



Contract No. T202069012

WESTOWN TID CTP COST DEVELOPMENT UPDATE REPORT

Prepared For:
Delaware Department of Transportation



June 2023

Prepared By:



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**Westown TID
CTP Cost Development Update Report**

Contract No. T202069012

Recommended by:



Mir Wahed, P.E., PTOE, PTP

June 2023

**Johnson, Mirmiran & Thompson, Inc.
Vice President
Traffic Planning & Engineering**



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1. INTRODUCTION

The purpose of this report is to provide an update to the previous Westtown Transportation Improvement District (TID) analysis and report provided by McCormick Taylor in 2015. This update was conducted to determine if the volume projections and improvements identified from the 2015 study are still applicable, especially with the opening of the new US 301 alignment. This report will present the updated methodology for the development of the traffic analysis, roadway concept plans, and cost estimates for the Westtown TID.

A TID is a geographic area defined for the purpose of identifying required improvements to transportation facilities within that area and establish a mechanism to fund for the improvements. A TID generally has the following:

- A target horizon year for which population and employment is forecast based on the future land use in the area.
- Service standards established to specify what is considered adequate transportation infrastructure.
- An infrastructure fee program to estimate the costs of improvements. The estimated costs are apportioned such that developers seeking plan approvals within the TID must either make identified improvements or contribute toward improvements to be made by others.

Due to the future development anticipated within the project area, a traffic analysis was performed to identify the needed roadway capacity and transportation improvements within the TID facilities boundary as previously defined by DeIDOT. The analysis year for the future volume projection was determined as 2030. The roadways within the study area were also analyzed to determine operational and safety needs. These analyses were combined to develop a total estimated cost for these improvements. Based on the estimated cost information, DeIDOT can prioritize the future projects within the project area. In addition, DeIDOT will be able to assign a portion of the total estimated transportation construction cost to developers who plan to construct within the TID facilities boundary in the future.

The Westtown TID is located in Middletown, on the southwest side of New Castle County. The study area (a.k.a TID facilities boundary) for this traffic analysis consists of 8 roadway segments totaling approximately 8 miles, as well as 24 intersections with 9 signalized intersections and 3 roundabouts. Within the study area, the Westtown TID participant boundary encompasses approximately 4.5 square miles and 15 of the total 24 intersections. Figure 1 displays the study area with the Westtown TID participant boundary marked in red, the analyzed roadway segments highlighted in purple, purposed future roadway connectors in magenta, the analyzed intersections within the TID participant boundary shown as green circles, and the analyzed intersections outside of the TID participant boundary shown as blue circles.

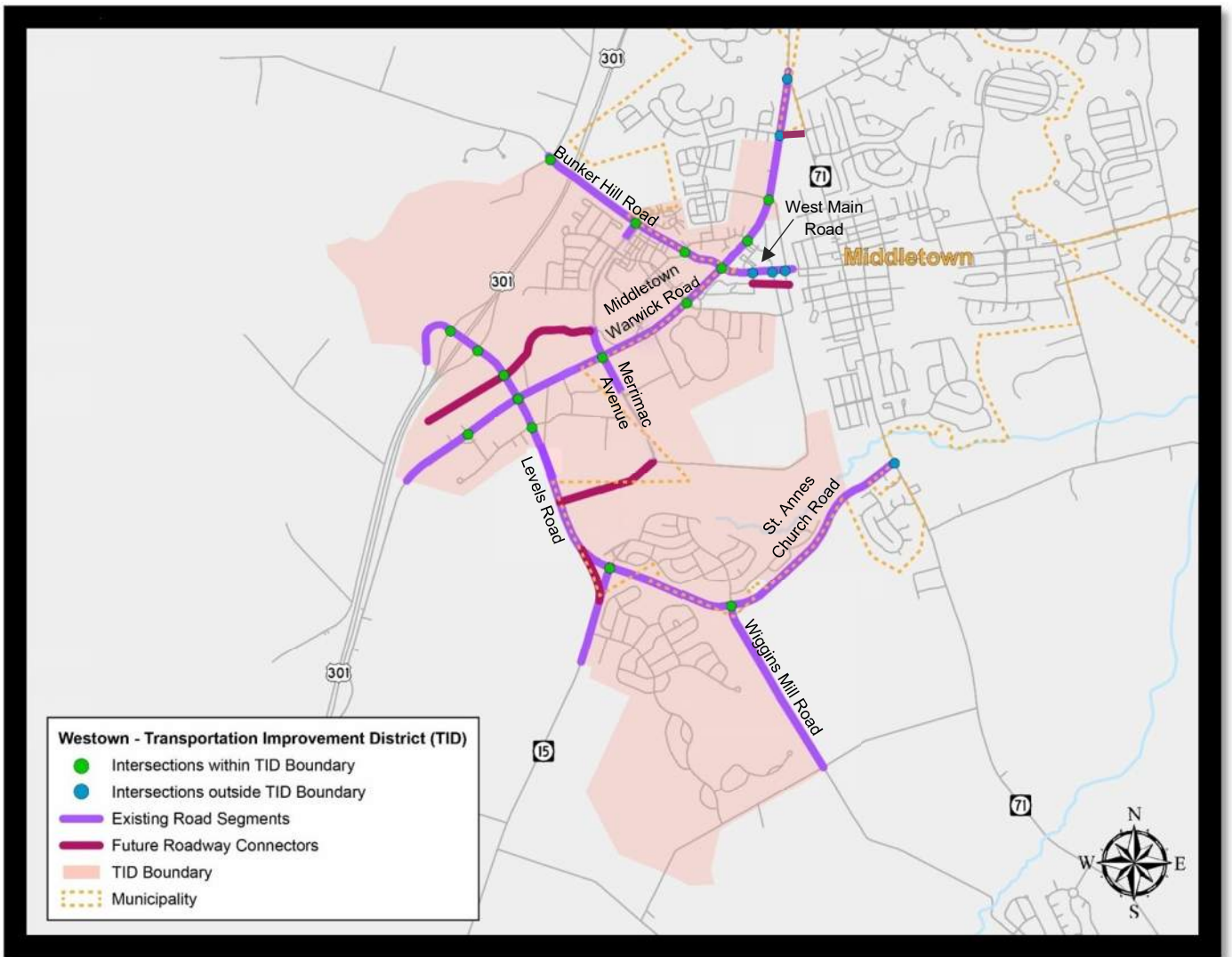


Figure 1: Study Area Map

2. METHODOLOGY

2.1 Existing Traffic Volumes

For the majority of study intersections, historical count data from 2017 to early 2020 was utilized to avoid impacts by COVID-19 pandemic and then grown to 2020 to create baseline conditions. At intersections without historical data available, weekday peak hour morning and evening counts were conducted in Fall of 2020 during COVID. Traffic volumes were then balanced between intersections and adjusted to account for the impacts of COVID on traffic patterns. Figure A-1 in Appendix A depicts the existing raw traffic volumes whereas Figure A-2 in Appendix A depicts the existing adjusted traffic volumes.



2.2 Planned Improvements & Developments

The Westtown TID currently encompasses 22 developments of varying sizes and land uses. Of all the developments, the most common land uses were a mix of various residential uses and commercial. ITE's *Trip Generation Manual* was used by DeIDOT and verified by JMT to predict how many additional vehicular trips would travel within the TID area from the new developments. JMT also employed methods to account for internal capture and pass by trips consistent with ITE methodologies. The trip generation calculations and a map showing the location of the study developments can be found in Appendix B. Additionally, Appendix B contains a copy of the committed developments considered by the 2015 McCormick Taylor TID Report for comparison.

In addition to the new developments, planned transportation improvements including three new roadway connections are being proposed by DeIDOT within the project area. Two of the new roadway connections include an extension of Merrimac Avenue to connect between Industrial Drive and Levels Road as well as an extension of Commerce Drive to connect between Merrimac Avenue and Levels Road. The third connection will provide a link between SR 71 and Middletown-Warwick Road and extend between either Ash Boulevard and the Middletown Commons Access or Greenlawn Boulevard and the private access located approximately 1,000 feet south of Ash Boulevard. Coordination is ongoing to select the preferred alignment. The proposed roadway connections are shown in red in each of the volume figures contained in Appendix A.

2.3 Future 2030 Volumes

Based on the anticipated development and planned roadway connections, DeIDOT performed travel demand forecasts for the 2030 scenario to provide background growth rates along each of the project roadways. These growth rates varied between 0.5% and 1.2% per year. In addition to background growth rates, these forecasts were also conducted to provide traffic distributions for each of the 22 committed developments. These distributions were reviewed and modified by JMT as needed and coordinated with DeIDOT Planning. The trip distributions for the 22 committed developments have been included in Appendix B.

The trip generation calculations performed for the 22 developments were combined with the trip distributions to create the total trip assignments. These trip assignments are summarized in Figure A-3 in Appendix A. These trip assignments were then combined with the background growth rates and the adjusted existing traffic volumes to create the future 2030 peak hour volumes summarized in Figure A-4 in Appendix A.

It should be noted, the future 2030 peak hour volumes accounted for the two new roadway connections from the Merrimac Avenue extension and the Commercial Drive extension. The roadway connection between SR 71 and Middletown Warwick Road was investigated after the initial development of the Westtown TID. As such, a memorandum summarizing the traffic study of the additional connector is included in Appendix F. Figure A-4 in Appendix A depicts the 2030 peak hour volumes without the SR 71 and Middletown Warwick Road connector whereas subsequent figures display the 2030 peak hour volumes with the additional connector. Per coordination with DeIDOT, all analysis and improvements were identified assuming the connection between Middletown Warwick Road and SR 71 was constructed.



3. TRAFFIC ANALYSIS

3.1 Capacity Analysis

Using the 2030 peak hour volumes, capacity analyses were conducted to identify needed roadway improvements within the project area. Intersection analyses were conducted using Synchro software based on Highway Capacity Manual (HCM) methodology. Any intersection identified by Synchro to operate at LOS E or worse for the 2019 Existing or 2030 Baseline scenarios were then further analyzed to identify improvements to improve LOS to D or better per the TID standards. After the submission of these improvements, DelDOT requested an additional scenario be analyzed where LOS E was considered the acceptable threshold instead of LOS D, consistent with other TIDs in the state. Table 1 below summarizes the recommendations for the LOS D and LOS E scenarios.

For all intersections that are controlled by all-way stop control, roundabouts, or signals, the LOS criteria would be applied to the overall intersection LOS. For unsignalized two-way stop-controlled intersections, the LOS criteria applied to the stop-controlled minor street approaches. Intersection improvements also included the addition of auxiliary lanes as well as converting stop-controlled intersections to roundabouts or signalized intersections. The LOS and queue length results for the capacity analysis are included in Appendix C.

For unsignalized intersections where traffic on the major street does not stop or yield, it was recognized that traffic volumes along the stop-controlled minor street may be insufficient to warrant any improvement such as an all-way stop, roundabout, or signal that would delay the through traffic along the major street to achieve an overall LOS D or better. As such, a combined peak hour left turn and through volume of 75 vehicles along the minor street was considered as a minimum threshold for any additional intersection improvements. This 75-vehicle threshold was determined based on the same criteria as part of the DEMUTCD's Warrant #3 – Peak Hour Signal Justification Warrant.

Based on the intersection capacity analysis, the following improvements were identified within the project area.

Table 1

LOS D Improvements	LOS E Improvements
<ul style="list-style-type: none"> • Installation of auxiliary lanes at three intersections. Current intersection control type is maintained. • Adding additional through lanes at four intersections • Installation of two single lane roundabouts • Conversion of one single lane roundabout to a dual-lane roundabout • Signalization of four intersections 	<ul style="list-style-type: none"> • Installation of auxiliary lanes at two intersections. Current intersection control type is maintained. • Adding additional through lanes at one intersection. • Installation of two single lane roundabouts • Conversion of one single lane roundabout to a dual-lane roundabout • Signalization of four intersections



Figure D-1 in Appendix D displays the recommended roadway widening and intersection improvements proposed by the TID under LOS D conditions whereas Figure D-2 displays the improvements recommended under LOS E conditions. Figure D-3 displays changes in recommendations between the LOS D and LOS E scenarios. It should be noted that recommendations previously made for Intersections 20-22 have been excluded as it is assumed that the Middletown Warwick Road and SR 71 connector is implemented which mitigates the improvement needs. Additional writeups are also included at the end of Appendix C discussing the logic behind selecting certain intersection improvements.

In addition to the capacity analysis, five simulation runs were conducted using SimTraffic software for the intersection improvement scenario to identify the projected queue lengths and needed storage lengths. The queue length results are summarized in Appendix C. In addition to the SimTraffic, analyses were conducted at each study intersection using the Auxiliary Lane Worksheet from the DeIDOT *Development Coordination Manual*. The Auxiliary Lane Worksheet from the DeIDOT *Development Coordination Manual* was completed at each intersection to confirm the required storage length needed along any turn lane.

4. COST ESTIMATES

As shown in Appendix E, conceptual cost estimates were developed for all 8 roadway segments within the TID totaling approximately 8 miles.

4.1 Planning Level Cost Estimates

JMT developed a standard concept estimate form utilizing DeIDOT's CTP template along with background calculation sheets. A conceptual estimate was created based on basic preliminary design line work of each improvement identified. Per coordination with DeIDOT, detailed concept plans were not requested as part of this TID effort. The design elements include the cost for preliminary engineering and environmental studies, project engineering, real estate acquisition, and construction. Initial estimates were submitted to DeIDOT but were then updated to account for high inflation experienced in 2022.

JMT developed a standard percentage cost for several items included in DeIDOT's standard CTP estimate form for the preliminary engineering, environmental studies, and project engineering tabs. To aid in the determination of right-of-way costs along each corridor on previous TID tasks, DeIDOT's real estate group provided input to help JMT estimate a square foot unit cost to be utilized for each zoning type encountered along a corridor. JMT utilized this information to develop unit costs unique to the Westtown TID. Total acquisitions were estimated utilizing information obtained by recent similar sales in the vicinity.

To determine construction costs, JMT developed a series of estimate forms based on the area of roadway widening and linear feet of improvement to estimate each line item used in DeIDOT's CTP form. For reconstruction purposes, JMT utilized a 12" asphalt paving section on top of 8" of subbase where shared-use paths utilized a 2" asphalt surface course over an 8" concrete base course. To determine unit costs, JMT utilized DeIDOT's historic bid tabs and previous construction project experience. For traffic related items, such as signalization and lighting, JMT determined appropriate costs based on recent experience with signal and lighting projects throughout the state.



Westtown TID CTP Cost Development Update Report

Per DeIDOT's *Lighting Policy*, at any location where a roundabout was proposed as part of the capacity analysis, lighting was considered to be needed. Based on the results of the traffic analysis and intersection improvement scenarios, lighting was recommended at 17 intersections within the project limit per 'Form A' warrants and engineering judgement.

Table 1 summarizes the cost estimate of each roadway segment within the project area. It should be noted, although the TID considered eight roadway segments in total, these roadway segments were consolidated into four separate segments. It should be noted that the cost of the connector roadway between Middletown Warwick Road and SR 71 is anticipated to be included in the Eastown TID. Technical memorandums summarizing the development of the cost estimates have been included in Appendix E. If multiple improvement alternatives were considered along a roadway segment, the higher cost alternative was considered when developing Table 1.

Table 1: Cost Estimate Along Each Roadway Segment

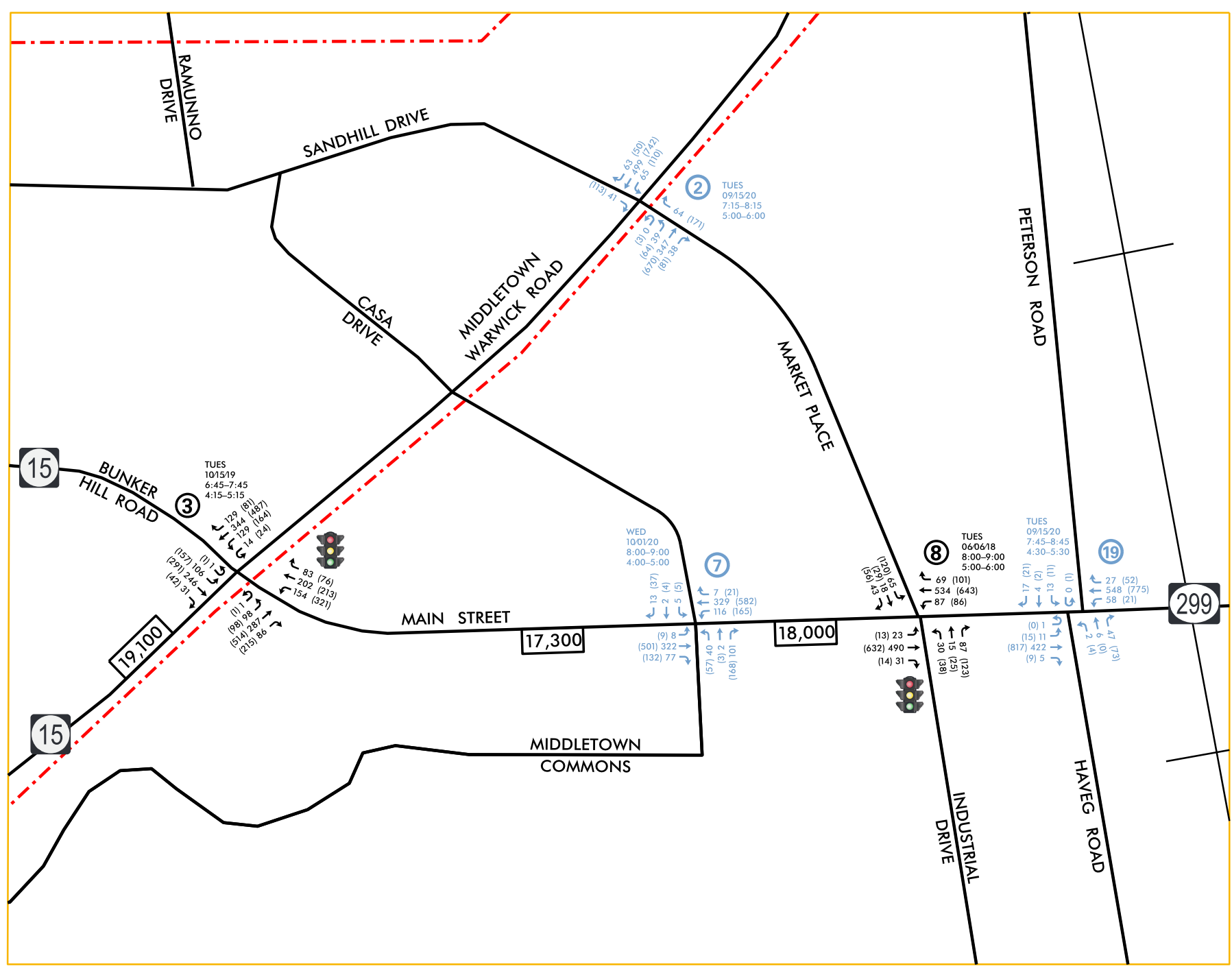
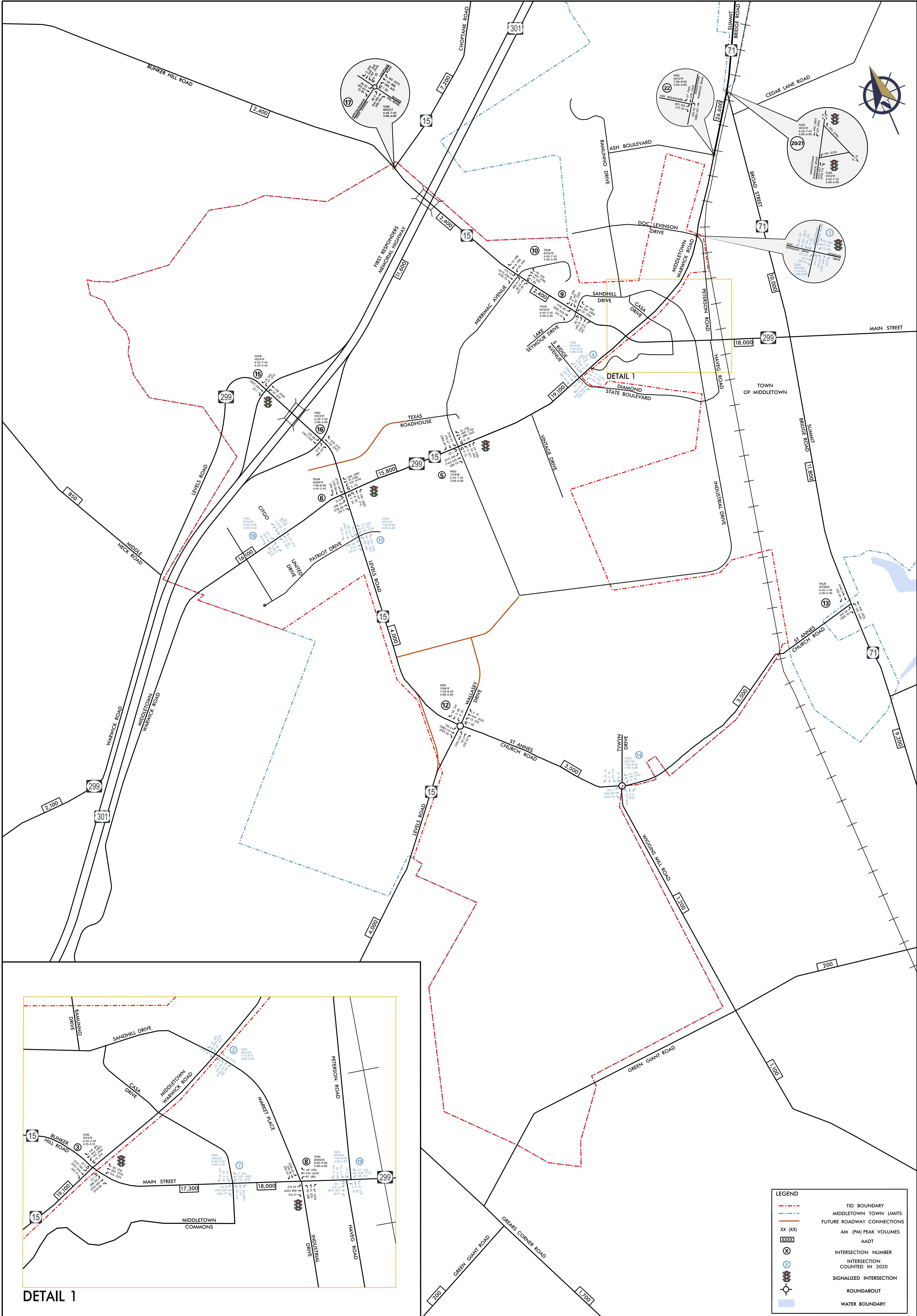
Corridor	Intersection #	Name	Cost Estimate	
			LOS D	LOS E
A	1	Middletown-Warwick Road & Doc Levinson/Peterson Drive	\$1,550,278	\$835,055
	2	Middletown-Warwick Road & Sandhill Drive	-	-
	3	Middletown-Warwick Road & Bunker Hill Road/Main Street	\$3,245,608	\$2,272,565
	20/21	Middletown-Warwick Road & SR 71	-	-
	22	Middletown-Warwick Road & Ash Boulevard	-	-
	4	Middletown-Warwick Road & Diamond State Boulevard	\$792,765	\$268,285
	5	Middletown-Warwick Road & Merrimac Avenue	\$3,733,338	\$428,325
	6	Middletown-Warwick Road & Levels Road	\$6,012,185	\$2,144,785
	18	Middletown-Warwick Road & United Drive	\$1,660,893	\$1,660,893
B	7/8/19	Main Street Intersections east of Middletown-Warwick Road	\$1,269,060	\$1,269,060
	8a	Future Connector to Industrial Drive	\$1,720,715	\$1,720,715
	9	Bunker Hill Road & Lake Seymour/Sand Hill Drive	\$2,348,975	\$1,517,195
	10	Bunker Hill Road & Merrimac Avenue	\$2,363,733	\$2,363,733
	17	Bunker Hill Road & Choptank Road	-	-
C	11	Levels Road & Patriot Drive	\$3,722,315	\$1,855,038
	24	Levels Road & Future Merrimac Avenue	\$3,665,395	\$3,142,500
	12	Levels Road & St Annes Church Road	\$4,328,650	\$3,475,065
	23	Levels Road & Poole Property Access	\$1,544,640	\$1,544,640
	15	Levels Road & US 301 SB Off Ramp	-	-
	16	Levels Road & US 301 NB Off Ramp	-	-
D	13	St Annes Church Road & SR 71	\$2,623,318	\$2,623,318
	14	St Annes Church Road & Wiggins Mill Road	\$1,435,458	\$1,435,458
		Wiggins Mill Road	\$4,120,475	\$4,120,475
Total			\$46,137,801	\$32,677,105

DeIDOT is currently planning on finalizing the Westtown TID using the LOS E improvements and associated cost estimates and the Town of Middletown has concurred with this decision.

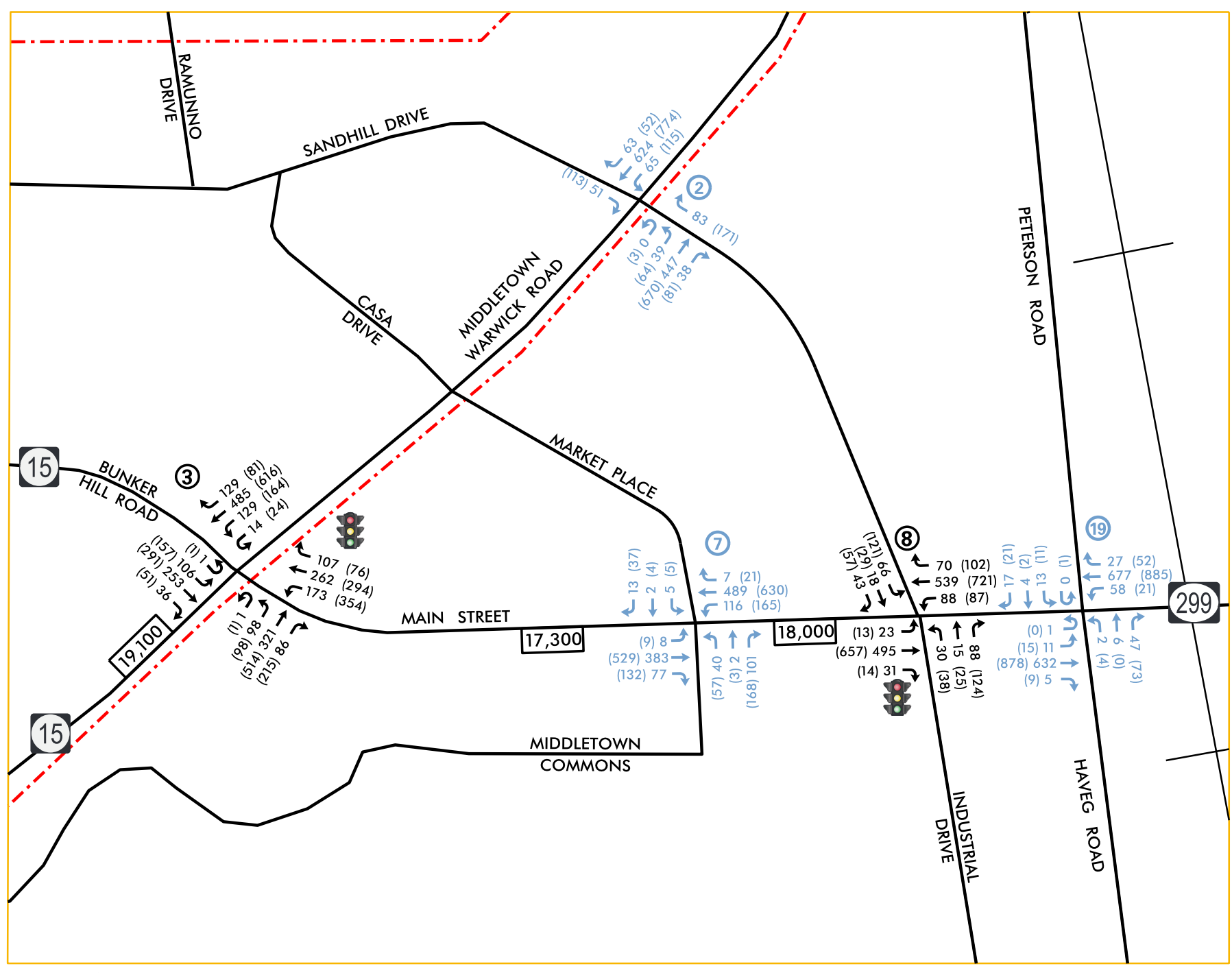
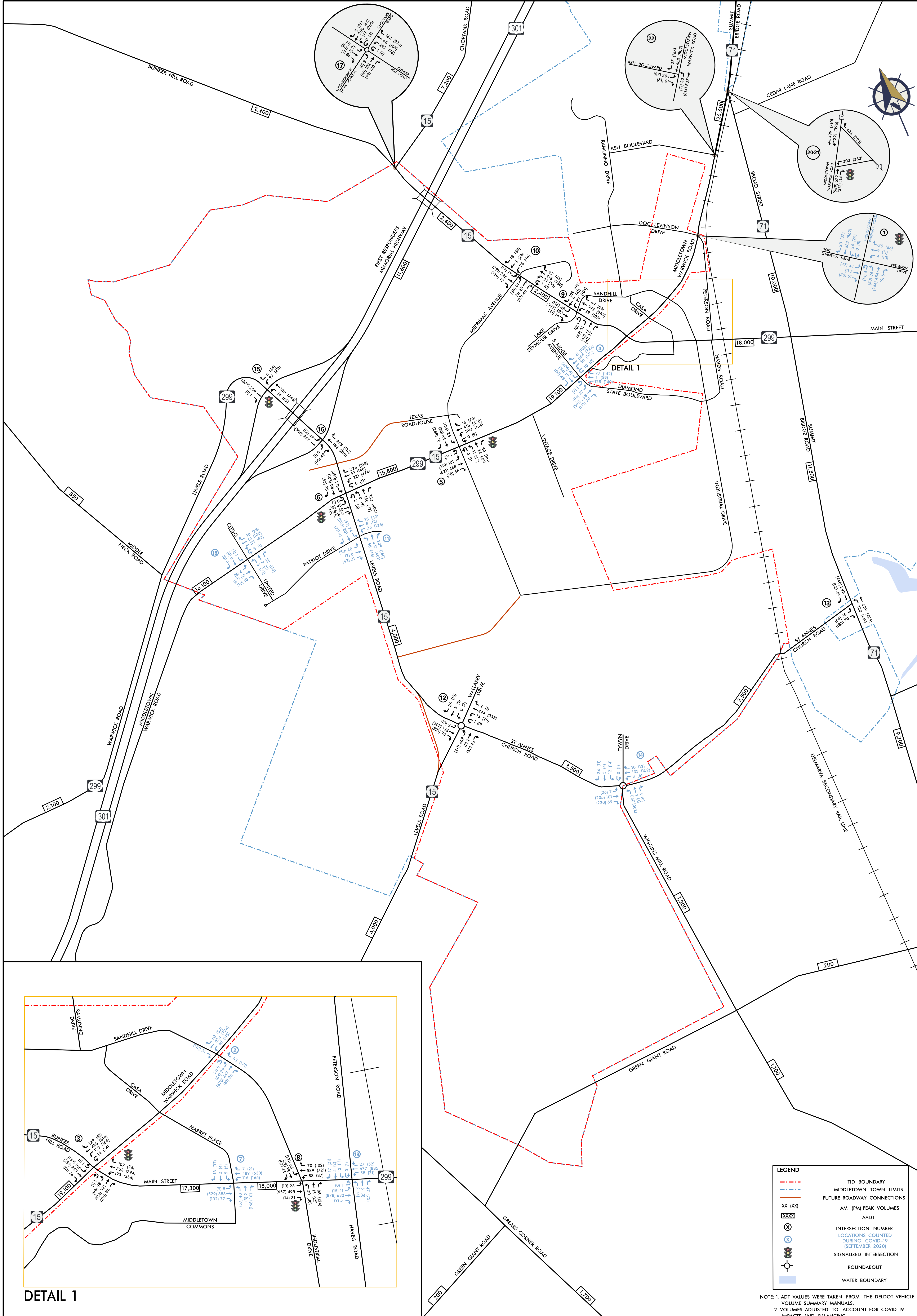


Appendix A

Traffic Volume Diagrams



LEGEND	
	TID BOUNDARY
	MIDDLETOWN TOWN LIMITS
	FUTURE ROADWAY CONNECTIONS
	AM (PM) PEAK VOLUMES
	AADT
	INTERSECTION NUMBER
	INTERSECTION COUNTED IN 2020
	SIGNALIZED INTERSECTION
	ROUNDBOUT
	WATER BOUNDARY



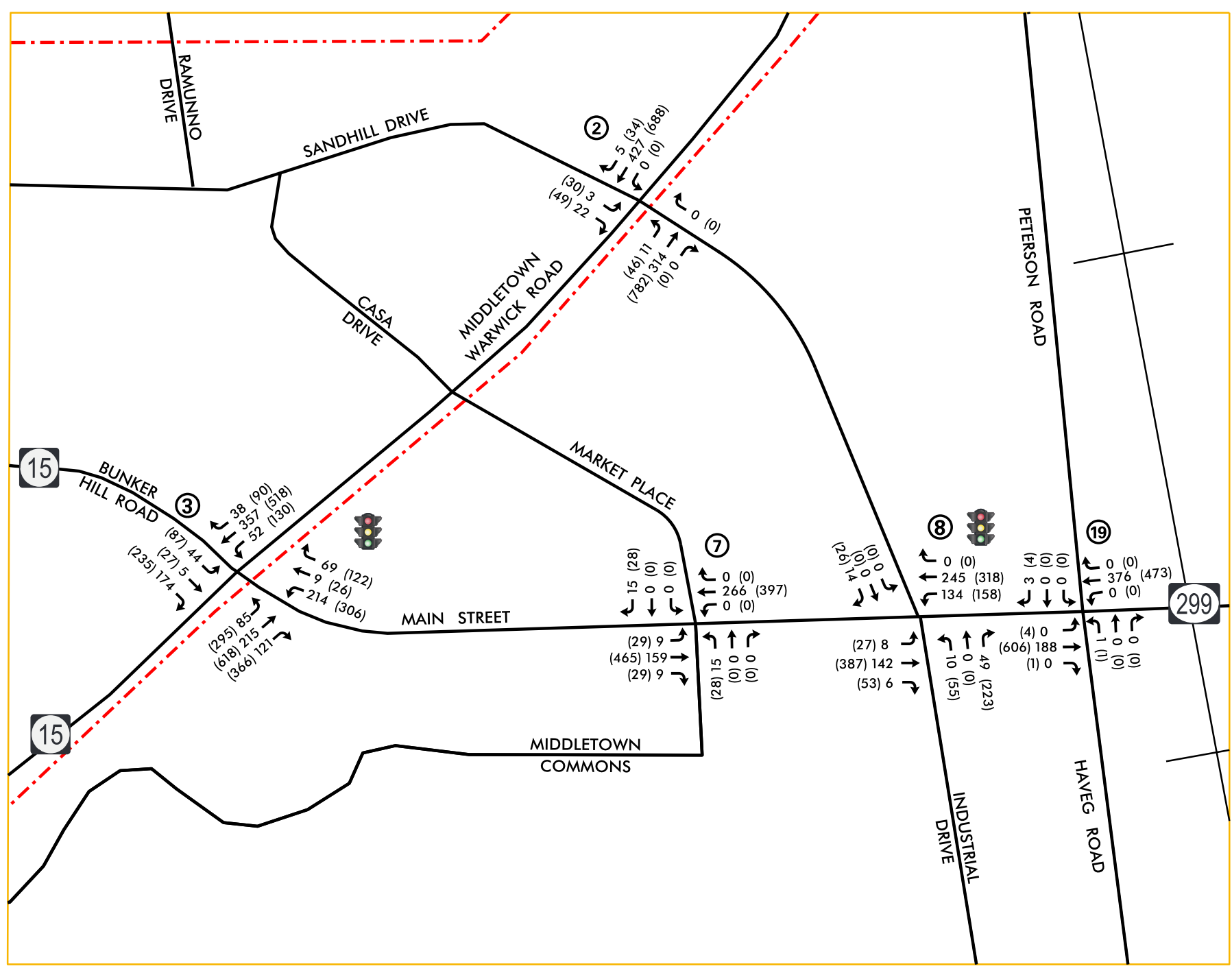
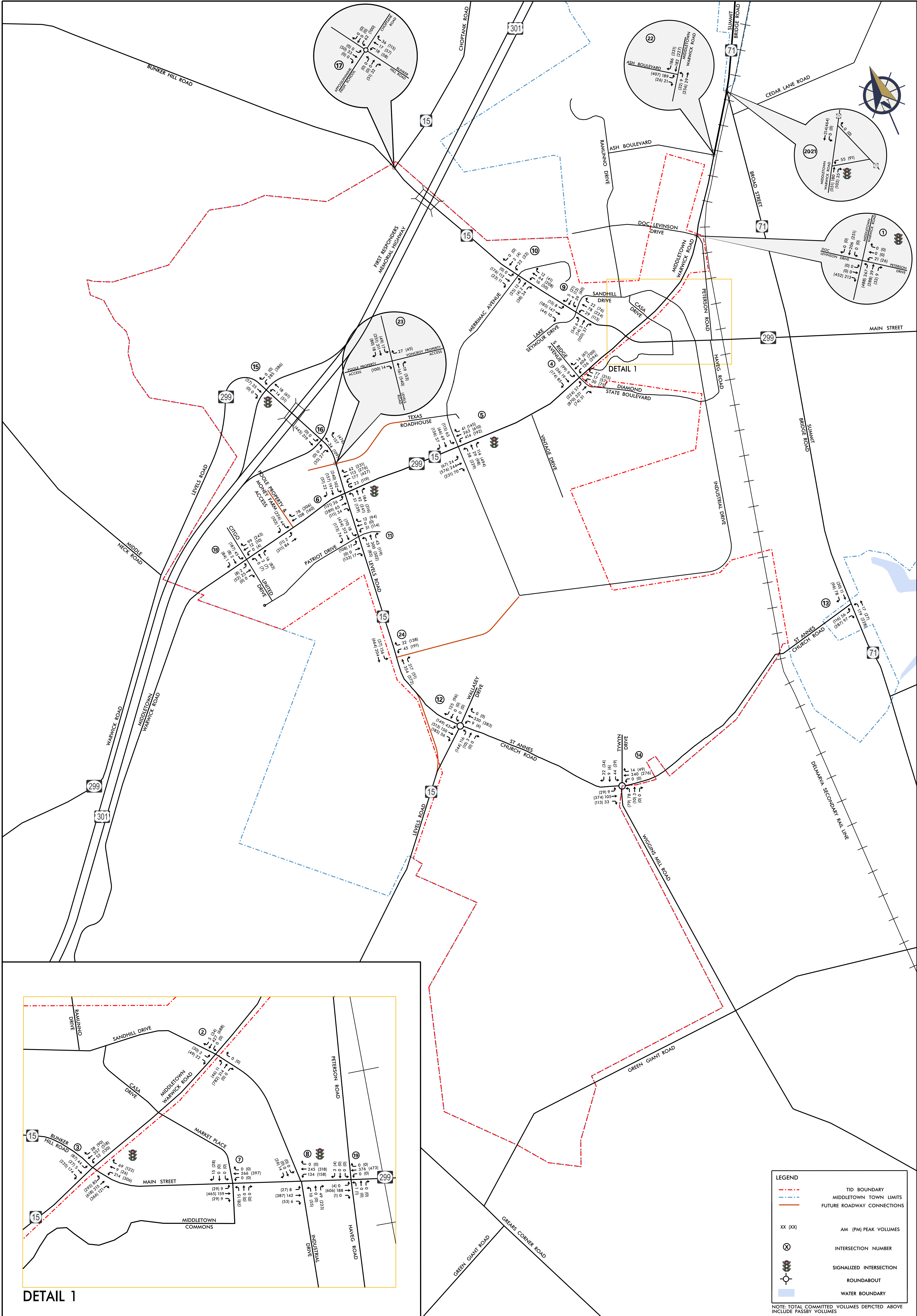
DETAIL 1

LEGEND




- - - TID BOUNDARY
- - - MIDDLETOWN TOWN LIMITS
- - - FUTURE ROADWAY CONNECTIONS
- XX (XX) AM (PM) PEAK VOLUMES
- XXXXX AADT
- (X) INTERSECTION NUMBER
- (X) LOCATIONS COUNTED DURING COVID-19 (SEPTEMBER 2020)
- SIGNALIZED INTERSECTION
- ROUNDABOUT
- WATER BOUNDARY

NOTE: 1. ADT VALUES WERE TAKEN FROM THE DELDOT VEHICLE VOLUME SUMMARY MANUALS.
 2. VOLUMES ADJUSTED TO ACCOUNT FOR COVID-19 IMPACTS AND BALANCING.

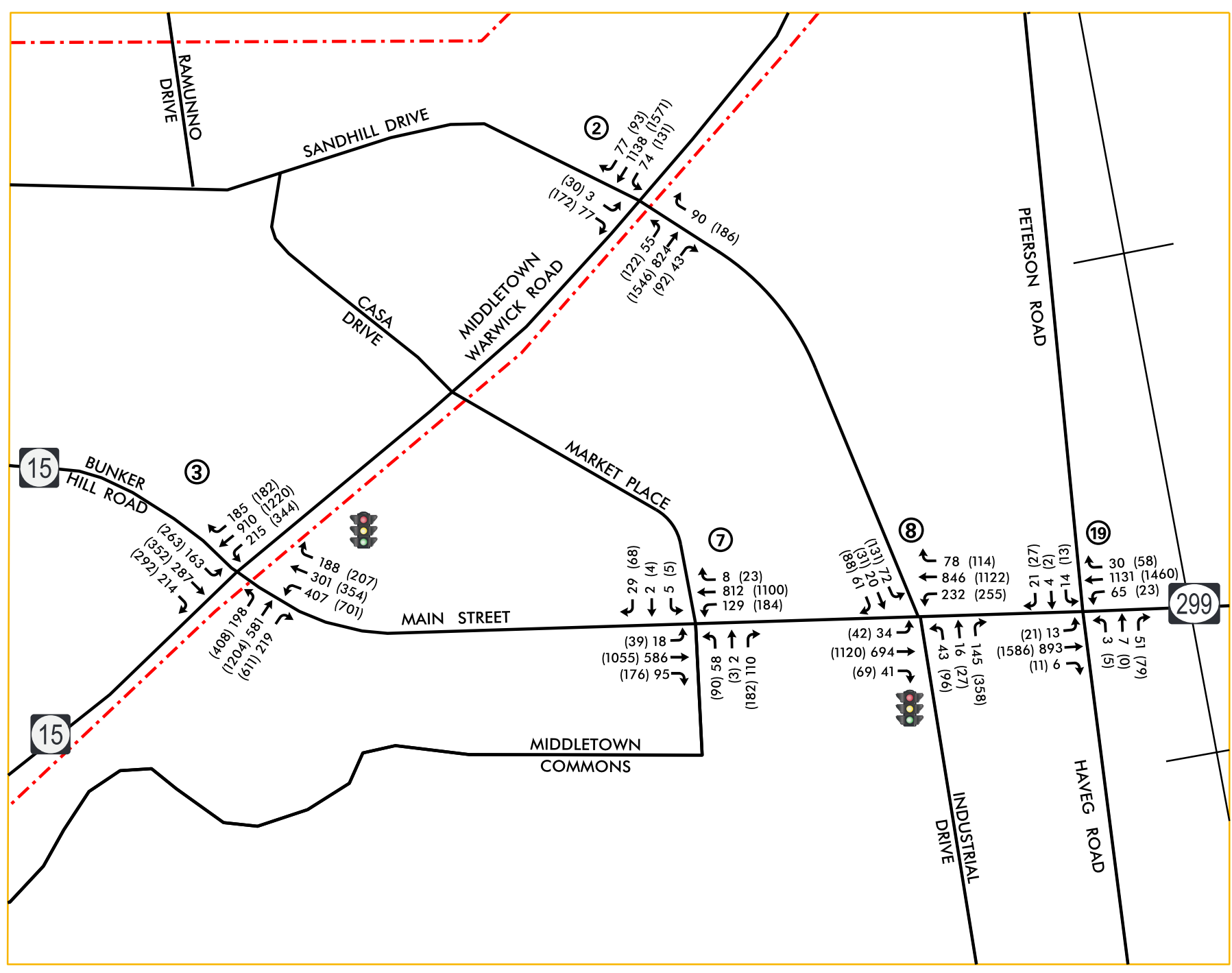
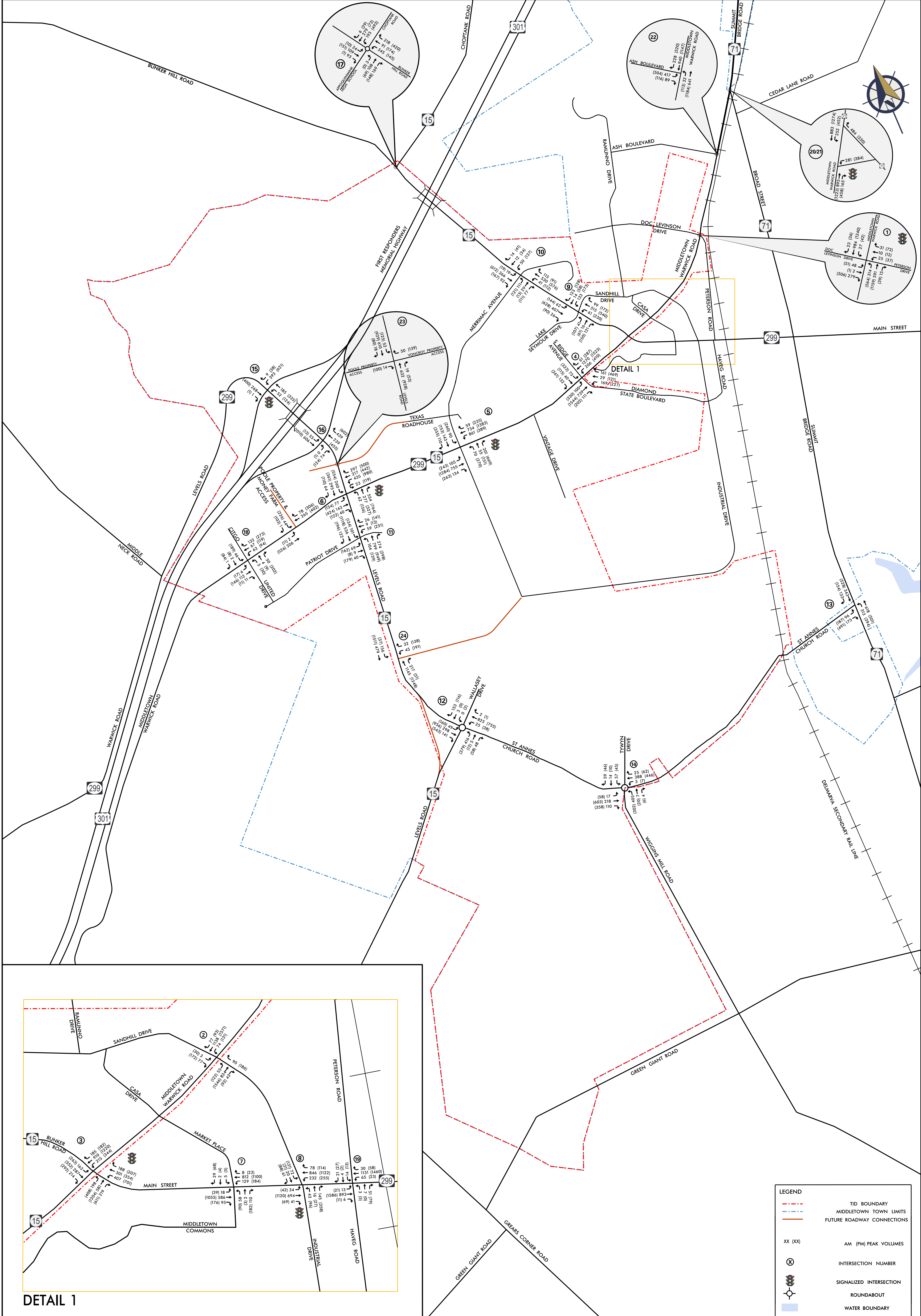
	DATE	ADDENDUMS / REVISIONS	NOT TO SCALE	WESTOWN TID (T202069012)	COUNTY	BRIDGE NO.	N/A	FIGURE A-2 EXISTING ADJUSTED TRAFFIC VOLUMES	SHEET NO.
					NEW CASTLE	DESIGNED BY: SAB/NR			2
							CHECKED BY: MAW	TOTAL SHTS. 4	



LEGEND

- - - TID BOUNDARY
- - - MIDDLETOWN TOWN LIMITS
- - - FUTURE ROADWAY CONNECTIONS
- XX (XX) AM (PM) PEAK VOLUMES
- ⊗ INTERSECTION NUMBER
-  SIGNALIZED INTERSECTION
-  ROUNDABOUT
-  WATER BOUNDARY

NOTE: TOTAL COMMITTED VOLUMES DEPICTED ABOVE INCLUDE PASSBY VOLUMES



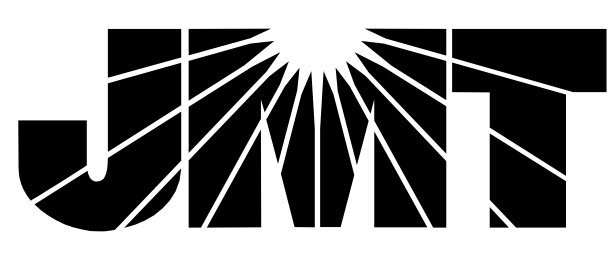
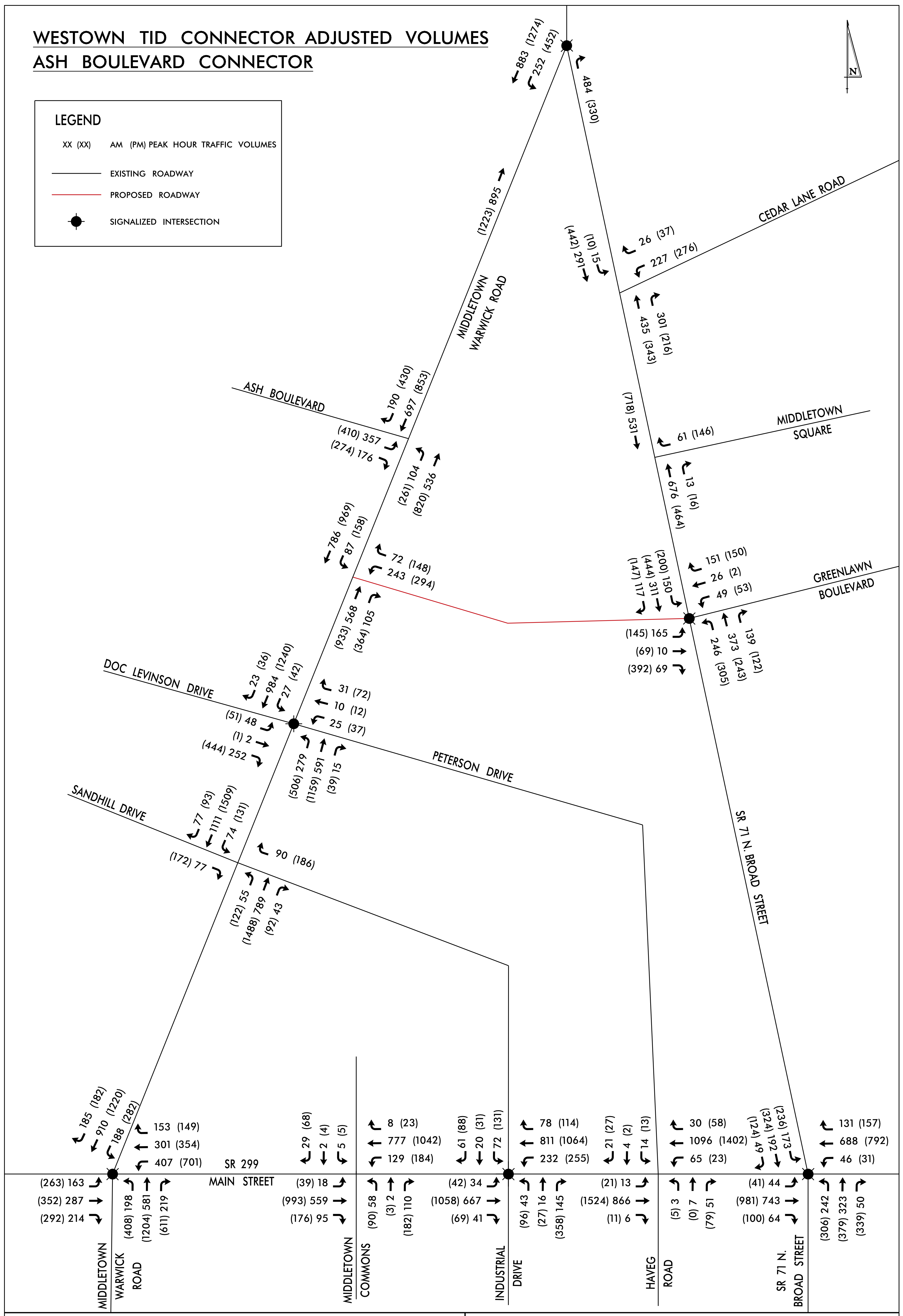
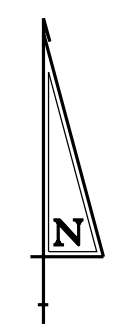
Volume Updates

Middletown Warwick Road to SR 72 Connector

WESTOWN TID CONNECTOR ADJUSTED VOLUMES ASH BOULEVARD CONNECTOR

LEGEND

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES
- EXISTING ROADWAY
- PROPOSED ROADWAY
- SIGNALIZED INTERSECTION



WESTOWN TID FUTURE CONNECTOR
ADJUSTED ASH BOULEVARD
CONNECTOR VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

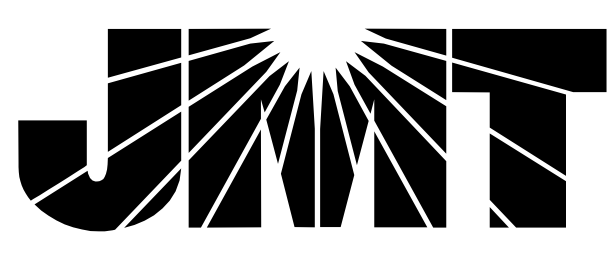
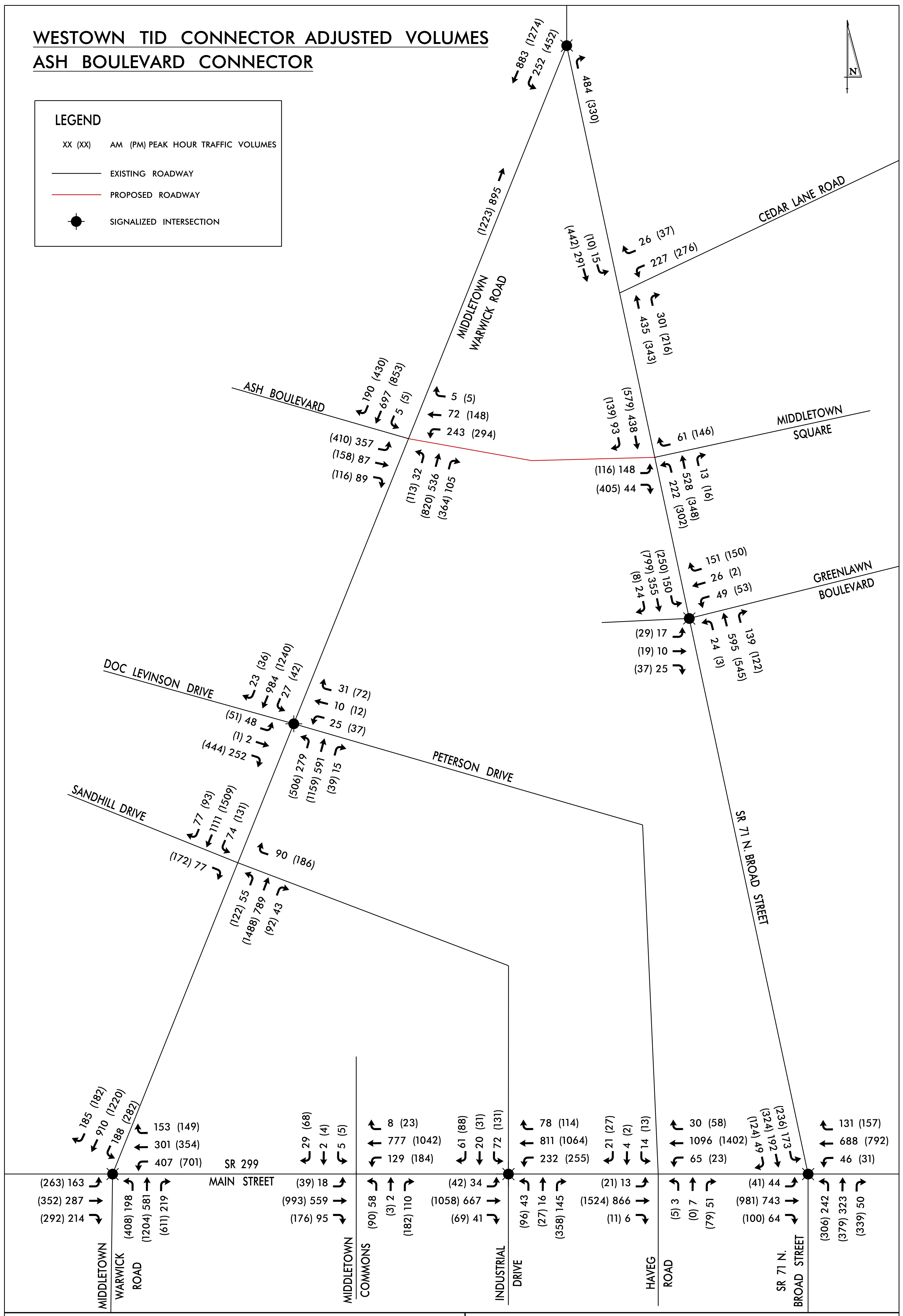
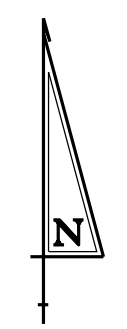
N.T.S.

FEBRUARY 2022

WESTOWN TID CONNECTOR ADJUSTED VOLUMES ASH BOULEVARD CONNECTOR

LEGEND

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES
- EXISTING ROADWAY
- PROPOSED ROADWAY
- SIGNALIZED INTERSECTION



WESTOWN TID FUTURE CONNECTOR
ADJUSTED ASH BOULEVARD
CONNECTOR VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

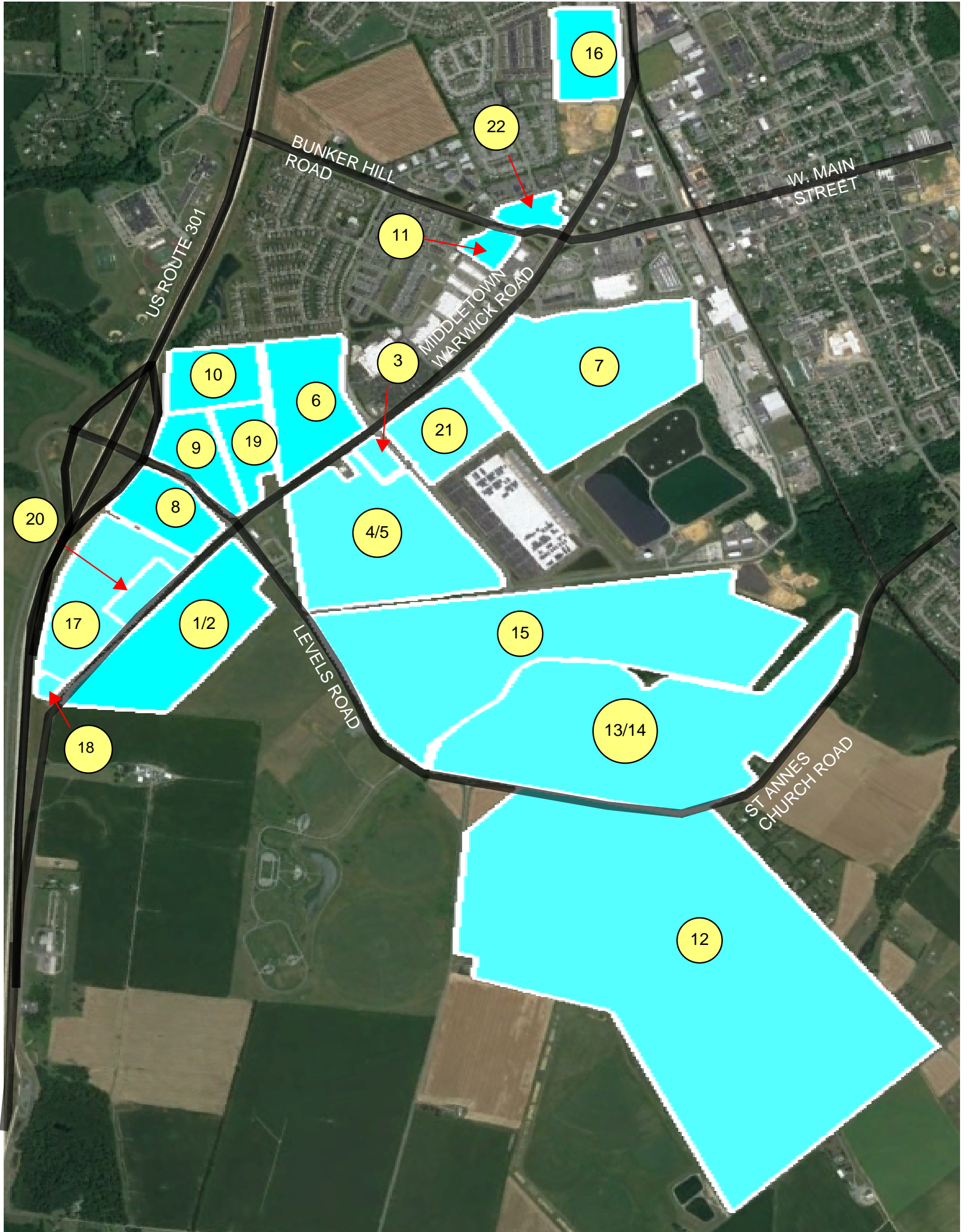
FEBRUARY 2022



Appendix B

Planned Developments

Committed Development Map



- | | | |
|------------------------------------|-----------------------------------|-----------------------------------|
| 1. Levels Business Park Commercial | 8. Pool-Von Croy North Commercial | 15. Rocks & Reading Industrial |
| 2. Levels Business Park Industrial | 9. Pool-Von Croy North Apartments | 16. Middletown Village |
| 3. Harley Davidson | 10. 301 SRV Age Restricted | 17. Money Farm (929 Warwick Road) |
| 4. Kohl South Capano | 11. 301 SRV Commercial | 18. Watchmaking |
| 5. Kohl South Commercial | 12. ST Anne's Residential | 19. Rutkoske |
| 6. Kohl North Employment | 13. The Preserve Single-Family DU | 20. US 301 Truck Stop |
| 7. Auto Mall Commercial | 14. The Preserve Multi-Family DU | 21. Cochran Employment Center |
| | | 22. Bunker Hill Center |



WESTOWN TID
 COMMITTED DEVELOPMENT MAP
 NEW CASTLE COUNTY, DELAWARE

N.T.S.

NOVEMBER 2021

Trip Generation

WESTOWN TID TRIP GENERATION

#	Site	ITE LUC	Size	UNIT	AM Peak								PM Peak							
					Total		Passby		Internal Capture ⁴		Net External Trips		Total		Passby		Internal Capture ⁴		Net External Trips	
					In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	IC In	IC Out
1	Levels Business Park Commercial	820	89	ksf	52	32	-	-	-	-	52	32	239	259	81	88	-	-	158	171
2	Levels Business Park Industrial	130	175	KSF	57	13	-	-	-	-	57	13	15	55	-	-	-	-	15	55
3	Harley Davidson	840	46	ksf	63	23	-	-	0	0	63	23	45	67	-	-	0	1	45	66
4	Kohl South Capano	220	120	du	13	44	-	-	0	0	13	44	43	26	-	-	20	11	23	15
5	Kohl South Commercial	820	58.6	ksf	34	21	-	-	0	0	34	21	176	190	60	64	2	3	114	123
6	Kohl North Employment	820	100	ksf	58	36	-	-	1	1	57	35	261	282	89	96	26	49	146	137
7	Auto Mall Commercial	820	268	KSF	156	96	-	-	0	0	156	96	541	586	184	199	5	9	352	378
8	Pool-Von Croy North Commercial	820	166	ksf	97	59	-	-	-	-	97	59	380	411	129	140	-	-	251	271
9	Pool-Von Croy North Apartments	220	300	du	31	104	-	-	1	1	30	103	99	58	-	-	45	23	54	35
10	301 SRV Age Restricted	252	50	du	3	7	-	-	0	0	3	7	8	6	-	-	4	3	4	3
11	301 SRV Commercial	820	144	ksf	84	51	-	-	-	-	84	51	342	370	116	126	-	-	226	244
12	ST Anne's Residential	210	28	du	6	19	-	-	-	-	6	19	19	11	-	-	-	-	19	11
13	The Preserve SF DU	210	251	du	46	137	-	-	-	-	46	137	155	91	-	-	-	-	155	91
14	The Preserve MF DU	220	108	du	11	40	-	-	-	-	11	40	40	23	-	-	-	-	40	23
15	Rocks & Reading Industrial ²	130	200	Acres	868	178	-	-	-	-	868	178	203	764	-	-	-	-	203	764
16	Middletown Village ³	820	280	KSF	163	100	-	-	-	-			559	605	190	206	-	-		
		960	20	VFP	281	281	177	177	-	-			230	230	151	151	-	-		
				total	444	381	-	-	-	-	267	204	788	834	341	357	-	-	447	477
17	Money Farm (929 Warwick Road) ⁵	-	181.5	ksf	2	1	-	-	-	-	2	1	71	35	-	-	-	-	71	35
18	Watchmaking	540	35	ksf	55	17	-	-	-	-	55	17	32	33	-	-	-	-	32	33
19	Rutoske	820	106	ksf	62	38	-	-	-	-	62	38	272	295	93	100	-	-	180	195
20	US 301 Truck Stop	820	83	ksf	48	30	-	-	-	-	48	30	227	246	77	84	-	-	150	162
21	Cochran Employment Center	820	200	ksf	117	71	-	-	0	0	117	71	436	472	148	161	4	7	284	305
22	Bunker Hill Center	820	20	ksf	12	7	-	-	-	-	12	7	79	86	27	29	-	-	52	57

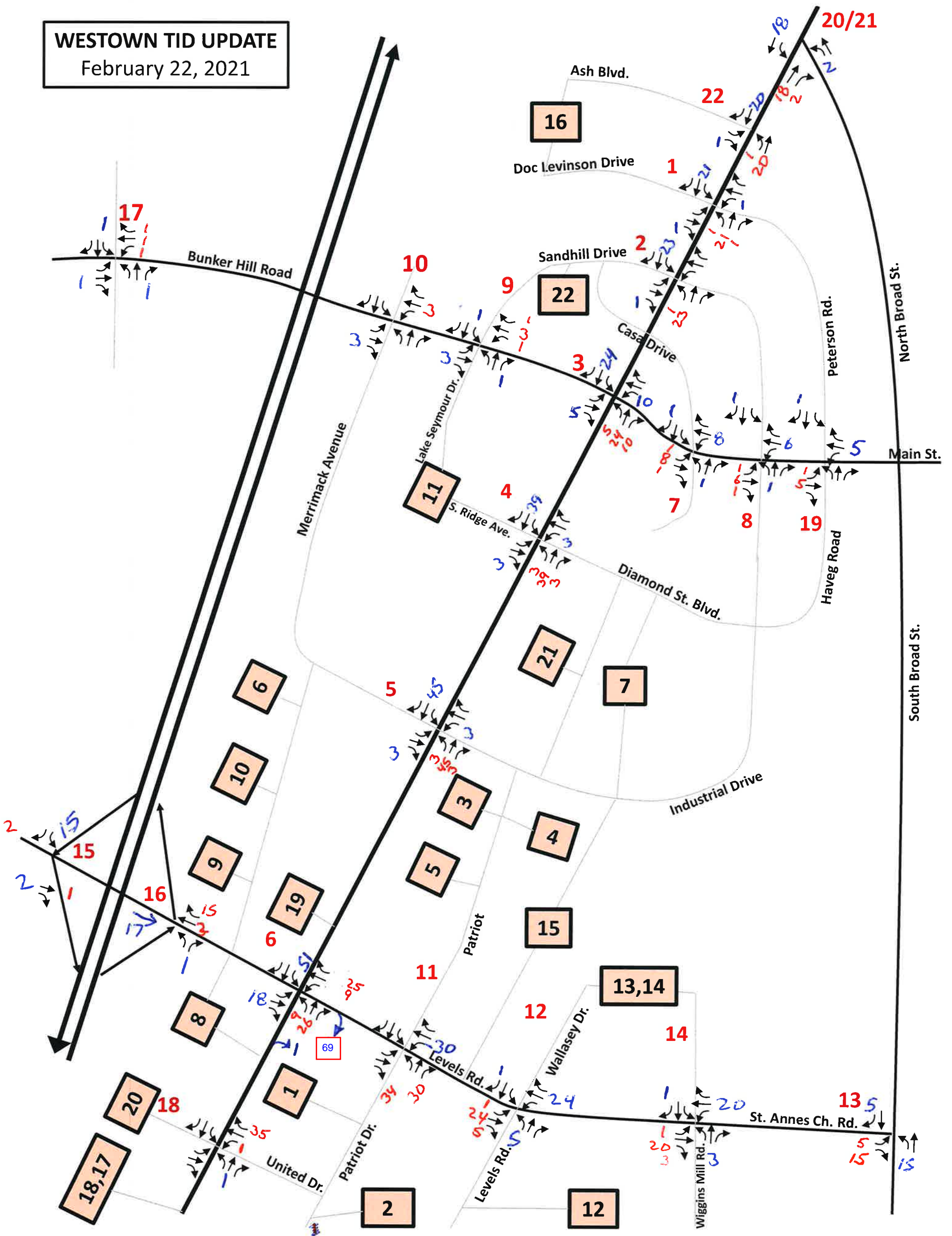
- Note:
1. Trip Generation values provided above were calculated using methodologies contained in the 10th Edition of ITE's Trip Generation Manual
 2. As the 10th Edition of the Trip Generation manual does not provide guidance for units of Acres, 9th Edition was utilized for this land use. As the large size of the development fell outside the data points provided by the trip gen manual, the fitted curve equation was used instead of the average rate equation despite the low R² value as the fitted curve provided a more realistic trip generation value.
 3. Based on the size of this development, it was assumed that the gas station would be larger than 5,000 SF and would fit the description for LUC 960.
 4. Internal capture calculations did not account for mode split, vehicle occupancy estimates, or proximity between land uses due to the low impact of these variables. Internal capture was distributed between land uses based on a weighted average of trips the sites are producing.
 5. Trip generation values were provided by developer constructing the fulfillment center site. It should be noted supplemental trip generation calculations were performed by JMT which validated the values provided by the developer.

Land Use
Commercial
Residential: Single Family Detached
Residential: Misc.
Industrial
Other

Trip Distribution

SITE 1
 LEVELS BUSINESS PARK
 PM IN 190
 PM OUT 198

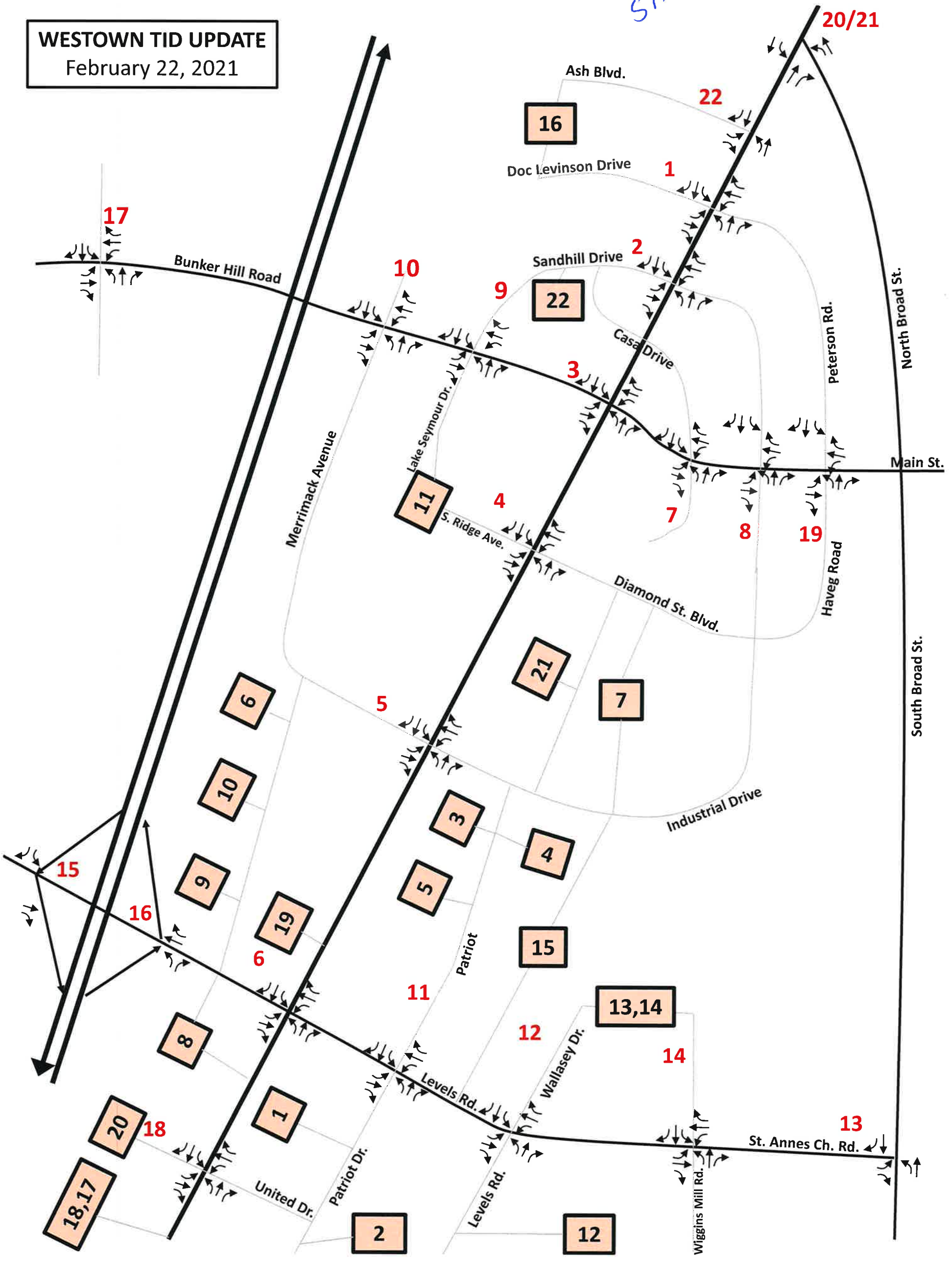
WESTOWN TID UPDATE
 February 22, 2021



SITE 2
LEVELS BUSINESS PARK
PM IN 20
PM OUT 149

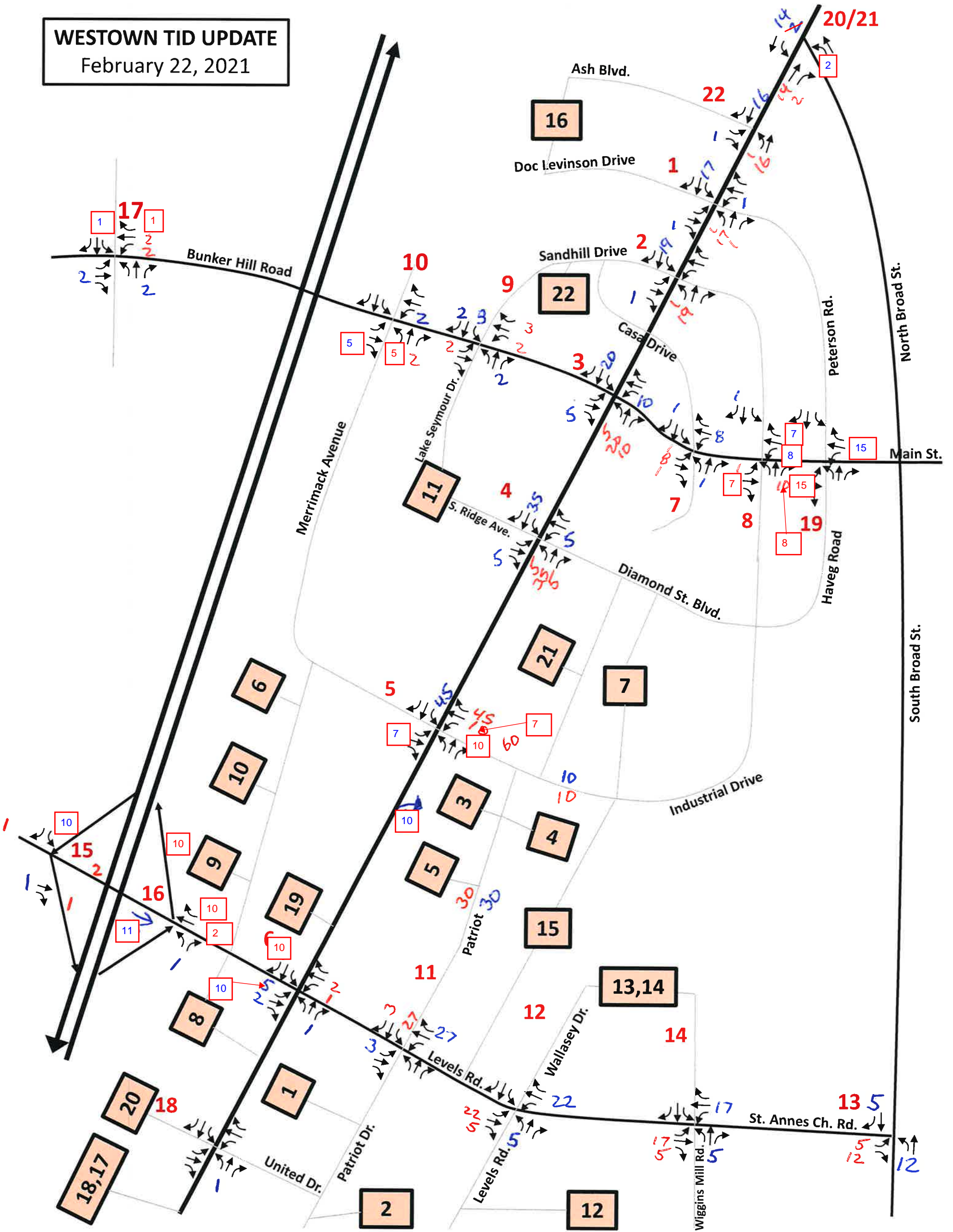
SAME % AS SITE 1

WESTOWN TID UPDATE
February 22, 2021



SITE 3
HARLEY DAVIDSON
PM IN 46
PM OUT 73

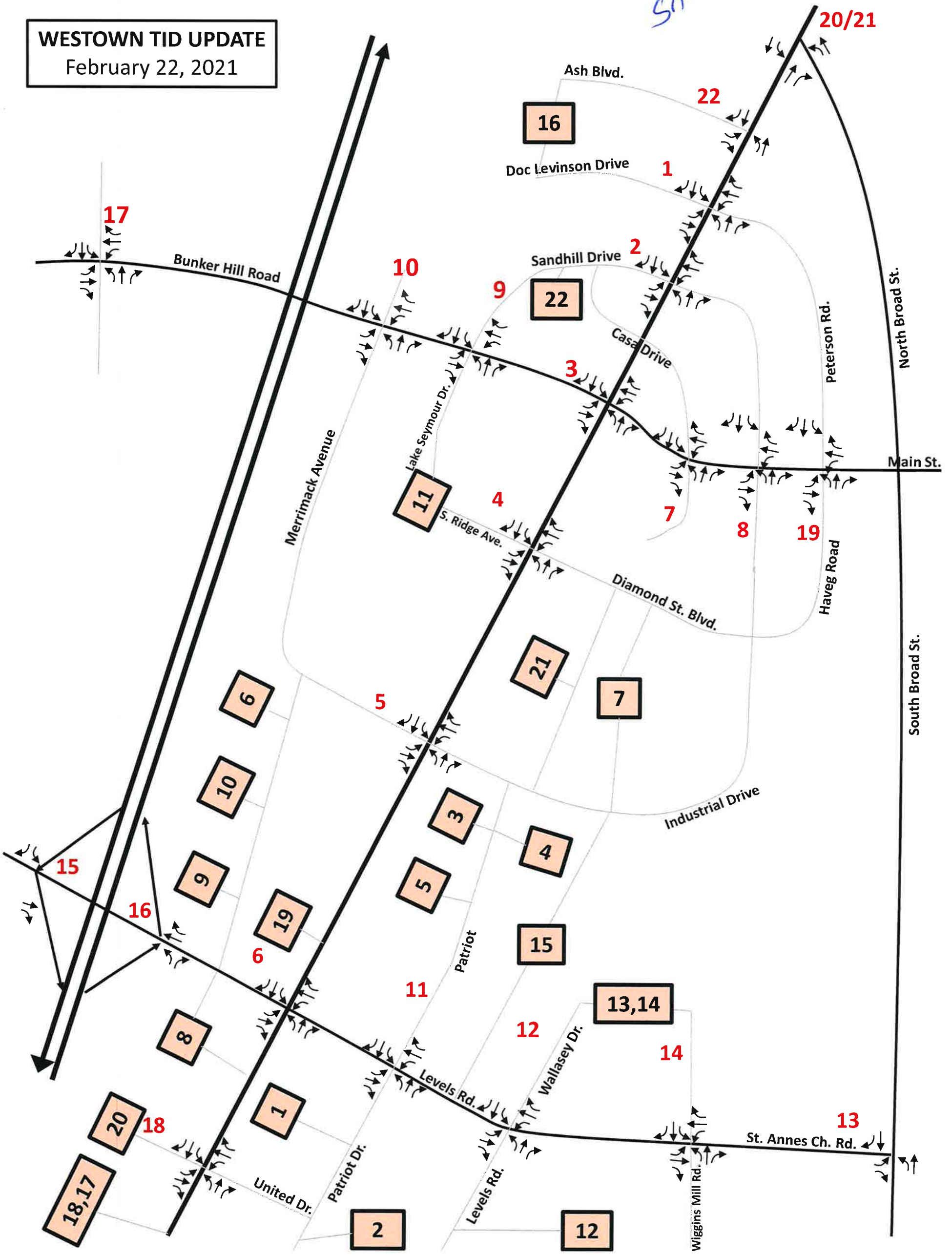
WESTOWN TID UPDATE
February 22, 2021



SITE 4
KOHLE SOUTH CAMPANO
PM IN 48
PM OUT 26

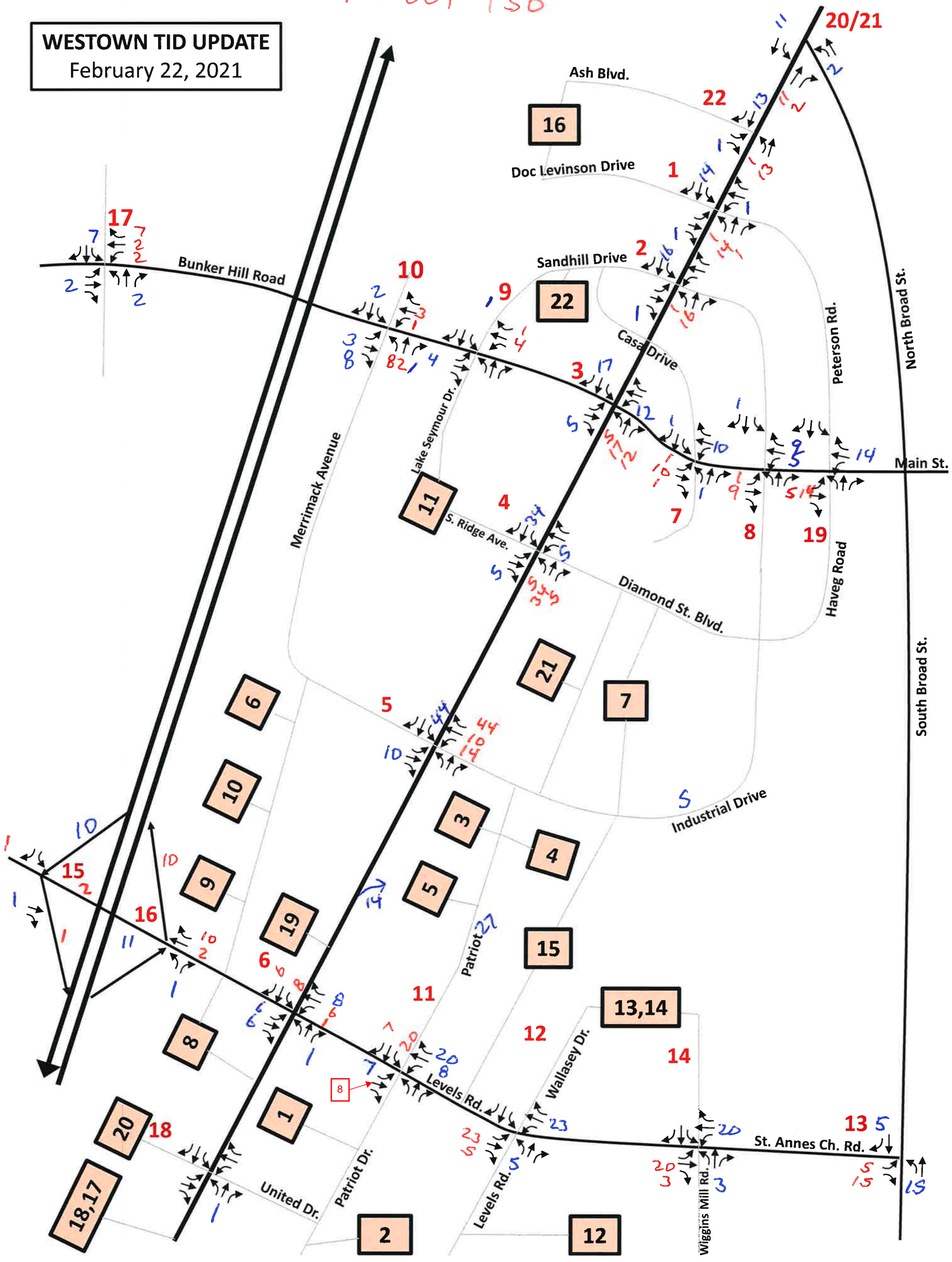
SAME AS SITE 3

WESTOWN TID UPDATE
February 22, 2021



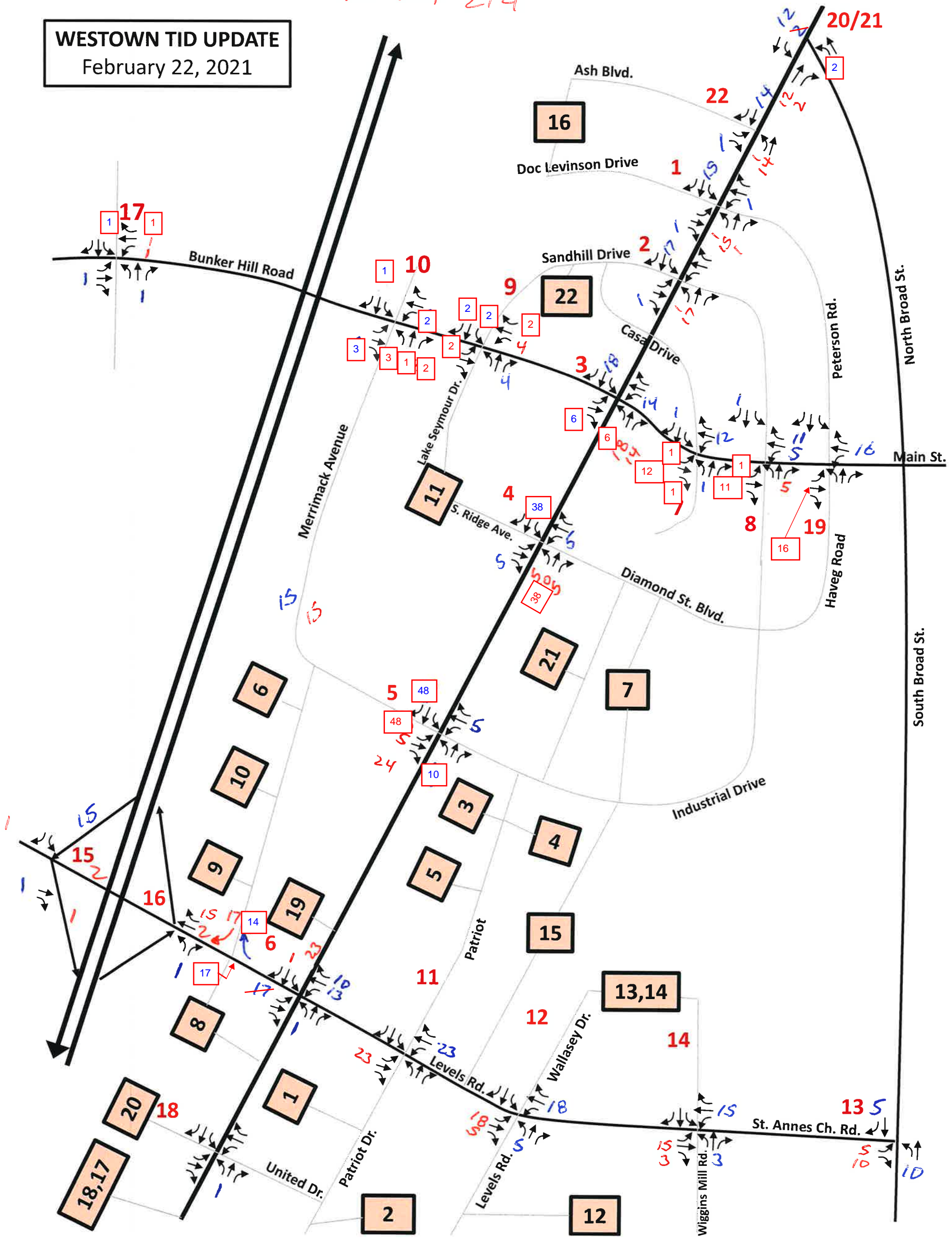
SITE 5
 KOHL SOUTH COMMERCIAL
 PM IN 144
 PM OUT 150

