WESTTOWN SCHOOL OAK LANE TURF FIELDS TRANSPORTATION OPERATIONAL ANALYSIS

FOR SUBMISSION TO:

Westtown Township, Chester County, PA

Prepared For:
Westtown School
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TPD # WESC00003

Est. 1989
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INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Operational Analysis (TOA) for the proposed improvements to the Westtown School Athletic Turf Fields in Westtown Township, Chester County, Pennsylvania. The project site is located on the southeastern corner of Westtown Road (S.R. 2007) and Oak Lane, as shown in **Figure 1**.

This TOA serves as a compilation of analyses performed in 2018 and 2019 which have been updated for the current application to Westtown Township. The updates have been incorporated per direction from the Westtown Township Traffic Engineer, Albert Federico, PE, PTOE in September 2022.

PROJECT BACKGROUND

The project involves improving the existing Westtown School athletic field complex to incorporate multi-use turf fields, a new support building, and parking lot. One field will be lit for nighttime use per Westtown Township ordinance. The fields will be used by Westtown School students and by other regional sports teams for practice on a rental basis.

The Westtown School property is located within the eastern side of Westtown Township, Chester County, PA. It is loosely bounded to the north by Little Shiloh Road & Westtown Way, to the south by PA 926 (Street Road) to the west by Westtown Road, and Walnut Hill Road/Shady Grove Way to the east. West School Lane, East School Lane, and Oak Lane all provide vehicular access to the developed portions of the school.

Infill of the surrounding neighborhoods started in the late 1950's and the most recent development to be built near the school was in the mid 1980's. The internal roadway system at the school has been established for many years and has remained unchanged since 2001 when the Oak Lane was vacated by Westtown Township, and the connection between Westtown Road and Shady Grove Way was closed as part of the construction of the Lower School. The connection was terminated to discourage through traffic through the campus and to promote internal circulation and safety within the Westtown School Campus.

The current enrollment at Westtown School is 695 students (263 boarding) across all grade levels. The projected peak student population for Westtown School is 800 students (300 boarding) across all grade levels.

In addition to the improvements proposed under this project, Westtown School has recently completed the construction of a school zone flashing signal system to increase safety at the West School Lane / Westtown Road entrance. The school zone flashing signal system will help decrease speeds and increase motorist awareness along Westtown Road, particularly during peak school loading and unloading periods.

Site Access Locations

As shown in **Figure 2** the parking lot is a completely one-way operation, with the western entrance approximately 90 feet east of the Oak Lane/Westtown Road intersection. The eastern driveway is for the exiting vehicles which will allow sufficient room on Oak Lane for queuing for vehicles waiting to access Westtown Road.

EXISTING ROADWAY NETWORK

Currently West School Lane, East School Lane, and Oak Lane provide vehicular access to the school. The West School Lane and Oak Lane driveways are stop controlled from the school's driveway. The East School Lane driveway is an all-way stop controlled intersection with Shady Grove Way / Walnut Hill Road and

Johnnys Way. A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the project area are summarized in **Table 1**. The existing lane configuration and intersection controls for the project area intersections are shown in **Figure 3**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Westtown Road	State (S.R. 2007)	Collector	North-South	1,965	35 mph
Shady Grove Way	State (S.R. G400)	Collector	North-South	651	35 mph
Johnnys Way	State (S.R. G400)	Collector	East-West	651	25 mph
East School Lane	Private	Local	East-West	N/A	Not Posted
Oak Lane	Private	Local	East-West	N/A	Not Posted

Oak Lane is an existing 20-foot-wide private driveway that provides for two-way traffic. The AASHTO publication "*A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018*" states that 20 feet is an acceptable width for two lane local roads in rural areas with a design speed up to 40 mph and daily traffic volumes between 400 and 2000 vehicles per day (Table 5-5). Given that Oak Lane is an existing private driveway intended for low-speed operation, serves only Westtown School, and has no other connection to the local street network, the 20-foot cartway width is appropriate. The 20-foot width provides a measure of traffic calming to ensure vehicles travel at a slow and safe speed on the Westtown School campus.

Pedestrian Facilities

The Westtown School has a fully integrated system of internal roads and walkways to access all current facilities and buildings. The internal roadway network has evolved with the school's growth to safely manage the vehicular and pedestrian traffic within the campus. This includes promotion of safe vehicular circulation patterns, clearly marked pedestrian crossings, and internal traffic control devices to control and regulate the flow and speed of vehicular traffic through the campus.

The proposed turf field improvement project will provide additional connections to the existing pedestrian network on the Westtown School Campus. A marked pedestrian crossing will be created across Oak Lane, and sidewalk will be provided to connect the new concession building, and bleachers to the interior of the field area.

Crash Data Investigation

A review of PennDOT accident data from 2015 to 2020 shows zero reportable crashes at Shady Grove Way / East School Lane and Westtown Road / Oak Lane. There were 4 reportable crashes in the vicinity of Westtown Road / West School Lane during the same period. Only one of those accidents was located at Westtown Road / West School Lane and was attributed to distracted driving. Accident data was also obtained for 2017 to 2021 from the Westtown – East Goshen Police Department for Westtown Road between West School Lane and Oak Lane. Three of the crashes were located at the Westtown Road / West School Lane intersection and were attributed to driver error and not deficient sight distance or roadway characteristics.

