



6 May 2020

Judy Lizza
Thornbury Township
8 Township Drive
Cheyney, PA 19319

VIA EMAIL ONLY

**RE: Robinson Tract, Intersection of 926/New,
Thornbury Township, Chester County**

FTA Job #217-010

Dear Ms. Lizza:

F. Tavani and Associates, Inc. (FTA) has conducted a review of the traffic investigations of the intersection of Route 926 (Street Road) and New Street as prepared by McMahan Associates, Inc. (McM) in its traffic impact study (TIS) for the Robinson Tract dated 13 August 2019. Select pages from that study are attached to this letter.

EXISTING INTERSECTION PERFORMANCE

The subject location is a currently-signalized four-leg intersection. Each leg is a one-lane approach presently. Existing overall levels of service are **E** under existing conditions and using existing timings, per the TIS. Level of service summary tables from the TIS are attached.

PROJECTED INTERSECTION PERFORMANCE

Projected future overall levels of service are **C** using optimized signal timings only (no physical road improvements). Even though these levels of service are a significant improvement over the existing condition, the applicant is offering new physical road improvements, namely the addition of left turn lanes in both directions along Street Road as well as a new right turn lane in the WB direction only (along Street Road). See attached "Conceptual Design Exhibit" dated 6 March 2020.

AUXILLIARY TURN LANE WARRANTS

The TIS includes some PennDOT turn lane warrant investigation spreadsheets. The TIS also includes a claim that left turn lanes (in both directions along Street Road) are warranted under existing conditions. One such worksheet (for the WB left turn lane, existing volumes, AM peak hour) is attached. The worksheets contain many user-defined fields, including 'Type of Terrain'. For this field, three responses are available: *level*, *rolling*, or *mountainous*. The TIS makes use of *rolling*, which does not appear appropriate for the location, since the EB and WB approach grades of Street Road at New Street are generally unremarkable. FTA replicated this worksheet changing the 'type of terrain' field from *rolling* (as in the TIS) to *level* along with one other change and found the WB left turn lane is no longer warranted. This is not especially surprising, since the existing left turn volumes in this direction are low (less than 25 vehicles per hour) and are also virtually unchanged (not meaningfully increased) by the project. Projected conditions also reveal the WB left turn movement operates at LOS B in the morning

and C in the afternoon, without the left turn lane. Providing the left turn lane does not improve LOS in the morning and only marginally increases it in the afternoon (from LOS C to LOS B).

The applicant is also offering to add a WB right turn lane. This lane provides even less benefit than the proposed left turn lane, and is completely unnecessary for mitigation purposes.^{1,2}

CONCLUSIONS

The performance of the intersection of Route 926 (Street Road) and New Street is substantially improved by signal timing changes alone, with overall levels of service being C during both weekday peak hours using optimized signal timings only. As identified in the TIS, no mitigation measures (i.e., lane additions / road widening) are needed to offset the impact of the proposed Robinson Tract development.

Left turn volumes are relatively low, especially in the WB direction, during both peak hours. Adding new left turn and right turn lanes on the WB approach affords no meaningful LOS improvement, are not necessary, and will serve little purpose other than changing the character of the intersection.

I hope this has been helpful. Please let me know if I can answer any questions.

Thank you,
F. TAVANI AND ASSOCIATES, INC.



