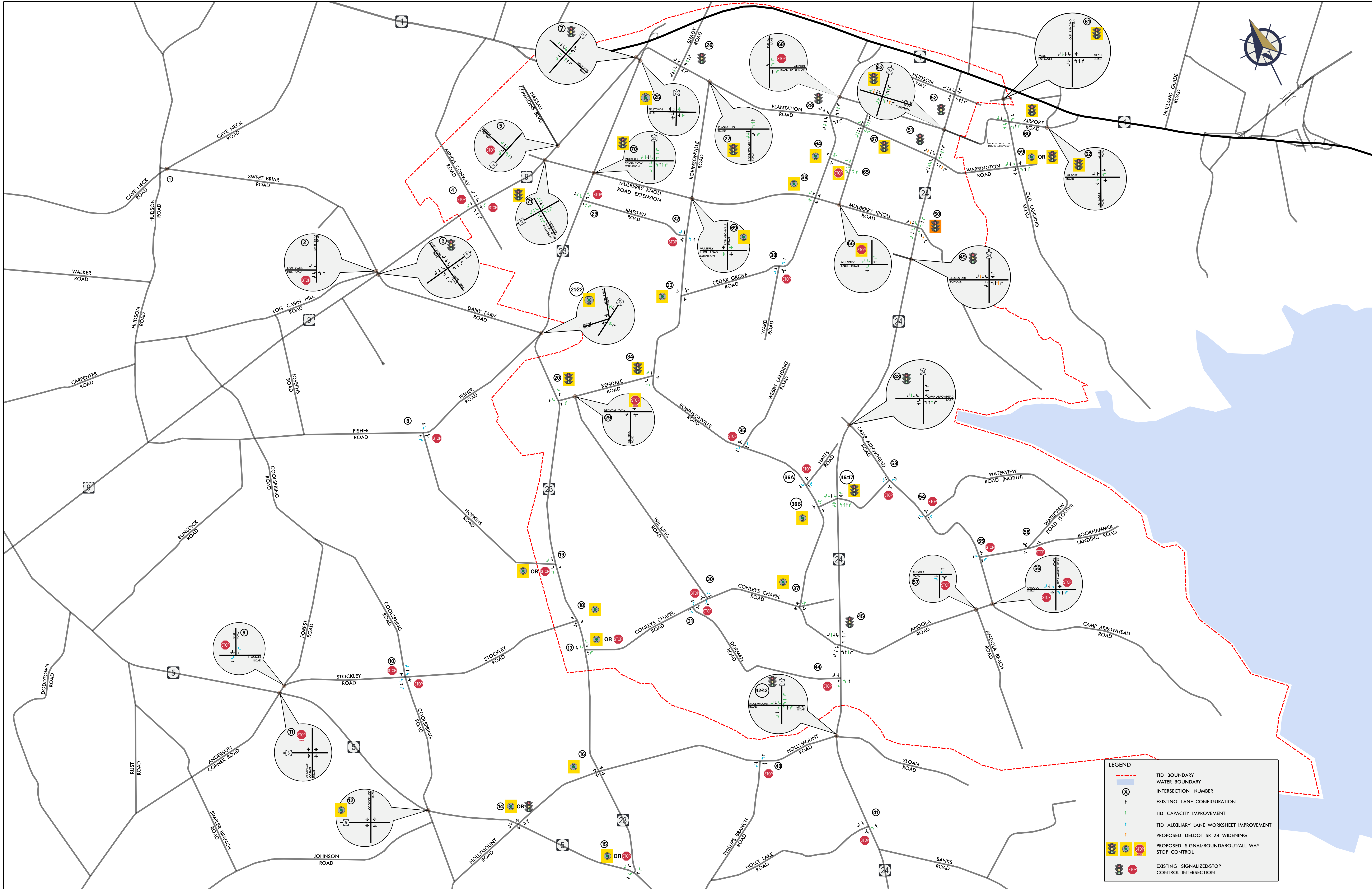
FIGURE D-1
2045 PROPOSED
TID IMPROVEMENTS

SHEET NO.

1

TOTAL SHTS.