Crash data were obtained from PennDOT for the study area intersections. PennDOT defines a reportable crash as follows, "A reportable (crash) is one in which an injury or fatality occurs or if at least one of the vehicles involved requires towing from the scene." Reportable crashes were tabulated for the five-year time period beginning 01/01/2017 and ending 12/31/2021. For a given intersection, PennDOT considers a crash occurrence of 5 reportable, correctable crashes over a continuous twelve-month period during the past five years to be a threshold value, above which the intersection design should be reviewed to examine if corrective measures can be taken to enhance safety. The number of reportable crashes at the study area intersections is shown in **Table 2.**

TABLE 2
PENNDOT REPORTABLE CRASH DATA

Study Area Intersection	Number of Reportable Crashes				
	2017	2018	2019	2020	2021
Westtown Road and Oak Lane	1	1	1	0	0
Westtown Road and West School Lane	1	1	1	0	1
Shady Grove Way and East School Lane	0	0	0	0	1

Based on a review of the crash data, there were no continuous twelve-month periods during the past five years where 5 or more crashes occurred that were deemed correctable.

EXISTING TRAFFIC CONDITIONS

Manual Turning Movement Counts

Manual traffic counts were conducted at the three school entrances on 15-minute intervals during the weekday morning (7:00 to 9:00 A.M.), weekday evening (3:00 to 6:00 P.M.) peak periods. Data pertaining to heavy vehicles, pedestrians and transit vehicles were observed during the manual counts. Peak hours and count dates for the study area intersections are identified in **Table 3**.

TABLE 3
MANUAL TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour[1]
Westtown Road & Oak Lane	Thursday, October 28, 2021	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:15 to 4:15 P.M.
Westtown Road & West School Lane	Thursday, October 28, 2021	Weekday A.M.	7:45 to 8:45 A.M.
		Weekday P.M.	4:00 to 5:00 P.M.
Shady Grove Way & East School Lane	Thursday, October 28, 2021	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:15 to 4:15 P.M.

Peak Hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

Existing condition traffic volumes for the weekday A.M., weekday P.M., and Saturday peak hours are illustrated in **Figure 4**, respectively.

Using these counts TPD performed an operational analysis at the Westtown Road / Oak Lane intersection. Existing (2021) and peak enrollment conditions were analyzed. The results of the analysis are shown in **Table 4** and show there are no current or projected operational deficiencies at this location.

TABLE 4
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	School Peak Hour			
		Weekday A.M.		Weekday P.M.	
		Existing	Peak Enrollment	Existing	Peak Enrollment
Westtown Road & Oak Lane	EB L/T/R	A	A	A	A
	WB L/T/R	A	A	A	A
	NB L/T/R	A	A	A	A
	SB L/T/R	A	A	A	A
	ILOS	**A (0.5)**	**A (0.5)**	**A (0.5)**	**A (0.5)**

Automatic Traffic Recorder Counts

Automatic Traffic Recorder (ATR) counts were conducted along Westtown Road north and east of the proposed site to determine the existing traffic volumes/patterns on a 24-hour weekday basis. The ATR counts were conducted from Tuesday, October 11, 2022, until Monday, October 17, 2022, when the Westtown School was in session.

TPD compared the October 2022 data to the previous ATR counts prepared for the project in October 2018. Between the hours of 3pm and 9pm on weekdays, there has been a significant decrease in total traffic on Westtown Road, ranging from 18% to 28%. **Table 5** below shows the relative comparisons of the 2018 and 2022 count data between 3pm and 9pm.

TABLE 5
PM PEAK COMPARISON

PM Peak	Weekday									
	Tuesday		Wednesday		Thursday		Friday		Monday	
Date	10/09/18	10/11/22	10/10/18	10/12/22	10/11/18	10/13/22	10/12/18	10/14/22	10/15/18	10/17/22
Volume	620	492	652	572	565	434	628	478	569	450
% Change	-21%		-12%		-23%		-24%		-21%	

Speed Study

In addition to traffic volumes, the ATR counters also collected the speeds of vehicles traveling along the Westtown Road (SR 2007) both North and East of the intersection of Oak Lane. Based upon the data collected, the 85th percentile speed, which is defined to be the speed which 85% of drivers travel at or below as they pass the sampling location (or the speed which 15% of drivers exceed), was determined for each location. **Table 6** summarizes the recorded 85th percentile speeds.

TABLE 6
85TH PERCENTILE TRAVEL SPEED SUMMARY

Location	Direction of Travel	2018 85th Percentile Speed	2022 85th Percentile Speed
Westtown Road East of Oak Lane	Eastbound	38 mph	38 mph
	Westbound	38 mph	39 mph
Westtown Road North of Oak Lane	Northbound	-	39 mph
	Southbound	-	43 mph

SIGHT DISTANCE ANALYSIS

A sight distance analysis was prepared for the proposed site driveways. In general, recommended safe sight distances depend upon the posted speed limit and roadway grades. The existing sight distances at the proposed driveways were measured in accordance with PennDOT Publication 282 Highway Occupancy Permit Operations Manual and compared to PennDOT's desirable sight distance standard, which is identified in 67 PA Code Chapter 441.8(h), "Access to and Occupancy of Highways by Driveways and Local Roads." In addition, measured sight distances at the proposed driveways were compared to PennDOT's safe stopping sight distance standard, which is calculated by the following equation:

$$\mathbf{SSSD = 1.47VT + V^2/[30(f \pm g)]}$$

SSSD = safe stopping sight distance (acceptable sight distance)
V = Vehicle Speed
T = Perception Reaction Time of Driver (2.5 seconds)
f = Coefficient of Friction for Wet Pavements
g = Percent of Roadway Grade Divided by 100

Table 7 shows the measured, sight distances at Oak Lane for vehicles entering and exiting the site and provided the field measurements in **Appendix B** that were performed on Wednesday, June 21, 2023.