FRANK TAVANI, P.E., PTOE
Principal

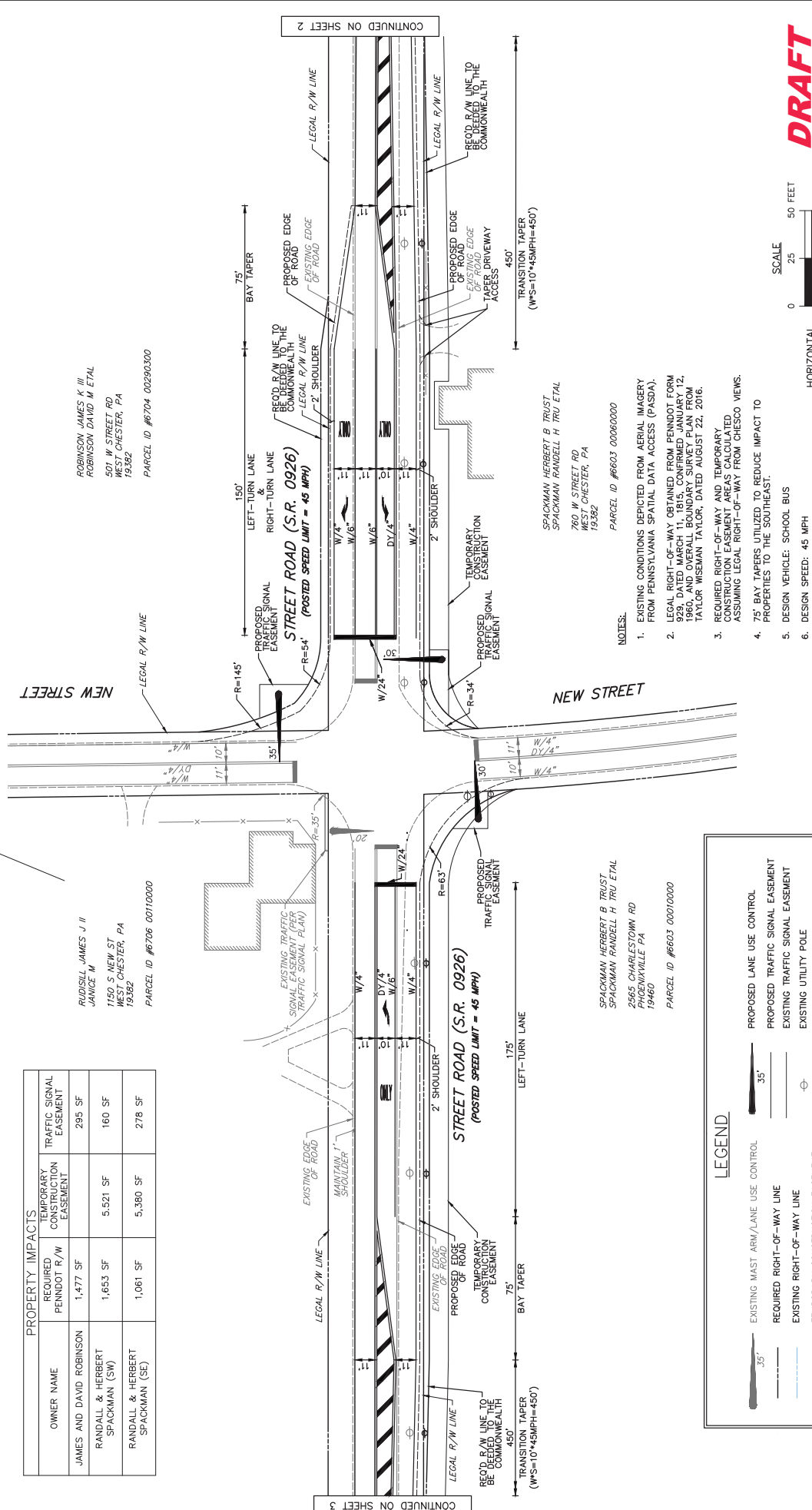
attachments

¹ Per the HCM 6th ed, Rolling terrain is: “...any combination of grades and horizontal or vertical alignment that causes heavy vehicles to reduce their speed **substantially** below that of passenger cars ...”

² The project adds 4 or less vph to the WB left turn movement during peak hours; the project adds 0 peak hour traffic to the WB right turn movement, per the TIS.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	CHESTER	WESTTOWN TOWNSHIP		1 OF 3
REVISION NUMBER	REVISIONS	DATE	BY	

PROPERTY IMPACTS			
OWNER NAME	REQUIRED PENNDOT R/W EASEMENT	TEMPORARY CONSTRUCTION EASEMENT	TRAFFIC SIGNAL EASEMENT
JAMES AND DAVID ROBINSON	1,477 SF		295 SF
RANDALL & HERBERT SPACKMAN (SW)	1,653 SF	5,521 SF	160 SF
RANDALL & HERBERT SPACKMAN (SE)	1,061 SF	5,380 SF	278 SF