1





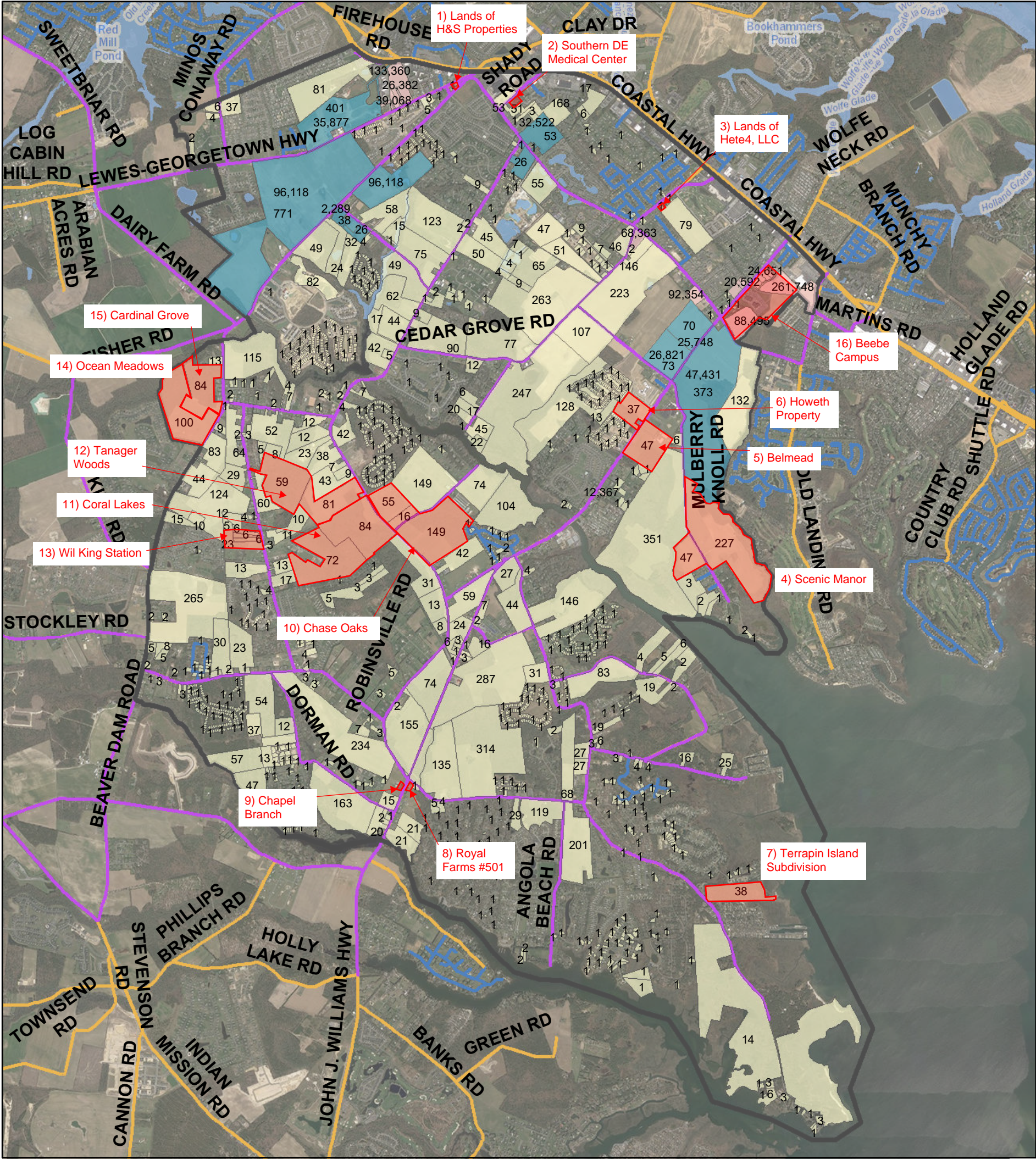
APPENDIX B

Volume Development

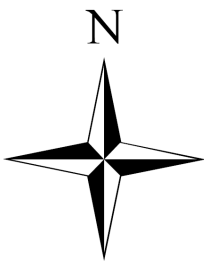


New and Modified Development Locations

Henlopen TID 2045 Build-Out



1.5 0.75 0 1.5 Miles



DeIDOT GIS Layers
Map created 5/23/18
Sarah C. Coakley, Project Planner



Regional
Systems
Planning

Legend

- | | | | |
|--|--------------|--|-----------------------------|
| | Commercial | | Henlopen_segments |
| | Residential | | MajorRivers |
| | Both | | MAINTENANCE_ROADS layer.lyr |
| | Henlopen_TID | | SUBURBAN_STREETS layer.lyr |
| | | | MUNICIPAL_ROADS layer.lyr |