WESTOWN TID UPDATE
 February 22, 2021



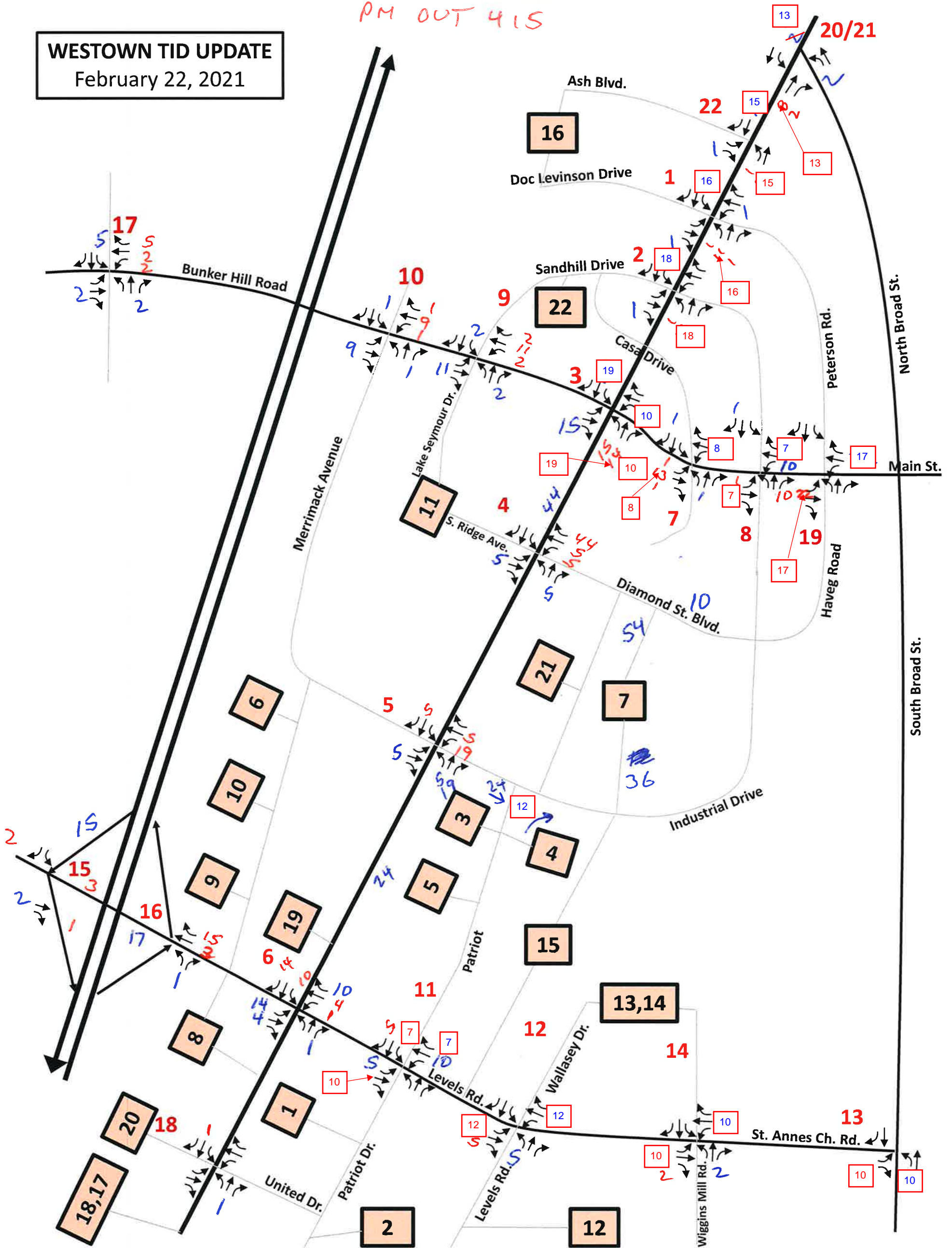
SITE 6
KOHL NORTH EMPLOYMENT
PM IN 206
PM OUT 214

WESTOWN TID UPDATE
February 22, 2021



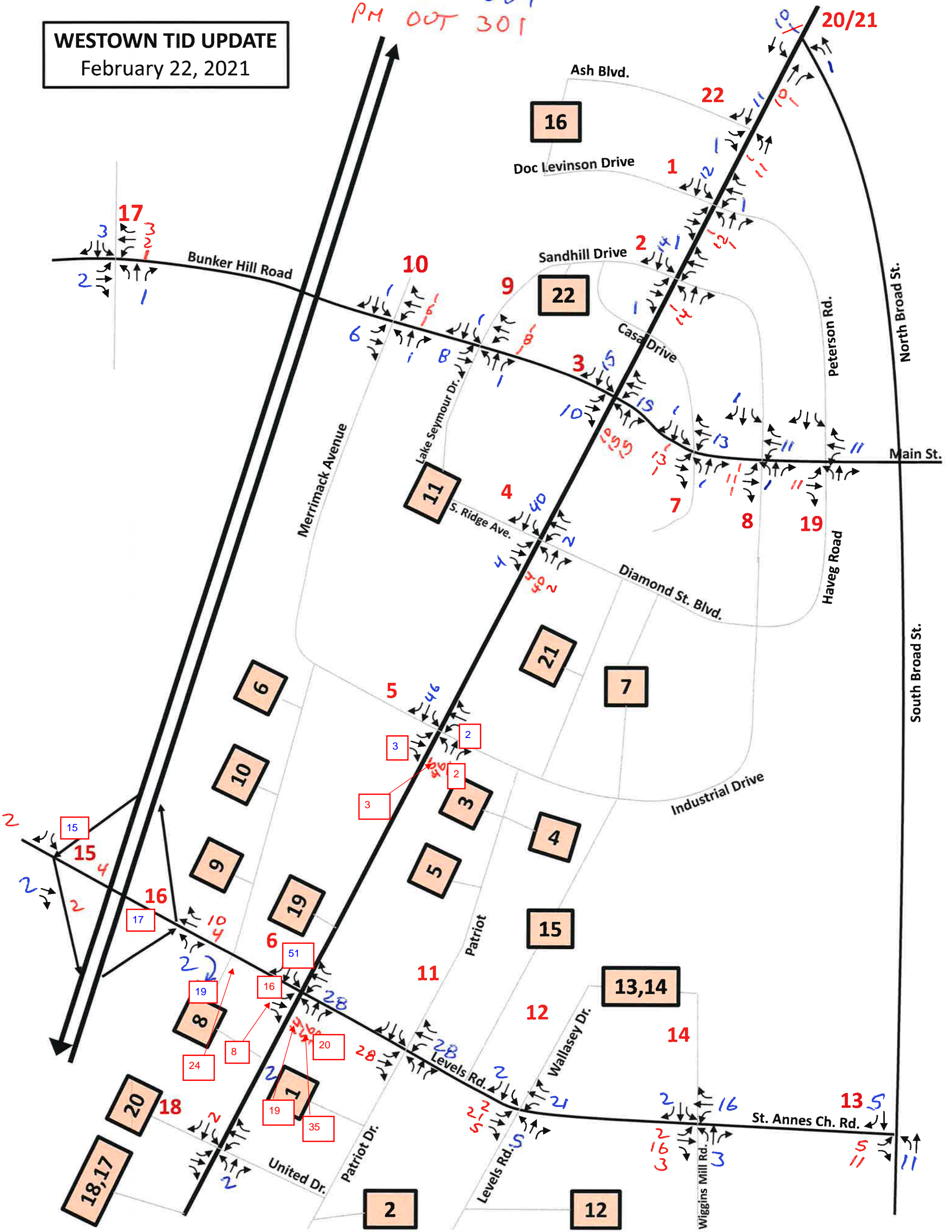
SITE 7
AUTO MALL COMMERCIAL
PM IN 398
PM OUT 415

WESTOWN TID UPDATE
February 22, 2021



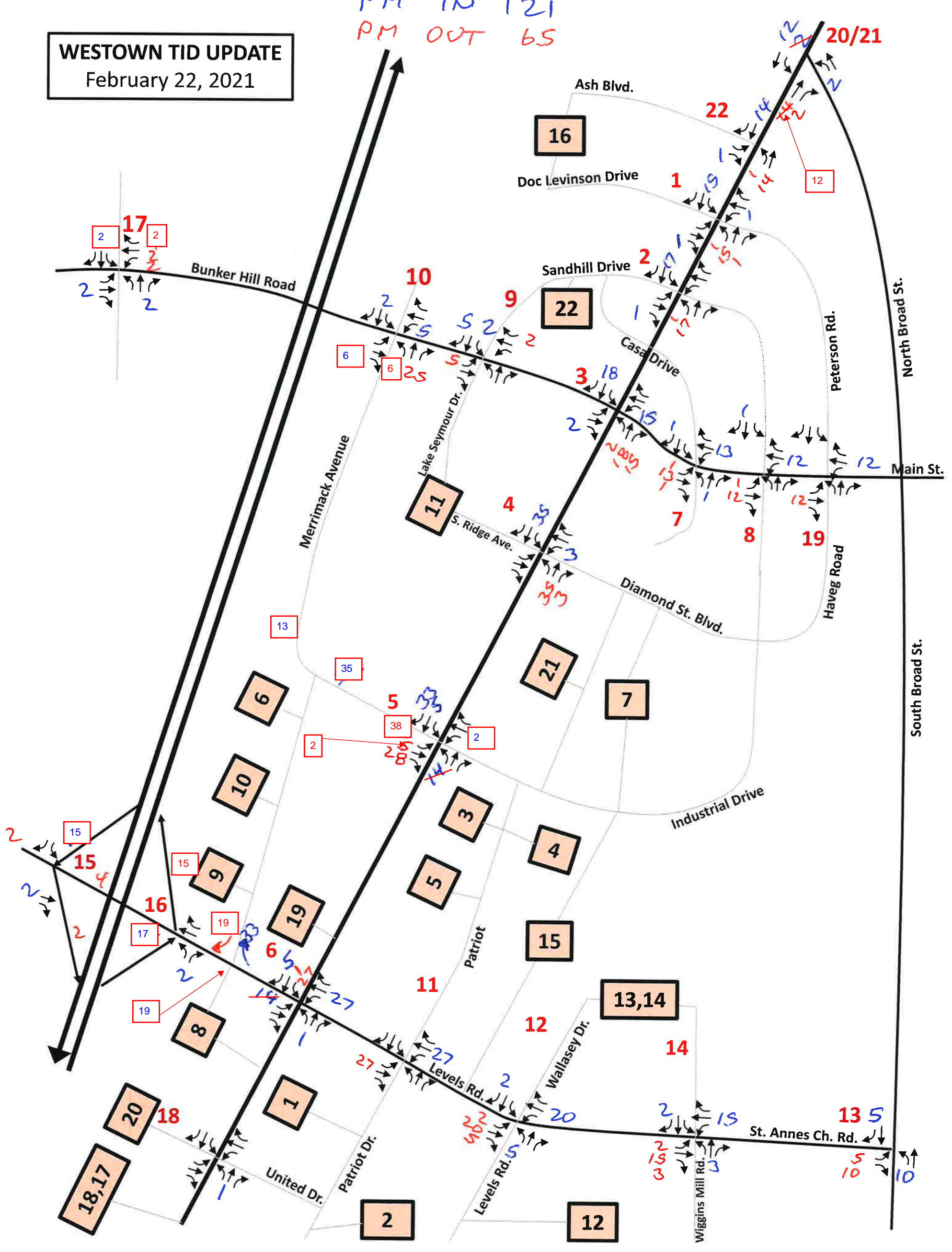
SITE 8
 POOLE-VON CROY NORTH
 COMMERCIAL
 PM IN 289
 PM OUT 301

WESTOWN TID UPDATE
 February 22, 2021



SITE 9
POOLE-VON CROY NORTH
APARTMENTS
PM IN 121
PM OUT 65

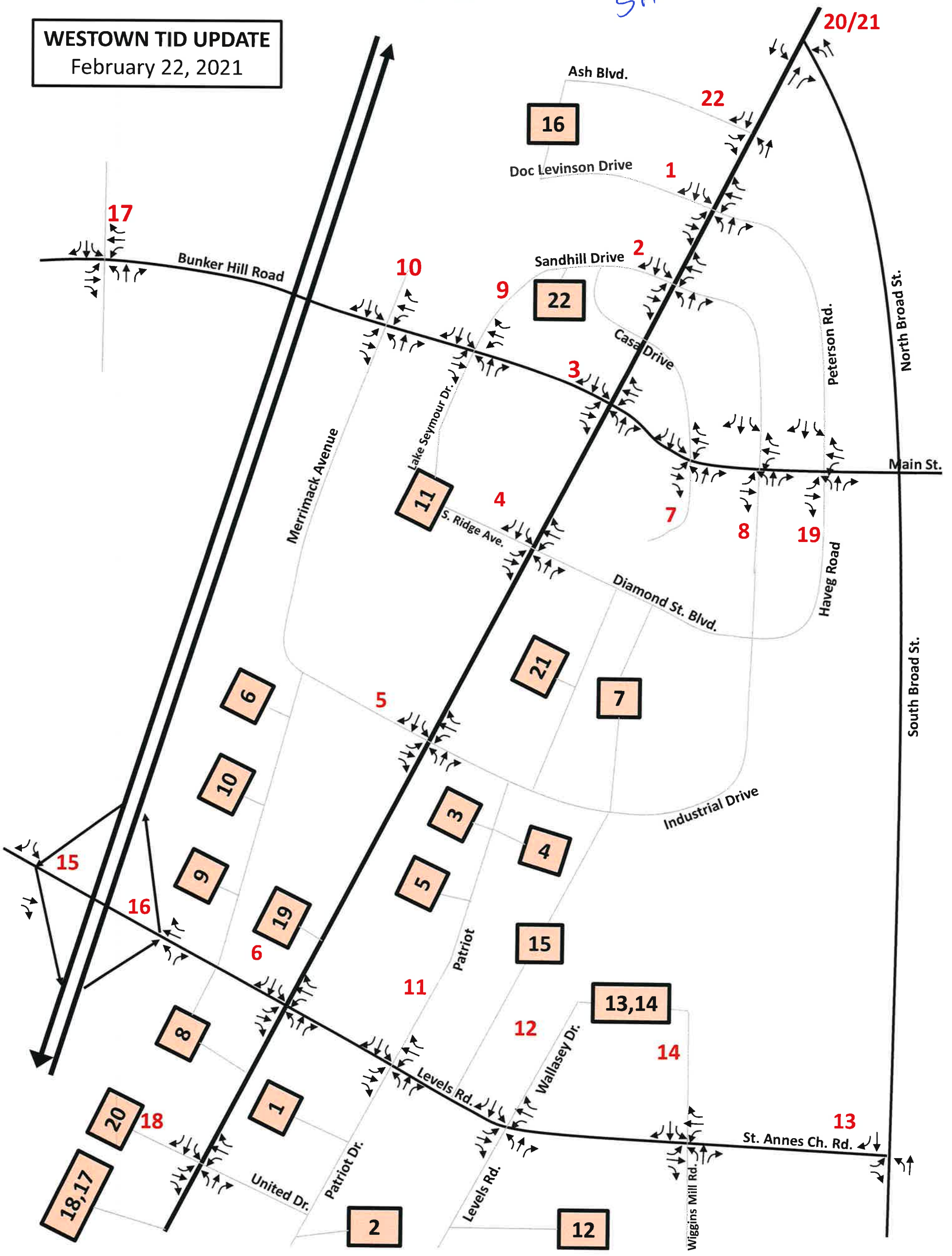
WESTOWN TID UPDATE
February 22, 2021



SITE 10
301 SRV AGE RESTRICTED
PM IN 20
PM OUT 11

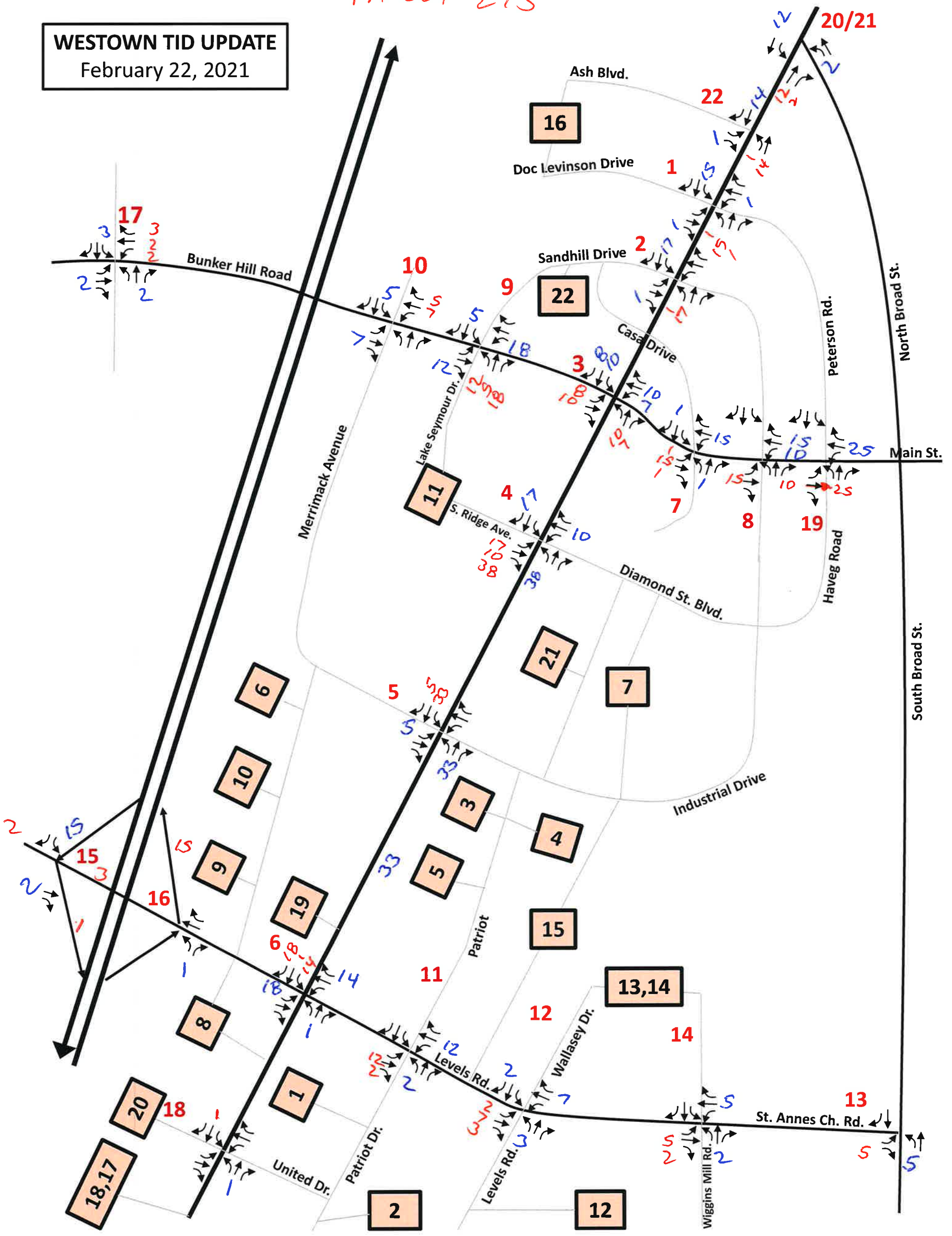
SAME AS #9

WESTOWN TID UPDATE
February 22, 2021



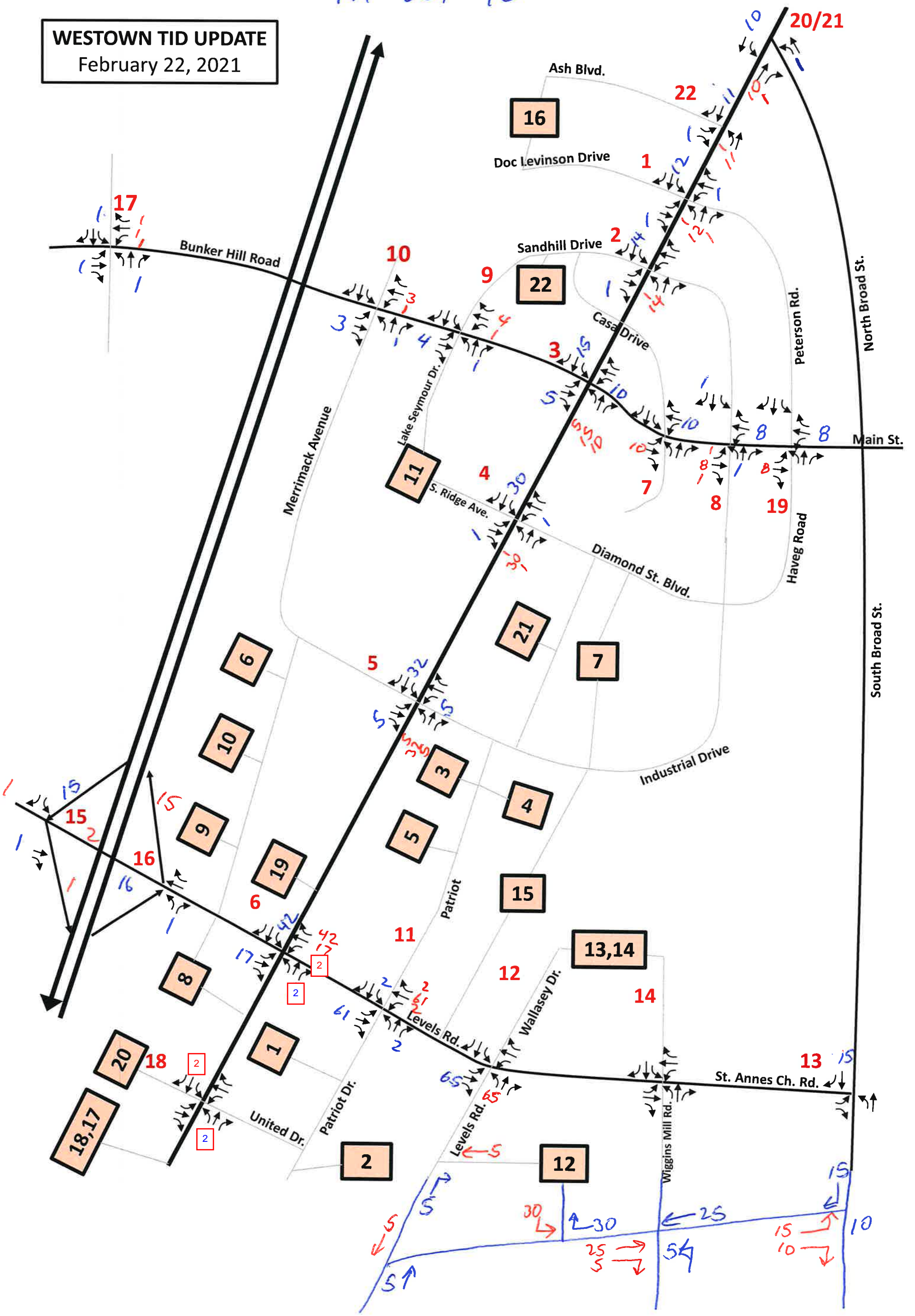
SITE 11
301 SRV COMMERCIAL
PM IN 263
PM OUT 273

WESTOWN TID UPDATE
February 22, 2021



SITE 12
 ST ANNES RESIDENTIAL
 PM IN 18
 PM OUT 10

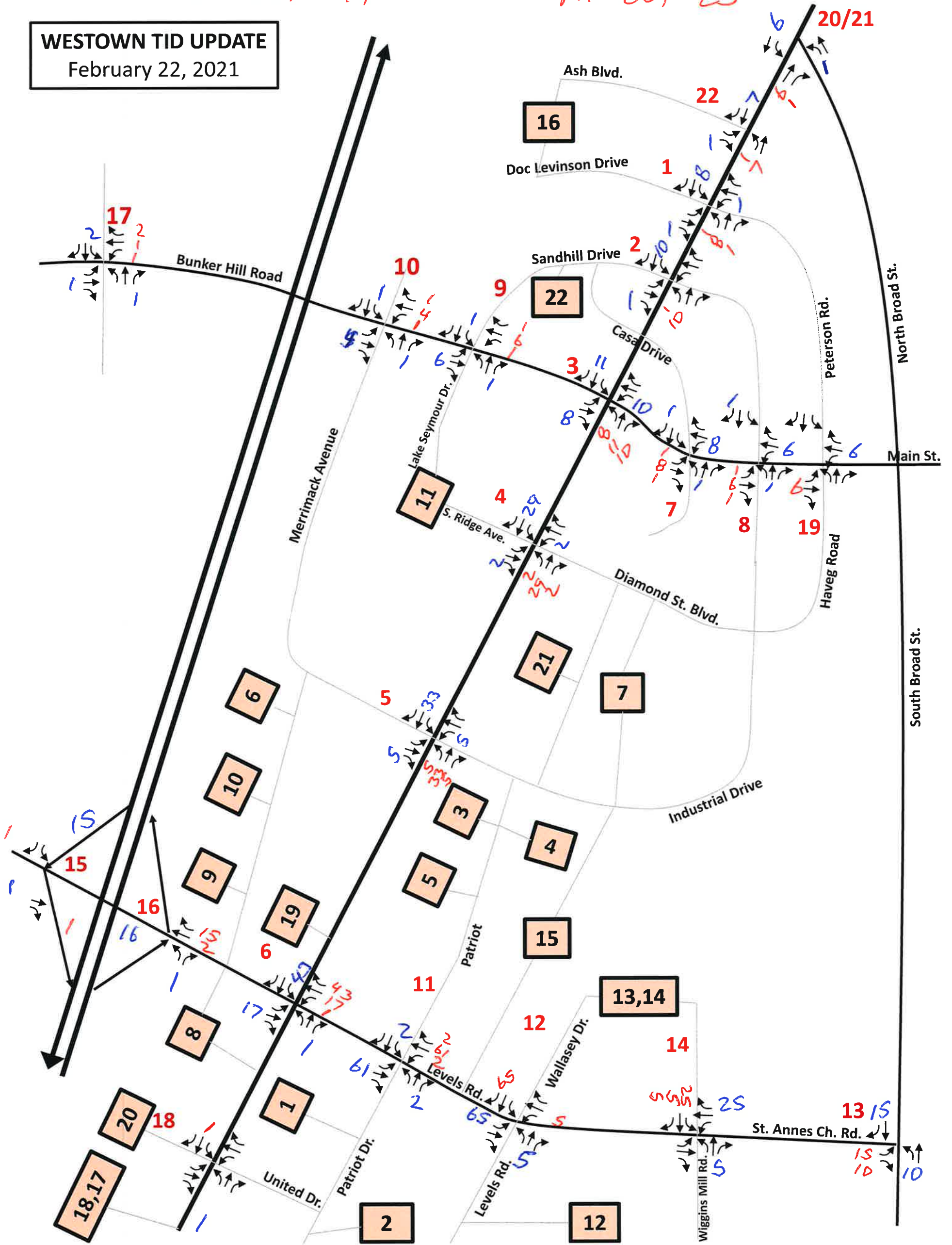
WESTOWN TID UPDATE
 February 22, 2021



SITE 13
THE PRESERVE SF DU
PM IN 160
PM OUT 94

SITE 14
THE PRESERVE - MF DU
PM IN 44
PM OUT 23

WESTOWN TID UPDATE
February 22, 2021

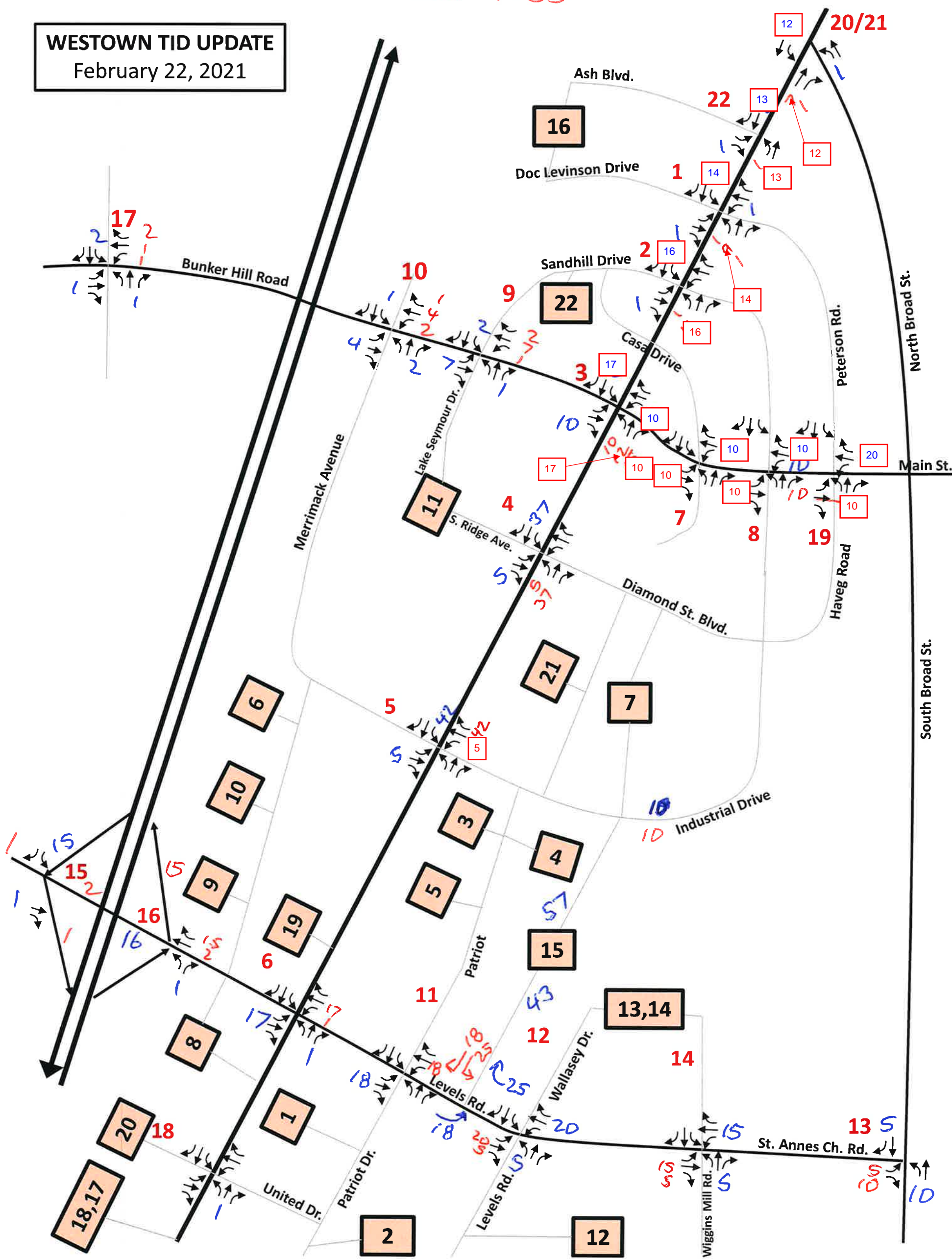


SITE 15 ROCKS + READING INDUSTRIAL

PM IN 319

PM OUT 1133

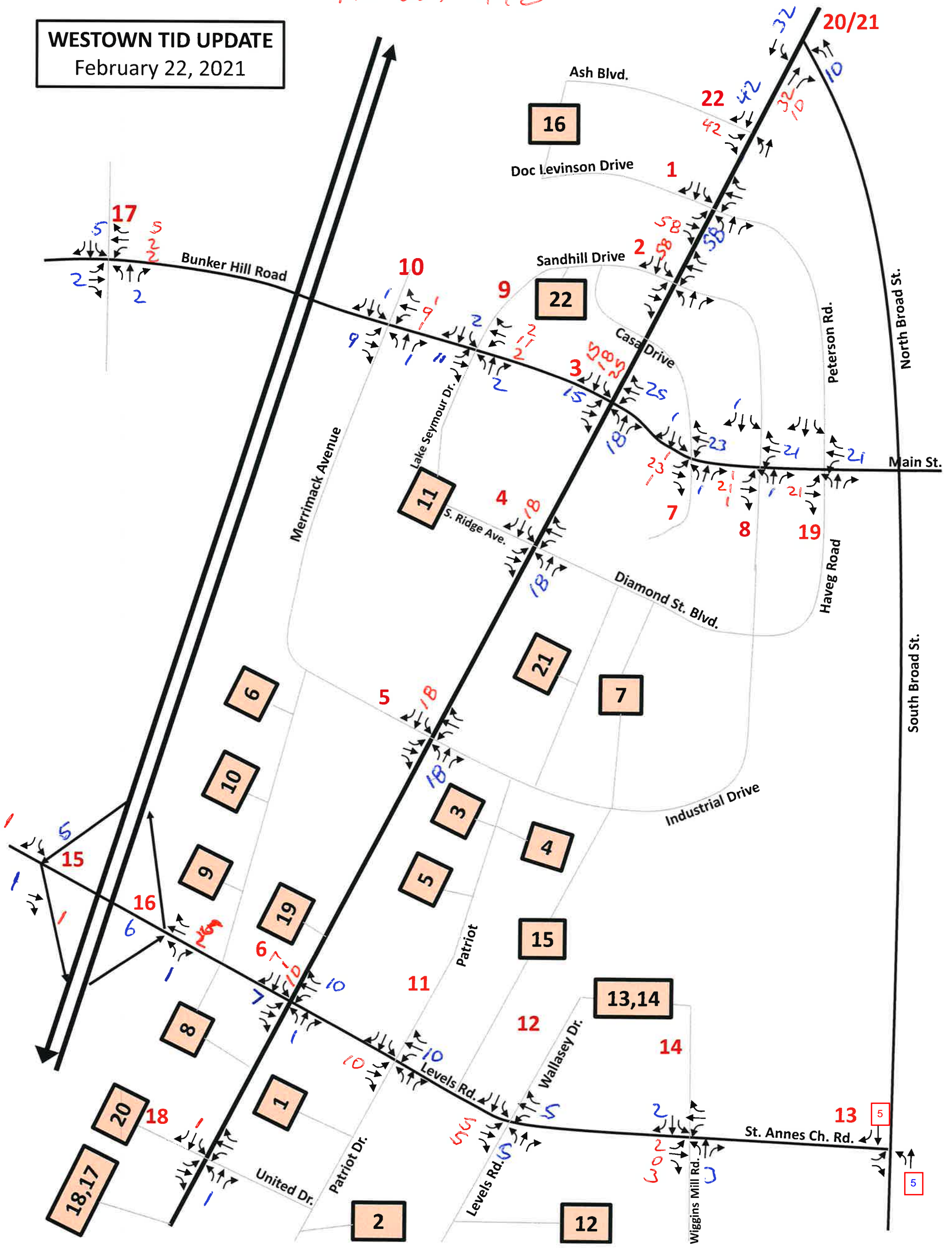
WESTOWN TID UPDATE
February 22, 2021



SITE 16
MIDDLETOWN VILLAGE
PM IN 475
PM OUT 492

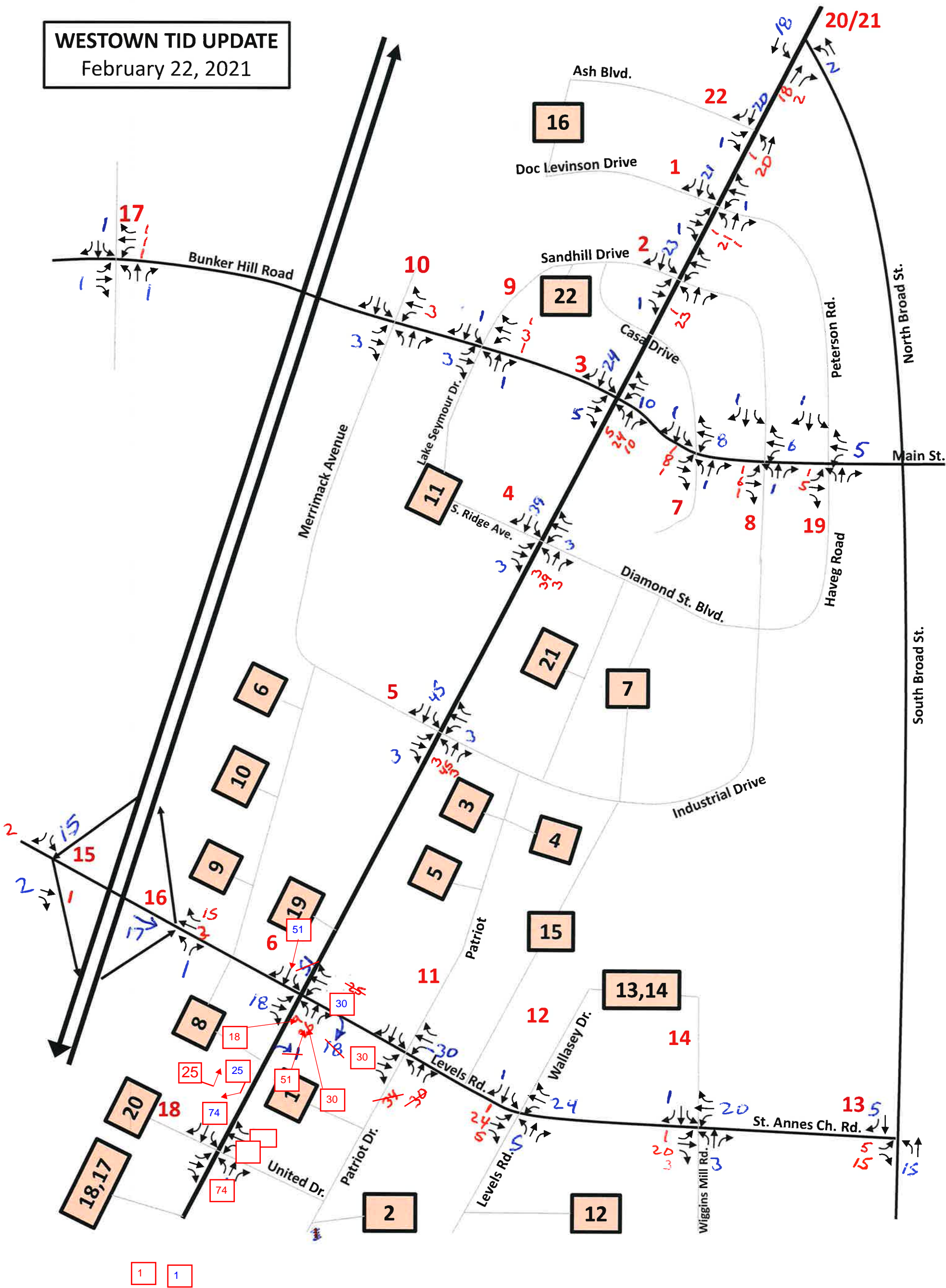
COMMERCIAL
+
20 PUMP CONV.