ROBINSON JAMES K III
ROBINSON DAVID M ETAL
501 W STREET RD
WEST CHESTER, PA
19382
PARCEL ID #6704 00290300

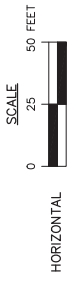
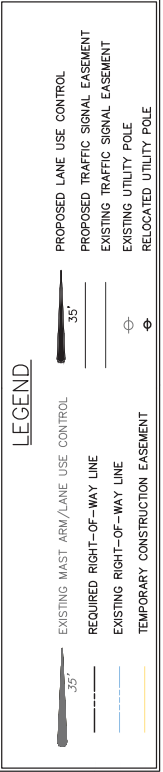
RUDISILL JAMES J II
JANICE M
1150 S NEW ST
WEST CHESTER, PA
19382
PARCEL ID #6706 00110000

SPACKMAN HERBERT B TRUST
SPACKMAN RANDELL H TRU ETAL
760 W STREET RD
WEST CHESTER, PA
19382
PARCEL ID #6603 00060000

SPACKMAN HERBERT B TRUST
SPACKMAN RANDELL H TRU ETAL
2656 CHARLESTOWN RD
PHOENIXVILLE PA
19460
PARCEL ID #6603 00010000

NOTES:

- EXISTING CONDITIONS DEPICTED FROM AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
- LEGAL RIGHT-OF-WAY OBTAINED FROM PENNDOT FORM 939 LATER MARCH 11 2016. CONFORMED TO ANNUAL 1960 AND OVERALL BOUNDARY SURVEY PLAN FROM TAYLOR WESEMAN TAYLOR, DATED AUGUST 22, 2016.
- REQUIRED RIGHT-OF-WAY AND TEMPORARY CONSTRUCTION EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS.
- 75' BAY TAPERS UTILIZED TO REDUCE IMPACT TO PROPERTIES TO THE SOUTH/EAST.
- DESIGN VEHICLE: SCHOOL BUS
- DESIGN SPEED: 45 MPH



DRAFT

<p>1315 SPRINGDALE DRIVE SUITE 200 EXTON, PA 19341 PH: (610) 594-9955 FAX: (610) 594-5955</p>	<p>DESIGN BY: SAK DRAWN BY: SBW CHECKED BY: AV</p>	<p>JOB NO. 816451 DWG. 451CPT01 DATE: 3/06/2020</p>	<p>TOLL BROTHERS, INC. 250 GERRARD RD HORSHAM, PA 19044</p>
	<p>ROBINSON TRACT RESIDENTIAL DEVELOPMENT STREET ROAD (S.R. 0926) AND NEW STREET WESTTOWN TOWNSHIP CHESTER COUNTY CONCEPTUAL DESIGN EXHIBIT ALTERNATIVE A</p>		

Transportation Impact Study for the Robinson Tract Westtown Township, Chester County, PA



Nicole R. Kline

Nicole Kline, P.E., PTOE
Pennsylvania PE License Number PE074792

Prepared by
McMahon Associates, Inc.
835 Springdale Drive, Suite 200
Exton, PA 19341
610.594.9995

Prepared for
Toll Brothers, Inc.

August 13, 2019
McMahon Project Number 816451.11

**Table 4. Overall Intersection Level-of-Service
Weekday Morning Peak Hour**

Intersection	Existing	Future 2030 Without Development (optimized)	Future 2030 With Development	Requires Mitigation?
U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)	F 90.8	F 107.6	F 95.2	NO
U.S. Route 202 (Wilmington Pike) and Pleasant Grove Road	A 0.6	A 1.4	A 1.5	NO
U.S. Route 202 (Wilmington Pike) and Skiles Boulevard/Stetson School	C 23.2	C 30.2	D 44.5	NO (increase in delay due to traffic diversions, not site traffic)
Street Road (S.R. 0926) and New Street	E 68.7	C 29.5	C 24.5	NO
Street Road (S.R. 0926) and Bridlewood Boulevard/Collector Road	A 1.2	A 1.4	B 14.2 (signalized)	NO
New Street and West Pleasant Grove Road	A 2.5	A 3.3	A 1.8	NO
West Pleasant Grove Road and Dunvegan Drive	A 0.5	A 0.3	A 1.7	NO
West Pleasant Grove Road and Orvis Way	-	A 2.6	A 6.3	NO