**Comparison Table for 2018 Land Use Forecast and Known Developments in 2022
/ Trip Generation Calculations**

Net Trip Generation Increase Between Original 2018 Henlopen TID Land Use Forecast and Updated 2022 Information

2022 Updated Land Uses & Trips ¹																											
Site #	Site name	Currently Proposed by Developer as of 2023			Henlopen TID Forecast from 2018			Net Change in Units			AM Trips Entering	AM Trips Exiting	AM Total Trips	PM Trips Entering	PM Trips Exiting	PM Trips Total											
		Units	Land Use	ITE Code	Units	Land Use	ITE Code	Units	Land Use	ITE Code																	
1	Lands of H&S Properties ²	4,050	Small Office Building	712	1	Single Family Res	210	4,050 SF	Small Office Building	712	7	1	8	3	7	10											
2	Southern DE Med Ctr	32,960 SF	Medical Office Building	720	-	-	-	32,960 SF	Medical Office Building	720	65	18	83	32	82	114											
3	Lands of Hete4, LLC	4	Single Family Res	210	1	Single Family Res	210	3	Single Family Res	210	2	5	7	3	1	4											
4	Scenic Manor	319	Single Family Res	210	274	Single Family Res	210	45	Single Family Res	210	9	28	37	30	17	47											
5	Belmead ³	480	Low Rise Multifamily Res	220	47	Single Family Res	210	415	Low Rise Multi Family Res	220	42	142	184	132	78	210											
		125,000 SF	Shopping Center	820	-	-	-	125,000 SF	Shopping Center	820	73	45	118	307	333	640											
		Subtotal (Unadjusted volume):									115	187	302	439	411	850											
Internal Capture:											2	2	4	92	92	184											
Pass-by Trips:											0	0	0	104	113	227											
Volume added to adjacent streets:											113	185	298	239	210	449											
6	Howeth Property ³	84	Low Rise Multifamily Res	220	47	Single Family Res	210	37	Low Rise Multi Family Res	220	4	15	19	15	9	24											
7	Terrapin Island Subdiv	42	Single Family Res	210	38	Single Family Res	210	4	Single Family Res	210	2	6	8	3	2	5											
8	Royal Farms Store # 501	16 VFP	Super Gas Station	960	-	-	-	16 VFP	Super Gas Station	960	224	225	449	183	184	367											
											Pass-by Trips:											170	171	341	139	140	279
											Volume added to adjacent streets:											54	53	107	45	44	89
9	Chapel Branch	58	Mid-rise Mutlifamily Residential	221	-	-	-	58	Mid Rise Multi Family Res	221	5	15	20	16	10	26											
10	Chase Oaks	253	Single Family Res	210	220	Single Family Res	210	33	Single Family Res	210	7	21	28	22	13	35											
11	Coral Lakes	304	Single Family Res	210	145	Single Family Res	210	159	Single Family Res	210	30	88	118	100	59	159											
12	Tanager Woods	168	Single Family Res	210	140	Single Family Res	210	28	Single Family Res	210	6	19	25	19	11	30											
13	Wil King Station	39	Single Family Res	210	29	Single Family Res	210	10	Single Family Residential	210	3	9	12	7	4	11											
14	Ocean Meadows	133	Single Family Res	210	101	Single Family Res	210	32	Single Family Res	210	7	21	28	21	13	34											
15	Cardinal Grove	98	Single Family Res	210	84	Single Family Res	210	14	Single Family Res	210	4	11	15	9	6	15											
16	Beebe Campus	40,000	Medical Office Building	720	-	-	-	40000	Medical Office Building	720	77	22	99	39	99	138											
											395	517	912	603	587	1190											

Notes:

1. ITE 10th Edition was used for the calculation/ distribution of new trips to be consistent with Henlopen TID update in 2018.

2. Due to the 2018 TID forecast only projecting 1 single family dwelling, the net change in units only accounts for the additional office space and does not account for the single family dwelling.

3. Due to the developer proposed land use accounting for multi-family housing while the TID forecast accounted for single family housing, the net change in units calculation calculated the esimated difference in trips based on multi-family housing.