TABLE 7
SIGHT DISTANCE ANALYSIS
OAK LANE TO WESTOWN RD

	Direction	Posted Speed	85th Percentile Speed	Grade1	Sight Distances (feet)		
					DES2	SSSD3	EXIST
Exiting Movements	To the left	35 mph	38 mph	+3%	440′	306′	**750′+**
	To the right	35 mph	43 mph	-2%	350′	371′	**630′**
Entering Left-Turns	Approaching same direction	35 mph	43 mph	-2%	300′	371′	**750′+**
	Approaching opposite direction	35 mph	38 mph	+3%	300′	306′	**330′**

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
EXIST = Existing (measured) Sight Distance
1 = Roadway Grade Approaching Driveway
2 = Based on Posted Speed
3 = Based on 85th Percentile Travel Speed

As shown in **Table 7** above, the measured sight distances at Oak Lane exceed PennDOT's desirable sight distance requirements. Additionally, the developer is proposing to trim trees/vegetation along the north side of Westtown Road just east of the Oak Lane intersection to improve the approaching opposite direction vehicle sight distance for entering left turn vehicles at Oak Lane.

PROPOSED PARKING LOT ACCESS FROM OAK LANE

There are two proposed entrances to the new Oak Lane Fields parking lot. The western entrance is entrance only and is approximately 90 feet from the Oak Lane/Westtown Road intersection. The eastern site entrance is exit only. The parking lot provides a 24' one-way circulation drive aisle, and a loading/unloading area in front of the concession building. All traffic will exit the parking lot from the eastern entrance, which is approximately 540 feet from the Oak Lane/Westtown Road intersection.

The driveways have been designed to accommodate the largest single unit emergency vehicle that would be dispatched to the site as dictated by Westtown Township. The driveway design was reviewed by the Goshen Fire Company and were found acceptable as stated in the November 7, 2018, letter from Deputy Chief DiNunzio to Timothy Barnard Esq. correspondence has been included in **Appendix A**.

PROPOSED TRIP GENERATION FOR ATHLETIC FIELDS

During weekday evenings, the newly lighted field are anticipated to be utilized by outside organizations, as well as Westtown School, primarily as practice space. These practices most likely will occur outside the weekday P.M. peak hour. However, to be extremely conservative for this assessment, TPD assumed the following times of operation:

- Practice sessions will occur between 5:30-10:00 P.M.
- Parents arrive for drop-off up to approximately 30 minutes before each session (first session drop-off approximately 5:00-5:30 P.M.)
- 50% of Parents drop-off and leave at the beginning of each session
- Assumed no carpooling
- Assumed no multi-child families
- Parents arrive for pickup approximately 15 minutes after each session (first session pick-up approximately 7:00-7:15 P.M.)
- 50% of Parents arrive and pick-up at the end of each session
- There will be overlap between pick-up and drop-off between sessions

It is anticipated that, based on the overlap between pick-up and drop-off, the time between sessions will experience the most site-related traffic to/from the newly lighted field. However, all these overlap periods will be brief and will occur outside of the peak hours of adjacent street traffic (first overlap approximately 7:00-7:15 P.M.).

The anticipated uses of the newly lighted field could be for Travel Soccer Clubs, Travel Lacrosse, Field Hockey, etc. Based on conversations with the Project Team, TPD assumed the following for each potential use:

Travel Soccer

- Half-field practices are assumed. Therefore, four (4) teams per session assumed
- 15 players and 2 coaches assumed for each team
- Therefore, the anticipated traffic generation would be:
  - Beginning of Session (1st Session: 5:00-5:30 P.M.) = Enter = 68 / Exit = 30
  - End of Session (1st Session: 7:00-7:15 P.M.) = Enter = 30 / Exit = 68
  - Beginning of Session (2nd Session: 7:00-7:30 P.M.) = Enter = 68 / Exit = 30
  - ***Overlap between Sessions = Enter = 83 / Exit = 64 (1/2 end of 1st Session plus all of 2nd Session assumed to overlap)***

Travel Lacrosse

- Full-field practices are assumed. Therefore, two (2) teams per session assumed
- 18 players and 2-3 coaches assumed for each team
- Therefore, the anticipated traffic generation would be:
  - Beginning of Session (1st Session: 5:00-5:30 P.M.) = Enter = 42 / Exit = 18
  - End of Session (1st Session: 7:00-7:15 P.M.) = Enter = 18 / Exit = 42
  - Beginning of Session (2nd Session: 7:00-7:30 P.M.) = Enter = 42 / Exit = 18
  - ***Overlap between Sessions = Enter = 51 / Exit = 39 (1/2 end of 1st Session plus all of 2nd Session assumed to overlap)***

Field Hockey

- Full-field practices are assumed. Therefore, two (2) teams per session assumed
- 15 players and 2-3 coaches assumed for each team
- Therefore, the anticipated traffic generation would be:
  - Beginning of Session (1st Session: 5:00-5:30 P.M.) = Enter = 36 / Exit = 15
  - End of Session (1st Session: 7:00-7:15 P.M.) = Enter = 15 / Exit = 36
  - Beginning of Session (2nd Session: 7:00-7:30 P.M.) = Enter = 36 / Exit = 15
  - ***Overlap between Sessions = Enter = 44 / Exit = 33 (1/2 end of 1st Session plus all of 2nd Session assumed to overlap)***

TPD observed lacrosse practices at the Westtown School Oak Lane fields on Sunday, October 28, 2018, between 12 noon and 2pm, and soccer practices at the West Chester United Soccer Club on Westtown Road in West Chester, PA on Thursday, November 1, 2018, between 4:30pm and 8pm.

The Girls Lacrosse practices were observed on Sunday, October 28, 2018, between 12 noon and 2pm. There were 5 teams utilizing the fields between 12 noon and 2pm. TPD observed 78 players and 7 coaches, which nearly matches the 15 players and 2 coaches per team assumed for 'worst case scenario'. The one 'anomaly' observed was that one team arrived via a school bus (1 coach and 12 players). For the purposes of summarizing the data for these observations, TPD is assuming those players and coach arrived via private vehicle at the same rate as the other teams, which is approximately 1.5 players/vehicle. It should be noted to Westtown Township that teams are utilizing buses to get to their practices, and that significantly cuts down on the number of potential trips generated.