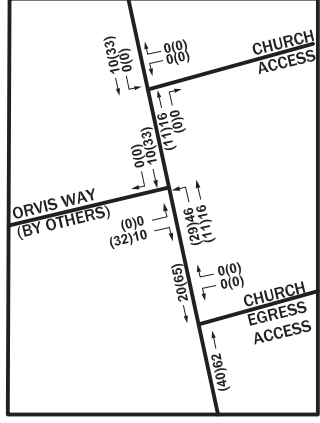
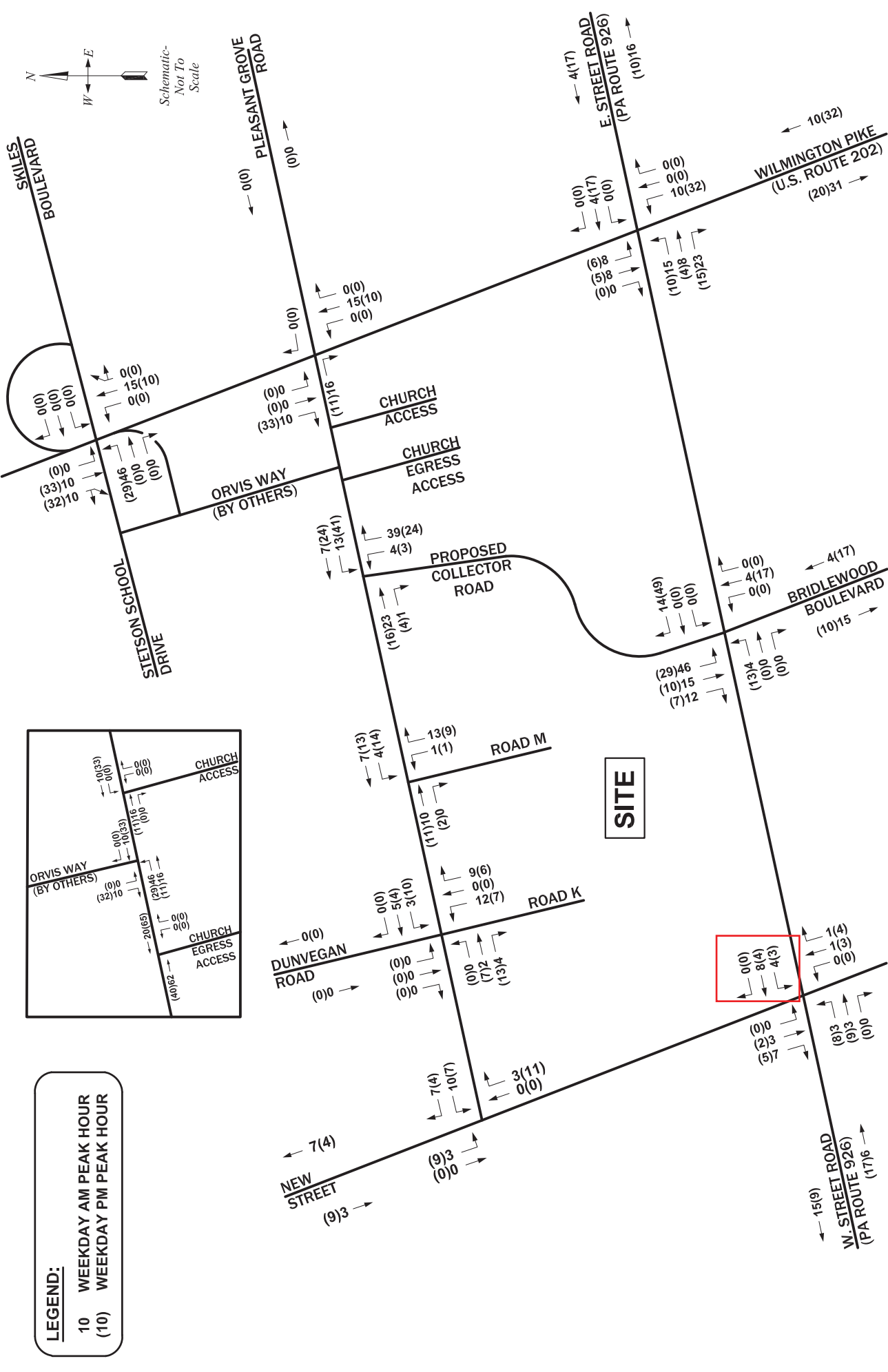
**Table 5A. Overall Intersection Level-of-Service
Weekday Afternoon Peak Hour**