WESTOWN TID UPDATE
February 22, 2021



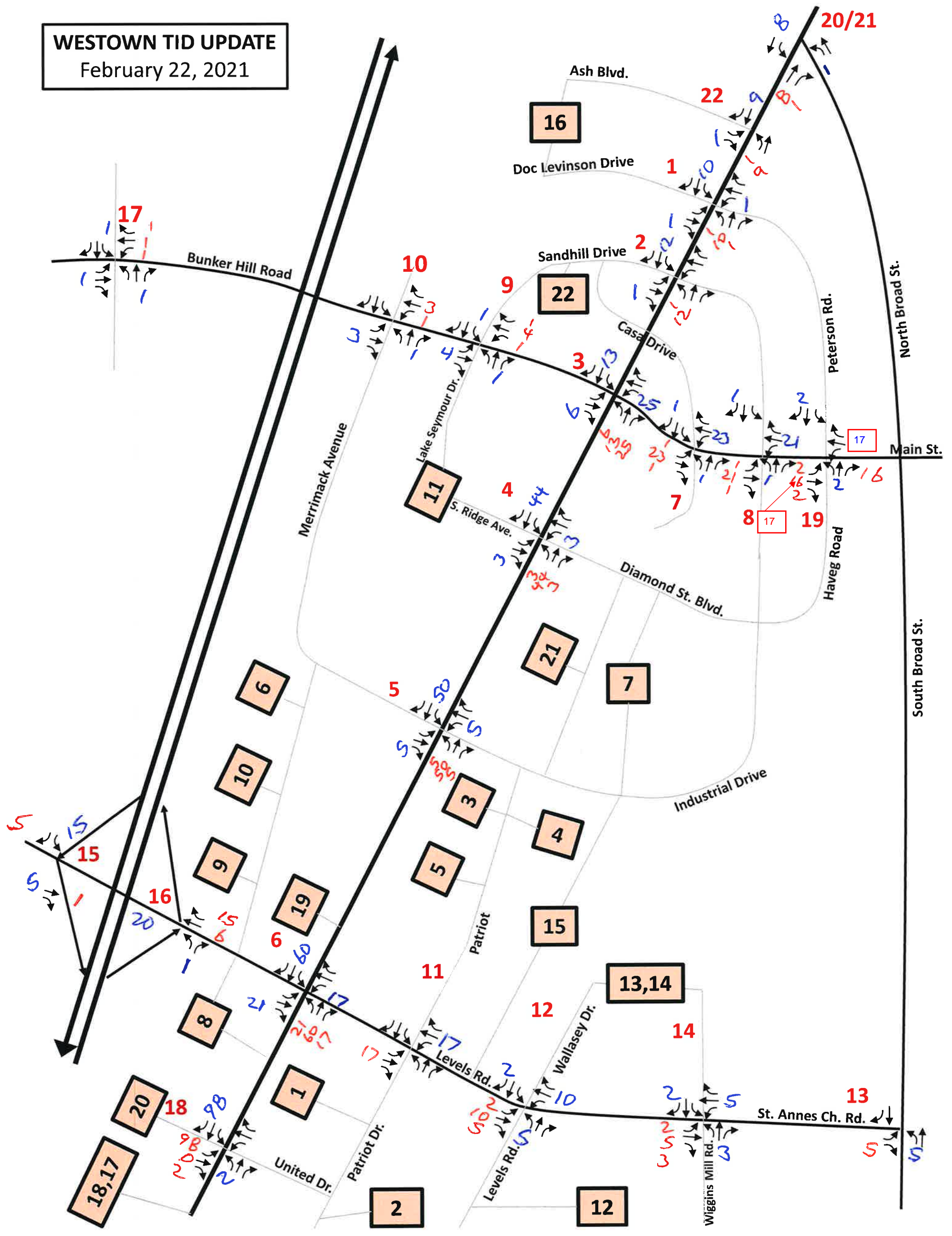
SITE 17
Money Farm Commercial

WESTOWN TID UPDATE
February 22, 2021



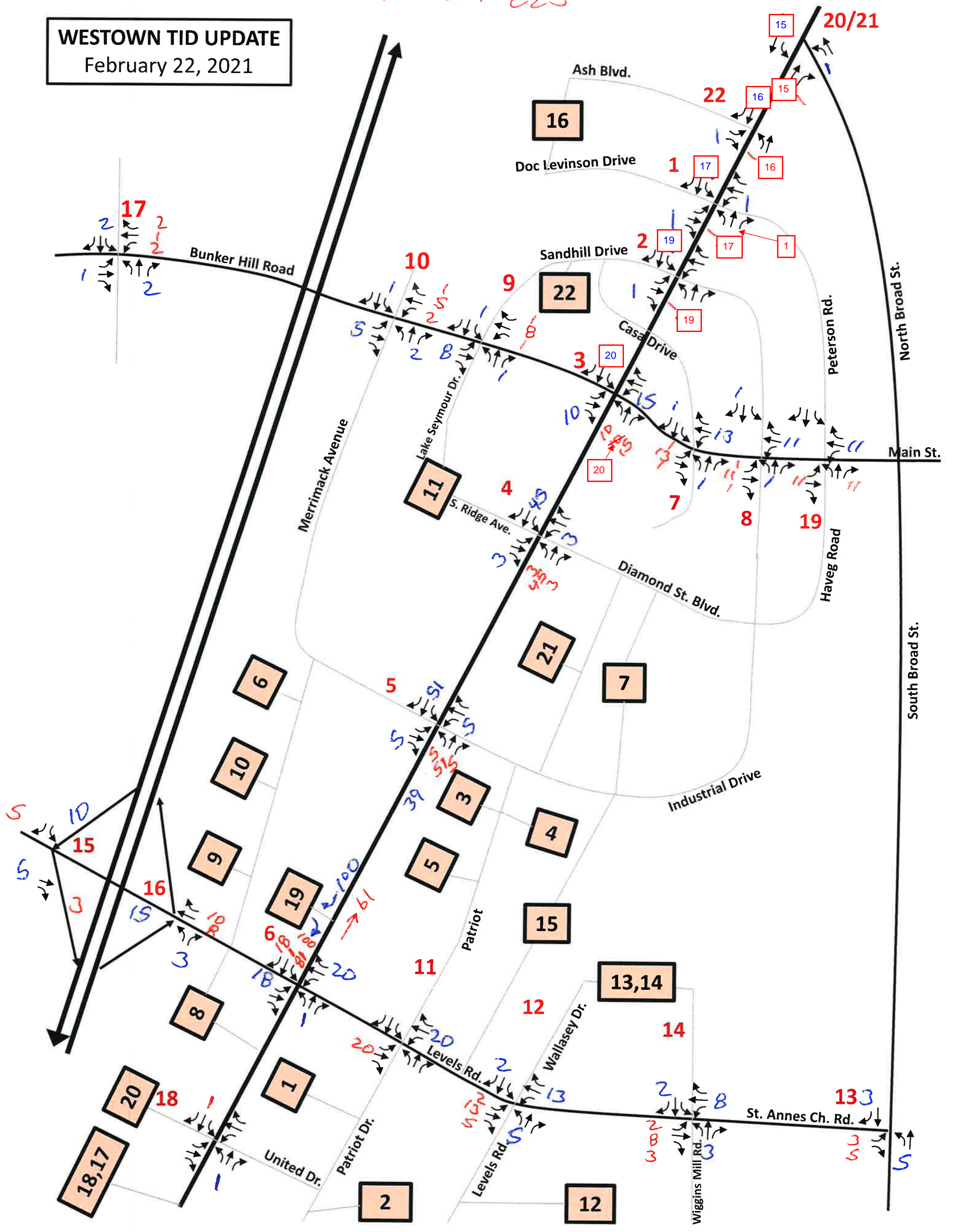
SITE 18
WATCH MAKING
PM IN 52
PM OUT 37

WESTOWN TID UPDATE
February 22, 2021



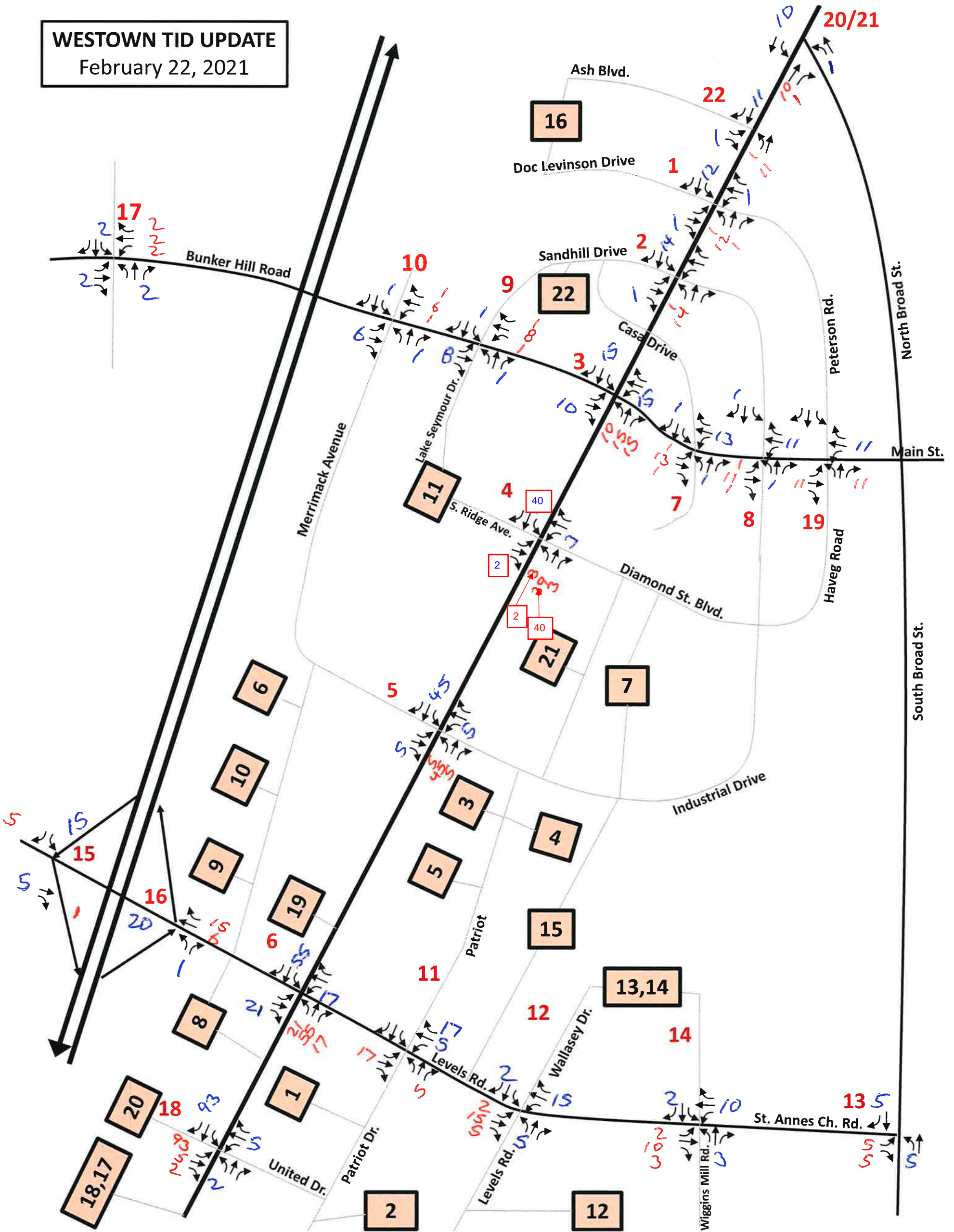
SITE 19
RUTOSKE
PM IN 214
PM OUT 223

WESTOWN TID UPDATE
February 22, 2021



SITE 20
U S 301 TRUCK STOP
PM IN 182
PM OUT 189

WESTOWN TID UPDATE
February 22, 2021

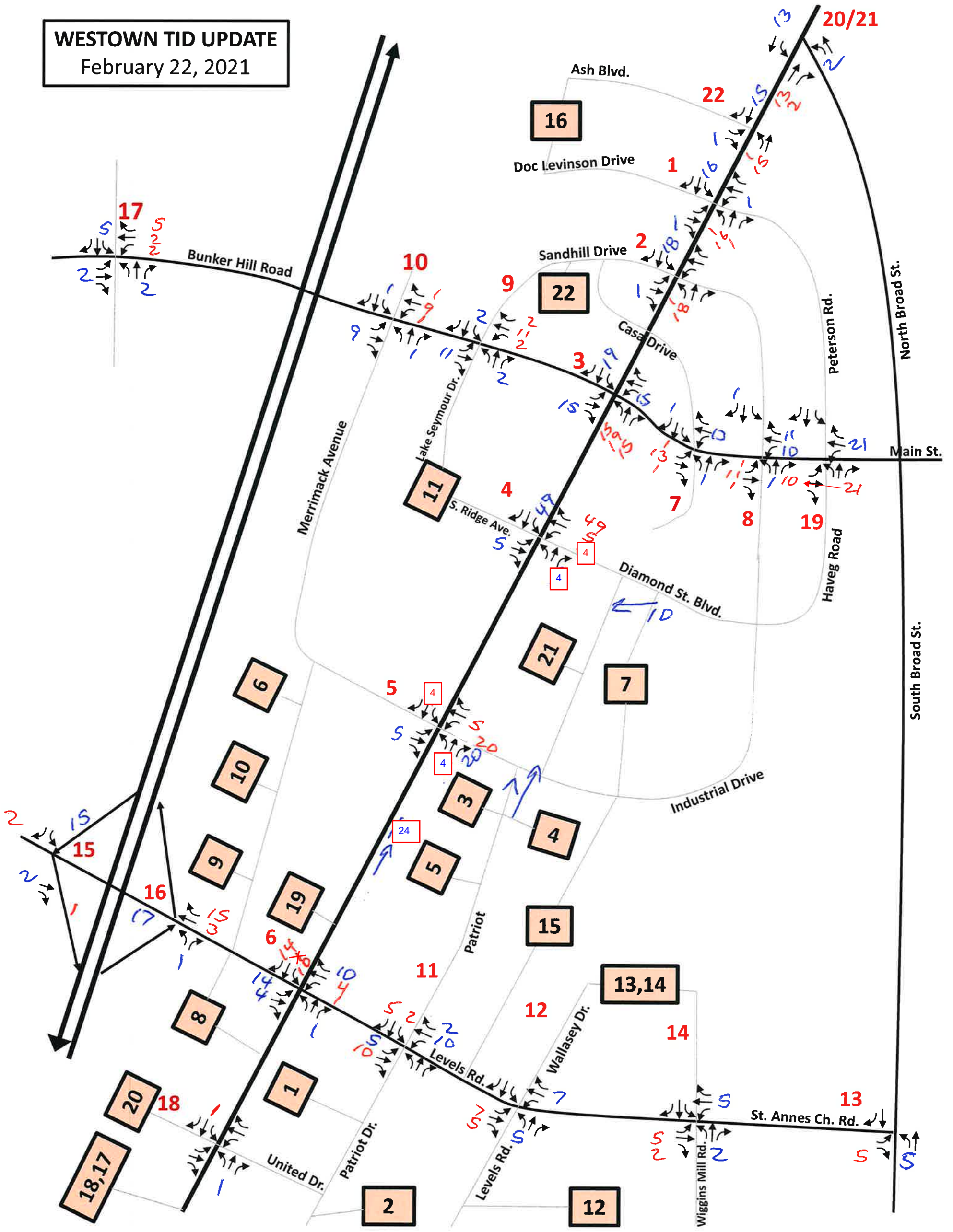


SITE 21 COCHRAN EMPLOYMENT CENTER

PM IN 327

PM OUT 341

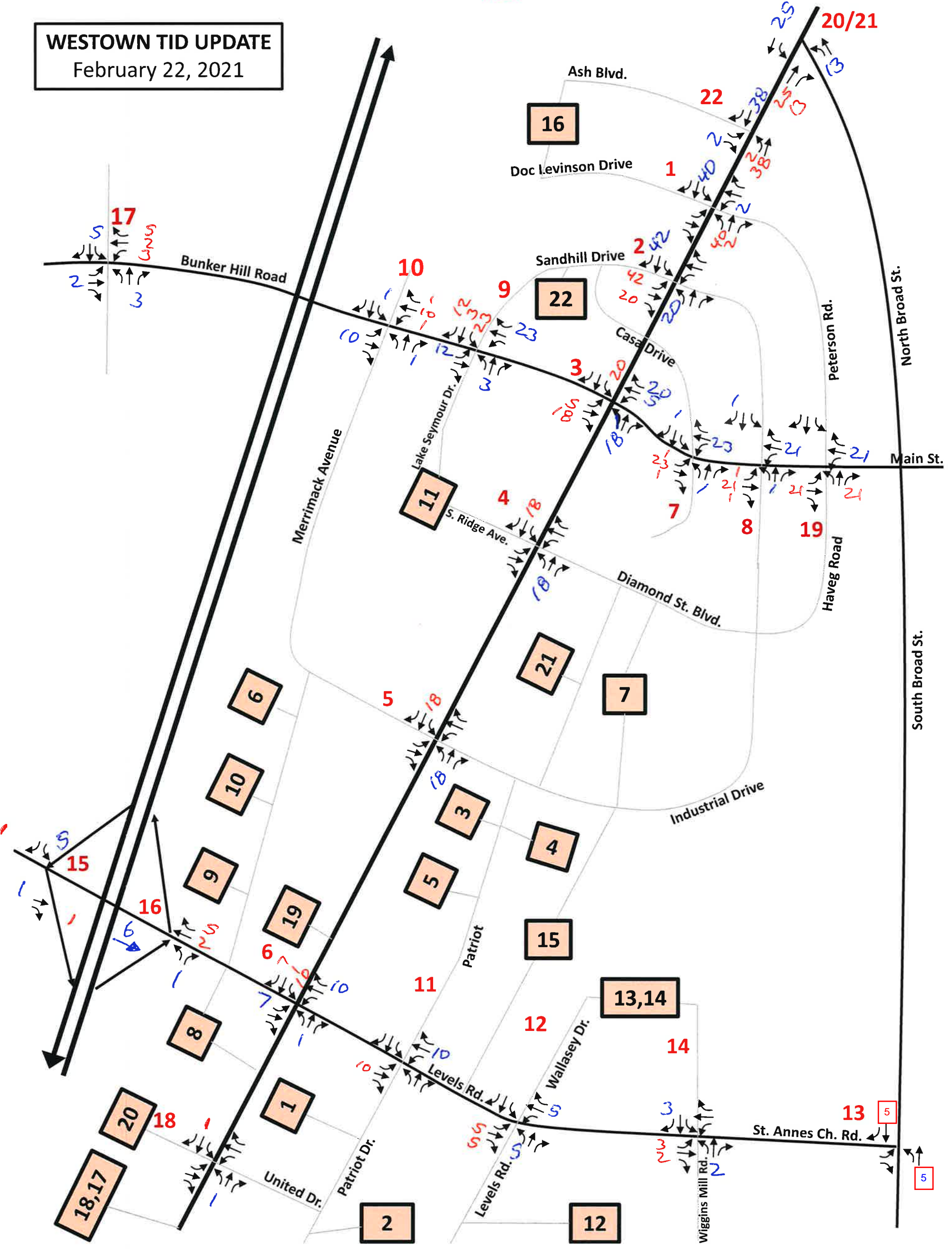
WESTOWN TID UPDATE
February 22, 2021



SITE 22
BUNKER HILL CENTER

PM IN 70
PM OUT 73

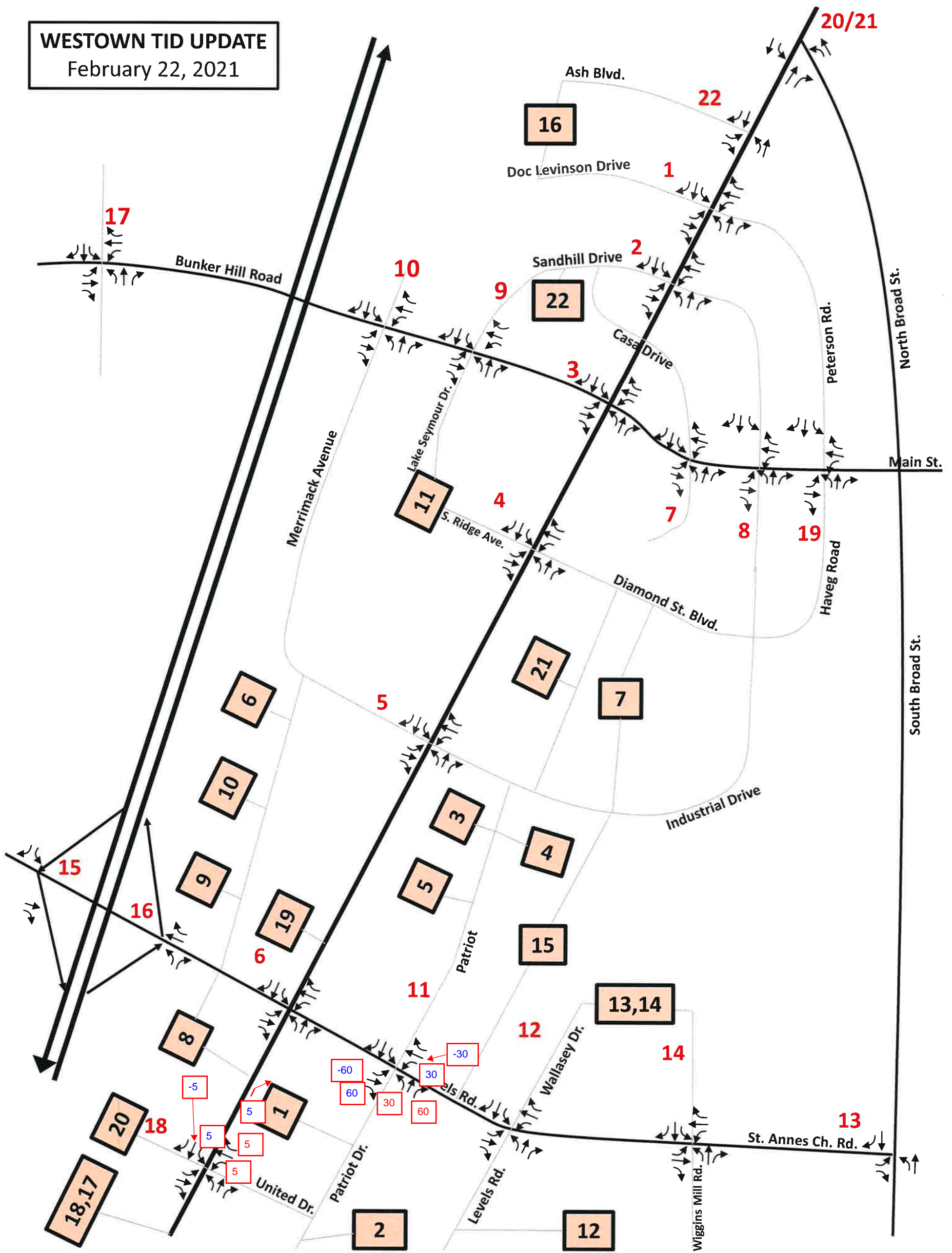
WESTOWN TID UPDATE
February 22, 2021



Trip Distribution:
Passby Trips

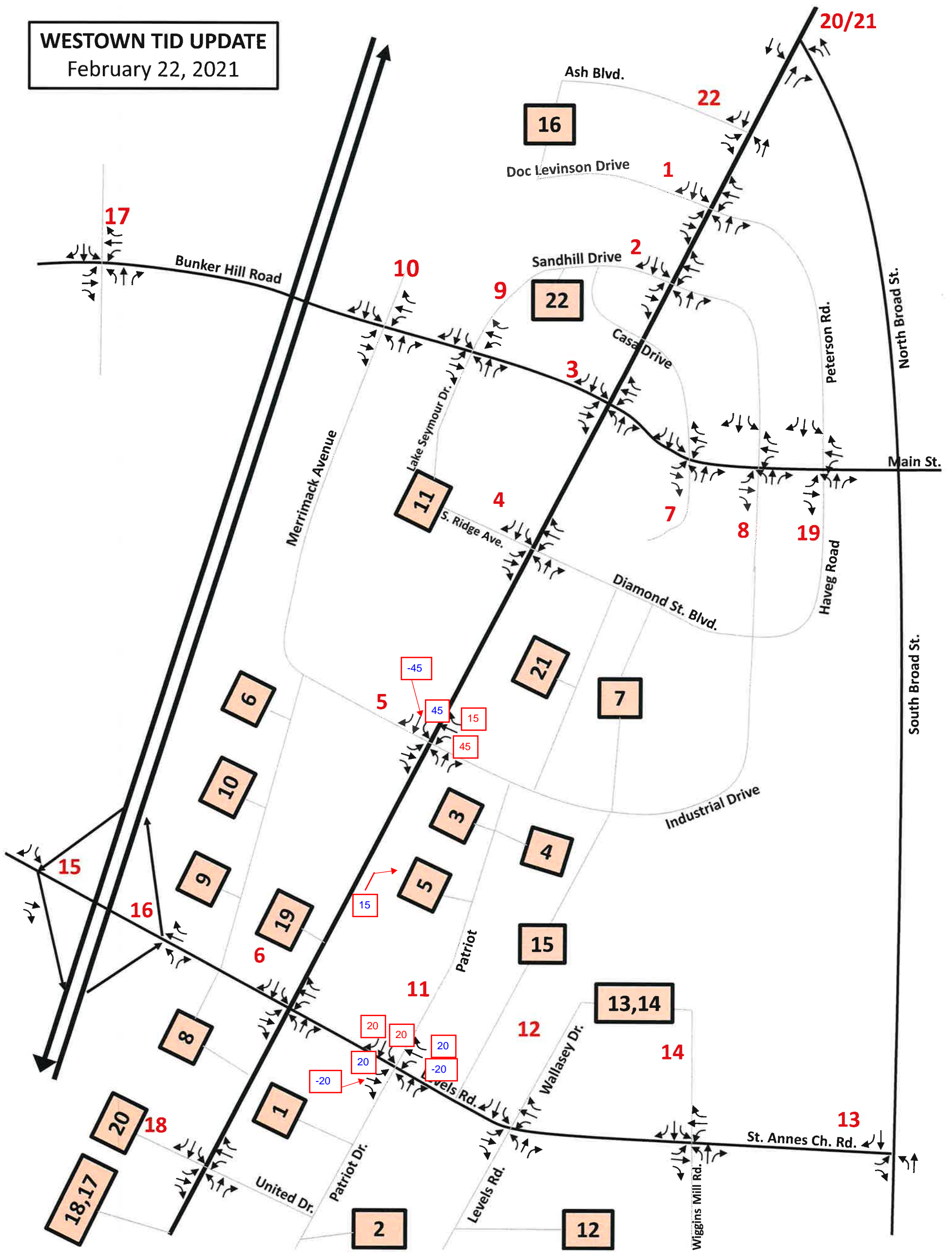
SITE 1
Levels Business Park Passby

WESTOWN TID UPDATE
February 22, 2021



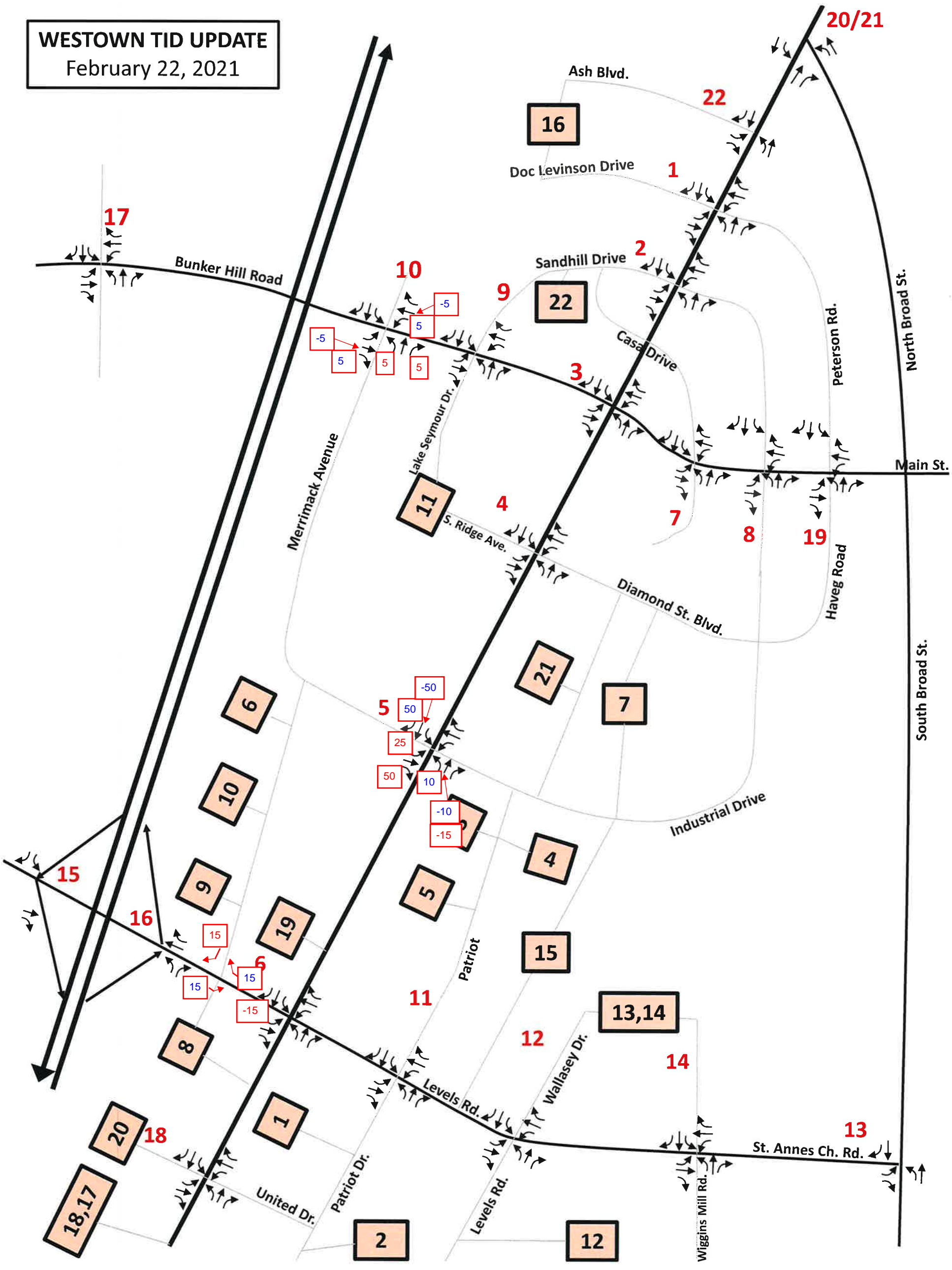
SITE 5
Kohl South Commercial Passby

WESTOWN TID UPDATE
February 22, 2021



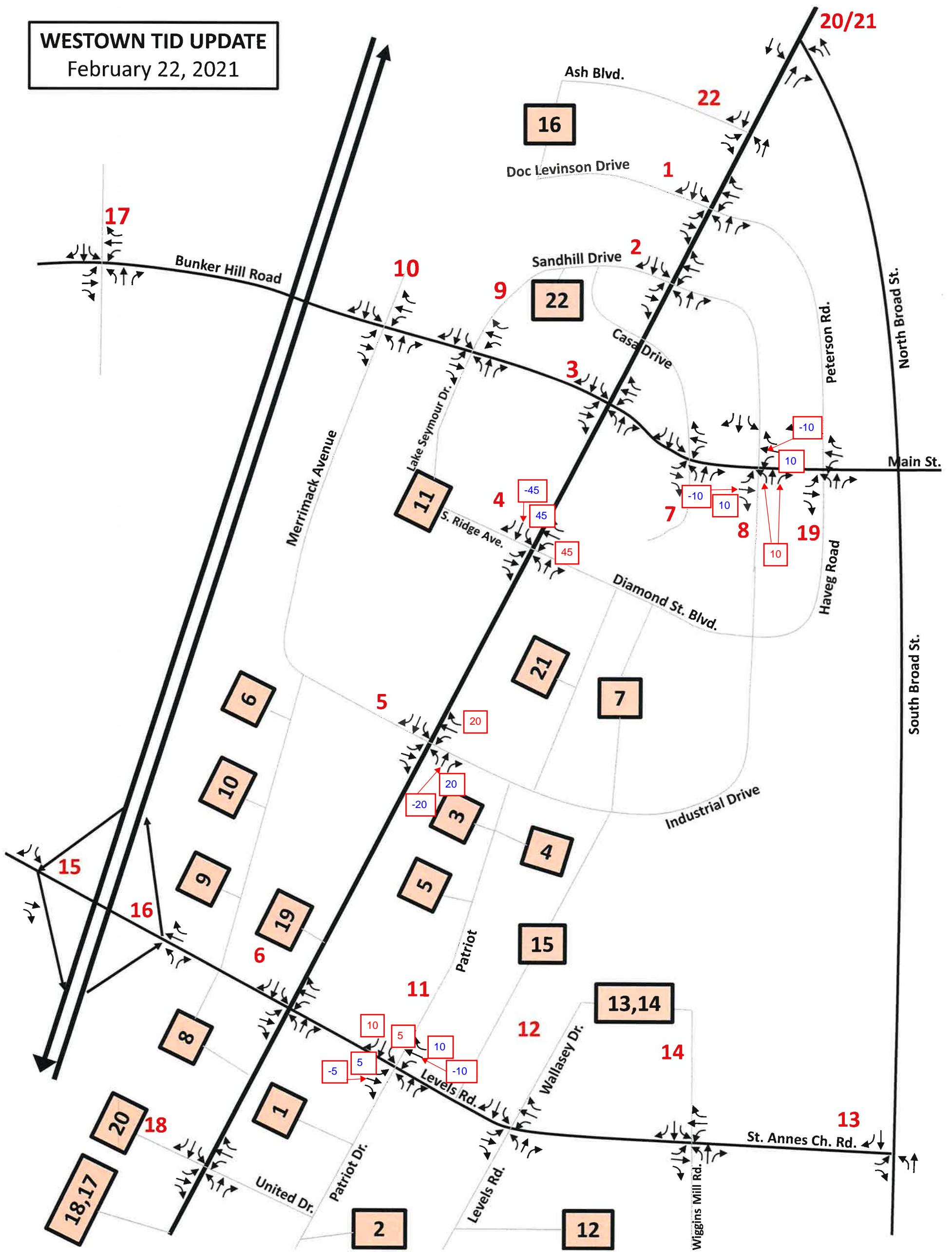
SITE 6
Kohl North Employment Passby

WESTOWN TID UPDATE
February 22, 2021



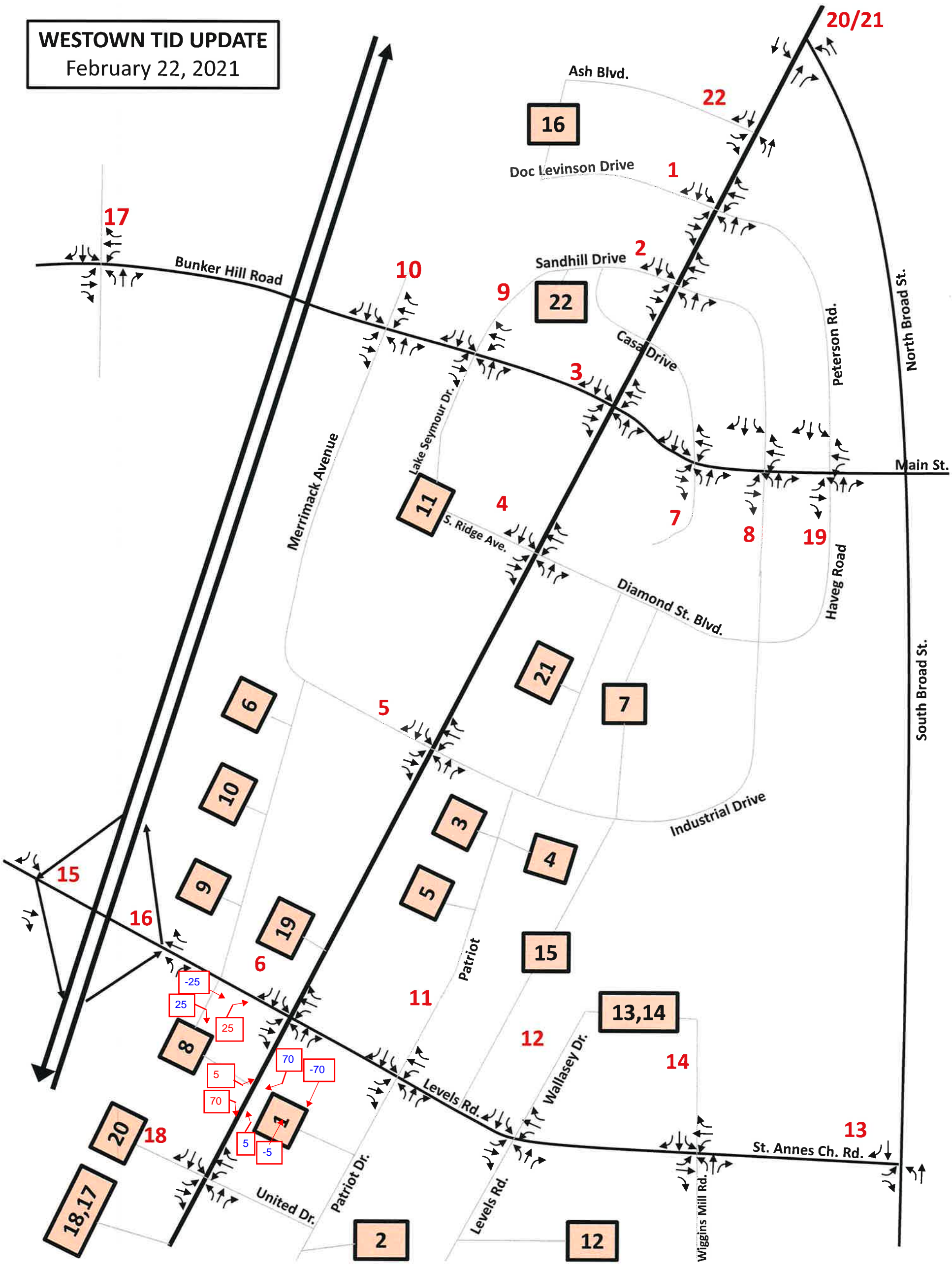
SITE 7
Auto Mall Commercial

WESTOWN TID UPDATE
February 22, 2021



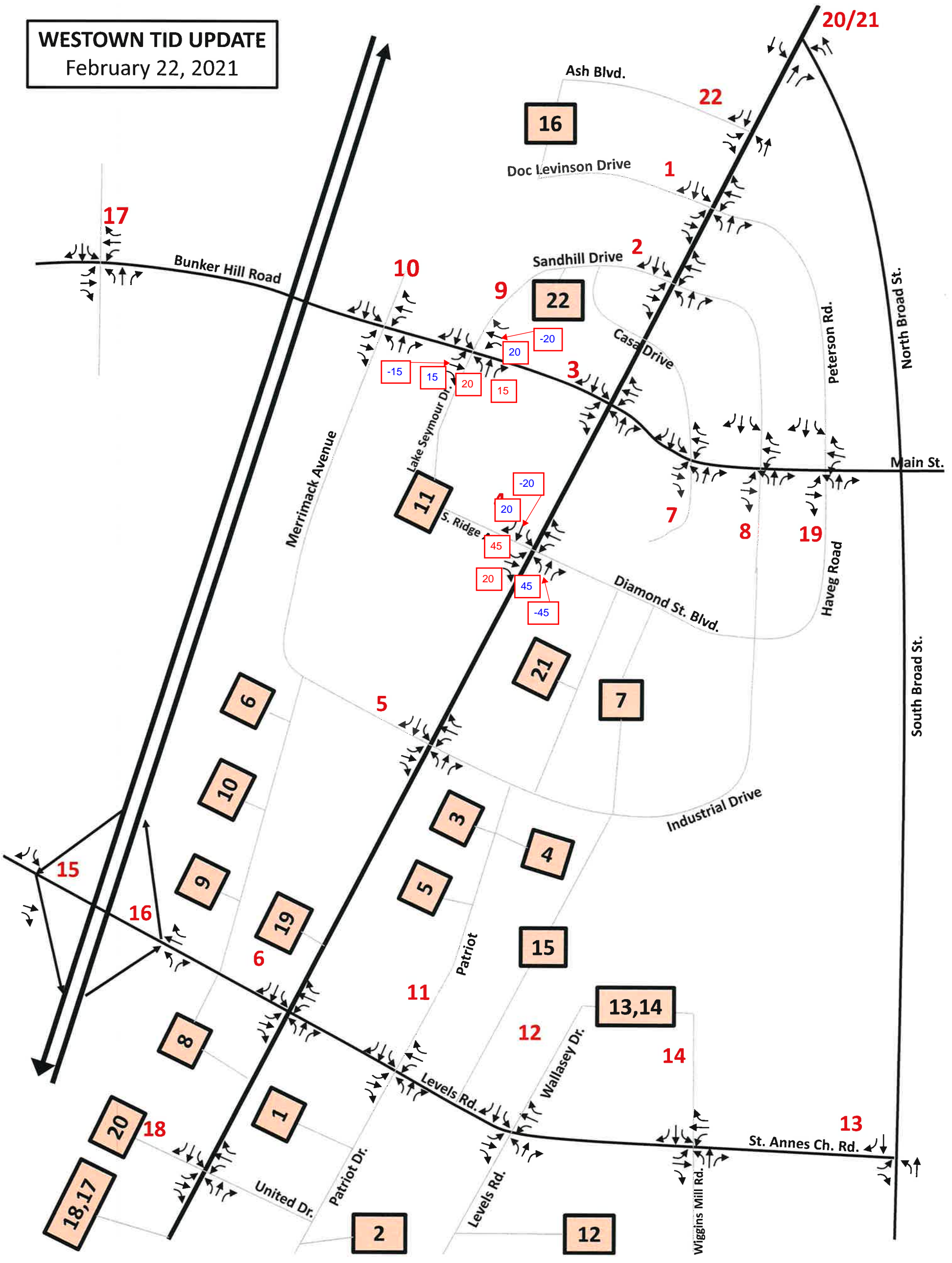
SITE 8
Pooler VonCroy North

WESTOWN TID UPDATE
February 22, 2021



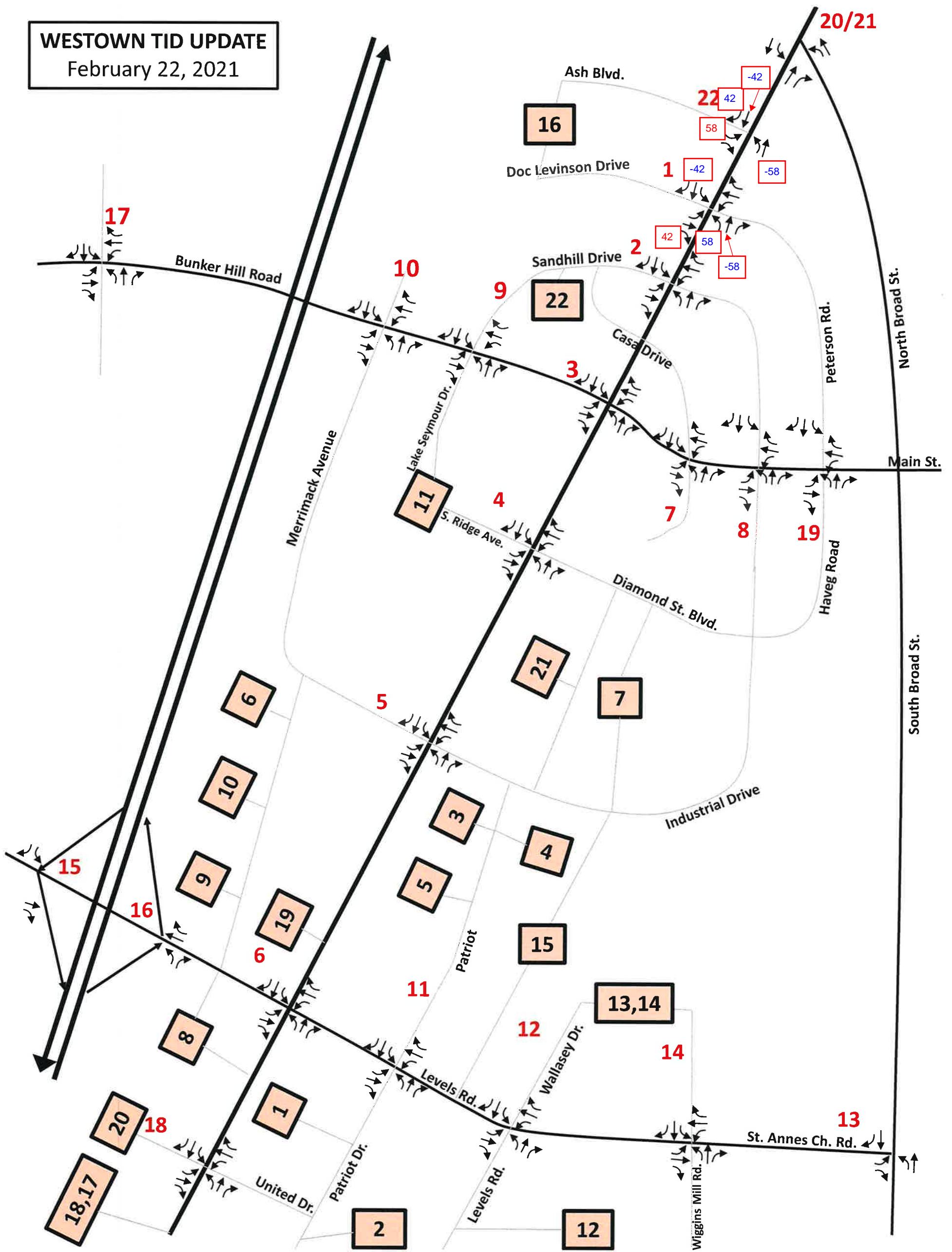
SITE 11
301 SRV Commercial

WESTOWN TID UPDATE
February 22, 2021



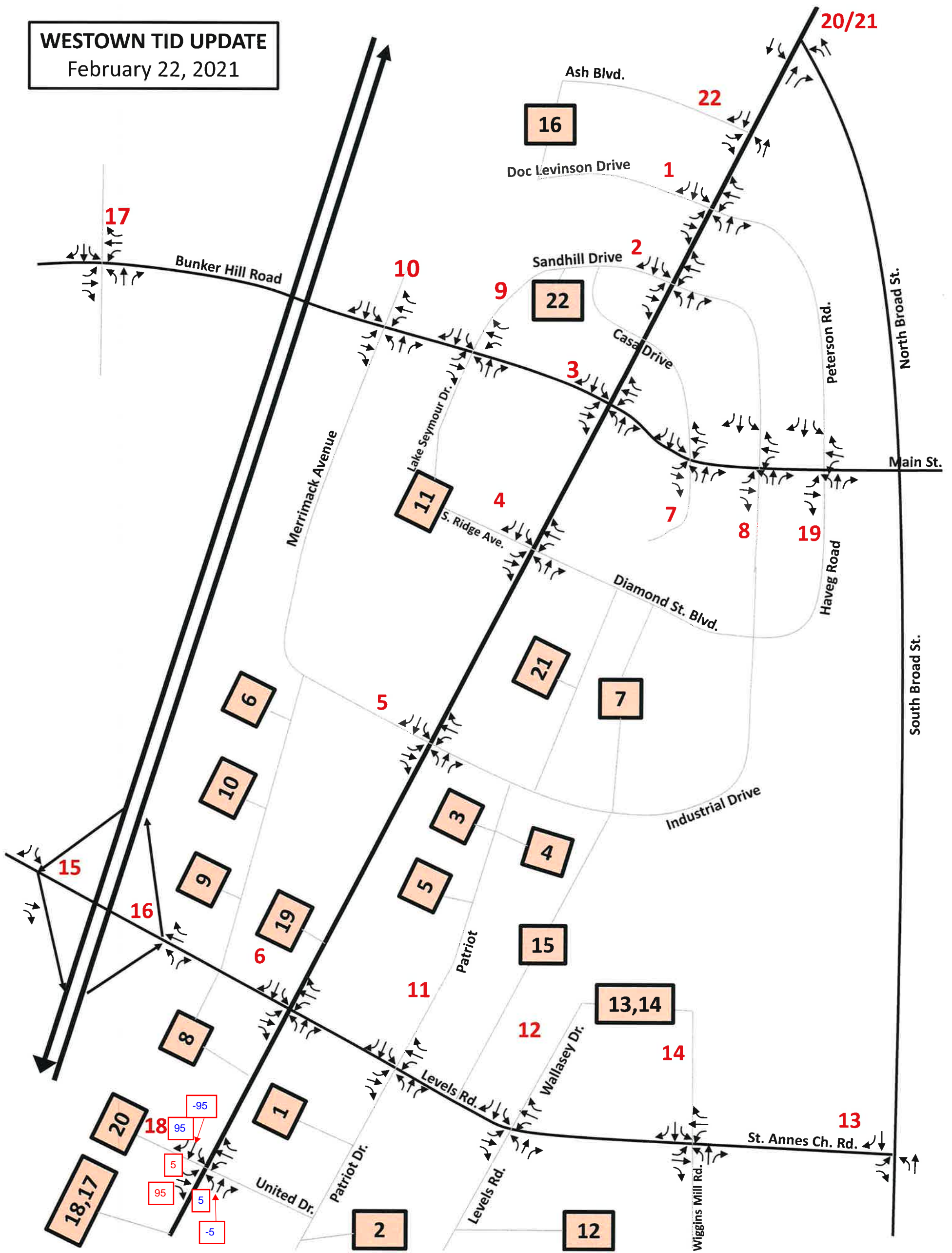
SITE 16
Middletown Village Passby

WESTOWN TID UPDATE
February 22, 2021



SITE 20
US 301 Truck Stop

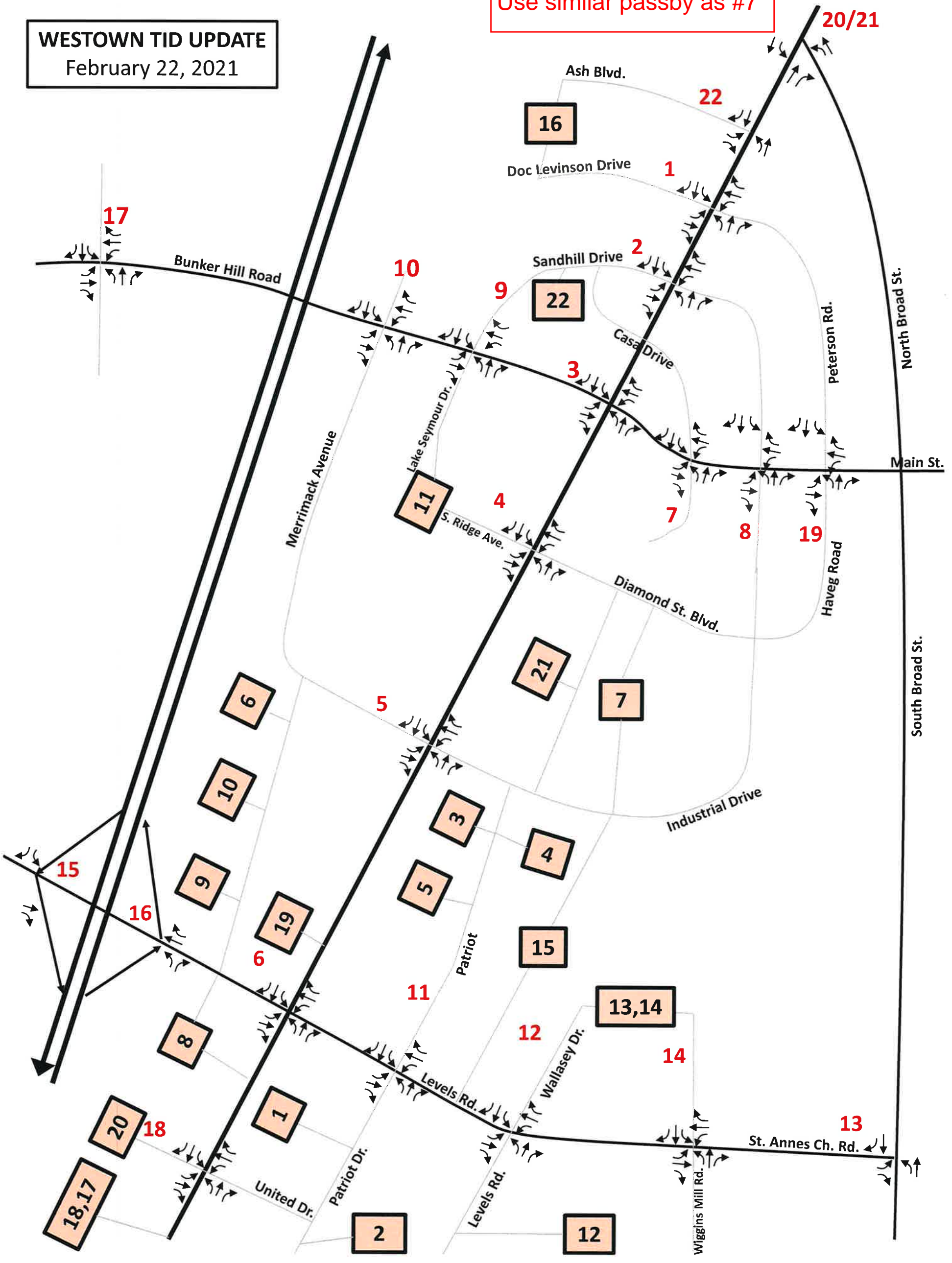
WESTOWN TID UPDATE
February 22, 2021



SITE 21
Auto Mall Commercial

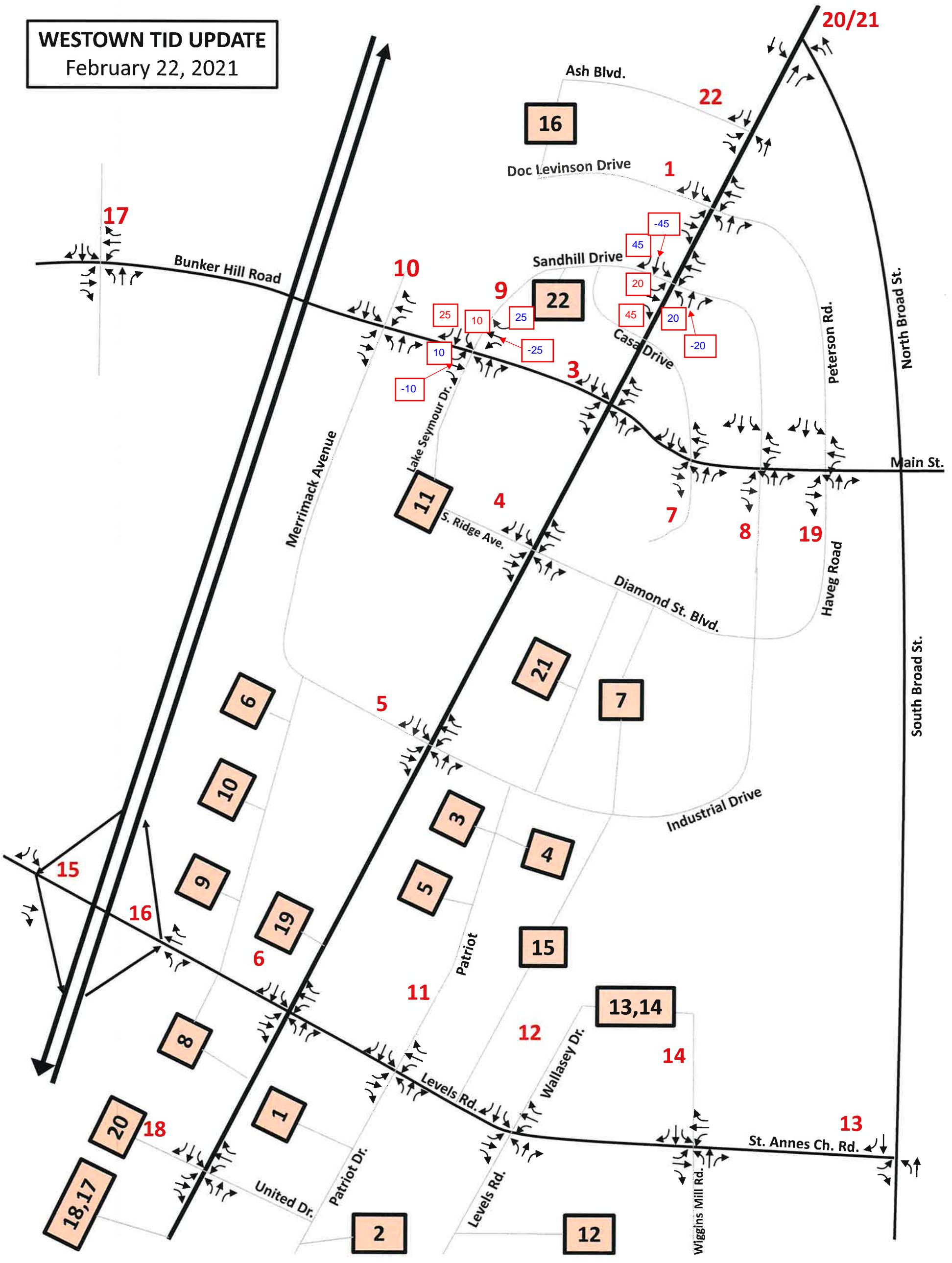
Use similar passby as #7

WESTOWN TID UPDATE
February 22, 2021



SITE 22
Bunker Hill Center Passby

WESTOWN TID UPDATE
February 22, 2021





Appendix C

Traffic Analysis Results and Discussion

Traffic Analysis Results:
LOS Tables

General Analysis Comments

1. The analysis was conducted using HCS6 outputs from Synchro 11 software, except in unique situations described by subsequent notes.
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the future scenario analyses. JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph.
3. Per DelDOT's *Development Coordination Manual*, JMT utilized a PHF of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher, except in unique situations described by subsequent footnotes.
4. Although the project area is south of the C&D Canal, JMT used a saturation flow rate of 1,900 passenger cars per hour green per lane (pcphgpl) for signalized intersections based on the anticipated development and increase in density and traffic volumes within the project area.
5. JMT optimized all signal timings and offsets as part of the future analysis.
6. JMT analyzed the following scenarios:
 - Existing = 2020 Peak Hour Volumes and existing geometry
 - 2030 Baseline = 2030 Peak Hour Volumes and existing geometry
 - 2030 LOS E = 2030 Peak Hour Volumes with improvements to achieve LOS E or better at the intersection
 - 2030 LOS D = 2030 Peak Hour Volumes with improvements to achieve LOS D or better at the intersection

When multiple alternatives were identified, preferred intersection improvement options are highlighted in grey in the following tables based on correspondence with DelDOT and the Town of Middletown.

Table 1
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
01 – Middletown Warwick Road/Doc Levinson Drive/Peterson Drive	Weekday AM	Weekday PM
Existing	B (12.5)	B (11.4)
2030 Baseline	C (23.4)	D (51.3)
2030 LOS D Additional Improvement ²	B (17.9)	D (42.6)

* LOS results are based on Synchro methodology as the signal operates without strict NEMA phasing that HCS is not able to analyze.

¹ For signalized and unsignalized intersection analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds based on the Highway Capacity Manual 6th Edition.

² Improvement scenario incorporates adding a separate right turn lane along eastbound Doc Levinson Drive due to the high volume of right turns along the side street.

Table 2
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection¹	LOS per Synchro	
	Weekday AM	Weekday PM
02 – Middletown Warwick Road/Sandhill Drive/Market Place		
Existing		
Eastbound Sandhill Drive Right Turn	B (11.3)	B (12.6)
Westbound Market Place Right Turn	B (10.6)	B (12.8)
Northbound Middletown Warwick Road Left Turn	A (9.4)	B (10.4)
Southbound Middletown Warwick Road Left Turn	A (8.8)	A (9.7)
2030 Baseline		
Eastbound Sandhill Right Turn	C (15.7)	D (33.5)
Westbound Market Place Right Turn	B (13.0)	D (29.5)
Northbound Middletown Warwick Road Left Turn	B (12.4)	C (18.1)
Southbound Middletown Warwick Road Left Turn	B (10.5)	C (18.1)

Table 3
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
	Weekday AM	Weekday PM
03 – Middletown Warwick Road/Bunker Hill Road/Main Street		
Existing	D (38.9)	D (42.1)
2030 Baseline	D (41.1)	F (92.5)
2030 LOS E ³	D (41.7)	E (61.2)
2030 LOS D ⁴	C (34.9)	D (53.7)

³ The LOS E scenario includes an additional left turn lane along northbound Middletown-Warwick Road.

⁴ The LOS D scenario includes an additional left turn lane along northbound and southbound Middletown-Warwick Road.

Table 4
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
04 – Middletown Warwick Road/S. Ridge Avenue/Diamond State Boulevard	Weekday AM	Weekday PM
Existing	C (20.7)	C (27.1)
2030 Baseline	C (23.3)	E (58.4)
2030 LOS D Option 1 ⁵	C (21.4)	D (46.9)
2030 LOS D Option 2 ⁶	C (24.2)	D (54.9)

⁵ Option 1 includes implementing a right turn overlap along the westbound Diamond State Boulevard approach and restricting U-turns along the southbound Middletown Warwick Road approach.

⁶ Option 2 includes adding signalized dual right turn lanes along the westbound Diamond State Boulevard approach.

Table 5
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
05 – Middletown Warwick Road/Merrimac Avenue	Weekday AM	Weekday PM
Existing	C (32.0)	D (36.0)
2030 Baseline	D (35.6)	E (69.2)
2030 LOS D Option 1 ⁷	D (35.7)	D (41.7)
2030 LOS D Option 2 ⁸	D (38.9)	D (54.8)
2030 LOS D Option 3 ⁹	D (37.0)	D (50.4)

⁷ Option 1 includes a lane add for westbound Merrimac Avenue right turn movements onto northbound Middletown Warwick Road.

⁸ Option 2 includes adding signalized dual right turns along the westbound Merrimac Avenue approach.

⁹ Option 3 includes implementing a right turn overlap along the westbound Merrimac Avenue approach and restricting U-turns along the southbound Middletown Warwick Road approach.

Table 6
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
06 – Middletown Warwick Road/Levels Road		
Existing	D (52.2)	E (57.2)
2030 Baseline	D (39.9)	F (199.2)
2030 LOS E Improvements ¹⁰	C (32.9)	E (73.3)
2030 LOS D Option 1 ^{11,12}	C (31.2)	D (43.8)
2030 LOS D Option 2 ^{11,13}	D (43.5)	E (65.2)
2030 LOS D Option 3 ^{11,14}	D (36.7)	D (49.9)

¹⁰ LOS E Improvement scenario includes dual left turns along the eastbound and westbound Middletown Warwick Road approaches along with the southbound Levels Road approach. One through lane drops into a left turn lane along westbound Middletown-Warwick Road

¹¹ All LOS D improvement scenarios include providing dual left turns along each approach to the intersection as well as an additional through lane along the eastbound and westbound Levels Road approaches.

¹² Option 1 includes a lane add for the westbound Levels Road right turn movements onto northbound Middletown Warwick Road. This lane add would drop as a right turn only to Hedgelawn Way.

¹³ Option 2 includes implementing signalized dual right turn lanes along the westbound Levels Road approach.

¹⁴ Option 3 includes implementing a right turn overlap along the westbound Levels Road approach and restricting U-Turns along the southbound Middletown Warwick Road approach.

Table 7
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
07 – Main Street/Casa Drive/Middletown Commons¹⁵		
Existing		
Eastbound Main Street Left Turn	A (8.7)	A (9.0)
Westbound Main Street Left Turn	A (8.7)	A (9.2)
Northbound Middletown Commons Left Turn	F (52.3)	F (168.4)
Southbound Casa Drive Approach	C (24.7)	D (33.4)
2030 Baseline		
Eastbound Main Street Left Turn	A (9.9)	B (11.4)
Westbound Main Street Left Turn	A (9.5)	B (12.9)
Northbound Middletown Commons Left Turn	F (489.6)	F (7860.9)
Northbound Middletown Commons Right Turn	C (15.1)	E (45.2)
Southbound Casa Drive Approach	E (41.8)	F (815.0)
2030 LOS D Option 1 ¹⁶		
Northbound Middletown Commons Right Turn	C (15.5)	F (50.4)
Southbound Casa Drive Right Turn	C (17.8)	D (29.4)
Southbound Casa Drive Right Turn	C (17.8)	D (29.2)

¹⁵ Signalized improvement scenarios are not presented as signalization would improve LOS, but volumes along the side streets do not meet the DEMUTCD Peak Hour Signal Warrant criteria. In addition, any extensive delays or queue lengths would be along entrances and not impact Main Street.

¹⁶ The Option 1 scenario assumes a connection would be provided from Middletown Commons and Casa Drive to Industrial Drive and the signalized intersection of Industrial Drive and Main Street. The side streets of Middletown Commons and Casa Drive would then be reconfigured as rights-in/rights-out only approaches.

Table 7 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
07 – Main Street/Casa Drive/Middletown Commons¹⁵		
2030 LOS D Option 2 ¹⁷		
Eastbound Main Street Left Turn	B (10.2)	B (12.0)
Westbound Main Street Left Turn	A (9.5)	B (12.9)
Northbound Middletown Commons Right Turn	C (15.1)	E (45.2)
Southbound Casa Drive Right Turn	C (17.8)	D (29.2)

¹⁷ The Option 2 scenario assumes a connection would be provided from Middletown Commons and Casa Drive to Industrial Drive and the signalized intersection of Industrial Drive and Main Street. The side streets of Middletown Commons and Casa Drive would then be reconfigured as lefts-in/rights-in/rights-out only approaches.

Table 8
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
08 – Main Street/Industrial Drive	Weekday AM	Weekday PM
Existing	B (13.3)	B (16.2)
2030 Baseline	B (14.5)	D (46.2)
2030 LOS D Option 1 ¹⁸	C (34.0)	F (88.1)
2030 LOS D Option 2 ¹⁹	C (21.9)	D (53.3)

¹⁸ Option 1 maintains the existing signalized configuration at the intersection. However, the adjacent Intersections #7 and #19 are configured as right-in/right-out only entrances along the side-streets which reroutes additional traffic through Intersection #8.

¹⁹ Option 2 maintains the existing signalized configuration at the intersection. However, the adjacent Intersections #7 and #19 are configured as left-in/right-in/right-out only and right-in/right-out only entrances along the side-streets, respectively. These updated configurations at the adjacent intersections reroute additional traffic through Intersection #8.

Table 9
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
09 – Bunker Hill Road/Lake Seymour Drive/Sandhill Drive		
Existing		
Eastbound Bunker Hill Road Left Turn	A (8.4)	A (8.1)
Westbound Bunker Hill Road Left Turn	A (7.9)	A (8.4)
Northbound Lake Seymour Drive Shared Left Turn/Through Lane	D (29.6)	F (125.7)
Southbound Sandhill Drive Left turn	E (39.7)	F (193.5)
2030 Baseline		
Eastbound Bunker Hill Road Left Turn	A (8.9)	A (9.2)
Westbound Bunker Hill Road Left Turn	A (8.5)	B (10.2)
Northbound Lake Seymour Drive Shared Left Turn/Through Lane	F (104.2)	F (*)
Southbound Sandhill Drive Left Turn	F (464.0)	F (*)

*Due to the high delay Synchro did not provide any LOS results.

Table 9 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Roundabout ¹	LOS per Synchro	
	Weekday AM	Weekday PM
09 – Bunker Hill Road/Lake Seymour Drive/Sandhill Drive		
2030 LOS E ²⁰	A (9.6)	E (44.1)
2030 LOS D Option 1 ²¹	A (9.1)	C (24.8)

²⁰ LOS E configures the intersection as a single lane roundabout while providing a bypassing right turn lane along the westbound Bunker Hill Road approach.

²¹ Option 1 configures the intersection as a single lane roundabout while providing bypassing right turn lanes along the eastbound and westbound Bunker Hill Road approaches.

Table 9 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
09 – Bunker Hill Road/Lake Seymour Drive/Sandhill Drive	Weekday AM	Weekday PM
2030 LOS D Option 2 ²²	C (31.9)	D (42.2)

²² Option 2 includes signalizing the intersection with 120 second and 150 second cycle lengths during the AM and PM peaks, respectively, and providing a separate left turn and a shared through/right turn lane along northbound Lake Seymour Drive approach.

Table 10
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
10 – Bunker Hill Road/Merrimac Avenue		
Existing		
Eastbound Bunker Hill Road Left Turn	A (8.7)	A (8.2)
Westbound Bunker Hill Road Left Turn	F (*)	A (8.8)
Northbound Merrimac Avenue Shared Left Turn/Through Lane	D (32.7)	E (44.4)
Southbound Merrimac Avenue Approach	C (20.6)	F (60.6)
2030 Baseline		
Eastbound Bunker Hill Road Left Turn	A (9.2)	A (9.2)
Westbound Bunker Hill Road Left Turn	A (8.6)	B (10.2)
Northbound Merrimac Avenue Shared Left Turn/Through Lane	F (144.5)	F (1103.5)
Southbound Merrimac Avenue Approach	F (64.9)	F (1409.6)

*Due to the high delay Synchro did not provide any LOS results.

Table 10 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Roundabout ¹	LOS per Synchro	
	Weekday AM	Weekday PM
10 – Bunker Hill Road/Merrimac Avenue		
2030 LOS D Option 1 ²³	B (10.6)	C (18.4)

²³ Option 1 configures the intersection as a single lane roundabout.

Table 10 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
10 – Bunker Hill Road/Merrimac Avenue	Weekday AM	Weekday PM
2030 LOS D Option 2 ²⁴	C (28.0)	D (38.4)

²⁴ Option 2 includes signalizing the intersection with 120 second and 150 second cycle lengths during the AM and PM peaks, respectively.

Table 11
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
11 – Levels Road/Patriot Drive		
Existing		
Eastbound Levels Road Left Turn	A (9.6)	A (8.9)
Westbound Levels Road Left Turn	A (8.0)	A (9.1)
Northbound Patriot Drive Approach	E (41.2)	F (74.1)
Southbound Patriot Drive Shared Left Turn/Through Lane	E (38.7)	F (327.7)
2030 Baseline		
Eastbound Levels Road Left Turn	B (12.4)	B (14.2)
Westbound Levels Road Left Turn	A (9.7)	C (15.2)
Northbound Patriot Drive Approach	F (1815.9)	F (*)
Southbound Patriot Drive Shared Left Turn/Through Lane	F (1713.4)	F (*)

*Due to the high delay Synchro did not provide any LOS results.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
11 – Levels Road/Patriot Drive		
2030 LOS E Improvements ²⁵	B (13.5)	E (62.9)
2030 LOS D Option 1 ²⁶	B (10.9)	C (24.7)
2030 LOS D Option 2 ²⁷	B (11.0)	C (33.2)

²⁵ LOS E scenario includes signalizing the intersection with a 120 second and 150 second cycle length during the AM and PM peaks hours, respectively. In addition, a separate left turn lane, one through lane, and one right turn lane would be provided along only the eastbound and westbound Levels Road approaches. The eastbound Levels Road right turn lane would operate as a right turn only from the additional through lane provided along eastbound Levels Road from Intersection #6. The northbound and southbound Patriot Drive approaches will be configured with one shared left turn/through lane and one right turn lane.

²⁶ Option 1 includes signalizing the intersection with a 120 second and 150 second cycle length during the AM and PM peaks hours, respectively. In addition, a separate left turn lane, two through lanes, and one right turn lane would be provided along only the eastbound Levels Road approach while a separate left turn, through lane and right turn lane would be provided along the westbound Levels Road as well as the northbound and southbound Patriot Drive approaches.

²⁷ Option 2 includes signalizing the intersection with a 120 second and 150 second cycle length during the AM and PM peaks hours, respectively. In addition, a separate left turn lane, one through lane, and one shared through/right turn lane would be provided along only the eastbound Levels Road approaches while a separate left turn, through lane and right turn lane would be provided along the westbound Levels Road as well as the northbound and southbound Patriot Drive approaches.

Table 12
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Roundabout ¹	LOS per Synchro	
	Weekday AM	Weekday PM
12 – St. Annes Church Road/Levels Road/Wallasey Drive		
Existing		
Eastbound Levels Road Approach	A (4.3)	B (11.1)
Westbound St. Annes Church Road Approach	A (9.3)	A (8.2)
Northbound Levels Road Approach	A (5.9)	A (9.2)
Southbound Wallasey Drive Approach	A (6.6)	A (5.9)
Overall	A (7.1)	A (9.9)
2030 Baseline		
Eastbound Levels Road Approach	A (6.6)	F (201.1)
Westbound St. Annes Church Road Approach	F (93.7)	F (127.9)
Northbound Levels Road Approach	B (11.3)	F (186.4)
Southbound Wallasey Drive Approach	C (23.7)	C (17.9)
Overall	E (46.8)	F (172.5)
2030 LOS D Option 2 ^{28, 29}		
Eastbound Levels Road Approach	A (5.3)	C (20.4)
Westbound St. Annes Church Road Approach	B (11.6)	B (11.7)
Northbound Levels Road Approach	A (9.9)	E (48.4)
Southbound Wallasey Drive Approach	C (15.9)	B (11.2)
Overall	B (10.3)	C (22.2)

²⁸ This scenario includes providing a bypass lane along eastbound Levels Road and providing an additional through lane along westbound Levels Road.

²⁹ Additional improvement scenario results are based on the HCS7 software due to the limitations of Synchro software including the delay from the bypass lane along eastbound Levels Road.

Table 12 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
12 – St. Annes Church Road/Levels Road/Wallasey Drive	Weekday AM	Weekday PM
2030 LOS D Option 1 ³⁰	D (44.4)	D (43.0)

³⁰ Option 1 includes signalizing the intersection with a 120 second cycle length during the AM and PM peaks hours. A separate left turn lane and one shared through/right turn lane would be provided along the northbound Levels Road and the westbound St. Annes Church Road. A separate right turn lane and shared through/left turn lane would be provided along the southbound Wallasey Drive approaches. The eastbound Levels Road approach would be configured with a separate left turn lane, through lane, and right turn lane which would bypass the intersection.

Table 13
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
13 – Summit Bridge Road/St. Annes Church Road		
Existing		
Eastbound Annes Church Road Approach	C (23.3)	F (54.3)
Northbound Summit Bridge Road Left Turn	A (8.6)	A (9.2)
2030 Baseline		
Eastbound Annes Church Road Approach	F (472.0)	F (2787.1)
Northbound Summit Bridge Road Left Turn	B (10.1)	B (13.2)

Table 13 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
13 – Summit Bridge Road/St. Annes Church Road		
2030 LOS D Option 1 ³¹	B (10.3)	B (18.9)
2030 LOS D Option 2 ³²	C (20.8)	F (105.5)

³¹ Option 1 includes signalizing the intersection with a cycle length of 120 and 150 seconds during the AM and PM peaks, respectively, and providing a separate left turn lane and a channelized right turn lane along the eastbound St. Annes Church Road approach. A separate left turn lane is also provided along the northbound Summit Bridge Road approach.

³² Option 2 includes signalizing the intersection with a cycle length of 120 and 150 seconds during the AM and PM peaks, respectively, and providing a shared left turn/right turn lane along the eastbound St. Annes Church Road approach.

Table 14
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Roundabout ¹	LOS per Synchro	
	Weekday AM	Weekday PM
14 – St. Annes Church Road/Wiggins Mill Road/Tywin Drive		
Existing		
Eastbound St. Annes Church Road Approach	A (4.1)	A (6.0)
Westbound St. Annes Church Road Approach	A (5.8)	A (5.1)
Northbound Wiggins Mill Road Approach	A (5.9)	A (5.5)
Southbound Tywin Drive Approach	A (5.4)	A (4.5)
Overall	A (5.3)	A (5.7)
2030 Baseline		
Eastbound St. Annes Church Road Approach	A (5.8)	C (22.4)
Westbound St. Annes Church Road Approach	B (12.6)	B (13.9)
Northbound Wiggins Mill Road Approach	A (9.4)	C (16.5)
Southbound Tywin Drive Approach	B (10.6)	A (8.7)
Overall	A (9.6)	C (18.5)

Table 15
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection¹	LOS per Synchro	
15 – Levels Road/First Responders Memorial Highway (US 301) Southbound Ramp	Weekday AM	Weekday PM
Existing	A (1.7)	A (2.0)
2030 Baseline	B (18.6)	C (21.5)

Table 16
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
16 – Levels Road/First Responders Memorial Highway (US 301) Northbound Ramp³³		
Existing		
Eastbound Levels Road Left Turn	A (7.8)	A (8.0)
Northbound US 301 Off Ramp Approach	A (9.3)	B (10.7)
2030 Baseline		
Eastbound Levels Road Left Turn	A (7.9)	A (8.5)
Northbound US 301 Off Ramp Approach	B (11.2)	C (15.6)

³³ As only one vehicle is projected to perform a left turn from the US 301 off ramp to westbound Levels Road, this left turn volume was excluded from the analysis.

Table 17
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Roundabout ¹	LOS per Synchro	
	Weekday AM	Weekday PM
17 – Bunker Hill Road/Appoquinimink High School/Choptank Road		
Existing		
Eastbound Bunker Hill Road Approach	C (17.7)	A (6.3)
Westbound Bunker Hill Road Approach	B (13.1)	A (6.8)
Northbound Appoquinimink High School Approach	A (7.3)	A (6.8)
Southbound Choptank Road Approach	C (17.4)	A (8.0)
Overall	B (13.9)	A (7.2)
2030 Baseline		
Eastbound Bunker Hill Road Approach	C (15.2)	B (10.1)
Westbound Bunker Hill Road Approach	B (11.2)	B (11.4)
Northbound Appoquinimink High School Approach	A (7.5)	B (10.8)
Southbound Choptank Road Approach	C (15.2)	C (15.1)
Overall	B (12.3)	B (12.5)

Table 18
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
18 – Middletown Warwick Road/Citgo/United Drive		
Existing		
Eastbound Citgo Approach	B (10.8)	B (14.0)
Westbound United Drive Shared Left Turn/Through Lane	B (11.2)	B (14.0)
Northbound Middletown Warwick Road Left Turn	A (7.4)	A (7.6)
Southbound Middletown Warwick Road Left Turn	A (7.7)	A (7.6)
2030 Baseline		
Eastbound Citgo Approach	B (11.7)	D (30.9)
Westbound United Drive Shared Left Turn/Through Lane	B (11.6)	C (16.6)
Northbound Middletown Warwick Road Left Turn	A (7.4)	A (7.5)
Southbound Middletown Warwick Road Left Turn	A (7.6)	A (7.7)

Table 19
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
19 – Main Street/Haveg Road/Peterson Road		
Existing		
Eastbound Main Street Left Turn	A (9.5)	B (10.2)
Westbound Main Street Left Turn	A (9.3)	B (10.0)
Northbound Haveg Road Approach	C (15.3)	C (23.2)
Southbound Peterson Road Approach	E (37.9)	F (67.1)
2030 Baseline		
Eastbound Main Street Left Turn	B (12.0)	B (14.2)
Westbound Main Street Left Turn	B (10.6)	C (15.0)
Northbound Haveg Road Approach	D (29.2)	F (417.3)
Southbound Peterson Road Approach	F (149.7)	F (11759.7)
2030 LOS D Option 1 ³⁴		
Northbound Haveg Road Approach	C (18.9)	F (76.5)
Southbound Peterson Road Approach	C (24.8)	E (37.2)

³⁴ Option 1 assumes a connection would be provided from Haveg Road and Peterson Road to Industrial Drive and the signalized intersection of Industrial Drive and Main Street. The side streets of Haveg Road and Peterson Road would then be reconfigured as rights-in/rights-out only approaches.

Table 20/21
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS Per Synchro	
	Weekday AM	Weekday PM
20/21 – Middletown Warwick Road/Summit Bridge Road/N Broad Street		
Existing	D (37.7)	E (61.1)
2030 Baseline	F (81.3)	F (189.4)
2030 LOS E ³⁵	D (44.7)	E (64.7)
2030 LOS D ³⁶	C (33.4)	D (48.3)

Note: No improvements recommended at this intersection as it is assumed the Middletown Warwick Road Connector and SR 71 Connector would be constructed. Please see memorandum in Appendix F for more information.

³⁵ LOS E includes providing an additional through lane along the northbound Middletown Warwick Road approach.

³⁶ LOS D includes providing an additional through lane along the northbound and southbound Middletown Warwick Road approaches.

Table 22
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
22 – Middletown Warwick Road/Ash Boulevard		
Existing		
Eastbound Ash Boulevard Approach	F (177.5)	F (239.1)
Northbound Middletown Warwick Road Left Turn	A (9.1)	A (9.9)
2030 Baseline		
Eastbound Ash Boulevard Approach	F (1654.5)	F (10406.3)
Northbound Middletown Warwick Road Left Turn	B (10.3)	B (12.5)

Table 22 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
22 – Middletown Warwick Road/Ash Boulevard		
2030 LOS D ³⁷	C (23.0)	D (47.0)

Note: Preferred improvement at this intersection is related to the construction of the Middletown Warwick Road and SR 71 connector. Please see memorandum in Appendix F for more information.

³⁷ LOS D scenario includes signalizing the intersection with 120 and 150 cycle lengths during the AM and PM peaks, respectively, with an additional through lane along the southbound Middletown Warwick Road approach.

Table 23
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
2030 Baseline ³⁸		
Eastbound Levels Road Left Turn	A (9.4)	B (11.6)
Northbound Poole Property Access Right Turn	B (10.6)	B (14.0)
Southbound Voncroy Property Access Right Turn	B (11.1)	C (15.0)

³⁸ The Baseline scenario configures the southbound Voncroy Property access as a right-in/right-out/left-in only entrance and the northbound Poole Property access as a right-in/right-out only entrance consistent with improvements originally identified in the *2015 Westown Circulation Concept Plan Update*.

Table 24
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
24 – Levels Road/Merrimac Avenue Extended		
2030 Baseline		
Eastbound Levels Road Left Turn	B (14.3)	B (12.9)
Southbound Industrial Drive Approach	F (390.9)	F (7967.3)

Table 24 (continued)
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection ¹	LOS per Synchro	
	Weekday AM	Weekday PM
24 – Levels Road/ Merrimac Avenue Extended		
2030 LOS E ³⁹	B (17.7)	E (55.4)
2030 LOS D ⁴⁰	B (19.4)	C (32.7)

³⁹ LOS E scenario includes signaling the intersection with a cycle length of 120 and 150 seconds during the AM and PM peaks, respectively. The Merrimac Avenue Extension approach was configured with a separate left turn and right turn lane and separate auxiliary lanes are also provided along the Levels Road approaches.

⁴⁰ LOS D scenario includes signaling the intersection with a cycle length of 120 and 150 seconds during the AM and PM peaks, respectively, and providing an additional through lane along only the eastbound Levels Road approach. The Merrimac Avenue Extension approach was configured with a separate left turn and right turn lane and separate auxiliary lanes are also provided along the Levels Road approaches.

Traffic Analysis Discussion



While the figure in Appendix D displays the selected TID improvements after coordinating with DeIDOT and the town of Middletown, some intersection locations did consider multiple alternatives. The following writeups document these multiple alternatives and summarize the coordination with DeIDOT.

Intersection #4 – Middletown Warwick Road & Diamond State Boulevard

At the intersection of Middletown Warwick Road and Diamond State Boulevard, the preferred alternative was selected to signalize the westbound Diamond State Boulevard right turn and implement a right turn overlap with the southbound Middletown Warwick Road left turns. This improvement should be considered a low priority as there is minimal operational differences between a yield controlled right turn and a signalized overlap. The preferred alternative was selected due to the minimal amount of right-of-way along the westbound approach.

Intersection #5 – Middletown Warwick Road & Merrimac Avenue

At the intersection of Middletown Warwick Road and Merrimac Avenue, the preferred alternative was selected to provide an acceleration lane from the westbound Merrimac Avenue right turn lane onto northbound Middletown Warwick Road (Option 1). However, the property just north of this intersection may be historical and prevent the widening along Middletown Warwick Road. As such, providing signalized dual right turn lanes along the westbound Merrimac Avenue approach (Option 2) should be considered as a backup. During the project development phase, DeIDOT can ultimately select which option to proceed with. For the CTP cost estimates at the intersection, the cost of the more expensive option is provided as part of this report and the technical memorandums contained in Appendix E.

Intersection #6 – Middletown Warwick Road & Levels Road

At the intersection of Middletown Warwick Road and Levels Road, the preferred alternative was selected to provide an acceleration lane from the westbound Levels Road right turn lane onto northbound Middletown Warwick Road (Option 1). However, in the event that issues are identified during the project development phase with Option 1, providing signalized dual right turn lanes along the westbound Levels Road approach (Option 2) should be considered as a backup. For the CTP cost estimates at the intersection, the cost of the more expensive option is provided as part of this report and the technical memorandums contained in Appendix E.

Intersection #7, #8, & #19 – Main Street & Market Place, Industrial Drive, and Peterson/Haveg Road

It was originally agreed to configure the Main Street intersections with Market Place and Peterson Road/Haveg Road as right-in/right-out only entrances as the preferred alternatives. As part of this preferred alternative, additional roadway connections would be provided between Middletown Commons, Peterson Road, and Haveg Road to connect to Industrial Drive. These additional connections would allow for the lefts-in and lefts-out at Market Place, Peterson Road, and Haveg Road to utilize the signalized intersection at Industrial Drive and Main Street. However, with all of this new traffic accessing the signalized intersection at



Industrial Drive, the signal is expected to operate at unacceptable LOS. As such, the eventual preferred alternative was selected to maintain the lefts-in to Market Place.

Intersection #9 & #10 – Bunker Hill Road & Sandhill Drive and Merrimac Avenue

At the Bunker Hill Road intersections with Sandhill Drive and Merrimac Avenue, both signalized and roundabout options were considered. Based on other traffic studies already conducted at the two intersections by DelDOT, the roundabouts were selected as the preferred alternatives.

Intersection #11 – Levels Road & Patriots Drive

At the intersection of Levels Road and Patriots Drive, the preferred alternative was selected to provide a separate right turn lane along eastbound Levels Road approach (Option 1). However, an additional alternative was identified which combines the eastbound right turn lane with the through lane (Option 2) to minimize the footprint of the intersection in case constraints are identified during the design process.

Intersection #12 – Levels Road & St. Annes Church Road

At the intersection of Levels Road and St. Annes Church Road, both signalized and roundabout options were considered. The dual lane roundabout option was selected preferred alternative to avoid having to convert the existing single lane roundabout to a signalized intersection. However, the signalized option should be considered as a backup. During the project development phase, DelDOT can ultimately select which option to proceed with. For the CTP cost estimates at the intersection, the cost of the more expensive option is provided as part of this report and the technical memorandums contained in Appendix E. For the roundabout alternative, the cost of providing a Rectangular Rapid Flashing Beacon (RRFB) along the dual lane approaches of the intersection for pedestrian crossings was included in the CTP estimate.

Intersection #20/#21 – Middletown Warwick Road & North Broad Street

At the intersection of Middletown Warwick Road and North Broad Street, an additional alternative was considered which would provide an additional through lane along only northbound Middletown (Option 1). This option would limit the amount of widening needed at the intersection but would result in the intersection operating at LOS E with significant queue lengths along multiple movements. As such, the preferred alternative was selected to provide an additional through lane along northbound and southbound Middletown Warwick Road (Option 2) to allow for acceptable LOS and queue lengths at the intersection.

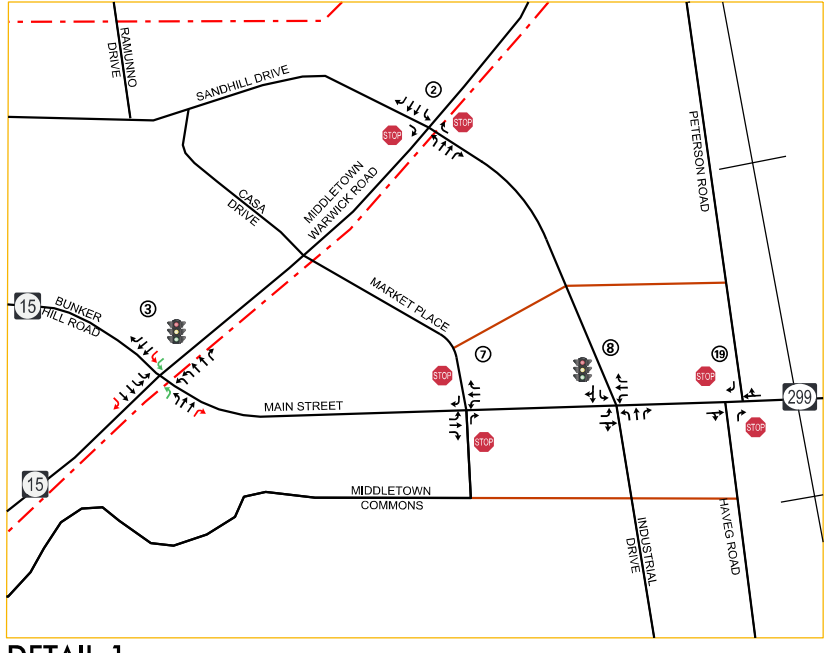
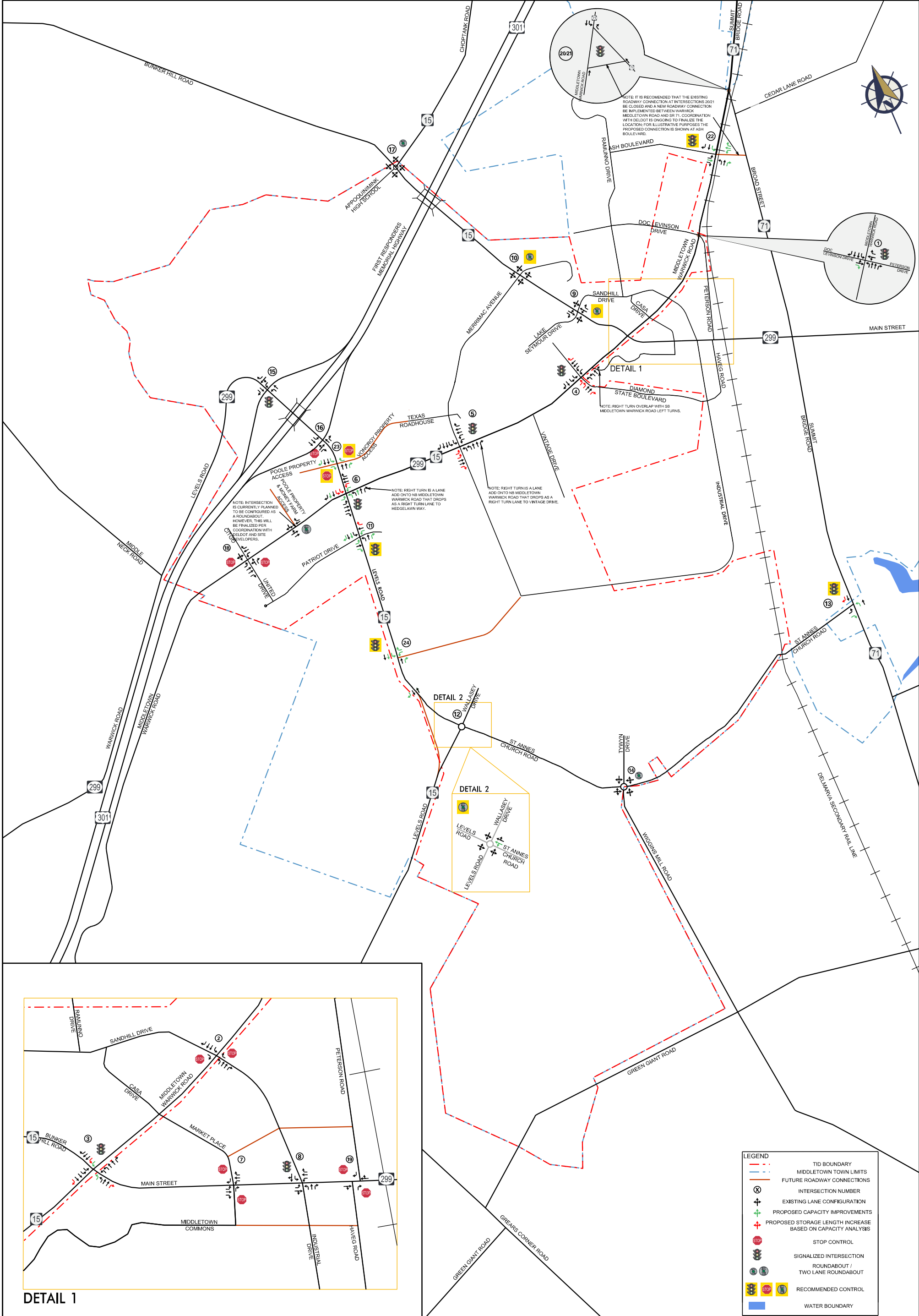
Intersection #22 – Middletown Warwick Road & Ash Boulevard

At the intersection of Middletown Warwick Road and Ash Boulevard, the capacity analysis only identified the need for an additional through lane along the southbound Middletown Warwick Road approach. However, as part of the CTP cost estimate development, based on the additional northbound through lanes being provided at the adjacent intersections, an additional northbound through lane should be provided at this intersection as well.

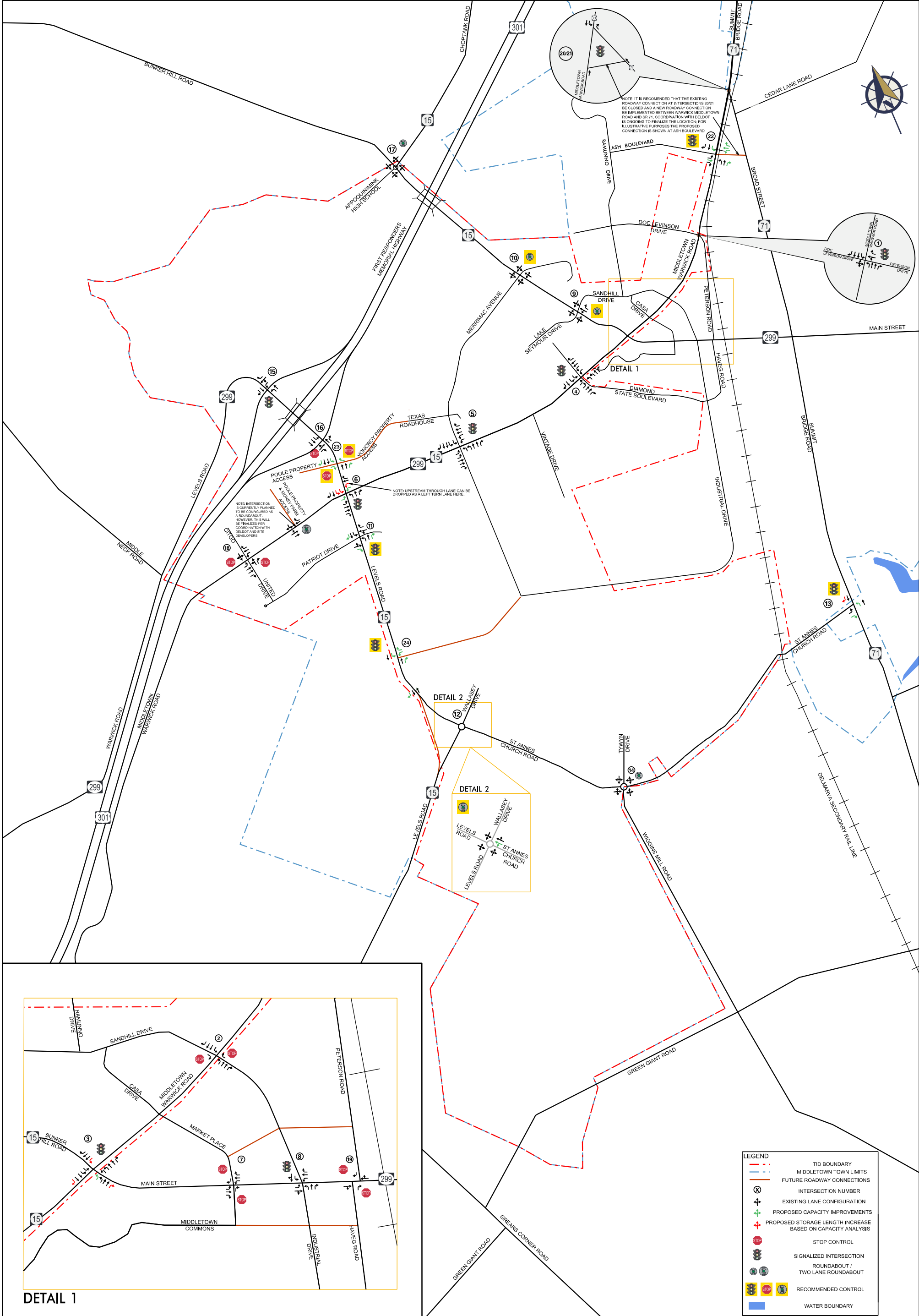


Appendix D

Roadway Improvement Diagram



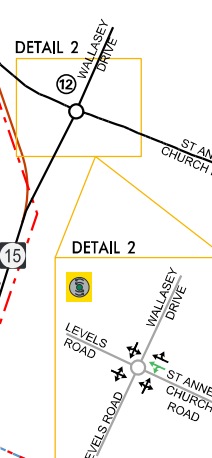
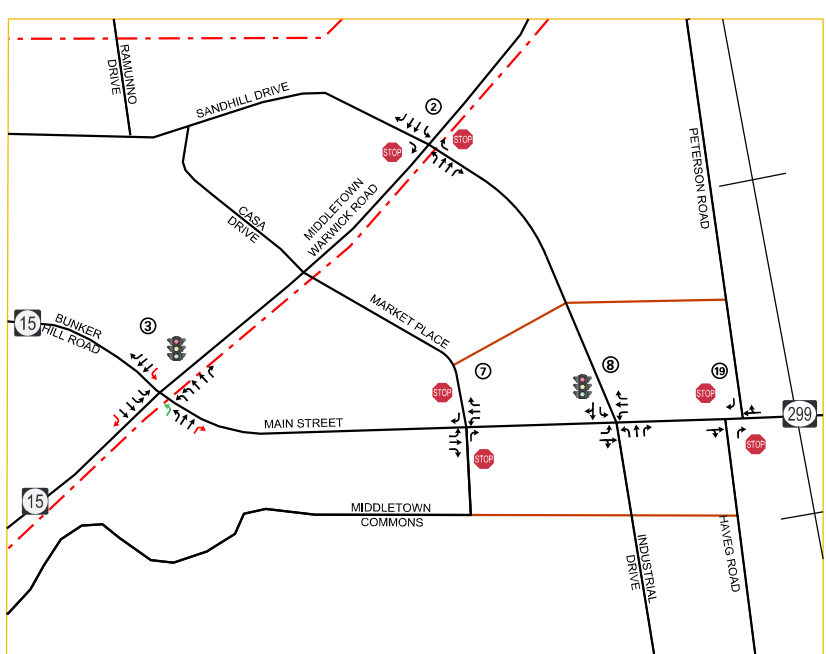
LEGEND	
	TID BOUNDARY
	MIDDLETOWN TOWN LIMITS
	FUTURE ROADWAY CONNECTIONS
	INTERSECTION NUMBER
	EXISTING LANE CONFIGURATION
	PROPOSED CAPACITY IMPROVEMENTS
	PROPOSED STORAGE LENGTH INCREASE BASED ON CAPACITY ANALYSIS
	STOP CONTROL
	SIGNALIZED INTERSECTION
	ROUNDABOUT / TWO LANE ROUNDABOUT
	RECOMMENDED CONTROL
	WATER BOUNDARY



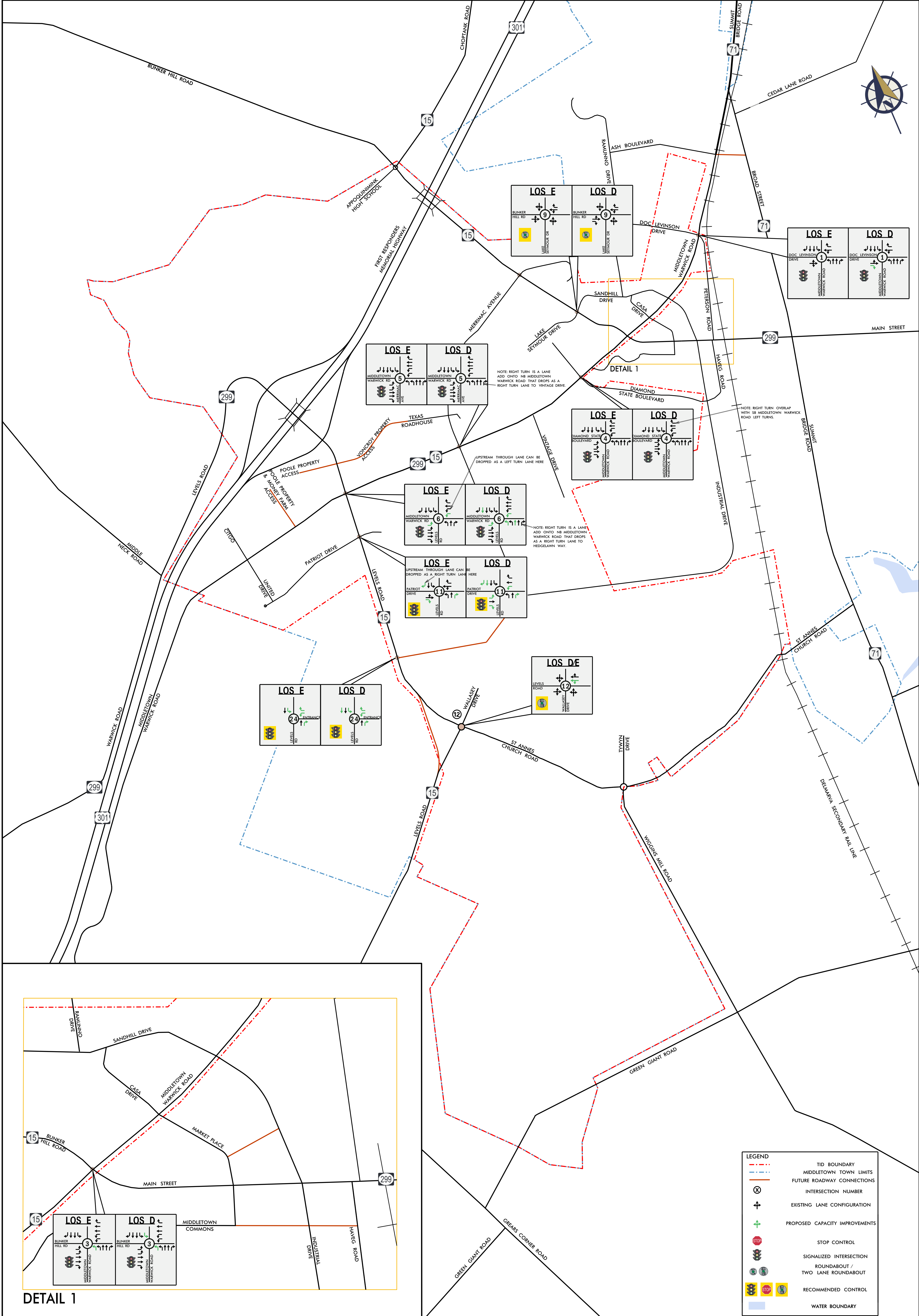
NOTE: IT IS RECOMMENDED THAT THE EXISTING ROADWAY CONNECTION AT INTERSECTION 2021 BE CLOSED AND A NEW ROADWAY CONNECTION BE IMPLEMENTED BETWEEN WARWICK MIDDLETOWN ROAD AND BR 71. COORDINATION WITH DELDOT IS Ongoing TO FINALIZE THE LOCATION FOR ILLUSTRATIVE PURPOSES THE PROPOSED CONNECTION IS SHOWN AT ASH BOULEVARD.

NOTE: INTERSECTION IS CURRENTLY PLANNED TO BE CONSIDERED AS A ROUNDABOUT. HOWEVER, THIS WILL BE FINALIZED PER COORDINATION WITH DELDOT AND SITE DEVELOPER.

NOTE: UPSTREAM THROUGH LANE CAN BE DROPPED AS A LEFT TURN LANE HERE.



LEGEND	
	TID BOUNDARY
	MIDDLETOWN TOWN LIMITS
	FUTURE ROADWAY CONNECTIONS
	INTERSECTION NUMBER
	EXISTING LANE CONFIGURATION
	PROPOSED CAPACITY IMPROVEMENTS
	PROPOSED STORAGE LENGTH INCREASE BASED ON CAPACITY ANALYSIS
	STOP CONTROL
	SIGNALIZED INTERSECTION
	ROUNDABOUT / TWO LANE ROUNDABOUT
	RECOMMENDED CONTROL
	WATER BOUNDARY



LEGEND	
	TID BOUNDARY
	MIDDLETOWN TOWN LIMITS
	FUTURE ROADWAY CONNECTIONS
	INTERSECTION NUMBER
	EXISTING LANE CONFIGURATION
	PROPOSED CAPACITY IMPROVEMENTS
	STOP CONTROL
	SIGNALIZED INTERSECTION
	ROUNDABOUT / TWO LANE ROUNDABOUT
	RECOMMENDED CONTROL
	WATER BOUNDARY



Appendix E

Roadway Segment Technical Memorandum and Cost Estimates

Westtown TID - Cost Summary				
Corridor	Intersection #	Name	Conceptual Cost	
			LOS D	LOS E
A	1	Middletown Warwick Road & Doc Levinson/Peterson Drive	\$ 1,550,278.00	\$ 835,055.00
	2	Middletown Warwick Road & Sand Hill Drive	\$ -	\$ -
	3	Middletown Warwick Road & Bunker Hill Rd./Main St.	\$ 3,245,608.00	\$ 2,272,565.00
	20/21	Middletown Warwick Road & SR 71	\$ -	\$ -
	22	Middletown Warwick Road & Ash Boulevard	\$ -	\$ -
	4	Middletown Warwick Road & Diamond State Blvd	\$ 792,765.00	\$ 268,285.00
	*5	Middletown Warwick Road & Merrimac Avenue	\$ 3,733,338.00	\$ 428,325.00
	*6	Middletown Warwick Road & Levels Road	\$ 6,012,185.00	\$ 2,144,785.00
	18	Middletown Warwick Road & United Drive	\$ 1,660,893.00	\$ 1,660,893.00
B	7/8/19	Main Street Intersections	\$ 1,269,060.00	\$ 1,269,060.00
	8a	Future Connector to Industrial Drive	\$ 1,720,715.00	\$ 1,720,715.00
	9	Bunker Hill Road & Lake Seymour/Sand Hill Drive	\$ 2,348,975.00	\$ 1,517,195.00
	10	Bunker Hill Road & Merrimac Avenue	\$ 2,363,733.00	\$ 2,363,733.00
	17	Bunker Hill Road & Choptank Road	\$ -	\$ -
C	11	Levels Road & Patriot Drive	\$ 3,722,315.00	\$ 1,855,038.00
	24	Levels Road & Future Merrimac Avenue	\$ 3,665,395.00	\$ 3,142,500.00
	*12	Levels Road & St. Annes Church Road	\$ 4,328,650.00	\$ 3,475,065.00
	23	Levels Road & Poole Property Access	\$ 1,544,640.00	\$ 1,544,640.00
	15	Levels Road & US 301 SB Off Ramp	\$ -	\$ -
	16	Levels Road & US 301 NB Off Ramp	\$ -	\$ -
D	13	St. Annes Church Road & SR 71	\$ 2,623,318.00	\$ 2,623,318.00
	14	St. Annes Church Road & Wiggins Mill Road	\$ 1,435,458.00	\$ 1,435,458.00
		Wiggins Mill Road	\$ 4,120,475.00	\$ 4,120,475.00
N/A		Proposed Connector Road (Greenlawn*)	\$ 7,764,005.00	\$ 7,764,005.00
Total			\$ 53,901,806.00	\$ 40,441,110.00

*Most Expensive Option



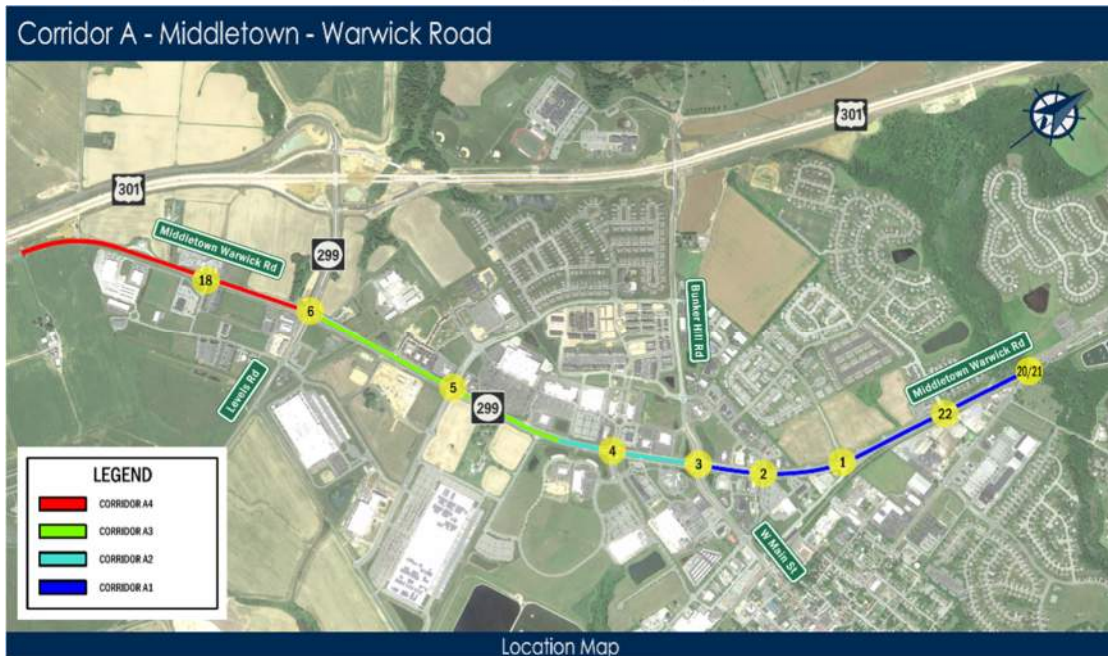
TECHNICAL MEMORANDUM

TO: Sarah Coakley, Regional Planner, Regional Systems Planning
 DATE: 11/05/2021 – Revised 09/19/2022
 FROM: Bill Dougherty, JMT
 PROJECT: Westown TID CTP Cost Updates
 JMT JOB NO.: 19-01340-2A1
 RE: Corridor A: Middletown Warwick Road Concept Assumptions and Summary
 CC: Pam Steinebach, Matt Vincent, Mir Wahed, Brad Herb, Nate Rahaim

Corridor A consists of ten intersections located along Middletown Warwick Road in the Westown section of Middletown, DE. The concepts are based on existing conditions and future traffic projections for the Westown Transportation Improvement District (TID) and are based on available aerial photography. The corridor was studied for Level of Service (LOS) D and E. A summary of the intersections, along with the estimated cost of improvements, is given in the table below:

Intersection #	Intersection Road Names	Estimated Cost - LOS D	Estimated Cost - LOS E
1	Middletown Warwick & Doc Levinson Drive & Peterson Drive	\$ 1,550,278.00	\$ 835,055.00
2	Middletown Warwick & Sand Hill Drive	\$ -	\$ -
3	Middletown Warwick & Bunker Hill Road & Main Street	\$ 3,245,608.00	\$ 2,272,565.00
20,21	Middletown Warwick Road & Summit Bridge Road	\$ -	\$ -
22	Middletown Warwick Road & Ash Boulevard	\$ -	\$ -
4	Middletown Warwick & Diamond State Boulevard	\$ 792,765.00	\$ 268,285.00
*5	Middletown Warwick & Merrimac Avenue	\$ 3,733,338.00	\$ 428,325.00
*6	Middletown Warwick & Levels Road	\$ 6,012,185.00	\$ 2,144,785.00
18	Middletown Warwick Road & United Drive	\$ 1,660,893.00	\$ 1,660,893.00
Total		\$ 16,995,067.00	\$ 7,609,908.00

* = Most Expensive Option



Middletown Warwick Road – Overall Conditions

Middletown Warwick Road (N443) corridor is a 1.06-mile principal arterial road on the west side of the Town of Middletown. This corridor contains a mix of existing commercial properties along with properties scheduled to develop in the future. The TID study area for Middletown Warwick Road begins south of its intersection with Levels Road and continues to just north of the intersection with Broad Street/SR 71. The corridor is broken into 4 different corridors due to the different Annual Average Daily Traffic (AADT) and Overall Pavement Condition (OPC) numbers in each section:

Corridor A1: Bunker Hill Road/Main Street to Broad Street/SR 71

Corridor A2: Diamond State Boulevard to Bunker Hill Road/Main Street

Corridor A3: Levels Road to Merrimac Avenue

Corridor A4: Hooper, Inc. Entrance to Levels Road

Corridor A1: Bunker Hill Road/Main Street to Broad Street/SR 71

The current AADT for this portion of Middletown Warwick Road is 19,318 VPD. The typical section of Middletown Warwick Road through the TID area is a separated 4 lane roadway with 12' travel lanes south of Doc Levinson Drive. North of Doc Levinson Drive, Middletown Warwick Road has a single northbound lane. North of Ash Boulevard, southbound Middletown Warwick Road has one lane. The posted speed limit is 45-mph; therefore a 50-mph design speed was utilized for conceptual design.

Road Site Conditions

- OPC Index (67)
- 4 lane separated asphalt pavement roadway south of Doc Levinson Drive.
- 3 lane separated asphalt pavement roadway from Doc Levinson to Ash Boulevard
- 2 lane asphalt pavement roadway north of Ash Boulevard.
- Open drainage northbound from Peterson Drive to Ash Boulevard.
- Open drainage southbound from the northern project limit to Ash Boulevard.



Intersection 1: Middletown Warwick Road & Doc Levinson Drive/Peterson Drive

Side-Road Existing Conditions

Doc Levinson Drive is a 0.42-mile local road within Investment Strategy Level 1, which links Middletown Warwick Road to the Middletown Village residential development. The parcels along the frontage are zoned Employment/Regional Retail and are expected to be developed into commercial properties. The current AADT for Doc Levinson Drive is estimated at 1,850 VPD, and the speed limit is 25 mph; therefore a 30-mph design speed was utilized for conceptual design.

Peterson Drive is a 0.37-mile local road located within Investment Strategy Level 1, which links Middletown Warwick Road to Main Street behind the Market Place shopping center. The Norfolk Southern Railroad borders Peterson Road to the east. The road has no opportunities for future development but will remain a useful connector road. The current AADT for Peterson Drive is estimated at 1,000 VPD, and the speed limit is 25 mph; therefore a 30-mph design speed was utilized for conceptual design. This intersection is currently signalized.

Road Site Conditions – Peterson Drive

- OPC Index (unknown)
- 2-lane asphalt pavement, with 3 lanes near the intersection approach (right turn lane and combined left/through lane)
- Combination closed/open drainage

Road Site Conditions – Doc Levinson Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Closed drainage

Design Elements

- No major design deficiencies are identified at this intersection.

Utilities

- A 20' wide utility easement exists along the west side of Middletown Warwick Road and along both sides of Doc Levinson Drive.
- Aerial
 - There are multiple aerial electric and communication lines running throughout the area with no apparent impacts.
- Underground
 - Eastern Shore Natural Gas and Chesapeake Gas both have underground facilities through the intersection.
 - The Town of Middletown owns a sanitary sewer force main and a water line that runs along the west side of Middletown Warwick Road and under Doc Levinson Drive.
 - Various communication utilities run underground along Doc Levinson Drive.
- Potential Conflicts:
 - At this time, no major utility conflicts are anticipated at this intersection. There appears to be enough space for closed drainage, light poles and/or signal equipment to be placed without impact to the underground utilities.

Potential for Future Development:

- A parcel on the eastbound side of Doc Levinson Drive is currently owned by Microtel Hotels, so it is anticipated that a hotel will be developed. Along the westbound side of Doc Levinson Drive, the parcel is now currently named Northside Shopping Center, it is anticipated that a retail center will be developed on that parcel. Development at this location has been slow to develop over the last two decades.

Multi-modal Analysis:

- Doc Levinson Drive currently has no pedestrian and/or bicycle facilities near the intersection. Middletown Warwick Road has an existing sidewalk along the northbound side of the roadway that ends at the Peterson Road intersection and continues along the west side of Peterson Road.
- It is anticipated that the parcels to be developed will be required, as part of their plan, to add pedestrian facilities to the intersection to connect to the existing pedestrian facilities. Since the parcels have been very slow to develop, leaving a pedestrian gap between established residential areas and established commercial areas, JMT suggests adding pedestrian facilities along southbound Middletown Warwick Road and on both sides of Doc Levinson Drive as part of the TID.

Recommendations:

To meet LOS D:

- The existing striping layout currently satisfies the storage lengths recommended by the TID analysis for auxiliary lanes for Peterson Drive and Middletown Warwick Road; therefore, no improvements are proposed along the Middletown Warwick Road and Peterson Drive legs of the intersection.
- The eastbound Doc Levinson Drive approach to the intersection requires the installation of a designated right turn lane with 250' of storage and a 50' taper.
- Install a 5' sidewalk along both sides of Doc Levinson Drive connecting the current residential section of Middletown Village to the intersection with Middletown Warwick Road. Also, this connection should continue south along Middletown Warwick Road to meet the existing sidewalk south of the intersection at the right in/right out entrance to the undeveloped parcel. Tie into sidewalk installed in Ash Boulevard intersection improvements (intersection #22).
 - This improvement will require installation of pedestrian signals and one crosswalk across both Doc Levinson Drive and Middletown Warwick Road on the southerly leg of the intersection.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$1,550,278. See attached estimate in Attachment 2 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- Mill and overlay the Doc Levinson Drive approach to the intersection with Middletown Warwick Road.
- No intersection improvements are required along both legs of the Middletown Warwick Road approach to the intersection as well as Peterson Drive.
- Install 5' sidewalk from right in right out south of Doc Levinson Drive up to Ash Boulevard along the Southbound side of Middletown Warwick Road. Install 5' sidewalk along both sides of Doc Levinson Drive.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$835,055. See attached estimate in Attachment 2E for more information.
- See attached intersection diagram in Attachment 1 for more information.

Intersection 2: Middletown Warwick Road & Sandhill Drive

Side-Road Existing Conditions

Sandhill Drive is a 0.33-mile local road/development access within Investment Strategy Level 1. On the southbound side of Middletown Warwick Road, Sandhill Drive links Bunker Hill Road and Middletown Warwick Road. On the northbound side of Middletown Warwick Road, it serves as an entrance to the Market Place commercial development. The AADT of Sand Hill Drive is estimated at 4,100 VPD. The posted speed limit is 25-mph; therefore a 30-mph design speed is to be utilized for conceptual design.

Road Site Conditions - Sandhill Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Eastbound Sandhill Drive is right out only onto southbound Middletown Warwick Road
- Westbound Sandhill Drive is right out only onto northbound Middletown Warwick Road
- Closed drainage

Utilities

- Aerial
 - A primary aerial electric line runs along the southbound side of Middletown Warwick Road.
 - Various communication lines are also attached to the utility poles.
- Underground
 - Underground communication lines run along both sides of the intersection.
 - A Town of Middletown water line runs underground southbound along Middletown Warwick Road, entering the development on the north side of Sandhill Drive.
 - A Town of Middletown Sanitary Sewer line runs along the northbound side of Middletown Warwick Road.

Potential for Future Development:

- There are no projects currently in development in the area but there are two undeveloped parcels on Sandhill Drive, centrally located between Middletown Warwick Road and Bunker Hill Road, that are zoned as Employment/Regional Retail.

Multi-modal Analysis:

- Both Middletown Warwick Road and Sand Hill Drive have sidewalks on both sides of the road with crosswalks across both minor legs of the intersection. The intersection is currently unsignalized and therefore does not have any pedestrian crossings across Middletown Warwick Road.

Recommendations:

- Based on the existing conditions and future projections, no improvements are needed at this intersection.

Intersection 3: Middletown Warwick Road & Bunker Hill Road/West Main Street

Side-Road Existing Conditions

Bunker Hill Road (N437) is a 1.07-mile major collector within Investment Strategy level 1. The current AADT for Bunker Hill Road is 2,336 VPD. The roadway is a separated 4 lane roadway with 12' travel lanes. The speed limit is 35-mph; therefore a 40-mph design speed was used for conceptual design.

West Main Street (N438) is a 0.33-mile minor arterial road within Investment Strategy level 1. The current AADT for West Main Street is 17,234 VPD. West Main Street is a 2-lane asphalt pavement. The speed limit for West Main Street is 25-mph; therefore, a design speed of 30-mph was utilized for conceptual design. This intersection is currently signalized.

Road Site Conditions – Bunker Hill Road

- OPC Index (83)
- 4-lane separated asphalt pavement
- Approach has a right turn lane, a bike lane, two through lanes and two left turn lanes
- Closed drainage

Road Site Conditions – West Main Street

- OPC Index (62)
- 4-lane asphalt pavement
- Approach has a right turn lane, a bike lane, two through lanes and two left turn lanes
- Closed drainage

Design Elements

- No major design deficiencies were identified for this intersection.

Utilities

- Aerial
 - South of this intersection, a primary aerial electric service line runs along both the northbound and southbound sides of Middletown Warwick Road. North of the intersection, the aerial electric service line runs along the southbound side of Middletown Warwick Road.
 - Aerial electric service lines run along both sides of West Main Street. Aerial service lines run along westbound Bunker Hill Road.
- Potential Conflicts:
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- Along Eastbound Bunker Hill Road, Westtown Town Center is currently developing multiple large retail stores.

Multi-modal Analysis:

- There are existing sidewalks along both sides of Middletown Warwick Road and West Main Street. There are no bike facilities along Middletown Warwick Road. There are bike lanes along Bunker Hill Road and West Main Street. Sidewalks currently exist on the south side of Bunker Hill Road, so it is recommended that sidewalk be added on the

north side of the road to complete the pedestrian connectivity between Sandhill Drive and Middletown Warwick Road.

Recommendations:

To meet LOS D:

- Install 5' sidewalk connecting the sidewalk from the southeast corner of the Hampton Inn parcel to sidewalk along westbound Bunker Hill Road.
- Extend the storage length of the right-turn lane along Bunker Hill Road to 300' with a 50' taper and replace the sidewalk as needed.
- At this time, there is a single left turn lane along northbound and southbound Middletown Warwick Road. Install a second left turn lane along each approach and extend the storage length of the southbound double left turn lanes to 550' with a 150' taper and the northbound double left turns to 300' with a 150' taper.
- It is also recommended to extend the right turn lanes along northbound and southbound Middletown Warwick Road to 325' of storage with a 50' taper.
- The recommended storage lengths for auxiliary lanes along West Main Street are satisfied by the existing striping layout; therefore, no improvements are proposed along West Main Street.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$3,245,608. See attached estimate in Attachment 3 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- Install 5' sidewalk connecting the sidewalk from the southeast corner of the Hampton Inn parcel to sidewalk along westbound Bunker Hill Road.
- Extend the storage length of the right-turn lane along Bunker Hill Road to 300' with a 50' taper and replace the sidewalk as needed.
- It is also recommended to extend the right turn lane along northbound Middletown Warwick Road to 425' of storage with a 50' taper.
- Extend southbound Middletown Warwick Road left turn lane storage to 550' with 100' taper. Provide an additional left turn lane with 325' of storage along northbound Middletown Warwick Road with a 100' taper.
- Install intersection lighting.
- The recommended storage lengths for auxiliary lanes along West Main Street are satisfied by the existing striping layout; therefore, no improvements are proposed along West Main Street.
- The estimated cost of intersection improvements is \$2,272,565. See attached estimate in Attachment 3E for more information.
- See attached intersection diagram in Attachment 1 for more information.

Intersection 20,21: Middletown Warwick Rd & Summit Bridge Road & N. Broad Street

Side-Road Existing Conditions

SR 71 north of the intersection is Summit Bridge Road. Summit Bridge Road (N039) is a 3.35-mile other principal arterial road within Investment Strategy level 1. The current AADT for Summit Bridge Road is 26,568 VPD. Summit Bridge Road north of the intersection is a 2-lane asphalt pavement roadway. The posted speed limit is 45-mph; therefore, a design speed of 50-mph shall be utilized for design. South of the intersection SR 71 is North Broad Street.

North Broad Street (N039) is a 1.00-mile major collector within Investment Strategy level 1. The current AADT for North Broad Street is 9,312 VPD. North Broad Street is a 2-lane asphalt pavement roadway. The posted speed limit of this road is 35-mph; therefore, a design speed of 40-mph is to be utilized in conceptual design. This intersection is currently signalized and located near a railroad crossing.

Road Site Conditions – Summit Bridge Road

- OPC Index (94)
- 2-lane asphalt pavement
- Open drainage

Road Site Conditions – North Broad Street

- OPC Index (87)
- 2-lane asphalt pavement
- Open drainage

Design Elements

- Although there are no geometric concerns with the current configuration of the intersection, the inclusion of an at-grade railroad crossing (Norfolk Southern) creates complexity. A future project to remove the at-grade crossing is recommended, but not included in the TID analysis or cost estimates.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the southbound side of North Broad Street.
 - There is a primary aerial electric service line running along both sides of Middletown Warwick Road and Summit Bridge Road. Near the railroad there is a brief area where the utility poles are only along the western side of Middletown Warwick Road.
- Potential Conflicts:
 - At this time, no major underground utility conflicts are anticipated at this intersection. There appears to be enough space for drainage items, light poles and/or signal equipment to be placed without impact to the underground utilities.
 - The aerial pole line along the southbound side of Middletown-Warwick Road will likely need to be relocated. The poles appear to be within DelDOT's right-of-way and would be relocated at no cost to DelDOT.

Potential for Future Development:

- A self-storage facility & retail center is planned along the western side of Summit Bridge Road near the intersection according to the PDCA (Planning Development Coordination Application).

Multi-modal Analysis:

- There are currently no pedestrian and/or bike facilities along Middletown Warwick Road, Summit Bridge Road, and North Broad Street near the intersection.

Recommendations:

- With the construction of the SR71 connector, no improvements will be required at this intersection.

Intersection 22: Middletown Warwick Rd & Ash Boulevard

Side-Road Existing Conditions

Ash Boulevard is a 0.36-mile local road within Investment Strategy level 1 which links Middletown Warwick Road to the Middletown Village subdivision. The current AADT for Ash Boulevard is estimated at 3,600 VPD. Ash Boulevard is a 2-lane separated asphalt roadway. The posted speed limit for Ash Boulevard is 25-mph; therefore, a design speed of 30-mph shall be utilized for conceptual design. The intersection is not currently signalized.

Road Site Conditions – Ash Boulevard

- OPC Index (unknown)
- 2-lane separated asphalt pavement
- Closed drainage

Design Elements

- There are no apparent design deficiencies at this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the south side of Ash Boulevard.
 - There is a primary aerial electric service line running along both sides of Middletown Warwick Road near this intersection.
- Underground
 - A Town of Middletown water and sewer line runs underground southbound along Middletown Warwick Road.
 - A Chesapeake Utilities gas line runs along the southbound side of Middletown Warwick Road south of the intersection.
 - Eastern Shore has natural gas lines running along the southbound side of Middletown Warwick Road south of the intersection.
- Potential Conflicts
 - With widening proposed along the southbound side of Middletown Warwick Road, it is possible that the underground utilities will have to be relocated.

Potential for Future Development:

- The road is currently developed on 2 corners and is bordered closely by the Norfolk Southern Railroad to the east. There is currently no development planned near the intersection and there is no potential for future development adjacent to the intersection.

Multi-modal Analysis:

- There are no pedestrian and/or bike facilities along Middletown Warwick Road near the intersection.

- There is an existing sidewalk present on both sides of Ash Boulevard.

Recommendations:

- With the construction of the SR71 connector, no improvements will be required at this intersection.

Corridor A2: Middletown Warwick Road - Existing Conditions

This section of Middletown Warwick Road (N443) is a 0.50-mile principal arterial road within Investment Strategy Level 1. This section of Middletown Warwick Road is from Bunker Hill Road to Diamond State Boulevard. The current AADT for Middletown Warwick Road is 19,052 VPD. The roadway is a separated 4 lane roadway with 12' travel lanes. The posted speed limit is 50-mph; therefore a 55-mph design speed was used for conceptual design.

Road Site Conditions

- OPC Index (78)
- 4 lane separated asphalt pavement
- Closed drainage



Intersection 4: Middletown Warwick Road & Diamond State Blvd & South Ridge Ave

Side-Road Existing Conditions

Diamond State Boulevard is a 0.48-mile local road within Investment Strategy Level 1 which links Middletown Warwick Road and the Westown Town Center. The current AADT of Diamond State Boulevard is estimated at 4,900 VPD. The posted speed limit is 25-mph; therefore, a design speed of 30-mph was used in conceptual design. This intersection is currently signalized.

South Ridge Avenue is a 0.07-mile commercial road within Investment Strategy Level 1 which links Middletown Warwick Road and Westown Town Center. South Ridge Avenue is a 2-lane separated asphalt roadway. There is no posted speed along South Ridge Avenue; therefore, a design speed of 25-mph was used in conceptual design. The approach to Middletown Warwick Road has two left turn lanes, a through lane, and a right turn lane.

Road Site Conditions – Diamond State Blvd

- OPC Index (unknown)
- 4 lane separated asphalt pavement
- Approach has a right turn lane, a through lane, and two left turn lanes
- Closed drainage

Road Site Conditions – South Ridge Ave

- OPC Index (unknown)
- 2 lane separated asphalt pavement
- Approach has a right turn lane, a through lane, and two left turn lanes
- Closed drainage

Design Elements

- There are no apparent design deficiencies at this intersection.

Utilities

- Aerial
 - South of this intersection, there is a primary aerial electric service line running along the southbound side of Middletown Warwick Road. North of the intersection, a primary aerial electric service line runs on both sides of Middletown Warwick Road.
 - Various communication lines are also attached to the utility poles.
 - There is an aerial electric service line along the north side of Diamond State Boulevard.
- Underground
 - Underground communication lines run along both sides of the intersection.
 - An Artesian Water line crosses Middletown Warwick Road along southbound South Ridge Avenue to Diamond State Boulevard.
 - A Chesapeake Utilities gas line crosses Middletown Warwick Road on the north side of South Ridge Avenue and Diamond State Boulevard.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection. There appears to be enough space for drainage, light poles and/or signal equipment to be placed without impact to the underground utilities.