Average occupancy/vehicle entering – 72/50 = 1.44*
Average occupancy/vehicle exiting – 72/46 = 1.56*
Average rate – 1.56+1.44/2 = 1.5 occupants/vehicle*
% players/coaches dropped off – 35 drop off/50 total trips = 70% (higher than assumed originally)
% players/coaches stay – 15 stay/50 total trips = 30% (lower than assumed originally)
*-does not include 12 players and coach who arrived by bus

Using the above vehicle occupancy rates, drop off/stay percentages, and TPDs original assumption of utilizing half field soccer practices, at four teams of 15 players with 2 coaches each (68 total participants) and assuming all participants arrived in a privately operated vehicle:

45 entering trips at the beginning of practice (68/1.5 people per vehicle).
32 exiting trips from drop off.
13 vehicles stay for entire practice.
At turnover time in between practices (peak condition) using same methodology as used above:
61 peak entering trips (32/2 from first practice pickup plus 45 for second practice)
55 exiting trips (45/2 from first practice plus 32 drop off for second practice).

Peak Rate Comparison:

Observed Rate	Assumed Rate
61 entering	83 entering
55 exiting	64 exiting

The Girls Soccer practices at the West Chester Sports Association Sports Complex were observed on Thursday, November 1, 2018, between 4:30pm and 8pm. There were 3 teams utilizing the soccer field at a time during two evening practice sessions (6 teams total). TPD observed a total of 92 players and 6 coaches, which nearly matches the 15 players and 2 coaches per team assumed for 'worst case scenario'. Because of the other sports occurring at the facility (football and softball), we were not able to accurately assess after practice pick up trips during the practice turnover period. For the purposes of this data set, we will be assuming the average occupancy of soccer related entering and exiting vehicles is the same.

Average occupancy/vehicle – 98/84 = 1.17
% players/coaches dropped off – 35 drop off/84 total trips = 42% (lower than assumed originally)
% players/coaches stay – 49 stay/84 total trips = 58% (higher than assumed originally)

Using the occupancy and drop off/stay percentages, and TPDs original assumption of utilizing half field soccer practices, at four teams of 15 players with 2 coaches each (68 total participants) and assuming all participants arrived in a privately operated vehicle:

59 entering trips at the beginning of practice (68/1.17 people per vehicle).
25 exiting trips from drop off.
34 vehicles stay for entire practice.

At turnover time in between practices (peak condition) using same methodology as above:
72 entering trips at turnover (25/2 from first practice pickup plus 59 for second practice)
55 exiting trips (59/2 from first practice plus 25 drop off for second practice).

Peak Rate Comparison:

Observed Rate	Assumed Rate
72 entering	83 entering
55 exiting	64 exiting

As shown in the assumptions, and confirmed by observations above, the scenario assuming the use of the newly lighted field for Travel Soccer, during the overlap between sessions, results in the most conservative in terms of trip generation (highest traffic flow), with a maximum of 83 vehicles entering or exiting.

TABLE 8
ANTICIPATED TRIP GENERATION SUMMARY

Time Period	Oak Lane Field Complex		
	Enter	Exit	Total
P.M. Peak Hour	83	64	147

Based on the trip generation analysis summarized in **Table 8**, the newly lighted field will generate approximately 147 new trips during the weekday P.M. peak hour.

Parking Demand

Based on a review of the Conditional Use Site Plans, a parking supply of 93 parking spaces will be provided in the immediate vicinity of the two synthetic turf fields. Based on the trip generations laid out above, TPD anticipates a maximum parking demand of 83 vehicles (highest directional traffic assuming Travel Soccer use with 100% retention during practice). Furthermore, there are an additional 76 existing parking spaces available within walking distance located near the adjacent existing athletic fields, with additional parking areas located within the school campus.

Internal Circulation

Access to and from Oak Lane for the improved turf fields of the Oak Lane field complex will be provided at two new driveways to the new parking lot off Oak Lane. Vehicles will enter at the western driveway and exit at the eastern driveway. Circulation through the new parking lot will be one-way heading west to east to avoid vehicles potentially being trapped on the western end of the parking lot and blocking the western entrance. Vehicles desiring to use the eastern most existing parking lot at the end of Oak Lane for the other natural turf and baseball fields can continue to do so.

The one-way internal drive aisles will provide adequate width for vehicular maneuvers and will allow for access and maneuvering of both fire vehicles and school buses. A drop off area has been provided in front of the concession building, and a school bus parking space has been provided on the eastern end of the proposed parking lot. The ability for vehicles to turn around at the eastern end of Oak Lane by the baseball field parking lot and Lower School playground will remain as existing.

CONCLUSIONS AND RECOMMENDATIONS

- Based on the extremely conservative trip generation assumptions, there will be minimal impact associated with the proposed increased use of the fields since it will occur during the overlap of sessions, which occurs outside the peak hours of adjacent street traffic. Additionally, it is important to note that these "new" vehicle trips will be dispersed over the 2-3 site driveways at the existing Westtown School.

- Based on the volumes shown above for Westtown Road (S.R. 2007) and Shady Grove Way, it is TPD's opinion that the anticipated trip generations listed above will not cause an adverse traffic operations impact at the existing site driveways or surrounding roadway network.

- It is TPD's opinion that the parking shown on the proposed plan is more than adequate given the peak nighttime parking of these fields will not overlap with the routine parking demand of the rest of the campus.

- The proposed parking lot one-way circulation plan and access design will allow for the safe ingress and egress of patron vehicles, minimize potential conflicts between vehicles and pedestrians, and will allow for the safe operation of buses and emergency equipment.