Intersection	Existing	Future 2030 Without Development (optimized)	Future 2030 With Development	Requires Mitigation?
U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)	F 139.4	F 143.6	F 130.8	NO
U.S. Route 202 (Wilmington Pike) and Pleasant Grove Road	A 0.9	A 1.6	A 1.6	NO
U.S. Route 202 (Wilmington Pike) and Skiles Boulevard/Stetson School	B 17.6	C 25.3	D 41.0	NO (increase in delay due to traffic diversions, not site traffic)
Street Road (S.R. 0926) and New Street	E 69.2	C 32.6	C 24.0	NO
Street Road (S.R. 0926) and Bridlewood Boulevard/Collector Road	A 1.4	A 1.6	B 13.6 (signalized)	NO
New Street and West Pleasant Grove Road	A 9.0	B 14.3	A 5.3	NO
West Pleasant Grove Road and Dunvegan Drive	A 0.2	A 0.2	A 0.9	NO
West Pleasant Grove Road and Orvis Way	-	A 1.8	A 7.3	NO

Table 6. Level of Service Matrices
Street Road (S.R. 0926) and New Street

Time Period		Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
Design Year		2030 Design Year				2030 Design Year			
Development Condition		Existing	w/o Dev Base	w/o Dev ⁽¹⁾ Optimized	w/Dev	Existing	w/o Dev Base	w/o Dev ⁽¹⁾ Optimized	w/Dev
Street Road (S.R. 0926)	Left Thru Right	A	B	D	C	B	B	D	C
	Left Thru Right	9.3	10.9	39.3	31.1	11.9	13.1	36.5	23.7
	Left Thru Right	A	A	B	B	A	B	C	B
	Left Thru Right	5.8	5.9	14.1	13.1	9.9	10.2	23.7	19.1
	NB Thru Right	C	C	B	B	C	D	B	C
	NB Thru Right	33.1	33.4	17.5	18.8	34.7	35.4	19.6	22.7
New Street	Left Thru Right	F	F	C	C	F	F	D	C
	Left Thru Right	238.3	312.1	28.2	26.1	205.5	270.9	40.5	31.8
	Overall	E	F	C	C	E	F	C	C
		68.7	91.3	29.5	24.5	69.2	90.0	32.6	24.0

(1) Future traffic signal timings have been optimized.



LEGEND:
 10 WEEKDAY AM PEAK HOUR
 (10) WEEKDAY PM PEAK HOUR

FIGURE 4B
 New Site Trip Assignments

ROBINSON TRACT
 WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

Off-Site Traffic Improvements

Collector Road

- The applicant will construct the Collector Road through the property between Street Road (S.R. 0926) and West Pleasant Grove Road, which will alleviate traffic at the congested U.S. Route 202 (Wilmington Pike)/Street Road (S.R. 0926) intersection, and reroute traffic currently using West Pleasant Grove Road and New Street as an alternate route to avoid that delay. The overall delays at several study intersections decrease in the with-development conditions versus without-development conditions, due to the diversion of traffic to the Collector Road.
- Based on the estimated Collector Road weekday peak hour traffic volumes in this report, diverted traffic constitutes approximately 70 to 80 percent of the total, while approximately 20 to 30 percent is site traffic from the Robinson Tract.

Street Road (S.R. 0926) and New Street

- The applicant will complete traffic signal retiming optimization.
- Although not necessary to mitigate traffic impact, the applicant will provide a dedicated right-turn lane along westbound Street Road (S.R. 0926) along the Robinson Tract property frontage.
- It is noted that left turn lanes are warranted based on existing traffic volumes. Left-turn lanes along Street Road (S.R. 0926) and New Street cannot be provided within the existing right-of-way or with additional right-of-way from the Robinson Tract alone.

U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)

- The applicant will complete traffic signal retiming optimization.

The traffic analyses contained herein reveal that efficient access to and from the proposed development can be provided, and furthermore, site-generated traffic is mitigated at the study area intersections with the committed improvements.