Updated 2045 Volume Figure



APPENDIX C
Capacity Analysis Results

LOS ANALYSIS - SIGNALIZED INTERSECTIONS

Intersection and approach LOS of E and F are noted in red. An * denotes a high delay of over 100 seconds.

ID	Intersection	AM				PM			
		Overall LOS	Delay (s)	Approach LOS	Notes	Overall LOS	Delay (s)	Approach LOS	Notes
3	US 9 & Sweetbriar Rd/Dairy Farm Rd	C	33.5	EB-C; WB-C; NB-E ; SB-D	PHF: 0.95; HV% = 3; 90 sec	C	33.6	EB-C; WB-C; NB-E ; SB-E	PHF: 0.96; HV% = 3; 120 sec
7	US 9 & Belltown Rd/SR 1D	D	43.5	EB-C; WB-B; NB-E ; SB-F*	PHF: 0.98; HV% = 3; 150 sec	D	52.6	EB-E ; WB-D; NB-E ; SB-E	PHF: 0.98; HV% = 3; 120 sec
20	SR 23 Beaver Dam Rd & Kendale Rd	D	47.4	WB-F* ; NB-D; SB-B	PHF: 0.98; HV% = 3; 150 sec	D	40.0	WB-E ; NB-D; SB-C	PHF: 0.98; HV% = 3; 120 sec
26	Plantation Rd & Shady Rd/Salt Marsh Blvd	B	15.9	SE-B; NW-A; NE-D; SW-D		C	31.4	SE-C; NW-C; NE-D; SW-D	
27	Plantation Rd & Robinsonville Rd	A	9.5	SE-A; NW-A; NE-D		A	5.8	SE-A; NW-A; NE-D	
28	Plantation Rd & Cedar Grove Rd/Postal Lane	C	23.1	SE-B; NW-C; NE-C; SW-C		C	33.0	SE-C; NW-C; NE-C; SW-D	
34	Robinsonville Rd & Kendale Rd	B	12.1	EB-B; NB-B; SB-A		B	10.1	EB-B; NB-A; SB-A	
42/43	SR 24 & Hollymount Rd/Sloan Rd	C	25.3	EB-D; WB-E ; NB-C; SB-B	PHF: 0.98; HV% = 3; 120 sec	D	40.4	EB-E ; WB-E ; NB-C; SB-D	PHF: 0.98; HV% = 3; 150 sec
45	SR 24 & Robinsonville Rd/Angola Rd	C	34.8	NB-C; SB-C; SE-D; NW-D	PHF: 0.98; HV% = 3; 90 sec	D	41.0	NB-C; SB-C; SE-E ; NW-D	PHF: 0.98; HV% = 3; 120 sec
46/47	SR 24 & Jolyns Way	C	33.7	EB-E ; WB-E ; NB-C; SB-C	120 sec	C	27.0	EB-D; WB-E ; NB-C; SB-C	90 sec
48	SR 24 & Camp Arrowhead Rd	C	25.6	EB-C; WB-B; NB-D; SB-D	90 sec	D	43.2	EB-D; WB-C; NB-F ; SB-F	120 sec
49	SR 24 & Beacon Middle Sch/Love Creek Elem Sch	C	24.7	SE-D; NW-E ; NE-C; SW-C	120 sec	B	19.6	SE-E ; NW-F* ; NE-B; SW-B	150 sec
50	SR 24 & Mulberry Knoll Rd	D	49.9	SE-F ; NW-E ; NE-D; SW-D	PHF: 0.98; HV% = 3; 150 sec	D	54.0	SE-F ; NW-E ; NE-D; SW-D	PHF: 0.98; HV% = 3; 150 sec
51	SR 24 & Plantation Rd/Warrington Road ²	D	43.9	SE-F ; NW-F* ; NE-D; SW-A	PHF: 0.98; HV% = 3; 150 sec	E	68.3	SE-F* ; NW-F* ; NE-D; SW-C	PHF: 0.98; HV% = 3; 150 sec
52	SR 24 & Rehoboth Mall Service Rd/Hudson Way	B	15.8	SE-C; NW-D; NE-B; SW-B		C	20.2	SE-D; NW-D; NE-B; SW-B	
60	Old Landing Rd & Airport Rd ¹	D	44.4	EB-D; WB-E ; NB-D; SB-C	PHF: 0.98; HV% = 3; 120 sec	D	53.4	EB-F ; WB-E ; NB-C; SB-D	PHF: 0.98; HV% = 3; 150 sec
61	Old Landing Rd & Rehoboth Mall Entrance	B	11.1	NB-A; SB-A; SE-D; NW-D		B	19.8	NB-B; SB-B; SE-D; NW-C	
62	Airport Rd & Miller Rd	C	28.6	EB-B; WB-A; NB-C; SB-E	PHF: 0.98; HV% = 3	B	18.5	EB-B; WB-B; NB-C; SB-C	PHF: 0.98; HV% = 3
63	SR 24 & Beebe Entrance (future Airport Rd Ext)	C	25.2	SE-E ; NW-E ; NE-B; SW-B	PHF: 0.98; HV% = 3; 150 sec	D	35.8	SE-F ; NW-E ; NE-A; SW-D	PHF: 0.98; HV% = 3; 150 sec
67	Plantation Rd & New Connector Rd 1	B	12.7	SE-A; NW-A; NE-E ; SW-A		A	8.5	SE-A; NW-A; NE-C; SW-A	
70	SR 23 Beaver Dam Rd & Mulberry Knoll Rd Ext	C	25.7	SE-D; NW-C; NE-C; SW-C	PHF: 0.98; HV% = 3; 90 sec	D	36.7	SE-D; NW-D; NE-C; SW-D	PHF: 0.98; HV% = 3; 120 sec
71	US 9 & Mulberry Knoll Rd Ext	D	38.3	EB-C; WB-B; NB-F* ; SB-D		C	33.4	EB-C; WB-C; NB-D; SB-D	