- TPD recommends that the underbrush on the west side of Westtown Road just north of Oak Lane between 978 and 1000 Westtown Road will be maintained to ensure sight distance is not obstructed and lateral obstructions which could cause safety concerns are removed. Similarly, the same maintenance of roadside vegetation will be performed on the north side of Westtown Road between 1000 and 1020 Westtown Road.

FIGURES: 1-6

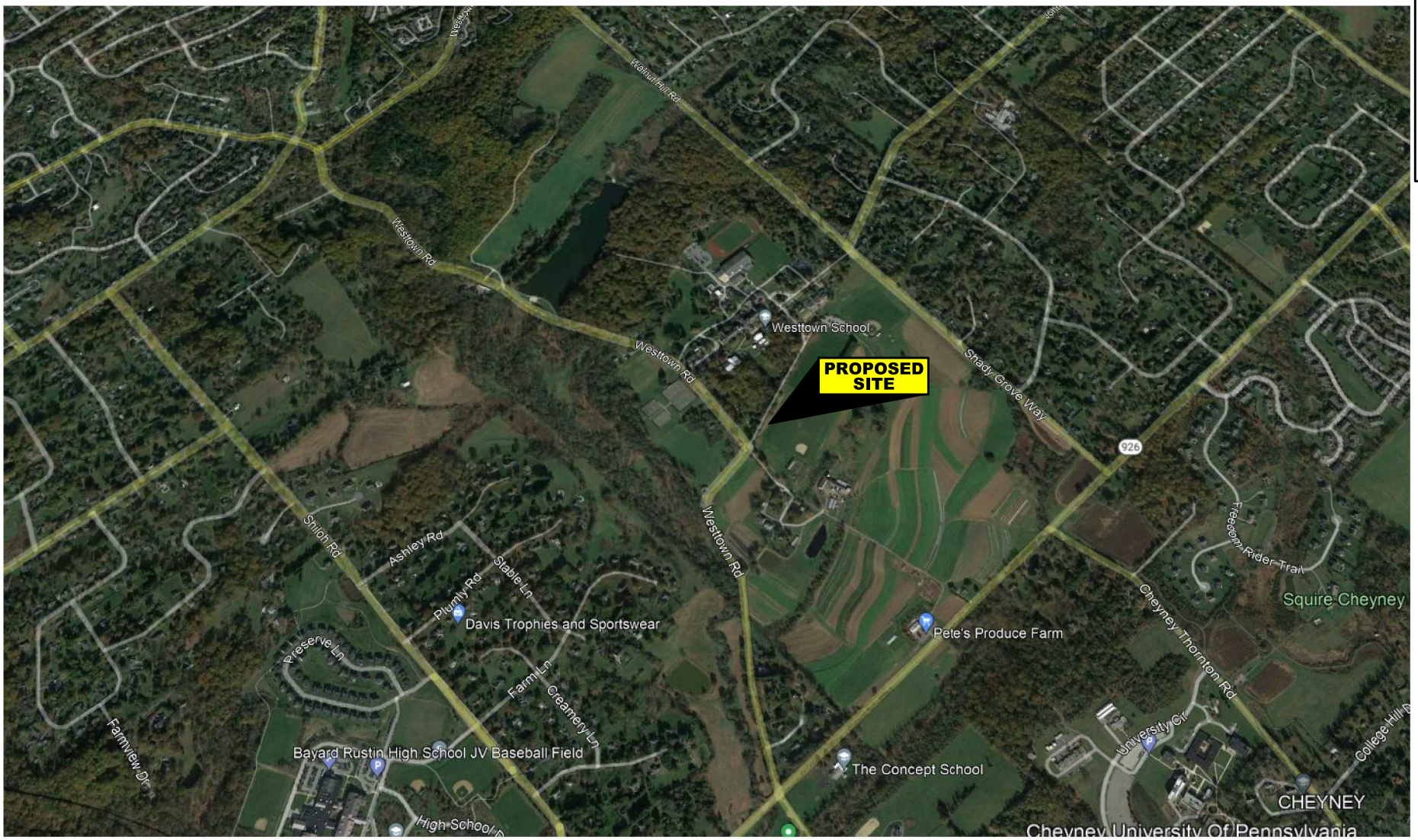

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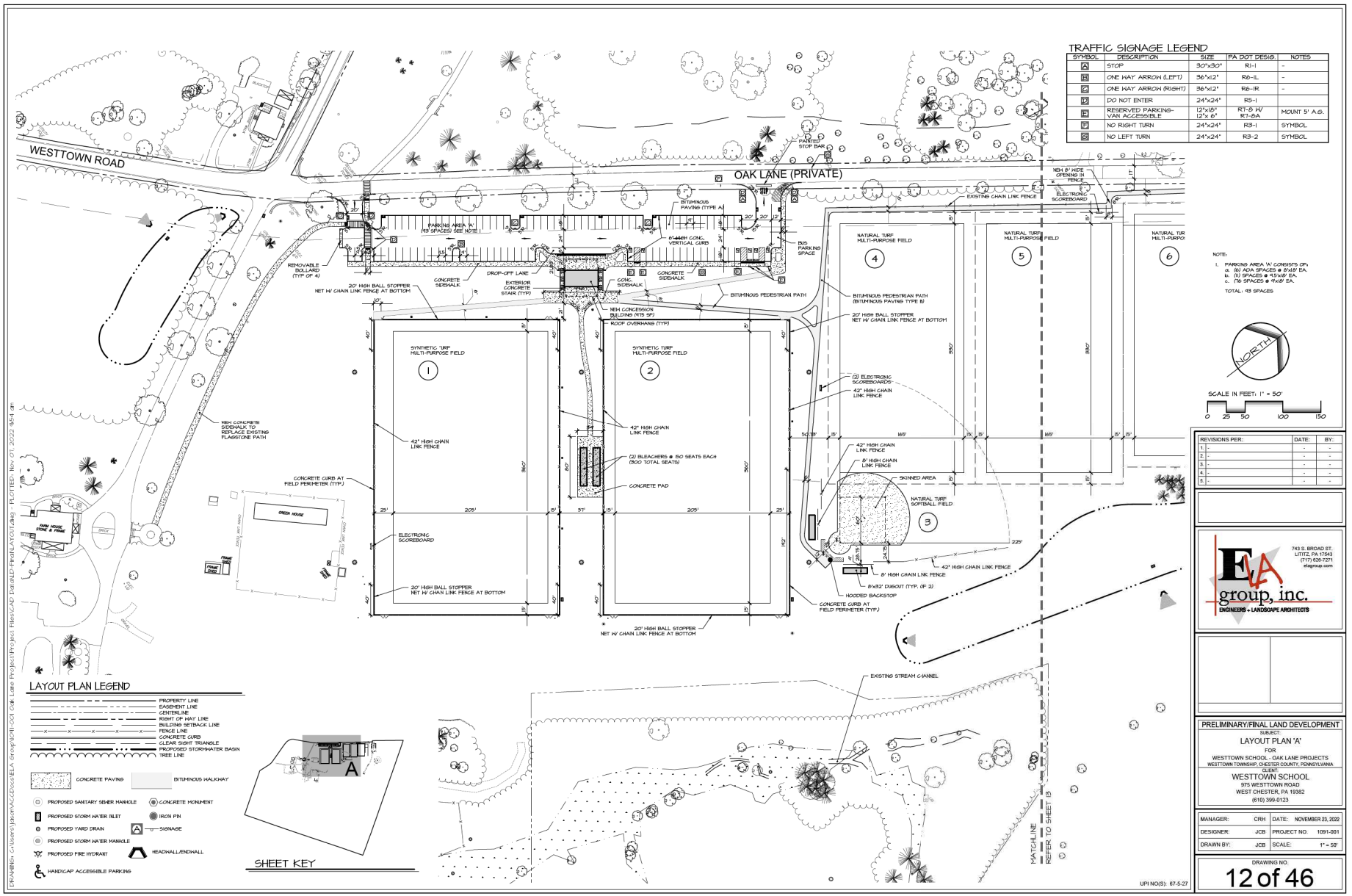
FIGURE 1

AERIAL LOCATION MAP
GOOGLE IMAGE



NOTE:
1. PARKING AREA 'A' CONSISTS OF:
   a. (6) ADA SPACES @ 8'x18' EA.
   b. (1) SPACES @ 9.5'x18' EA.
   c. (78 SPACES @ 9'x18' EA.
   TOTAL: 49 SPACES

TRAFFIC SIGNAGE LEGEND

SYMBOL	DESCRIPTION	SIZE	PA DOT DESIG.	NOTES
A	STOP	30"x30"	R1-1	-
B	ONE WAY ARROW (LEFT)	36"x12"	R6-1L	-
C	ONE WAY ARROW (RIGHT)	36"x12"	R6-1R	-
D	DO NOT ENTER	24"x24"	R5-1	
E	RESERVED PARKING-VAN ACCESSIBLE	12"x18" 12"x 6"	R7-8 W/ R7-8A	MOUNT 5' A.G.
F	NO RIGHT TURN	24"x24"	R3-1	SYMBOL