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Westtown Township"/>	Analysis Date: <input type="text" value="1/4/2017"/>
County: <input type="text" value="Chester County"/>	Conducted By: <input type="text" value="BGG"/>
PennDOT Engineering District: <input type="text" value="6"/>	Checked By: <input type="text" value="TML"/>
	Agency/Company Name: <input type="text" value="McMahon Associates, Inc."/>
Intersection & Approach Description: <input type="text" value="Street Road (S.R. 0926) and New Street
Westbound Street Road (S.R. 0926) Left-Turn Lane"/>	
Analysis Period: <input type="text" value="2016 Existing"/>	Number of Approach Lanes: <input type="text" value="1"/>
Design Hour: <input type="text" value="AM Peak Hour"/>	Undivided or Divided Highway: <input type="text" value="Undivided"/>
Intersection Control: <input type="text" value="Signalized"/>	
Posted Speed Limit (MPH): <input type="text" value="45"/>	Type of Analysis: <input type="text" value="Left Turn Lane"/>
Type of Terrain: <input type="text" value="Rolling"/>	Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	11	27.0%	16
	Through	-	324	8.0%	363
	Right	Yes	50	6.0%	55
Opposing	Left	Yes	75	3.0%	79
	Through	-	689	3.0%	721
	Right	Yes	4	0.0%	4

Advancing Volume:	<input type="text" value="434"/>
Opposing Volume:	<input type="text" value="804"/>
Left Turn Volume:	<input type="text" value="16"/>
% Left Turns in Advancing Volume: <input type="text" value="3.69%"/>	

Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	N/A
	Right	-	0	0.0%	N/A

Advancing Volume:	<input type="text" value="N/A"/>
Right Turn Volume:	<input type="text" value="N/A"/>

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="Figure 3"/>	Applicable Warrant Figure: <input type="text" value="N/A"/>
Warrant Met?: <input type="text" value="Yes"/>	Warrant Met?: <input type="text" value="N/A"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Signalized"/>	
Design Hour Volume of Turning Lane: <input type="text" value="16"/>	
Cycles Per Hour (Assumed): <input type="text" value="Known"/>	
Cycles Per Hour (If Known): <input type="text" value="40"/>	Average # of Vehicles/Cycle: <input type="text" value="1.0"/>

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	<input type="text" value="N/A"/>	Feet
Condition B:	<input type="text" value="125"/>	Feet
Condition C:	<input type="text" value="150"/>	Feet
Required Left Turn Lane Storage Length:	<input type="text" value="150"/>	Feet

Additional Findings:

Additional Comments / Justifications:

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Westtown Township"/>	Analysis Date: <input type="text" value="4/20/2020"/>
County: <input type="text" value="Chester County"/>	Conducted By: <input type="text" value="FLT"/>
PennDOT Engineering District: <input type="text" value="6"/>	Checked By: <input type="text" value="FLT"/>
	Agency/Company Name: <input type="text" value="FTA"/>
Intersection & Approach Description: <input type="text" value="Street Road (S.R. 0926) and New Street
Westbound Street Road (S.R. 0926) Left-Turn Lane"/>	
Analysis Period: <input type="text" value="2016 Existing"/>	Number of Approach Lanes: <input type="text" value="1"/>
Design Hour: <input type="text" value="AM Peak Hour"/>	Undivided or Divided Highway: <input type="text" value="Undivided"/>
Intersection Control: <input type="text" value="Unsignalized"/>	
Posted Speed Limit (MPH): <input type="text" value="45"/>	Type of Analysis: <input type="text" value="Left Turn Lane"/>
Type of Terrain: <input type="text" value="Level"/>	Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	10	27.0%	12
	Through	-	324	8.0%	337
	Right	Yes	50	6.0%	52
Opposing	Left	Yes	75	3.0%	77
	Through	-	689	3.0%	700
	Right	Yes	4	0.0%	4

Advancing Volume:	401
Opposing Volume:	781
Left Turn Volume:	12
% Left Turns in Advancing Volume: <input style="width: 100px;" type="text" value="2.99%"/>	

Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	-	0	0.0%	N/A

Advancing Volume:	N/A
Right Turn Volume:	N/A

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input style="width: 100px;" type="text" value="Figure 3"/>	Applicable Warrant Figure: <input style="width: 100px;" type="text" value="N/A"/>
Warrant Met?: <input style="width: 100px;" type="text" value="No"/>	Warrant Met?: <input style="width: 100px;" type="text" value="N/A"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/>	
Design Hour Volume of Turning Lane: <input type="text" value="12"/>	
Cycles Per Hour (Assumed): <input type="text" value="60"/>	
Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input style="width: 100px;" type="text" value="N/A"/>

Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Left Turn Lane Storage Length:	N/A	Feet

Additional Findings:

Additional Comments / Justifications:

*** LEFT TURN LANE NOT WARRANTED IF TERRAIN SELECTED IS 'LEVEL' and if WB LT VOLUME IS REDUCED 1 VPH***