Potential for Future Development:

- Along the south side of Diamond State Boulevard Middletown Auto Mall is currently in development.

Multi-modal Analysis:

- There are sidewalks along both sides of Diamond State Boulevard, South Ridge Avenue, and Middletown Warwick Road north of the intersection. South of the intersection, there is a sidewalk along the southbound side of Middletown Warwick Road.

Recommendations:

To meet LOS D:

- The recommended storage lengths for auxiliary lanes along northbound Middletown Warwick Road are satisfied by the existing striping layout; therefore no roadway improvements are proposed along northbound Middletown Warwick Road.
- Add a sidewalk on the northbound side of Middletown Warwick Road between Vintage Drive and Diamond State Blvd.
- Extend the length of the right turn lanes along southbound Middletown Warwick Road by 200', Diamond State Boulevard by 50', and South Ridge Road by 75'.
- Existing lighting at intersection will be satisfactory. No additional lighting required.
- The estimated cost of intersection improvements is \$792,765. See attached estimate in Attachment 6 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- No roadway intersection improvements are required based on future projections for LOS E.
- Install 5' sidewalk along the northbound side of Middletown Warwick Road south of the intersection from Diamond State Boulevard to Vintage Avenue.
- The estimated cost of intersection improvements is \$268,285. See attached estimate in Attachment 6E for more information.

Corridor A3: Middletown Warwick Road - Existing Conditions

Middletown Warwick Road (N443) is a 0.47-mile principal arterial road within Investment Strategy level 1. This section of Middletown Warwick Road goes from Levels Road to Merrimac Avenue. The current AADT for Middletown Warwick Road is 15,778 VPD. The roadway is a separated 4 lane roadway with 12' travel lanes. The posted speed limit is 50-mph; therefore a 55-mph design speed was used for conceptual design.

Road Site Conditions

- OPC Index (78)
- 4 lane separated asphalt pavement
- Closed drainage



Intersection 5: Middletown Warwick Road & Merrimac Avenue

Side-Road Existing Conditions

Merrimac Avenue is a 1.30-mile municipal road within Investment Strategy level 1. The current AADT of Merrimac Avenue is estimated at 5,140 VPD. Merrimac Avenue is a 4-lane separated roadway. The posted speed limit is 35-mph; therefore, a design speed of 40-mph was used in conceptual design. This intersection is currently signalized.

Road Site Conditions – Merrimac Avenue

- OPC Index (unknown)
- 4-lane separated asphalt pavement
- Both approaches along Merrimac Ave have a right turn lane, a bike lane, two through lanes, and two left turn lanes
- Closed drainage

Design Elements

- There are currently no design deficiencies identified at this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the southbound side of Middletown Warwick Road.
 - Various communication lines are also attached to the utility poles.
 - There are no aerial electric service lines along Merrimac Avenue.
- Underground
 - Underground communication lines run along both sides of the intersection.
 - A Town of Middletown sewer line crosses Merrimac Avenue close to the intersection north of the intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection. There appears to be enough space for drainage, light poles and/or signal equipment to be placed without impact to the underground utilities.

Potential for Future Development:

- Near this intersection, along northbound Middletown Warwick Road there is current and future development occurring in Hedgelawn Plaza, including the construction of a Harley Davidson building.

Multi-modal Analysis:

- There are sidewalks along the southbound side of Middletown Warwick Road, and on both sides of Merrimac Avenue west of the intersection. As part of the development of Hedgelawn Plaza, sidewalks are being installed along the northbound side of Middletown Warwick Road south of the intersection. There are no bike facilities along

Middletown Warwick Road. Designated bike facilities are present along Merrimac Avenue on both sides of the intersection.

Recommendations:

To meet LOS D:

- The recommended storage lengths for auxiliary lanes along southbound Middletown Warwick Road and southbound Merrimac Avenue are satisfied by the existing striping layout; therefore, no improvements are proposed along southbound Middletown Warwick Road and southbound Merrimac Avenue.
- Install 5' sidewalk on the northbound side of Middletown Warwick Road from Hedgelawn Plaza to Vintage Avenue.
- As part of intersection improvements pedestrian signals will need to be installed along the northbound side of Middletown Warwick Road.

Option 1:

- The right turn lane on northbound Merrimac Avenue towards northbound Middletown Warwick Road shall become a third travel lane along Middletown Warwick Road that is kept until Vintage Avenue where the lane is dropped as a right turn only.
- The northbound approach of Middletown Warwick requires the extension of the designated right turn lane to 525' with a 50' taper and the dual left turn lanes to 550' with a 150' taper.
- Existing lighting at intersection will be satisfactory. No additional lighting required.
- The estimated cost of intersection improvements for this option is \$3,607,898. See attached estimate in Attachment 7 for more information.
- See attached intersection diagram in Attachment 1 for more information.

Option 2:

- Along northbound Merrimac Avenue, install a double right turn lane onto Middletown Warwick Road.
- Lengthen the northbound Middletown Warwick Road dual left turn lane storage of northbound Middletown Warwick Road to 550' with a 150' taper. Lengthen the right turn lane storage onto southbound Merrimac Avenue to 525' with a 50' taper.
- Existing lighting at intersection will be satisfactory. Southeast corner of intersection existing lighting will have to be adjusted due to the double right turn lane installation.
- The estimated cost of intersection improvements for this option is \$3,733,338. Most conservative cost option was used in the overall cost estimates. See attached estimate in Attachment 8 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- No roadway intersection improvements are required based on future projections for LOS E.
- Install a 5' sidewalk along the northbound side of Middletown Warwick Road south of Vintage Avenue down to south of the intersection and tie into existing sidewalk at Hedgelawn Plaza.
- The estimated cost of intersection improvements for this option is \$428,325. See attached estimate in Attachment 7E for more information.

Intersection 6: Middletown Warwick Road & Levels Road

Side-Road Existing Conditions

Levels Road (N010) is a 1.01-mile minor collector within Investment Strategy Level 1. The current AADT for Levels Road is 3,949 VPD. Levels Road is a 4-lane separated asphalt pavement roadway. The posted speed limit is 35-mph; therefore a 40-mph design speed was used for conceptual design. This intersection is currently signalized.

Road Site Conditions – Levels Road

- OPC Index (85)
- 4-lane separated asphalt pavement
- Southbound approach to intersection has a right turn lane, a bike lane, a through lane, and two left turn lanes
- Northbound approach has a right turn lane, a bike lane, a through lane, and a left turn lane
- Closed drainage

Design Elements

- There are currently no design deficiencies noted for this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the southbound side of Middletown Warwick Road. There is also a primary aerial electric service line that runs along the eastbound side of Levels Road east of the intersection.
- Underground
 - An Artesian Water line runs along the northbound side of Middletown Warwick Road near the intersection.
 - Underground communication lines run along both sides of the intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection. There appears to be enough space for drainage, light poles and/or signal equipment to be placed without impact to the underground utilities.

Potential for Future Development:

- At the northwest corner of the Levels Road and Middletown Warwick intersection, there is currently a Wawa in development. Along the northern Levels Road approach, the Poole Farm commercial project is also in development.
- Along northbound Middletown Warwick Road, Levels Business Park is currently in development. East of the intersection Parcel E-2 Apartments are in development.
- At the southwest corner of the intersection Summerton Place is currently in development.

Multi-modal Analysis:

- There are no bike facilities along northbound Middletown Warwick Road. All other approaches to the intersection have designated bike lanes.
- North of the intersection, there is a 5' sidewalk on the southbound side of Middletown Warwick Road. There is a short segment of pedestrian facility on the southwest corner of the intersection. South of the intersection, there is no pedestrian facility along southbound Middletown Warwick Road.
- There are pedestrian facilities on both sides of Levels Road on the east side of the intersection. The pedestrian facility extends along northbound Middletown Warwick Road across the Royal Farms frontage but does not provide a connection to the southeasterly corner.
- There are crosswalks across Middletown Warwick Road on the northerly side of the intersection and across SR 299 on the westerly side of the intersection.

Recommendations:

To meet LOS D:

- For improvements on southbound Levels Road east of the intersection, to avoid conflicts with the new developments, hold the southbound curb line and push all improvements to the northern side of Levels Road.
- Install an additional through lane along both northbound and southbound Levels Road.
- Install an additional left turn lane on northbound Middletown Warwick Road and extend left turn storage to 200'. Lengthen the right turn storage lane onto southbound Levels Road to 305' with a 50' taper.
- Install an additional left turn lane on southbound Levels Road and extend the left turn lane storage to 650' with a 150' taper.
- Install an additional left turn lane on northbound Levels Road and extend the left turn lane storage to 200' with a 150' taper.
- Install 5' sidewalk along both sides of Levels Road north of the intersection. South of the intersection install sidewalk along southbound Middletown Warwick Road. North of the intersection install sidewalk along the northbound side of Middletown Warwick Road. Installation of pedestrian signals is required as part of intersection improvements.
- Provide pedestrian connection at the southwest corner of the intersection. Add connection to existing sidewalk in front of Royal Farms.
- Install an additional left turn lane along northbound Levels Road and change the storage to 200'.

Option 1:

- The northbound Levels Road right turn lane becomes a third northbound Middletown Warwick Road travel lane that drops as a right turn only onto Hedgelawn Way. The right turn lane requires 250' of storage with a 50' taper.
- On southbound Middletown Warwick Road, add an additional left turn lane and extend the existing storage to 600' with a 150' taper.

- Existing lighting at intersection will be satisfactory. No additional lighting required.
- The estimated cost of intersection improvements for this option is \$6,012,185. See attached estimate in Attachment 9 for more information.
- See attached intersection diagram in Attachment 1 for more information.

Option 2:

- For northbound Levels Road, install a double right turn lane onto northbound Middletown Warwick Road with 625' of storage with a 50' taper.
- On southbound Middletown Warwick Road add an additional left turn lane and extend the existing storage to 750' with a 150' taper.
- Intersection lighting to be disturbed by installation of the double right turn lane. Adjust lighting accordingly.
- The estimated cost of intersection improvements for this option is \$5,463,693. Most conservative cost option was used in the overall cost estimates. See attached estimate in Attachment 10 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- No improvements are required for the northbound approach of Levels Road.
- For the southbound approach of Levels Road requires two left turn lanes with 650' of storage with a 100' taper. Widen into the median. Hold the existing southbound edge of pavement.
- The northbound Middletown Warwick Road approach requires two left turn lanes with 415' of storage with a 100' taper as well as a right turn lane with 305' of storage with a 50' taper. Widening for the additional left turn lane will go into the median. Hold the existing edge of pavement. The southbound approach along Middletown Warwick Road requires two left turn lanes with 600' of storage with a 100' taper and a right turn lane with 300' of storage with a 50' taper.
- Install 5' along both sides of Levels Road north of the intersection to connect to future Poole Property Access. Install 5' sidewalk along the northbound side of Middletown Warwick Road from Hedgelawn Way to the Greenhill Car Wash. Install along the southbound side of Middletown Warwick Road from the Levels Road intersection to the 301 Travel Plaza.
- Existing lighting satisfactory at this intersection. No additional lights required.
- The estimated cost of intersection improvements for this option is \$2,144,785. See attached estimate in Attachment 9E for more information.

Corridor A4: Middletown Warwick Road - Existing Conditions

Middletown Warwick Road (N443) is a 1.39-mile principal arterial road within Investment Strategy level 1. This section of Middletown Warwick Road is from the Hooper Inc retail entrance to Levels Road. The current AADT for Middletown Warwick Road is 16,015 VPD. Middletown Warwick Road is a separated four-lane roadway with 12' travel lanes that transitions to a three-lane roadway south of Levels Road. The posted speed limit is 50-mph; therefore a 55-mph design speed is to be utilized for conceptual design.

Road Site Conditions

- OPC Index (78)
- 3-lane asphalt pavement
- Closed drainage



Intersection 18: Middletown Warwick Road & United Drive

Side-Road Existing Conditions

United Drive is a 0.16-mile local road within Investment Strategy level 1 which links Middletown Warwick Road and Patriot Drive. The current AADT for United Drive is estimated at 1,650 VPD. The posted speed limit is 25-mph; therefore a 30-mph design speed is to be utilized for conceptual design. This intersection is not currently signalized.

Road Site Conditions – United Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Closed drainage

Design Elements

- No apparent design deficiencies are noted at this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the southbound side of Middletown Warwick Road.
- Potential Conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- Along northbound Middletown Warwick Road, Levels Business Park is currently in development.
- Along the southbound side of Middletown Warwick Road, 929 Warwick Road and the Poole Farm Property are currently in development.

Multi-modal Analysis:

- There are no bike facilities along Middletown Warwick Road or along United Drive.
- South of the intersection along southbound Middletown Warwick Road there is an existing sidewalk along the frontage of the truck stop. There is no curb ramp on the southwesterly corner at the intersection
- There is a limited run of existing sidewalk on both sides of the intersection along northbound Middletown Warwick Road. The sidewalk continues on both sides of United Drive and includes a crosswalk across United Drive at the intersection.

Recommendations:

To meet LOS D:

- The existing striping on the northbound Middletown Warwick Road approach satisfies the recommended storage lengths, therefore, we do not recommend any improvements south of United Drive.

- No improvements are recommended along United Drive.
- Extend the southbound Middletown Warwick Road right turn lane to provide 305' of storage and a 50' taper.
- North of the intersection, install sidewalks on both sides of Middletown Warwick Road as necessary to connect to pedestrian facilities at the Levels Road intersection.
- The estimated cost of intersection improvements for this option is \$1,660,893. See attached estimate in Attachment 11 for more information.
- See attached intersection diagram in Attachment 1 for more information.
- LOS E improvements match the existing conditions of the intersection.



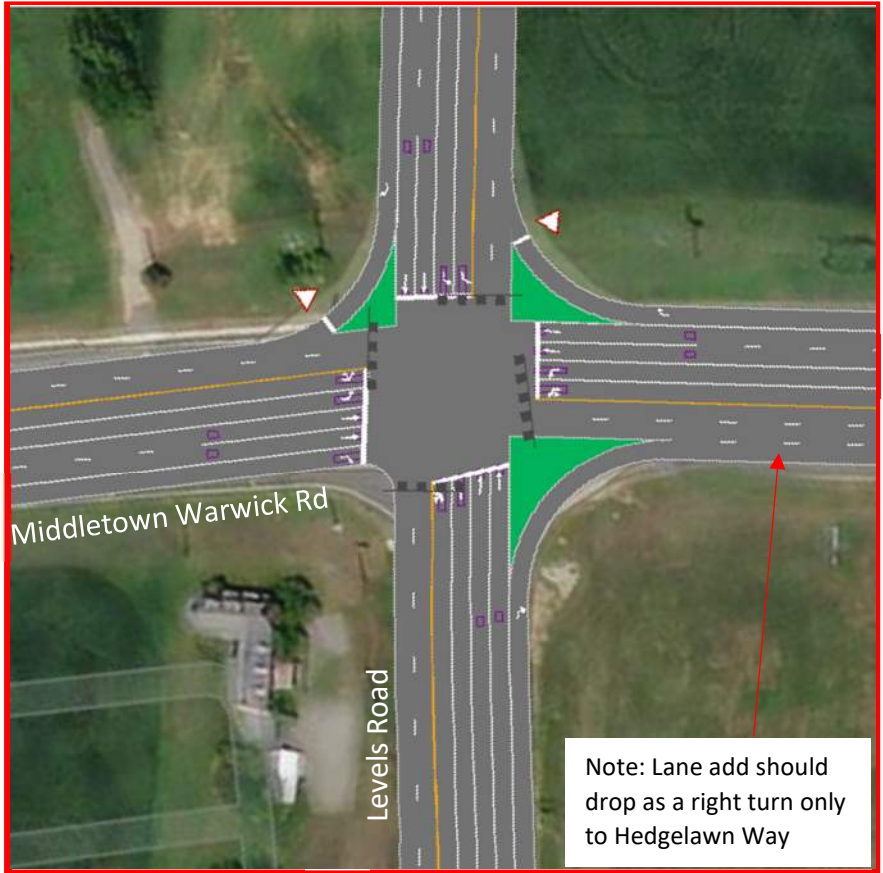
Attachment 1: Intersection Diagrams



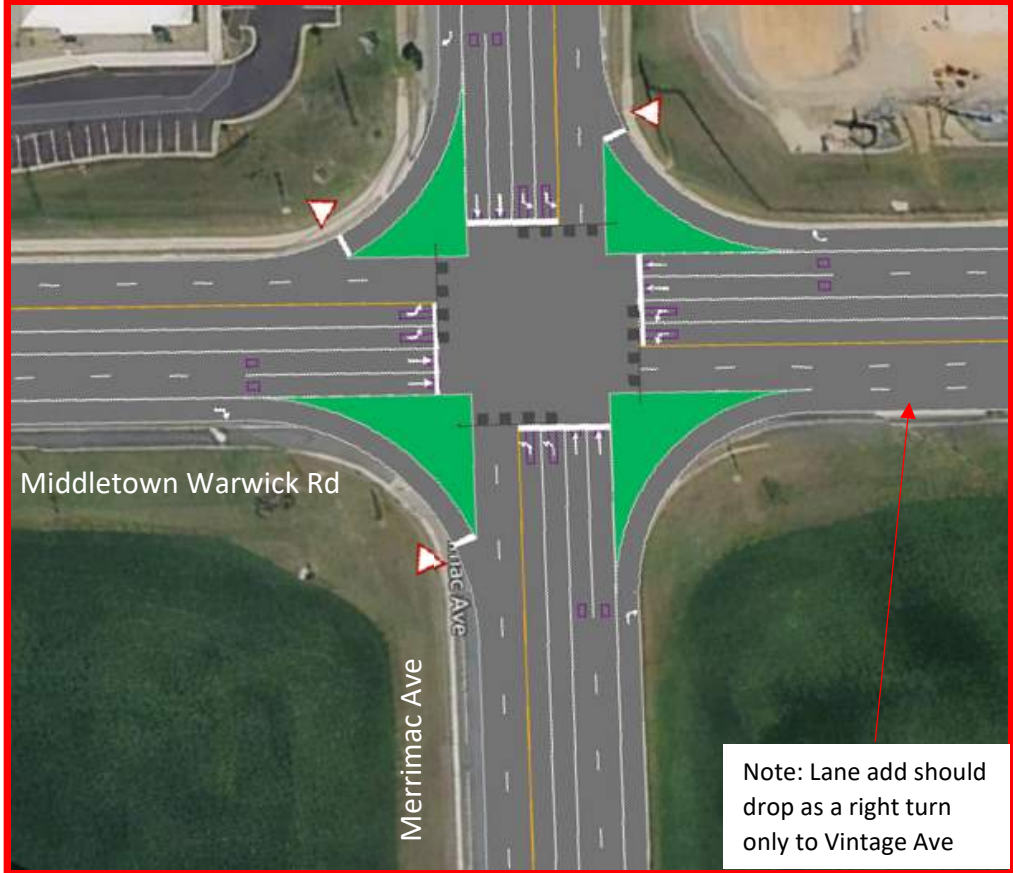
Detail 1 – Maintain Existing TWSC, Extend SB Right Turn Storage



Detail 2 – Widen Existing Signalized Intersection

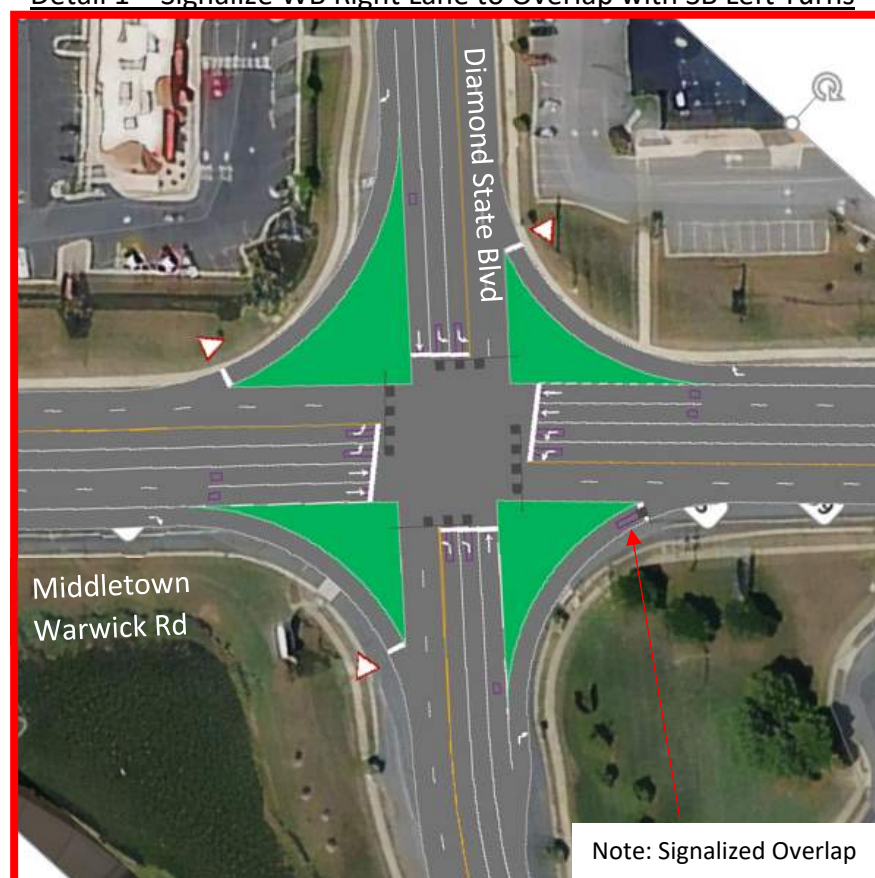


Detail 3 – Modify WB Right Turn Lane

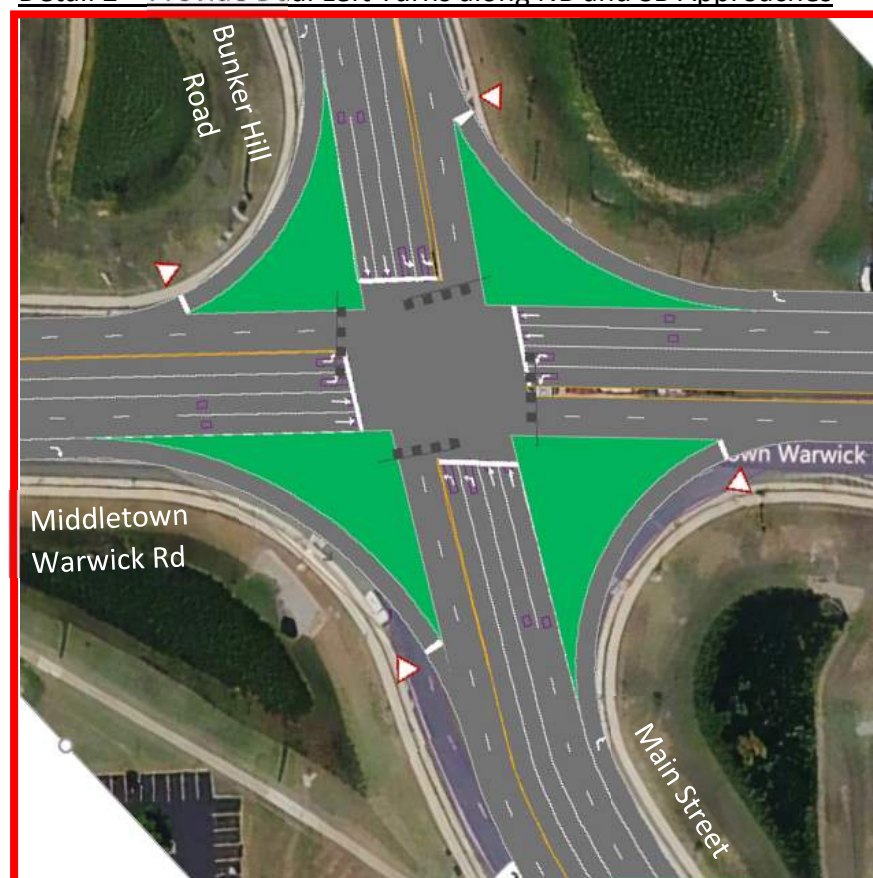




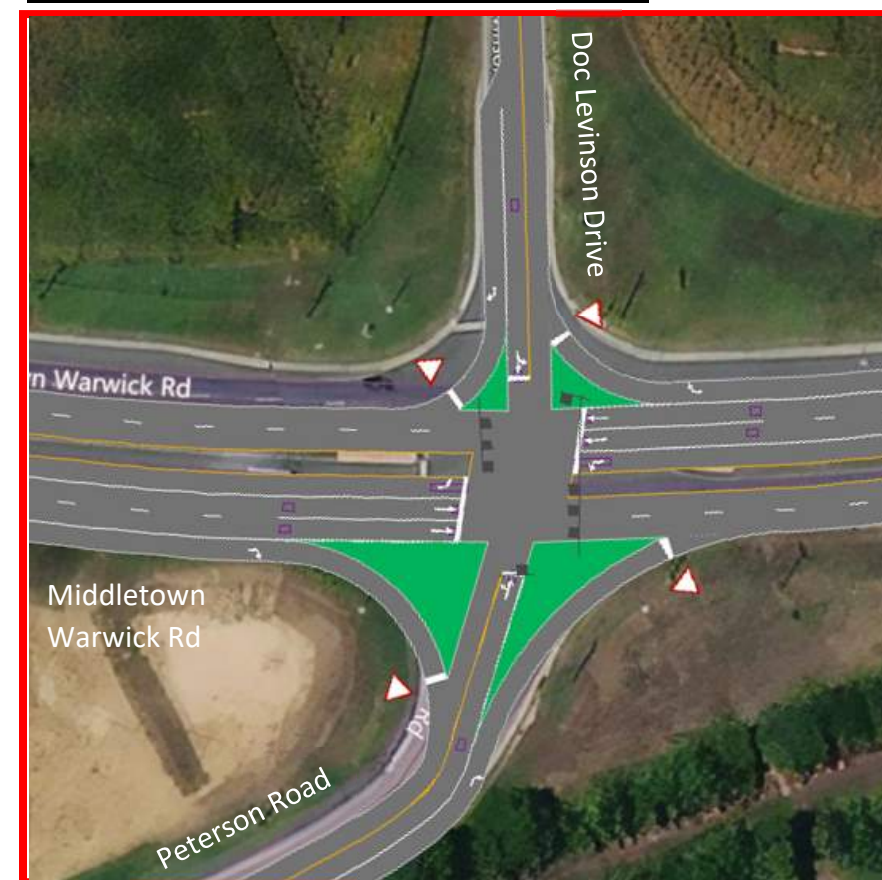
Detail 1 – Signalize WB Right Lane to Overlap with SB Left Turns



Detail 2 – Provide Dual Left Turns along NB and SB Approaches

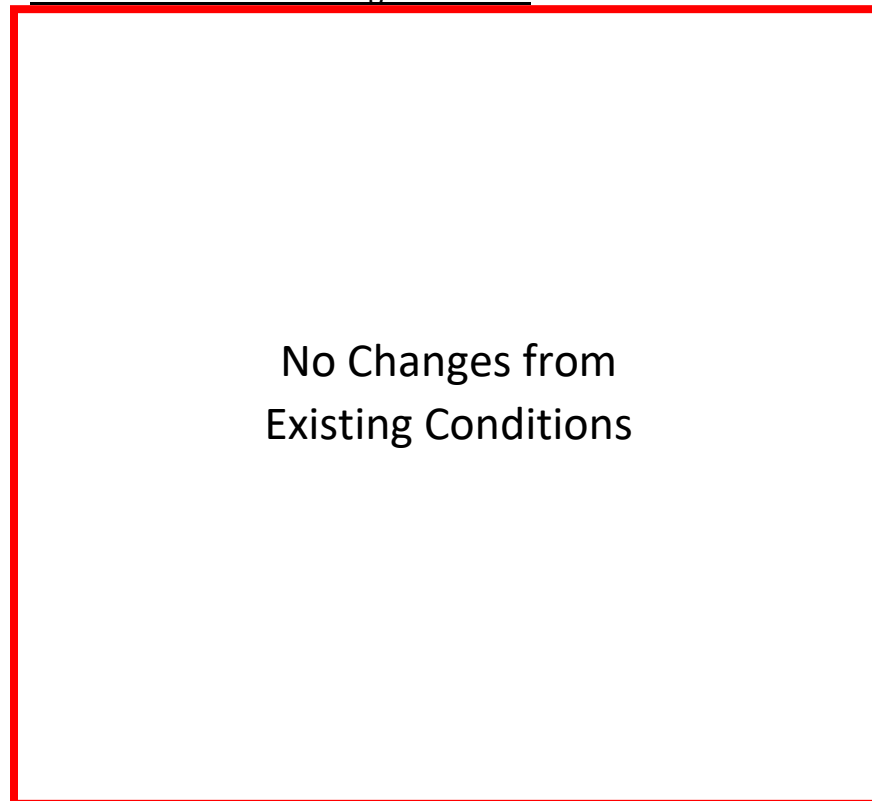


Detail 3 – Provide Additional EB Right Turn Lane

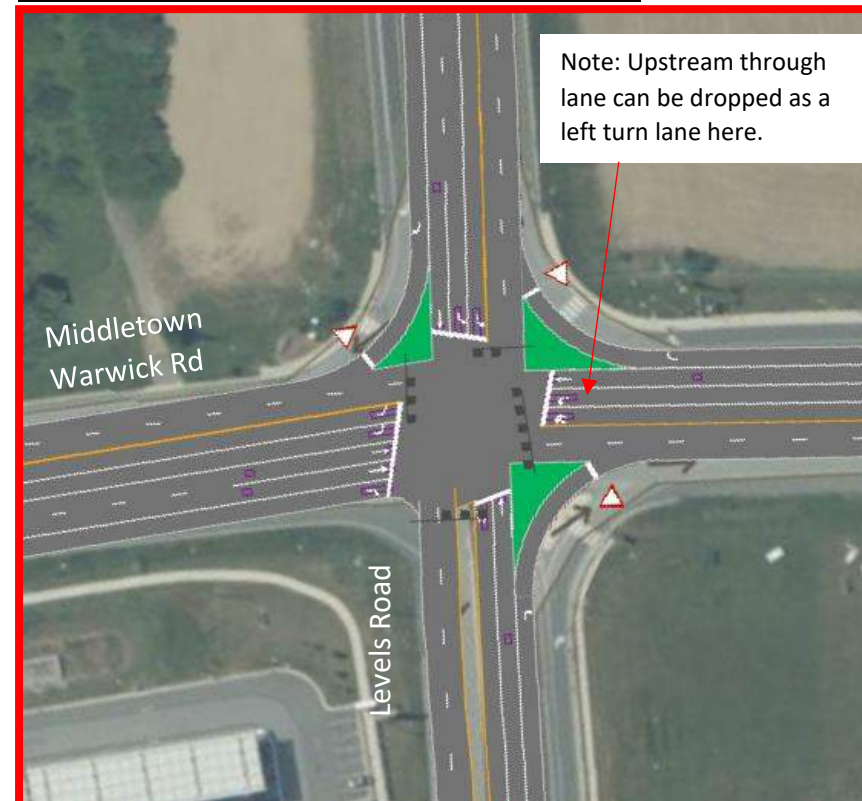




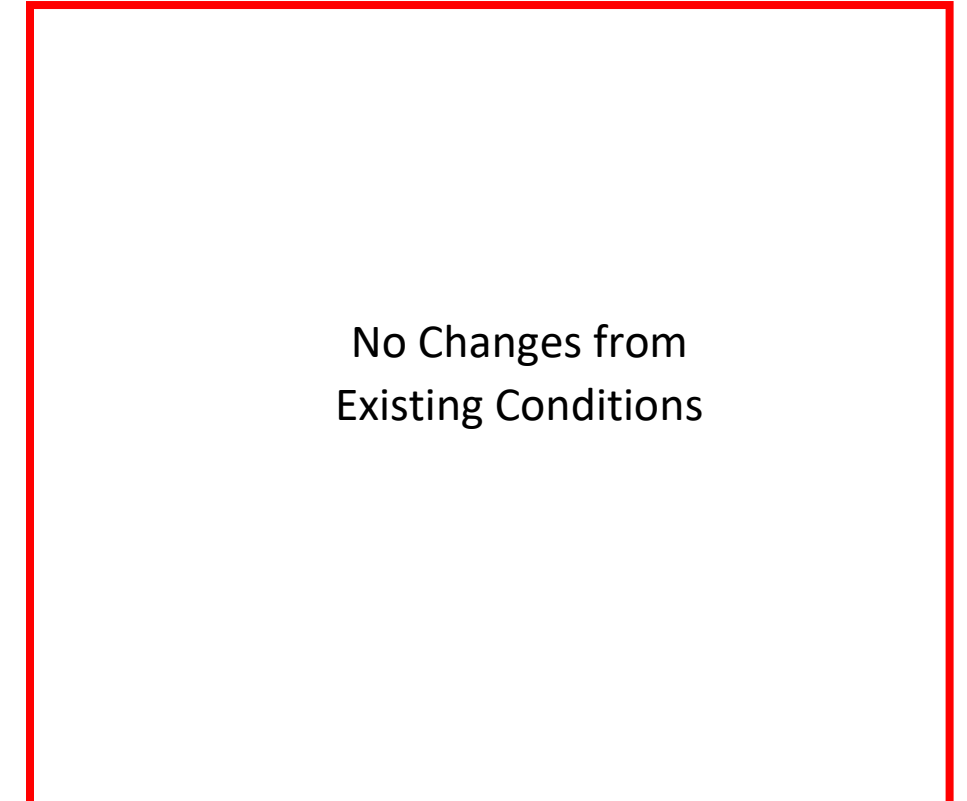
Detail 1 – Maintain Existing Conditions



Detail 2 – Widen Existing Signalized Intersection

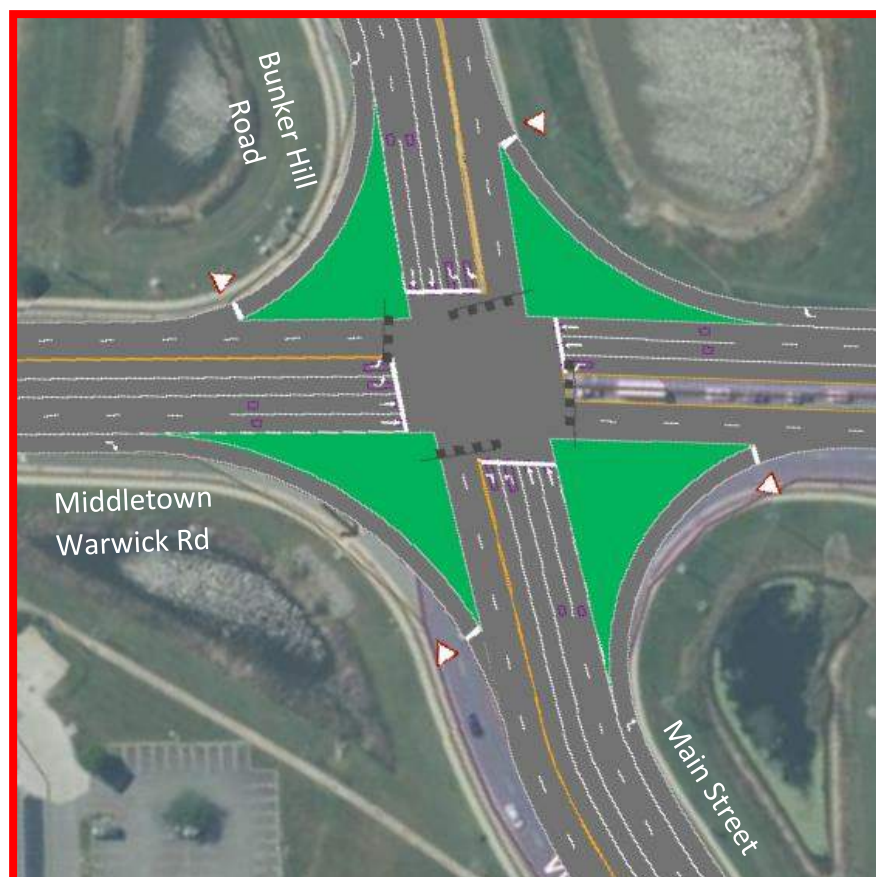


Detail 3 – Maintain Existing Conditions

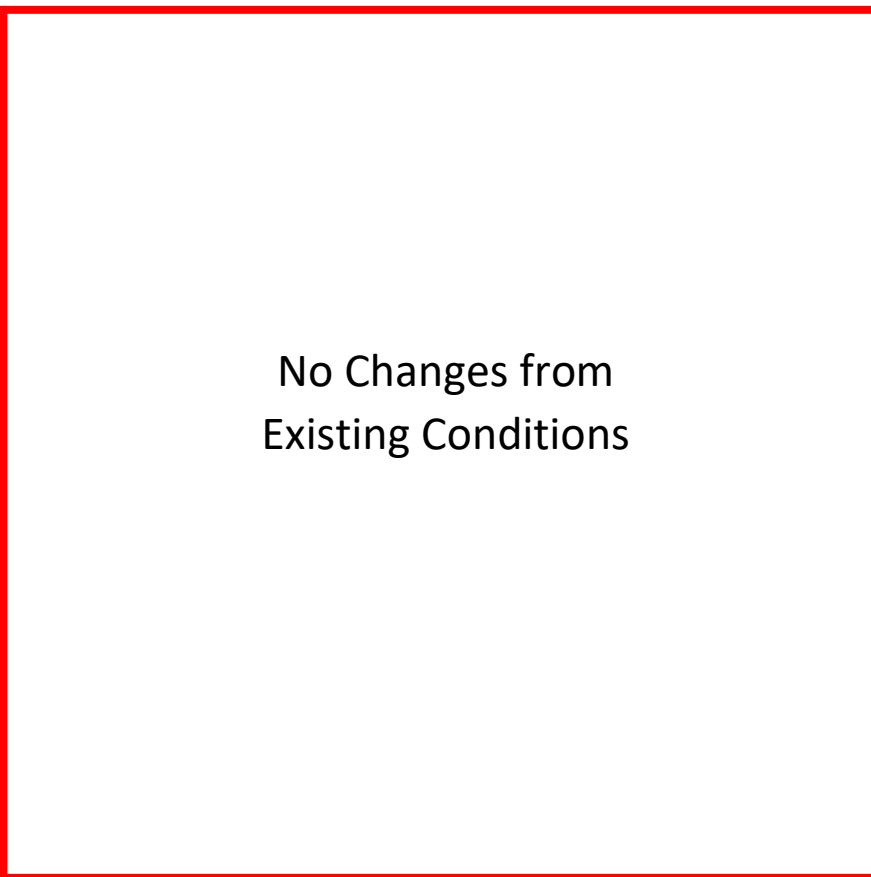


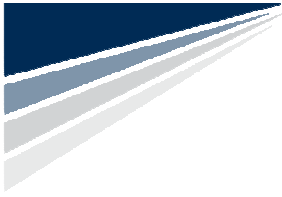


Detail 1 – Provide Dual Left Turns along NB Approach



Detail 2 – Maintain Existing Conditions





Attachment 2 - Intersection 1 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 1 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Doc Levinson Drive</u>	<u>Peterson Drive</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road, Doc Levinson Drive, and Peterson Drive. The existing conditions on Middletown Warwick Road, and Peterson Drive were satisfactory to proposed improvements. Doc Levinson Drive Sidewalk to be installed on north side of Doc Levinson Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$29,700</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$183,700</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$137,500</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,199,378</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,550,278</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 1 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$13,253</u>	E. HISTORIC	<u>\$2,651</u>
B. ARCHAEOLOGY	<u>\$5,301</u>	1. Phase 1 (study)	<u>\$2,651</u>
1. Phase I (study)	<u>\$5,301</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$5,301</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$5,301</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	<u> </u>
1. Phase 1 (study)	<u>\$0</u>	2. _____	<u> </u>
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$27,000

CONTINGENCY COSTS 10% \$2,700
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$29,700
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 1 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$23,855</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$23,855</u>
B. DESIGN ENGINEERING	<u>\$142,678</u>
1. Design	<u>\$79,517</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$79,517</u>
2. Traffic	<u>\$26,505</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$26,505</u>
3. Real Estate Plan Preparation	<u>\$13,253</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 13,253</u>
4. Utilities	<u>\$15,903</u>
a. Inhouse	<u>\$ 5,301</u>
b. Consultant	<u>\$ 5,301</u>
c. Test Holes	<u>\$ 5,301</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$167,000

CONTINGENCY COSTS 10% \$16,700
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$183,700
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 1 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$116,330</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 111,330</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$2,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$5,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$1,100</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$125,000

CONTINGENCY COSTS 10% \$12,500
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$137,500
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 1 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION <u>\$352,592</u></p> <p>1. Grading</p> <p style="padding-left: 20px;">a. Excavation <u>\$1,960</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$79</u></p> <p>2. Drainage <u>\$15,903</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$28,301</u></p> <p style="padding-left: 20px;">b. Base <u>\$80,579</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$0</u></p> <p>4. Erosion/Sed. Cont. <u>\$21,204</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$0</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$191,313</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$13,253</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u>Modular Block</u></p> <p style="padding-left: 20px;">b. Size <u>371 LF</u></p> <p style="padding-left: 20px;">c. \$/l.f. <u>\$50</u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$110,985</u></p> <p>1. Beautification <u>\$110,985</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 13,252.74</u></p>
--	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 1 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$53,280</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 3,280.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$531,000

I. MISC. ITEMS \$79,650

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$26,550

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$26,550

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$53,100

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$716,850

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$107,528

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$824,378

Estimator: JMT

Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator:

Date:

Q. TRAFFIC SECTION ITEMS \$375,000

(Enter on PNR funding line 6)

1. Signing	
2. Signals	\$300,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. <u>Ped Signals</u>	\$75,000

Traffic
Estimator:

Date:



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



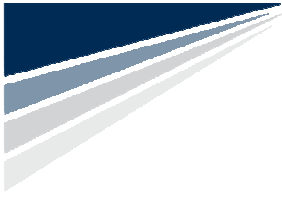
DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 13,253
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 5,301
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 5,301
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 2,651
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.5%	\$ 23,855
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 79,517
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 26,505
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 13,253
4. Utilities		
a. Inhouse	1.0%	\$ 5,301
b. Consultant	1.0%	\$ 5,301
c. Test Holes	1.00%	\$ 5,301
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	6,185.00	\$ 111,330.00	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 111,330.00	Total:	0

Number of Parcels Impacted: 2

Appraisal Fees: \$ 2,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 5,000.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 1,100.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	3171	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	19155	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)				Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Length of 5' Wide Sidewalk (LF)	3061	Type C Depth (in)	2	Hotmix Sawcut (LF)	395
Area of 5' Wide Sidewalk (SF)	15305	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	575
Length of Curb/Gutter		SW Pavement Box			
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

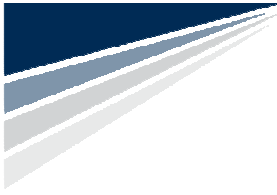
CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	76	\$ 24.50	\$ 1,862.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	4	\$ 24.50	\$ 98.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	72	\$ 24.50	\$ 1,760.94
					Total:	\$ 1,960.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	5	\$ 15.75	\$ 78.75
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 15,903	\$ 15,903.28
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	182	\$ 155.50	\$ 28,301.00
401015	Superpave Type B, PG 70-22	Ton	Na	0	\$ 155.50	\$ -
					Total:	\$ 28,301



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	28733	\$ 2.70	\$ 77,579.10	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	575	\$ 3.50	\$ 2,012.50	
762000	Sawcutting, Bituminous Concrete	LF	NA	395	\$ 2.50	\$ 987.50	
Total:						\$ 80,579.10	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 21,204.38	\$ 21,204.38	



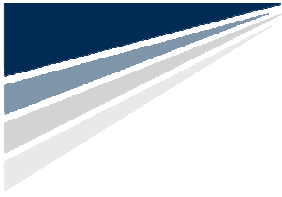
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	0	\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
Total:					\$	\$ -
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	15305	\$ 12.50	\$ 191,312.50
Total:					\$	\$ 191,312.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	3%	1	\$ 13,252.74	\$ 13,252.74
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,000.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	10570	\$ 1.50	\$ 15,855.00
908004	Topsoil, 6" Depth	SY	NA	10570	\$ 9.00	\$ 95,130.00
Total:					\$	\$ 110,985.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	3%	1	\$ 13,252.74	\$ 13,252.74
	Detour Route of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 13,252.74
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		1600	\$ 1.50	\$ 2,400.00
		Each		5	\$ 176.00	\$ 880.00
Total:						\$ 3,280.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000/pole		EA			\$ 2,000.00	
H: Subtotal						\$ 530,109.49



Attachment 2E: Intersection 1 CTP Estimate LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 1 - LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Doc Levinson Drive</u>	<u>Peterson Drive</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DeIDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road, Doc Levinson Drive, and Peterson Drive. The existing conditions on Middletown Warwick Road, Peterson Drive, and Doc Levinson Drive were satisfactory to proposed improvements. Sidewalk to be installed on both sides of Doc Levinson Drive to improve pedestrian connectivity.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$22,000</u>	Part I	<u>Bill Dougherty, JMT</u> <u>09/14/22</u>
b. Preliminary Engineering	<u>\$140,800</u>	Part II	<u>Bill Dougherty, JMT</u> <u>09/14/22</u>
c. Real Estate	<u>\$79,200</u>	Part III	<u>Bill Dougherty, JMT</u> <u>09/14/22</u>
d. Construction *	<u>\$593,055</u>	Part IV	<u>Bill Dougherty, JMT</u> <u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$835,055</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 1 - LOS E

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$9,543</u>	E. HISTORIC	<u>\$1,909</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$3,817</u>	1. Phase 1 (study)	<u>\$1,909</u>
1. Phase I (study)	\$3,817	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$3,817</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$3,817</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$20,000

CONTINGENCY COSTS 10% \$2,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$22,000
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 1 - LOS E

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$17,178</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$17,178</u>
B. DESIGN ENGINEERING	<u>\$109,844</u>
1. Design	<u>\$57,261</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$57,261</u>
2. Traffic	<u>\$19,087</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$19,087</u>
3. Real Estate Plan Preparation	<u>\$9,543</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 9,543</u>
4. Utilities	<u>\$11,452</u>
a. Inhouse	<u>\$ 3,817</u>
b. Consultant	<u>\$ 3,817</u>
c. Test Holes	<u>\$ 3,817</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$5,000</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a.	<u>\$0</u>
b.	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. <u> </u>	<u>\$ -</u>
b. <u> </u>	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$128,000

CONTINGENCY COSTS \$12,800
(normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$140,800
(also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 1 - LOS E

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$63,176</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 58,176</u>	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$2,000</u>
5. Wetland mitigation Other (specify)	<u> </u>	F. STAFF	<u>\$5,000</u>
6. <u> </u>	<u> </u>	G. SETTLEMENT	<u>\$1,100</u>
7. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	<u> </u>
1. Residential	<u> </u>	2. As acquired plans	<u> </u>
2. Business	<u> </u>	I. CONDEMNATION	<u> </u>
Other (specify)	<u> </u>	J. OTHER (specify)	<u>\$0</u>
3. <u> </u>	<u> </u>	1. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$72,000

CONTINGENCY COSTS 10% \$7,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$79,200
 (also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 1 - LOS E

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION

	<u>\$276,434</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$2,328</u>
b. Borrow	\$236
2. Drainage	\$11,452
3. Pavement	
a. Surface	<u>\$0</u>
b. Base	<u>\$0</u>
c. Subbase	<u>\$0</u>
4. Erosion/Sed. Cont.	<u>\$15,270</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$0</u>
b. Sidewalk	<u>\$235,625</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$1,980</u>
e. Clear/Grubb	<u>\$9,543</u>
f. Field Office	<u>\$0</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. <u>Fence Relocation</u>	<u>\$0</u>
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

B. STRUCTURE CONSTRUCTION

	<u>\$0</u>
1. New Bridge	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$43,985</u>
1. Beautification	<u>\$43,985</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$0</u>

D. MAINTENANCE OF TRAFFIC \$ 9,543.49

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 1 - LOS E

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$51,778</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000
3. Pavement Markings	\$ 1,778
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$382,000

I. MISC. ITEMS \$57,300

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$19,100

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$19,100

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$38,200

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$515,700

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$77,355

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$593,055

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities

Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

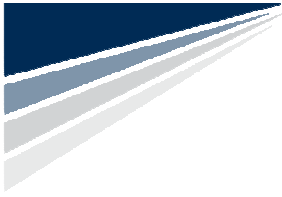
Traffic

Estimator: _____

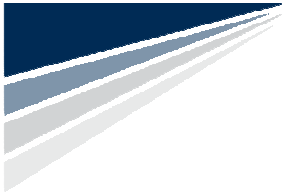
Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22

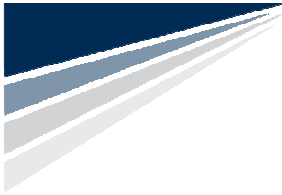


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 9,543
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 3,817
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 3,817
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 1,909
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.5%	\$ 17,178
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 57,261
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 19,087
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 9,543
4. Utilities		
a. Inhouse	1.0%	\$ 3,817
b. Consultant	1.0%	\$ 3,817
c. Test Holes	1.00%	\$ 3,817
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Estimated Commercial PE Area	C-1	N			\$ -	3,232.00	\$ 58,176.00		
					\$ -		\$ -		
					\$ -		\$ -		
					\$ -		\$ -		
					\$ -		\$ -		
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					\$ -		\$ -		
					\$ -		\$ -		
			Total: \$ -		Total: \$ -		Total: \$ 58,176.00		Total: \$ -

Number of Parcels Impacted: 2
 Appraisal Fees: \$ 2,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 5,000.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 1,100.00 Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 - LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Sidewalk Segment (LF)	3770	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	0				
Widening/Reconstruction Area (SF)	0	SUP Pavement Box		Duration (Month) 9	
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2		
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	3770	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	18850	Concrete Depth (in) (Typ 4")	4		
Length of Curb/Gutter	0	GABC Depth (in) (Typ 4")	4		
Area of Triangular Concrete Islands	0				
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	94	\$ 24.50	\$ 2,303.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	1	\$ 24.50	\$ 24.50
Total:						\$ 2,327.50
A.1.b: Borrow						
	General Borrow (15% of Excavation and Embankment (202000) QTY)	CY	NA	15	\$ 15.75	\$ 236.25
A.2: Drainage						
	General Drainage (3% of project cost)	LS	3%	1	\$ 11,452.18	\$ 11,452.18
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
401015	Superpave Type B, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
Total:						\$ -
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -
Total:						\$ -
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
A.4: Erosion/Sediment Control						
	General E&S (4% of Overall Project Cost)	LS	4.0%	1	\$ 15,269.58	\$ 15,269.58

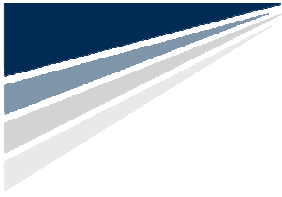
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
- LOS E

A.5.a: Miscellaneous Curb/Gutter						
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA	0	\$ 32.54	\$ -
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -
Total:						\$ -
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	18850	\$ 12.50	\$ 235,625.00
Total:						\$ 235,625.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ -	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ -	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	9	\$ 220.00	\$ 1,980.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (2.5%) of project cost	LS	2.5%	1	\$ 9,543.49	\$ 9,543.49
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
A.5.h: Fence Relocation						
Fence Relocation		LF	NA	0	\$ -	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	4189	\$ 1.50	\$ 6,283.50
908004	Topsoil, 6" Depth	SY	NA	4189	\$ 9.00	\$ 37,701.00
Total:						\$ 43,984.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -
D: Maintenance of Traffic						
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 9,543.49	\$ 9,543.49
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 9,543.49



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 1 Middletown Warwick Road and Doc Levinson Drive - Peterson Drive
 - LOS E

E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		1185	\$ 1.50	\$ 1,777.50
		Each		0	\$ 176.00	\$ -
Total:						\$ 1,777.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 381,739.49



Attachment 3 - Intersection 3 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 3 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Bunker Hill Rd (437)</u>	<u>Main Street (438)</u>	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the intersection of Middletown Warwick Road, Bunker Hill Road, and Main Street.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$33,000</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$398,200</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$938,300</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,876,108</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,245,608</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 3 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$14,732</u>	E. HISTORIC	<u>\$4,911</u>
B. ARCHAEOLOGY	<u>\$4,911</u>	1. Phase 1 (study)	<u>\$4,911</u>
1. Phase I (study)	<u>\$4,911</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$4,911</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$4,911</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$30,000

CONTINGENCY COSTS 10% \$3,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$33,000
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 3 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$58,930</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$58,930</u>
B. DESIGN ENGINEERING	<u>\$302,148</u>
1. Design	<u>\$196,432</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$196,432</u>
2. Traffic	<u>\$49,108</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$49,108</u>
3. Real Estate Plan Preparation	<u>\$19,643</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 19,643</u>
4. Utilities	<u>\$29,465</u>
a. Inhouse	<u>\$ 9,822</u>
b. Consultant	<u>\$ 9,822</u>
c. Test Holes	<u>\$ 9,822</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$362,000

CONTINGENCY COSTS 10% \$36,200
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$398,200
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 3 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$812,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 600,000</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 207,000</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$10,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$25,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$5,500</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$853,000

CONTINGENCY COSTS 10% \$85,300
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$938,300
 (also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 3 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$916,331</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$17,714</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$614</u></p> <p>2. Drainage <u>\$29,465</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$177,639</u></p> <p style="padding-left: 20px;">b. Base <u>\$518,383</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$18,023</u></p> <p>4. Erosion/Sed. Cont. <u>\$39,286</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$43,154</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$47,500</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$24,554</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p style="text-align: right;"><u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u>Modular Block</u></p> <p style="padding-left: 20px;">b. Size <u>371 LF</u></p> <p style="padding-left: 20px;">c. \$/l.f. <u>\$50</u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$25,340</u></p> <p>1. Beautification <u>\$25,340</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 24,553.96</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 3 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$15,933</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 15,933.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$983,000

I. MISC. ITEMS \$147,450

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$49,150

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$49,150

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$98,300

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$1,327,050

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$199,058

(Enter on PNR funding line 4)

(% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$1,526,108

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$350,000

(Enter on PNR funding line 6)

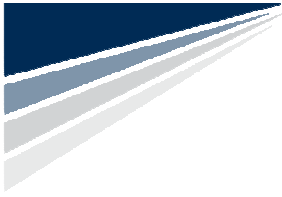
1. Signing	
2. Signals	<u>\$350,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____

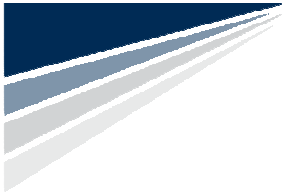
Date: _____

Estimator: JMT

Date: 9/14/2022

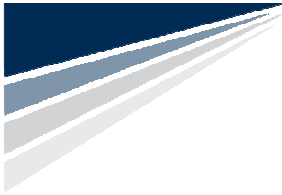


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 14,732
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 4,911
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 4,911
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 4,911
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	6.0%	\$ 58,930
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 196,432
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 49,108
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 19,643
4. Utilities		
a. Inhouse	1.0%	\$ 9,822
b. Consultant	1.0%	\$ 9,822
c. Test Holes	1.00%	\$ 9,822
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	11,500.00	\$ 207,000.00	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		20,000.00	\$ 600,000.00	-	\$ -	-	
Total:			0	Total:	\$ 600,000.00	Total:	\$ 207,000.00	Total:	0

Number of Parcels Impacted: 10

Appraisal Fees:

\$ 10,000.00

Staff:

\$ 25,000.00

Settlement:

\$ 5,500.00

Number of Parcels Impacted X \$1,000

Number of Parcels Impacted X \$2,500

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions

for now assuming r/w length x5'

r/w length=18365

assume 15% of land acquisition

on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	760	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	118785	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	10800			Duration (Month)	0
Full Depth Hotmix Area (SF)	0			Modular Block Retaining Wall (LF)	
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Hotmix Sawcut (LF)	1145
Length of 5' Wide Sidewalk (LF)	760	Type C Depth (in)	2	Removal of Roadway (SF)	
Area of 5' Wide Sidewalk (SF)	3800	GABC Depth (in) (Typ 4")	8	CELLS IN BLUE SHADE ARE AUTOMATED.	
Length of Curb/Gutter	1569	SW Pavement Box			
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	667	\$ 24.50	\$ 16,341.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	19	\$ 24.50	\$ 465.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	37	\$ 24.50	\$ 906.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 24.50	\$ -
					Total:	\$ 17,713.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	39	\$ 15.75	\$ 614.25
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 29,465	\$ 29,464.75
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1261	\$ 115.50	\$ 145,645.50
401015	Superpave Type B, PG 70-22	Ton	Na	277	\$ 115.50	\$ 31,993.50
					Total:	\$ 177,639



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
 LOS D

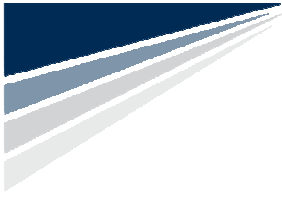
A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	178178	\$ 2.70	\$ 481,080.60	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	410	\$ 84.00	\$ 34,440.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	1145	\$ 2.50	\$ 2,862.50	
Total:						\$ 518,383.10	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	267	\$ 67.50	\$ 18,022.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 39,286.33	\$ 39,286.33	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	1274	\$ 26.00	\$ 33,124
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	295	\$ 34.00	\$ 10,030
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
Total:					\$	\$ 43,154
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	3800	\$ 12.50	\$ 47,500.00
Total:					\$	\$ 47,500.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 24,553.96	\$ 24,553.96
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,000.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	2534	\$ 1.00	\$ 2,534.00
908004	Topsoil, 6" Depth	SY	NA	2534	\$ 9.00	\$ 22,806.00
Total:					\$	\$ 25,340.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 24,553.96	\$ 24,553.96
	Detour Route of Project Cost	LS	0%	1	\$ -	\$ -
Total:						\$ 24,553.96
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		11453	\$ 1.00	\$ 11,453.00
		Each		28	\$ 160.00	\$ 4,480.00
Total:						\$ 15,933.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 982,158.35



Attachment 3E: Intersection 3 CTP Estimate LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int 3 LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Bunker Hill Road (SR443)</u>	<u>Bunker Hill Road (437)</u>	<u>Main Street (438)</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Intersections improvemetnt to the intersection of Middletown Warwick Road, Bunker Hill Road, and Main Street.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$22,000</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$278,300</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$938,300</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,033,965</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$2,272,565</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 3 - LOS E

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$9,988</u>	E. HISTORIC	<u>\$3,329</u>
B. ARCHAEOLOGY	<u>\$3,329</u>	1. Phase 1 (study)	<u>\$3,329</u>
1. Phase I (study)	\$3,329	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$3,329</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$3,329</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$20,000

CONTINGENCY COSTS 10% \$2,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$22,000
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 3 - LOS E

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$39,954</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$39,954</u>
B. DESIGN ENGINEERING	<u>\$212,270</u>
1. Design	<u>\$133,180</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$133,180</u>
2. Traffic	<u>\$33,295</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$33,295</u>
3. Real Estate Plan Preparation	<u>\$13,318</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 13,318</u>
4. Utilities	<u>\$19,977</u>
a. Inhouse	<u>\$ 6,659</u>
b. Consultant	<u>\$ 6,659</u>
c. Test Holes	<u>\$ 6,659</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$5,000</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a.	<u>\$0</u>
b.	<u>\$0</u>

C. ENVIRON. ASSESSMENT

(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. <u> </u>	<u>\$ -</u>
b. <u> </u>	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$253,000

CONTINGENCY COSTS \$25,300
(normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$278,300
(also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 3 - LOS E

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$812,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	_____	1. Testing	_____
2. Partial acquisitions	\$ 600,000	2. Abatement	_____
3. Permanent easements	\$ 207,000	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$10,000</u>
5. Wetland mitigation Other (specify) _____	_____	F. STAFF	<u>\$25,000</u>
6. _____	_____	G. SETTLEMENT	<u>\$5,500</u>
7. _____	_____	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	_____
1. Residential	_____	2. As acquired plans	_____
2. Business Other (specify) _____	_____	I. CONDEMNATION	_____
3. _____	_____	J. OTHER (specify)	<u>\$0</u>
4. _____	_____	1. _____	_____
		2. _____	_____

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$853,000

CONTINGENCY COSTS 10% \$85,300
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$938,300
 (also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 3 - LOS E

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading \$466,680</p> <p style="padding-left: 20px;">a. Excavation \$490 (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow \$47</p> <p>2. Drainage \$19,977</p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface \$171,864</p> <p style="padding-left: 20px;">b. Base \$2,130</p> <p style="padding-left: 20px;">c. Subbase \$0</p> <p>4. Erosion/Sed. Cont. \$26,636</p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter \$166,068</p> <p style="padding-left: 20px;">b. Sidewalk \$46,500</p> <p style="padding-left: 20px;">c. Guardrail \$0</p> <p style="padding-left: 20px;">d. C.P.M. Schedule \$1,320</p> <p style="padding-left: 20px;">e. Clear/Grubb \$16,647</p> <p style="padding-left: 20px;">f. Field Office \$15,000</p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> \$0</p> <p style="padding-left: 20px;">h. <u>Fence Relocation</u> \$0</p> <p style="padding-left: 20px;">i. _____ _____</p> <p style="padding-left: 20px;">j. _____ _____</p> <p style="padding-left: 20px;">k. _____ _____</p> <p style="padding-left: 20px;">l. _____ _____</p> <p style="padding-left: 20px;">m. _____ _____</p>	<p>B. STRUCTURE CONSTRUCTION \$0</p> <p>1. New Bridge _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/c.y. _____</p> <p>3. Retaining Wall _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/c.y. _____</p> <p>4. Box Culvert _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>C. LANDSCAPING \$113,054</p> <p>1. Beautification \$113,054</p> <p>2. Noise Mitigation \$0</p> <p>3. Visual Mitigation \$0</p> <p>4. Tree Mitigation \$0</p> <p>D. MAINTENANCE OF TRAFFIC \$ 16,647.44</p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 3 - LOS E

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$69,517</u>
1. Signing Structures	
a. Overhead Bridges	<u>\$ -</u>
b. Cantilever Supports	<u>\$ -</u>
2. Roadway Lighting	<u>\$ 50,000</u>
3. Pavement Markings	<u>\$ 19,517</u>
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	<u>\$ -</u>
2. Sanitary Sewer	<u>\$ -</u>
Other (specify)	
3. _____ Electric Relocation (Poles)	<u>\$ -</u>

H. SUBTOTAL (A thru G) ROUNDED \$666,000

I. MISC. ITEMS \$99,900

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$33,300

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$33,300

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$66,600

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$899,100

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$134,865

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$1,033,965

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities

Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

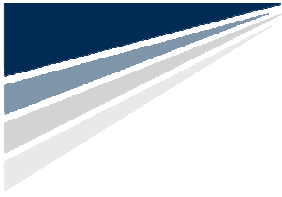
Traffic

Estimator: _____

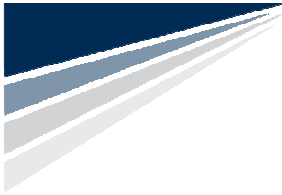
Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22

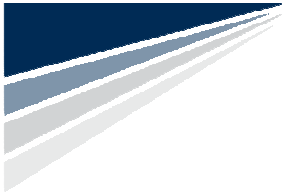


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
 - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 9,988
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 3,329
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 3,329
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 3,329
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
 - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	6.0%	\$ 39,954
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 133,180
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 33,295
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 13,318
4. Utilities		
a. Inhouse	1.0%	\$ 6,659
b. Consultant	1.0%	\$ 6,659
c. Test Holes	1.00%	\$ 6,659
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
 - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Estimated Commercial R/W Area	C-1	N		20,000.00	\$ 600,000.00				
Estimated Commercial PE Area	C-1	N		-	\$ -	11,500.00	\$ 207,000.00		
		N			\$ -				
		N				-	\$ -		
Total:			\$ -	Total:	\$ 600,000.00	Total:	\$ 207,000.00	Total:	\$ -

Number of Parcels Impacted: 10
 Appraisal Fees: \$ 10,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 25,000.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 5,500.00 Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
- LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Roadway Edge (LF)	2486	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	117965				
Widening/Reconstruction Area (SF)	0	SUP Pavement Box		Duration (Month)	6
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	Sawcut (LF) 852	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	744	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	3720	Concrete Depth (in) (Typ 4")	4		
Length of Curb/Gutter	5570	GABC Depth (in) (Typ 4")	4		
Area of Triangular Concrete Islands	0				
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	19	\$ 24.50	\$ 465.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	1	\$ 24.50	\$ 24.50
					Total:	\$ 490.00
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	3	\$ 15.75	\$ 47.25
A.2: Drainage						
	General Drainage (10% of project cost)	LS	3%	1	\$ 19,976.92	\$ 19,976.92
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1488	\$ 115.50	\$ 171,864.00
401015	Superpave Type B, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
					Total:	\$ 171,864.00
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -
762000	Sawcutting, Bituminous Concrete	LF	NA	852	\$ 2.50	\$ 2,130.00
					Total:	\$ 2,130.00
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
A.4: Erosion/Sediment Control						
	General E&S (4%) of Overall Project Cost	LS	4.0%	1	\$ 26,635.90	\$ 26,635.90

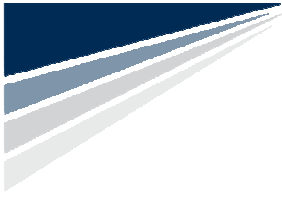
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
- LOS E

A.5.a: Miscellaneous Curb/Gutter						
701014	P.C.C. Curb, Type 2	LF	NA	2914	\$ 26.00	\$ 75,764
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	2656	\$ 34.00	\$ 90,304
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -
Total:						\$ 166,068.00
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	3720	\$ 12.50	\$ 46,500.00
Total:						\$ 46,500.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	6	\$ 220.00	\$ 1,320.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (15% of project cost)	LS	2.5%	1	\$ 16,647.44	\$ 16,647.44
A.5.f: Field Office						
		EAMO	NA	6	\$ 2,500.00	\$ 15,000.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
A.5.h: Fence Relocation						
	Fence Relocation	LF	NA	0	\$ -	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	10767	\$ 1.50	\$ 16,150.50
908004	Topsoil, 6" Depth	SY	NA	10767	\$ 9.00	\$ 96,903.00
Total:						\$ 113,053.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -
D: Maintenance of Traffic						
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 16,647.44	\$ 16,647.44
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 3 Middletown Warwick Road, Bunker Hill Road, and Main Street
 - LOS E

					Total:	\$ 16,647.44
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		10430	\$ 1.50	\$ 15,645.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		22	\$ 176.00	\$ 3,872.00
					Total:	\$ 19,517.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 665,897.44



Attachment 6 - Intersection 4 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 4 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Diamond State Blvd</u>	<u>S. Ridge Ave</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$13,200</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$108,900</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$19,800</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$650,865</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$792,765</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 4 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$5,626</u>	E. HISTORIC	<u>\$1,125</u>
B. ARCHAEOLOGY	<u>\$2,250</u>	1. Phase 1 (study)	<u>\$1,125</u>
1. Phase I (study)	<u>\$2,250</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$2,250</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$2,250</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$12,000

CONTINGENCY COSTS 10% \$1,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$13,200
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 4 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$22,503</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$22,503</u>	
B. DESIGN ENGINEERING		<u>\$76,134</u>	
1. Design		<u>\$45,006</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$45,006</u>	
2. Traffic		<u>\$11,251</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$11,251</u>	
3. Real Estate Plan Preparation		<u>\$5,626</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 5,626</u>	
4. Utilities		<u>\$6,751</u>	
a. Inhouse		<u>\$ 2,250</u>	
b. Consultant		<u>\$ 2,250</u>	
c. Test Holes		<u>\$ 2,250</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$99,000

CONTINGENCY COSTS 10% \$9,900
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$108,900
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 4 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$5,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ -</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$3,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$7,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$1,650</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$18,000

CONTINGENCY COSTS 10% \$1,800
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$19,800
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 4 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$219,402</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$6,983</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$236</u></p> <p>2. Drainage <u>\$6,751</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$21,714</u></p> <p style="padding-left: 20px;">b. Base <u>\$33,193</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$6,210</u></p> <p>4. Erosion/Sed. Cont. <u>\$9,001</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$27,564</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$102,125</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$5,626</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$0</u></p> <p>1. Beautification <u>\$0</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 5,625.70</u></p>
---	---

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 4 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$0</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ -
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$226,000

I. MISC. ITEMS \$33,900

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$11,300

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$11,300

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$22,600

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$305,100

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%

(% used) \$45,765

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$350,865

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS

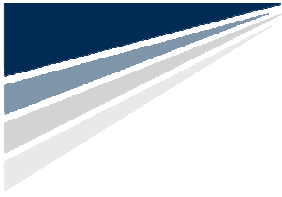
	<u>\$0</u>
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS

	<u>\$300,000</u>
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	<u>\$300,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	
Traffic	
Estimator: _____	Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 5,626
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 2,250
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 2,250
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 1,125
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



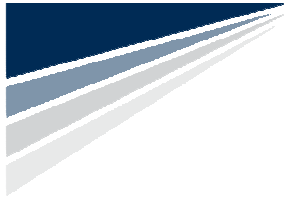
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	10.0%	\$ 22,503
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 45,006
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 11,251
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 5,626
4. Utilities		
a. Inhouse	1.0%	\$ 2,250
b. Consultant	1.0%	\$ 2,250
c. Test Holes	1.00%	\$ 2,250
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ -	Total:	0

Number of Parcels Impacted: 3

Appraisal Fees: \$ 3,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 7,500.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 1,650.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions assume 15% of land acquisition
for now assuming r/w length x5' on commercial land
r/w length=18365



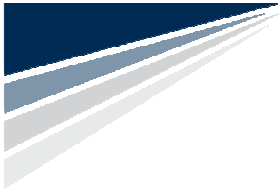
Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

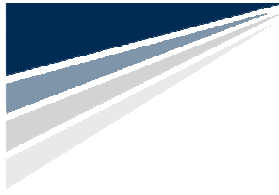
General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)		Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	4853	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	3706			Duration (Month)	0
Full Depth Hotmix Area (SF)	0			Modular Block Retaining Wall (LF)	
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Hotmix Sawcut (LF)	649
Length of 5' Wide Sidewalk (LF)	1634	Type C Depth (in)	2	Removal of Roadway (SF)	
Area of 5' Wide Sidewalk (SF)	8170	GABC Depth (in) (Typ 4")	8	CELLS IN BLUE SHADE ARE AUTOMATED.	
Length of Curb/Gutter	852	SW Pavement Box			
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	229	\$ 24.50	\$ 5,610.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	41	\$ 24.50	\$ 1,004.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	15	\$ 24.50	\$ 367.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 24.50	\$ -
					Total:	\$ 6,982.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	15	\$ 15.75	\$ 236.25
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 6,751	\$ 6,750.84
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	93	\$ 115.50	\$ 10,741.50
401015	Superpave Type B, PG 70-22	Ton	Na	95	\$ 115.50	\$ 10,972.50
					Total:	\$ 21,714



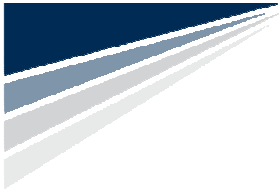
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	7280	\$ 2.70	\$ 19,656.00	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	141	\$ 84.50	\$ 11,914.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	649	\$ 2.50	\$ 1,622.50	
Total:						\$ 33,193.00	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	92	\$ 67.50	\$ 6,210.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 9,001.13	\$ 9,001.13	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	351	\$ 30.00	\$ 10,530
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	501	\$ 34.00	\$ 17,034
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
					Total:	\$ 27,564
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	8170	\$ 12.50	\$ 102,125.00
					Total:	\$ 102,125.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 5,625.70	\$ 5,625.70
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,000.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	0	\$ 1.00	\$ -
908004	Topsoil, 6" Depth	SY	NA	0	\$ 9.00	\$ -
					Total:	\$ -
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	3%	1	\$ 5,625.70	\$ 5,625.70
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 5,625.70
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF			\$ 1.50	\$ -
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each			\$ 176.00	\$ -
Total:						\$ -
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 225,028.13



Attachment 6E: Intersection 4 CTP Estimate LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int 4 LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Diamond State Blvd</u>	<u>S. Ridge Ave</u>	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation Section or Legis. Dist. _____
Name Estimate only

4. DESCRIPTION OF IMPROVEMENT:

Install 5' sidewalk along Middletown Warwick Road northbound from Vintage Avenue to Diamond State Boulevard

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$7,700</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$78,100</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$5,500</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$176,985</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$268,285</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 4

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$2,833</u>	E. HISTORIC	<u>\$1,133</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$1,133</u>	1. Phase 1 (study)	<u>\$1,133</u>
1. Phase I (study)	\$1,133	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$1,133</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$1,133</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$7,000

CONTINGENCY COSTS 10% \$700
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$7,700
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 4

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$11,331</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$11,331</u>	
B. DESIGN ENGINEERING		<u>\$58,956</u>	
1. Design		<u>\$22,662</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$22,662</u>	
2. Traffic		<u>\$11,331</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$11,331</u>	
3. Real Estate Plan Preparation		<u>\$5,665</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 5,665</u>	
4. Utilities		<u>\$6,798</u>	
a. Inhouse		<u>\$ 2,266</u>	
b. Consultant		<u>\$ 2,266</u>	
c. Test Holes		<u>\$ 2,266</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$5,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a.		<u>\$0</u>
b.		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$71,000

CONTINGENCY COSTS \$7,100
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$78,100
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 4

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$5,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions		1. Testing	
2. Partial acquisitions	\$ -	2. Abatement	
3. Permanent easements	\$ -	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$0</u>
5. Wetland mitigation Other (specify)		F. STAFF	<u>\$0</u>
6. _____		G. SETTLEMENT	<u>\$0</u>
7. _____		H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	
1. Residential		2. As acquired plans	
2. Business Other (specify)		I. CONDEMNATION	
3. _____		J. OTHER (specify)	<u>\$0</u>
4. _____		1. _____	
		2. _____	

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$5,000

CONTINGENCY COSTS 10% \$500
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$5,500
 (also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 4

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION

	<u>\$74,942</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$662</u>
b. Borrow	\$79
2. Drainage	\$3,399
3. Pavement	
a. Surface	<u>\$0</u>
b. Base	<u>\$0</u>
c. Subbase	<u>\$0</u>
4. Erosion/Sed. Cont.	<u>\$4,532</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$0</u>
b. Sidewalk	<u>\$63,438</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$0</u>
e. Clear/Grubb	<u>\$2,833</u>
f. Field Office	<u>\$0</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. <u>Fence Relocation</u>	<u>\$0</u>
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

B. STRUCTURE CONSTRUCTION

	<u>\$0</u>
1. New Bridge	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$35,532</u>
1. Beautification	<u>\$35,532</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$0</u>

D. MAINTENANCE OF TRAFFIC \$ 2,832.66

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 4

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$0</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ -
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$114,000

I. MISC. ITEMS \$17,100

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$5,700

(normally 5% of H) 5%
(% used)

K. INITIAL EXPENSE \$5,700

(normally 5% of H) 5%
(% used)

L. CONSTRUCTION CONTINGENCY \$11,400

(normally 10% of H) 10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$153,900

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$23,085

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$176,985

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities

Estimator:

Date:

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

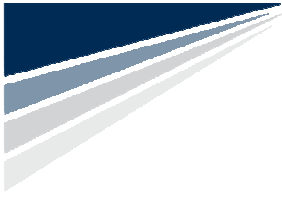
Traffic

Estimator:

Date:

Estimator: Bill Dougherty, JMT

Date: 09/14/22



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 2,833
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 1,133
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 1,133
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	1.0%	\$ 1,133
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



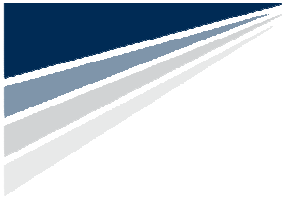
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	10.0%	\$ 11,331
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 22,662
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 11,331
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 5,665
4. Utilities		
a. Inhouse	2.0%	\$ 2,266
b. Consultant	2.0%	\$ 2,266
c. Test Holes	2.00%	\$ 2,266
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
		N			\$ -				
		N			\$ -				
		N			\$ -				
		N				-	\$ -		
		Total:	\$ -	Total:	\$ -	Total:	\$ -	Total:	\$ -

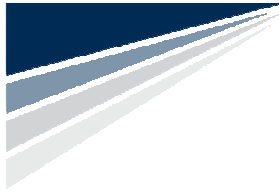
Number of Parcels Impacted: 0
 Appraisal Fees: \$ - Number of Parcels Impacted X \$1,000
 Staff: \$ - Number of Parcels Impacted X \$2,500
 Settlement: \$ - Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).