G	NO LEFT TURN	24"x24"	R3-2	SYMBOL

LAYOUT PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- CENTERLINE
- RIGHT OF WAY LINE
- BUILDING SETBACK LINE
- FENCE LINE
- CONCRETE CURB
- CLEAR SIGHT TRIANGLE
- PROPOSED STORMWATER BASIN
- TREE LINE
- CONCRETE PAVING
- BITUMINOUS WALKWAY
- PROPOSED SANITARY SEWER MANHOLE
- CONCRETE MONUMENT
- PROPOSED STORM WATER INLET
- IRON PIN
- PROPOSED YARD DRAIN
- SIGNAGE
- PROPOSED STORM WATER MANHOLE
- HEADWALL/ENDWALL
- PROPOSED FIRE HYDRANT
- HANDICAP ACCESSIBLE PARKING

SHEET KEY

UPI NO(S): 67-5-27

REVISIONS PER:	DATE:	BY:
1 -	-	-
2 -	-	-
3 -	-	-
4 -	-	-
5 -	-	-

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(717) 626-7271
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PRELIMINARY/FINAL LAND DEVELOPMENT
SUBJECT:
LAYOUT PLAN 'A'
FOR
WESTTOWN SCHOOL - OAK LANE PROJECTS
WESTTOWN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA
CLIENT:
WESTTOWN SCHOOL
975 WESTTOWN ROAD
WEST CHESTER, PA 19382
(610) 399-0123

MANAGER:	CRH	DATE:	NOVEMBER 23, 2022
DESIGNER:	JCB	PROJECT NO.	1091-001
DRAWN BY:	JCB	SCALE:	1" = 50'