Notes:

- Due to limitations of HCM methodology capturing delay savings from Right Turns on Red at these locations with the shared through/right turn lane configurations along some of the intersection approaches, the PM results listed here were obtained from Synchro methodology.
- Additional intersection upgrades are anticipated to be captured by the increased TID fee expected to be paid by the Belmeade development due to the increase in land use from the 2018 TID analysis. No further TID improvements identified here.

LOS ANALYSIS - UNSIGNALIZED INTERSECTIONS

Intersection and approach LOS of E and F are noted in red. An * denotes a high delay of over 100 seconds.

ID	Intersection	Control Type (red = future)	AM				PM			
			Overall LOS	Delay (s)	Approach LOS	Notes	Overall LOS	Delay (s)	Approach LOS	Notes
4	US 9 & Minos Conaway Rd/Lakeview Blvd ¹	TWSC			NB-F*(170.9); SB-F*(548.4)				NB-F*(745.5); SB-F*(842.1)	
5	US 9 & Nassau Commons Blvd ¹	TWSC			SB-B (12.9)				SB-F (51.6)	
15	SR 5 Indian Mission Rd & SR 23 Beaver Dam Rd	RDBT	A	7.4	SE-A; NW-A; SW-A		A	8.0	SE-A; NW-A; SW-A	
16	SR 23 Beaver Dam Rd & Hollymount Rd	RDBT	C	15.1	EB-B; WB-B; NB-C; SB-B		C	22.4	EB-C; WB-B; NB-B; SB-D	
17	SR 23 Beaver Dam Rd & Conleys Chapel Rd	RDBT	C	16.1	WB-C; NB-C; SB-A		C	17.2	WB-A; NB-B; SB-C	
18	SR 23 Beaver Dam Rd & Stockley Rd	RDBT	D	26.0	EB-A; WB-NA; NB-E; SB-B		C	21.7	EB-C; WB-NA; NB-B; SB-D	
19	SR 23 Beaver Dam Rd & Hopkins Rd ¹	TWSC			EB-F (90.2)				EB-F (73.2)	
1/2	SR 23 Beaver Dam Rd/Dairy Farm Rd/Fisher Rd	RDBT	B	12.3	EB-A; WB-A; NB-B; SB-A	lane config adj; PHF: 0.93	C	15.3	EB-C; WB-C; NB-A; SB-D	lane config adj; PHF: 0.92
23	SR 23 Beaver Dam Rd & Jimtown Rd ¹	TWSC			LOS not given; significant delay				LOS not given; significant delay	
25	SR 23 Beaver Dam Rd & SR 1D/Belltown Rd/Plantation Rd	RDBT	C	22.1	EB-C; WB-E; NB-C; SB-A	PHF = 0.98	D	28.2	EB-C; WB-C; NB-C; SB-D	PHF = 0.92
29	Kendale Rd & Wil King Rd	AWSC	C	15.6	EB-C; WB-B; NB-C	PHF: 0.98	D	32.8	EB-E; WB-D; NB-B	PHF: 0.96
30	Conleys Chapel Rd & Wil King Rd	TWSC			SB-B (13.2)				SB-D (28.4)	
31	Conleys Chapel Rd & Dorman Rd	TWSC			NB-B (10.0)				NB-B (12.1)	
32	Robinsonville Rd & Jimtown Rd	TWSC			EB-B (12.8)				EB-C (17.4)	
33	Robinsonville Rd & Cedar Grove Rd	RDBT	A	9.2	WB-A; NB-B; SB-A		B	10.8	WB-A; NB-A; SB-C	