Appendix C

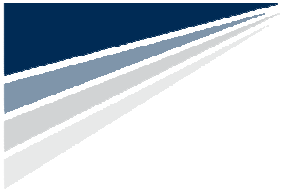
Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Road Segment (LF)	0	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)					
Widening/Reconstruction Area (SF)	0	SUP Pavement Box		Duration (Month)	
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	0	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8	Hotmix Sawcut (LF)	
Length of 5' Wide Sidewalk (LF)	1015	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	5075	Concrete Depth (in) (Typ 4")	4		
Length of Curb/Gutter	0	GABC Depth (in) (Typ 4")	4	Removal of Roadway (SF)	
Area of Triangular Concrete Islands	0			Brick Hatching (SF)	
Length of Ditch Runs (LF)				CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.	
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -	
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -	
	Sidewalk Excavation	CY	NA	26	\$ 24.50	\$ 637.00	
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -	
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	1	\$ 24.50	\$ 24.50	
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -	
Total:						\$ 661.50	
A.1.b: Borrow							
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	5	\$ 15.75	\$ 78.75	
A.2: Drainage							
	General Drainage (10% of project cost)	LS	3%	1	\$ 3,399.20	\$ 3,399.20	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 115.50	\$ -	
401015	Superpave Type B, PG 70-22	Ton	NA	0	\$ 115.50	\$ -	
Total:						\$ -	
A.3.b: Pavement Base							
401021	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -	
Total:						\$ -	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	



DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

A.4: Erosion/Sediment Control							
	General E&S (4%) of Overall Project Cost	LS	4.0%		1	\$ 4,532.26	\$ 4,532.26

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -	
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -	
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -	
						Total:	\$ -
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	5075	\$ 12.50	\$ 63,437.50	
						Total:	\$ 63,437.50
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
						Total:	\$ -
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (2.5%) of project cost	LS	2.5%	1	\$ 2,832.66	\$ 2,832.66	
A.5.f: Field Office							
		EAMO	NA	0	\$ 2,500.00	\$ -	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
						Total:	\$ -
A.5.h: Fence Relocation							
Fence Relocation		LF	NA	0	\$ -	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	3384	\$ 1.50	\$ 5,076.00	
908004	Topsoil, 6" Depth	SY	NA	3384	\$ 9.00	\$ 30,456.00	
						Total:	\$ 35,532.00
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 2,832.66	\$ 2,832.66	
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 4 Middletown Warwick Road and Diamond State Boulevard - LOS E

					Total:	\$ 2,832.66
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		0	\$ 1.50	\$ -
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		0	\$ 176.00	\$ -
					Total:	\$ -
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 113,306.53



Attachment 7 - Intersection 5 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 5 299 & Merrimac New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Merrimac Ave</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road and Merrimac Ave. This option has a right turn lane that turns into a third through lane on Middletown Warwick. That lane is then dropped at the next right in right out at Vintage Avenue.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$79,200</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$495,000</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$157,300</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,876,398</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,607,898</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 5 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

<p>A. ENGINEERING <u>\$39,472</u> (Includes NEPA)</p> <p>B. ARCHAEOLOGY <u>\$15,789</u></p> <p>1. Phase I (study) <u>\$15,789</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (mitigation) <u>\$0</u></p> <p>C. WETLANDS <u>\$7,894</u></p> <p>1. Delineation (study) <u>\$7,894</u></p> <p>2. Permit preparation <u>\$0</u></p> <p>3. Mitigation (design) <u>\$0</u></p> <p>D. HAZARDOUS MATERIAL <u>\$0</u></p> <p>1. Phase 1 (study) <u>\$0</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (remediation) <u>\$0</u></p>	<p>E. HISTORIC <u>\$7,894</u></p> <p>1. Phase 1 (study) <u>\$7,894</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Mitigation (by loc./env.) <u>\$0</u></p> <p>4. Mitigation (by design) yes <input type="checkbox"/></p> <p>F. NOISE <u>\$0</u></p> <p>1. Studies <u>\$0</u></p> <p>2. Mitigation (by design) yes <input type="checkbox"/></p> <p>G. OTHER <u>\$0</u></p> <p>1. _____</p> <p>2. _____</p>
--	---

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$72,000

CONTINGENCY COSTS 10% \$7,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$79,200
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 5 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$63,155</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$63,155</u>	
B. DESIGN ENGINEERING		<u>\$386,430</u>	
1. Design		<u>\$236,831</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$236,831</u>	
2. Traffic		<u>\$78,944</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$78,944</u>	
3. Real Estate Plan Preparation		<u>\$15,789</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 15,789</u>	
4. Utilities		<u>\$47,366</u>	
a. Inhouse		<u>\$ 15,789</u>	
b. Consultant		<u>\$ 15,789</u>	
c. Test Holes		<u>\$ 15,789</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$450,000

CONTINGENCY COSTS \$45,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$495,000
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 5 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$113,720</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 108,720</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$7,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$17,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$3,850</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$143,000

CONTINGENCY COSTS 10% \$14,300
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$157,300
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 5 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,424,656</u></p> <p> a. Excavation <u>\$1,348</u> (includes SWM pond)</p> <p> b. Borrow <u>\$47</u></p> <p>2. Drainage <u>\$47,366</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$161,931</u></p> <p> b. Base <u>\$601,285</u></p> <p> c. Subbase <u>\$68</u></p> <p>4. Erosion/Sed. Cont. <u>\$63,155</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$372,915</u></p> <p> b. Sidewalk <u>\$123,750</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$1,320</u></p> <p> e. Clear/Grubb <u>\$39,472</u></p> <p> f. Field Office <u>\$12,000</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____</p> <p> i. _____</p> <p> j. _____</p> <p> k. _____</p> <p> l. _____</p> <p> m. _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/l.f. _____</p> <p>4. Box Culvert _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>C. LANDSCAPING <u>\$89,250</u></p> <p> 1. Beautification <u>\$89,250</u></p> <p> 2. Noise Mitigation <u>\$0</u></p> <p> 3. Visual Mitigation <u>\$0</u></p> <p> 4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 47,366.18</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 5 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$17,600</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 17,600.00
Other (specify)	
4. _____	_____

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	_____

H. SUBTOTAL (A thru G) ROUNDED \$1,579,000

I. MISC. ITEMS \$236,850

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$78,950

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$78,950

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$157,900

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$2,131,650

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15% \$319,748
(% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$2,451,398

Estimator: JMT

Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	<u>\$0</u>
(Enter on PNR funding line 7)	
1. Water	_____
2. Sanitary Sewer	_____
3. Electric	_____
4. Telephone	_____
5. Gas	_____
6. CATV	_____
Other (specify)	
7. _____ General	_____
8. _____	_____
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS	<u>\$425,000</u>
(Enter on PNR funding line 6)	
1. Signing	_____
2. Signals	<u>\$350,000</u>
3. Detour Signing	_____
4. DelTrac	_____
Other (specify)	
5. _____ Pedestrian Signals	<u>\$75,000</u>
Traffic	
Estimator: _____	Date: _____

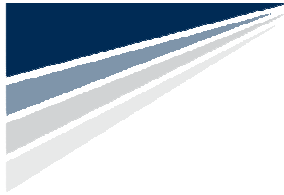


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 39,472
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 15,789
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 7,894
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 7,894
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.0%	\$ 63,155
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 236,831
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 78,944
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 15,789
4. Utilities		
a. Inhouse	1.0%	\$ 15,789
b. Consultant	1.0%	\$ 15,789
c. Test Holes	1.00%	\$ 15,789
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	15,100.00	\$ 108,720.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 108,720.00	Total:	0

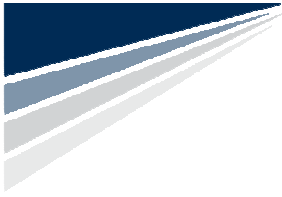
Number of Parcels Impacted: **7**

Appraisal Fees: **\$ 7,000.00** Number of Parcels Impacted X \$1,000

Staff: **\$ 17,500.00** Number of Parcels Impacted X \$2,500

Settlement: **\$ 3,850.00** Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

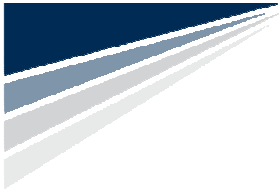
Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	2550	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	147855.6	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	40	SUP Pavement Box		Duration (Month)	6
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	1980	Type C Depth (in)	2	Hotmix Sawcut (LF)	0
Area of 5' Wide Sidewalk (SF)	9900	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	657
Length of Curb/Gutter	5315	SW Pavement Box			
Area of Triangular Concrete Islands	2965	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	3	\$ 24.50	\$ 73.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	49	\$ 24.50	\$ 1,200.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	3	\$ 24.50	\$ 73.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	82	\$ 24.50	\$ 2,012.06
					Total:	\$ 1,347.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	3	\$ 15.75	\$ 47.25
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 47,366	\$ 47,366.18
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1400	\$ 115.50	\$ 161,700.00
401015	Superpave Type B, PG 70-22	Ton	Na	2	\$ 115.50	\$ 231.00
					Total:	\$ 161,931

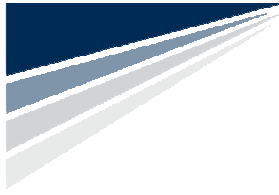


DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	221784	\$ 2.70	\$ 598,816.80	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	2	\$ 84.50	\$ 169.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	657	\$ 3.50	\$ 2,299.50	
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -	
Total:						\$ 601,285.30	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	1	\$ 67.50	\$ 67.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 63,154.91	\$ 63,154.91	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	1605	\$ 30.00	\$ 48,150
71014	P.C.C. Curb, Type 2	LF	NA	3710	\$ 26.00	\$ 96,460
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	2965	\$ 77.00	\$ 228,305.00
Total:						\$ 372,915
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	9900	\$ 12.50	\$ 123,750.00
Total:						\$ 123,750.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	6	\$ 220.00	\$ 1,320.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 39,471.82	\$ 39,471.82
A.5.f: Field Office						
		EAMO	NA	6	\$ 2,000.00	\$ 12,000.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	8500	\$ 1.50	\$ 12,750.00
908004	Topsoil, 6" Depth	SY	NA	8500	\$ 9.00	\$ 76,500.00
Total:						\$ 89,250.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	1%	1	\$ 15,788.73	\$ 15,788.73
	Maintenance of Traffic Items (1%) of project cost	LS	2%	1	\$ 31,577.45	\$ 31,577.45
Total:						\$ 47,366.18
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		12000	\$ 1.00	\$ 12,000.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		35	\$ 160.00	\$ 5,600.00
Total:						\$ 17,600.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,578,872.63



Attachment 8 - Intersection 5 Alternative CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 5 299 & Merrimac Alt. New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Merrimac Ave</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road and Merrimac Ave. This alternative has a double right turn lane on WB Merrimac onto Middletown Warwick. It also has an extended LTL storage on SB Middletown Warwick Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$81,400</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$512,600</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$176,000</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,963,338</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,733,338</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 5 Alternative - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

<p>A. ENGINEERING <u>\$40,851</u> (Includes NEPA)</p> <p>B. ARCHAEOLOGY <u>\$16,341</u></p> <p>1. Phase I (study) <u>\$16,341</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (mitigation) <u>\$0</u></p> <p>C. WETLANDS <u>\$8,170</u></p> <p>1. Delineation (study) <u>\$8,170</u></p> <p>2. Permit preparation <u>\$0</u></p> <p>3. Mitigation (design) <u>\$0</u></p> <p>D. HAZARDOUS MATERIAL <u>\$0</u></p> <p>1. Phase 1 (study) <u>\$0</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (remediation) <u>\$0</u></p>	<p>E. HISTORIC <u>\$8,170</u></p> <p>1. Phase 1 (study) <u>\$8,170</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Mitigation (by loc./env.) <u>\$0</u></p> <p>4. Mitigation (by design) yes <input type="checkbox"/></p> <p>F. NOISE <u>\$0</u></p> <p>1. Studies <u>\$0</u></p> <p>2. Mitigation (by design) yes <input type="checkbox"/></p> <p>G. OTHER <u>\$0</u></p> <p>1. _____ <u> </u></p> <p>2. _____ <u> </u></p>
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TOTAL COSTS FOR PART I (A thru G) ROUNDED \$74,000

CONTINGENCY COSTS 10% \$7,400
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$81,400
(also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Int. 5 Alternative - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS \$65,362

- 1. Inhouse \$0
- 2. Consultant \$65,362

B. DESIGN ENGINEERING \$399,674

- 1. Design \$245,109
 - a. Inhouse \$0
 - b. Consultant \$245,109

- 2. Traffic \$81,703
 - a. Inhouse \$0
 - b. Consultant \$81,703

- 3. Real Estate Plan Preparation \$16,341
 - a. Inhouse \$ -
 - b. Consultant \$ 16,341

- 4. Utilities \$49,022
 - a. Inhouse \$ 16,341
 - b. Consultant \$ 16,341
 - c. Test Holes \$ 16,341
 - d. Utility Company \$ -

5. Materials & Research \$7,500

6. Borings _____

7. Pile Load Tests _____

8. Subdivision \$0

- a. Inhouse \$ -
- b. Consultant \$ -
- c. Railroad P.E. \$ -

9. Other (specify) \$0

- a. _____ \$0
- b. _____ \$0

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands \$ -

2. Hazardous Materials \$ -

3. Noise \$ -

4. Historic \$ -

5. Archaeology \$ -

6. Other _____

a. _____ \$ -

b. _____ \$ -

Loc/Environ _____

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin _____

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$466,000

CONTINGENCY COSTS \$46,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$512,600
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 5 Alternative - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$130,712</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 125,712</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$7,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$17,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$3,850</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$160,000

CONTINGENCY COSTS 10% \$16,000
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$176,000
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Int. 5 Alternative - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,409,058</u></p> <p> a. Excavation <u>\$22,246</u> (includes SWM pond)</p> <p> b. Borrow <u>\$756</u></p> <p>2. Drainage <u>\$49,022</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$172,442</u></p> <p> b. Base <u>\$465,471</u></p> <p> c. Subbase <u>\$22,343</u></p> <p>4. Erosion/Sed. Cont. <u>\$65,362</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$459,303</u></p> <p> b. Sidewalk <u>\$84,063</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$2,200</u></p> <p> e. Clear/Grubb <u>\$40,851</u></p> <p> f. Field Office <u>\$25,000</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____</p> <p> i. _____</p> <p> j. _____</p> <p> k. _____</p> <p> l. _____</p> <p> m. _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/l.f. _____</p> <p>4. Box Culvert _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>C. LANDSCAPING <u>\$140,007</u></p> <p> 1. Beautification <u>\$140,007</u></p> <p> 2. Noise Mitigation <u>\$0</u></p> <p> 3. Visual Mitigation <u>\$0</u></p> <p> 4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 40,851.34</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Int. 5 Alternative - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$44,138</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 25,000.00
3. Pavement Markings	\$ 19,137.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,635,000

I. MISC. ITEMS \$245,250

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$81,750

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$81,750

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$163,500

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$2,207,250

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$331,088

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$2,538,338

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$425,000

(Enter on PNR funding line 6)

1. Signing	
2. Signals	\$350,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Ped Signals	\$75,000

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022

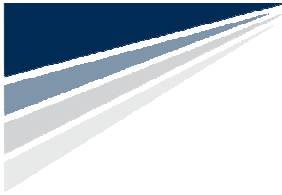


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 40,851
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 16,341
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 8,170
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 8,170
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.0%	\$ 65,362
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 245,109
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 81,703
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 16,341
4. Utilities		
a. Inhouse	1.0%	\$ 16,341
b. Consultant	1.0%	\$ 16,341
c. Test Holes	1.00%	\$ 16,341
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	17,460.00	\$ 125,712.00	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 125,712.00	Total:	0

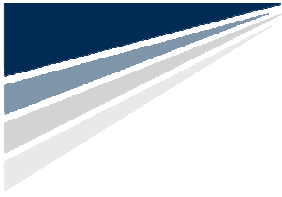
Number of Parcels Impacted: **7**

Appraisal Fees: **\$ 7,000.00** Number of Parcels Impacted X \$1,000

Staff: **\$ 17,500.00** Number of Parcels Impacted X \$2,500

Settlement: **\$ 3,850.00** Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



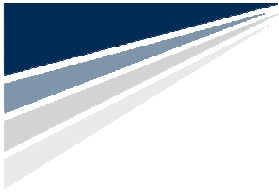
Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	4000	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	103566.3	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	13404.5			Duration (Month)	10
Full Depth Hotmix Area (SF)	0			Modular Block Retaining Wall (LF)	
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Hotmix Sawcut (LF)	1240
Length of 5' Wide Sidewalk (LF)	1345	Type C Depth (in)	2	Removal of Roadway (SF)	0
Area of 5' Wide Sidewalk (SF)	6725	GABC Depth (in) (Typ 4")	8	CELLS IN BLUE SHADE ARE AUTOMATED.	
Length of Curb/Gutter	2732	SW Pavement Box			
Area of Triangular Concrete Islands	4991	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	828	\$ 24.50	\$ 20,286.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	34	\$ 24.50	\$ 833.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	46	\$ 24.50	\$ 1,127.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 24.50	\$ -
					Total:	\$ 22,246.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	48	\$ 15.75	\$ 756.00
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 49,022	\$ 49,021.60
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1150	\$ 115.50	\$ 132,825.00
401015	Superpave Type B, PG 70-22	Ton	Na	343	\$ 115.50	\$ 39,616.50
					Total:	\$ 172,442

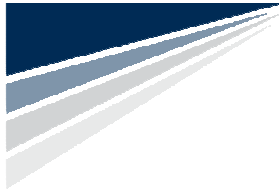


DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	155350	\$ 2.70	\$ 419,445.00	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	508	\$ 84.50	\$ 42,926.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	1240	\$ 2.50	\$ 3,100.00	
Total:						\$ 465,471.00	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	331	\$ 67.50	\$ 22,342.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 65,362.14	\$ 65,362.14	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	991	\$ 30.00	\$ 29,730
71014	P.C.C. Curb, Type 2	LF	NA	1741	\$ 26.00	\$ 45,266
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	4991	\$ 77.00	\$ 384,307.00
Total:						\$ 459,303
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	6725	\$ 12.50	\$ 84,062.50
Total:						\$ 84,062.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	10	\$ 220.00	\$ 2,200.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 40,851.34	\$ 40,851.34
A.5.f: Field Office						
		EAMO	NA	10	\$ 2,500.00	\$ 25,000.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	13334	\$ 1.50	\$ 20,001.00
908004	Topsoil, 6" Depth	SY	NA	13334	\$ 9.00	\$ 120,006.00
Total:						\$ 140,007.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 40,851.34	\$ 40,851.34
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 40,851.34
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 25,000.00	\$ 25,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		9825	\$ 1.50	\$ 14,737.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		25	\$ 176.00	\$ 4,400.00
Total:						\$ 19,137.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 1,634,053.41



Attachment 7E: Intersection 5 CTP Estimate LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int 5 - LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Merrimac Ave</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Install 5' sidewalk along the northbound side of Middletown Warwick Road in the area of the intersection.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$11,000</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$85,800</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$5,500</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$326,025</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$428,325</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 5 - LOS E

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$5,236</u>	E. HISTORIC	<u>\$1,047</u>
B. ARCHAEOLOGY	<u>\$2,094</u>	1. Phase 1 (study)	<u>\$1,047</u>
1. Phase I (study)	\$2,094	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$1,047</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$1,047</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$10,000

CONTINGENCY COSTS 10% \$1,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$11,000
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 5 - LOS E

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	\$12,567
1. Inhouse	\$0
2. Consultant	\$12,567
B. DESIGN ENGINEERING	\$64,862
1. Design	\$31,417
a. Inhouse	\$0
b. Consultant	\$31,417
2. Traffic	\$10,472
a. Inhouse	\$0
b. Consultant	\$10,472
3. Real Estate Plan Preparation	\$4,189
a. Inhouse	\$ -
b. Consultant	\$ 4,189
4. Utilities	\$6,283
a. Inhouse	\$ 2,094
b. Consultant	\$ 2,094
c. Test Holes	\$ 2,094
d. Utility Company	\$ -
5. Materials & Research	\$7,500
6. Borings	\$5,000
7. Pile Load Tests	_____

8. Subdivision	\$0
a. Inhouse	\$ -
b. Consultant	\$ -
c. Railroad P.E.	\$ -

9. Other (specify)	\$0
a.	\$0
b.	\$0

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands	\$ -
2. Hazardous Materials	\$ -
3. Noise	\$ -
4. Historic	\$ -
5. Archaeology	\$ -
6. Other	
a. _____	\$ -
b. _____	\$ -

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED **\$78,000**

CONTINGENCY COSTS **\$7,800**
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING **\$85,800**
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 5 - LOS E

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$5,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ -</u>	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$0</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$0</u>
Other (specify)	<u> </u>		
6. <u> </u>	<u> </u>	G. SETTLEMENT	<u>\$0</u>
7. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	<u> </u>
1. Residential	<u> </u>	2. As acquired plans	<u> </u>
2. Business	<u> </u>	I. CONDEMNATION	<u> </u>
Other (specify)	<u> </u>	J. OTHER (specify)	<u>\$0</u>
3. <u> </u>	<u> </u>	1. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$5,000

CONTINGENCY COSTS 10% \$500
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$5,500
(also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 5 - LOS E

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION

	<u>\$138,512</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$1,176</u>
b. Borrow	\$126
2. Drainage	\$6,283
3. Pavement	
a. Surface	<u>\$0</u>
b. Base	<u>\$0</u>
c. Subbase	<u>\$0</u>
4. Erosion/Sed. Cont.	<u>\$8,378</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$0</u>
b. Sidewalk	<u>\$117,313</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$0</u>
e. Clear/Grubb	<u>\$5,236</u>
f. Field Office	<u>\$0</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. <u>Fence Relocation</u>	<u>\$0</u>
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

B. STRUCTURE CONSTRUCTION

	<u>\$0</u>
1. New Bridge	
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$65,699</u>
1. Beautification	<u>\$65,699</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$0</u>

D. MAINTENANCE OF TRAFFIC \$ 5,236.16

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 5 - LOS E

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$0</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ -
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$210,000

I. MISC. ITEMS \$31,500

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$10,500

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$10,500

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$21,000

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$283,500

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$42,525

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$326,025

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities

Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic

Estimator: _____

Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22

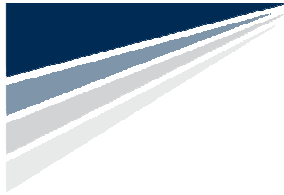


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



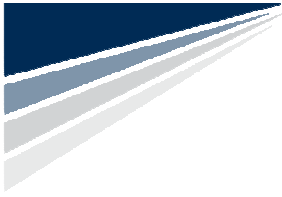
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering(Includes NEPA)	2.5%	\$ 5,236
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 2,094
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 1,047
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 1,047
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	6.0%	\$ 12,567
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 31,417
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 10,472
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 4,189
4. Utilities		
a. Inhouse	1.0%	\$ 2,094
b. Consultant	1.0%	\$ 2,094
c. Test Holes	1.00%	\$ 2,094
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

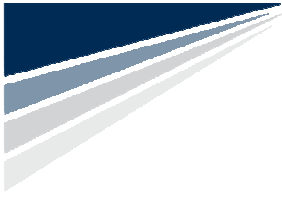
Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
		N			\$ -				
		N			\$ -				
		N			\$ -				
		N				-	\$ -		
		Total:	\$ -	Total:	\$ -	Total:	\$ -	Total:	\$ -

Number of Parcels Impacted:
 Appraisal Fees: Number of Parcels Impacted X \$1,000
 Staff: Number of Parcels Impacted X \$2,500
 Settlement: Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Road Segment (LF)	0	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)					
Widening/Reconstruction Area (SF)	0	SUP Pavement Box		Duration (Month)	0
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	Hotmix Sawcut (LF)	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	1877	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	9385	Concrete Depth (in) (Typ 4")	4	Removal of Roadway (SF)	
Length of Curb/Gutter	0	GABC Depth (in) (Typ 4")	4	Brick Hatching (SF)	
Area of Triangular Concrete Islands	0			CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.	
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	47	\$ 24.50	\$ 1,151.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	1	\$ 24.50	\$ 24.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 1,176.00
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	8	\$ 15.75	\$ 126.00
A.2: Drainage						
	General Drainage (10% of project cost)	LS	3%	1	\$ 6,283.40	\$ 6,283.40
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
401015	Superpave Type B, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
					Total:	\$ -
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -
					Total:	\$ -
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -



DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

A.4: Erosion/Sediment Control							
	General E&S (4%) of Overall Project Cost	LS	4.0%		1	\$ 8,377.86	\$ 8,377.86

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -	
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -	
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -	
Total:						\$ -	
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	9385	\$ 12.50	\$ 117,312.50	
Total:						\$ 117,312.50	
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
Total:						\$ -	
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (2.5%) of project cost	LS	2.5%	1	\$ 5,236.16	\$ 5,236.16	
A.5.f: Field Office							
		EAMO	NA	0	\$ 2,500.00	\$ -	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
Total:						\$ -	
A.5.h: Fence Relocation							
	Fence Relocation	LF	NA	0	\$ -	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	6257	\$ 1.50	\$ 9,385.50	
908004	Topsoil, 6" Depth	SY	NA	6257	\$ 9.00	\$ 56,313.00	
Total:						\$ 65,698.50	
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 5,236.16	\$ 5,236.16	
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 5 - Middletown Warwick Road and Merrimac Avenue - LOS E

					Total:	\$ 5,236.16
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		0	\$ 1.50	\$ -
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		0	\$ 176.00	\$ -
					Total:	\$ -
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 209,446.59



Attachment 9 - Intersection 6 CTP Estimate

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 6 Levels & 299 - LOS I New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Levels Road (SR10)</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road and Levels Road. This option has a right turn lane that turns into a third through lane on Middletown Warwick. That lane is then dropped at the next right in right out.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$143,000</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$909,700</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$72,600</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$4,886,885</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$6,012,185</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 6 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$71,846</u>	E. HISTORIC	<u>\$14,369</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$28,739</u>	1. Phase 1 (study)	<u>\$14,369</u>
1. Phase I (study)	<u>\$28,739</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$14,369</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$14,369</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$130,000

CONTINGENCY COSTS 10% \$13,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$143,000
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 6 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$86,216</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$86,216</u>	
B. DESIGN ENGINEERING		<u>\$740,334</u>	
1. Design		<u>\$431,079</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$431,079</u>	
2. Traffic		<u>\$143,693</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$143,693</u>	
3. Real Estate Plan Preparation		<u>\$71,846</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 71,846</u>	
4. Utilities		<u>\$86,216</u>	
a. Inhouse		<u>\$ 28,739</u>	
b. Consultant		<u>\$ 28,739</u>	
c. Test Holes		<u>\$ 28,739</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$827,000

CONTINGENCY COSTS 10% \$82,700
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$909,700
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 6 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$41,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 36,000</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$6,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$15,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$3,300</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$66,000

CONTINGENCY COSTS 10% \$6,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$72,600
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 6 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$2,557,057</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$44,688</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$1,512</u></p> <p>2. Drainage <u>\$86,216</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$362,208</u></p> <p style="padding-left: 20px;">b. Base <u>\$1,022,278</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$43,335</u></p> <p>4. Erosion/Sed. Cont. <u>\$114,954</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$488,770</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$321,250</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$71,846</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$203,700</u></p> <p>1. Beautification <u>\$203,700</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 71,846.49</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 6 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$41,256</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 41,256.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$2,874,000

I. MISC. ITEMS \$431,100

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$143,700

(normally 5% of H) 5%

(% used)

K. INITIAL EXPENSE \$143,700

(normally 5% of H) 5%

(% used)

L. CONSTRUCTION CONTINGENCY \$287,400

(normally 10% of H) 10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$3,879,900

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$581,985

(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$4,461,885

(use this total + Q + P for Construction Project Estimate from line 7d)

Estimator: JMT

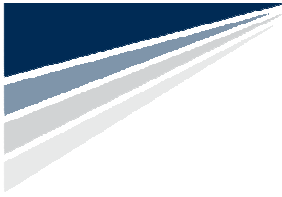
Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	<u>\$0</u>
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	
Utilities	
Estimator:	Date:

Q. TRAFFIC SECTION ITEMS	<u>\$425,000</u>
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	<u>\$350,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Ped Signal	<u>\$75,000</u>
Traffic	
Estimator:	Date:



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



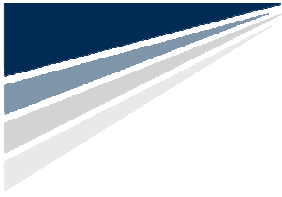
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 71,846
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 28,739
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 14,369
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 14,369
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 86,216
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 431,079
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 143,693
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 71,846
4. Utilities		
a. Inhouse	1.0%	\$ 28,739
b. Consultant	1.0%	\$ 28,739
c. Test Holes	1.00%	\$ 28,739
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	5,000.00	\$ 36,000.00	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 36,000.00	Total:	0

Number of Parcels Impacted: 6

Appraisal Fees: \$ 6,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 15,000.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 3,300.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365 assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

General Roadway Data							
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)		
Length of Widening/SW Edge** (LF)	5820	Hotmix Type C (in)		2	Type C	151.3	
Existing Roadway Width (LF)	0	Type B (in)		4	Type B	153.5	
Proposed Roadway Width (LF)	0	BCBC (in)		6	BCBC	151.5	
Widening Width (LF)	n/a	GABC Depth (in)		8	Project Duration (Assume 12 Mo/Mile)		
Overlay Area (SF)	226600	Overlay depth (in)		1.5			
Widening/Reconstruction Area (SF)	25990	SUP Pavement Box			Duration (Month)		0
Full Depth Hotmix Area (SF)	0						
Length of 10' Wide SUP (LF)	0	SUP Pavement Box			Modular Block Retaining Wall (LF)		0
Area of 10' SUP (SF)	0						
Length of 5' Wide Sidewalk (LF)	5140	Type C Depth (in)		2	Hotmix Sawcut (LF)		3682
Area of 5' Wide Sidewalk (SF)	25700	GABC Depth (in) (Typ 4")		8	Removal of Roadway (SF)		3460
Length of Curb/Gutter	9515	SW Pavement Box					
Area of Triangular Concrete Islands	2840	Concrete Depth (in) (Typ 4")		4			
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")		4			
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11						

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	1605	\$ 24.50	\$ 39,322.50	
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -	
	Sidewalk Excavation	CY	NA	127	\$ 24.50	\$ 3,111.50	
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -	
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	92	\$ 24.50	\$ 2,254.00	
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	433	\$ 20.00	\$ 8,650.00	
Total:						\$ 44,688.00	
A.1.b: Borrow							
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	96	\$ 15.75	\$ 1,512.00	
A.2: Drainage							
	General Drainage of project cost	LS	3%	1	\$ 86,216	\$ 86,215.79	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	2471	\$ 115.50	\$ 285,400.50	
401015	Superpave Type B, PG 70-22	Ton	Na	665	\$ 115.50	\$ 76,807.50	
Total:						\$ 362,208	

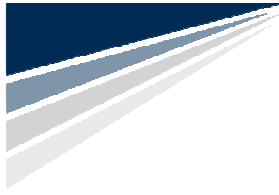


DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	339900	\$ 2.70	\$ 917,730.00	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	985	\$ 84.50	\$ 83,232.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	3460	\$ 3.50	\$ 12,110.00	
762000	Sawcutting, Bituminous Concrete	LF	NA	3682	\$ 2.50	\$ 9,205.00	
Total:						\$ 1,022,277.50	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	642	\$ 67.50	\$ 43,335.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 114,954.39	\$ 114,954.39	

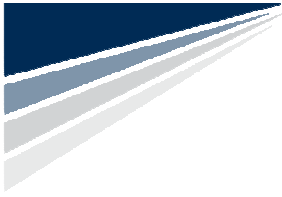
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	4485	\$ 30.00	\$ 134,550
71014	P.C.C. Curb, Type 2	LF	NA	4435	\$ 26.00	\$ 115,310
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	595	\$ 34.00	\$ 20,230
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	2840	\$ 77.00	\$ 218,680.00
Total:						\$ 488,770
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	25700	\$ 12.50	\$ 321,250.00
Total:						\$ 321,250.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	3%	1	\$ 71,846.49	\$ 71,846.49
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	19400	\$ 1.50	\$ 29,100.00
908004	Topsoil, 6" Depth	SY	NA	19400	\$ 9.00	\$ 174,600.00
Total:						\$ 203,700.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 71,846.49	\$ 71,846.49
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 71,846.49
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		21520	\$ 1.50	\$ 32,280.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		51	\$ 176.00	\$ 8,976.00
Total:						\$ 41,256.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 2,873,859.66



Attachment 10 - Intersection 6 Alternative CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 6 Levels & 299 - LOS I New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Levels Road (SR10)</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Middletown Warwick Road and Merrimac Ave. This alternative has a double right turn lane on WB Levels Road onto Middletown Warwick. It also has an extended LTL storage on SB Middletown Warwick Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$126,500</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$804,100</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$169,400</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$4,363,693</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$5,463,693</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 6 Alternative - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$63,422</u>	E. HISTORIC	<u>\$12,684</u>
B. ARCHAEOLOGY	<u>\$25,369</u>	1. Phase 1 (study)	<u>\$12,684</u>
1. Phase I (study)	<u>\$25,369</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$12,684</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$12,684</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$115,000

CONTINGENCY COSTS 10% \$11,500
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$126,500
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Int. 6 Alternative - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS \$76,106

- 1. Inhouse \$0
- 2. Consultant \$76,106

B. DESIGN ENGINEERING \$654,404

- 1. Design \$380,532
 - a. Inhouse \$0
 - b. Consultant \$380,532

- 2. Traffic \$126,844
 - a. Inhouse \$0
 - b. Consultant \$126,844

- 3. Real Estate Plan Preparation \$63,422
 - a. Inhouse \$ -
 - b. Consultant \$ 63,422

- 4. Utilities \$76,106
 - a. Inhouse \$ 25,369
 - b. Consultant \$ 25,369
 - c. Test Holes \$ 25,369
 - d. Utility Company \$ -

5. Materials & Research \$7,500

6. Borings _____

7. Pile Load Tests _____

8. Subdivision \$0

- a. Inhouse \$ -
- b. Consultant \$ -
- c. Railroad P.E. \$ -

9. Other (specify) \$0

- a. _____ \$0
- b. _____ \$0

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands \$ -

2. Hazardous Materials \$ -

3. Noise \$ -

4. Historic \$ -

5. Archaeology \$ -

6. Other _____

a. _____ \$ -

b. _____ \$ -

Loc/Environ _____

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin _____

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$731,000

CONTINGENCY COSTS \$73,100
(normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$804,100
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 6 Alternative - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$129,200</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 124,200</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$6,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$15,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$3,300</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$154,000

CONTINGENCY COSTS 10% \$15,400
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$169,400
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Int. 6 Alternative - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$2,266,363</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$60,736</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$2,063</u></p> <p>2. Drainage <u>\$76,106</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$382,190</u></p> <p style="padding-left: 20px;">b. Base <u>\$953,134</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$61,830</u></p> <p>4. Erosion/Sed. Cont. <u>\$101,475</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$399,407</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$166,000</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$63,422</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p align="right"><u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$118,304</u></p> <p>1. Beautification <u>\$118,304</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 63,421.96</u></p>
--	---

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Int. 6 Alternative - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$88,790</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 38,790.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$2,537,000

I. MISC. ITEMS \$380,550

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$126,850

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$126,850

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$253,700

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$3,424,950

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15%

(Enter on PNR funding line 4)

(% used)

\$513,743

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$3,938,693

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	<u>\$0</u>
--	------------

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS	<u>\$425,000</u>
---------------------------------	------------------

(Enter on PNR funding line 6)

1. Signing	
2. Signals	<u>\$350,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Ped Signals	<u>\$75,000</u>

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



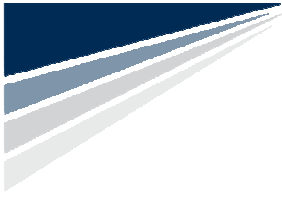
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 63,422
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 25,369
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 12,684
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 12,684
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



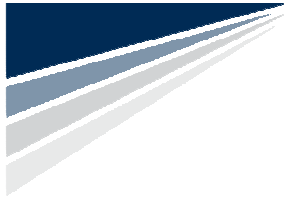
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 76,106
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 380,532
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 126,844
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 63,422
4. Utilities		
a. Inhouse	1.0%	\$ 25,369
b. Consultant	1.0%	\$ 25,369
c. Test Holes	1.00%	\$ 25,369
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1R	N			\$ -	3,500.00	\$ 25,200.00	-	
Estimated Commercial PE Area	C-1	N			\$ -	5,500.00	\$ 99,000.00	-	
Estimated Residential R/W Area	AR-1R	N			\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N			\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 124,200.00	Total:	0

Number of Parcels Impacted: 6

Appraisal Fees: \$ 6,000.00

Staff: \$ 15,000.00

Settlement: \$ 3,300.00

Number of Parcels Impacted X \$1,000

Number of Parcels Impacted X \$2,500

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

General Roadway Data							
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)		
Length of Widening/SW Edge** (LF)	3380	Hotmix Type C (in)		2	Type C	151.3	
Existing Roadway Width (LF)	0	Type B (in)		4	Type B	153.5	
Proposed Roadway Width (LF)	0	BCBC (in)		6	BCBC	151.5	
Widening Width (LF)	n/a	GABC Depth (in)		8	Project Duration (Assume 12 Mo/Mile)		
Overlay Area (SF)	199997	Overlay depth (in)		1.5			
Widening/Reconstruction Area (SF)	37073	SUP Pavement Box			Duration (Month)		0
Full Depth Hotmix Area (SF)	0						
Length of 10' Wide SUP (LF)	0	SUP Pavement Box			Modular Block Retaining Wall (LF)		0
Area of 10' SUP (SF)	0						
Length of 5' Wide Sidewalk (LF)	2656	Type C Depth (in)		2	Hotmix Sawcut (LF)		4330
Area of 5' Wide Sidewalk (SF)	13280	GABC Depth (in) (Typ 4")		8	Removal of Roadway (SF)		3885
Length of Curb/Gutter	7700	SW Pavement Box					
Area of Triangular Concrete Islands	2311	Concrete Depth (in) (Typ 4")		4			
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")		4			
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11						

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	2289	\$ 24.50	\$ 56,080.50	
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -	
	Sidewalk Excavation	CY	NA	66	\$ 24.50	\$ 1,617.00	
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -	
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	124	\$ 24.50	\$ 3,038.00	
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	486	\$ 20.00	\$ 9,712.50	
Total:						\$ 60,735.50	
A.1.b: Borrow							
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	131	\$ 15.75	\$ 2,063.25	
A.2: Drainage							
	General Drainage of project cost	LS	3%	1	\$ 76,106	\$ 76,106.35	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	2360	\$ 115.50	\$ 272,580.00	
401015	Superpave Type B, PG 70-22	Ton	Na	949	\$ 115.50	\$ 109,609.50	
Total:						\$ 382,190	

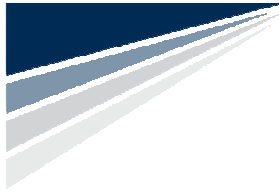


DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	299996	\$ 2.70	\$ 809,989.20	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1405	\$ 84.50	\$ 118,722.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	3885	\$ 3.50	\$ 13,597.50	
762000	Sawcutting, Bituminous Concrete	LF	NA	4330	\$ 2.50	\$ 10,825.00	
Total:						\$ 953,134.20	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	916	\$ 67.50	\$ 61,830.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 101,475.13	\$ 101,475.13	

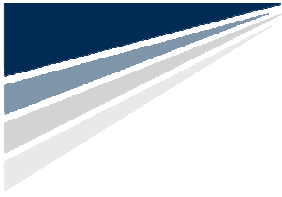
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	3623	\$ 30.00	\$ 108,690
71014	P.C.C. Curb, Type 2	LF	NA	3231	\$ 26.00	\$ 84,006
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	846	\$ 34.00	\$ 28,764
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	2311	\$ 77.00	\$ 177,947.00
					Total:	\$ 399,407
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	13280	\$ 12.50	\$ 166,000.00
					Total:	\$ 166,000.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 63,421.96	\$ 63,421.96
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	11267	\$ 1.50	\$ 16,900.50
908004	Topsoil, 6" Depth	SY	NA	11267	\$ 9.00	\$ 101,403.00
					Total:	\$ 118,303.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 63,421.96	\$ 63,421.96
	Maintenance of Traffic Items (1%) of project cost	LS		1	\$ -	\$ -
Total:						\$ 63,421.96
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		20580	\$ 1.50	\$ 30,870.00
		Each		45	\$ 176.00	\$ 7,920.00
Total:						\$ 38,790.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 2,536,878.35



Attachment 9E: Intersection 6 CTP Estimate LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 6 LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>Levels Road (SR10)</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the intersection of Middletown Warwick Road and Levels Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$53,900</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$350,900</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$72,600</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,667,385</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$2,144,785</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 6

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$26,848</u>	E. HISTORIC	<u>\$5,370</u>
B. ARCHAEOLOGY	<u>\$10,739</u>	1. Phase 1 (study)	<u>\$5,370</u>
1. Phase I (study)	\$10,739	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$5,370</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$5,370</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$49,000

CONTINGENCY COSTS 10% \$4,900
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$53,900
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 6

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$32,218</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$32,218</u>	
B. DESIGN ENGINEERING		<u>\$286,354</u>	
1. Design		<u>\$161,091</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$161,091</u>	
2. Traffic		<u>\$53,697</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$53,697</u>	
3. Real Estate Plan Preparation		<u>\$26,848</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 26,848</u>	
4. Utilities		<u>\$32,218</u>	
a. Inhouse		<u>\$ 10,739</u>	
b. Consultant		<u>\$ 10,739</u>	
c. Test Holes		<u>\$ 10,739</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$5,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ -</u>	
c. Railroad P.E.		<u>\$ -</u>	

9. Other (specify)		<u>\$0</u>	
a.		<u>\$0</u>	
b.		<u>\$0</u>	

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>	
2. Hazardous Materials		<u>\$ -</u>	
3. Noise		<u>\$ -</u>	
4. Historic		<u>\$ -</u>	
5. Archaeology		<u>\$ -</u>	
6. Other		<u>\$ -</u>	
a. _____		<u>\$ -</u>	
b. _____		<u>\$ -</u>	

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$319,000

CONTINGENCY COSTS \$31,900
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$350,900
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 6

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$41,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 36,000</u>	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$6,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$15,000</u>
Other (specify)	<u> </u>		
6. <u> </u>	<u> </u>	G. SETTLEMENT	<u>\$3,300</u>
7. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	<u> </u>
1. Residential	<u> </u>	2. As acquired plans	<u> </u>
2. Business	<u> </u>	I. CONDEMNATION	<u> </u>
Other (specify)	<u> </u>	J. OTHER (specify)	<u>\$0</u>
3. <u> </u>	<u> </u>	1. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$66,000

CONTINGENCY COSTS 10% \$6,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$72,600
(also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 6

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p style="text-align: right;">\$799,404</p> <p>1. Grading</p> <p style="padding-left: 20px;">a. Excavation (includes SWM pond) \$29,351</p> <p style="padding-left: 20px;">b. Borrow \$2,835</p> <p>2. Drainage \$32,218</p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface \$265,650</p> <p style="padding-left: 20px;">b. Base \$64,992</p> <p style="padding-left: 20px;">c. Subbase \$28,890</p> <p>4. Erosion/Sed. Cont. \$42,957</p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter \$0</p> <p style="padding-left: 20px;">b. Sidewalk \$292,063</p> <p style="padding-left: 20px;">c. Guardrail \$0</p> <p style="padding-left: 20px;">d. C.P.M. Schedule \$1,100</p> <p style="padding-left: 20px;">e. Clear/Grubb \$26,848</p> <p style="padding-left: 20px;">f. Field Office \$12,500</p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> \$0</p> <p style="padding-left: 20px;">h. <u>Fence Relocation</u> \$0</p> <p style="padding-left: 20px;">i. _____ _____</p> <p style="padding-left: 20px;">j. _____ _____</p> <p style="padding-left: 20px;">k. _____ _____</p> <p style="padding-left: 20px;">l. _____ _____</p> <p style="padding-left: 20px;">m. _____ _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p style="text-align: right;">\$0</p> <p>1. New Bridge</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>2. Old Structure Rem.</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/c.y. _____</p> <p>3. Retaining Wall</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/c.y. _____</p> <p>4. Box Culvert</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>C. LANDSCAPING \$230,475</p> <p>1. Beautification \$230,475</p> <p>2. Noise Mitigation \$0</p> <p>3. Visual Mitigation \$0</p> <p>4. Tree Mitigation \$0</p> <p>D. MAINTENANCE OF TRAFFIC \$ 26,848.39</p>
---	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 6

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	\$17,208
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 17,208
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$1,074,000

I. MISC. ITEMS \$161,100

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$53,700

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$53,700

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$107,400

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$1,449,900

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$217,485

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

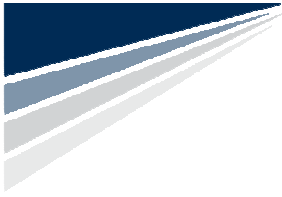
\$1,667,385

Estimator: Bill Dougherty, JMT

Date: 09/14/22

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	\$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS	\$0
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	
Traffic	
Estimator: _____	Date: _____

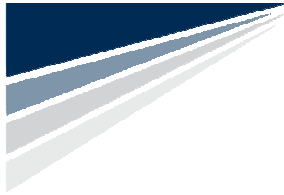


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 26,848
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 10,739
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 5,370
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 5,370
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



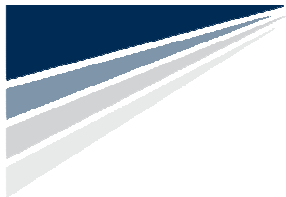
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 32,218
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 161,091
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 53,697
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 26,848
4. Utilities		
a. Inhouse	1.0%	\$ 10,739
b. Consultant	1.0%	\$ 10,739
c. Test Holes	1.00%	\$ 10,739
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Estimated Residential PE Area	AR-1R	N			\$ -	5,000.00	\$ 36,000.00		
Total:			\$ -	Total:	\$ -	Total:	\$ 36,000.00	Total:	\$ -

Number of Parcels Impacted: **6**
 Appraisal Fees: **\$ 6,000.00** Number of Parcels Impacted X \$1,000
 Staff: **\$ 15,000.00** Number of Parcels Impacted X \$2,500
 Settlement: **\$ 3,300.00** Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

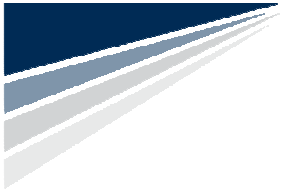
Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

General Roadway Data							
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)		
Length of Roadway Edge (LF)	1912	Type C Depth (in)	2		Type C	151.3	
Existing Roadway Width (LF)	0	Type B Depth (in)	4		Type B	153.5	
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6		BCBC	151.5	
Widening Width (LF)	0	GABC Depth (in)	8		Project Duration (Assume 12 Mo/Mile)		
Overlay Area (SF)	129880						
Widening/Reconstruction Area (SF)	17305	SUP Pavement Box			Duration (Month)	5	
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2		Hotmix Sawcut (LF) 2365		
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8				
Length of 5' Wide Sidewalk (LF)	4673	SW Pavement Box					
Area of 5' Wide Sidewalk (SF)	23365	Concrete Depth (in) (Typ 4")	4		Removal of Roadway (SF)		
Length of Curb/Gutter	4590	GABC Depth (in) (Typ 4")	4				
Area of Triangular Concrete Islands	0			Brick Hatching (SF)			
Length of Ditch Runs (LF)							
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0						

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	1069	\$ 24.50	\$ 26,190.50	
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -	
	Sidewalk Excavation	CY	NA	116	\$ 24.50	\$ 2,842.00	
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -	
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	13	\$ 24.50	\$ 318.50	
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -	
Total:						\$ 29,351.00	
A.1.b: Borrow							
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	180	\$ 15.75	\$ 2,835.00	
A.2: Drainage							
	General Drainage (10% of project cost)	LS	3%	1	\$ 32,218.07	\$ 32,218.07	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	1857	\$ 115.50	\$ 214,483.50	
401015	Superpave Type B, PG 70-22	Ton	NA	443	\$ 115.50	\$ 51,166.50	
Total:						\$ 265,650.00	
A.3.b: Pavement Base							
401021	Superpave Type BCBC, PG 64-22	Ton	NA	656	\$ 84.50	\$ 55,432.00	
762000	Sawcutting, Bituminous Concrete	LF	NA	3824	\$ 2.50	\$ 9,560.00	
Total:						\$ 64,992.00	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	428	\$ 67.50	\$ 28,890.00	

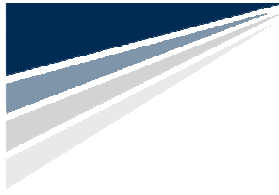


DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

A.4: Erosion/Sediment Control						
General E&S (4%) of Overall Project Cost	LS	4.0%		1	\$ 42,957.43	\$ 42,957.43

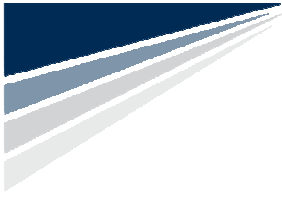
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	1785	\$ 30.00	\$ 53,550
71014	P.C.C. Curb, Type 2	LF	NA	2805	\$ 26.00	\$ 72,930
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -
Total:						\$ -
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	23365	\$ 12.50	\$ 292,062.50
Total:						\$ 292,062.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	5	\$ 220.00	\$ 1,100.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (15%) of project cost	LS	2.5%	1	\$ 26,848.39	\$ 26,848.39
A.5.f: Field Office						
		EAMO	NA	5	\$ 2,500.00	\$ 12,500.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
A.5.h: Fence Relocation						
	Fence Relocation	LF	NA	0	\$ -	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	21950	\$ 1.50	\$ 32,925.00
908004	Topsoil, 6" Depth	SY	NA	21950	\$ 9.00	\$ 197,550.00
Total:						\$ 230,475.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -
D: Maintenance of Traffic						
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 26,848.39	\$ 26,848.39
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 6 - Middletown Warwick Road and Levels Road - LOS E

					Total:	\$ 26,848.39
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		11472	\$ 1.50	\$ 17,208.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		0	\$ 176.00	\$ -
					Total:	\$ 17,208.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,073,935.80



Attachment 11 - Intersection 18 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 18 299 & United Drive New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Middletown Warwick Road (SR443)</u>	<u>United Drive</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the intersection of Middletown Warwick Road and United Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$33,000</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$191,400</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$602,800</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$833,693</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,660,893</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 18 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$13,404</u>	E. HISTORIC	<u>\$5,361</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$5,361</u>	1. Phase 1 (study)	<u>\$5,361</u>
1. Phase I (study)	<u>\$5,361</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$5,361</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$5,361</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$30,000

CONTINGENCY COSTS 10% \$3,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$33,000
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 18 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$32,169</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$32,169</u>	
B. DESIGN ENGINEERING		<u>\$141,537</u>	
1. Design		<u>\$80,422</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$80,422</u>	
2. Traffic		<u>\$26,807</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$26,807</u>	
3. Real Estate Plan Preparation		<u>\$10,723</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 10,723</u>	
4. Utilities		<u>\$16,084</u>	
a. Inhouse		<u>\$ 5,361</u>	
b. Consultant		<u>\$ 5,361</u>	
c. Test Holes		<u>\$ 5,361</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED		<u>\$174,000</u>
CONTINGENCY COSTS		<u> </u>
(normally 5% for large projects and 10% for small projects - to be approved by section head)	<u>10%</u> (% used)	<u>\$17,400</u>
TOTAL PRELIMINARY ENGINEERING		<u>\$191,400</u>
(also total for Construction Project Estimate form line 7b)		

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 18 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$531,140</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 238,500</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 287,640</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$4,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$10,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,200</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$548,000

CONTINGENCY COSTS 10% \$54,800
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$602,800
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 18 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$464,141</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$1,470</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$63</u></p> <p>2. Drainage <u>\$16,084</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$47,124</u></p> <p style="padding-left: 20px;">b. Base <u>\$174,652</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$0</u></p> <p>4. Erosion/Sed. Cont. <u>\$21,446</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$47,836</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$142,063</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$13,404</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$52,920</u></p> <p>1. Beautification <u>\$52,920</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 13,403.63</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 18 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$5,680</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 5,680.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$537,000

I. MISC. ITEMS \$80,550

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$26,850

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$26,850

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$53,700

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$724,950

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$108,743

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$833,693

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

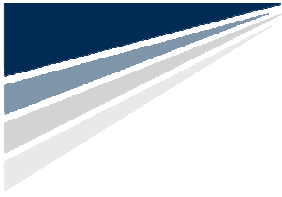
1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 13,404
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 5,361
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 5,361
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	1.0%	\$ 5,361
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	6.0%	\$ 32,169
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	15.0%	\$ 80,422
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 26,807
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 10,723
4. Utilities		
a. Inhouse	1.0%	\$ 5,361
b. Consultant	1.0%	\$ 5,361
c. Test Holes	1.00%	\$ 5,361
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Residential PE Area	AR-1R	N			\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	15,980.00	\$ 287,640.00	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		7,950.00	\$ 238,500.00	-	\$ -	-	
Total:			0	Total:	\$ 238,500.00	Total:	\$ 287,640.00	Total:	0

Number of Parcels Impacted: **4**

Appraisal Fees:

\$ 4,000.00

Number of Parcels Impacted X \$1,000

Staff:

\$ 10,000.00

Number of Parcels Impacted X \$2,500

Settlement:

\$ 2,200.00

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions
for now assuming r/w length x5'
r/w length=18365

assume 15% of land acquisition
on commercial land



Appendix C

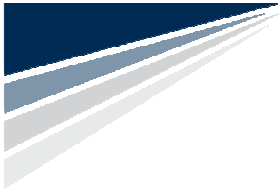
Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	1512	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	43124	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	0	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	2273	Type C Depth (in)	2	Hotmix Sawcut (LF)	
Area of 5' Wide Sidewalk (SF)	11365	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	
Length of Curb/Gutter	863	SW Pavement Box			
Area of Triangular Concrete Islands	286	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	57	\$ 24.50	\$ 1,396.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	3	\$ 24.50	\$ 73.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 1,470.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	4	\$ 15.75	\$ 63.00
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 16,084	\$ 16,084.35
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	408	\$ 115.50	\$ 47,124.00
401015	Superpave Type B, PG 70-22	Ton	Na	0	\$ 115.50	\$ -
					Total:	\$ 47,124

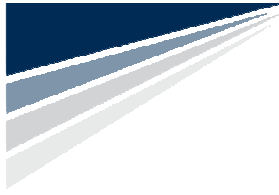


DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	64686	\$ 2.70	\$ 174,652.20	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -	
Total:						\$ 174,652.20	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 21,445.80	\$ 21,445.80	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	844	\$ 30.00	\$ 25,320
71014	P.C.C. Curb, Type 2	LF	NA	19	\$ 26.00	\$ 494
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	286	\$ 77.00	\$ 22,022.00
					Total:	\$ 47,836
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	11365	\$ 12.50	\$ 142,062.50
					Total:	\$ 142,062.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 13,403.63	\$ 13,403.63
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	5040	\$ 1.50	\$ 7,560.00
908004	Topsoil, 6" Depth	SY	NA	5040	\$ 9.00	\$ 45,360.00
					Total:	\$ 52,920.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 18 - Middletown Warwick Road and United Drive - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 13,403.63	\$ 13,403.63
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 13,403.63
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		2848	\$ 1.50	\$ 4,272.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		8	\$ 176.00	\$ 1,408.00
Total:						\$ 5,680.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 536,145.11

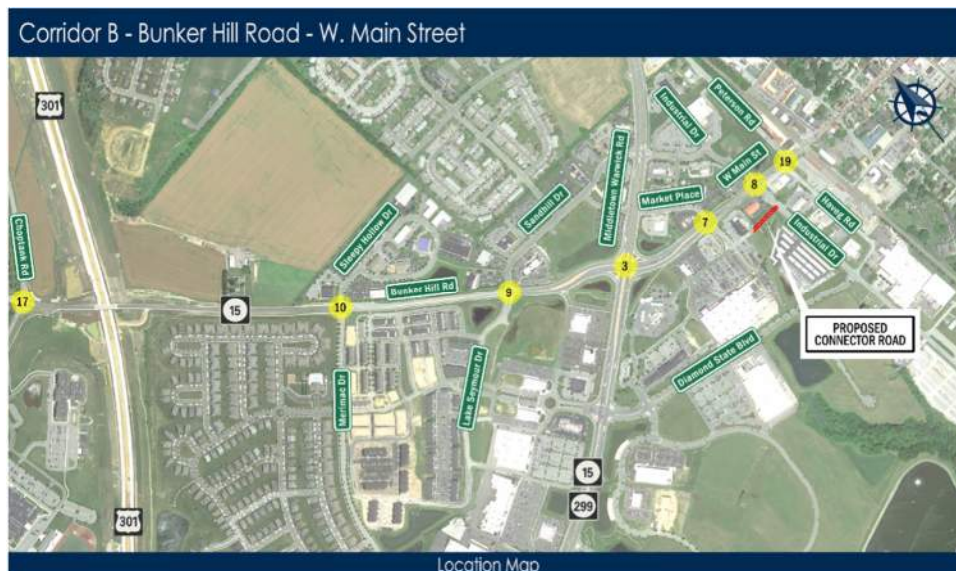


TECHNICAL MEMORANDUM

TO: Sarah Coakley, Regional Planner, Regional Systems Planning
 DATE: 11/05/2021 – Revised 9/19/2022
 FROM: Bill Dougherty, JMT
 PROJECT: Westtown TID CTP Cost Updates
 JMT JOB NO.: 19-01340-2A1
 RE: Corridor B - Bunker Hill Road and Main Street Concept Assumptions and Summary
 CC: Pam Steinebach, Matt Vincent, Mir Wahed, Brad Herb, Nate Rahaim

Included are recommendations for improvements based on existing conditions and future traffic for the intersections studied along Bunker Hill Road and West Main Street. The corridor was studied for both Level of Service (LOS) D and E. A general breakdown of intersection improvement costs along the Bunker Hill Road corridor is given in the table below. Please note that Intersection # 3 is included in the analysis for Corridor A – Middletown Warwick Road.

Intersection #	Intersection Road Names	Estimated Cost - LOS D	Estimated Cost - LOS E
9	Bunker Hill Road, Lake Seymour Drive & Sand Hill Drive	\$ 2,348,975.00	\$ 1,517,195.00
10	Bunker Hill Road & Merrimac Avenue - DelDOT Estimate	\$ 2,363,733.00	\$ 2,363,733.00
17	Bunker Hill Road & Choptank Road	\$ -	\$ -
7,8,19	Main Street & Market Place, Industrial Drive, & Haveg Road	\$ 1,269,060.00	\$ 1,269,060.00
8a	Future Connector to Industrial Drive	\$ 1,720,715.00	\$ 1,720,715.00
Total		\$ 7,702,483.00	\$ 6,870,703.00



Bunker Hill Road - Existing Conditions

Bunker Hill Road (N437) is a 1.07-mile major collector within Investment Strategy Level 1. The current AADT (Annual Average Daily Traffic) for Bunker Hill Road is 2,336 VPD. The roadway is a two-lane roadway starting at Choptank Road that widens to a separated 4 lane roadway with 12' travel lanes east of Sandhill Road as it approaches Middletown-Warwick Road. The speed limit is 35-mph; therefore a 40-mph design speed was used for conceptual design.

Road Site Conditions

- OPC Index (83)
- 4-lane separated asphalt pavement
- Closed drainage
- Speed limit 35 (posted)

Intersection 9: Bunker Hill Road & Lake Seymour Drive & Sandhill Drive

Lake Seymour Drive is a 0.78-mile local road within Investment Strategy Level 1 which links Bunker Hill Road to the Parkway at South Ridge subdivision. The AADT of Lake Seymour Drive is estimated at 2,465 VPD. The posted speed limit is 25-mph; therefore a 30-mph design speed is to be utilized for conceptual design.

Sand Hill Drive is a 0.33-mile local road within Investment Strategy level 1 which links Bunker Hill Road and Middletown Warwick Road. The AADT of Sand Hill Drive is estimated at 4,100 VPD. The posted speed limit is 25-mph; therefore a 30-mph design speed is to be utilized for conceptual design.

Road Site Conditions – Sand Hill Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Approach to Bunker Hill Road has a right turn lane and a shared left turn/through lane.
- Closed drainage

Road Site Conditions – Lake Seymour Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Approach to Bunker Hill Road has a right turn lane and a shared left turn/through lane.
- Closed drainage

Design Elements

- No substandard design elements have been recognized at this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the westbound side of Bunker Hill Road.
- Underground
 - The Town of Middletown has an electric line running along the eastbound side of Bunker Hill Road near this intersection.
- Potential Conflicts
 - Intersection improvements are anticipated to cause utility pole relocations. It is not anticipated that improvements will have an impact on the underground utilities.

Potential for Future Development:

- The Parkway at South Ridge and Westtown Town Center is currently in development along the east side of Lake Seymour Drive and eastbound side of Bunker Hill Road.

Multi-modal Analysis:

- There is an existing sidewalk along the south side of Bunker Hill Road the length of the road and a crosswalk across Lake Seymour Drive. There are bike lanes provided along Bunker Hill Road.
- Sidewalk exists on the west side of Lake Seymour Drive.
- There is an existing sidewalk adjacent to the Hampton Inn parking lot on the northeast corner of Sandhill Drive and Bunker Hill Road.
- There is sidewalk along the east side of Sandhill Drive but does not provide a curb ramp on the northeasterly corner. Sidewalk exists internally on the west side of Sandhill Drive but does not extend to the northwesterly corner.

Recommendations:

To meet LOS D:

- Install a single-lane roundabout at the intersection of Bunker Hill Road, Lake Seymour Drive, and Sandhill Drive. Drop the outside westbound Bunker Hill Road travel lane as a right turn bypass lane onto Sandhill Drive. Install a right turn bypass lane along eastbound Bunker Hill Drive onto southbound Lake Seymour Drive with 350' of storage and a 50' taper.
- Connect sidewalk along westbound Bunker Hill Road to the existing sidewalk in front of the Christiana Care Primary Care at Middletown-West property. Replace any existing sidewalk impacted by roundabout design. Connect new sidewalk with existing sidewalk along both sides of Sandhill Drive.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$2,348,975. See attached estimate in Attachment 2 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- Install a single-lane roundabout at the intersection of Bunker Hill Road, Lake Seymour Drive, and Sandhill Drive. Drop the outside westbound Bunker Hill Road travel lane as a right turn bypass lane onto Sandhill Drive.
- Connect sidewalk along westbound Bunker Hill Road to the existing sidewalk in front of the Christiana Care Primary Care at Middletown-West property. Replace any existing sidewalk impacted by roundabout design. Connect new sidewalk with existing sidewalk along both sides of Sandhill Drive.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$1,517,195. See attached estimate in Attachment 2E for more information.
- See attached intersection diagram in Attachment 1 for more information.

Intersection 10: Bunker Hill Road & Merrimac Avenue & Sleepy Hollow Drive

Existing Conditions

Merrimac Avenue is a 1.30-mile municipal road within Investment Strategy Level 1. The current AADT of Merrimac Avenue is estimated at 5,140 VPD. Merrimac Avenue is a 2-lane asphalt pavement roadway. The posted speed limit is 25-mph; therefore, a design speed of 30-mph was used in conceptual design.

Sleepy Hollow Drive is a 0.40-mile local road within Investment Strategy Level 1. The current AADT of Sleepy Hollow Drive is estimated at 1,050 VPD. Sleepy Hollow Drive is a 2-lane asphalt pavement roadway. There is no posted speed limit; therefore, a design speed of 30-mph was used in conceptual design. This intersection is not currently signalized.

Road Site Conditions – Merrimac Avenue

- OPC Index (unknown)
- 2-lane asphalt pavement
- Approach has a shared left turn/through lane, a bike lane, and a right turn lane

- Closed drainage

Road Site Conditions – Sleepy Hollow Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Closed drainage

Design Elements

- No substandard design elements have been observed for this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the westbound side of Bunker Hill Road.
- Potential conflicts
 - Intersection improvements are anticipated to require utility pole relocations. No impacts to underground utilities are anticipated.

Potential for Future Development:

- There are no projects currently in development in the area but there is a farm parcel north of the intersection along Bunker Hill Road that could be developed in the future.

Multi-modal Analysis:

- There are sidewalks on both sides of the road along Sleepy Hollow Drive, Merrimac Avenue and Bunker Hill Road. Crosswalks exist across the Sleepy Hollow Drive and Merrimac Avenue legs.
- There are bike lanes along Bunker Hill Road and Merrimac Avenue. There are no bike facilities along Sleepy Hollow Drive.

Recommendations:

- Install a single-lane roundabout at this intersection.
- Replace existing sidewalk impacted by the roundabout design.
- Install intersection lighting.
- The estimated cost of intersection improvements is \$2,363,733. See attached estimate in Attachment 3 for more information.
- See attached intersection diagram in Attachment 1 for more information.
- Traffic studies were completed for both LOS D and LOS E improvements. At this intersection, LOS E recommendations match LOS D geometry.

Intersection 17: Bunker Hill Road & Choptank Road

Existing Conditions

Choptank Road (N435) is a 2.42-mile major collector within Investment Strategy Level 4 which links Bunker Hill Road and Churchtown Road. The current AADT for Choptank Road is 7,136 VPD. The post speed limit of Choptank Road is 45-mph; therefore, a design speed of 50-mph was used in conceptual design. The existing intersection is a single-lane roundabout. The southerly School Drive leg serves as the access to Appoquinimink high school and Bunker Hill elementary school.

Road Site Conditions – Choptank Road

- OPC Index (98)
- 2-lane asphalt pavement
- Open drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO's 'A Policy on the Geometric Design of Highways and Streets' (Green Book).

Utilities

- Aerial
 - There are no primary aerial electric service lines along Choptank Road.
 - There is a primary aerial electric service line running along the westbound side of Bunker Hill Road with poles located at several corners of the intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Multi-modal Analysis:

- Bike Lanes currently exist on Choptank Road.
- The existing roundabout has paved bike bypass areas around it with ramps allow cyclists the opportunity to maneuver outside the roundabout. Bicycles coming from southbound Choptank Road are taken out of shoulder to the sidewalk around the roundabout until the sidewalk tapers back into the shoulder of eastbound Bunker Hill Road. Bikes coming from westbound Bunker Hill Road would be directed out of the shoulder to the sidewalk and are then directed back into the road on northbound Choptank Road.
- A sidewalk exists along eastbound Bunker Hill Road and continues onto the east side of School Drive. The sidewalks are not currently connected to the roundabout.

Recommendations:

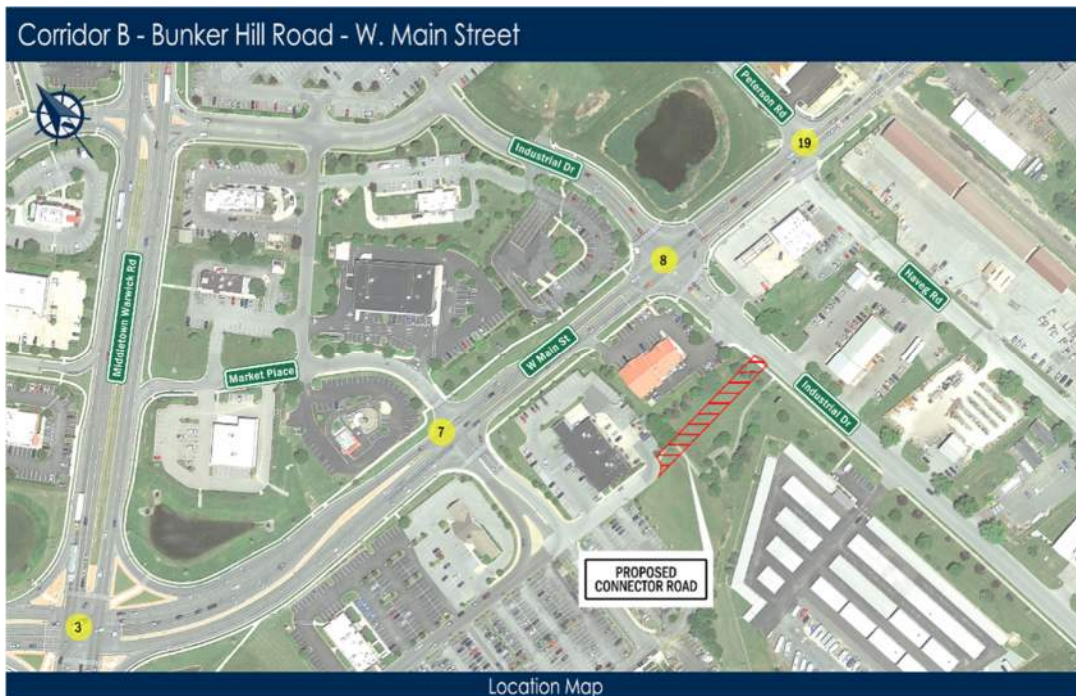
- Based on the existing conditions and future projections, no roadway improvements are needed at this intersection.
- Recommend DeIDOT works with the school to study the pedestrian activity to/from the roundabout. The existing sidewalk connection was completed as part of the US 301 and makes logical connection within the TID, it appears to underserve both Choptank Road and the western part of Bunker Hill Road which fall outside the limit of the TID.

West Main Street - Existing Conditions

West Main Street (N438) is a 0.33-mile minor arterial road within Investment Strategy Level 1. The current AADT for West Main Street is 17,234 VPD. West of Market Place West Main Street is a 4-lane separated asphalt roadway. East of Market Place West Main Street is a 2-lane asphalt roadway. The speed limit for West Main Street is 25-mph; therefore, a design speed of 30-mph was utilized for conceptual design.

Road Site Conditions – West Main Street

- OPC Index (62)
- 2-lane asphalt pavement east of Market Place; 4-lane asphalt pavement west of Market Place
- Closed drainage
- Speed limit 25 (posted)



Intersection 7,8,19: West Main Street & Industrial Drive/Market Place/Haveg Road

Existing Conditions

Industrial Drive is 1.70-mile local road within Investment Strategy Level 1 which links West Main Street and Levels Road. The current AADT for Industrial Drive is estimated at 3,300 VPD. The posted speed limit of Industrial Drive is 35-mph; therefore, a design speed of 40-mph was used for conceptual design. The eastbound West Main Street approach to Industrial Drive has a left turn lane and a shared through/right turn lane. The westbound West Main Street approach to Industrial Drive has a left turn lane, a through lane, and a right turn lane. Northbound Industrial Drive has a left turn lane and a shared through/left turn lane. Southbound Industrial Drive has a right turn lane and a shared through/right turn lane. The intersection at Industrial Drive is signalized.

Market Place is a 0.12-mile commercial road within Investment Strategy 1. It is a right-in only along Middletown Warwick Road and connects to West Main Street. The current AADT for Market Place is estimated at 1,700 VPD. The road does not have a posted speed limit; therefore a 25-mph design was used for conceptual design. Both West Main Street approaches to Market Place have a right turn lane, a bike lane, a through lane, and a left turn lane. The Northbound Market Place approach has a right turn lane and a shared left/through lane. The intersection is not signalized.

Haveg Road is a 0.25-mile local road within Investment Strategy Level 1 which links West Main Street to Industrial Drive. The current AADT for Haveg Road is estimated at 1150. The posted speed limit on Haveg Road is 25-mph; therefore, a design speed of 30-mph was utilized for conceptual design. This intersection is not signalized.

Peterson Drive is a 0.37-mile local road located within Investment Strategy Level 1 which links Middletown Warwick Road to West Main Street behind the Market Place shopping center. The Norfolk Southern Railroad borders Peterson Road to the east. The road has no opportunities for future development but will remain a useful connector road. The current AADT for Peterson Drive is estimated at 1,000 VPD, and the speed limit is 25 mph; therefore a 30-mph design speed was utilized for conceptual design. This intersection is not signalized.

Road Site Conditions – Industrial Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Closed drainage

Road Site Conditions – Haveg Road

- OPC Index (unknown)
- 2-lane asphalt pavement
- Open drainage

Road Site Conditions – Peterson Drive

- OPC Index (unknown)
- 2-lane asphalt pavement
- Approach to West Main Street has a left turn lane and a shared right-turn/through lane
- Open drainage

Road Site Conditions – Market Place

- OPC Index (unknown)
- 2-lane asphalt pavement
- Closed drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO's 'A Policy on the Geometric Design of Highways and Streets' (Green Book).

Utilities

- Aerial
 - There is a primary aerial electric service line running along both sides of West Main Street. East of Industrial Drive the service line runs along only the westbound side of West Main Street, then east of Peterson Drive the service line runs along only the eastbound side of West Main Street.
 - There is a primary aerial electric service line running along the eastern side of Haveg Road.
 - There is a primary aerial electric service line running along the western side of Industrial Drive and Peterson Road.
- Underground
 - The Town of Middletown has sanitary sewer and water lines along West Main Street in this area.
 - A Chesapeake Utilities gas line runs along the north side West Main Street in this area.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- On the east side of Industrial Road north of stormwater facility, there is currently a Veterinary Hospital in development.

- The DeIDOT (Delaware Department of Transportation) Green Street Extension project will extend Green Street to provide a connection between South Scott Street and Haveg Road crossing the existing railroad.

Multi-modal Analysis:

- There are both pedestrian and bicycle facilities along both directions of West Main Street.
- Haveg Road and Peterson Drive do not have any pedestrian or bicycle facilities. Sidewalk along eastbound West Main Street crosses Haveg Road.
- South of West Main Street, Industrial Drive has pedestrian facilities along the southbound side of the roadway.
- Pedestrian signals/crossings present at all corners of the Industrial Drive and West Main Street intersections.
- North of West Main Street, Industrial Drive has sidewalks on both sides of the road.
- Market Place has sidewalks on both sides of the road. Pedestrian crossings are present across both legs.

Recommendations:

- The existing striping layout of the left-turn lanes along West Main Street is similar to the recommended storage lengths, therefore no updates are recommended along West Main Street in this area.
- Install porkchop islands to make both approaches of Market Place a right out only, eliminating the left-out movements. Left-in movements from West Main Street will still be permitted. Those looking to go west along West Main Street from the northbound approach of Market Place will use a proposed new connector road described later in this document.
- Install triangular channelizing islands to make Peterson Road and Haveg Road right in/ right out only access points along West Main Street.
- For the northbound Industrial Drive approach to West Main Street, install a left turn lane with 200' of storage with a 100' taper, a designated through lane, and right turn lane with 500' of storage with a 50' taper.
- The installation of lighting is only required at the intersection of West Main Street and Industrial Drive.
- The estimated cost of intersection improvements is \$1,269,060. See attached estimate in Attachment 4 for more information.
- See attached intersection diagram in Attachment 1 for more information.
- Traffic studies were completed for both LOS D and LOS E improvements. At this intersection, LOS E recommendations match LOS D geometry.

New Connector Recommendations:

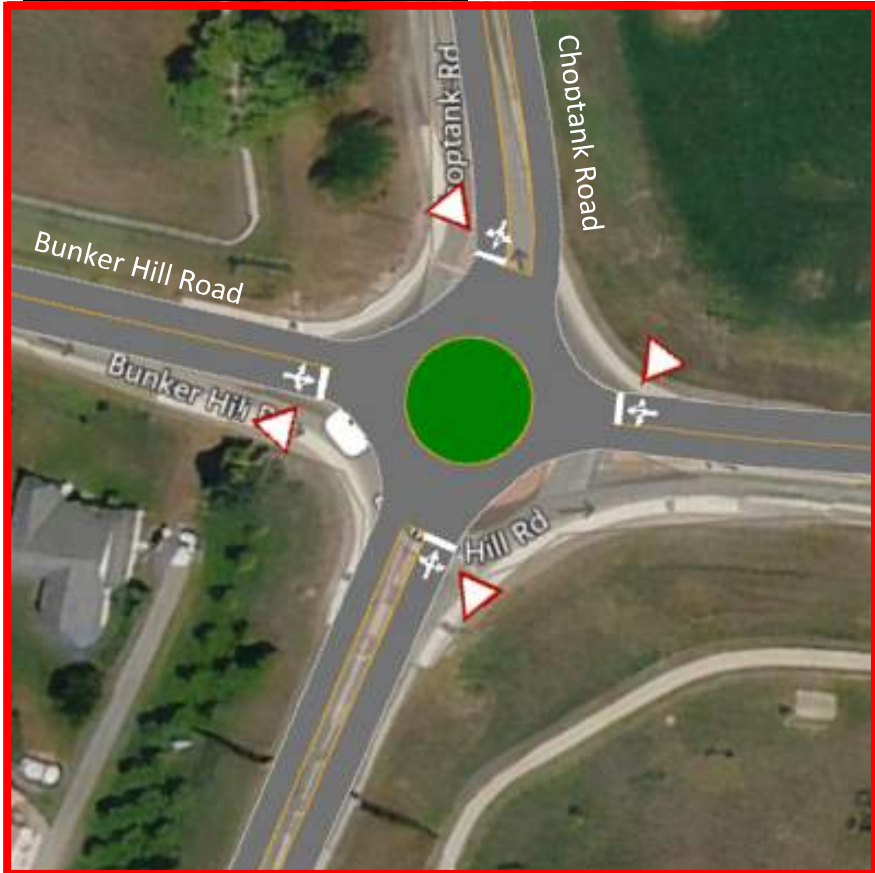
- Construct 32' asphalt roadway with 2-11' travel lanes and 5' shoulders, connecting existing Industrial Drive to the Middletown Commons parking lot near the Cuzino's Pizza. New Connector is to divert traffic from the intersection of northbound Market Place and eastbound West Main Street.
- Install 5' sidewalk on either side of the new connecting road.
- The estimated cost of intersection improvements for this option is \$1,720,715. See attached estimate in Attachment 5 for more information.
- See attached intersection diagram in Attachment 1 for more information.
- Traffic studies were completed for both LOS D and LOS E improvements. At this intersection, LOS E recommendations match LOS D geometry.



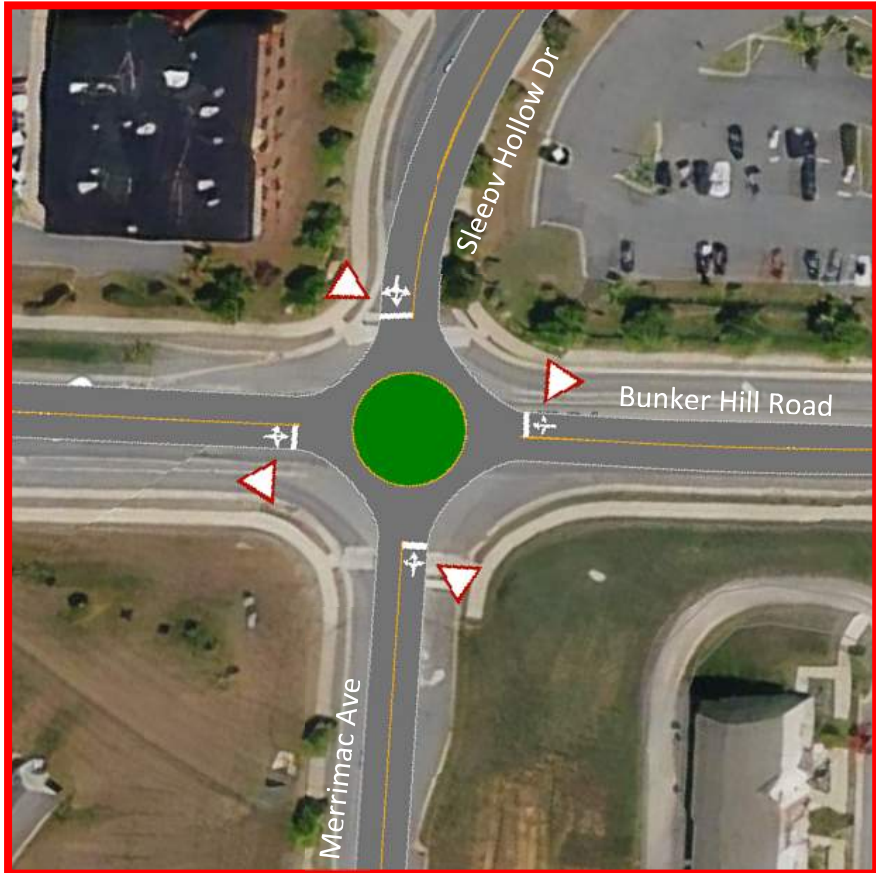
Attachment 1: Intersection Diagrams



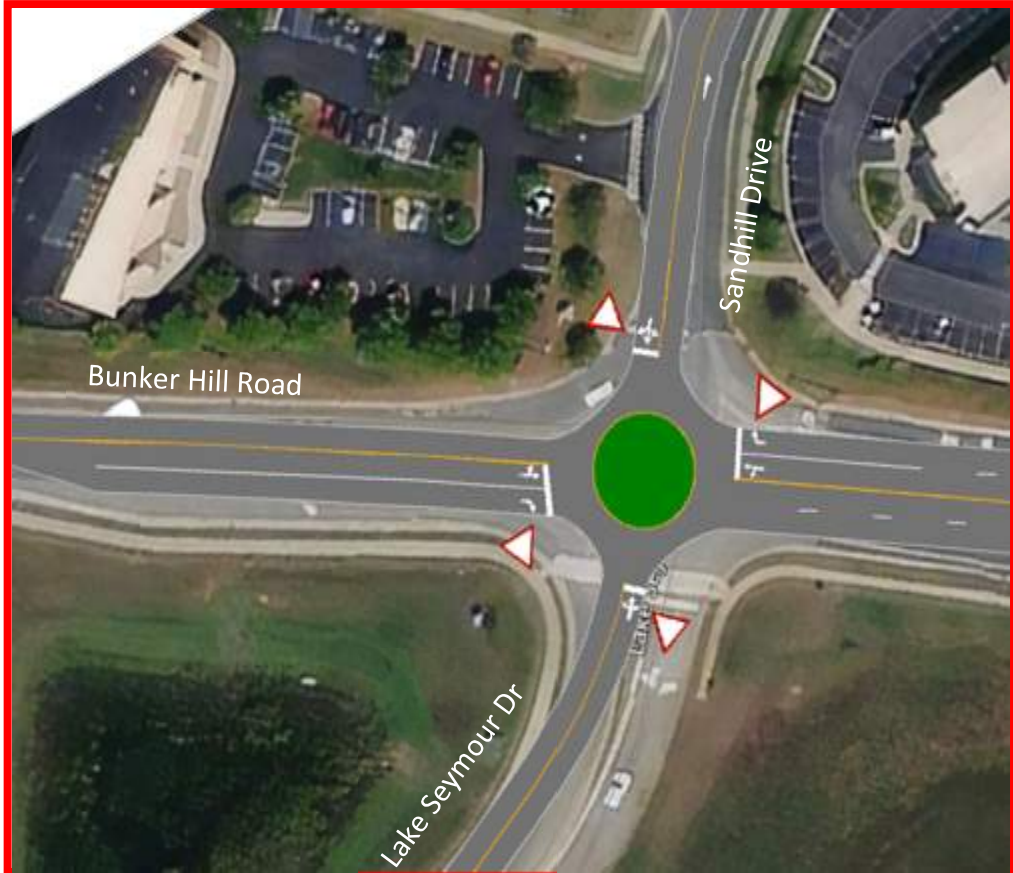
Detail 1 – Single Lane Roundabout

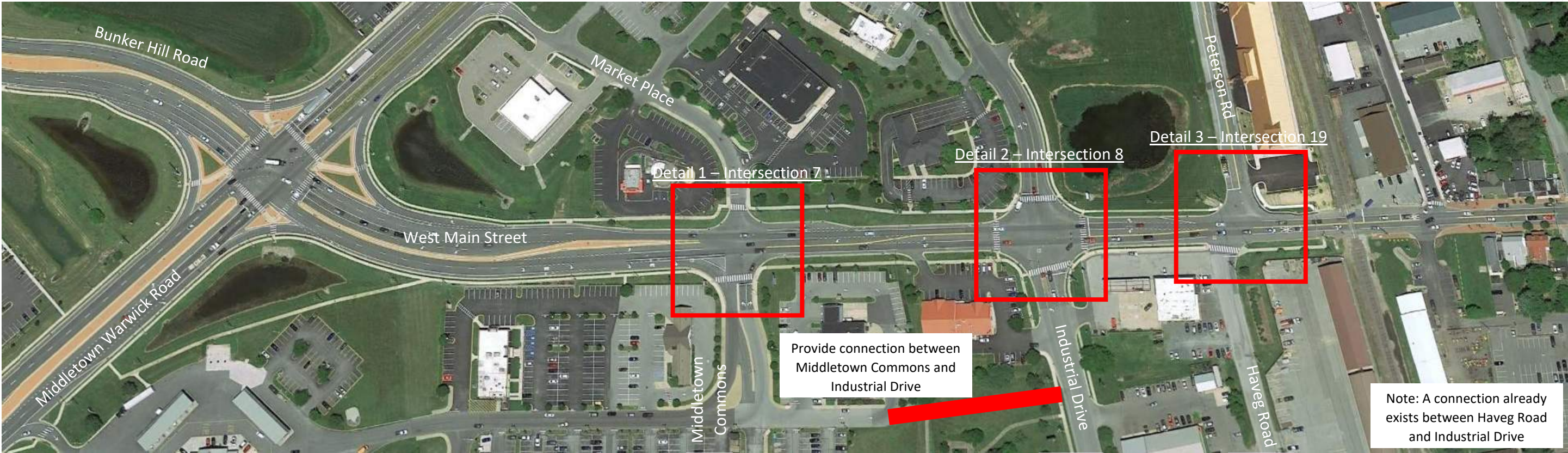


Detail 2 – Single Lane Roundabout

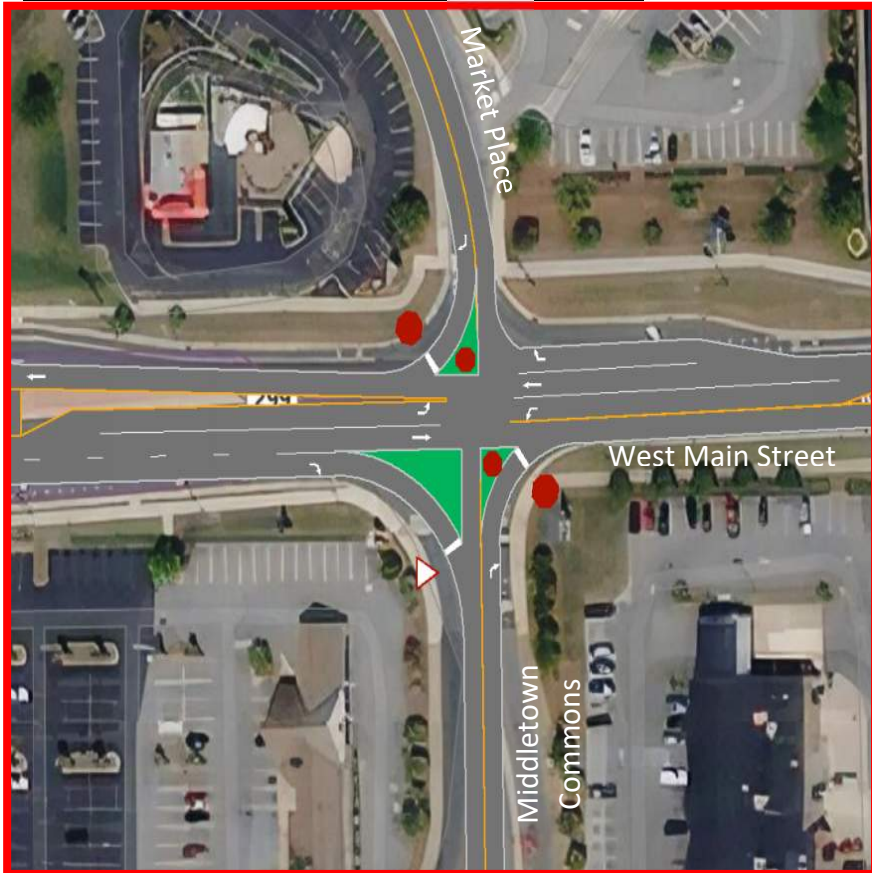


Detail 3 – Single Lane Roundabout with Bypass Lanes





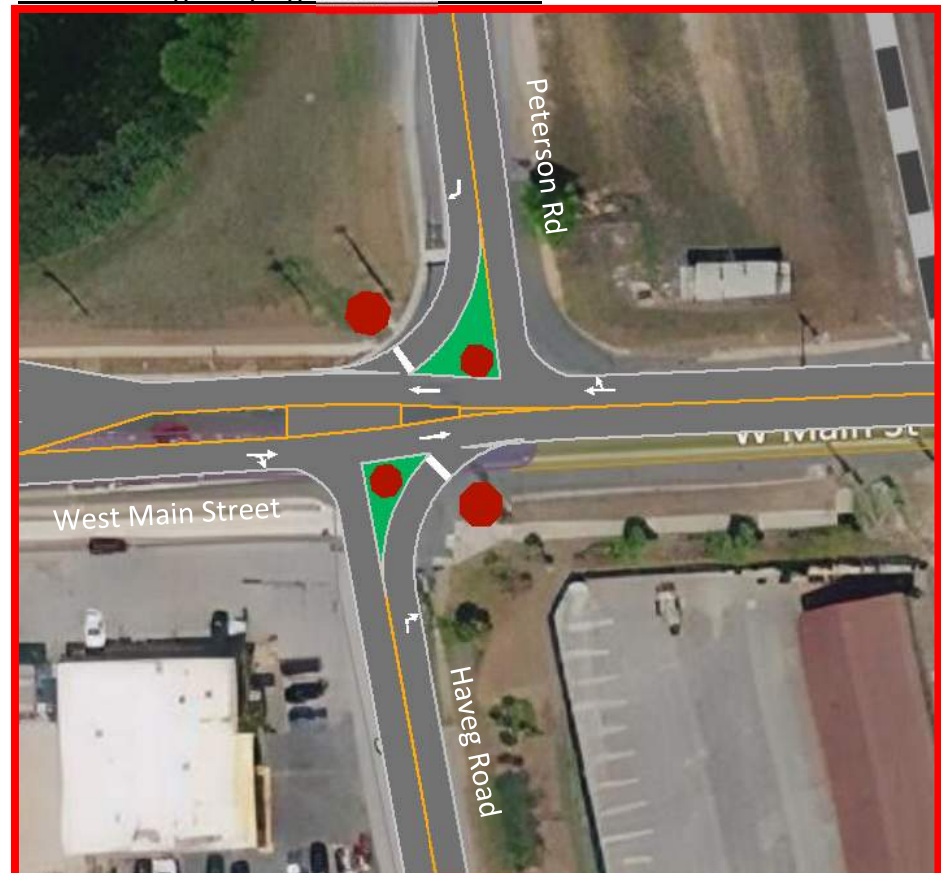
Detail 1 – Right-In/Right-Out/Left-In Conversion