DRAWING NO.
12 of 46

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FIGURE 2

SITE PLAN
PREPARED BY OTHERS

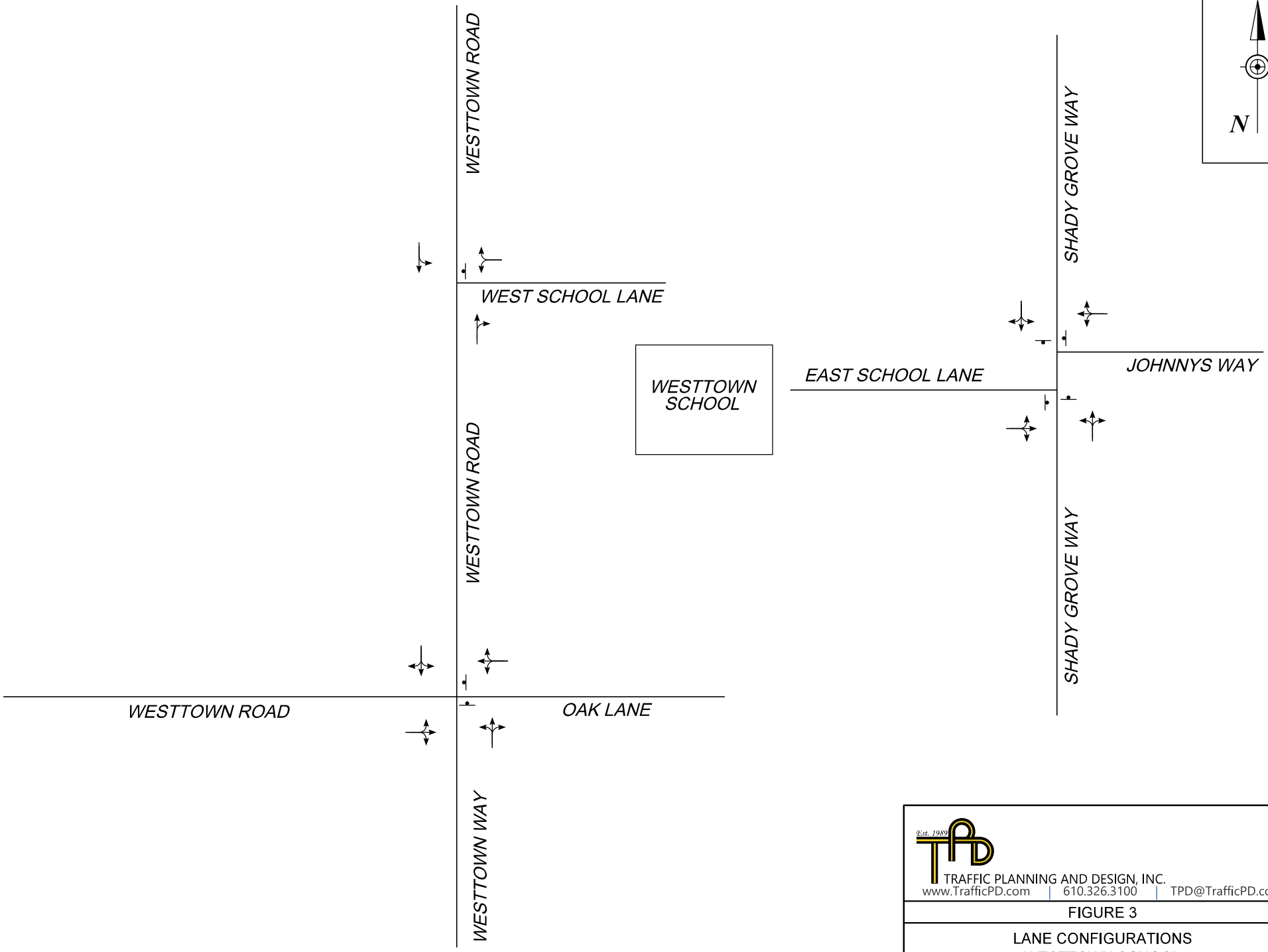

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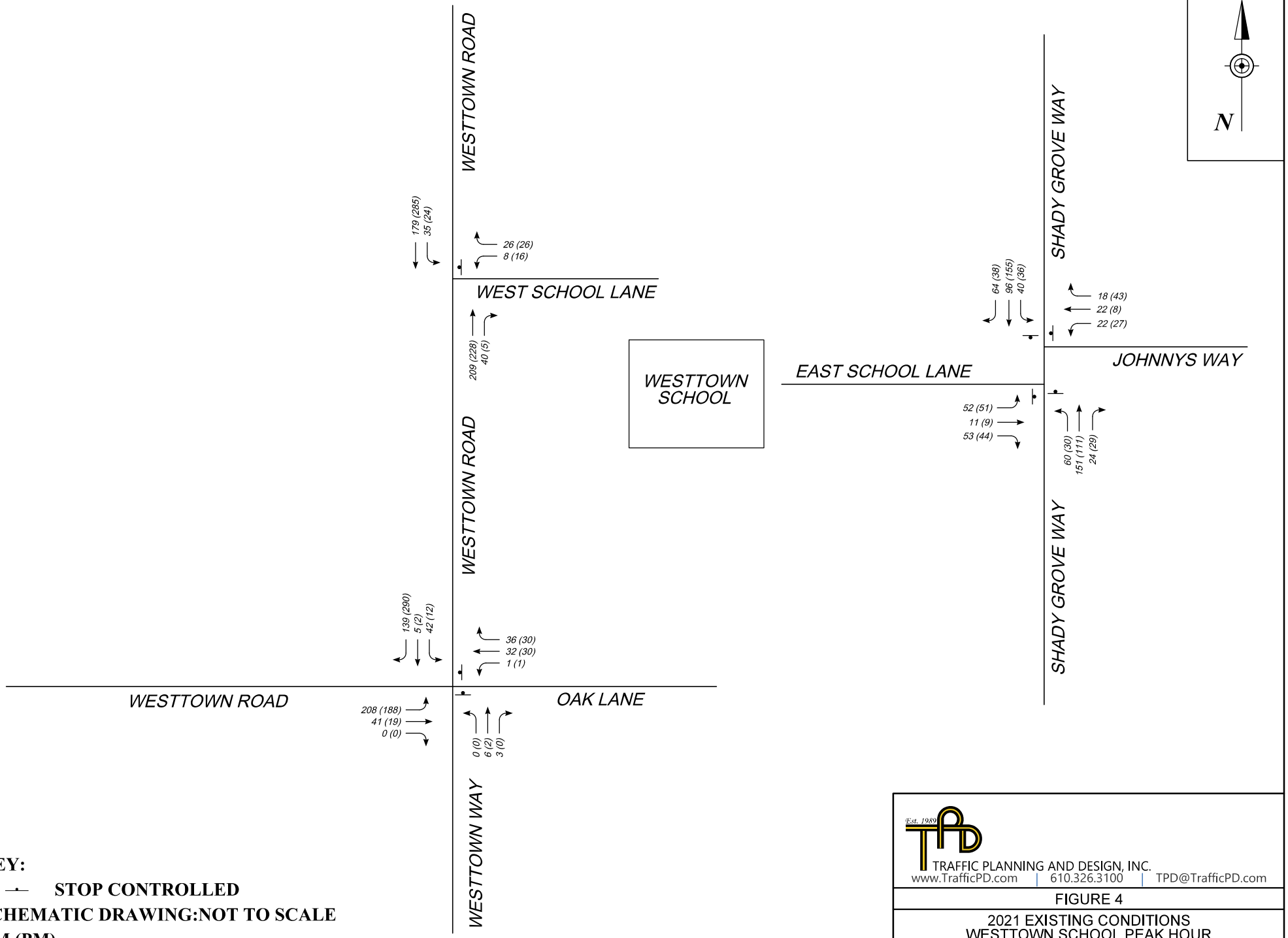
FIGURE 3