35	Robinsonville Rd & Webbs Landing Rd	TWSC			SW-D (28.7)				SW-D (34.7)	
36	Robinsonville Rd & Harts Rd	TWSC			WB-B (14.7)				WB-C (20.1)	
37	Robinsonville Rd & Conleys Chapel Rd	RDBT	A	5.9	NB-A; SB-A; SE-A; NW-A		A	6.6	NB-A; SB-A; SE-A; NW-A	
38	Cedar Grove Rd & Ward Rd	TWSC			NE-C (16.3)				NE-C (16.3)	
39	Cedar Grove Rd & Mulberry Knoll Rd	RDBT	C	19.4	SE-A; NW-C; NE-D; SW-A	PHF: 0.98	C	21.7	SE-C; NW-B; NE-A; SW-D	PHF: 0.98
40	Hollymount Rd & Phillips Branch Rd	TWSC			NB-A (9.6)				NB-B (10.2)	
41	SR 24 & Holly Lake Rd ¹	TWSC			EB-D (32.0)				EB-F* (122.5)	
44	SR 24 & Dorman Rd ¹	TWSC			No EB LOS given; NBL-B (10.5); EBR-C (17.8)	PHF = 0.92; TBbP % = custom			No EB LOS given; NBL-E (41.1); EBR-F* (121.7)	PHF = 0.95; TBbP % = custom
53	Camp Arrowhead Rd & Jolyns Way	TWSC			EB-B (11.6)				EB-C (16.1)	
54	Camp Arrowhead Rd & Waterview Rd North	TWSC			WB-B (11.6)				WB-B (13.7)	
55	Camp Arrowhead Rd & Waterview Rd South	TWSC			WB-B (10.4)				WB-B (11.4)	
56	Camp Arrowhead & Angola Rd/Oak Dr	TWSC			EB-C (17.2); WB-B (11.8)				EB-C (19.1); WB-B (13.4)	
57	Angola Rd & Angola Beach Rd	TWSC			NB-B (12.4)				NB-C (15.7)	
58	Waterview Rd & Bookhammer Landing Rd	TWSC			NW-A (8.8)				NW-A (8.8)	
59	Old Landing Rd & Warrington Rd/Strawberry Way	RDBT	B	12.4	EB-B; WB-A; NB-C; SB-A		C	21.8	EB-C; WB-A; NB-A; SB-D	
64	Cedar Grove Rd & New Connector Rd 2	RDBT	A	8.6	SE-A; NW-A; NE-A; SW-A		B	13.2	SE-A; NW-A; NE-A; SW-C	
65	New Connector Rd 1 & New Connector Rd 2	TWSC			SE-B (10.8)				SE-A (9.6)	
66	Mulberry Knoll Rd & New Connector Rd 1	TWSC			SW-C (18.5)				SW-C (21.9)	
68	Airport Rd Ext & Postal Lane	TWSC			NW-C (19.1)				NW-F* (132.6)	
69	Mulberry Knoll Rd Ext & Robinsonville Rd	RDBT	A	8.9	SE-A; NW-B; NE-A; SW-A	PHF: 0.98	C	16.7	SE-D; NW-A; NE-A; SW-C	PHF: 0.98
72	Robinsonville Rd & Jolyns Way Ext.	RDBT	A	7.1	WB-A; NB-A; SB-A		A	7.7	WB-A; NB-A; SB-A	

Notes:

- Sidestreet volumes do not meet peak hour warrant volume threshold. No further improvements required.
- Intersection improvement required anticipated to be the installation of a traffic signal with no geometric widening. Based on minimal cost of the signal installation compared to the overall cost estimate of the TID, no additional cost estimates were incorporated.