Detail 2 – Signal

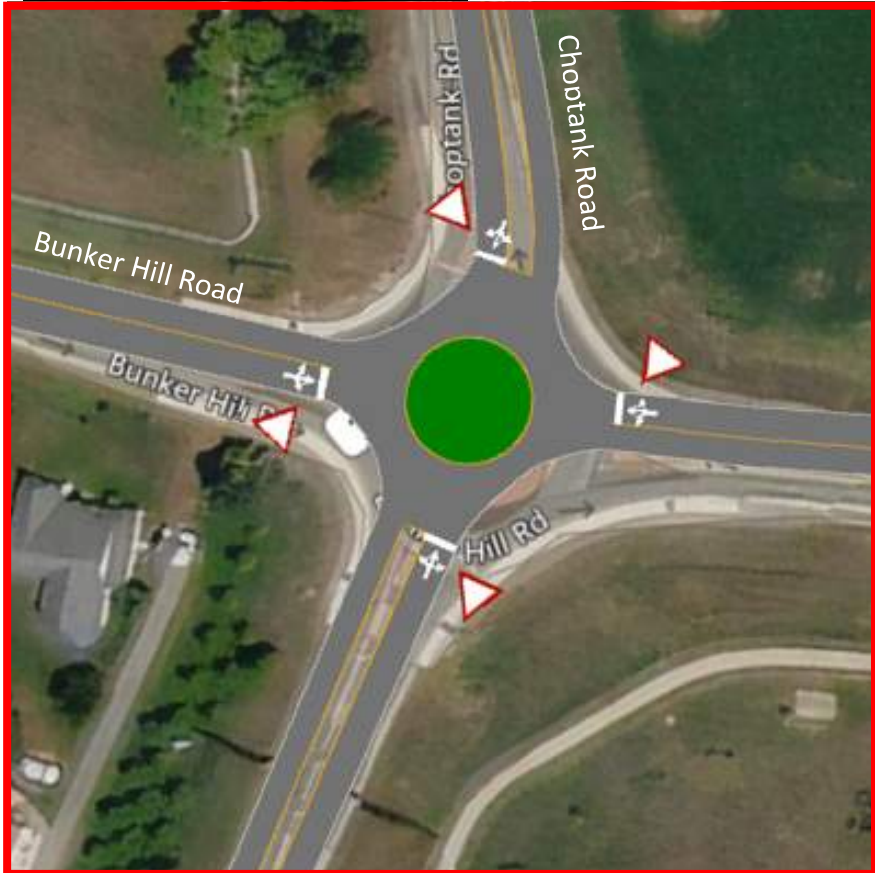


Detail 3 – Right-In/Right-Out Conversion

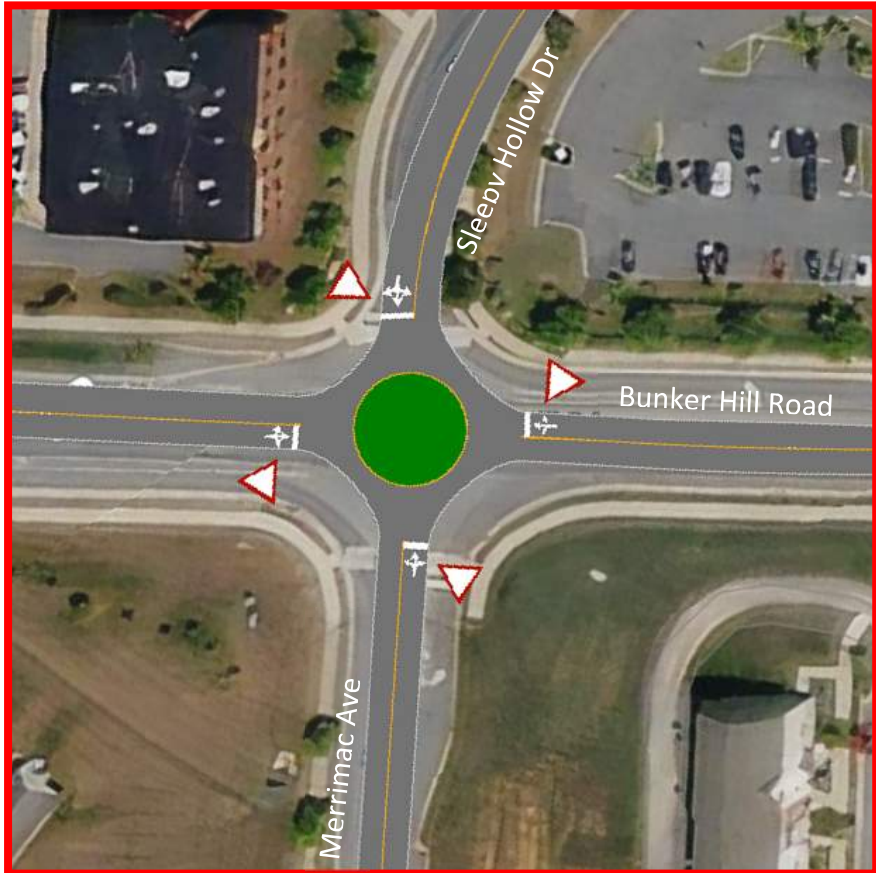




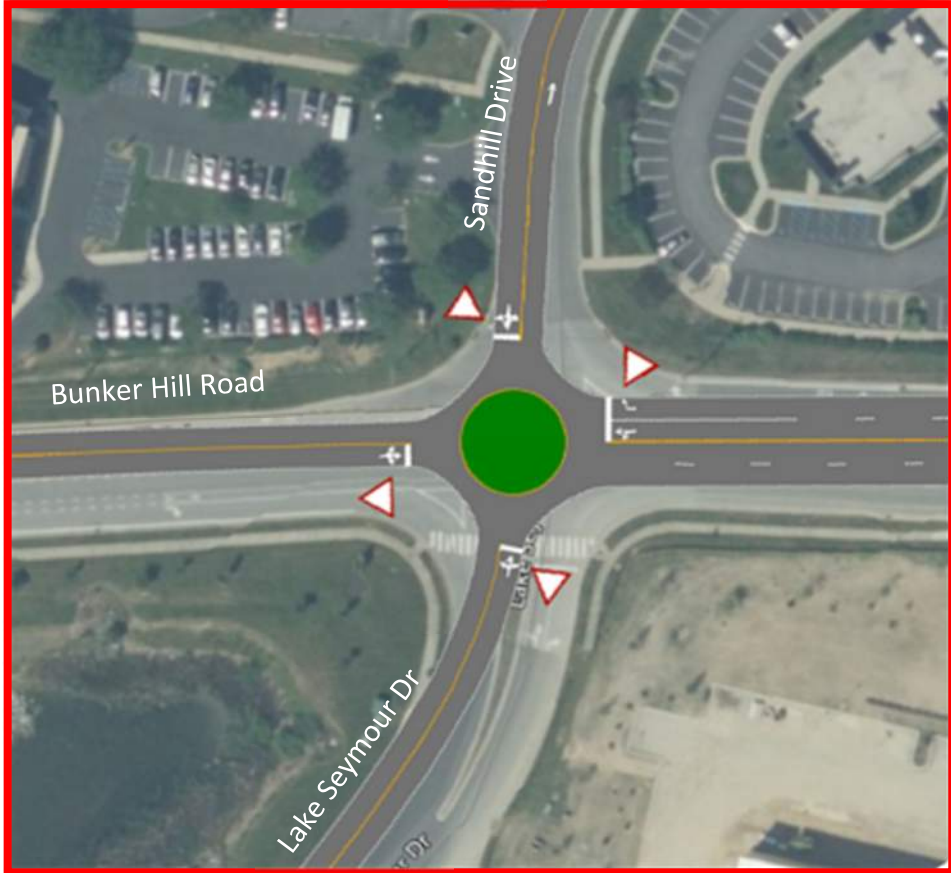
Detail 1 – Single Lane Roundabout

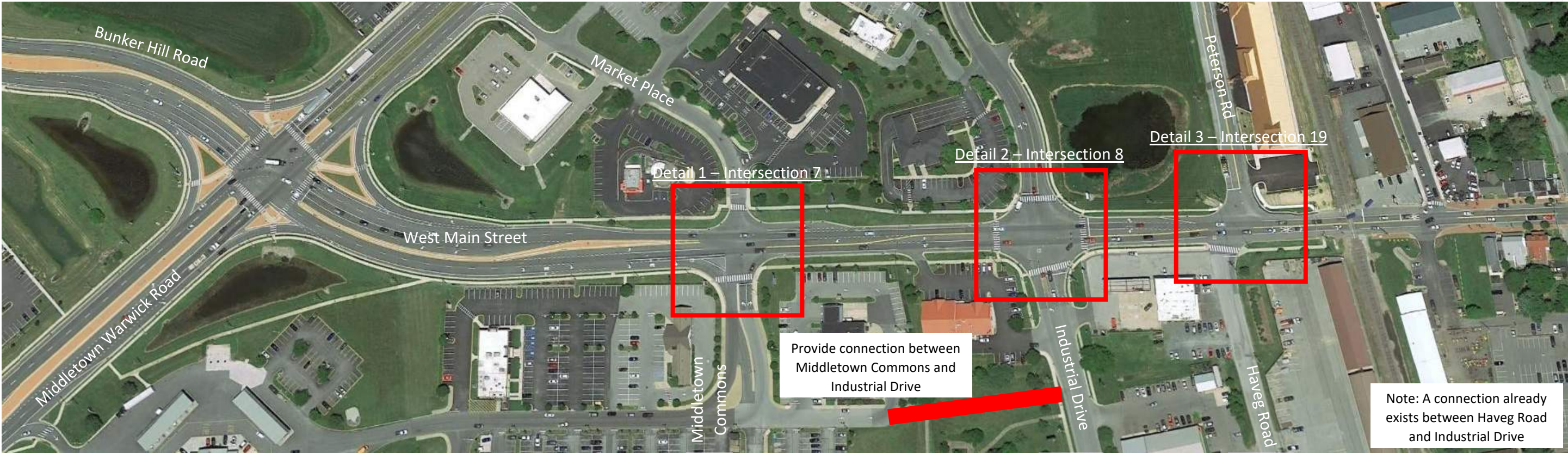


Detail 2 – Single Lane Roundabout

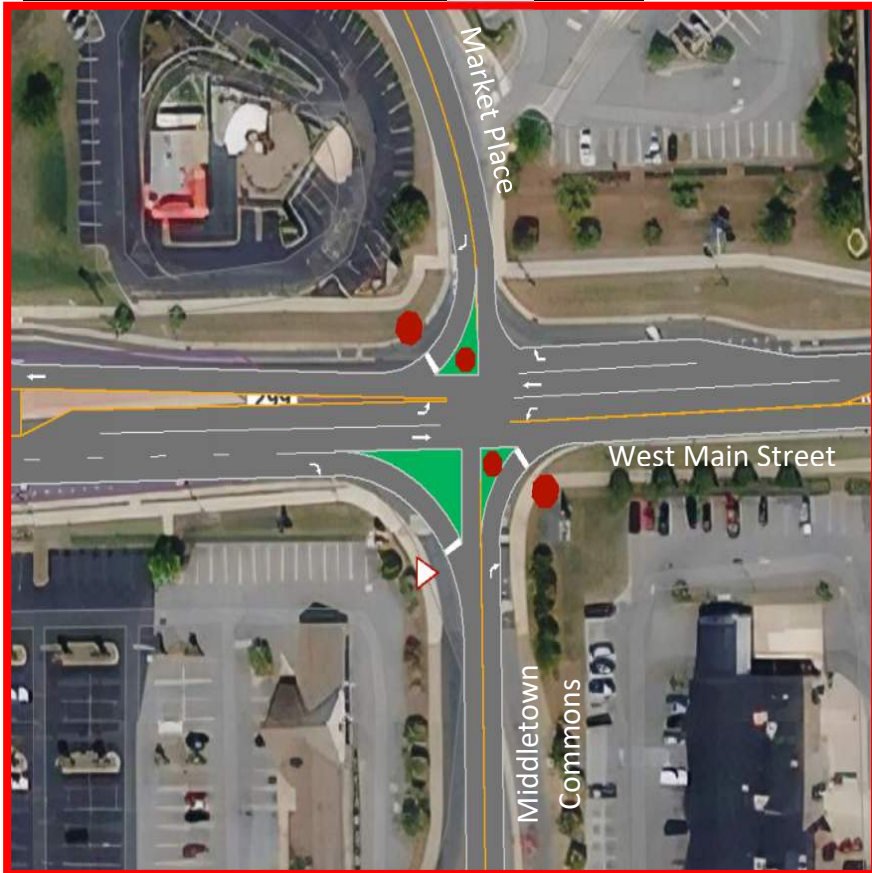


Detail 3 – Single Lane Roundabout with Bypass Lane





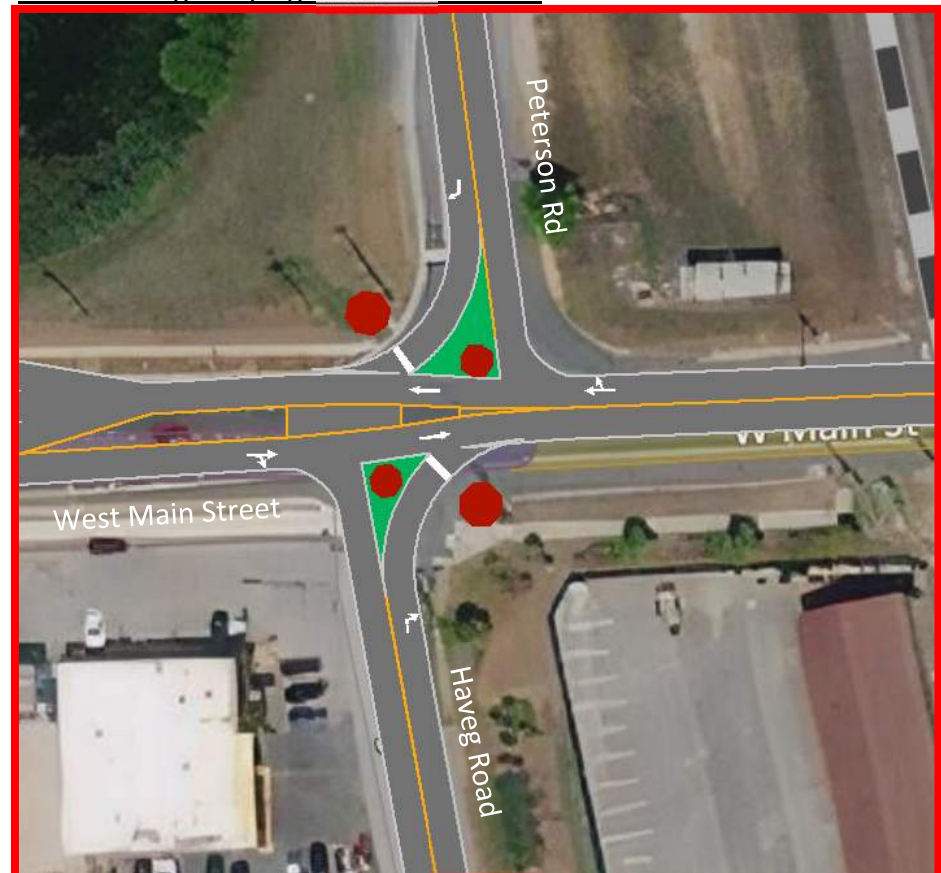
Detail 1 – Right-In/Right-Out/Left-In Conversion



Detail 2 – Signal



Detail 3 – Right-In/Right-Out Conversion





Attachment 2 - Intersection 9 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 9 New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Bunker Hill Road (N437)</u>	<u>Lake Seymour Drive</u>	<u>Sandhill Drive</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist. _____

4. DESCRIPTION OF IMPROVEMENT:
 Installation of a single-lane roundabout at the intersection of Bunker Hill Road, Sandhill Drive, and Lake Seymour Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$42,900</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$246,400</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$88,000</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,971,675</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$2,348,975</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 9

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$12,699</u>	E. HISTORIC	<u>\$6,349</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$12,699</u>	1. Phase 1 (study)	<u>\$6,349</u>
1. Phase I (study)	<u>\$12,699</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$6,349</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$6,349</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$39,000

CONTINGENCY COSTS 10% \$3,900
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$42,900
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 9

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$38,096</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$38,096</u>	
B. DESIGN ENGINEERING		<u>\$185,284</u>	
1. Design		<u>\$101,591</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$101,591</u>	
2. Traffic		<u>\$25,398</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$25,398</u>	
3. Real Estate Plan Preparation		<u>\$12,699</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 12,699</u>	
4. Utilities		<u>\$38,096</u>	
a. Inhouse		<u>\$ 12,699</u>	
b. Consultant		<u>\$ 12,699</u>	
c. Test Holes		<u>\$ 12,699</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u> </u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u>\$ -</u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$224,000

CONTINGENCY COSTS \$22,400
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$246,400
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 9

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$59,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 54,000</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$80,000

CONTINGENCY COSTS 10% \$8,000
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$88,000
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 9

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,078,311</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$21,340</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$725</u></p> <p>2. Drainage <u>\$38,096</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$171,843</u></p> <p style="padding-left: 20px;">b. Base <u>\$353,112</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$21,263</u></p> <p>4. Erosion/Sed. Cont. <u>\$50,795</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$288,828</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$100,563</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$31,747</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p align="right"><u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$97,619</u></p> <p>1. Beautification <u>\$97,619</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 31,746.97</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 9

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$62,203</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 12,202.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,270,000

I. MISC. ITEMS \$190,500

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$63,500

(normally 5% of H) 5%

(% used)

K. INITIAL EXPENSE \$63,500

(normally 5% of H) 5%

(% used)

L. CONSTRUCTION CONTINGENCY \$127,000

(normally 10% of H) 10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$1,714,500
(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$257,175
(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$1,971,675
(use this total + Q + P for Construction Project Estimate from line 7d)

Estimator: JMT

Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____ Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____ Date: _____

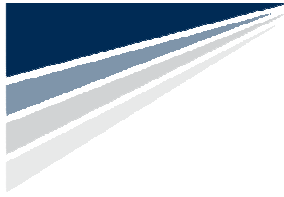


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 12,699
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 12,699
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 6,349
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 6,349
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



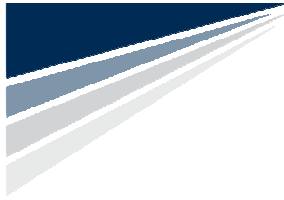
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 38,096
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	8.0%	\$ 101,591
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 25,398
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 12,699
4. Utilities		
a. Inhouse	1.0%	\$ 12,699
b. Consultant	1.0%	\$ 12,699
c. Test Holes	1.00%	\$ 12,699
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	C-1	N		-	\$ -	3,000.00	\$ 54,000.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 54,000.00	Total:	0

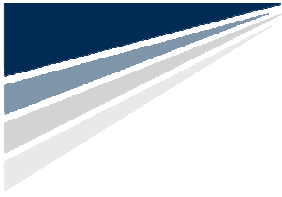
Number of Parcels Impacted: 5

Appraisal Fees: \$ 5,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 12,500.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 2,750.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	2789	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	74010	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	12746	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SW Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	1609	Type C Depth (in)	2	Hotmix Sawcut (LF)	2093
Area of 5' Wide Sidewalk (SF)	8045	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	8266
Length of Curb/Gutter	3222	Concrete Depth (in) (Typ 4")		Brick Hatching	4389
Area of Triangular Concrete Islands	2392				
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4	Concrete Sawcut (LF)	
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11			CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.	

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	787	\$ 24.50	\$ 19,281.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	40	\$ 24.50	\$ 980.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	44	\$ 24.50	\$ 1,078.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	1033	\$ 20.00	\$ 20,665.00
					Total:	\$ 21,339.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	46	\$ 15.75	\$ 724.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 38,096	\$ 38,096.36
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	861	\$ 115.50	\$ 99,445.50
401015	Superpave Type B, PG 70-22	Ton	Na	327	\$ 115.50	\$ 37,768.50
501526	Patterned PCC, 8"	Ton	Na	4389	\$ 7.89	\$ 34,629.21
					Total:	\$ 171,843



DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	111015	\$ 2.70	\$ 299,740.50	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	483	\$ 84.50	\$ 40,813.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	2093	\$ 3.50	\$ 7,325.50	
762000	Sawcutting, Bituminous Concrete	LF	NA	2093	\$ 2.50	\$ 5,232.50	
Total:						\$ 353,112.00	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	315	\$ 67.50	\$ 21,262.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 50,795.15	\$ 50,795.15	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	613	\$ 26.00	\$ 15,938
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	2609	\$ 34.00	\$ 88,706
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	2392	\$ 77.00	\$ 184,184.00
					Total:	\$ 288,828
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	8045	\$ 12.50	\$ 100,562.50
					Total:	\$ 100,562.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 31,746.97	\$ 31,746.97
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	9297	\$ 1.50	\$ 13,945.50
908004	Topsoil, 6" Depth	SY	NA	9297	\$ 9.00	\$ 83,673.00
					Total:	\$ 97,618.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 31,746.97	\$ 31,746.97
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 31,746.97
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		8135	\$ 1.50	\$ 12,202.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		0	\$ 176.00	\$ -
Total:						\$ 12,202.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,269,878.65



Attachment 2E: Intersection 9 CTP Estimate - LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 9 LOS E New Castle
County

Subdivision or Road Name

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Bunker Hill Road (N437)</u>	<u>Lake Seymour Drive</u>	<u>Sandhill Drive</u>	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation Estimate only

Name Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Installation of a single-lane roundabout at the intersection of Bunker Hill Road, Sandhill Drive, and Lake Seymour Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$26,400</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$163,900</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$88,000</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,238,895</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,517,195</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 9

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$7,973</u>	E. HISTORIC	<u>\$3,987</u>
B. ARCHAEOLOGY	<u>\$7,973</u>	1. Phase 1 (study)	<u>\$3,987</u>
1. Phase I (study)	\$7,973	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$3,987</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$3,987</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$24,000

CONTINGENCY COSTS 10% \$2,400
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$26,400
(also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 9

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$23,920</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$23,920</u>	
B. DESIGN ENGINEERING		<u>\$124,128</u>	
1. Design		<u>\$63,788</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$63,788</u>	
2. Traffic		<u>\$15,947</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$15,947</u>	
3. Real Estate Plan Preparation		<u>\$7,973</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 7,973</u>	
4. Utilities		<u>\$23,920</u>	
a. Inhouse		<u>\$ 7,973</u>	
b. Consultant		<u>\$ 7,973</u>	
c. Test Holes		<u>\$ 7,973</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$5,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a.		<u>\$0</u>
b.		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$149,000

CONTINGENCY COSTS \$14,900
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$163,900
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 9

PART III - REAL ESTATE

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$80,000

CONTINGENCY COSTS \$8,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL REAL ESTATE COSTS \$88,000
 (also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 9

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$672,476</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$34,643</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$961</u></p> <p>2. Drainage <u>\$23,920</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$171,150</u></p> <p style="padding-left: 20px;">b. Base <u>\$19,182</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$9,990</u></p> <p>4. Erosion/Sed. Cont. <u>\$31,894</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$283,804</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$77,000</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$19,934</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. <u>Fence Relocation</u> <u>\$0</u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$43,124</u></p> <p>1. Beautification <u>\$43,124</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 19,933.52</u></p>
---	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 9

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	\$61,808
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000
3. Pavement Markings	\$ 11,808
Other (specify)	
4. _____	
F. WETLAND MITIGATION	\$0
G. UTILITY RELOC. IN CONTRACT	\$0
1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -
H. SUBTOTAL (A thru G) ROUNDED	\$798,000
I. MISC. ITEMS	\$119,700
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
	15%
	(_____% used)
J. CONTRACTOR'S CONST. ENG.	\$39,900
(normally 5% of H)	5%
	(_____% used)
K. INITIAL EXPENSE	\$39,900
(normally 5% of H)	5%
	(_____% used)
L. CONSTRUCTION CONTINGENCY	\$79,800
(normally 10% of H)	10%
	(_____% used)
M. TOTAL CONSTRUCTION COSTS (H thru L)	\$1,077,300
(Enter on PNR funding line 5)	
N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)	15%
(Enter on PNR funding line 4)	(_____% used)
O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)	\$1,238,895
(use this total + Q + P for Construction Project Estimate from line 7d)	

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	\$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS	\$0
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	
Traffic	
Estimator: _____	Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22

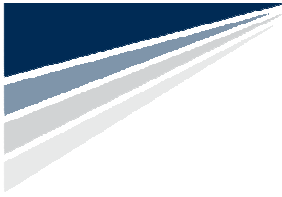


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



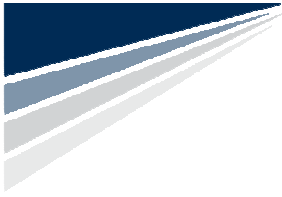
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 7,973
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 7,973
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 3,987
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 3,987
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 23,920
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	8.0%	\$ 63,788
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 15,947
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 7,973
4. Utilities		
a. Inhouse	1.0%	\$ 7,973
b. Consultant	1.0%	\$ 7,973
c. Test Holes	1.00%	\$ 7,973
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

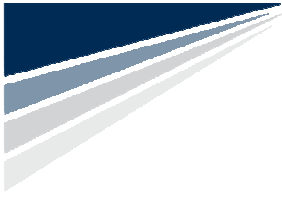
Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	C-1	N		-	\$ -	3,000.00	\$ 54,000.00		
Total:			\$ -	Total:	\$ -	Total:	\$ 54,000.00	Total:	\$ -

Number of Parcels Impacted: 5
 Appraisal Fees: \$ 5,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 12,500.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 2,750.00 Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Road Segment (LF)	0	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	75515				
Widening/Reconstruction Area (SF)	5971	SUP Pavement Box		Duration (Month)	0
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	Removal of Pavement (SF) 9888	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	1232	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	6160	Concrete Depth (in) (Typ 4")	4	Brick Hatching (SF)	4389
Length of Curb/Gutter	3343	GABC Depth (in) (Typ 4")	4	Hotmix Sawcut	1891
Area of Triangular Concrete Islands	2392				
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	369	\$ 24.50	\$ 9,040.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	31	\$ 24.50	\$ 759.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	5	\$ 24.50	\$ 122.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	1236	\$ 20.00	\$ 24,720.00
					Total:	\$ 34,642.50
A.1.b: Borrow						
	General Borrow (15% of Excavation and Embankment (202000) QTY)	CY	NA	61	\$ 15.75	\$ 960.75
A.2: Drainage						
	General Drainage (10% of project cost)	LS	3%	1	\$ 23,920.23	\$ 23,920.23
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1029	\$ 115.50	\$ 118,849.50
401015	Superpave Type B, PG 70-22	Ton	NA	153	\$ 115.50	\$ 17,671.50
501526	Patterned PCC, 8"	Ton	Na	4389	\$ 7.89	\$ 34,629.21
					Total:	\$ 171,150.21
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	227	\$ 84.50	\$ 19,181.50
762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -
					Total:	\$ 19,181.50
A.3.c: Pavement Subbase						



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

301001	Graded Aggregate Base Course, Type B	CY	NA	148	\$ 67.50	\$ 9,990.00
A.4: Erosion/Sediment Control						
	General E&S (4%) of Overall Project Cost	LS	4.0%	1	\$ 31,893.63	\$ 31,893.63

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA	413	\$ 26.00	\$ 10,738	
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	2930	\$ 34.00	\$ 99,620	
702000	Triangular Channelizing Islands	SF	NA	2392	\$ 77.00	\$ 184,184.00	
						Total:	\$ 283,804.00
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	6160	\$ 12.50	\$ 77,000.00	
						Total:	\$ 77,000.00
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
						Total:	\$ -
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (15%) of project cost	LS	2.5%	1	\$ 19,933.52	\$ 19,933.52	
A.5.f: Field Office							
		EAMO	NA	0	\$ 2,500.00	\$ -	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
						Total:	\$ -
A.5.h: Fence Relocation							
Fence Relocation		LF	NA	0	\$ -	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	4107	\$ 1.50	\$ 6,160.50	
908004	Topsoil, 6" Depth	SY	NA	4107	\$ 9.00	\$ 36,963.00	
						Total:	\$ 43,123.50
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 19,933.52	\$ 19,933.52	
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 9: Bunker Hill Road and Lake Seymour Drive - LOS E

					Total:	\$ 19,933.52
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		7285	\$ 1.50	\$ 10,927.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		5	\$ 176.00	\$ 880.00
					Total:	\$ 11,807.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 797,340.86



Attachment 3 - Intersection 10 CTP Estimate LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 10 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Bunker Hill Road (N437)</u>	<u>Merrimac Avenue</u>	<u>Sleepy Hollow Drive</u>	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation Section or Legis. Dist. _____
Name Estimate only

4. DESCRIPTION OF IMPROVEMENT:

Installation of a single-lane roundabout at the intersection of Bunker Hill Road, Merrimac Avenue, and Sleepy Hollow Drive

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$45,100</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$376,200</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$214,500</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,727,933</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$2,363,733</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 10 LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$16,686</u>	E. HISTORIC	<u>\$5,562</u>
B. ARCHAEOLOGY	<u>\$8,899</u>	1. Phase 1 (study)	<u>\$5,562</u>
1. Phase I (study)	<u>\$8,899</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$8,899</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$8,899</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$41,000

CONTINGENCY COSTS 10% \$4,100
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$45,100
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 10 LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$55,621</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$55,621</u>
B. DESIGN ENGINEERING	<u>\$285,606</u>
1. Design	<u>\$133,491</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$133,491</u>
2. Traffic	<u>\$55,621</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$55,621</u>
3. Real Estate Plan Preparation	<u>\$22,248</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 22,248</u>
4. Utilities	<u>\$66,745</u>
a. Inhouse	<u>\$ 22,248</u>
b. Consultant	<u>\$ 22,248</u>
c. Test Holes	<u>\$ 22,248</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$342,000

CONTINGENCY COSTS 10% \$34,200
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$376,200
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 10 LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$174,290</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 169,290</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$195,000

CONTINGENCY COSTS 10% \$19,500
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$214,500
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 10 LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$923,364</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$11,564</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$394</u></p> <p>2. Drainage <u>\$33,373</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$138,659</u></p> <p style="padding-left: 20px;">b. Base <u>\$302,626</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$11,475</u></p> <p>4. Erosion/Sed. Cont. <u>\$44,497</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$293,904</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$59,063</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$27,811</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p align="right"><u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$102,795</u></p> <p>1. Beautification <u>\$102,795</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 27,810.50</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 10 LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$58,451</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 8,451.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,113,000

I. MISC. ITEMS \$166,950

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$55,650

(normally 5% of H) 5%
(% used)

K. INITIAL EXPENSE \$55,650

(normally 5% of H) 5%
(% used)

L. CONSTRUCTION CONTINGENCY \$111,300

(normally 10% of H) 10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$1,502,550

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$225,383

(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$1,727,933

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____ Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

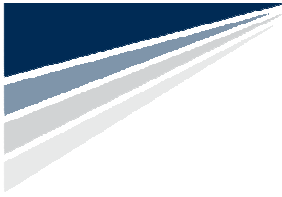
Traffic
Estimator: _____ Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



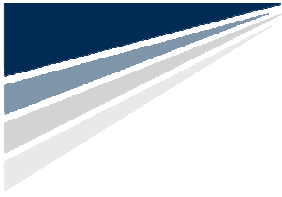
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 16,686
B. Archeology		
1. Phase 1 (study)	0.8%	\$ 8,899
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.8%	\$ 8,899
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 5,562
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	5.0%	\$ 55,621
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 133,491
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 55,621
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 22,248
4. Utilities		
a. Inhouse	2.0%	\$ 22,248
b. Consultant	2.0%	\$ 22,248
c. Test Holes	2.00%	\$ 22,248
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	C-1	N		-	\$ -	4,055.00	\$ 72,990.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	5,350.00	\$ 96,300.00	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 169,290.00	Total:	0

Number of Parcels Impacted: 5

Appraisal Fees:

\$ 5,000.00

Number of Parcels Impacted X \$1,000

Staff:

\$ 12,500.00

Number of Parcels Impacted X \$2,500

Settlement:

\$ 2,750.00

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions
for now assuming r/w length x5'
r/w length=18365

assume 15% of land acquisition
on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	2937	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	63202	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	6868			Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Length of 5' Wide Sidewalk (LF)	945	Type C Depth (in)	2	Hotmix Sawcut (LF)	814
Area of 5' Wide Sidewalk (SF)	4725	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	6448
Length of Curb/Gutter	3245	SW Pavement Box		Brick Hatching	4970
Area of Triangular Concrete Islands	2406	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	424	\$ 24.50	\$ 10,388.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	24	\$ 24.50	\$ 588.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	24	\$ 24.50	\$ 588.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	806	\$ 20.00	\$ 16,120.00
					Total:	\$ 11,564.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	25	\$ 15.75	\$ 393.75
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 33,373	\$ 33,372.60
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	685	\$ 115.50	\$ 79,117.50
401015	Superpave Type B, PG 70-22	Ton	Na	176	\$ 115.50	\$ 20,328.00
501526	Patterned PCC, 8"	Ton	Na	4970	\$ 7.89	\$ 39,213.30
					Total:	\$ 138,659



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

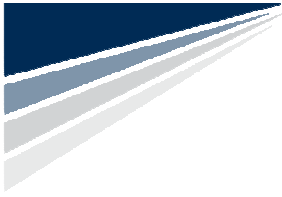
A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	94803	\$ 2.70	\$ 255,968.10	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	261	\$ 84.50	\$ 22,054.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	6448	\$ 3.50	\$ 22,568.00	
762000	Sawcutting, Bituminous Concrete	LF	NA	814	\$ 2.50	\$ 2,035.00	
Total:						\$ 302,625.60	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	170	\$ 67.50	\$ 11,475.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 44,496.80	\$ 44,496.80	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	211	\$ 26.00	\$ 5,486
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	3034	\$ 34.00	\$ 103,156
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	2406	\$ 77.00	\$ 185,262.00
Total:					\$	\$ 293,904
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	4725	\$ 12.50	\$ 59,062.50
Total:					\$	\$ 59,062.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 27,810.50	\$ 27,810.50
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	9790	\$ 1.50	\$ 14,685.00
908004	Topsoil, 6" Depth	SY	NA	9790	\$ 9.00	\$ 88,110.00
Total:					\$	\$ 102,795.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 10: Bunker Hill Road and Merrimac Avenue - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 27,810.50	\$ 27,810.50
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 27,810.50
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		5634	\$ 1.50	\$ 8,451.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		0	\$ 176.00	\$ -
Total:						\$ 8,451.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 1,112,420.06



Attachment 4 - Intersection 7,8,19 CTP Estimate - LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 7,8,19 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>W Main Street (N438)</u>	<u>Industrial Drive</u>	<u>Haveg Drive</u>	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of West Main Street, Industrial Drive, Market Place, and Haveg Drive. Add islands along West Main Street to create right-in, right-out conditions. Add a left turn lane and right turn lane along Industrial Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$29,700</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$177,100</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$166,100</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$896,160</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,269,060</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 7,8,19 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$9,583</u>	E. HISTORIC	<u>\$3,833</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$9,583</u>	1. Phase 1 (study)	<u>\$3,833</u>
1. Phase I (study)	<u>\$9,583</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$3,833</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$3,833</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$27,000

CONTINGENCY COSTS 10% \$2,700
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$29,700
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Int. 7,8,19 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$30,666</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$30,666</u>
B. DESIGN ENGINEERING	<u>\$130,164</u>
1. Design	<u>\$76,665</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$76,665</u>
2. Traffic	<u>\$19,166</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$19,166</u>
3. Real Estate Plan Preparation	<u>\$9,583</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 9,583</u>
4. Utilities	<u>\$17,250</u>
a. Inhouse	<u>\$ 5,750</u>
b. Consultant	<u>\$ 5,750</u>
c. Test Holes	<u>\$ 5,750</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$161,000

CONTINGENCY COSTS 10% \$16,100
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$177,100
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int. 7,8,19 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$113,900</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 108,900</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$9,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$22,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$4,950</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$151,000

CONTINGENCY COSTS 10% \$15,100
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$166,100
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Int. 7,8,19 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$293,479</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$784</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$32</u></p> <p>2. Drainage <u>\$11,500</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$35,574</u></p> <p style="padding-left: 20px;">b. Base <u>\$126,078</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$810</u></p> <p>4. Erosion/Sed. Cont. <u>\$15,333</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$93,786</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$0</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$9,583</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ _____</p> <p style="padding-left: 20px;">i. _____ _____</p> <p style="padding-left: 20px;">j. _____ _____</p> <p style="padding-left: 20px;">k. _____ _____</p> <p style="padding-left: 20px;">l. _____ _____</p> <p style="padding-left: 20px;">m. _____ _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p align="right"><u>\$0</u></p> <p>1. New Bridge _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/l.f. _____</p> <p>4. Box Culvert _____</p> <p style="padding-left: 20px;">a. Type _____</p> <p style="padding-left: 20px;">b. Size _____</p> <p style="padding-left: 20px;">c. \$/s.f. _____</p> <p>C. LANDSCAPING <u>\$25,767</u></p> <p>1. Beautification <u>\$25,767</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 9,583.10</u></p>
---	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Int. 7,8,19 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	\$54,495
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 4,495.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$384,000

I. MISC. ITEMS \$57,600

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$19,200

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$19,200

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$38,400

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$518,400

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%

(% used) \$77,760

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$596,160

Estimator: JMT

Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	\$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	
Utilities	
Estimator:	Date:

Q. TRAFFIC SECTION ITEMS	\$300,000
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	\$300,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	
Traffic	
Estimator:	Date:

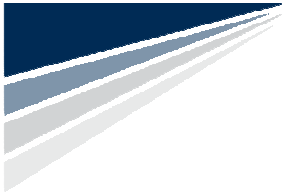


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



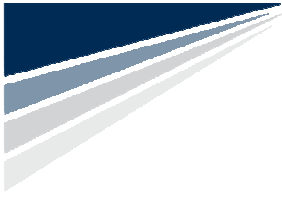
DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
 - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.5%	\$ 9,583
B. Archeology		
1. Phase 1 (study)	2.5%	\$ 9,583
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 3,833
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	1.0%	\$ 3,833
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



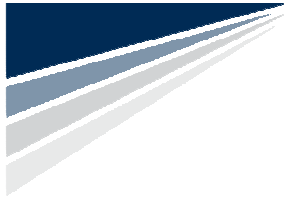
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
- LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	8.0%	\$ 30,666
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 76,665
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 19,166
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.5%	\$ 9,583
4. Utilities		
a. Inhouse	1.5%	\$ 5,750
b. Consultant	1.5%	\$ 5,750
c. Test Holes	1.50%	\$ 5,750
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
 - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

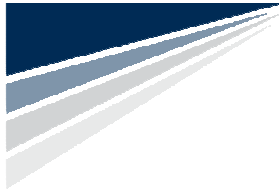
Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	0	\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	6,050.00	\$ 108,900.00	-	
Total:			0	Total:	\$ -	Total:	\$ 108,900.00	Total:	0

Number of Parcels Impacted:	9		
Appraisal Fees:	\$ 9,000.00	Number of Parcels Impacted X \$1,000	Assuming 400k for Full Acquisitions
Staff:	\$ 22,500.00	Number of Parcels Impacted X \$2,500	for now assuming r/w length x5'
Settlement:	\$ 4,950.00	Number of Parcels Impacted X \$550	assume 15% of land acquisition on commercial land r/w length=18365



Appendix C

Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
- LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	736	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile) Duration (Month) 0	
Overlay Area (SF)	30440.2	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	480				
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF) 0 Hotmix Sawcut (LF) 475 Removal of Roadway (SF)	
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	0	Type C Depth (in)	2		
Area of 5' Wide Sidewalk (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of Curb/Gutter	154	SW Pavement Box			
Area of Triangular Concrete Islands	1150	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

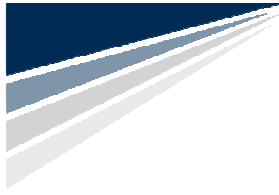
CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	30	\$ 24.50	\$ 735.00	
	SUP Excavation	CY	NA	0	\$ 24.50	-	
	Sidewalk Excavation	CY	NA	0	\$ 24.50	-	
	Ditch Excavation	CY	NA	0	\$ 24.50	-	
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	2	\$ 24.50	\$ 49.00	
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	-	
Total:						\$ 784.00	
A.1.b: Borrow							
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	2	\$ 15.75	\$ 31.50	
A.2: Drainage							
	General Drainage of project cost	LS	3%	1	\$ 11,500	\$ 11,499.72	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	295	\$ 115.50	\$ 34,072.50	
401015	Superpave Type B, PG 70-22	Ton	Na	13	\$ 115.50	\$ 1,501.50	
Total:						\$ 35,574	



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
 - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	45661	\$ 2.70	\$ 123,284.70	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	19	\$ 84.50	\$ 1,605.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	475	\$ 2.50	\$ 1,187.50	
Total:						\$ 126,077.70	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	12	\$ 67.50	\$ 810.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 15,332.96	\$ 15,332.96	



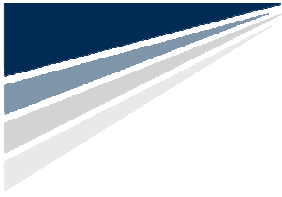
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
- LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	154	\$ 34.00	\$ 5,236
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	1150	\$ 77.00	\$ 88,550.00
Total:					\$	\$ 93,786
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	0	\$ 12.50	\$ -
Total:					\$	\$ -
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 9,583.10	\$ 9,583.10
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	2454	\$ 1.50	\$ 3,681.00
908004	Topsoil, 6" Depth	SY	NA	2454	\$ 9.00	\$ 22,086.00
Total:					\$	\$ 25,767.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 7,8,19 - Main Street, Industrial Drive, and Haveg Drive
 - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 9,583.10	\$ 9,583.10
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 9,583.10
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		2410	\$ 1.50	\$ 3,615.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		5	\$ 176.00	\$ 880.00
Total:						\$ 4,495.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
H: Subtotal						\$ 383,324.09



Attachment 5 - Intersection 8A - New Connector CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Industrial Connection

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$6,413</u>	E. HISTORIC	<u>\$12,825</u>
B. ARCHAEOLOGY	<u>\$25,651</u>	1. Phase 1 (study)	<u>\$12,825</u>
1. Phase I (study)	<u>\$25,651</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$6,413</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$6,413</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$12,825</u>	1. _____	_____
1. Phase 1 (study)	<u>\$12,825</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$65,000

CONTINGENCY COSTS 10% \$6,500
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$71,500
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Industrial Connection

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$25,651</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$25,651</u>	
B. DESIGN ENGINEERING		<u>\$225,533</u>	
1. Design		<u>\$115,429</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$115,429</u>	
2. Traffic		<u>\$12,825</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$12,825</u>	
3. Real Estate Plan Preparation		<u>\$51,302</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 51,302</u>	
4. Utilities		<u>\$38,476</u>	
a. Inhouse		<u>\$ 12,825</u>	
b. Consultant		<u>\$ 12,825</u>	
c. Test Holes		<u>\$ 12,825</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u> </u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$252,000

CONTINGENCY COSTS \$25,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$277,200
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Industrial Connection

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$885,650</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u>\$750,000</u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 130,650</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ -</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$3,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$7,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$1,650</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$898,000

CONTINGENCY COSTS 10% \$89,800
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$987,800
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Industrial Connection

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$200,908</u></p> <p> a. Excavation <u>\$16,244</u> (includes SWM pond)</p> <p> b. Borrow <u>\$551</u></p> <p>2. Drainage <u>\$7,695</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$43,659</u></p> <p> b. Base <u>\$32,018</u></p> <p> c. Subbase <u>\$16,470</u></p> <p>4. Erosion/Sed. Cont. <u>\$10,260</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$20,910</u></p> <p> b. Sidewalk <u>\$46,688</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$0</u></p> <p> e. Clear/Grubb <u>\$6,413</u></p> <p> f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____ <u> </u></p> <p> i. _____ <u> </u></p> <p> j. _____ <u> </u></p> <p> k. _____ <u> </u></p> <p> l. _____ <u> </u></p> <p> m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$47,670</u></p> <p>1. Beautification <u>\$47,670</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 6,412.72</u></p>
--	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Industrial Connection

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$1,519</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 1,518.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$257,000

I. MISC. ITEMS \$25,700

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

10%
(% used)

J. CONTRACTOR'S CONST. ENG. \$12,850

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$12,850

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$25,700

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$334,100

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$50,115

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$384,215

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

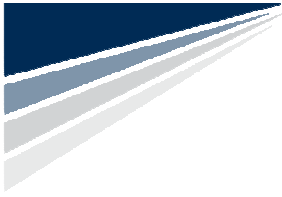
1. Signing	
2. Signals	\$0
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____

Date: _____

Estimator: JMT

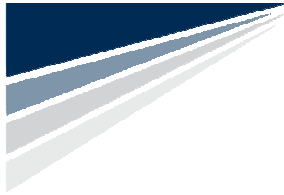
Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering(Includes NEPA)	2.5%	\$ 6,413
B. Archeology		
1. Phase 1 (study)	10.0%	\$ 25,651
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	2.5%	\$ 6,413
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	5.0%	\$ 12,825
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	5.0%	\$ 12,825
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -

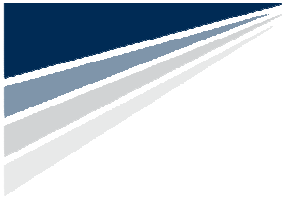


PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	10.0%	\$ 25,651
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	45.0%	\$ 115,429
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 12,825
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 51,302
4. Utilities		
a. Inhouse	5.0%	\$ 12,825
b. Consultant	5.0%	\$ 12,825
c. Test Holes	5.00%	\$ 12,825
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 2,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Cuzino's Driveway Extension - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	0	\$ -	-	
Estimated Residential PE Area	AR-1R	N			\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N	\$ 750,000		\$ -		\$ -	-	
Estimated Commercial R/W Area	C-1	N		4,355.00	\$ 130,650.00		\$ -	-	
Total:			\$ 750,000	Total:	\$ 130,650.00	Total:	\$ -	Total:	0

Number of Parcels Impacted: 3

Appraisal Fees: \$ 3,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 7,500.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 1,650.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365 assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

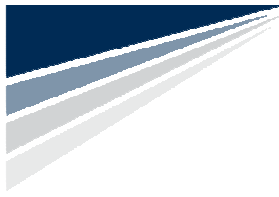
General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	1362	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	0	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	9872			Duration (Month)	0
Full Depth Hotmix Area (SF)	0			Modular Block Retaining Wall (LF)	
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Hotmix Sawcut (LF)	166
Length of 5' Wide Sidewalk (LF)	747	Type C Depth (in)	2	Removal of Roadway (SF)	
Area of 5' Wide Sidewalk (SF)	3735	GABC Depth (in) (Typ 4")	8	CELLS IN BLUE SHADE ARE AUTOMATED.	
Length of Curb/Gutter	615	SW Pavement Box			
Area of Triangular Concrete Islands		Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	610	\$ 24.50	\$ 14,945.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	19	\$ 24.50	\$ 465.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	34	\$ 24.50	\$ 833.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 16,243.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	35	\$ 15.75	\$ 551.25
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 7,695	\$ 7,695.26
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	125	\$ 115.50	\$ 14,437.50
401015	Superpave Type B, PG 70-22	Ton	Na	253	\$ 115.50	\$ 29,221.50
					Total:	\$ 43,659



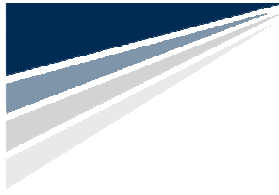
DELDOT PROJECT: Westtown TIP CTP Estimates -
Cuzino's Driveway Extension - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	0	\$ 2.70	\$ -	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	374	\$ 84.50	\$ 31,603.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	166	\$ 2.50	\$ 415.00	
						Total:	\$ 32,018.00
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	244	\$ 67.50	\$ 16,470.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 10,260.35	\$ 10,260.35	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Cuzino's Driveway Extension - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	615	\$ 34.00	\$ 20,910
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
Total:					\$	\$ 20,910
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	3735	\$ 12.50	\$ 46,687.50
Total:					\$	\$ 46,687.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 6,412.72	\$ 6,412.72
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	4540	\$ 1.50	\$ 6,810.00
908004	Topsoil, 6" Depth	SY	NA	4540	\$ 9.00	\$ 40,860.00
Total:					\$	\$ 47,670.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Cuzino's Driveway Extension - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 6,412.72	\$ 6,412.72
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 6,412.72
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS			\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		895	\$ 1.50	\$ 1,342.50
		Each		1	\$ 176.00	\$ 176.00
Total:						\$ 1,518.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 256,508.81

TECHNICAL MEMORANDUM

TO: Sarah Coakley, Regional Planner, Regional Systems Planning
 DATE: 11/05/2021 – Revised 09/19/2022
 FROM: Bill Dougherty, JMT
 PROJECT: Westtown TID CTP Cost Updates
 JMT JOB NO.: 19-01340-2A1
 RE: Corridor C: Levels Road Concept Assumptions and Summary
 CC: Pam Steinebach, Matt Vincent, Mir Wahed, Brad Herb, Nate Rahaim

Included in the following memo are recommendations for improvements to Levels Road based on existing conditions and traffic projections associated with the TID. The corridor was studied for both Level of Service (LOS) D and E. Please note that Intersection #6 is included in the memo for Corridor A – Middletown Warwick Road. A general breakdown of intersection improvement costs along the Levels Road corridor is given in the table below.

Intersection #	Intersection Road Names	Estimated Cost - LOS D	Estimated Cost LOS E
11	Levels Road & Patriot Drive	\$ 3,722,315.00	\$ 1,855,038.00
24	Levels Road & Future Merrimac Avenue	\$ 3,665,395.00	\$ 3,142,500.00
*12	Levels Road & St. Anne's Church Road	\$ 4,328,650.00	\$ 3,475,065.00
23	Levels Road & Poole Property Access	\$ 1,544,640.00	\$ 1,544,640.00
15	Levels Road & US301 Southbound Off Ramp	\$ -	\$ -
16	Levels Road & US301 Northbound Off Ramp	\$ -	\$ -
Total		\$ 13,261,000.00	\$ 10,017,243.00

* = Most Expensive Option



Corridor: Levels Road South of Middletown Warwick Road - Existing conditions

Levels Road (N010) is a 1.01-mile minor collector within Investment Strategy Level 1. This segment of Levels Road is from Middletown Warwick Road to St. Anne's Church Road. South of Middletown Warwick Road, it is a 2-lane asphalt roadway. The current AADT for Levels Road is 3,949 VPD. The posted speed limit is 35-mph; therefore a 40-mph design speed was used for conceptual design.

Road Site Conditions

- OPC Index (85)
- 2-lane asphalt roadway south of Middletown Warwick Road.
- Open drainage south of Patriot Drive

Intersection 11: Levels Road & Patriot Drive

Existing Conditions

Patriot Drive is a 1.03-mile local road within Investment Strategy level 1 which links Merrimac Avenue and Levels Business Park. The current AADT for Patriot Drive is estimated at 2,000 VPD. Patriot Way is a 2-lane asphalt roadway. The posted speed limit is 25-mph; therefore a 30-mph design speed was used for conceptual design.

Road Site Conditions – Patriot Drive

- OPC Index (unknown)
- 2-lane asphalt roadway
- Westbound approach to intersection has a right turn lane and a shared left/through lane
- Closed drainage

Design Elements

- There are no apparent design deficiencies associated with this intersection.

Utilities

- Aerial
 - There is a primary aerial electric service line running along the southbound side of Levels Road.
 - There are no aerial electric service lines along Patriot Drive.
- Underground
 - Underground communication lines run along both sides of the intersection.
 - Artesian Water has a water line running near this intersection.
- Potential conflicts

- At this time, no major utility conflicts are anticipated at this intersection. There appears to be enough space for drainage items, light poles and/or signal equipment to be placed without impact to the underground utilities.

Potential for Future Development:

- Along Northbound Levels Road, Levels Business Park is currently in development.
- Along Patriot Drive both Hedgelawn Plaza and an Amazon facility are in development.

Multi-modal Analysis:

- East of Levels Road, there are sidewalks on both sides of Patriot Drive. West of Levels Road there are no bike facilities along Patriot Drive, and there is an existing sidewalk along the Levels Business Park frontage.
- North of Patriot Drive, there are sidewalks on both sides of Levels Road and bicycle facilities. South of Patriot Drive, there are no bicycle or pedestrian facilities along Levels Road.

Recommendations:

To meet LOS D:

- Hold the existing southbound Levels Road curb line to minimize impacts on the newly developed Summerton Place. Push all widening along Levels Road to the northbound side of Levels Road.
- Southbound Levels Road requires a left turn lane with 200' of storage and a 100' taper, two through lanes, and a right turn lane with 145' of storage and a 50' taper.
- Northbound Levels Road requires a left turn lane with 250' of storage and a 100' taper, one through lane, and a right turn lane with 500' of storage and a 50' taper.
- The eastbound Patriot Drive approach to this intersection requires a left turn lane with 250' of storage and a 100' taper, one through lane, and a right turn lane with 150' of storage and a 50' taper.
- The westbound Patriot Drive approach to this intersection requires a left turn lane with 150' and a 100' taper, a through lane, and a right turn lane with 325' of storage and a 50' taper.
- Along each approach to the intersection, install a 5' bike lane.
- On the East side of the intersection, Patriot Drive eastbound will be two lanes: one through lane, and a left turn lane that will be dropped at the entrance to Premier Comprehensive Dental.
- South of the intersection maintain two southbound lanes on Levels Road to the intersection at St. Anne's Church Road.

- Install 5' sidewalk on either side of Levels Road south of the intersection. Install 5' sidewalk on either side of Patriot Drive west of the intersection where necessary.
- Install traffic signal at this intersection. Pedestrian signal also required to be installed.
- The installation of lighting at this intersection is required.
- The estimated cost of intersection improvements for this option is \$3,722,315. See attached estimate in Attachment 2 for more information.
- See attached intersection diagram in Attachment 1 for more information.

To meet LOS E:

- Hold the existing southbound Levels Road curb line to minimize impacts on the newly developed Summerton Place. Push all widening along Levels Road to the northbound side of Levels Road.
- Southbound Levels Road requires a left turn lane with 200' of storage and a 100' taper, one through lane and the right through lane becomes a right turn lane that drops onto Patriot Drive.
- Northbound Levels Road requires a left turn lane with 250' of storage and a 100' taper, one through lane, and a right turn lane with 500' of storage and a 50' taper.
- The eastbound Patriot Drive approach to this intersection requires a shared left-through lane, and a right turn lane with 150' of storage and a 50' taper.
- Westbound Patriot Drive requires no improvements.
- Along each approach to the intersection, install a 5' bike lane.
- Install 5' sidewalk on either side of Levels Road south of the intersection. Install 5' sidewalk on either side of Patriot Drive west of the intersection where necessary.
- Install traffic signal at this intersection. Pedestrian signal also required to be installed.
- The installation of lighting at this intersection is required.
- The estimated cost of intersection improvements for this option is \$1,855,038. See attached estimate in Attachment 2E for more information.

Intersection 24: Levels Road & Future Merrimac Avenue

Existing Conditions

Merrimac Avenue is a 1.30-mile municipal road within Investment Strategy level 1 which links Middletown Warwick Road and Industrial Drive. The current AADT of Merrimac Avenue is estimated at 5,140 VPD. Merrimac Avenue is a 4-lane asphalt roadway. The posted speed limit is 35-mph; therefore, a design speed of 40-mph was used in conceptual design. In the future Merrimac Avenue will be extended through undeveloped farmland to intersect with Levels Road and create this intersection.

Road Site Conditions – Merrimac Avenue

- OPC Index (N/A)
- 2-lane asphalt pavement
- Closed drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO's 'A Policy on the Geometric Design of Highways and Streets' (Green Book).

Utilities

- Aerial
 - There is a primary aerial electric service line along northbound Levels Road.
- Underground
 - Water and gas lines are anticipated to be present along Levels Road near this intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- The properties near this future intersection are undeveloped farmland, so there is high potential for future development in the future.
- North of the future intersection there is a property being developed into a Breakthru Beverage according to DeIDOT's PDCA.
- Along southbound Levels Road, Delaware Sports Complex is in development.

Multi-modal Analysis:

- There are no pedestrian or bicycle facilities near the proposed intersection.

Recommendations:

To meet LOS D:

- Proposed improvements at the intersection of Middletown Warwick Road and Levels Road recommend two southbound travel lanes along Levels Road. Continue two southbound travel lanes along Levels Road through this intersection to the roundabout at St. Anne's Church Road.
- Install 5' sidewalk along both sides of Levels Road and Future Merrimac Avenue in this area. Tie into sidewalk improvements from other intersection improvements along Levels Road. Install pedestrian connections at the intersection.
- The Merrimac Avenue approach to this intersection requires a left turn lane, a 5' bike lane, and a right turn lane with 275' of storage and a 50' taper.
- Northbound Levels Road requires a through lane, a 5' bike lane, and a right turn lane with 300' of storage and a 50' taper.
- Southbound Levels Road requires two through lanes and a left turn lane with 150' of storage and a 100' taper.
- Install intersection lighting.
- Install signal equipment at the intersection. Installation of pedestrian signals is also required.
- The estimated cost of intersection improvements for this option is \$3,665,395. See attached estimate in Attachment 3 for more information.
- See attached intersection diagram in Appendix A for more information.

To meet LOS E:

- Install 5' sidewalk along both sides of Levels Road and Future Merrimac Avenue in this area. Tie into sidewalk improvements from other intersection improvements along Levels Road. Install pedestrian connections at the intersection.
- The Merrimac Avenue approach to this intersection requires a left turn lane, a 5' bike lane, and a right turn lane with 275' of storage and a 50' taper.
- Northbound Levels Road requires a through lane, a 5' bike lane, and a right turn lane with 300' of storage and a 50' taper.
- Southbound Levels Road requires a through lane and a left turn lane with 150' of storage and a 100' taper.
- Install intersection lighting.
- Install signal equipment at the intersection. Installation of pedestrian signals is also required.
- The estimated cost of intersection improvements for this option is \$3,142,500. See attached estimate in Attachment 3E for more information.
- See attached intersection diagram in Appendix A for more information.

Intersection 12: Levels Road & St. Anne's Church Road

Existing Conditions

St. Anne's Church Road (N447) is a 1.73-mile local road within Investment Strategy level 1 which links Levels Road to SR71. The current AADT for St. Anne's Church Road is 3,425 VPD. St. Anne's Church Road is a 2-lane asphalt roadway. The posted speed limit along St. Anne's Church Road is 45-mph; therefore, a 50-mph design speed was used for conceptual design.

At this intersection, eastbound Levels Road then continues south. Levels Road (N010) south of this intersection is a 1.36-mile minor collector within Investment Strategy level 1. Levels Road south of the intersection is a 2-lane asphalt roadway. The current AADT for Levels Road from St. Anne's Church Road to Strawberry Lane is 3,950 VPD. The posted speed limit is 45-mph; therefore, a 50-mph design speed was used for conceptual design. This intersection is currently a single-lane roundabout.

Road Site Conditions – Levels Road south of the intersection

- OPC Index (80)
- 2-lane asphalt roadway
- Open drainage

Road Site Conditions – St. Anne's Church Road

- OPC Index (80)
- 2-lane asphalt roadway
- Open drainage

Design Elements

- There are no design deficiencies currently associated with this intersection.

Utilities

- Aerial
 - There are no primary aerial electric service poles near this intersection.
- Underground
 - Water and gas lines are anticipated to be present along Levels Road near this intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- The north leg of this intersection, Wallasey Drive, leads into the Preserve at Deep Creek, a subdivision still in development.
- West of the intersection along Levels Road Delaware Sports Complex is in development.
- Along St. Anne's Church Road east of the intersection, the Estates at St. Anne's are still in development.

Multi-modal Analysis:

- There are no pedestrian or bicycle facilities near the intersection. It is anticipated that pedestrian facilities may be installed as part of the development of the Preserve at Deep Creek.

Recommendations:

To meet LOS D:

Option 1: Roundabout

- Install a partial double roundabout at the intersection. The roundabout shall be two lanes along only the westbound St. Anne's Church Road approach with the exterior lane of the roundabout is dropping onto westbound Levels Road west of the intersection. RRFB (Rectangular Rapid Flashing Beacon) will be required for all legs with two lanes entering/exiting the roundabout. The roundabout is a single lane along all other approaches.
- For the eastbound Levels Road approach to the proposed roundabout, the exterior travel lane shall be dropped as a bypassing right turn lane onto southbound Levels Road.
- Install intersection lighting.
- The estimated cost of intersection improvements for this option is \$4,328,650. See attached estimate in Attachment 4 for more information.
- See attached intersection diagram in Appendix A for more information.

Option 2: Signalized intersection

- Remove the existing roundabout and install a signalized intersection. Installation of pedestrian signals and intersection lighting would also be required.
- Northbound Levels Road require a shared through right turn lane and a left turn lane with 450' of storage and a 100' taper.
- Westbound St. Anne's Church Road requires a shared through right turn lane and a left turn lane with 200' of storage and a 100' taper.
- The Wallasey Drive approach to the intersection requires a designated right turn lane and a shared through left turn lane.
- The eastbound Levels Road approach to the intersection requires a left turn lane with 250' of storage and a 100' taper, a through lane, and a bypassing right turn lane onto southbound Levels Road.
- The estimated cost of intersection improvements for this option is \$4,192,013. The most conservative cost option was used in the overall cost estimates. See attached estimate in Attachment 5 for more information.
- See attached intersection diagram in Appendix A for more information.

To meet LOS E: Roundabout

- Install a partial double roundabout at the intersection. The roundabout shall be two lanes along only the westbound St. Anne's Church Road approach with the exterior lane of the roundabout is dropping onto westbound Levels Road west of the intersection. RRFB (Rectangular Rapid Flashing Beacon) will be required for all legs with two lanes entering/exiting the roundabout. The roundabout is a single lane along all other approaches.
- For the eastbound Levels Road approach to the proposed roundabout, taper out a right turn lane and create a bypassing right turn lane onto southbound Levels Road.
- Install intersection lighting.
- The estimated cost of intersection improvements for this option is \$3,475,065. See attached estimate in Attachment 4E for more information.
- See attached intersection diagram in Appendix A for more information.

Corridor: Levels Road North of Middletown Warwick Road - Existing Conditions

Levels Road (N014) is a 0.79-mile minor collector within Investment Strategy level 1. This segment of Levels Road is from the US301 southbound off ramp to Middletown Warwick Road. The current AADT for Levels Road is 3,949 VPD. The posted speed limit is 35-mph; therefore a 40-mph design speed is to be utilized for conceptual design.

Road Site Conditions

- OPC Index (84)
- 4-lane separated asphalt roadway
- Open drainage

Intersection 23: Levels Road and Poole Property Access

Existing Conditions

Currently, along both sides of Levels Road between Middletown Warwick Road and the US 301 ramps there is nothing but undeveloped farmland which will be developed by the Poole Property development and create this intersection. The design speed used for conceptual design for the Poole Property Access is 25-mph.

Road Site Conditions - Poole Property Access

- OPC Index (N/A)
- 2-lane asphalt roadway
- Closed drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO's 'A Policy on the Geometric Design of Highways and Streets' (Green Book).

Utilities

- Aerial
 - There are currently no primary aerial electric service lines in this area.
- Underground
 - Water and gas lines are anticipated to be present along Levels Road near this intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- Along southbound Levels Road there is currently a Wawa in development in the PDCA.
- Along both sides of Levels Road, the Poole Farm project is in development.

Multi-modal Analysis:

- There are no pedestrian or bicycle facilities in this area. It is anticipated that pedestrian facilities will be installed as part of the Wawa and Poole Farm project developments.

Recommendations:

- The Poole Property access shall operate as a right-in right-out only entrance. Install triangular channelizing island to prevent left-out and left-in access.
- The VonCroy Property Access shall operate as a right-in/right-out with a left-in along eastbound Levels Road. Install triangular channelizing island to prevent left-out access.
- Eastbound Levels Road to this intersection requires two through lanes, a designated left turn lane with 170' of storage and a 100' taper, and a right turn lane into the Poole Property Access with 145' of storage and a 50' taper.

- Westbound Levels Road requires two through lanes and a right turn lane into the VonCroy Property with 100' of storage and a 50' taper.
- Install 5' sidewalk on both sides of Levels Road near this intersection as well as along the Poole Property and VonCroy Property accesses and tie into future improvements.
- The installation of lighting at this intersection is not required.
- The estimated cost of intersection improvements for this option is \$1,544,640. See attached estimate in Attachment 6 for more information.
- See attached intersection diagram in Appendix A for more information.
- Traffic studies were completed for both LOS D and LOS E improvements. At this intersection, LOS E recommendations match LOS D recommendations.

Intersection 15,16: Levels Road and US 301 Northbound and Southbound Off Ramps

The US 301 northbound off ramp (Ramp 661-2) is a 0.29-mile expressway within Investment Strategy level 1. The current AADT of the off ramp is estimated to be 615 VPD. This intersection is not currently signalized. The US 301 southbound off ramp is a 0.29-mile expressway within Investment Strategy level 1. The current AADT of the southbound off ramp is estimated to be 1,750 VPD. The intersection with the southbound ramp is currently signalized.

Road Site Conditions – US 301 Northbound Off Ramp

- OPC Index (76)
- 2-lane concrete roadway
- Approach to intersection has a shared left-turn/through lane and a right turn lane
- Open drainage

Road Site Conditions – US 301 Southbound Off Ramp

- OPC Index (74)
- 2-lane concrete roadway
- Approach to intersection has a left turn lane, a shared left-turn/through lane and right turn lane
- Open drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO's 'A Policy on the Geometric Design of Highways and Streets' (Green Book).

Utilities

- There are no aerial primary electric service lines in the area of the intersections.

Potential for Future Development:

- Wawa-Middletown is currently in development near the southbound off ramp.

Multi-modal Analysis:

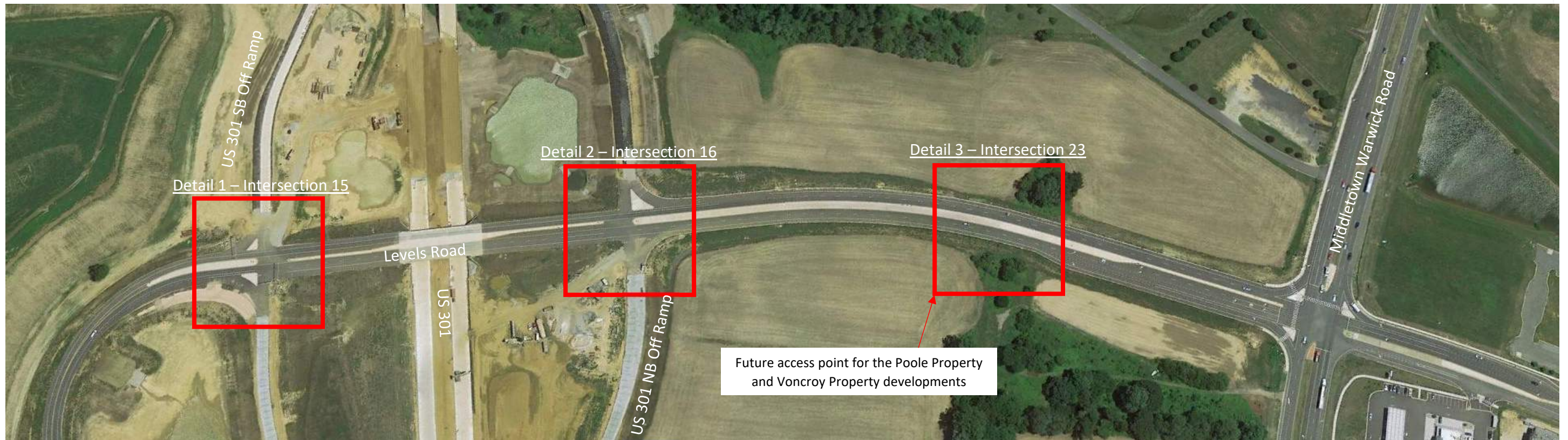
- There are no pedestrian or bicycle facilities in the area of these intersections.

Recommendations:

- Based on the existing conditions and future projections, no improvements are needed at either intersection.



Attachment 1: Intersection Diagrams



Detail 1 – Maintain Intersection As Is



Detail 2 – Maintain Intersection As Is



Detail 3 – Install Additional Access Point with Turn Restrictions





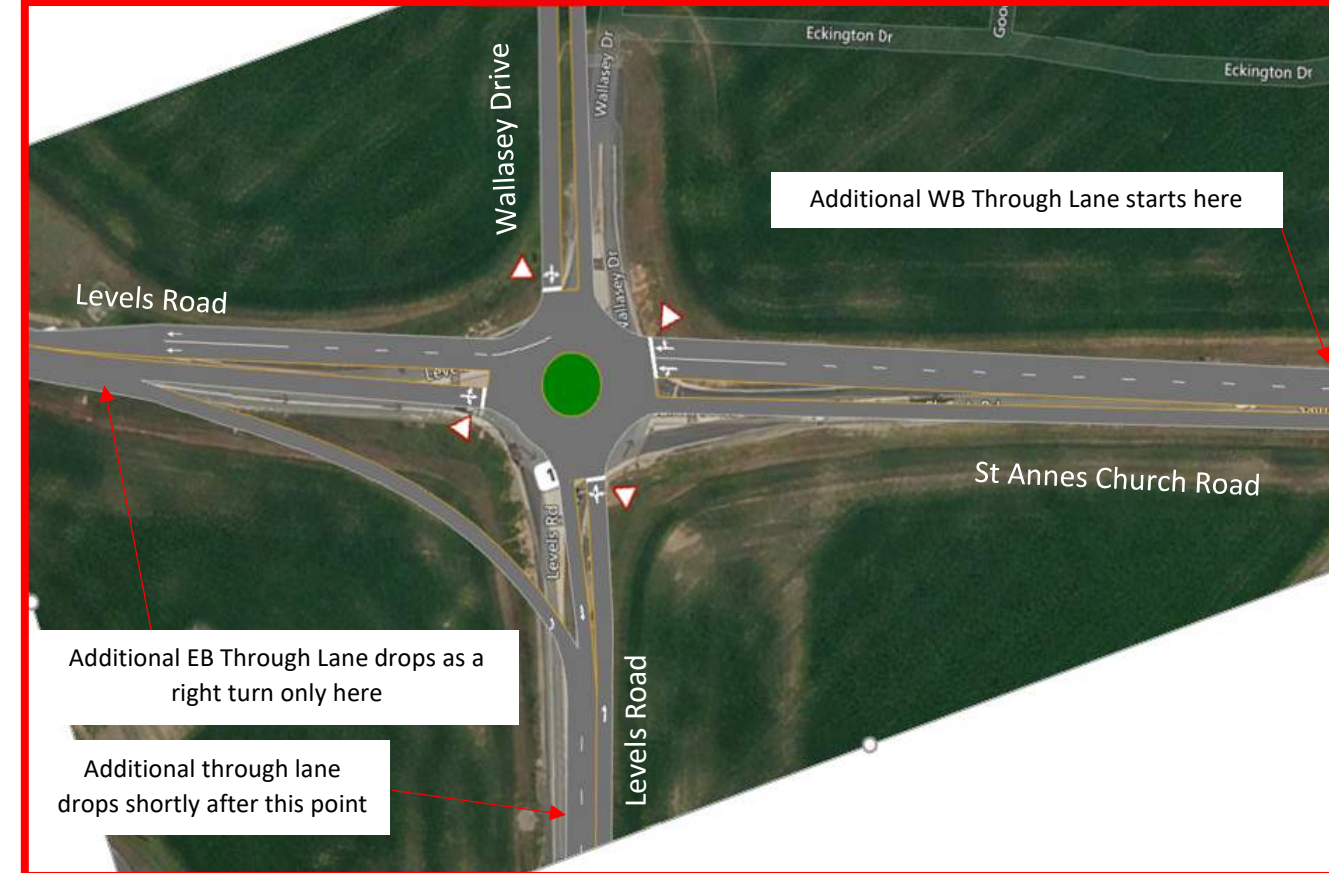
Detail 1 – Signalize Intersection and Install Additional Aux Lanes

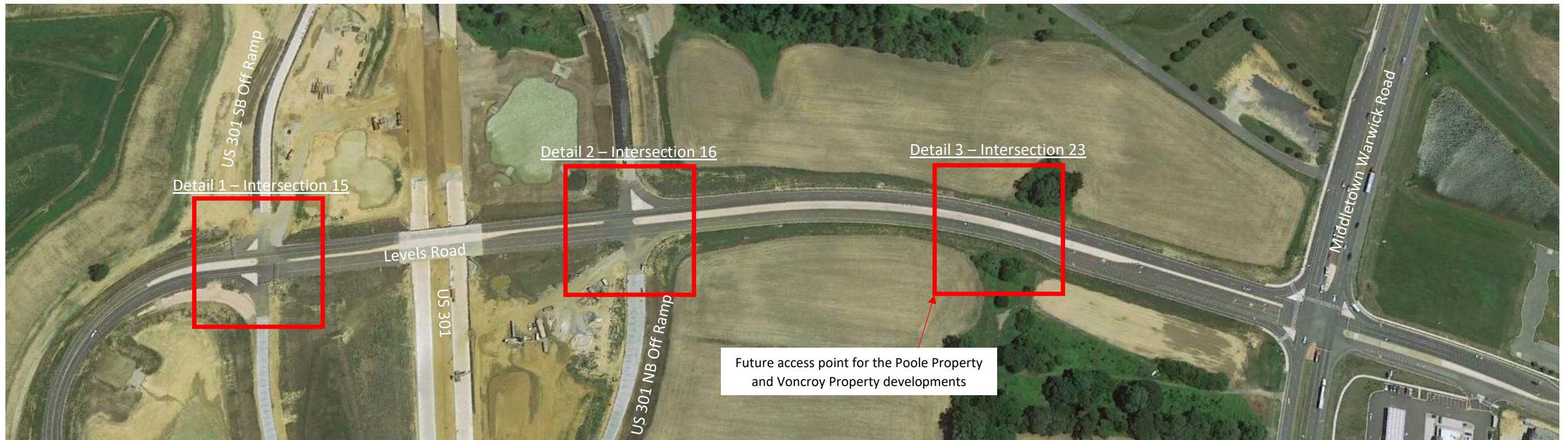


Detail 2 – Install Additional Access Point and Signalize



Detail 3 – Convert to a Dual Lane Roundabout





Detail 1 – Maintain Intersection As Is



Detail 2 – Maintain Intersection As Is



Detail 3 – Install Additional Access Point with Turn Restrictions

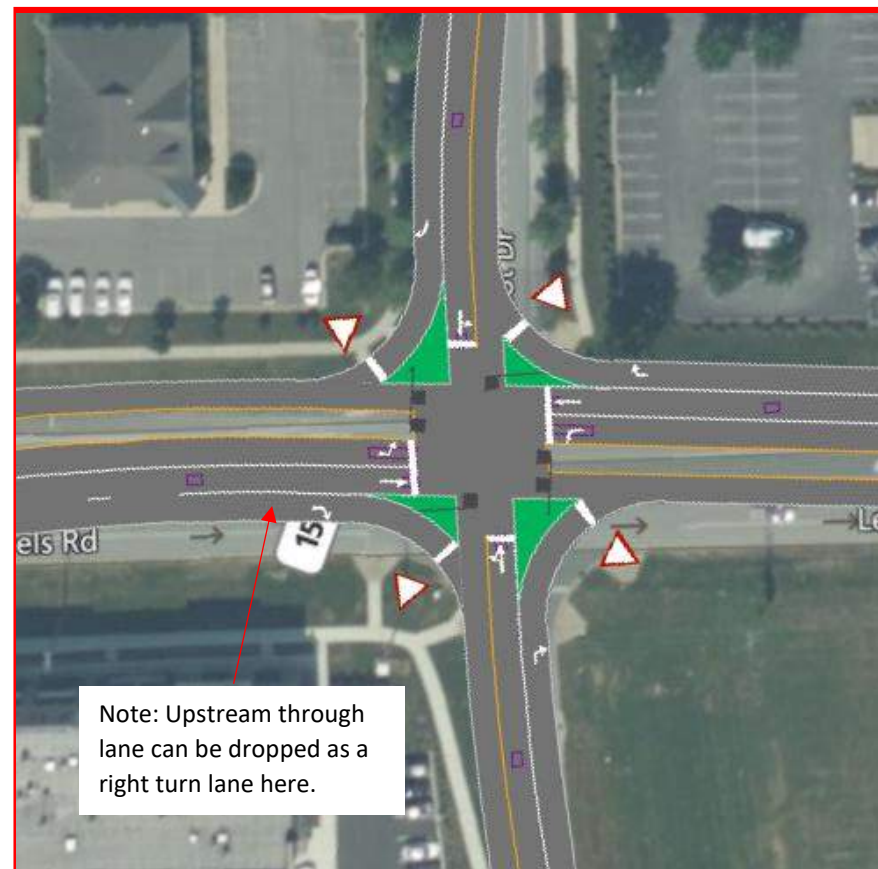




Provide an additional through lane along EB Levels Road and drop as a right turn only at intersection with Patriot Drive

Future access point for the Merrimac Avenue Extension

Detail 1 – Signalize Intersection and Install Additional Aux Lanes

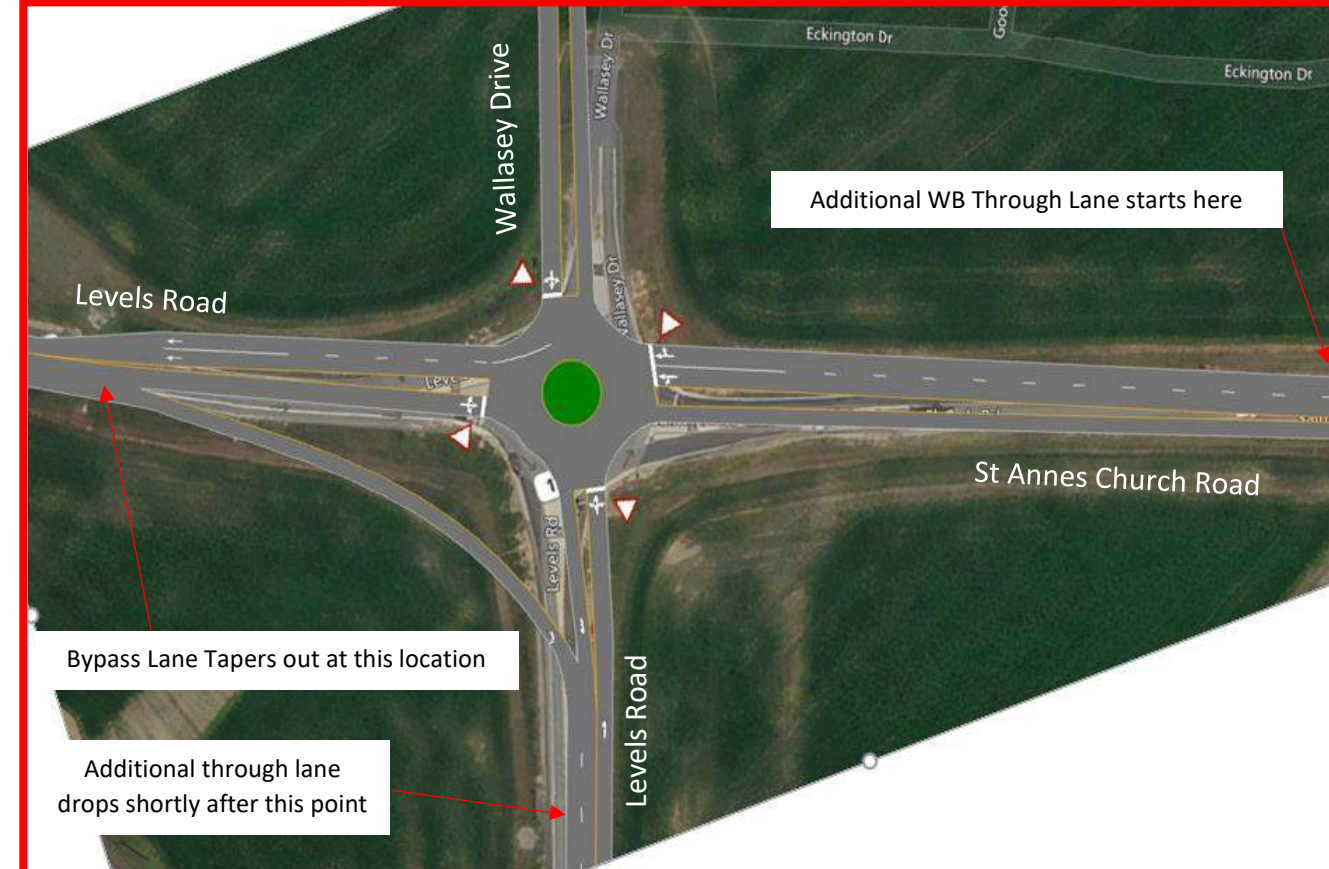


Note: Upstream through lane can be dropped as a right turn lane here.

Detail 2 – Install Additional Access Point and Signalize



Detail 3 – Convert to a Dual Lane Roundabout



Additional WB Through Lane starts here

Bypass Lane Tapers out at this location

Additional through lane drops shortly after this point



Attachment 2 - Intersection 11 CTP Estimate LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 11 - LOS D New Castle
County
 Subdivision or Road Name

2. LIMITS Street Name or Road Number	From	To	Length
Levels Road (N10)	Patriot Drive		

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
 Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the future intersection of Levels Road and Patriot Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$62,700</u>	Part I	JMT <u>09/14/22</u>
b. Preliminary Engineering	<u>\$455,400</u>	Part II	JMT <u>09/14/22</u>
c. Real Estate	<u>\$149,600</u>	Part III	JMT <u>09/14/22</u>
d. Construction *	<u>\$3,054,615</u>	Part IV	JMT <u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,722,315</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____
 Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 11 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$25,886</u>	E. HISTORIC	<u>\$8,629</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$8,629</u>	1. Phase 1 (study)	<u>\$8,629</u>
1. Phase I (study)	<u>\$8,629</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$13,806</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$13,806</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$57,000

CONTINGENCY COSTS 10% \$5,700
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$62,700
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 11 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$60,401</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$60,401</u>	
B. DESIGN ENGINEERING		<u>\$352,648</u>	
1. Design		<u>\$172,574</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$172,574</u>	
2. Traffic		<u>\$86,287</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$86,287</u>	
3. Real Estate Plan Preparation		<u>\$34,515</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 34,515</u>	
4. Utilities		<u>\$51,772</u>	
a. Inhouse		<u>\$ 17,257</u>	
b. Consultant		<u>\$ 17,257</u>	
c. Test Holes		<u>\$ 17,257</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ -</u>	
c. Railroad P.E.		<u>\$ -</u>	

9. Other (specify)		<u>\$0</u>	
a. _____		<u>\$0</u>	
b. _____		<u>\$0</u>	

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>	
2. Hazardous Materials		<u>\$ -</u>	
3. Noise		<u>\$ -</u>	
4. Historic		<u>\$ -</u>	
5. Archaeology		<u>\$ -</u>	
6. Other		<u>\$ -</u>	
a. _____		<u>\$ -</u>	
b. _____		<u>\$ -</u>	

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$414,000

CONTINGENCY COSTS \$41,400
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$455,400
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 11 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$114,800</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 109,800</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$136,000

CONTINGENCY COSTS 10% \$13,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$149,600
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 11 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,463,189</u></p> <p> a. Excavation <u>\$54,782</u> (includes SWM pond)</p> <p> b. Borrow <u>\$1,859</u></p> <p>2. Drainage <u>\$51,772</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$286,440</u></p> <p> b. Base <u>\$644,722</u></p> <p> c. Subbase <u>\$55,215</u></p> <p>4. Erosion/Sed. Cont. <u>\$25,886</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$122,160</u></p> <p> b. Sidewalk <u>\$177,210</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$0</u></p> <p> e. Clear/Grubb <u>\$43,143</u></p> <p> f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____</p> <p> i. _____</p> <p> j. _____</p> <p> k. _____</p> <p> l. _____</p> <p> m. _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/l.f. _____</p> <p>4. Box Culvert _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>C. LANDSCAPING <u>\$140,007</u></p> <p> 1. Beautification <u>\$140,007</u></p> <p> 2. Noise Mitigation <u>\$0</u></p> <p> 3. Visual Mitigation <u>\$0</u></p> <p> 4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 43,143.45</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 11 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$79,399</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 29,398.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,726,000

I. MISC. ITEMS \$258,900

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$86,300

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$86,300

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$172,600

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$2,330,100

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$349,515

(Enter on PNR funding line 4)

(% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$2,679,615

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$375,000

(Enter on PNR funding line 6)

1. Signing	
2. Signals	<u>\$300,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Ped Signals	<u>\$75,000</u>

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 25,886
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 8,629
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.8%	\$ 13,806
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 8,629
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.5%	\$ 60,401
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 172,574
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 86,287
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 34,515
4. Utilities		
a. Inhouse	1.0%	\$ 17,257
b. Consultant	1.0%	\$ 17,257
c. Test Holes	1.00%	\$ 17,257
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	C-1	N		-	\$ -	6,100.00	\$ 109,800.00	-	
Estimated Residential PE Area	AR-1F	N			\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N			\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1F	N			\$ -		\$ -	-	
Estimated Commercial R/W Area	C-1	N			\$ -		\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 109,800.00	Total:	0

Number of Parcels Impacted: 5

Appraisal Fees: \$ 5,000.00

Staff: \$ 12,500.00

Settlement: \$ 2,750.00

Number of Parcels Impacted X \$1,000

Number of Parcels Impacted X \$2,500

Number of Parcels Impacted X \$550

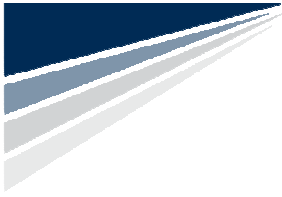
Assuming 400k for Full Acquisitions

for now assuming r/w length x5'

r/w length=18365

assume 15% of land acquisition

on commercial land



Appendix C

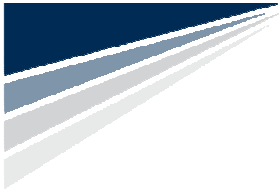
Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	4000	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	128406	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	33100			Duration (Month)	0
Full Depth Hotmix Area (SF)	0			Modular Block Retaining Wall (LF)	
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Length of 5' Wide Sidewalk (LF)	3222	Type C Depth (in)	2	Hotmix Sawcut (LF)	5201
Area of 5' Wide Sidewalk (SF)	16110	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	1632
Length of Curb/Gutter	4072	SW Pavement Box			
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	2044	\$ 24.50	\$ 50,078.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	80	\$ 24.50	\$ 1,960.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	112	\$ 24.50	\$ 2,744.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	204	\$ 20.00	\$ 4,080.00
					Total:	\$ 54,782.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	118	\$ 15.75	\$ 1,858.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 51,772	\$ 51,772.14
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1633	\$ 115.50	\$ 188,611.50
401015	Superpave Type B, PG 70-22	Ton	Na	847	\$ 115.50	\$ 97,828.50
					Total:	\$ 286,440



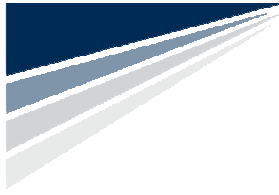
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	192609	\$ 2.70	\$ 520,044.30	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1254	\$ 84.50	\$ 105,963.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	1632	\$ 3.50	\$ 5,712.00	
762000	Sawcutting, Bituminous Concrete	LF	NA	5201	\$ 2.50	\$ 13,002.50	
Total:						\$ 644,721.80	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	818	\$ 67.50	\$ 55,215.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	1.5%	1	\$ 25,886.07	\$ 25,886.07	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	4072	\$ 30.00	\$ 122,160
71014	P.C.C. Curb, Type 2	LF	NA	0	\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
					Total:	\$ 122,160
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	16110	\$ 11.00	\$ 177,210.00
					Total:	\$ 177,210.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	3%	1	\$ 43,143.45	\$ 43,143.45
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	13334	\$ 1.50	\$ 20,001.00
908004	Topsoil, 6" Depth	SY	NA	13334	\$ 9.00	\$ 120,006.00
					Total:	\$ 140,007.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 43,143.45	\$ 43,143.45
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 43,143.45
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		14319	\$ 1.50	\$ 21,478.50
		Each		45	\$ 176.00	\$ 7,920.00
Total:						\$ 29,398.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,725,737.90



Attachment 2E - Intersection 11 CTP Estimate - LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 11 LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (N10)</u>	<u>Patriot Drive</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the future intersection of Levels Road and Patriot Drive.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$34,100</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$250,800</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$149,600</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,420,538</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,855,038</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 11 - LOS E

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$13,720</u>	E. HISTORIC	<u>\$4,573</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$4,573</u>	1. Phase 1 (study)	<u>\$4,573</u>
1. Phase I (study)	\$4,573	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$7,317</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$7,317</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$31,000

CONTINGENCY COSTS 10% \$3,100
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$34,100
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 11 - LOS E

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$32,012</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$32,012</u>	
B. DESIGN ENGINEERING		<u>\$195,428</u>	
1. Design		<u>\$91,464</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$91,464</u>	
2. Traffic		<u>\$45,732</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$45,732</u>	
3. Real Estate Plan Preparation		<u>\$18,293</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 18,293</u>	
4. Utilities		<u>\$27,439</u>	
a. Inhouse		<u>\$ 9,146</u>	
b. Consultant		<u>\$ 9,146</u>	
c. Test Holes		<u>\$ 9,146</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$5,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ -</u>	
c. Railroad P.E.		<u>\$ -</u>	

9. Other (specify)		<u>\$0</u>	
a.		<u>\$0</u>	
b.		<u>\$0</u>	

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>	
2. Hazardous Materials		<u>\$ -</u>	
3. Noise		<u>\$ -</u>	
4. Historic		<u>\$ -</u>	
5. Archaeology		<u>\$ -</u>	
6. Other		<u> </u>	
a. _____		<u>\$ -</u>	
b. _____		<u>\$ -</u>	

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$228,000

CONTINGENCY COSTS \$22,800
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$250,800
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 11 - LOS E

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$114,800</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 109,800</u>	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation Other (specify)	<u> </u>	F. STAFF	<u>\$12,500</u>
6. <u> </u>	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
7. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	<u> </u>
1. Residential	<u> </u>	2. As acquired plans	<u> </u>
2. Business	<u> </u>	I. CONDEMNATION	<u> </u>
Other (specify)	<u> </u>	J. OTHER (specify)	<u>\$0</u>
3. <u> </u>	<u> </u>	1. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$136,000

CONTINGENCY COSTS 10% \$13,600
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$149,600
 (also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 11 - LOS E

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	\$668,620	B. STRUCTURE CONSTRUCTION	\$0
1. Grading		1. New Bridge	
a. Excavation (includes SWM pond)	<u>\$17,420</u>	a. Type	
b. Borrow	\$1,685	b. Size	
2. Drainage	\$27,439	c. \$/s.f.	
3. Pavement		2. Old Structure Rem.	
a. Surface	<u>\$188,612</u>	a. Type	
b. Base	<u>\$43,617</u>	b. Size	
c. Subbase	<u>\$16,605</u>	c. \$/c.y.	
4. Erosion/Sed. Cont.	<u>\$36,586</u>	3. Retaining Wall	
5. Miscellaneous		a. Type	
a. Curb/Gutter	<u>\$76,534</u>	b. Size	
b. Sidewalk	<u>\$220,938</u>	c. \$/c.y.	
c. Guardrail	<u>\$0</u>	4. Box Culvert	
d. C.P.M. Schedule	<u>\$1,320</u>	a. Type	
e. Clear/Grubb	<u>\$22,866</u>	b. Size	
f. Field Office	<u>\$15,000</u>	c. \$/s.f.	
Other (specify)		C. LANDSCAPING	<u>\$206,052</u>
g. <u>Shared Use Path</u>	<u>\$0</u>	1. Beautification	<u>\$206,052</u>
h. <u>Fence Relocation</u>	<u>\$0</u>	2. Noise Mitigation	<u>\$0</u>
i. _____	_____	3. Visual Mitigation	<u>\$0</u>
j. _____	_____	4. Tree Mitigation	<u>\$0</u>
k. _____	_____	D. MAINTENANCE OF TRAFFIC	<u>\$ 22,865.94</u>
l. _____	_____		
m. _____	_____		

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 11 - LOS E

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$17,100</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 17,100
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$915,000

I. MISC. ITEMS \$137,250

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$45,750

(normally 5% of H) 5%
(% used)

K. INITIAL EXPENSE \$45,750

(normally 5% of H) 5%
(% used)

L. CONSTRUCTION CONTINGENCY \$91,500

(normally 10% of H) 10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$1,235,250

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$185,288
(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$1,420,538

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities
Estimator: _____ Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____ Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22

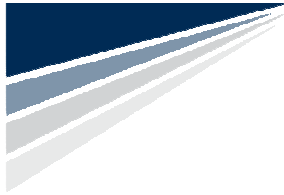


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 13,720
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 4,573
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.8%	\$ 7,317
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 4,573
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



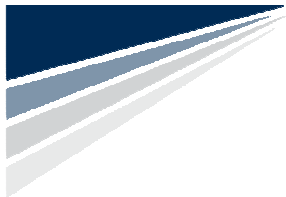
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.5%	\$ 32,012
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 91,464
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 45,732
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 18,293
4. Utilities		
a. Inhouse	1.0%	\$ 9,146
b. Consultant	1.0%	\$ 9,146
c. Test Holes	1.00%	\$ 9,146
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

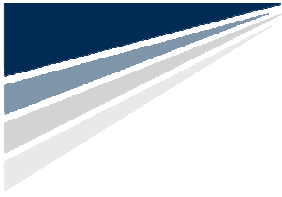
Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	C-1	N		-	\$ -	6,100.00	\$ 109,800.00		
		N			\$ -				
		N			\$ -				
		N				-	\$ -		
Total:			\$ -	Total:	\$ -	Total:	\$ 109,800.00	Total:	\$ -

Number of Parcels Impacted: 5
 Appraisal Fees: \$ 5,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 12,500.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 2,750.00 Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





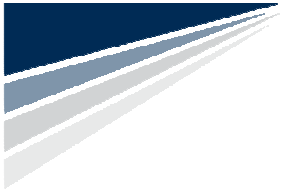
Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Roadway Segment (LF)	2352	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	99221				
Widening/Reconstruction Area (SF)	9950	SUP Pavement Box		Duration (Month)	6
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	Hotmix Sawcut (LF) 2105	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	3535	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	17675	Concrete Depth (in) (Typ 4")	4	Removal of Roadway (SF)	
Length of Curb/Gutter	3126	GABC Depth (in) (Typ 4")	4	Brick Hatching (SF)	
Area of Triangular Concrete Islands	0			CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.	
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	615	\$ 24.50	\$ 15,067.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	88	\$ 24.50	\$ 2,156.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	8	\$ 24.50	\$ 196.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 17,419.50
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	107	\$ 15.75	\$ 1,685.25
A.2: Drainage						
	General Drainage (10% of project cost)	LS	3%	1	\$ 27,439.13	\$ 27,439.13
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1378	\$ 115.50	\$ 159,159.00
401015	Superpave Type B, PG 70-22	Ton	NA	255	\$ 115.50	\$ 29,452.50
					Total:	\$ 188,611.50
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	377	\$ 84.50	\$ 31,856.50
762000	Sawcutting, Bituminous Concrete	LF	NA	4704	\$ 2.50	\$ 11,760.00
					Total:	\$ 43,616.50
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	246	\$ 67.50	\$ 16,605.00

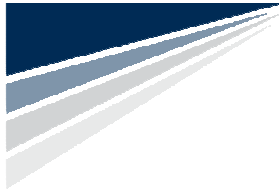


DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

A.4: Erosion/Sediment Control						
General E&S (4%) of Overall Project Cost	LS	4.0%		1	\$ 36,585.51	\$ 36,585.51

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA	875	\$ 26.00	\$ 22,750	
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	2251	\$ 34.00	\$ 76,534	
702000	Triangular Channelizing Islands	SF	NA	0	\$ 77.00	\$ -	
						Total:	\$ 76,534.00
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	17675	\$ 12.50	\$ 220,937.50	
						Total:	\$ 220,937.50
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
						Total:	\$ -
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	6	\$ 220.00	\$ 1,320.00	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (15%) of project cost	LS	2.5%	1	\$ 22,865.94	\$ 22,865.94	
A.5.f: Field Office							
		EAMO	NA	6	\$ 2,500.00	\$ 15,000.00	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
						Total:	\$ -
A.5.h: Fence Relocation							
Fence Relocation		LF	NA	0	\$ -	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	19624	\$ 1.50	\$ 29,436.00	
908004	Topsoil, 6" Depth	SY	NA	19624	\$ 9.00	\$ 176,616.00	
						Total:	\$ 206,052.00
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 22,865.94	\$ 22,865.94	
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 11: Level Road and Patriot Drive - LOS E

					Total:	\$ 22,865.94
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		9640	\$ 1.50	\$ 14,460.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		15	\$ 176.00	\$ 2,640.00
					Total:	\$ 17,100.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 914,637.78



Attachment 3 - Intersection 24 CTP Estimate - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 24 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (N10)</u>	<u>Merrimac Ave</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the future intersection of Levels Road and future Merrimac Avenue.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$61,600</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$515,900</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$107,800</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,980,095</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,665,395</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 24 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$25,167</u>	E. HISTORIC	<u>\$8,389</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$8,389</u>	1. Phase 1 (study)	<u>\$8,389</u>
1. Phase I (study)	<u>\$8,389</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$13,423</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$13,423</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$56,000

CONTINGENCY COSTS 10% \$5,600
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$61,600
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 24 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$75,502</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$75,502</u>
B. DESIGN ENGINEERING	<u>\$393,398</u>
1. Design	<u>\$167,782</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$167,782</u>
2. Traffic	<u>\$83,891</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$83,891</u>
3. Real Estate Plan Preparation	<u>\$33,556</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 33,556</u>
4. Utilities	<u>\$100,669</u>
a. Inhouse	<u>\$ 33,556</u>
b. Consultant	<u>\$ 33,556</u>
c. Test Holes	<u>\$ 33,556</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$469,000

CONTINGENCY COSTS \$46,900
(normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$515,900
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 24 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$89,684</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 75,405</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 9,279</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$2,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$5,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$1,100</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$98,000

CONTINGENCY COSTS 10% \$9,800
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$107,800
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 24 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION <u>\$1,395,002</u></p> <p>1. Grading</p> <p style="padding-left: 20px;">a. Excavation <u>\$85,897</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$2,914</u></p> <p>2. Drainage <u>\$50,335</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$304,343</u></p> <p style="padding-left: 20px;">b. Base <u>\$450,161</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$86,670</u></p> <p>4. Erosion/Sed. Cont. <u>\$67,113</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$0</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$305,625</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$41,945</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$171,150</u></p> <p>1. Beautification <u>\$171,150</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 41,945.44</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 24 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$69,720</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 19,720.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,678,000

I. MISC. ITEMS \$251,700

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$83,900

(normally 5% of H) 5%

(% used)

K. INITIAL EXPENSE \$83,900

(normally 5% of H) 5%

(% used)

L. CONSTRUCTION CONTINGENCY \$167,800

(normally 10% of H) 10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$2,265,300

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$339,795

(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$2,605,095

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____ Date: _____

Q. TRAFFIC SECTION ITEMS \$375,000

(Enter on PNR funding line 6)

1. Signing	
2. Signals	<u>\$300,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Pedestrian Signal	<u>\$75,000</u>

Traffic
Estimator: _____ Date: _____

Estimator: JMT

Date: 9/14/2022

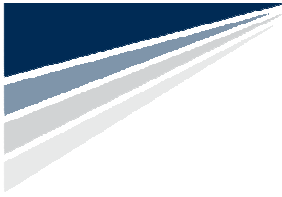


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



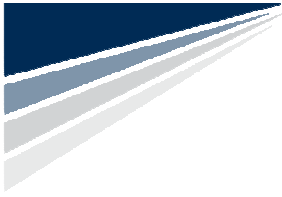
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 25,167
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 8,389
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.8%	\$ 13,423
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 8,389
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



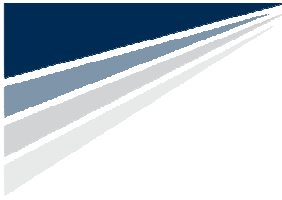
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.5%	\$ 75,502
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 167,782
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 83,891
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 33,556
4. Utilities		
a. Inhouse	2.0%	\$ 33,556
b. Consultant	2.0%	\$ 33,556
c. Test Holes	2.00%	\$ 33,556
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1F	N			\$ -	8,435.00	\$ 9,278.50	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1F	N		68,550.00	\$ 75,405.00	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ 75,405.00	Total:	\$ 9,278.50	Total:	0

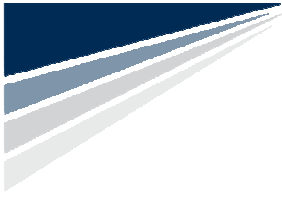
Number of Parcels Impacted: 2

Appraisal Fees: \$ 2,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 5,000.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 1,100.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365 assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

General Roadway Data						
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	4890	Hotmix Type C (in)		2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)		4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)		6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)		8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	68535	Overlay depth (in)		1.5		
Widening/Reconstruction Area (SF)	51985	SUP Pavement Box			Duration (Month)	
Full Depth Hotmix Area (SF)	0				0	
Length of 10' Wide SUP (LF)	0	SUP Pavement Box			Modular Block Retaining Wall (LF)	
Area of 10' SUP (SF)	0				0	
Length of 5' Wide Sidewalk (LF)	4890	Type C Depth (in)		2	Hotmix Sawcut (LF)	2485
Area of 5' Wide Sidewalk (SF)	24450	GABC Depth (in) (Typ 4")		8	Removal of Roadway (SF)	
Length of Curb/Gutter		SW Pavement Box			CELLS IN BLUE SHADE ARE AUTOMATED.	
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")		4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")		4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11					

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	3209	\$ 24.50	\$ 78,620.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	121	\$ 24.50	\$ 2,964.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	176	\$ 24.50	\$ 4,312.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 85,897.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	185	\$ 15.75	\$ 2,913.75
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 50,335	\$ 50,334.52
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1305	\$ 115.50	\$ 150,727.50
401015	Superpave Type B, PG 70-22	Ton	Na	1330	\$ 115.50	\$ 153,615.00
					Total:	\$ 304,343



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	102803	\$ 2.70	\$ 277,568.10	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1969	\$ 84.50	\$ 166,380.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	2485	\$ 2.50	\$ 6,212.50	
Total:						\$ 450,161.10	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	1284	\$ 67.50	\$ 86,670.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 67,112.70	\$ 67,112.70	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -	
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -	
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -	
					Total:	\$ -	
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	24450	\$ 12.50	\$ 305,625.00	
					Total:	\$ 305,625.00	
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
					Total:	\$ -	
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 41,945.44	\$ 41,945.44	
A.5.f: Field Office							
		EAMO	NA	0	\$ 2,500.00	\$ -	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
					Total:	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	16300	\$ 1.50	\$ 24,450.00	
908004	Topsoil, 6" Depth	SY	NA	16300	\$ 9.00	\$ 146,700.00	
					Total:	\$ 171,150.00	
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 41,945.44	\$ 41,945.44
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 41,945.44
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		10800	\$ 1.50	\$ 16,200.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		20	\$ 176.00	\$ 3,520.00
Total:						\$ 19,720.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,677,817.44



Attachment 3E: Intersection 24 CTP Estimate - LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 24 - LOS E New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (N10)</u>	<u>Merrimac Ave</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the future intersection of Levels Road and future Merrimac Avenue.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$51,700</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$437,800</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$104,500</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,548,500</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,142,500</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 24 - LOS E

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$20,986</u>	E. HISTORIC	<u>\$6,995</u>
B. ARCHAEOLOGY	<u>\$6,995</u>	1. Phase 1 (study)	<u>\$6,995</u>
1. Phase I (study)	\$6,995	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$11,193</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$11,193</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$47,000

CONTINGENCY COSTS \$4,700
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$51,700
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Intersection 24 - LOS E

PART II - PRELIMINARY ENGINEERING

A. SURVEYS

	<u>\$62,958</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$62,958</u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

B. DESIGN ENGINEERING

	<u>\$334,288</u>
1. Design	<u>\$139,908</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$139,908</u>
2. Traffic	<u>\$69,954</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$69,954</u>
3. Real Estate Plan Preparation	<u>\$27,981</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 27,981</u>
4. Utilities	<u>\$83,944</u>
a. Inhouse	<u>\$ 27,981</u>
b. Consultant	<u>\$ 27,981</u>
c. Test Holes	<u>\$ 27,981</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$5,000</u>
7. Pile Load Tests	<u> </u>

9. Other (specify)	<u>\$0</u>
a.	<u>\$0</u>
b.	<u>\$0</u>

C. ENVIRON. ASSESSMENT

(use for class "II" projects only)

	<u>\$0</u>
1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED

\$398,000

CONTINGENCY COSTS

(normally 5% for large projects and 10% for small projects - to be approved by section head)

<u>10%</u>	<u>\$39,800</u>
(% used)	

TOTAL PRELIMINARY ENGINEERING

(also total for Construction Project Estimate form line 7b)

\$437,800

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Intersection 24 - LOS E

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$85,972</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 75,405</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 5,567</u>	D. DEMOLITION	
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$2,000</u>
5. Wetland mitigation Other (specify)	<u> </u>	F. STAFF	<u>\$5,000</u>
6. <u> </u>	<u> </u>	G. SETTLEMENT	<u>\$1,100</u>
7. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
B. RELOCATION	<u>\$0</u>	1. Consultant survey	<u> </u>
1. Residential	<u> </u>	2. As acquired plans	<u> </u>
2. Business	<u> </u>	I. CONDEMNATION	<u> </u>
Other (specify)	<u> </u>	J. OTHER (specify)	<u>\$0</u>
3. <u> </u>	<u> </u>	1. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$95,000

CONTINGENCY COSTS 10% \$9,500
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$104,500
(also total for Construction Project Estimate form line 7c)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Intersection 24 - LOS E

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION

	<u>\$1,089,922</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$49,123</u>
b. Borrow	\$4,741
2. Drainage	\$139,907
3. Pavement	
a. Surface	<u>\$212,174</u>
b. Base	<u>\$107,967</u>
c. Subbase	<u>\$50,963</u>
4. Erosion/Sed. Cont.	<u>\$55,963</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$0</u>
b. Sidewalk	<u>\$245,625</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$1,100</u>
e. Clear/Grubb	<u>\$209,861</u>
f. Field Office	<u>\$12,500</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. <u>Fence Relocation</u>	<u>\$0</u>
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

B. STRUCTURE CONSTRUCTION

	<u>\$0</u>
1. New Bridge	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$208,950</u>
1. Beautification	<u>\$208,950</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$0</u>

D. MAINTENANCE OF TRAFFIC \$ 34,976.87

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Intersection 24 - LOS E

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$65,226</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000
3. Pavement Markings	\$ 15,226
Other (specify)	
4. _____	
F. WETLAND MITIGATION	<u>\$0</u>
G. UTILITY RELOC. IN CONTRACT	<u>\$0</u>
1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -
H. SUBTOTAL (A thru G) ROUNDED	<u>\$1,400,000</u>
I. MISC. ITEMS	<u>\$210,000</u>
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
15%	
(_____) (%) used	
J. CONTRACTOR'S CONST. ENG.	<u>\$70,000</u>
(normally 5% of H)	
5%	
(_____) (%) used	
K. INITIAL EXPENSE	<u>\$70,000</u>
(normally 5% of H)	
5%	
(_____) (%) used	
L. CONSTRUCTION CONTINGENCY	<u>\$140,000</u>
(normally 10% of H)	
10%	
(_____) (%) used	
M. TOTAL CONSTRUCTION COSTS (H thru L)	<u>\$1,890,000</u>
(Enter on PNR funding line 5)	
N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)	<u>15%</u>
(Enter on PNR funding line 4)	
	(_____) (%) used
O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)	<u>\$2,173,500</u>
(use this total + Q + P for Construction Project Estimate from line 7d)	

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	<u>\$0</u>
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	
Utilities	
Estimator: _____	Date: _____

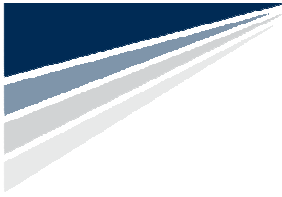
Q. TRAFFIC SECTION ITEMS	<u>\$375,000</u>
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	\$300,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Pedestrian Signal	\$75,000
Traffic	
Estimator: _____	Date: _____

Estimator: Bill Dougherty, JMT

Date: 09/14/22



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



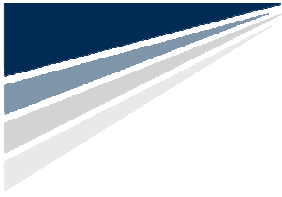
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering(Includes NEPA)	1.5%	\$ 20,986
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 6,995
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.8%	\$ 11,193
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 6,995
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.5%	\$ 62,958
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 139,908
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 69,954
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 27,981
4. Utilities		
a. Inhouse	2.0%	\$ 27,981
b. Consultant	2.0%	\$ 27,981
c. Test Holes	2.00%	\$ 27,981
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acqisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Estimated Residential PE Area	AR-1F	N			\$ -	8,435.00	\$ 5,567.10		
Estimated Residential R/W Area	AR-1F	N		68,550.00	\$ 75,405.00				
Total:			\$ -	Total:	\$ 75,405.00	Total:	\$ 5,567.10	Total:	\$ -

Number of Parcels Impacted: 2
 Appraisal Fees: \$ 2,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 5,000.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 1,100.00 Number of Parcels Impacted X \$550

Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

General Roadway Data							
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)		
Length of Roadway Edge (LF)	2040	Type C Depth (in)	2		Type C	151.3	
Existing Roadway Width (LF)	0	Type B Depth (in)	4		Type B	153.5	
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6		BCBC	151.5	
Widening Width (LF)	0	GABC Depth (in)	8		Project Duration (Assume 12 Mo/Mile)		
Overlay Area (SF)	53057						
Widening/Reconstruction Area (SF)	30540	SUP Pavement Box			Duration (Month)	5	
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2		Hotmix Sawcut (LF) 1865 Removal of Roadway (SF) 0 Brick Hatching (SF) 0		
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8				
Length of 5' Wide Sidewalk (LF)	3930	SW Pavement Box					
Area of 5' Wide Sidewalk (SF)	19650	Concrete Depth (in) (Typ 4")	4				
Length of Curb/Gutter	0	GABC Depth (in) (Typ 4")	4	CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.			
Area of Triangular Concrete Islands	0						
Length of Ditch Runs (LF)							
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0						

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	1886	\$ 24.50	\$ 46,207.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	98	\$ 24.50	\$ 2,401.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	21	\$ 24.50	\$ 514.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 49,122.50
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	301	\$ 15.75	\$ 4,740.75
A.2: Drainage						
	General Drainage (10% of project cost)	LS	10%	1	\$139,907.48	\$ 139,907.48
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1055	\$ 115.50	\$ 121,852.50
401015	Superpave Type B, PG 70-22	Ton	NA	782	\$ 115.50	\$ 90,321.00
					Total:	\$ 212,173.50
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	1157	\$ 84.50	\$ 97,766.50
762000	Sawcutting, Bituminous Concrete	LF	NA	4080	\$ 2.50	\$ 10,200.00
					Total:	\$ 107,966.50
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	755	\$ 67.50	\$ 50,962.50



DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

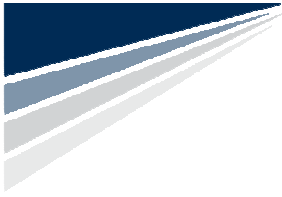
A.4: Erosion/Sediment Control						
General E&S (4%) of Overall Project Cost	LS	4.0%		1	\$ 55,962.99	\$ 55,962.99

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$	30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA		\$	26.00	\$ -
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$	32.54	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$	34.00	\$ -
702000	Triangular Channelizing Islands	SF	NA	0	\$	77.00	\$ -
Total:							\$ -
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	19650	\$	12.50	\$ 245,625.00
Total:							\$ 245,625.00
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$	30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$	3,000.00	\$ -
Total:							\$ -
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	5	\$	220.00	\$ 1,100.00
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (15%) of project cost	LS	15.0%	1	\$	209,861.22	\$ 209,861.22
A.5.f: Field Office							
		EAMO	NA	5	\$	2,500.00	\$ 12,500.00
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$	91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$	67.50	\$ -
Total:							\$ -
A.5.h: Fence Relocation							
	Fence Relocation	LF	NA	0	\$	-	\$ -
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$	-	\$ -
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$	-	\$ -
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$	-	\$ -
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$	-	\$ -
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	19900	\$	1.50	\$ 29,850.00
908004	Topsoil, 6" Depth	SY	NA	19900	\$	9.00	\$ 179,100.00
Total:							\$ 208,950.00
C.2: Noise Mitigation							
			0%	1	\$	-	\$ -
C.3: Visual Mitigation							
			0%	1	\$	-	\$ -
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$	-	\$ -
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$	34,976.87	\$ 34,976.87
	Detour Route (0%) of project cost	LS	0%	1	\$	-	\$ -

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 24 Levels Road and Merrimac Avenue - LOS E

					Total:	\$ 34,976.87
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		8625	\$ 1.50	\$ 12,937.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		13	\$ 176.00	\$ 2,288.00
					Total:	\$ 15,225.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,399,074.82



Attachment 4 - Intersection 12 CTP Estimate - Roundabout Option - LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 12-Roundabout LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (SR10)</u>	<u>St. Anne's Church (SR447)</u>	<u>Wallasey Drive</u>	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the intersection of Levels Road and St. Anne's Church Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$89,100</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$545,600</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$123,200</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$3,570,750</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$4,328,650</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates -Int.12-Roundabout LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$22,994</u>	E. HISTORIC	<u>\$11,497</u>
B. ARCHAEOLOGY	<u>\$22,994</u>	1. Phase 1 (study)	<u>\$11,497</u>
1. Phase I (study)	<u>\$22,994</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$22,994</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$22,994</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$81,000

CONTINGENCY COSTS 10% \$8,100
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$89,100
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates -Int.12-Roundabout LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$45,988</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$45,988</u>
B. DESIGN ENGINEERING	<u>\$449,129</u>
1. Design	<u>\$275,926</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$275,926</u>
2. Traffic	<u>\$91,975</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$91,975</u>
3. Real Estate Plan Preparation	<u>\$34,491</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 34,491</u>
4. Utilities	<u>\$45,988</u>
a. Inhouse	<u>\$ 11,497</u>
b. Consultant	<u>\$ 11,497</u>
c. Test Holes	<u>\$ 22,994</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$750</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$496,000

CONTINGENCY COSTS 10% \$49,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$545,600
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates -Int.12-Roundabout LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$91,400</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 86,400</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$112,000

CONTINGENCY COSTS 10% \$11,200
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$123,200
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates -Int.12-Roundabout LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,932,943</u></p> <p> a. Excavation <u>\$65,807</u> (includes SWM pond)</p> <p> b. Borrow <u>\$2,237</u></p> <p>2. Drainage <u>\$68,981</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$327,070</u></p> <p> b. Base <u>\$583,242</u></p> <p> c. Subbase <u>\$64,733</u></p> <p>4. Erosion/Sed. Cont. <u>\$91,975</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$281,664</u></p> <p> b. Sidewalk <u>\$389,750</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$0</u></p> <p> e. Clear/Grubb <u>\$57,484</u></p> <p> f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____</p> <p> i. _____</p> <p> j. _____</p> <p> k. _____</p> <p> l. _____</p> <p> m. _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>2. Old Structure Rem. _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type <u>Modular Block</u></p> <p> b. Size <u>371 LF</u></p> <p> c. \$/l.f. <u>\$50</u></p> <p>4. Box Culvert _____</p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p>	<p>C. LANDSCAPING <u>\$212,804</u></p> <p>1. Beautification <u>\$212,804</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p>	<p>D. MAINTENANCE OF TRAFFIC <u>\$ 57,484.40</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates -Int.12-Roundabout LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$96,145</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 75,000.00
3. Pavement Markings	\$ 21,145.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$2,300,000

I. MISC. ITEMS \$345,000

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$115,000

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$115,000

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$230,000

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$3,105,000

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$465,750

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$3,570,750

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



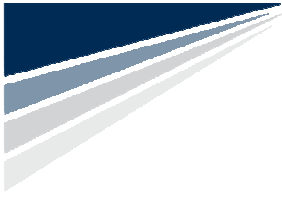
DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 22,994
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 22,994
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 22,994
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 11,497
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	2.0%	\$ 45,988
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 275,926
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	4.0%	\$ 91,975
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.5%	\$ 34,491
4 Utilities		
a. Inhouse	0.5%	\$ 11,497
b. Consultant	0.5%	\$ 11,497
c. Test Holes	1.00%	\$ 22,994
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	12,000.00	\$ 86,400.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -	-	\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 86,400.00	Total:	0

Number of Parcels Impacted: 5

Appraisal Fees:

\$ 5,000.00

Number of Parcels Impacted X \$1,000

Staff:

\$ 12,500.00

Number of Parcels Impacted X \$2,500

Settlement:

\$ 2,750.00

Number of Parcels Impacted X \$550

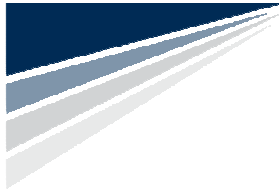
Assuming 400k for Full Acquisitions
for now assuming r/w length x5'
r/w length=18365

assume 15% of land acquisition
on commercial land



Appendix C

Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	6080	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	110742	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	38828	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	6236	Type C Depth (in)	2	Hotmix Sawcut (LF)	4175
Area of 5' Wide Sidewalk (SF)	31180	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	
Length of Curb/Gutter	779	SW Pavement Box		Brick Hatching	4389
Area of Triangular Concrete Islands	3370	Concrete Depth (in) (Typ 4")	4	CELLS IN BLUE SHADE ARE AUTOMATED.	
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	2397	\$ 24.50	\$ 58,726.50
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	154	\$ 24.50	\$ 3,773.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	135	\$ 24.50	\$ 3,307.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 65,807.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	142	\$ 15.75	\$ 2,236.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 68,981	\$ 68,981.28
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1538	\$ 115.50	\$ 177,639.00
401015	Superpave Type B, PG 70-22	Ton	Na	994	\$ 115.50	\$ 114,807.00
501526	Patterned PCC, 8"	SF	NA	4389	\$ 7.89	\$ 34,624.33
					Total:	\$ 327,070



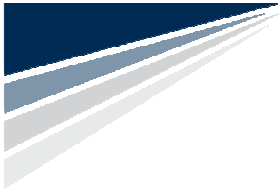
DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	166113	\$ 2.70	\$ 448,505.10	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1471	\$ 84.50	\$ 124,299.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	4175	\$ 2.50	\$ 10,437.50	
						Total:	\$ 583,242.10
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	959	\$ 67.50	\$ 64,732.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 91,975.04	\$ 91,975.04	



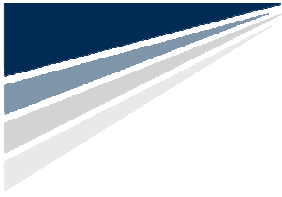
DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	180	\$ 30.00	\$ 5,400
71014	P.C.C. Curb, Type 2	LF	NA	449	\$ 26.00	\$ 11,674
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	150	\$ 34.00	\$ 5,100
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	3370	\$ 77.00	\$ 259,490.00
Total:						\$ 281,664
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	31180	\$ 12.50	\$ 389,750.00
Total:						\$ 389,750.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 57,484.40	\$ 57,484.40
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	20267	\$ 1.50	\$ 30,400.50
908004	Topsoil, 6" Depth	SY	NA	20267	\$ 9.00	\$ 182,403.00
Total:						\$ 212,803.50
C.2: Noise Mitigation			0%	1	\$ -	\$ -
C.3: Visual Mitigation			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 57,484.40	\$ 57,484.40
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 57,484.40
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 75,000.00	\$ 75,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		13510	\$ 1.50	\$ 20,265.00
		Each		5	\$ 176.00	\$ 880.00
Total:						\$ 21,145.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 2,299,376.06



Attachment 5 - Intersection 12 CTP Estimate - Signal Option LOS D

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 12 - Signalized LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (SR10)</u>	<u>St. Anne's Church (SR447)</u>	<u>Wallasey Drive</u>	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Intersection improvements at the intersection of Levels Road and St. Anne's Church Road. This is the signalized alternative of the intersection. Would remove existing roundabout at intersection.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$78,100</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$487,300</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$107,800</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$3,518,813</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$4,192,013</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Assistant Director, M&O/Transportation Solutions/Planning _____
Date Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Int.12 - Signalized LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$20,247</u>	E. HISTORIC	<u>\$10,123</u>
B. ARCHAEOLOGY	<u>\$20,247</u>	1. Phase 1 (study)	<u>\$10,123</u>
1. Phase I (study)	<u>\$20,247</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$20,247</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$20,247</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	<u> </u>
1. Phase 1 (study)	<u>\$0</u>	2. _____	<u> </u>
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$71,000

CONTINGENCY COSTS 10% \$7,100
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$78,100
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Int.12 - Signalized LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$40,494</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$40,494</u>	
B. DESIGN ENGINEERING		<u>\$402,316</u>	
1. Design		<u>\$242,964</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$242,964</u>	
2. Traffic		<u>\$80,988</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$80,988</u>	
3. Real Estate Plan Preparation		<u>\$30,370</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 30,370</u>	
4. Utilities		<u>\$40,494</u>	
a. Inhouse		<u>\$ 10,123</u>	
b. Consultant		<u>\$ 10,123</u>	
c. Test Holes		<u>\$ 20,247</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$0</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		<u> </u>
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$443,000

CONTINGENCY COSTS \$44,300
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$487,300
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Int.12 - Signalized LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$77,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 72,000</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$98,000

CONTINGENCY COSTS 10% \$9,800
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$107,800
 (also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Int.12 - Signalized LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,672,261</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$66,836</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$2,268</u></p> <p>2. Drainage <u>\$60,741</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$298,106</u></p> <p style="padding-left: 20px;">b. Base <u>\$623,994</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$65,543</u></p> <p>4. Erosion/Sed. Cont. <u>\$80,988</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$11,232</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$411,938</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$0</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$50,617</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. _____ <u> </u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p align="right"><u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$225,960</u></p> <p>1. Beautification <u>\$225,960</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 50,617.39</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Int.12 - Signalized LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$75,857</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 25,857.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$2,025,000

I. MISC. ITEMS \$303,750

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$101,250

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$101,250

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$202,500

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$2,733,750

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%

(% used) \$410,063

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$3,143,813

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____ General	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$375,000

(Enter on PNR funding line 6)

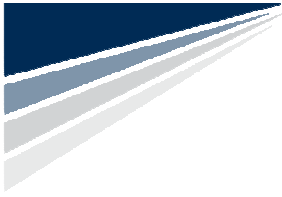
1. Signing	
2. Signals	<u>\$300,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____ Pedestrian Signal	<u>\$75,000</u>

Traffic
Estimator: _____

Date: _____

Estimator: JMT

Date: 9/14/2022



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 20,247
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 20,247
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 20,247
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 10,123
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



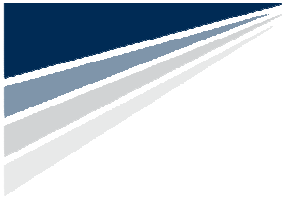
DELDOT PROJECT: Westown TIP CTP Estimates - Intersection 12 Signalized
LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	2.0%	\$ 40,494
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 242,964
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	4.0%	\$ 80,988
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.5%	\$ 30,370
4. Utilities		
a. Inhouse	0.5%	\$ 10,123
b. Consultant	0.5%	\$ 10,123
c. Test Holes	1.00%	\$ 20,247
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westown TIP CTP Estimates - Intersection 12 Signalized
LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	10,000.00	\$ 72,000.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -		\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 72,000.00	Total:	0

Number of Parcels Impacted: 5

Appraisal Fees: \$ 5,000.00 Number of Parcels Impacted X \$1,000

Staff: \$ 12,500.00 Number of Parcels Impacted X \$2,500

Settlement: \$ 2,750.00 Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Signalized
LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	6456	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	114060	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	39319.33	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	6591	Type C Depth (in)	2	Hotmix Sawcut (LF)	3100
Area of 5' Wide Sidewalk (SF)	32955	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	8113
Length of Curb/Gutter	432	SW Pavement Box		CELLS IN BLUE SHADE ARE AUTOMATED.	
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
		%	QTY	Conceptual Unit Cost	Conceptual Cost	
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	2428	\$ 24.50	\$ 59,486.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	163	\$ 24.50	\$ 3,993.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	137	\$ 24.50	\$ 3,356.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	1014	\$ 20.00	\$ 20,282.50
					Total:	\$ 66,836.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	144	\$ 15.75	\$ 2,268.00
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 60,741	\$ 60,740.86
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1575	\$ 115.50	\$ 181,912.50
401015	Superpave Type B, PG 70-22	Ton	Na	1006	\$ 115.50	\$ 116,193.00
					Total:	\$ 298,106

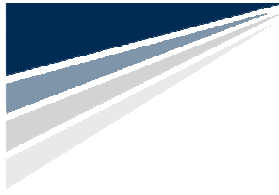


DELDOT PROJECT: Westown TIP CTP Estimates - Intersection 12 Signalized
LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	171090	\$ 2.70	\$ 461,943.00	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1490	\$ 84.50	\$ 125,905.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	8113	\$ 3.50	\$ 28,395.50	
762000	Sawcutting, Bituminous Concrete	LF	NA	3100	\$ 2.50	\$ 7,750.00	
Total:						\$ 623,993.50	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	971	\$ 67.50	\$ 65,542.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 80,987.82	\$ 80,987.82	

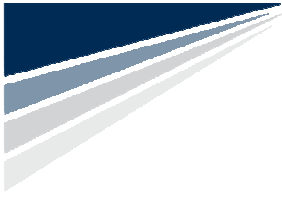
DELDOT PROJECT: Westown TIP CTP Estimates - Intersection 12 Signalized
LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	0	\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	432	\$ 26.00	\$ 11,232
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
Total:						\$ 11,232
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	32955	\$ 12.50	\$ 411,937.50
Total:						\$ 411,937.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 50,617.39	\$ 50,617.39
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	21520	\$ 1.50	\$ 32,280.00
908004	Topsoil, 6" Depth	SY	NA	21520	\$ 9.00	\$ 193,680.00
Total:						\$ 225,960.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westown TIP CTP Estimates - Intersection 12 Signalized
LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 50,617.39	\$ 50,617.39
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 50,617.39
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		15478	\$ 1.50	\$ 23,217.00
		Each		15	\$ 176.00	\$ 2,640.00
Total:						\$ 25,857.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 2,024,695.45



Attachment 4E: Intersection 12 CTP Estimate - LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 12 - LOS E New Castle
County
Subdivision or Road Name

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (SR10)</u>	<u>St. Anne's Church (SR447)</u>	<u>Wallasey Drive</u>	

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation Estimate only
Name Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Improvements at the intersection of Levels Road and St. Anne's Church Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$70,400</u>	Part I <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$446,600</u>	Part II <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$123,200</u>	Part III <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,834,865</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,475,065</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. N/A

Project Title: Westown TIP CTP Estimates - Int.12 - Roundabout

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$18,259</u>	E. HISTORIC	<u>\$9,130</u>
B. ARCHAEOLOGY	<u>\$18,259</u>	1. Phase 1 (study)	<u>\$9,130</u>
1. Phase I (study)	\$18,259	2. Phase 2 (study)	\$0
2. Phase 2 (study)	\$0	3. Mitigation (by loc./env.)	\$0
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$18,259</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$18,259</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$64,000

CONTINGENCY COSTS 10% \$6,400
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$70,400
(also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. N/A

Project Title: Westtown TIP CTP Estimates - Int.12 - Roundabout

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$36,518</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$36,518</u>	
B. DESIGN ENGINEERING		<u>\$368,555</u>	
1. Design		<u>\$219,111</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$219,111</u>	
2. Traffic		<u>\$73,037</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$73,037</u>	
3. Real Estate Plan Preparation		<u>\$27,389</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 27,389</u>	
4. Utilities		<u>\$36,518</u>	
a. Inhouse		<u>\$ 9,130</u>	
b. Consultant		<u>\$ 9,130</u>	
c. Test Holes		<u>\$ 18,259</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$5,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ -</u>	
c. Railroad P.E.		<u>\$ -</u>	

9. Other (specify)		<u>\$0</u>	
a.		<u>\$0</u>	
b.		<u>\$0</u>	

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>	
2. Hazardous Materials		<u>\$ -</u>	
3. Noise		<u>\$ -</u>	
4. Historic		<u>\$ -</u>	
5. Archaeology		<u>\$ -</u>	
6. Other		<u>\$ -</u>	
a. _____		<u>\$ -</u>	
b. _____		<u>\$ -</u>	

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$406,000

CONTINGENCY COSTS \$40,600
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$446,600
 (also total for Construction Project Estimate form line 7b)

Estimator: Bill Dougherty, JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. N/A

Project Title Westown TIP CTP Estimates - Int.12 - Roundabout

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,432,152</u></p> <p style="padding-left: 20px;">a. Excavation <u>\$52,577</u> (includes SWM pond)</p> <p style="padding-left: 20px;">b. Borrow <u>\$5,072</u></p> <p>2. Drainage <u>\$54,778</u></p> <p>3. Pavement</p> <p style="padding-left: 20px;">a. Surface <u>\$336,200</u></p> <p style="padding-left: 20px;">b. Base <u>\$117,686</u></p> <p style="padding-left: 20px;">c. Subbase <u>\$53,190</u></p> <p>4. Erosion/Sed. Cont. <u>\$73,037</u></p> <p>5. Miscellaneous</p> <p style="padding-left: 20px;">a. Curb/Gutter <u>\$281,080</u></p> <p style="padding-left: 20px;">b. Sidewalk <u>\$391,125</u></p> <p style="padding-left: 20px;">c. Guardrail <u>\$0</u></p> <p style="padding-left: 20px;">d. C.P.M. Schedule <u>\$1,760</u></p> <p style="padding-left: 20px;">e. Clear/Grubb <u>\$45,648</u></p> <p style="padding-left: 20px;">f. Field Office <u>\$20,000</u></p> <p>Other (specify)</p> <p style="padding-left: 20px;">g. <u>Shared Use Path</u> <u>\$0</u></p> <p style="padding-left: 20px;">h. <u>Fence Relocation</u> <u>\$0</u></p> <p style="padding-left: 20px;">i. _____ <u> </u></p> <p style="padding-left: 20px;">j. _____ <u> </u></p> <p style="padding-left: 20px;">k. _____ <u> </u></p> <p style="padding-left: 20px;">l. _____ <u> </u></p> <p style="padding-left: 20px;">m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION <u>\$0</u></p> <p>1. New Bridge <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/c.y. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p style="padding-left: 20px;">a. Type <u> </u></p> <p style="padding-left: 20px;">b. Size <u> </u></p> <p style="padding-left: 20px;">c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$328,304</u></p> <p>1. Beautification <u>\$328,304</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 45,648.07</u></p>
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(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. N/A

Project Title Westtown TIP CTP Estimates - Int.12 - Roundabout

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	\$19,820
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 19,820
Other (specify)	
4. _____	_____

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Electric Relocation (Poles)	\$ -

H. SUBTOTAL (A thru G) ROUNDED \$1,826,000

I. MISC. ITEMS \$273,900

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$91,300

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$91,300

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$182,600

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$2,465,100

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%

(% used) \$369,765

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

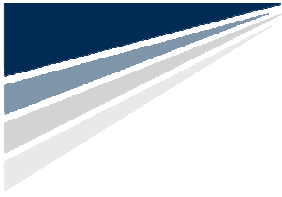
\$2,834,865

Estimator: Bill Dougherty, JMT

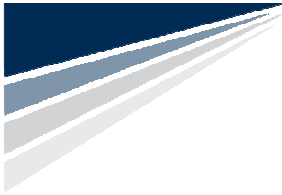
Date: 09/14/22

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	\$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	_____
8. _____	_____
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS	\$0
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	_____
Traffic	
Estimator: _____	Date: _____



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 18,259
B. Archeology		
1. Phase 1 (study)	1.0%	\$ 18,259
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 18,259
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 9,130
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



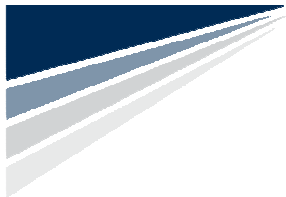
DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	2.0%	\$ 36,518
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 219,111
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	4.0%	\$ 73,037
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.5%	\$ 27,389
4. Utilities		
a. Inhouse	0.5%	\$ 9,130
b. Consultant	0.5%	\$ 9,130
c. Test Holes	1.00%	\$ 18,259
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

Zoning (In Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Parkland	18PL	\$ -	\$ 1.700
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	12,000.00	\$ 86,400.00		
		N			\$ -				
		N			\$ -				
		N				-	\$ -		
		Total:	\$ -		Total: \$ -		Total: \$ 86,400.00		Total: \$ -

Number of Parcels Impacted: 5
 Appraisal Fees: \$ 5,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 12,500.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 2,750.00 Number of Parcels Impacted X \$550

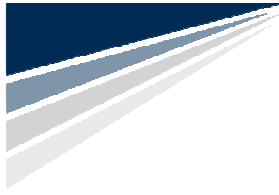
Note: It is anticipated that any TCE's required to construct the path will be donated by the adjacent owners (Privately owned parkland parcel).





Appendix C

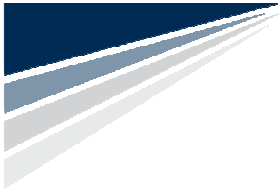
Backup Calculations for Part IV - Construction



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

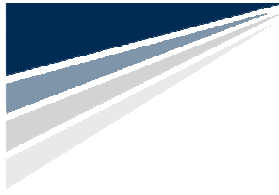
General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Roadway Edge (LF)	3122	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	110459				
Widening/Reconstruction Area (SF)	31878	SUP Pavement Box		Duration (Month)	8
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2	Hotmix Sawcut (LF) 3614	
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	6258	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	31290	Concrete Depth (in) (Typ 4")	4	Removal of Roadway (SF)	0
Length of Curb/Gutter	635	GABC Depth (in) (Typ 4")	4	Brick Hatching (SF)	4389
Area of Triangular Concrete Islands	3370			CELLS IN BLUE SHADE ARE AUTOMATED. EDITING IS NOT REQUIRED.	
Length of Ditch Runs (LF)					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	0				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	1968	\$ 24.50	\$ 48,216.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	155	\$ 24.50	\$ 3,797.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 10% of Excavation QTY)	CY	NA	23	\$ 24.50	\$ 563.50
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 52,577.00
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	322	\$ 15.75	\$ 5,071.50
A.2: Drainage						
	General Drainage (10% of project cost)	LS	3%	1	\$ 54,777.69	\$ 54,777.69
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1795	\$ 115.50	\$ 207,322.50
401015	Superpave Type B, PG 70-22	Ton	NA	816	\$ 115.50	\$ 94,248.00
501526	Patterned PCC, 8"	Ton	Na	4389	\$ 7.89	\$ 34,629.21
					Total:	\$ 336,199.71
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	1208	\$ 84.50	\$ 102,076.00
762000	Sawcutting, Bituminous Concrete	LF	NA	6244	\$ 2.50	\$ 15,610.00
					Total:	\$ 117,686.00
A.3.c: Pavement Subbase						



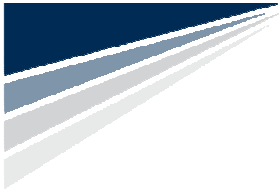
DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

301001	Graded Aggregate Base Course, Type B	CY	NA	788	\$ 67.50	\$ 53,190.00
A.4: Erosion/Sediment Control						
	General E&S (4%) of Overall Project Cost	LS	4.0%	1	\$ 73,036.92	\$ 73,036.92



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

A.5.a: Miscellaneous Curb/Gutter							
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -	
71014	P.C.C. Curb, Type 2	LF	NA		\$ 26.00	\$ -	
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA		\$ 32.54	\$ -	
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	635	\$ 34.00	\$ 21,590	
702000	Triangular Channelizing Islands	SF	NA	3370	\$ 77.00	\$ 259,490.00	
						Total:	\$ 281,080.00
A.5.b: Miscellaneous Sidewalk							
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	31290	\$ 12.50	\$ 391,125.00	
						Total:	\$ 391,125.00
A.5.c: Guardrail							
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -	
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -	
						Total:	\$ -
A.5.d: CPM Schedule							
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	8	\$ 220.00	\$ 1,760.00	
A.5.e: Clearing/Grubbing							
201000	Clearing And Grubbing (15%) of project cost	LS	2.5%	1	\$ 45,648.07	\$ 45,648.07	
A.5.f: Field Office							
		EAMO	NA	8	\$ 2,500.00	\$ 20,000.00	
A.5.g: Shared Use Path							
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -	
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -	
						Total:	\$ -
A.5.h: Fence Relocation							
Fence Relocation		LF	NA	0	\$ -	\$ -	
B.1: Structure Construction: New Bridge							
		LS	NA	0	\$ -	\$ -	
B.2: Structure Construction: Old Structure Removal							
		LS	NA	0	\$ -	\$ -	
B.3: Structure Construction: Retaining Wall							
		LS	NA	0	\$ -	\$ -	
B.4: Structure Construction: Box Culvert							
		LS	NA	0	\$ -	\$ -	
C.1: Landscaping Beautification							
908014	Permanent Grass Seeding, Dry Ground	SY	NA	31267	\$ 1.50	\$ 46,900.50	
908004	Topsoil, 6" Depth	SY	NA	31267	\$ 9.00	\$ 281,403.00	
						Total:	\$ 328,303.50
C.2: Noise Mitigation							
			0%	1	\$ -	\$ -	
C.3: Visual Mitigation							
			0%	1	\$ -	\$ -	
C.4: Tree Mitigation (1%) of project cost							
			0%	1	\$ -	\$ -	
D: Maintenance of Traffic							
801000	Maintenance of Traffic (2.5%) of project cost	LS	2.5%	1	\$ 45,648.07	\$ 45,648.07	
	Detour Route (0%) of project cost	LS	0%	1	\$ -	\$ -	



DELDOT PROJECT: Westtown TIP CTP Estimates - Intersection 12 Roundabout
St. Anne's Church Road Levels Road - LOS E

					Total:	\$ 45,648.07
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		12861	\$ 1.50	\$ 19,291.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		3	\$ 176.00	\$ 528.00
					Total:	\$ 19,819.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,825,922.97



Attachment 6 - Intersection 23 CTP Estimate - LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 23 - LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Levels Road (N10)</u>	<u>Poole Property Access</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the future intersection of Levels Road and future Poole Property access.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$26,400</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$268,400</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$45,100</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,204,740</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,544,640</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 23 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$11,629</u>	E. HISTORIC	<u>\$3,876</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$3,876</u>	1. Phase 1 (study)	<u>\$3,876</u>
1. Phase I (study)	<u>\$3,876</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$3,876</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$3,876</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$24,000

CONTINGENCY COSTS 10% \$2,400
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$26,400
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 23 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS

	<u>\$23,258</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$23,258</u>

B. DESIGN ENGINEERING

	<u>\$220,695</u>
1. Design	<u>\$93,031</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$93,031</u>
2. Traffic	<u>\$54,268</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$54,268</u>
3. Real Estate Plan Preparation	<u>\$15,505</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 15,505</u>
4. Utilities	<u>\$50,391</u>
a. Inhouse	<u>\$ 15,505</u>
b. Consultant	<u>\$ 15,505</u>
c. Test Holes	<u>\$ 19,381</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT

(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED

\$244,000

CONTINGENCY COSTS

(normally 5% for large projects and 10% for small projects - to be approved by section head)

10%
(\$24,400)
(% used)

TOTAL PRELIMINARY ENGINEERING

(also total for Construction Project Estimate form line 7b)

\$268,400

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 23 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$32,566</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 23,716</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 3,850</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$2,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$5,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$1,100</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$41,000

CONTINGENCY COSTS 10% \$4,100
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$45,100
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 23 - LOS D

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$692,322</u></p> <p> a. Excavation <u>\$32,267</u> (includes SWM pond)</p> <p> b. Borrow <u>\$1,103</u></p> <p>2. Drainage <u>\$23,258</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$125,780</u></p> <p> b. Base <u>\$211,598</u></p> <p> c. Subbase <u>\$32,670</u></p> <p>4. Erosion/Sed. Cont. <u>\$31,010</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$113,070</u></p> <p> b. Sidewalk <u>\$102,188</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$0</u></p> <p> e. Clear/Grubb <u>\$19,381</u></p> <p> f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$0</u></p> <p> h. _____ <u> </u></p> <p> i. _____ <u> </u></p> <p> j. _____ <u> </u></p> <p> k. _____ <u> </u></p> <p> l. _____ <u> </u></p> <p> m. _____ <u> </u></p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$0</u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/s.f. <u> </u></p> <p>2. Old Structure Rem. <u> </u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/c.y. <u> </u></p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/l.f. <u> </u></p> <p>4. Box Culvert <u> </u></p> <p> a. Type <u> </u></p> <p> b. Size <u> </u></p> <p> c. \$/s.f. <u> </u></p> <p>C. LANDSCAPING <u>\$56,007</u></p> <p> 1. Beautification <u>\$56,007</u></p> <p> 2. Noise Mitigation <u>\$0</u></p> <p> 3. Visual Mitigation <u>\$0</u></p> <p> 4. Tree Mitigation <u>\$0</u></p> <p>D. MAINTENANCE OF TRAFFIC <u>\$ 19,381.26</u></p>
--	--

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 23 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$7,540</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 7,540.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$776,000

I. MISC. ITEMS \$116,400

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%

(% used)

J. CONTRACTOR'S CONST. ENG. \$38,800

(normally 5% of H)

5%

(% used)

K. INITIAL EXPENSE \$38,800

(normally 5% of H)

5%

(% used)

L. CONSTRUCTION CONTINGENCY \$77,600

(normally 10% of H)

10%

(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$1,047,600

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%

(% used) \$157,140

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$1,204,740

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS

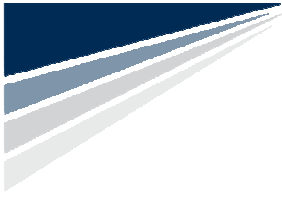
(Enter on PNR funding line 7)	
1. Water	_____
2. Sanitary Sewer	_____
3. Electric	_____
4. Telephone	_____
5. Gas	_____
6. CATV	_____
Other (specify)	
7. _____ General	_____
8. _____	_____
Utilities	
Estimator: _____	Date: _____

Q. TRAFFIC SECTION ITEMS

(Enter on PNR funding line 6)	
1. Signing	_____
2. Signals	<u>\$0</u>
3. Detour Signing	_____
4. DelTrac	_____
Other (specify)	
5. _____	_____
Traffic	
Estimator: _____	Date: _____

Estimator: JMT

Date: 9/14/2022

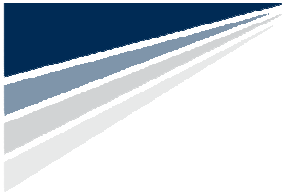


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 11,629
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 3,876
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 3,876
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 3,876
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



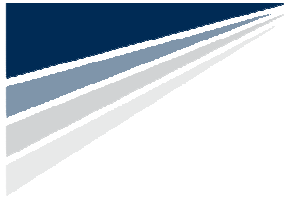
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	3.0%	\$ 23,258
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 93,031
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	7.0%	\$ 54,268
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 15,505
4. Utilities		
a. Inhouse	2.0%	\$ 15,505
b. Consultant	2.0%	\$ 15,505
c. Test Holes	2.50%	\$ 19,381
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	-	\$ -	-	
Estimated Residential PE Area	AR-1F	N			\$ -	3,500.00	\$ 3,850.00	-	
Estimated Commercial PE Area	C-1	N		-	\$ -	-	\$ -	-	
Estimated Residential R/W Area	AR-1F	N		21,560.00	\$ 23,716.00	-	\$ -	-	
Estimated Commercial R/W Area	C-1	N			\$ -	-	\$ -	-	
Total:			0	Total:	\$ 23,716.00	Total:	\$ 3,850.00	Total:	0

Number of Parcels Impacted: 2

Appraisal Fees: \$ 2,000.00

Staff: \$ 5,000.00

Settlement: \$ 1,100.00

Number of Parcels Impacted X \$1,000

Number of Parcels Impacted X \$2,500

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

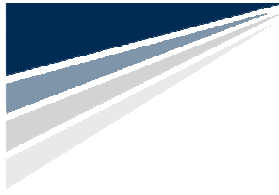
Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	1600	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	n/a	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	35870	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	19590	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	0	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	0				
Length of 5' Wide Sidewalk (LF)	1635	Type C Depth (in)	2	Hotmix Sawcut (LF)	1450
Area of 5' Wide Sidewalk (SF)	8175	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	
Length of Curb/Gutter	1180	SW Pavement Box			
Area of Triangular Concrete Islands	1070	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	1210	\$ 24.50	\$ 29,645.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	41	\$ 24.50	\$ 1,004.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	66	\$ 24.50	\$ 1,617.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 32,266.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	70	\$ 15.75	\$ 1,102.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 23,258	\$ 23,257.52
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	587	\$ 115.50	\$ 67,798.50
401015	Superpave Type B, PG 70-22	Ton	Na	502	\$ 115.50	\$ 57,981.00
					Total:	\$ 125,780



DELDOT PROJECT: Westown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	53805	\$ 2.70	\$ 145,273.50	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	742	\$ 84.50	\$ 62,699.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	1450	\$ 2.50	\$ 3,625.00	
Total:						\$ 211,597.50	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	484	\$ 67.50	\$ 32,670.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 31,010.02	\$ 31,010.02	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	1180	\$ 26.00	\$ 30,680
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	1070	\$ 77.00	\$ 82,390.00
Total:					\$	\$ 113,070
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	8175	\$ 12.50	\$ 102,187.50
Total:					\$	\$ 102,187.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 19,381.26	\$ 19,381.26
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	5334	\$ 1.50	\$ 8,001.00
908004	Topsoil, 6" Depth	SY	NA	5334	\$ 9.00	\$ 48,006.00
Total:					\$	\$ 56,007.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 23 Levels Road and Poole Property Access - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 19,381.26	\$ 19,381.26
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 19,381.26
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		4440	\$ 1.50	\$ 6,660.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		5	\$ 176.00	\$ 880.00
Total:						\$ 7,540.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 775,250.57

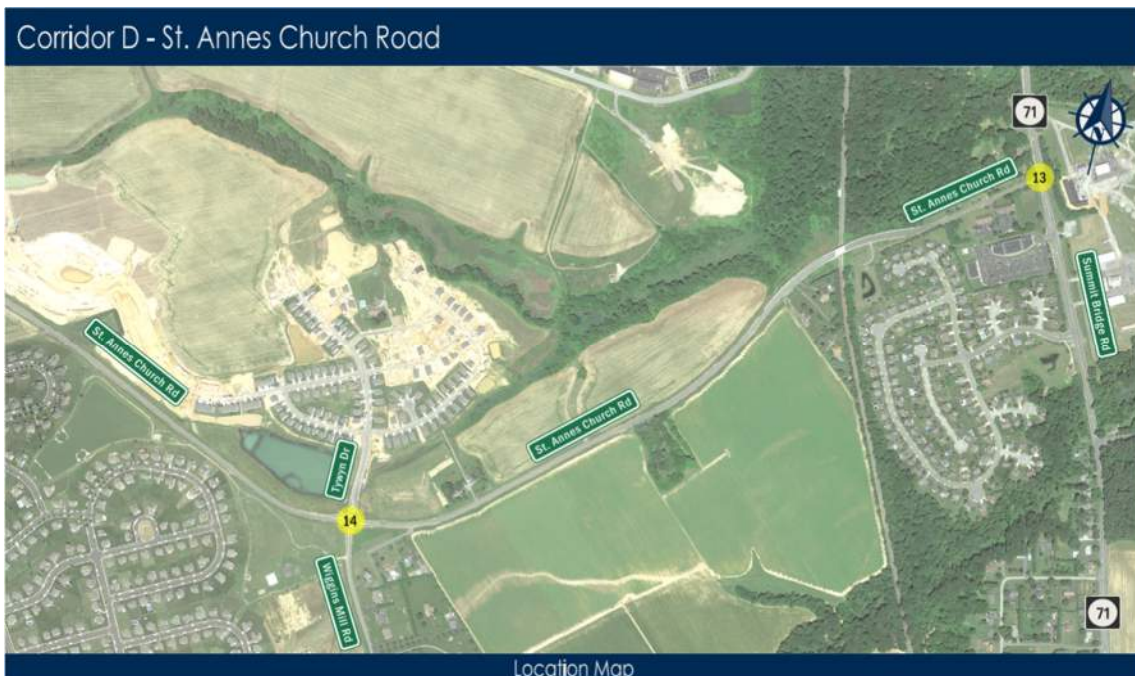


TECHNICAL MEMORANDUM

TO: Sarah Coakley, Regional Planner, Regional Systems Planning
 DATE: 11/05/2021 – Revised 09/19/2022
 FROM: Bill Dougherty, JMT
 PROJECT: Westown TID CTP Cost Updates
 JMT JOB NO.: 19-01340-2A1
 RE: St. Anne’s Church Road Concept Assumptions and Summary
 CC: Pam Steinebach, Matt Vincent, Mir Wahed, Brad Herb, Nate Rahaim

Included are recommendations for improvements based on existing conditions and future traffic projections for Corridor D of the Westown TID which covers the eastern portion of St Annes Church Road and Wiggins Mill Road. This corridor was studied for both Level of Service (LOS) D and E. Recommendations for LOS D matched the recommendations for LOS E. A general breakdown of intersection improvement costs along the St. Anne’s Church Road corridor is given in the table below.

Intersection #	Intersection Road Names	Estimated Cost
13	St. Anne's Church Road & SR71	\$ 2,623,318.00
14	St. Anne's Church Road & Wiggins Mill Road	\$ 1,435,458.00
	Wiggins Mill Road	\$ 4,120,475.00
Total		\$ 8,179,251.00



St. Anne’s Church Road - Existing Conditions

St. Anne’s Church Road (N447) is a 1.73-mile local road within Investment Strategy Level 1 which links Levels Road to SR 71. The current AADT (Annual Average Daily Traffic) for St. Anne’s Church Road is 3,425 VPD. St. Anne’s Church Road is a 2-lane asphalt roadway. Approximately 1550’ west of SR 71, St. Anne’s Church Road has a bridge crossing the Norfolk Southern Railroad. The posted speed limit along St. Anne’s Church Road is 45-mph; therefore, a 50-mph design speed was used for conceptual design.

Road Site Conditions – St. Anne’s Church Road

- OPC Index (91)
- 2-lane asphalt roadway
- Open drainage

Intersection 13: St. Anne’s Church Road & SR 71 (including improvements from Norfolk Southern Railroad to SR 71)

Existing Conditions

SR 71 (N014) is a minor arterial road within Investment Strategy level 1 which links Summit Bridge Road to US 13. The current AADT for SR 71 is 9,195 VPD. North of the intersection the posted speed limit is 35-mph; therefore, a design speed of 40-mph was used for design. South of the intersection the posted speed limit is 45-mph; therefore, a design speed of 50-mph was used for design. This intersection is not currently signalized. Currently northbound SR 71 has a bypass lane for left turn movements onto St. Anne’s Church Road. Southbound SR 71 has a right turn lane onto St. Anne’s Church Road.

Road Site Conditions – SR 71

- OPC Index (89)
- 2-lane asphalt roadway
- Open drainage

Design Elements

- There are currently no design deficiencies noted for the roadway. When future designs for this segment of road are considered, the designer should be cautious when evaluating sight distance requirements at the cemetery wall.

Utilities

- Aerial
 - There is a primary aerial electric service line along St. Anne’s Church Road along the south side of the roadway.

- There is a primary aerial electric service line along both sides of SR 71 near this intersection.
- Underground
 - Water and gas lines are anticipated to be present along St. Anne's Church Road near this intersection.
- Potential Conflicts
 - Based off the proposed layout of the St. Anne’s Church Road of this intersection, several utility poles will have to be relocated.

Potential for Future Development:

- The Preserve at Deep Creek, a subdivision still in development, is located west of the intersection.
- There is an existing cemetery along the north side of St. Anne’s Church Road near this intersection, limiting any development in the area and widening St. Anne’s Church Road and SR 71 towards the cemetery.
- Along northbound SR 71 there is a DelDOT maintenance yard that prevents future development in this area.

Multi-modal Analysis:

- North of the intersection, a 5’ sidewalk is located along southbound SR 71 along the frontage of the cemetery but there is no crosswalk across St Annes Church Road.
- West of the intersection there is existing sidewalk on both sides of St. Anne’s Church Road crossing a railroad bridge.
- No bicycle facilities currently exist at the intersection.

Recommendations:

- Widen St Annes Church Road to the south and SR 71 to the east away from the existing cemetery.
- Northbound SR 71 requires a center left turn lane and a through lane. The left turn lane onto St. Anne’s Church Road requires 250’ of storage with a 100’ taper. Southbound SR 71 requires a designated right turn lane, a bike lane, and through lane. Lengthen the right turn lane to provide 250’ of storage with a 50’ taper.
- The eastbound St. Anne’s Church Road approach to the intersection requires a separate left turn lane and a right turn lane. The right turn lane requires 275’ of storage with a 50’ taper.

- Install sidewalk along the south side of St. Anne’s Church Road from SR 71 to connect with existing sidewalk near the railroad bridge.
- Install traffic signal and include pedestrian signals crossing St. Annes Church Road at the intersection.
- Install intersection lighting.
- See attached intersection diagram in Attachment 1 for more information.
- The estimated cost of intersection improvements for this segment is \$2,623,318. See attached estimate in Attachment 2 for more information.

Intersection 14: St. Anne’s Church Road & Wiggins Mill Road & Tywyn Drive

Existing Conditions

Wiggins Mill Road (N446) is a 0.87-mile local road within Investment Strategy level 1 that links St. Anne’s Church Road and Green Giant Road. The current AADT for Wiggins Mill Road is 1,157 VPD. The posted speed limit is 45-mph; therefore, a design speed of 50-mph was used for design. The existing intersection is a single lane roundabout.

Tywyn Drive is a newly constructed local road within Investment Strategy level 1 that connects St. Anne’s Church Road to the Preserve at Deep Creek subdivision.

Road Site Conditions – Wiggins Mill Road

- OPC Index (63)
- 2-lane asphalt roadway
- Open drainage

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO’s ‘A Policy on the Geometric Design of Highways and Streets’ (Green Book).

Utilities

- Aerial
 - There is a primary aerial electric service line along St. Anne’s Church Road along the south side of the roadway.
 - There is a primary aerial electric service line along the west side of Wiggins Mill Road.
- Underground
 - Water and gas lines are anticipated to be present along St. Anne’s Church Road near this intersection.
- Potential conflicts
 - At this time, no major utility conflicts are anticipated at this intersection.

Potential for Future Development:

- The north side of the intersection is currently under development as The Preserve at Deep Creek.
- The Estates at St. Anne’s and St. Anne’s Golf Course have recently been completed to the west of Wiggins Mill Road and established homes are situated on the east side, therefore there is little potential for development along Wiggins Mill Road.

Multi-modal Analysis:

- There are no bike or pedestrian facilities along St. Anne’s Church Road and Wiggins Mill Road near this intersection.
- There are existing sidewalks on both sides of Tywyn Drive.

Recommendations:

- Based on the existing conditions and future projections, no roadway improvements are needed at this intersection.
- Install 5’ sidewalk on both sides of St. Anne’s Church Road east of the intersection to connect the existing sidewalks near the bridge crossing the Norfolk Southern Railroad and along Tywyn Drive.
- The estimated cost of intersection improvements for this option is \$1,435,458. See attached estimate in Attachment 3 for more information.

Corridor: Wiggins Mill Road roadway improvements between St Annes Church Road and Green Giant Road.

Existing Conditions

See above for information regarding Wiggins Mill Road (N446).

Design Elements

- Proposed horizontal curvature is in accordance with AASHTO’s ‘A Policy on the Geometric Design of Highways and Streets’ (Green Book).

Utilities

- Aerial
 - There is a primary aerial electric service line along the west side of Wiggins Mill Road, north of the culvert. South of the culvert, the aerial service line switches to the east side of the road.
- Potential conflicts
 - Due to proposed widening and installation of shared-use-path, the relocation of utility poles is anticipated as part of Wiggins Mill Road improvements.

Potential for Future Development:

- The Estates at St. Anne’s and St. Anne’s Golf Course are currently in development on the west of Wiggins Mill Road.

Multi-modal Analysis:

- There are no bike or pedestrian facilities along Wiggins Mill Road.

Recommendations:

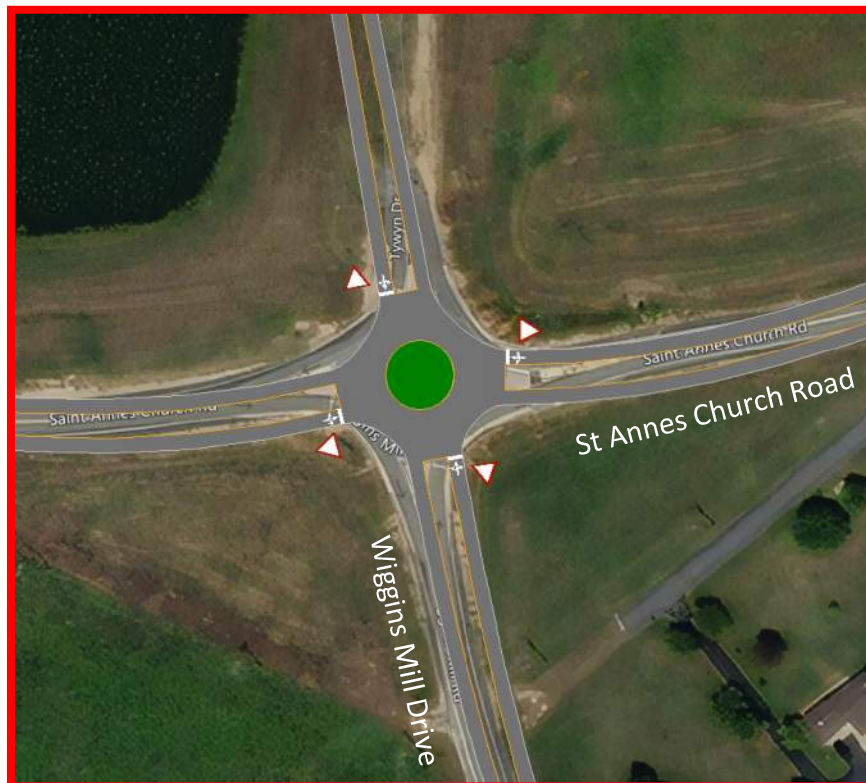
- Install a 10’ shared-use-path on the northbound side of Wiggins Mill Road.
- Widen Wiggins Mill Road to a 32’ roadway, with two 11’ travel lanes and two-5’ shoulders. Hold the existing northbound edge of pavement and widen only to the west side of the road.
- Replace existing 20’ culvert with 60’ precast concrete culvert to provide proper space for widening and 10’ shared-use-path.
- The estimated cost of intersection improvements for this option is \$4,120,475. See attached estimate in Attachment 4 for more information.
- Traffic studies were completed for both LOS D and LOS E improvements. Along Wiggins Mill Road LOS E recommendations match LOS D recommendations.



Attachment 1: Intersection Diagrams



Detail 1 – Maintain Intersection As Is

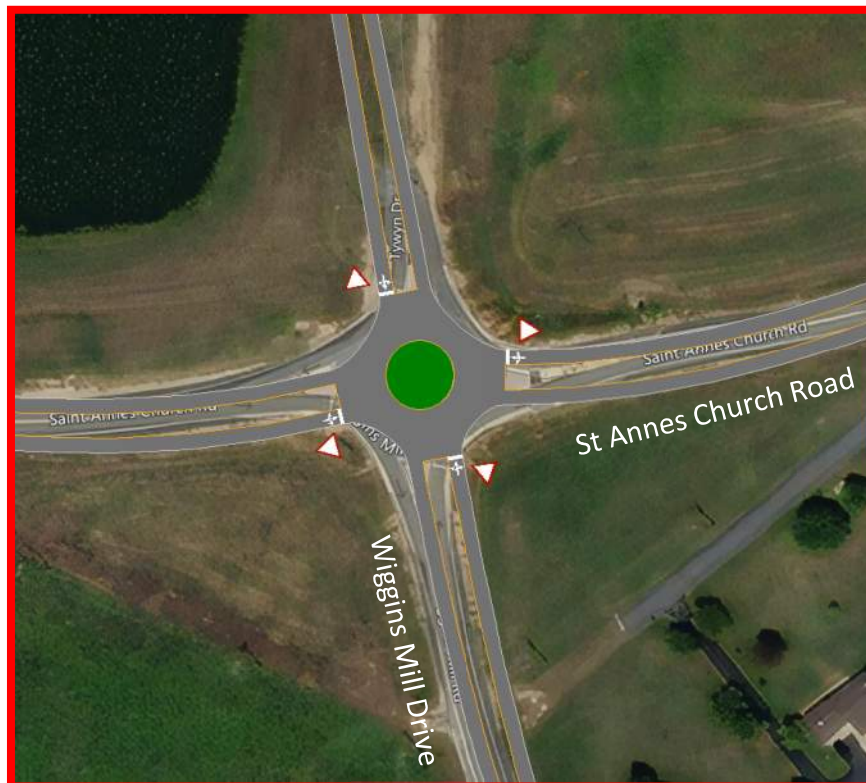


Detail 2 –Signalize Intersection and Install Additional Aux Lanes





Detail 1 – Maintain Intersection As Is



Detail 2 – Signalize Intersection and Install Additional Aux Lanes





Attachment 2 - Intersection 13 CTP Estimate - LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Int. 13 LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>SR71</u>	<u>St. Anne's Church (SR447)</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Improvements at the intersection of SR71 and St. Anne's Church Road.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$152,900</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$390,500</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$48,400</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$2,031,518</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$2,623,318</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 13 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

<p>A. ENGINEERING <u>\$32,001</u> (Includes NEPA)</p> <p>B. ARCHAEOLOGY <u>\$26,668</u></p> <p>1. Phase I (study) <u>\$26,668</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (mitigation) <u>\$0</u></p> <p>C. WETLANDS <u>\$26,668</u></p> <p>1. Delineation (study) <u>\$26,668</u></p> <p>2. Permit preparation <u>\$0</u></p> <p>3. Mitigation (design) <u>\$0</u></p> <p>D. HAZARDOUS MATERIAL <u>\$0</u></p> <p>1. Phase 1 (study) <u>\$0</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Phase 3 (remediation) <u>\$0</u></p>	<p>E. HISTORIC <u>\$53,335</u></p> <p>1. Phase 1 (study) <u>\$53,335</u></p> <p>2. Phase 2 (study) <u>\$0</u></p> <p>3. Mitigation (by loc./env.) <u>\$0</u></p> <p>4. Mitigation (by design) yes <input type="checkbox"/></p> <p>F. NOISE <u>\$0</u></p> <p>1. Studies <u>\$0</u></p> <p>2. Mitigation (by design) yes <input type="checkbox"/></p> <p>G. OTHER <u>\$0</u></p> <p>1. _____ <u> </u></p> <p>2. _____ <u> </u></p>
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TOTAL COSTS FOR PART I (A thru G) ROUNDED \$139,000

CONTINGENCY COSTS 10% \$13,900
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$152,900
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 13 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	<u>\$42,668</u>
1. Inhouse	<u>\$0</u>
2. Consultant	<u>\$42,668</u>
B. DESIGN ENGINEERING	<u>\$311,511</u>
1. Design	<u>\$128,005</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$128,005</u>
2. Traffic	<u>\$42,668</u>
a. Inhouse	<u>\$0</u>
b. Consultant	<u>\$42,668</u>
3. Real Estate Plan Preparation	<u>\$53,335</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 53,335</u>
4. Utilities	<u>\$80,003</u>
a. Inhouse	<u>\$ 26,668</u>
b. Consultant	<u>\$ 26,668</u>
c. Test Holes	<u>\$ 26,668</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$7,500</u>
6. Borings	<u>\$0</u>
7. Pile Load Tests	<u> </u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$0</u>
b. _____	<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0
(use for class "II" projects only)

1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u> </u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION _____

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$355,000

CONTINGENCY COSTS 10% \$35,500
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$390,500
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 13 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$23,072</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ 18,072</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$5,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$12,500</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$2,750</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$44,000

CONTINGENCY COSTS 10% \$4,400
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$48,400
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 13 - LOS D

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	<u>\$830,891</u>	B. STRUCTURE CONSTRUCTION	<u>\$0</u>
1. Grading		1. New Bridge	
a. Excavation (includes SWM pond)	<u>\$19,306</u>	a. Type	
b. Borrow	<u>\$662</u>	b. Size	
2. Drainage	<u>\$32,001</u>	c. \$/s.f.	
3. Pavement		2. Old Structure Rem.	
a. Surface	<u>\$155,694</u>	a. Type	
b. Base	<u>\$428,025</u>	b. Size	
c. Subbase	<u>\$19,305</u>	c. \$/c.y.	
4. Erosion/Sed. Cont.	<u>\$42,668</u>	3. Retaining Wall	<u>\$0</u>
5. Miscellaneous		a. Type	
a. Curb/Gutter	<u>\$22,500</u>	b. Size	
b. Sidewalk	<u>\$84,063</u>	c. \$/l.f.	
c. Guardrail	<u>\$0</u>	4. Box Culvert	
d. C.P.M. Schedule	<u>\$0</u>	a. Type	
e. Clear/Grubb	<u>\$26,668</u>	b. Size	
f. Field Office	<u>\$0</u>	c. \$/s.f.	
Other (specify)		C. LANDSCAPING	<u>\$140,007</u>
g. <u>Shared Use Path</u>	<u>\$0</u>	1. Beautification	<u>\$140,007</u>
h. _____		2. Noise Mitigation	<u>\$0</u>
i. _____		3. Visual Mitigation	<u>\$0</u>
j. _____		4. Tree Mitigation	<u>\$0</u>
k. _____		D. MAINTENANCE OF TRAFFIC	<u>\$ 26,667.58</u>
l. _____			
m. _____			

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 13 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$69,138</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 19,137.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,067,000

I. MISC. ITEMS \$160,050

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$53,350

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$53,350

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$106,700

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$1,440,450

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$216,068

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$1,656,518

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$375,000

(Enter on PNR funding line 6)

1. Signing	
2. Signals	\$300,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. <u>Pedestrian Signals</u>	\$75,000

Traffic
Estimator: _____

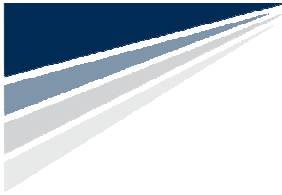
Date: _____

Estimator: JMT

Date: 9/14/2022

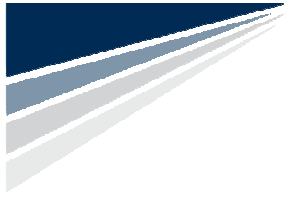


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



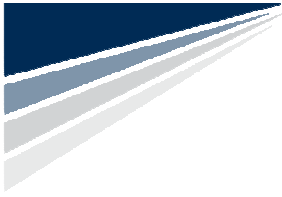
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering(Includes NEPA)	3.0%	\$ 32,001
B. Archeology		
1. Phase 1 (study)	2.5%	\$ 26,668
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	2.5%	\$ 26,668
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	5.0%	\$ 53,335
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



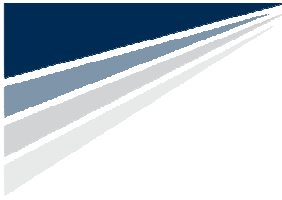
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	4.0%	\$ 42,668
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	12.0%	\$ 128,005
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	4.0%	\$ 42,668
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	5.0%	\$ 53,335
4. Utilities		
a. Inhouse	2.5%	\$ 26,668
b. Consultant	2.5%	\$ 26,668
c. Test Holes	2.50%	\$ 26,668
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -	2,510.00	\$ 18,072.00	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -		\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ 18,072.00	Total:	0

Number of Parcels Impacted: 5

Appraisal Fees: \$ 5,000.00

Staff: \$ 12,500.00

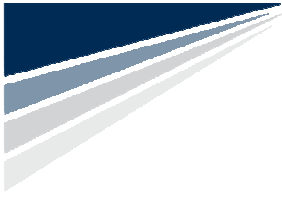
Settlement: \$ 2,750.00

Number of Parcels Impacted X \$1,000

Number of Parcels Impacted X \$2,500

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365
assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

General Roadway Data							
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)		
Length of Widening/SW Edge** (LF)	4000	Hotmix Type C (in)		2	Type C	151.3	
Existing Roadway Width (LF)	0	Type B (in)		4	Type B	153.5	
Proposed Roadway Width (LF)	0	BCBC (in)		6	BCBC	151.5	
Widening Width (LF)	n/a	GABC Depth (in)		8	Project Duration (Assume 12 Mo/Mile)		
Overlay Area (SF)	95781	Overlay depth (in)		1.5			
Widening/Reconstruction Area (SF)	11560	SUP Pavement Box			Duration (Month)		0
Full Depth Hotmix Area (SF)	0						
Length of 10' Wide SUP (LF)	0				Modular Block Retaining Wall (LF)		0
Area of 10' SUP (SF)	0	Type C Depth (in)		2	Hotmix Sawcut (LF)		1240
Length of 5' Wide Sidewalk (LF)	1345	GABC Depth (in) (Typ 4")		8	Removal of Roadway (SF)		0
Area of 5' Wide Sidewalk (SF)	6725	SW Pavement Box					
Length of Curb/Gutter	750	Concrete Depth (in) (Typ 4")		4			
Area of Triangular Concrete Islands	0	GABC Depth (in) (Typ 4")		4			
Length of Ditch Runs (LF)	0						
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11						

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	714	\$ 24.50	\$ 17,493.00
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	34	\$ 24.50	\$ 833.00
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	40	\$ 24.50	\$ 980.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 19,306.00
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	42	\$ 15.75	\$ 661.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 32,001	\$ 32,001.10
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1052	\$ 115.50	\$ 121,506.00
401015	Superpave Type B, PG 70-22	Ton	Na	296	\$ 115.50	\$ 34,188.00
					Total:	\$ 155,694



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	143672	\$ 2.70	\$ 387,914.40	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	438	\$ 84.50	\$ 37,011.00	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	1240	\$ 2.50	\$ 3,100.00	
Total:						\$ 428,025.40	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	286	\$ 67.50	\$ 19,305.00	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 42,668.13	\$ 42,668.13	

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA	750	\$ 30.00	\$ 22,500
71014	P.C.C. Curb, Type 2	LF	NA	0	\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
					Total:	\$ 22,500
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	6725	\$ 12.50	\$ 84,062.50
					Total:	\$ 84,062.50
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 26,667.58	\$ 26,667.58
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
					Total:	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	13334	\$ 1.50	\$ 20,001.00
908004	Topsoil, 6" Depth	SY	NA	13334	\$ 9.00	\$ 120,006.00
					Total:	\$ 140,007.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 13 SR71 and St. Anne's Church Road - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 26,667.58	\$ 26,667.58
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 26,667.58
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		9825	\$ 1.50	\$ 14,737.50
		Each		25	\$ 176.00	\$ 4,400.00
Total:						\$ 19,137.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,066,703.30



Attachment 3 - Intersection 14 CTP Estimate - LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Intersection 14 LOS D New Castle
County
Subdivision or Road Name

2. LIMITS

Street Name or Road Number	From	To	Length
<u>St. Anne's Church Road (N447)</u>	<u>Wiggins Mill Rd (N446)</u>	<u>Tywyn Ave</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Intersection 14 improvements. Install a 5' sidewalk on both sides of St. Anne's Church Road from the roundabout at the intersection of St. Anne's Church Road and Wiggins Mills Road to the Norfolk Southern Railroad Bridge

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$30,800</u>	Part I <u>JMT</u>	<u>09/14/22</u>
b. Preliminary Engineering	<u>\$293,700</u>	Part II <u>JMT</u>	<u>09/14/22</u>
c. Real Estate	<u>\$50,600</u>	Part III <u>JMT</u>	<u>09/14/22</u>
d. Construction *	<u>\$1,060,358</u>	Part IV <u>JMT</u>	<u>09/14/22</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$1,435,458</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimates - Intersection 14 - LOS D

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$10,235</u>	E. HISTORIC	<u>\$3,412</u>
B. ARCHAEOLOGY	<u>\$3,412</u>	1. Phase 1 (study)	<u>\$3,412</u>
1. Phase I (study)	<u>\$3,412</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$10,235</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$10,235</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$0</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$28,000

CONTINGENCY COSTS 10% \$2,800
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$30,800
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 14 - LOS D

PART II - PRELIMINARY ENGINEERING

A. SURVEYS \$34,116

- 1. Inhouse \$0
- 2. Consultant \$34,116

B. DESIGN ENGINEERING \$232,667

- 1. Design \$136,465
 - a. Inhouse \$0
 - b. Consultant \$136,465

- 2. Traffic \$54,586
 - a. Inhouse \$0
 - b. Consultant \$54,586

- 3. Real Estate Plan Preparation \$13,646
 - a. Inhouse \$ -
 - b. Consultant \$ 13,646

- 4. Utilities \$20,470
 - a. Inhouse \$ 6,823
 - b. Consultant \$ 6,823
 - c. Test Holes \$ 6,823
 - d. Utility Company \$ -

5. Materials & Research \$7,500

6. Borings \$0

7. Pile Load Tests

8. Subdivision \$0

- a. Inhouse \$ -
- b. Consultant \$ -
- c. Railroad P.E. \$ -

9. Other (specify) \$0

- a. \$0
- b. \$0

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

- 1. Wetlands \$ -
- 2. Hazardous Materials \$ -
- 3. Noise \$ -
- 4. Historic \$ -
- 5. Archaeology \$ -
- 6. Other \$ -
 - a. \$ -
 - b. \$ -

Loc/Environ
Estimator: Date:

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: Date:

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$267,000

CONTINGENCY COSTS 10% \$26,700
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL PRELIMINARY ENGINEERING \$293,700
(also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimates - Intersection 14 - LOS D

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$5,000</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ -</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ -</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$10,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$25,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$5,500</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$46,000

CONTINGENCY COSTS 10% \$4,600
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$50,600
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimates - Intersection 14 - LOS D

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	<u>\$520,859</u>	B. STRUCTURE CONSTRUCTION	<u>\$0</u>
1. Grading		1. New Bridge	
a. Excavation (includes SWM pond)	<u>\$4,631</u>	a. Type	
b. Borrow	<u>\$158</u>	b. Size	
2. Drainage	<u>\$20,470</u>	c. \$/s.f.	
3. Pavement		2. Old Structure Rem.	
a. Surface	<u>\$0</u>	a. Type	
b. Base	<u>\$0</u>	b. Size	
c. Subbase	<u>\$0</u>	c. \$/c.y.	
4. Erosion/Sed. Cont.	<u>\$27,293</u>	3. Retaining Wall	<u>\$0</u>
5. Miscellaneous		a. Type	
a. Curb/Gutter	<u>\$0</u>	b. Size	
b. Sidewalk	<u>\$451,250</u>	c. \$/l.f.	
c. Guardrail	<u>\$0</u>	4. Box Culvert	
d. C.P.M. Schedule	<u>\$0</u>	a. Type	
e. Clear/Grubb	<u>\$17,058</u>	b. Size	
f. Field Office	<u>\$0</u>	c. \$/s.f.	
Other (specify)		C. LANDSCAPING	<u>\$144,407</u>
g. <u>Shared Use Path</u>	<u>\$0</u>	1. Beautification	<u>\$144,407</u>
h. _____		2. Noise Mitigation	<u>\$0</u>
i. _____		3. Visual Mitigation	<u>\$0</u>
j. _____		4. Tree Mitigation	<u>\$0</u>
k. _____		D. MAINTENANCE OF TRAFFIC	<u>\$ 17,058.08</u>
l. _____			
m. _____			

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimates - Intersection 14 - LOS D

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$0</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ -
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$683,000

I. MISC. ITEMS \$102,450

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$34,150

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$34,150

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$68,300

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$922,050

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$138,308

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$1,060,358

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator: _____

Date: _____

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____

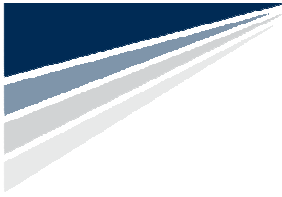
Date: _____

Estimator: JMT

Date: 9/14/2022

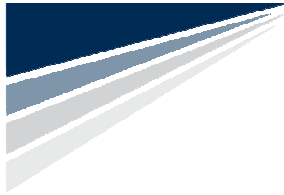


Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



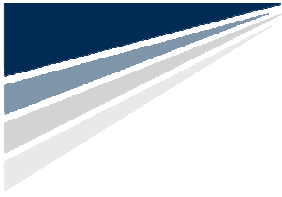
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.5%	\$ 10,235
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 3,412
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.5%	\$ 10,235
2. Permit Preparation	0.0%	\$ -
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 3,412
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	5.0%	\$ 34,116
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 136,465
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	8.0%	\$ 54,586
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	2.0%	\$ 13,646
4. Utilities		
a. Inhouse	1.0%	\$ 6,823
b. Consultant	1.0%	\$ 6,823
c. Test Holes	1.00%	\$ 6,823
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N			\$ -		\$ -	-	
Estimated Commercial R/W Area	C-1	N			\$ -		\$ -	-	
Total:			0	Total:	\$ -	Total:	\$ -	Total:	0

Number of Parcels Impacted: 10

Appraisal Fees:

\$ 10,000.00

Number of Parcels Impacted X \$1,000

Staff:

\$ 25,000.00

Number of Parcels Impacted X \$2,500

Settlement:

\$ 5,500.00

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions
for now assuming r/w length x5'
r/w length=18365

assume 15% of land acquisition
on commercial land



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	7220	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	0	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	0	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	0	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	0				
Full Depth Hotmix Area (SF)	0	SUP Pavement Box		Duration (Month)	0
Length of 10' Wide SUP (LF)	0				
Area of 10' SUP (SF)	0			Modular Block Retaining Wall (LF)	0
Length of 5' Wide Sidewalk (LF)	7220	Type C Depth (in)	2	Hotmix Sawcut (LF)	0
Area of 5' Wide Sidewalk (SF)	36100	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	0
Length of Curb/Gutter	0	SW Pavement Box			
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	0	\$ 24.50	\$ -
	SUP Excavation	CY	NA	0	\$ 24.50	\$ -
	Sidewalk Excavation	CY	NA	179	\$ 24.50	\$ 4,385.50
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	10	\$ 24.50	\$ 245.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 4,630.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	10	\$ 15.75	\$ 157.50
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 20,470	\$ 20,469.70
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 115.50	\$ -
401015	Superpave Type B, PG 70-22	Ton	Na	0	\$ 115.50	\$ -
					Total:	\$ -
A.3.b: Pavement Base						
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	0	\$ 2.70	\$ -
401027	Superpave Type BCBC, PG 64-22	Ton	NA	0	\$ 84.50	\$ -
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -



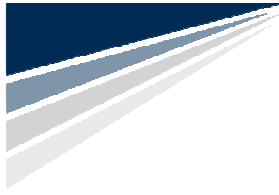


DELDOT PROJECT: Westtown TIP CTP Estimates -
 Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

762000	Sawcutting, Bituminous Concrete	LF	NA	0	\$ 2.50	\$ -
Total:						\$ -
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
A.4: Erosion/Sediment Control						
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 27,292.93	\$ 27,292.93

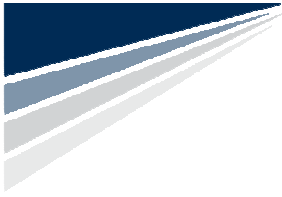
DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	0	\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	0	\$ 34.00	\$ -
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
Total:					\$	\$ -
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	36100	\$ 12.50	\$ 451,250.00
Total:					\$	\$ 451,250.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
Total:					\$	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 17,058.08	\$ 17,058.08
A.5.f: Field Office						
		EAMO	NA		\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 91.00	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 67.50	\$ -
Total:					\$	\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	24067	\$ 1.50	\$ 36,100.50
908004	Topsoil, 6" Depth	SY	NA	12034	\$ 9.00	\$ 108,306.00
Total:					\$	\$ 144,406.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



DELDOT PROJECT: Westtown TIP CTP Estimates -
Intersection 14 - St. Anne's Church Road and Wiggins Mill Road - LOS D

D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 17,058.08	\$ 17,058.08
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 17,058.08
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF			\$ 1.50	\$ -
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each			\$ 176.00	\$ -
Total:						\$ -
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 682,323.30



Attachment 4 - Wiggins Mill Road CTP Estimate - LOS D/LOS E

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Westown TIP CTP Estimate - Wiggins Mill Road-LOS D New Castle
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Wiggins Mill Road (N446)</u>	<u>St. Anne's Church (SR447)</u>	<u>Green Giant Rd (N458)</u>	<u>0.91-miles</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT PD North for (check one) Project initiation
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:
 Widening of Wiggins Mill Road with installation of 10' SUP along the northbound side.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION
 32' - 2-11' travel lanes with 2-5' shoulders

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:

	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$178,200</u>	<u>Part I</u>	<u>JMT</u>
b. Preliminary Engineering	<u>\$773,300</u>	<u>Part II</u>	<u>JMT</u>
c. Real Estate	<u>\$452,100</u>	<u>Part III</u>	<u>JMT</u>
d. Construction *	<u>\$2,716,875</u>	<u>Part IV</u>	<u>JMT</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$4,120,475</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED
 Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201470301

Project Title: Westown TIP CTP Estimate - Wiggins Mill Road

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING	<u>\$32,273</u>	E. HISTORIC	<u>\$32,273</u>
(Includes NEPA)			
B. ARCHAEOLOGY	<u>\$32,273</u>	1. Phase 1 (study)	<u>\$32,273</u>
1. Phase I (study)	<u>\$32,273</u>	2. Phase 2 (study)	<u>\$0</u>
2. Phase 2 (study)	<u>\$0</u>	3. Mitigation (by loc./env.)	<u>\$0</u>
3. Phase 3 (mitigation)	<u>\$0</u>	4. Mitigation (by design)	yes <input type="checkbox"/>
C. WETLANDS	<u>\$64,547</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$16,137</u>	1. Studies	<u>\$0</u>
2. Permit preparation	<u>\$48,410</u>	2. Mitigation (by design)	yes <input type="checkbox"/>
3. Mitigation (design)	<u>\$0</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	_____
1. Phase 1 (study)	<u>\$0</u>	2. _____	_____
2. Phase 2 (study)	<u>\$0</u>		
3. Phase 3 (remediation)	<u>\$0</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$162,000

CONTINGENCY COSTS 10% \$16,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$178,200
 (also total for Construction Project Estimate form line 7a)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimate - Wiggins Mill Road

PART II - PRELIMINARY ENGINEERING

A. SURVEYS		<u>\$96,820</u>	
1. Inhouse		<u>\$0</u>	
2. Consultant		<u>\$96,820</u>	
B. DESIGN ENGINEERING		<u>\$606,147</u>	
1. Design		<u>\$322,734</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$322,734</u>	
2. Traffic		<u>\$48,410</u>	
a. Inhouse		<u>\$0</u>	
b. Consultant		<u>\$48,410</u>	
3. Real Estate Plan Preparation		<u>\$129,093</u>	
a. Inhouse		<u>\$ -</u>	
b. Consultant		<u>\$ 129,093</u>	
4. Utilities		<u>\$48,410</u>	
a. Inhouse		<u>\$ 16,137</u>	
b. Consultant		<u>\$ 16,137</u>	
c. Test Holes		<u>\$ 16,137</u>	
d. Utility Company		<u>\$ -</u>	
5. Materials & Research		<u>\$7,500</u>	
6. Borings		<u>\$50,000</u>	
7. Pile Load Tests		<u> </u>	

8. Subdivision		<u>\$0</u>
a. Inhouse		<u>\$ -</u>
b. Consultant		<u>\$ -</u>
c. Railroad P.E.		<u>\$ -</u>

9. Other (specify)		<u>\$0</u>
a. _____		<u>\$0</u>
b. _____		<u>\$0</u>

C. ENVIRON. ASSESSMENT \$0

(use for class "II" projects only)

1. Wetlands		<u>\$ -</u>
2. Hazardous Materials		<u>\$ -</u>
3. Noise		<u>\$ -</u>
4. Historic		<u>\$ -</u>
5. Archaeology		<u>\$ -</u>
6. Other		
a. _____		<u>\$ -</u>
b. _____		<u>\$ -</u>

Loc/Environ
Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin
Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED \$703,000

CONTINGENCY COSTS \$70,300
 (normally 5% for large projects and 10% for small projects - to be approved by section head) 10%
(% used)

TOTAL PRELIMINARY ENGINEERING \$773,300
 (also total for Construction Project Estimate form line 7b)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part III of V

Contract No. T201470301

Project Title: Westtown TIP CTP Estimate - Wiggins Mill Road

PART III - REAL ESTATE

A. REAL PROPERTY	<u>\$288,800</u>	C. ASBESTOS PROGRAM	<u>\$0</u>
1. Total acquisitions	<u> </u>	1. Testing	<u> </u>
2. Partial acquisitions	<u>\$ 283,800</u>	2. Abatement	<u> </u>
3. Permanent easements	<u>\$ -</u>	D. DEMOLITION	<u> </u>
4. Temporary easements	<u>\$5,000</u>	E. APPRAISAL FEES	<u>\$30,000</u>
5. Wetland mitigation	<u> </u>	F. STAFF	<u>\$75,000</u>
Other (specify)	<u> </u>	G. SETTLEMENT	<u>\$16,500</u>
6. <u> </u>	<u> </u>	H. REAL ESTATE ENG.	<u>\$0</u>
7. <u> </u>	<u> </u>	1. Consultant survey	<u> </u>
B. RELOCATION	<u>\$0</u>	2. As acquired plans	<u> </u>
1. Residential	<u> </u>	I. CONDEMNATION	<u> </u>
2. Business	<u> </u>	J. OTHER (specify)	<u>\$0</u>
Other (specify)	<u> </u>	1. <u> </u>	<u> </u>
3. <u> </u>	<u> </u>	2. <u> </u>	<u> </u>
4. <u> </u>	<u> </u>		

TOTAL COSTS FOR PART III (A thru J) ROUNDED \$411,000

CONTINGENCY COSTS 10% \$41,100
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS \$452,100
(also total for Construction Project Estimate form line 7c)

Estimator: JMT

Date: 09/14/22

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201470301

Project Title Westown TIP CTP Estimate - Wiggins Mill Road

PART IV -CONSTRUCTION

<p>A. ROADWAY/APPROACH CONSTRUCTION</p> <p>1. Grading <u>\$1,353,633</u></p> <p> a. Excavation <u>\$102,876</u> (includes SWM pond)</p> <p> b. Borrow <u>\$3,481</u></p> <p>2. Drainage <u>\$48,410</u></p> <p>3. Pavement</p> <p> a. Surface <u>\$299,030</u></p> <p> b. Base <u>\$585,711</u></p> <p> c. Subbase <u>\$67,568</u></p> <p>4. Erosion/Sed. Cont. <u>\$64,547</u></p> <p>5. Miscellaneous</p> <p> a. Curb/Gutter <u>\$5,950</u></p> <p> b. Sidewalk <u>\$0</u></p> <p> c. Guardrail <u>\$0</u></p> <p> d. C.P.M. Schedule <u>\$0</u></p> <p> e. Clear/Grubb <u>\$40,342</u></p> <p> f. Field Office <u>\$0</u></p> <p>Other (specify)</p> <p> g. <u>Shared Use Path</u> <u>\$135,721</u></p> <p> h. _____</p> <p> i. _____</p> <p> j. _____</p> <p> k. _____</p> <p> l. _____</p> <p> m. _____</p>	<p>B. STRUCTURE CONSTRUCTION</p> <p>1. New Bridge <u>\$762,500</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p> <p>2. Old Structure Rem. <u>\$12,500</u></p> <p> a. Type <u>Culvert</u></p> <p> b. Size _____</p> <p> c. \$/c.y. _____</p> <p>3. Retaining Wall <u>\$0</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/l.f. _____</p> <p>4. Box Culvert <u>\$750,000</u></p> <p> a. Type _____</p> <p> b. Size _____</p> <p> c. \$/s.f. _____</p>
	<p>C. LANDSCAPING <u>\$333,449</u></p> <p>1. Beautification <u>\$333,449</u></p> <p>2. Noise Mitigation <u>\$0</u></p> <p>3. Visual Mitigation <u>\$0</u></p> <p>4. Tree Mitigation <u>\$0</u></p>
	<p>D. MAINTENANCE OF TRAFFIC <u>\$ 40,341.64</u></p>

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201470301

Project Title Westtown TIP CTP Estimate - Wiggins Mill Road

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$21,963</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 21,962.50
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____	

H. SUBTOTAL (A thru G) ROUNDED \$1,750,000

I. MISC. ITEMS \$262,500

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$87,500

(normally 5% of H)

5%
(% used)

K. INITIAL EXPENSE \$87,500

(normally 5% of H)

5%
(% used)

L. CONSTRUCTION CONTINGENCY \$175,000

(normally 10% of H)

10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L)

(Enter on PNR funding line 5)

\$2,362,500

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs)

(Enter on PNR funding line 4)

15%
(% used) \$354,375

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering)

(use this total + Q + P for Construction Project Estimate from line 7d)

\$2,716,875

Estimator: JMT

Date: 9/14/2022

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. <u>General</u>	
8. _____	

Utilities
Estimator:

Date:

Q. TRAFFIC SECTION ITEMS \$0

(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator:

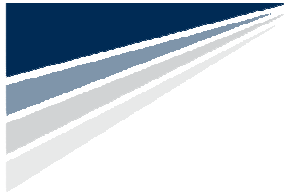
Date:



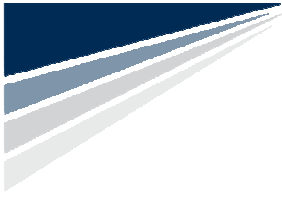
Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	2.0%	\$ 32,273
B. Archeology		
1. Phase 1 (study)	2.0%	\$ 32,273
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	1.0%	\$ 16,137
2. Permit Preparation	3.0%	\$ 48,410
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	2.0%	\$ 32,273
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	6.0%	\$ 96,820
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	20.0%	\$ 322,734
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	3.0%	\$ 48,410
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	8.0%	\$ 129,093
4. Utilities		
a. Inhouse	1.0%	\$ 16,137
b. Consultant	1.0%	\$ 16,137
c. Test Holes	1.00%	\$ 16,137
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 20,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: Westtown TIP CTP Estimates -
Wiggins Mill Road - LOS D

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 12.00	\$ 7.200
Agricultural Residential AR-2R Residential	AR-2R	\$ 12.00	\$ 7.200
General Residential - GR	GR	\$ 12.00	\$ 7.200
Medium Residential	MR	\$ 12.00	\$ 7.200
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ 30.00	\$ 18.000

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
Total Estimated TCE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Residential PE Area	AR-1R	N		-	\$ -		\$ -	-	
Estimated Commercial PE Area	C-1	N		-	\$ -		\$ -	-	
Estimated Residential R/W Area	AR-1R	N		23,650.00	\$ 283,800.00		\$ -	-	
Estimated Commercial R/W Area	C-1	N		-	\$ -		\$ -	-	
Total:			0	Total:	\$ 283,800.00	Total:	\$ -	Total:	0

Number of Parcels Impacted: 30

Appraisal Fees:

\$ 30,000.00

Number of Parcels Impacted X \$1,000

Staff:

\$ 75,000.00

Number of Parcels Impacted X \$2,500

Settlement:

\$ 16,500.00

Number of Parcels Impacted X \$550

Assuming 400k for Full Acquisitions for now assuming r/w length x5' r/w length=18365 assume 15% of land acquisition on commercial land



Appendix C

Backup Calculations for Part IV - Construction

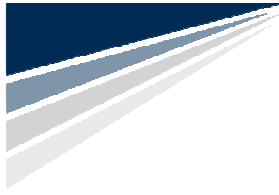
General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Widening/SW Edge** (LF)	9527	Hotmix Type C (in)	2	Type C	151.3
Existing Roadway Width (LF)	22	Type B (in)	4	Type B	153.5
Proposed Roadway Width (LF)	32	BCBC (in)	6	BCBC	151.5
Widening Width (LF)	10	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	109988	Overlay depth (in)	1.5		
Widening/Reconstruction Area (SF)	40515	SUP Pavement Box		Duration (Month)	0
Full Depth Hotmix Area (SF)	0				
Length of 10' Wide SUP (LF)	4821	SUP Pavement Box		Modular Block Retaining Wall (LF)	0
Area of 10' SUP (SF)	48210				
Length of 5' Wide Sidewalk (LF)		Type C Depth (in)	2	Hotmix Sawcut (LF)	4221
Area of 5' Wide Sidewalk (SF)	0	GABC Depth (in) (Typ 4")	8	Removal of Roadway (SF)	0
Length of Curb/Gutter	175	SW Pavement Box		CELLS IN BLUE SHADE ARE AUTOMATED.	
Area of Triangular Concrete Islands	0	Concrete Depth (in) (Typ 4")	4		
Length of Ditch Runs (LF)	0	GABC Depth (in) (Typ 4")	4		
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	2501	\$ 24.50	\$ 61,274.50
	SUP Excavation	CY	NA	1488	\$ 24.50	\$ 36,456.00
	Sidewalk Excavation	CY	NA	0	\$ 24.50	\$ -
	Ditch Excavation	CY	NA	0	\$ 24.50	\$ -
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	210	\$ 24.50	\$ 5,145.00
211001	Removal of PCC Pavement, Curb, and Sidewalk	SY	NA	0	\$ 20.00	\$ -
					Total:	\$ 102,875.50
A.1.b: Borrow						
	General Borrow (5%) of Excavation and Embankment (202000) QTY	CY	NA	221	\$ 15.75	\$ 3,480.75
A.2: Drainage						
	General Drainage of project cost	LS	3%	1	\$ 48,410	\$ 48,409.97
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	1552	\$ 115.50	\$ 179,256.00
401015	Superpave Type B, PG 70-22	Ton	Na	1037	\$ 115.50	\$ 119,773.50
					Total:	\$ 299,030



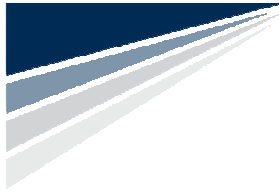
DELDOT PROJECT: Westtown TIP CTP Estimates -
Wiggins Mill Road - LOS D

A.3.b: Pavement Base							
760010	Pavement Milling, Bituminous Concrete Pavement	SYIN	NA	164982	\$ 2.70	\$ 445,451.40	
401027	Superpave Type BCBC, PG 64-22	Ton	NA	1535	\$ 84.50	\$ 129,707.50	
762001	Saw Cutting, Concrete, Full Depth	LF	NA	0	\$ 3.50	\$ -	
762000	Sawcutting, Bituminous Concrete	LF	NA	4221	\$ 2.50	\$ 10,552.50	
						Total:	\$ 585,711.40
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	1001	\$ 67.50	\$ 67,567.50	
A.4: Erosion/Sediment Control							
	General E&S (%) of Overall Project Cost	LS	4.0%	1	\$ 64,546.62	\$ 64,546.62	



DELDOT PROJECT: Westtown TIP CTP Estimates -
Wiggins Mill Road - LOS D

A.5.a: Miscellaneous Curb/Gutter						
701012	P.C.C. Curb, Type 1-6	LF	NA		\$ 30.00	\$ -
71014	P.C.C. Curb, Type 2	LF	NA	0	\$ 26.00	\$ -
701022	I.P.C.C. Curb and Gutter, Type 3-6	LF	NA	175	\$ 34.00	\$ 5,950
607010	Modular Block Retaining Walls	LF	NA	0	\$ 50.00	\$ -
702000	Triangular Channelizing Islands	SY	NA	0	\$ 77.00	\$ -
					Total:	\$ 5,950
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	0	\$ 12.50	\$ -
					Total:	\$ -
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ 30.00	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ 3,000.00	\$ -
					Total:	\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	0	\$ 220.00	\$ -
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (1%) of project cost	LS	2.5%	1	\$ 40,341.64	\$ 40,341.64
A.5.f: Field Office						
		EAMO	NA	0	\$ 2,500.00	\$ -
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	608	\$ 91.00	\$ 55,328.00
301001	Graded Aggregate Base Course, Type B	CY	NA	1191	\$ 67.50	\$ 80,392.50
					Total:	\$ 135,720.50
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	31757	\$ 1.50	\$ 47,635.50
908004	Topsoil, 6" Depth	SY	NA	31757	\$ 9.00	\$ 285,813.00
					Total:	\$ 333,448.50
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			0%	1	\$ -	\$ -



D: Maintenance of Traffic						
801000	Maintenance of Traffic (1%) of project cost	LS	2.5%	1	\$ 40,341.64	\$ 40,341.64
	Maintenance of Traffic Items (1%) of project cost	LS	0%	1	\$ -	\$ -
Total:						\$ 40,341.64
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -
E.2: Roadway Lighting						
	Intersection Lighting	LS		0	\$ 50,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		14055	\$ 1.50	\$ 21,082.50
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		5	\$ 176.00	\$ 880.00
Total:						\$ 21,962.50
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS	0%	1	\$ -	\$ -
G.3: Electric Relocation (\$2,000 per pole)		EA		0	\$ 2,000.00	\$ -
H: Subtotal						\$ 1,613,665.51



Appendix F

Middletown Warwick Road to SR 71 Traffic Study
Technical Memorandum



Technical Memorandum

TO: Sarah Coakley, AICP
DATE: May 19, 2022
FROM: Mir Wahed and Nathan Rahaim
PROJECT: Westown TID Middletown Warwick-North Broad Street Connector
Contract No. T202266001
JMT Job No. 19-01340-4A6
SUBJECT: Westown TID Middletown Warwick-North Broad Street Connector Study
CC: Pamela Steinebach, Matt Vincent, Mark Luszcz, Peter Haag, Bill Dougherty, Jess Butterly

This memorandum was developed to report the results of the traffic study performed to evaluate the impacts of implementing an additional roadway connection between Middletown Warwick Road and North Broad Street. This study was conducted as part of the 2020 *Westown Transportation Improvement District (TID) CTP Cost Development Update Report* (DeIDOT Contract No. T202069012).

Background Information

Based on the 2030 traffic analyses and coordination with DeIDOT, the current Westown TID project is proposing significant geometric improvements to meet acceptable LOS for intersections in the area of Middletown Warwick Road, North Broad Street (SR 71), Summit Bridge Road (SR 71), and Levels Road (SR 15). These recommendations include widening along Middletown Warwick Road between Summit Bridge Road and Ash Boulevard which is constrained by the existing Norfolk Southern Delmarva Secondary Rail Line running parallel to Middletown Warwick Road. Widening is also proposed along Levels Road from Middletown Warwick Road to St Annes Church Road. In addition, the Eastown TID also proposes improvements at the N. Broad Street intersection with Cedar Lane Road. Appendix A contains diagram A1 which depicts the improvements identified by the Eastown and Westown TIDs.

Currently, there is interest from private developers to redevelop the Johnson Controls property (New Castle County Tax Parcel 23-003.00-009). With this potential redevelopment, DeIDOT and the Town of Middletown requested an additional roadway connection between Middletown Warwick Road and North Broad Street be investigated. Specifically, JMT was requested to investigate the impacts to traffic operations with the installation of the new roadway connection and determine if improvements identified by the Westown TID analysis could be reduced. As part of this request, two roadway alignments were considered. The first would connect Ash Boulevard to the Middletown Common's Entrance, while the second would connect Greenlawn Boulevard to a proposed driveway along Middletown Warwick Road approximately 1,000 feet south of Ash Boulevard. It should be noted that DeIDOT and Middletown are only pursuing one of the two new roadway connections and either connection would require an additional at-grade rail crossing over the Norfolk Southern Rail Line. See Figure 1 for the proposed locations of the future roadway connector.

Based on the location of the proposed connector roadway, the study area is a combination of project intersections from both the Westown TID and the Eastown TID. The study area encompasses SR 299 from Middletown Warwick Road to N. Broad Street, N. Broad Street from SR 299 to Summit Bridge Road, and Middletown Warwick Road from Summit Bridge Road to SR 299. Along these corridors, eight TID project intersections were selected to be analyzed based on the expected rerouting of traffic due to the new roadway connection.

Volume Development

To evaluate the impacts from the potential roadway connection, year 2030 was selected as the horizon year analysis, similar to the Westown TID. As such, the 2030 peak hour volumes projected by the Westown TID were utilized where available. For the remaining study intersections, volumes were adjusted to 2030 from the Eastown TID project and additional volume data collected in January 2022 to develop the 2030 peak hour volumes. These adjustments were coordinated with DeIDOT Planning before finalizing. Finally, the 2030 peak hour volumes were then redistributed based on the two potential roadway alignments. The traffic volume diagrams can be found in Appendix B. Detailed notes describing the volume developments methodology are included in Appendix C.

It should be noted that one significant benefit identified with the implementation of the new roadway connector is the potential to close certain movements at the Middletown Warwick Road and N. Broad Street intersection. Specifically, the northbound Middletown Warwick Road right turn and the northbound N. Broad Street left turn could be closed with the new roadway connection. As such, the volume scenarios for either new connector roadway alignment assumed that these movements would be closed and all traffic would shift to utilizing the proposed connector.



Figure 1: Study Area Overview

Synchro Analysis

Using the 2030 volume projections, analyses were performed at the study intersections for the AM and PM peak hours using Synchro 11 software. For each intersection location, the following scenarios were analyzed:

1. 2030 No Build – Existing Intersection Geometry without Additional Roadway Connection
2. 2030 with Connector Road – Existing Intersection Geometry with Additional Roadway Connection
3. 2030 with Connector Road and Additional Improvements – Improved Intersection Geometry to Achieve Acceptable LOS (as applicable) with Additional Roadway Connection

At the N. Broad Street intersections with Greenlawn Boulevard and Middletown Commons and the Middletown Warwick Road intersections with Ash Boulevard and Greenlawn Connector, additional analysis scenarios were also conducted based on the local volume differences between the Ash Boulevard Connector and the Greenlawn Connectors. As part of the analysis at Greenlawn Boulevard and the



entrance south of Ash Boulevard, the existing right-in/right-out entrances were assumed to be maintained. Appendix D contains tables summarizing LOS and queue lengths for each study Intersection.

Figures 2 and 3 at the end of this memo summarize the identified roadway improvements for either the Greenlawn Boulevard or Ash Boulevard connectors. It should be noted that the intersection of SR 299 and N. Broad Street would continue to operate at LOS F with or without the connector roadways. No additional intersection improvements were identified based on the geometric constraints located there.

Conclusions

Based on the results shown in Figure 2 and 3, implementing either connector roadway alignment could allow for the removal of certain intersection movements and the signal at N. Broad Street and Middletown Warwick Road. Either of the proposed connector roadway would also eliminate the widening along Middletown Warwick Road from Summit Bridge Road to Peterson Drive recommended by the Westown TID. It should be noted that the geometric improvements proposed by the Eastown TID at N. Broad Street and Cedar Lane Road could also be potentially reduced. However, it is recommended to maintain the original recommendations at this intersection as this analysis investigated a 2030 horizon year while the Eastown TID investigated a 2045 horizon year.

If DeIDOT and Middletown decide to pursue one of the potential roadway connections, JMT recommends that the Ash Boulevard Connector be investigated further. The Ash Boulevard Connector provides a shorter roadway connection that can accommodate the projected queue lengths along it while also avoiding railroad curvature and superelevation that is present with the Greenlawn Connector. As part of this investigation, conceptual plans and cost estimates should be developed to identify any geometric constraints with the connector. Preliminary coordination with the Norfolk Southern Corp. should also occur to determine the feasibility of removing the existing at-grade crossing at Middletown Warwick Road and N. Broad Street while allowing the new at-grade crossing at the westerly end of the new connector roadway.

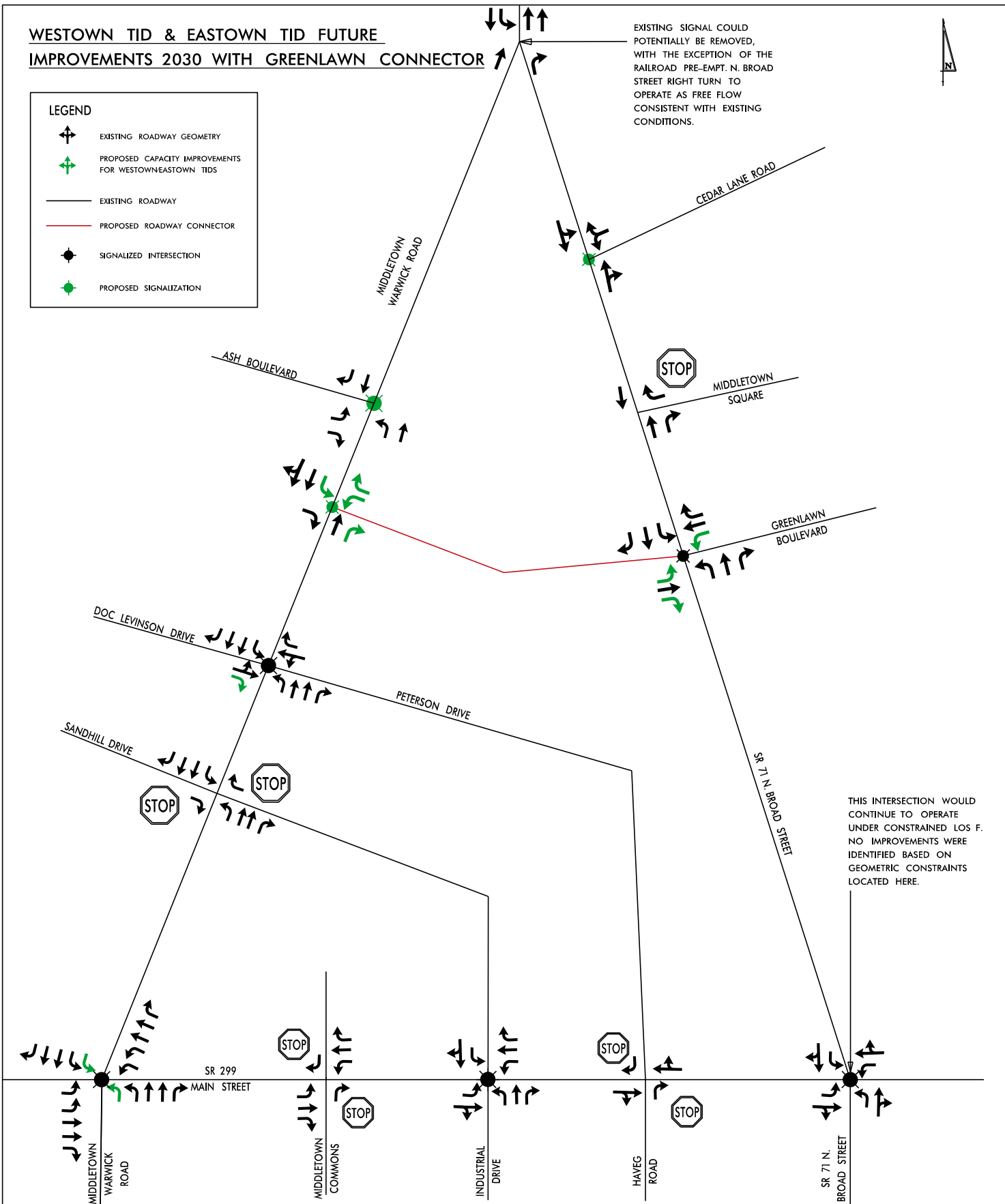
WESTOWN TID & EASTOWN TID FUTURE IMPROVEMENTS 2030 WITH GREENLAWN CONNECTOR

EXISTING SIGNAL COULD POTENTIALLY BE REMOVED, WITH THE EXCEPTION OF THE RAILROAD PRE-EMPT. N. BROAD STREET RIGHT TURN TO OPERATE AS FREE FLOW CONSISTENT WITH EXISTING CONDITIONS.



LEGEND

- EXISTING ROADWAY GEOMETRY
- PROPOSED CAPACITY IMPROVEMENTS FOR WESTOWNEASTOWN TIDS
- EXISTING ROADWAY
- PROPOSED ROADWAY CONNECTOR
- SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZATION



THIS INTERSECTION WOULD CONTINUE TO OPERATE UNDER CONSTRAINED LOS F. NO IMPROVEMENTS WERE IDENTIFIED BASED ON GEOMETRIC CONSTRAINTS LOCATED HERE.



WESTOWN TID & EASTOWN TID
2030 IMPROVEMENTS WITH
GREENLAWN CONNECTOR
NEW CASTLE COUNTY, DELAWARE

N.T.S.

FIGURE 2

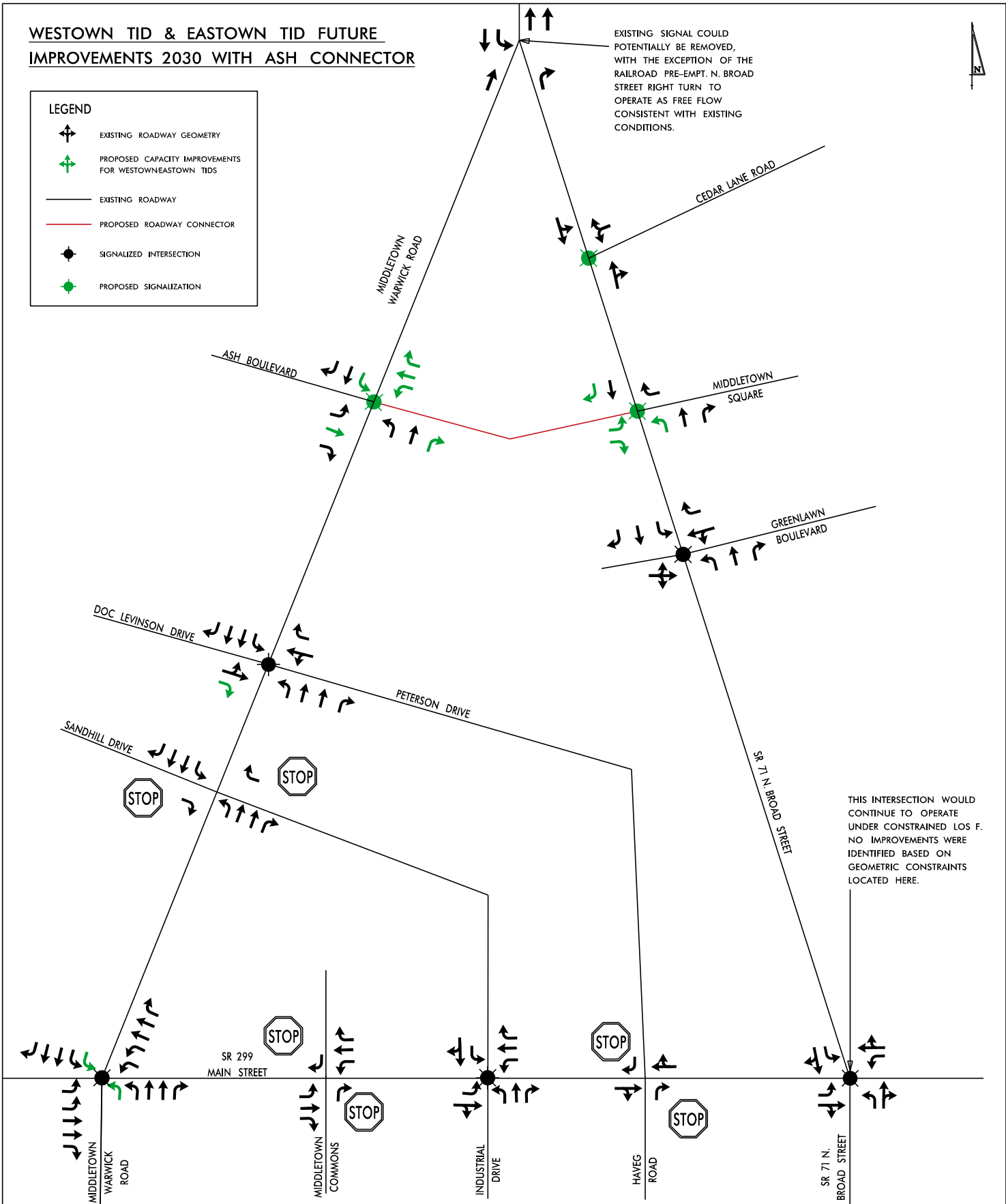
MARCH 2022

WESTOWN TID & EASTOWN TID FUTURE IMPROVEMENTS 2030 WITH ASH CONNECTOR

LEGEND

- EXISTING ROADWAY GEOMETRY
- PROPOSED CAPACITY IMPROVEMENTS FOR WESTOWN/EASTOWN TIDS
- EXISTING ROADWAY
- PROPOSED ROADWAY CONNECTOR
- SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZATION

EXISTING SIGNAL COULD POTENTIALLY BE REMOVED, WITH THE EXCEPTION OF THE RAILROAD PRE-EMPT. N. BROAD STREET RIGHT TURN TO OPERATE AS FREE FLOW CONSISTENT WITH EXISTING CONDITIONS.



THIS INTERSECTION WOULD CONTINUE TO OPERATE UNDER CONSTRAINED LOS F. NO IMPROVEMENTS WERE IDENTIFIED BASED ON GEOMETRIC CONSTRAINTS LOCATED HERE.



WESTOWN TID & EASTOWN TID
2030 IMPROVEMENTS WITH
ASH CONNECTOR
NEW CASTLE COUNTY, DELAWARE

N.T.S.

FIGURE 3

MARCH 2022



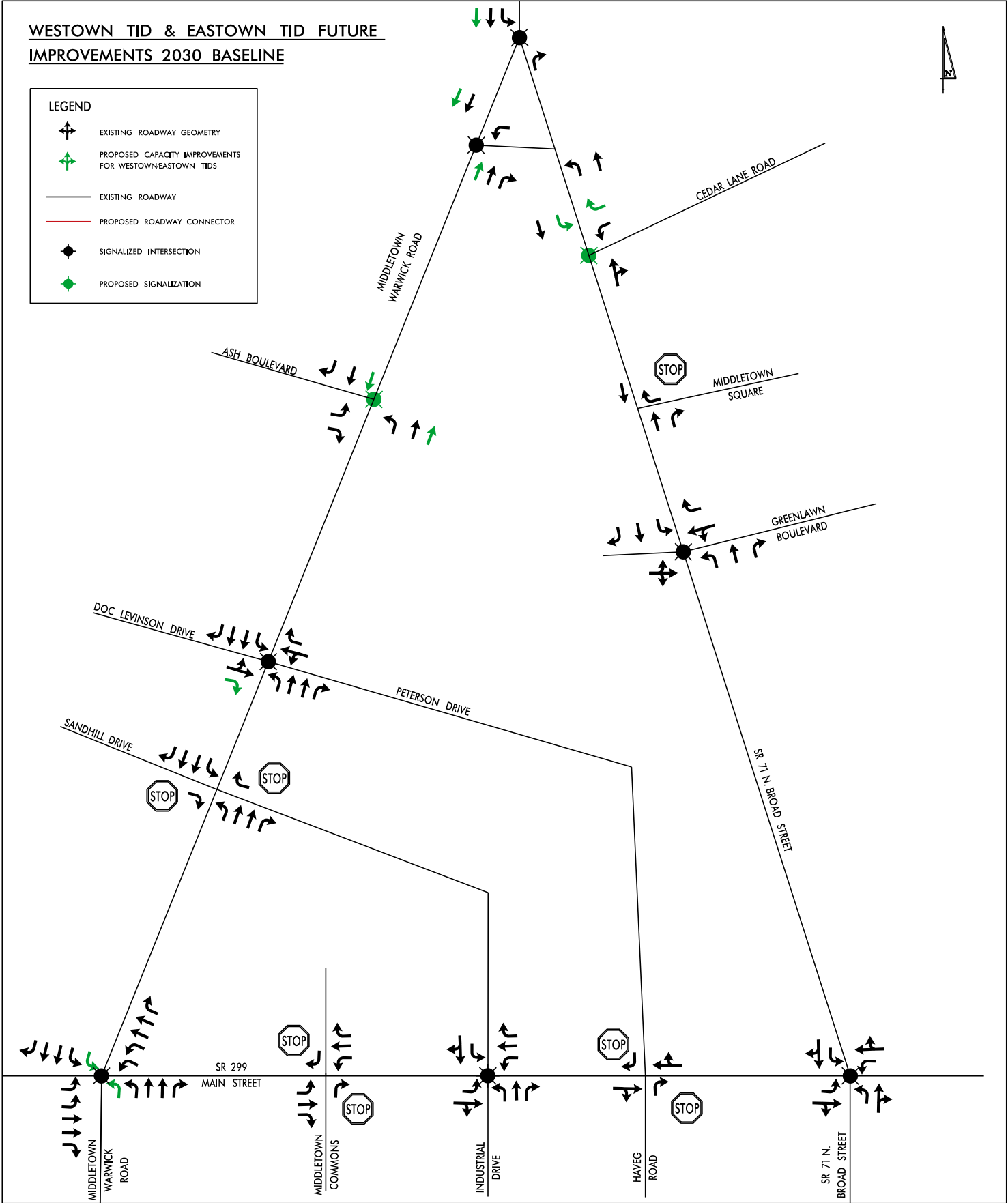
APPENDIX A
Eastown and Westown TID Improvements Diagram

WESTTOWN TID & EASTTOWN TID FUTURE IMPROVEMENTS 2030 BASELINE



LEGEND

- EXISTING ROADWAY GEOMETRY
- PROPOSED CAPACITY IMPROVEMENTS FOR WESTTOWN/EASTTOWN TIDS
- EXISTING ROADWAY
- PROPOSED ROADWAY CONNECTOR
- SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZATION



WESTTOWN TID & EASTTOWN TID
RECOMMENDED IMPROVEMENTS
NEW CASTLE COUNTY, DELAWARE

N.T.S.

FIGURE A1

MARCH 2022



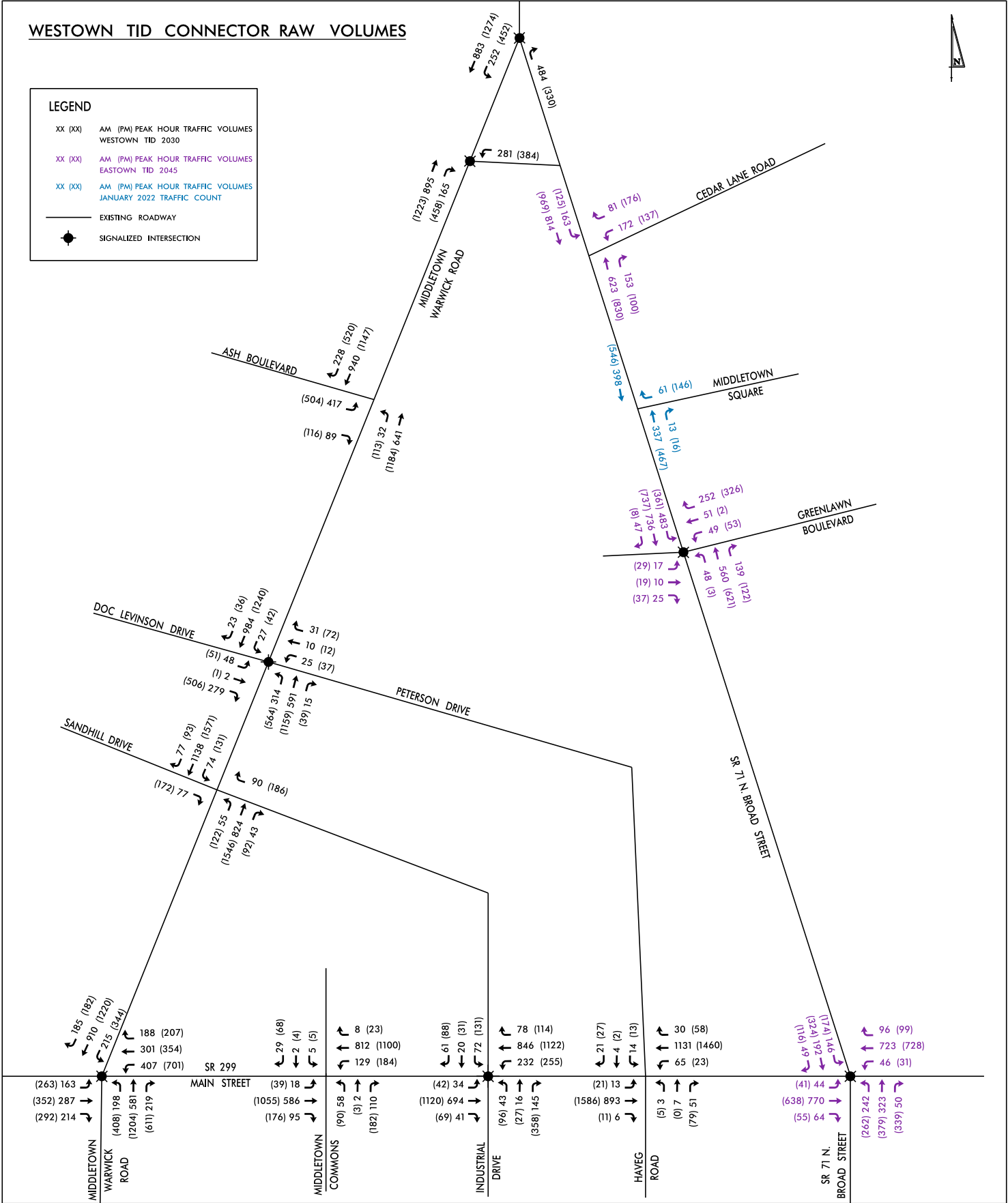
**APPENDIX B
Traffic Volumes**

WESTOWN TID CONNECTOR RAW VOLUMES



LEGEND

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES WESTOWN TID 2030
- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES EASTOWN TID 2045
- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES JANUARY 2022 TRAFFIC COUNT
- EXISTING ROADWAY
- SIGNALIZED INTERSECTION



WESTOWN TID FUTURE CONNECTOR
RAW UNBALANCED VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

MARCH 2022

WESTTOWN TID CONNECTOR ADJUSTED VOLUMES

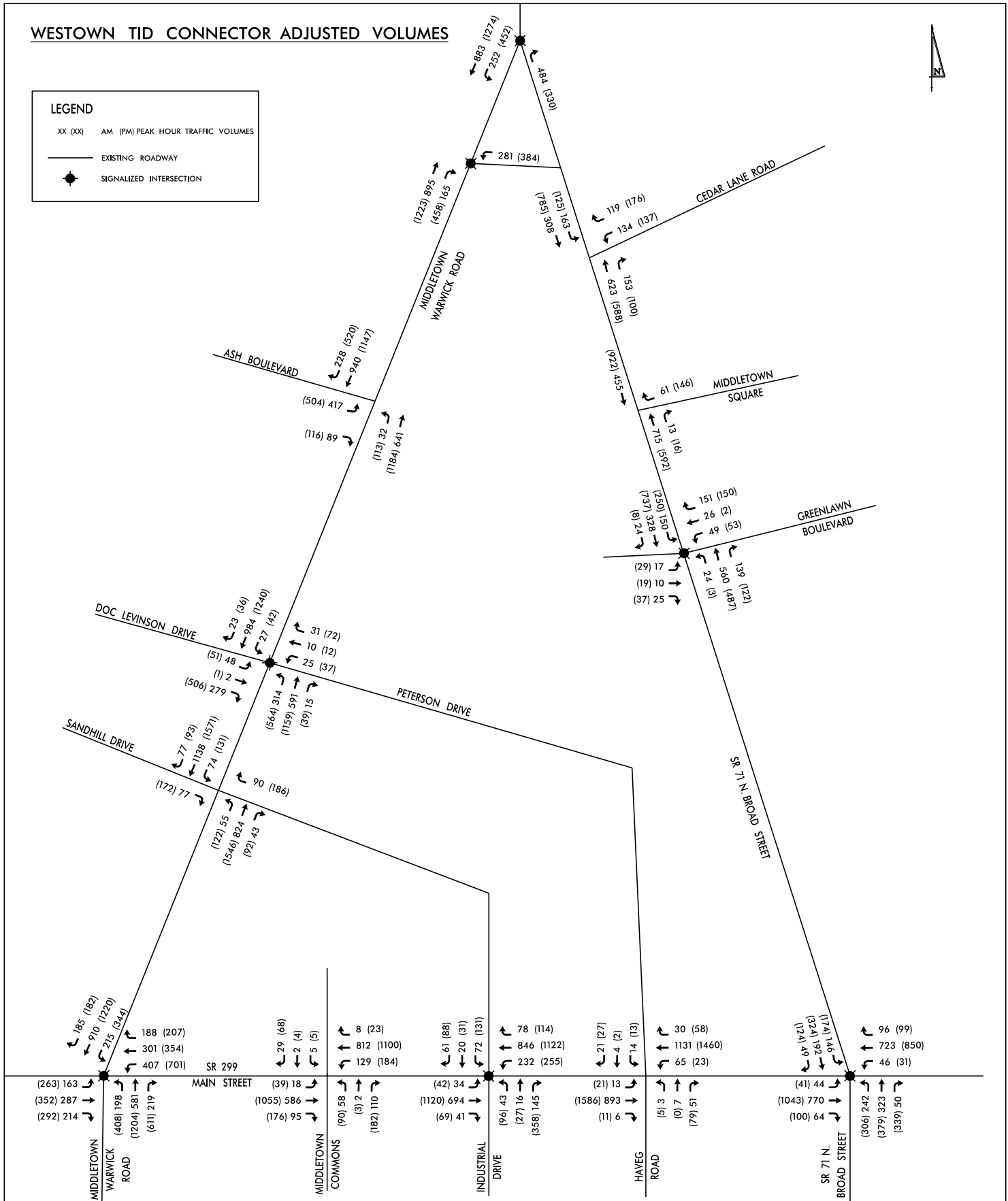


LEGEND

XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES

— EXISTING ROADWAY

● SIGNALIZED INTERSECTION



WESTTOWN TID FUTURE CONNECTOR
ADJUSTED VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

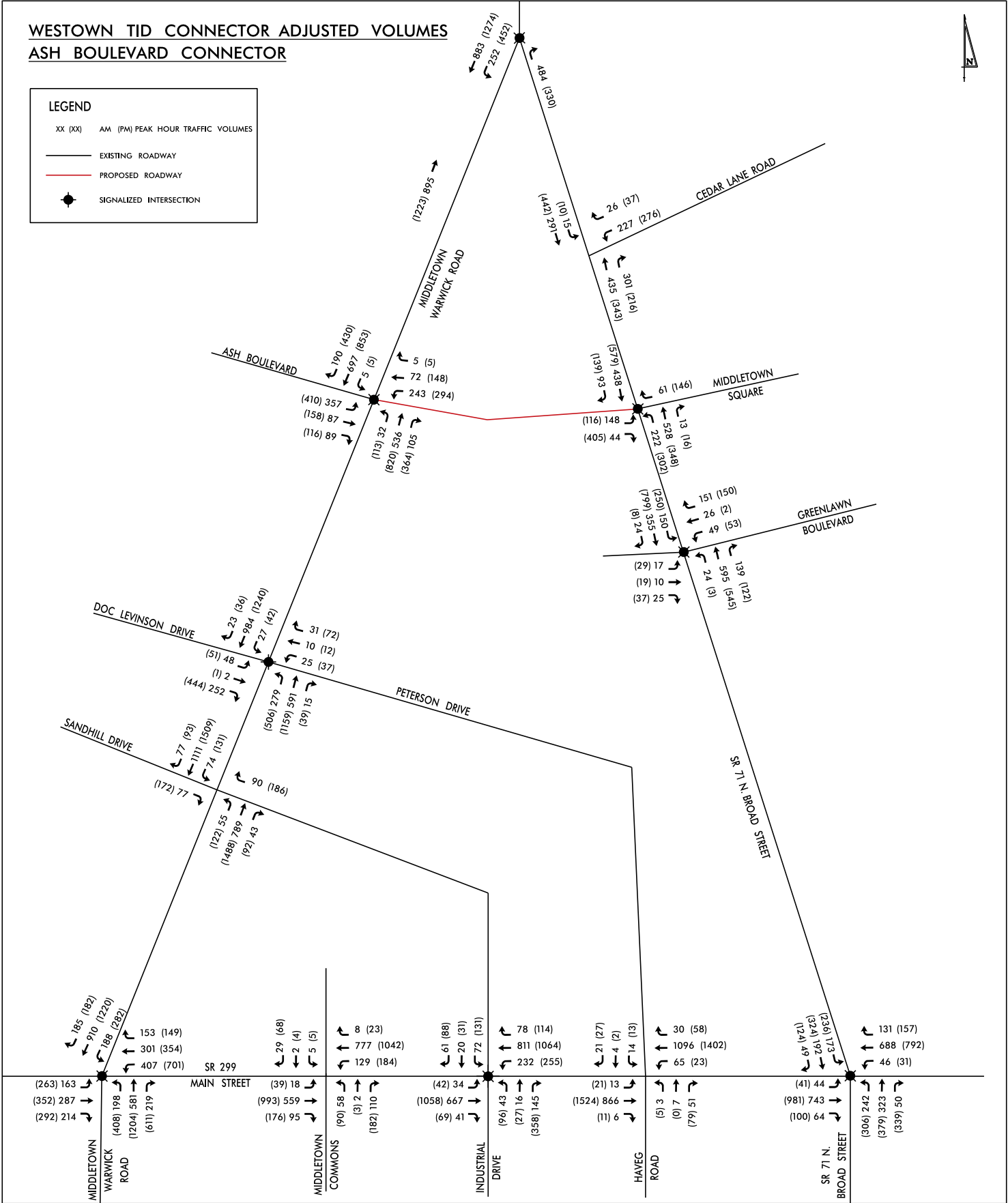
MARCH 2022

WESTTOWN TID CONNECTOR ADJUSTED VOLUMES ASH BOULEVARD CONNECTOR



LEGEND

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES
- EXISTING ROADWAY
- PROPOSED ROADWAY
- SIGNALIZED INTERSECTION



WESTTOWN TID FUTURE CONNECTOR
ADJUSTED ASH BOULEVARD
CONNECTOR VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

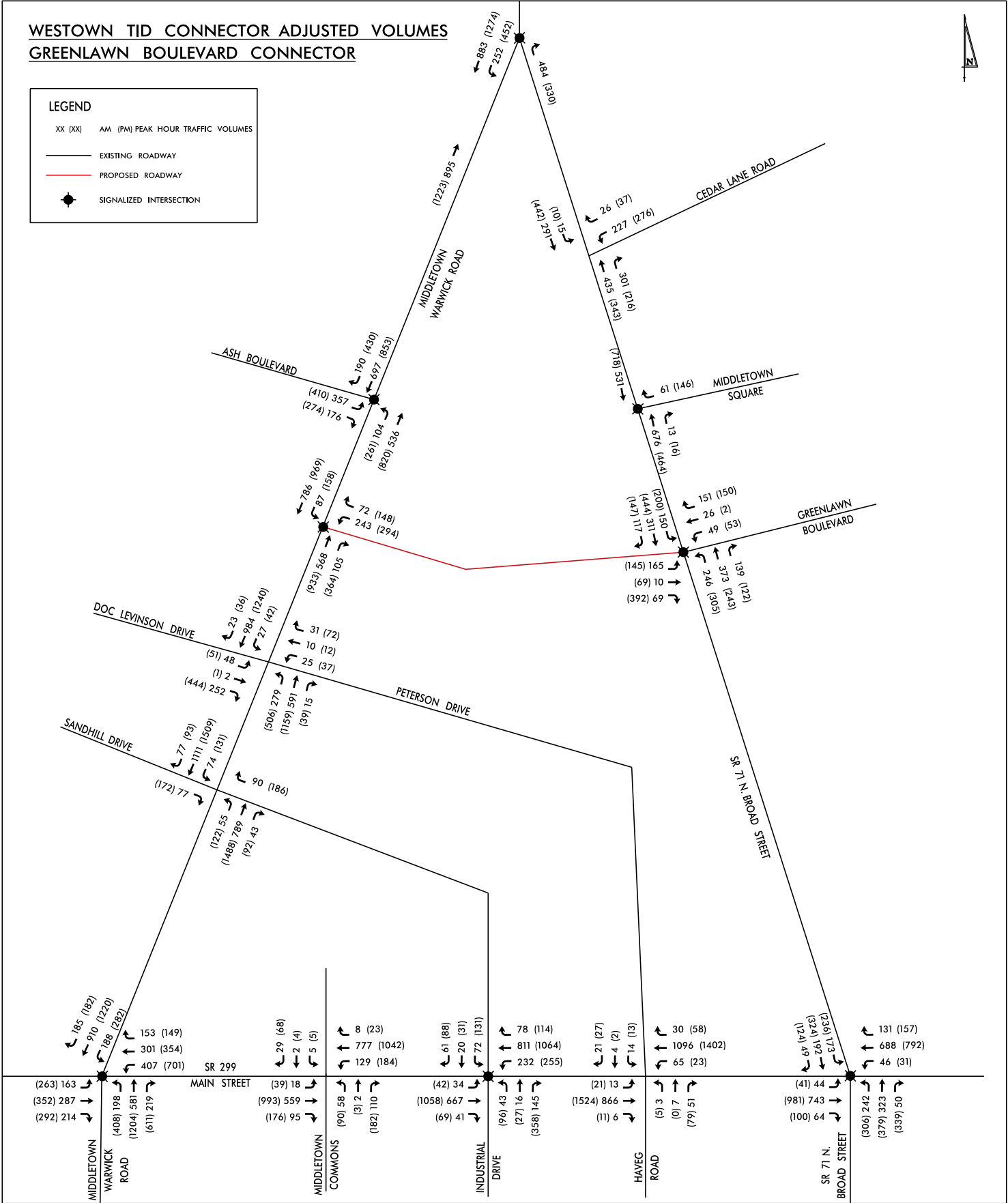
MARCH 2022

WESTTOWN TID CONNECTOR ADJUSTED VOLUMES GREENLAWN BOULEVARD CONNECTOR



LEGEND

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUMES
- EXISTING ROADWAY
- PROPOSED ROADWAY
- SIGNALIZED INTERSECTION



WESTTOWN TID FUTURE CONNECTOR
ADJUSTED GREENLAWN BOULEVARD
CONNECTOR VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

MARCH 2022



APPENDIX C
Detailed Volume Development Discussion



The following section describes the methodology utilized to develop the volume figures contained in Appendix B. All volume modifications were coordinated with the DeIDOT Planning Section.

To develop the Raw Volume Diagram, volume data and projections were obtained from the Westown TID 2030 volume projections, the Eastown TID 2045 volume projections, and existing count data. Volume projections from the Westown TID project were utilized at the Middletown Warwick Road intersections with N. Broad Street, Ash Boulevard, Peterson Drive, and SR 299. The Westown TID projections were also utilized at the SR 299 intersections with Industrial Drive and the adjacent unsignalized intersections. For the N. Broad Street intersections with SR 299, Greenlawn Boulevard, and Cedar Lane Road, 2045 volume projections from the Eastown TID project were utilized. Finally, existing count data was collected in January 2022 at the N. Broad Street and Middletown Square intersection as neither TID provided projections here.

To develop the Adjusted 2030 Volume Diagram, it was determined that the projected Westown TID volumes should be maintained as they match the horizon year for the capacity analysis. However, large volume imbalances were identified between the 2030 Westown TID projections and the 2045 Eastown TID projections at the following locations:

1. Along northbound and southbound N. Broad Street between the Westown TID intersection with Middletown Warwick Road and the Eastown TID intersections with Cedar Lane Road and Greenlawn Boulevard.
2. Along eastbound and westbound SR 299 between the Westown TID intersection with Haveg Road and the Eastown TID intersection with N. Broad Street. It should be noted that this imbalance was only observed during the PM peak hour.

After discussing the imbalances above with DeIDOT Planning, it was identified that the existing count data utilized by the Eastown projections at the N. Broad Street intersection with Greenlawn Boulevard were obtained from AADT outputs from a forecasting model and not from collected field data. After performing a spot count in January 2022, it was determined that the volumes projected at this intersection by the Eastown TID were too high and should be reduced. These reductions were also applied at the adjacent intersection of N. Broad Street and Cedar Lane Road which allowed for balancing with the Westown TID projections along N. Broad Street.

For the imbalance along SR 299 during the PM peak hour, the balancing was reviewed between existing volumes utilized at the Westown TID intersections and the existing volumes utilized at the East TID intersection. Based on this comparison, it was determined that the Eastown TID existing PM peak hour volumes at the SR 299 and N. Broad Street intersection could have been increased. Based on this, the balanced diagram was able to increase the Eastown TID projection at this intersection to balance with the Westown TID intersection.

To create the Peak Hour Volume with Connector Roads Diagrams, it was first determined that Sites 16 and 22 from the Westown TID would have local impacts to their site distributions based on the new connector road scenarios. Figure C-1, C-2, and C-3 display the redistribution of this site traffic. From there, it was determined that the main redistribution remaining for either connector road scenario was assuming the northbound Middletown Warwick Road right turn to southbound N. Broad Street as well as the N. Broad Street left turn to southbound Middletown Warwick Road would be closed and these movements would use the new connector roads. Figure C-4 display the redistributions of these movements.

Figure C-1

SITE 16
MIDDLETOWN VILLAGE
PM IN 475
PM OUT 492

COMMERCIAL
+
20 PUMP CONV.

WESTOWN TID UPDATE
February 22, 2021

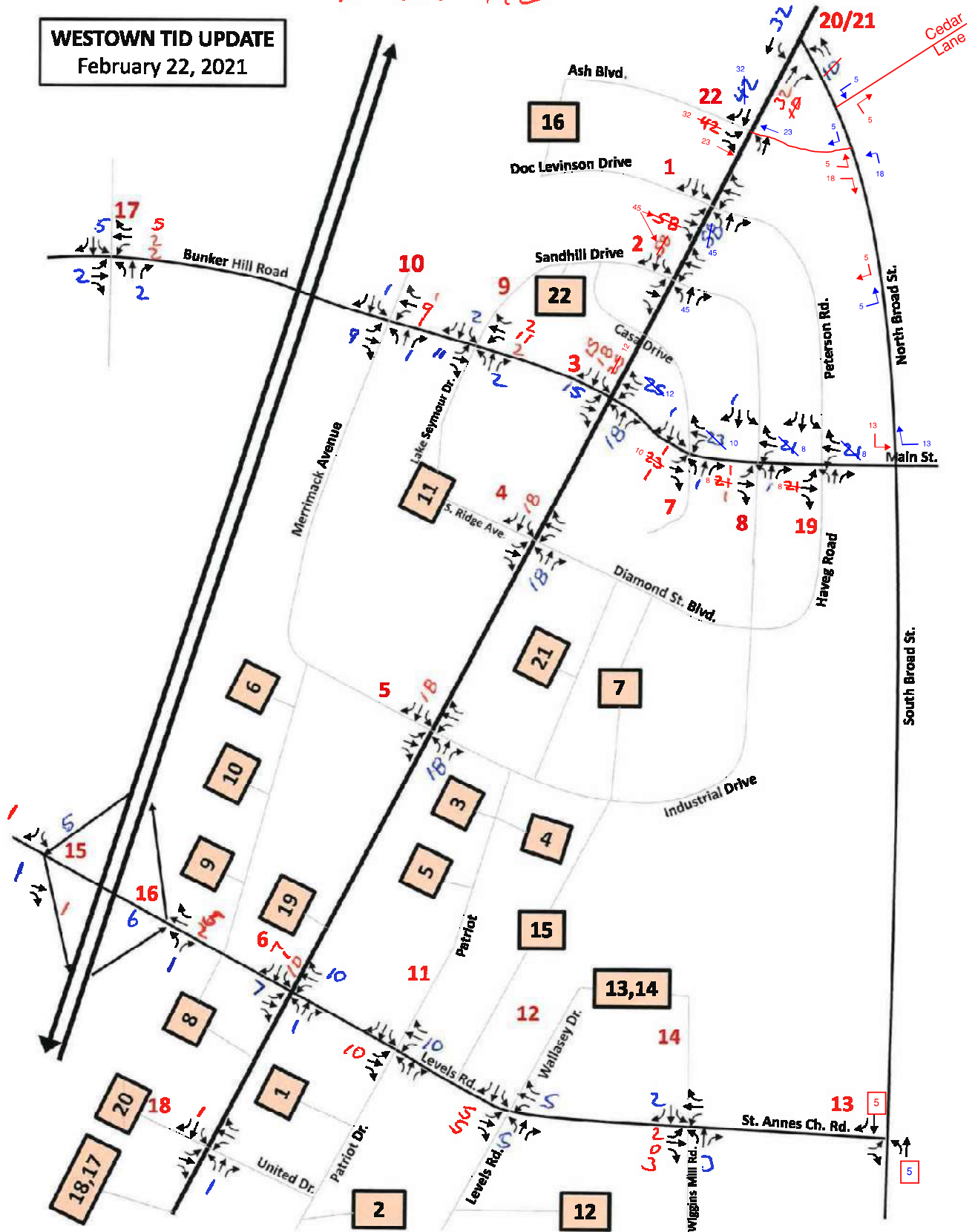


Figure C-2

SITE 22
BUNKER HILL CENTER
PM IN 70
PM OUT 73

WESTOWN TID UPDATE
February 22, 2021

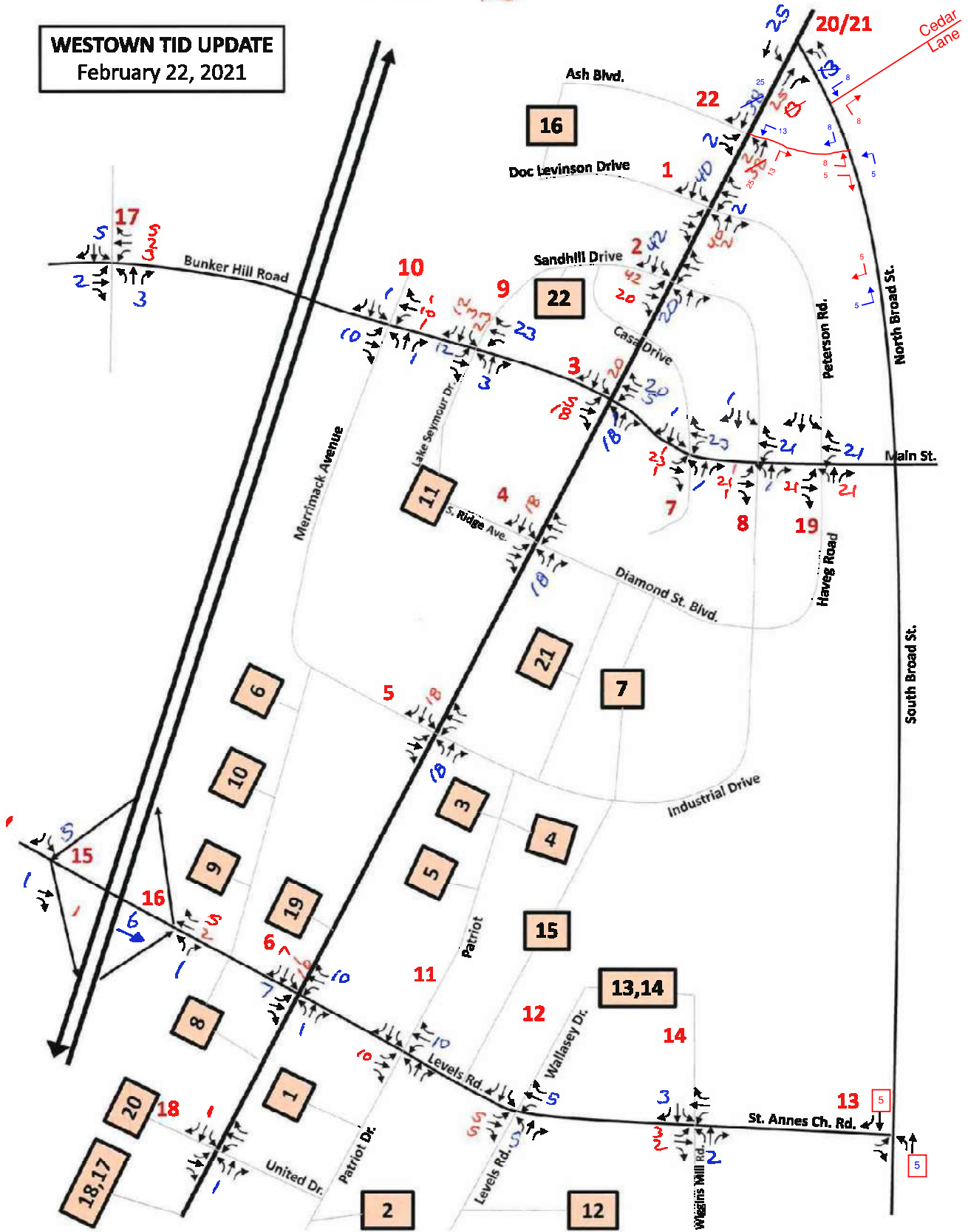
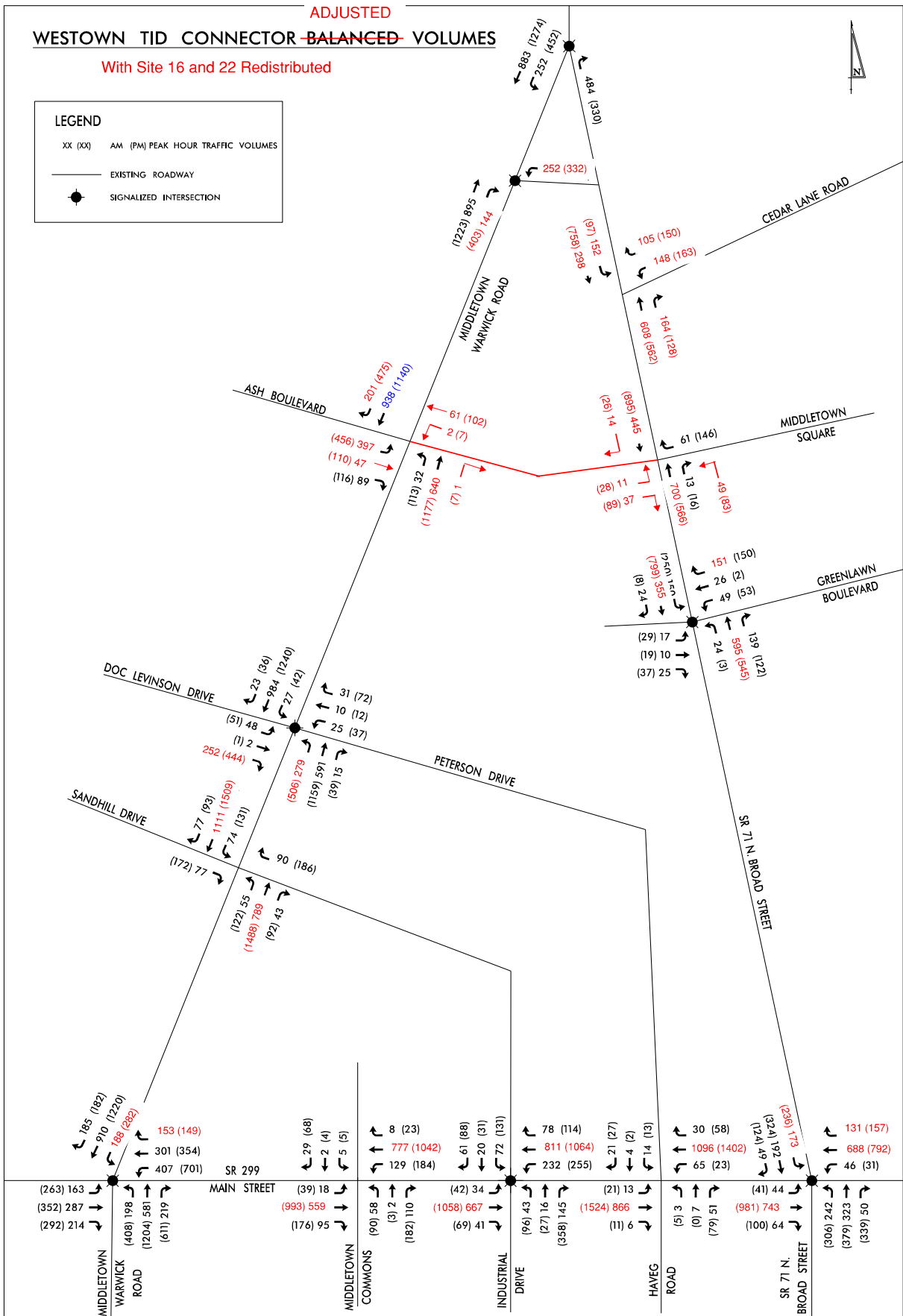


Figure C-3

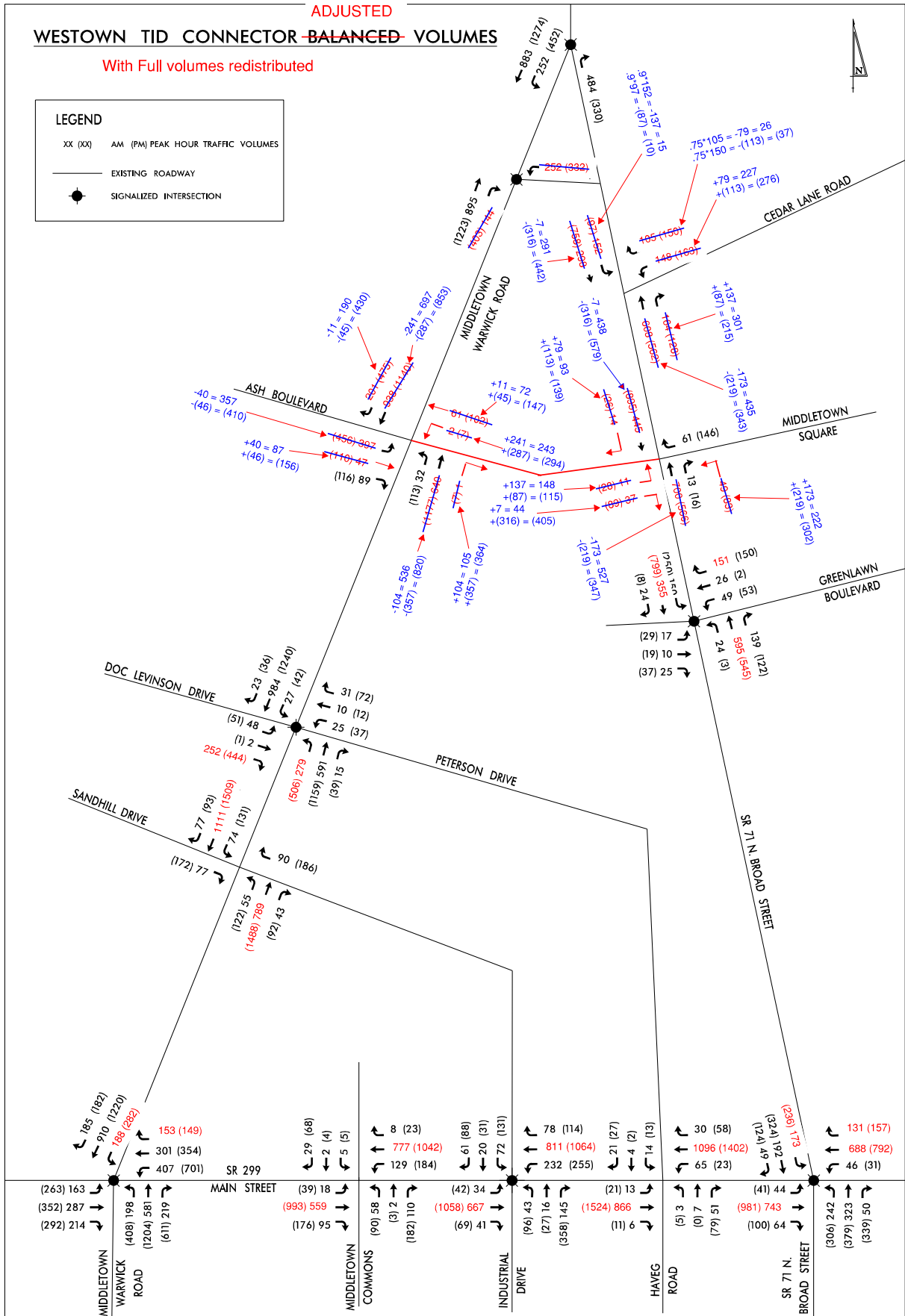


ADJUSTED ~~RAW UNBALANCED~~ VOLUME DIAGRAM
 NEW CASTLE COUNTY, DELAWARE

N.T.S.

FEBRUARY 2022

Figure C-4



ADJUSTED ~~RAW UNBALANCED~~ VOLUME DIAGRAM
NEW CASTLE COUNTY, DELAWARE

N.T.S.

FEBRUARY 2022



**APPENDIX D
LOS & Queue Tables**

General Analysis Comments

1. The analysis was conducted using HCM 6th Edition outputs from Synchro 11 software
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the future scenario analyses. JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph.
3. Per DelDOT's *Development Coordination Manual*, JMT utilized a PHF of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher, except in unique situations described by subsequent footnotes.
4. Although the project area is south of the C&D Canal, JMT used a saturation flow rate of 1,900 passenger cars per hour green per lane (pcphgpl) for signalized intersections based on the anticipated development and increase in density and traffic volumes within the project area.
5. JMT optimized all signal timings and offsets as part of the future analysis.
6. For 95th Percentile Queues JMT used the Synchro generated values.
7. For each intersection, JMT analyzed the following scenarios:
 - a. 2030 No Build – Existing Intersection Geometry without Additional Roadway Connection
 - b. 2030 with Connector Road – Existing Intersection Geometry with Additional Roadway Connection
 - c. 2030 with Connector Road and Additional Improvements – Improved Intersection Geometry (as applicable) with Additional Roadway Connection

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 1
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	LOS Per Synchro	
Middletown Warwick Road/Summit Bridge Road/N. Broad Street	Weekday AM	Weekday PM
2030 No Build	F (81.3)	F (189.4)

Unsignalized Intersection	LOS Per Synchro	
Middletown Warwick Road/Summit Bridge Road/N. Broad Street	Weekday AM	Weekday PM
2030 with Connector Road ¹		
Southbound Middletown Warwick Road Left Turn	B (13.1)	D (33.6)

Table 1 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection	Queues Per Synchro (Feet)	
Middletown Warwick Road/Summit Bridge Road/N. Broad Street	Weekday AM	Weekday PM
2030 with Connector Road ¹		
Southbound Summit Bridge Road Left Turn	45	203

¹For the 2030 Baseline with Connector Road scenario, the northbound Middletown Warwick Road right turn and northbound N. Broad Street left turn movements were closed as these movements could occur at the new roadway connection. With the removal of these movements, the intersection was updated to an unsignalized intersection. The northbound N. Broad Street right turns were configured as a free flow movement similar to the existing operations.

Table 2
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection¹	LOS per Synchro	
Middletown Warwick Road/Ash Boulevard	Weekday AM	Weekday PM
2030 No Build		
Eastbound Ash Boulevard Approach	F (1654.5)	F (10406.3)
Northbound Middletown Warwick Road Left Turn	B (10.3)	B (12.5)

Signalized Intersection	LOS per Synchro	
Middletown Warwick Road/Ash Boulevard	Weekday AM	Weekday PM
2030 with Ash Boulevard Connector ²	D (36.0)	D (54.5)
2030 with Greenlawn Boulevard Connector ³	C (22.0)	C (34.9)

² The Ash Boulevard Connector scenario includes signalizing the intersection and the addition of a southbound left-turn lane, eastbound through lane, northbound right turn lane, and westbound left turn, through, and right turn lane. The signal was configured with protected-permissive left turns along all intersection approaches.

³ The Greenlawn Boulevard Connector scenario includes signalizing the intersection and providing a separate left turn and right turn lane along the eastbound Ash Boulevard approach, a right turn and through lane along the southbound Middletown Warwick Road approach, and a separate left turn and through lane along the northbound Middletown Warwick Road approach.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 2 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
Middletown Warwick Road/Ash Boulevard		
2030 with Ash Boulevard Connector ²		
Eastbound Ash Boulevard Left Turn	365	588
Eastbound Ash Boulevard Through	121	230
Eastbound Ash Boulevard Right Turn	0	47
Westbound Ash Boulevard Left Turn	239	340
Westbound Ash Boulevard Through	110	294
Westbound Ash Boulevard Right Turn	0	0
Northbound Middletown Warwick Road Left Turn	19	219
Northbound Middletown Warwick Road Through	210	1014
Northbound Middletown Warwick Road Right Turn	5	53
Southbound Middletown Warwick Road Left Turn	8	9
Southbound Middletown Warwick Road Through	713	1099
Southbound Middletown Warwick Road Right Turn	41	87
2030 with Greenlawn Boulevard Connector ³		
Eastbound Ash Boulevard Left Turn	333	627
Eastbound Ash Boulevard Right Turn	48	154
Northbound Middletown Warwick Road Left Turn	68	305
Northbound Middletown Warwick Road Through	206	398
Southbound Middletown Warwick Road Through	738	1074
Southbound Middletown Warwick Road Right Turn	42	76

Table 3
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	LOS per Synchro	
Middletown Warwick Road/Greenlawn Connector	Weekday AM	Weekday PM
2030 with Greenlawn Boulevard Connector ⁴	B (17.6)	B (18.2)

Table 3 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
Middletown Warwick Road/Greenlawn Connector	Weekday AM	Weekday PM
2030 with Greenlawn Boulevard Connector ⁴		
Westbound Greenlawn Boulevard Left Turn	270	493
Westbound Greenlawn Boulevard Right Turn	42	132
Northbound Middletown Warwick Road Through	428	1202
Northbound Middletown Warwick Road Right Turn	9	324
Southbound Middletown Warwick Road Left Turn	17	130
Southbound Middletown Warwick Road Through	67	101

⁴ The Greenlawn Boulevard Connector scenario includes signaling the intersection and providing a separate left turn and right turn lane along the westbound Connector Road approach, a right turn and through lane along the northbound Middletown Warwick Road approach, and a separate left turn and two through lanes along the southbound Middletown Warwick Road approach.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 4
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	LOS per Synchro	
	Weekday AM	Weekday PM
Middletown Warwick Road/Bunker Hill Road/Main Street		
2030 No Build	D (41.1)	F (92.5)
2030 with Connector Road	D (50.6)	E (68.7)
2030 with Connector Road and Additional Improvements ⁵	D (40.0)	D (53.6)

⁵ The Additional Improvement scenario includes providing dual left turn lanes along northbound and southbound Middletown Warwick Road, consistent with the Westown TID improvements.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 4 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
Middletown Warwick Road/Bunker Hill Road/Main Street		
2030 with Connector Road and Additional Improvements ⁵		
Eastbound Bunker Hill Road Left Turn	105	160
Eastbound Bunker Hill Road Through	171	232
Eastbound Bunker Hill Road Right Turn	142	254
Westbound Main Street Left Turn	216	462
Westbound Main Street Through	149	210
Westbound Main Street Right Turn	56	65
Northbound Middletown Warwick Road Left Turn	111	260
Northbound Middletown Warwick Road Through	278	509
Northbound Middletown Warwick Road Right Turn	129	72
Southbound Middletown Warwick Road Left Turn	116	175
Southbound Middletown Warwick Road Through	364	701
Southbound Middletown Warwick Road Right Turn	9	76

Table 5
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection	LOS per Synchro	
	Weekday AM	Weekday PM
SR 71 N. Broad St./Cedar Lane Road		
2030 No Build		
Westbound Cedar Lane Approach	F (397.9)	F (962.6)
Southbound N. Broad Street Left Turn	B (10.9)	A (9.9)
2030 with Connector Road		
Westbound Cedar Lane Approach	F (89.3)	F (154.4)
Southbound N. Broad Street Left Turn	A (9.5)	A (8.8)

Signalized Intersection	LOS per Synchro	
	Weekday AM	Weekday PM
SR 71 N. Broad St./Cedar Lane Road		
2030 with Connector Road and Additional Improvements ⁶	B (17.5)	B (14.7)

⁶ The Additional Improvement scenario includes signaling the intersection and providing a shared through/right turn lane along northbound N. Broad Street, a shared through/left turn lane along southbound N. Broad Street, and a shared right turn/left turn lane along westbound Cedar Lane Road.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 5 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
SR 71 N. Broad St./Cedar Lane Road		
2030 with Connector Road and Additional Improvements ⁶		
Westbound Cedar Lane Road Shared Left/Right turn	222	252
Northbound N. Broad Street Shared Through/Right turn	402	371
Southbound N. Broad Street Shared Left Turn/Through	125	239

Table 6
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Unsignalized Intersection	LOS per Synchro	
SR 71 N. Broad St./Middletown Commons	Weekday AM	Weekday PM
2030 No Build		
Westbound Middletown Commons Approach	C (16.4)	C (16.0)
2030 with Greenlawn Boulevard Connector		
Westbound Middletown Commons Approach	C (15.3)	B (13.8)

Signalized Intersection	LOS per Synchro	
SR 71 N. Broad St./Middletown Commons	Weekday AM	Weekday PM
2030 with Ash Boulevard Connector ⁷	B (11.9)	B (16.3)

⁷ The Ash Boulevard Connector scenario includes signaling the intersection and providing a separate left turn and right turn lane along the eastbound Connector Road approach, a separate left turn, through, and right turn lane along the northbound N. Broad Street approach, and a separate right turn and through lane along the southbound N. Broad Street approach. The westbound right-out only exit from Middletown Commons was maintained consistent with existing conditions. Due to HCS limitations with analyzing non-NEMA signal phasing, the results listed for this alternative use Synchro methodology.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 6 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
SR 71 N. Broad St./Middletown Commons		
2030 with Ash Boulevard Connector ⁷		
Eastbound Connector Left Turn	107	116
Eastbound Connector Right Turn	0	109
Westbound Main Street Right Turn	0	0
Northbound N. Broad Street Left Turn	57	187
Northbound N. Broad Street Through	155	146
Northbound N. Broad Street Road Right Turn	0	1
Southbound N. Broad Street Through	216	423
Southbound N. Broad Street Right Turn	9	32

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 7
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	LOS per Synchro	
	Weekday AM	Weekday PM
SR 71 N. Broad Street/Greenlawn Boulevard		
2030 No Build	B (18.5)	C (21.4)
2030 with Ash Boulevard Connector ⁸	C (23.2)	B (16.0)
2030 with Greenlawn Boulevard Connector ⁹	B (19.5)	B (17.4)

⁸ Due to HCS limitations with analyzing non-NEMA signal phasing, the results listed for this alternative use Synchro methodology.

⁹ The Greenlawn Boulevard Connector scenario includes providing a separate left turn, right turn, and through lane along each approach to the intersection. Protected-permissive left turns would also be provided along each approach.

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 7 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
SR 71 N. Broad Street/Greenlawn Boulevard		
2030 with Ash Boulevard Connector		
Eastbound Driveway Shared Left Turn/Through/Right Turn	75	155
Westbound Greenlawn Boulevard Through	115	105
Westbound Greenlawn Boulevard Right Turn	55	70
Northbound N. Broad Street Left Turn	16	3
Northbound N. Broad Street Through	431	342
Northbound N. Broad Street Right Turn	25	16
Southbound N. Broad Street Left Turn	78	102
Southbound N. Broad Street Through	217	664
Southbound N. Broad Street Right Turn	0	0

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 7 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
SR 71 N. Broad Street/Greenlawn Boulevard		
2030 with Greenlawn Boulevard Connector ⁹		
Eastbound Connector Roadway Left Turn	130	121
Eastbound Connector Roadway Through	19	77
Eastbound Connector Roadway Right Turn	0	94
Westbound Greenlawn Boulevard Left Turn	48	52
Westbound Greenlawn Boulevard Through	39	8
Westbound Greenlawn Boulevard Right Turn	46	44
Northbound N. Broad Street Left Turn	119	249
Northbound N. Broad Street Through	269	165
Northbound N. Broad Street Right Turn	25	16
Southbound N. Broad Street Left Turn	74	94
Southbound N. Broad Street Through	236	355
Southbound N. Broad Street Right Turn	15	31

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 8
Peak Hour Levels Of Service (LOS)
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	LOS per Synchro	
SR 71 N. Broad Street/SR 299	Weekday AM	Weekday PM
2030 No Build	E (71.5)	F (177.8)
2030 with Connector Road	E (72.1)	F (185.8)

*Westown TID Middletown Warwick-North- Broad Street Connector Study
Level of Service and 95th Percentile Queue Tables*

Table 8 (continued)
Peak Hour 95th Percentile Queue Lengths
Westown Transportation Improvement District (TID) Analysis

Signalized Intersection	Queues per Synchro (Feet)	
	Weekday AM	Weekday PM
SR 71 N. Broad Street/SR 299		
2030 with Connector Road		
Eastbound SR 299 Left Turn	34	19
Eastbound SR 299 Through/Right Turn	964	1572
Westbound SR 299 Left Turn	35	34
Westbound SR 299 Through/Right Turn	988	1421
Northbound S. Broad Street Left Turn	288	508
Northbound S. Broad Street Shared Through/Right Turn	542	1192
Southbound N. Broad Street Left Turn	245	440
Southbound N. Broad Street Shared Through/Right Turn	328	705