LANE CONFIGURATIONS
WESTTOWN SCHOOL



KEY:

STOP CONTROLLED

SCHEMATIC DRAWING:NOT TO SCALE

AM (PM)

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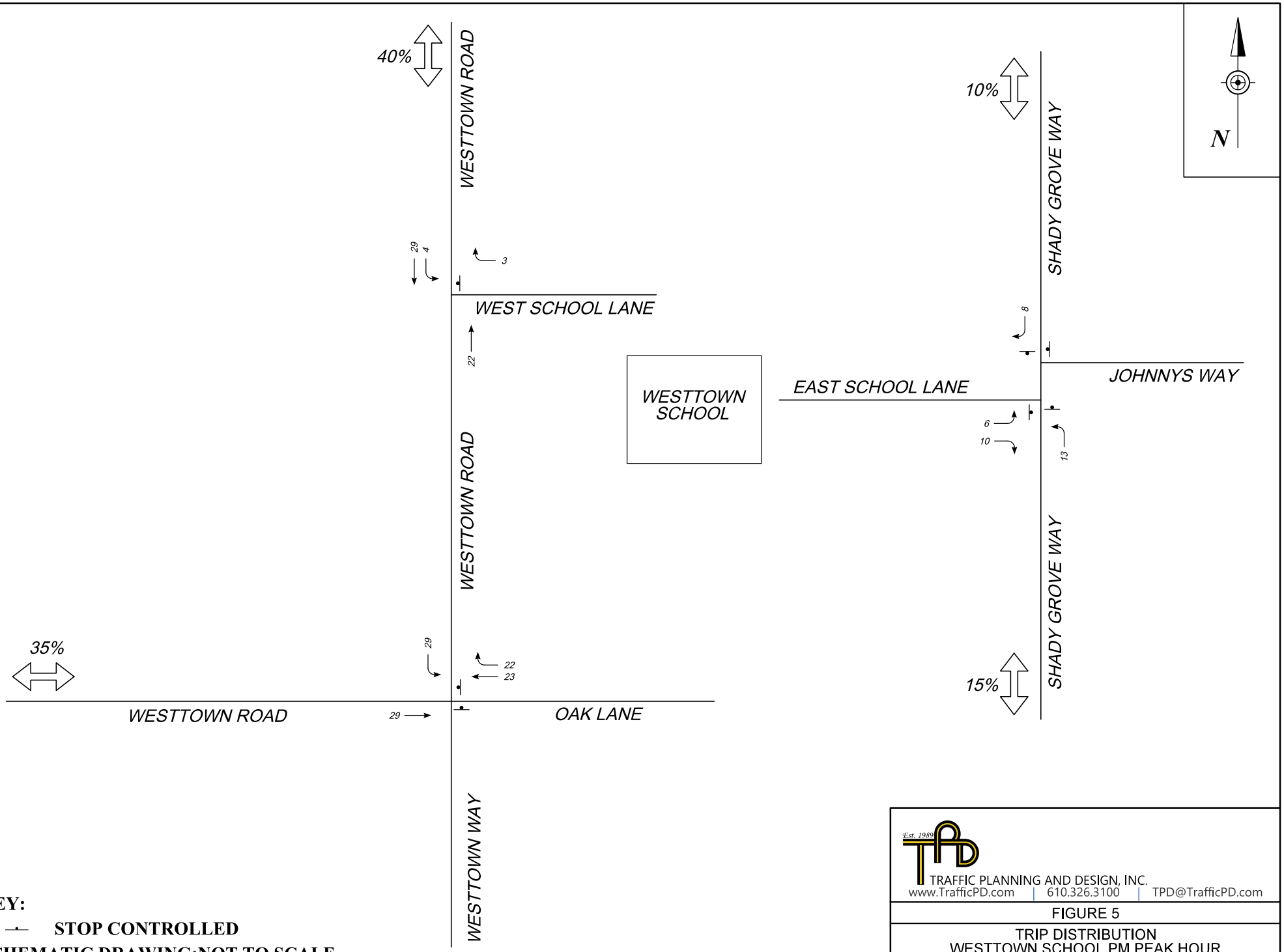
FIGURE 4

2021 EXISTING CONDITIONS
WESTTOWN SCHOOL PEAK HOUR
VEHICULAR VOLUMES



KEY:

STOP CONTROLLED

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FIGURE 5

TRIP DISTRIBUTION
WESTTOWN SCHOOL PM PEAK HOUR
VEHICULAR VOLUMES

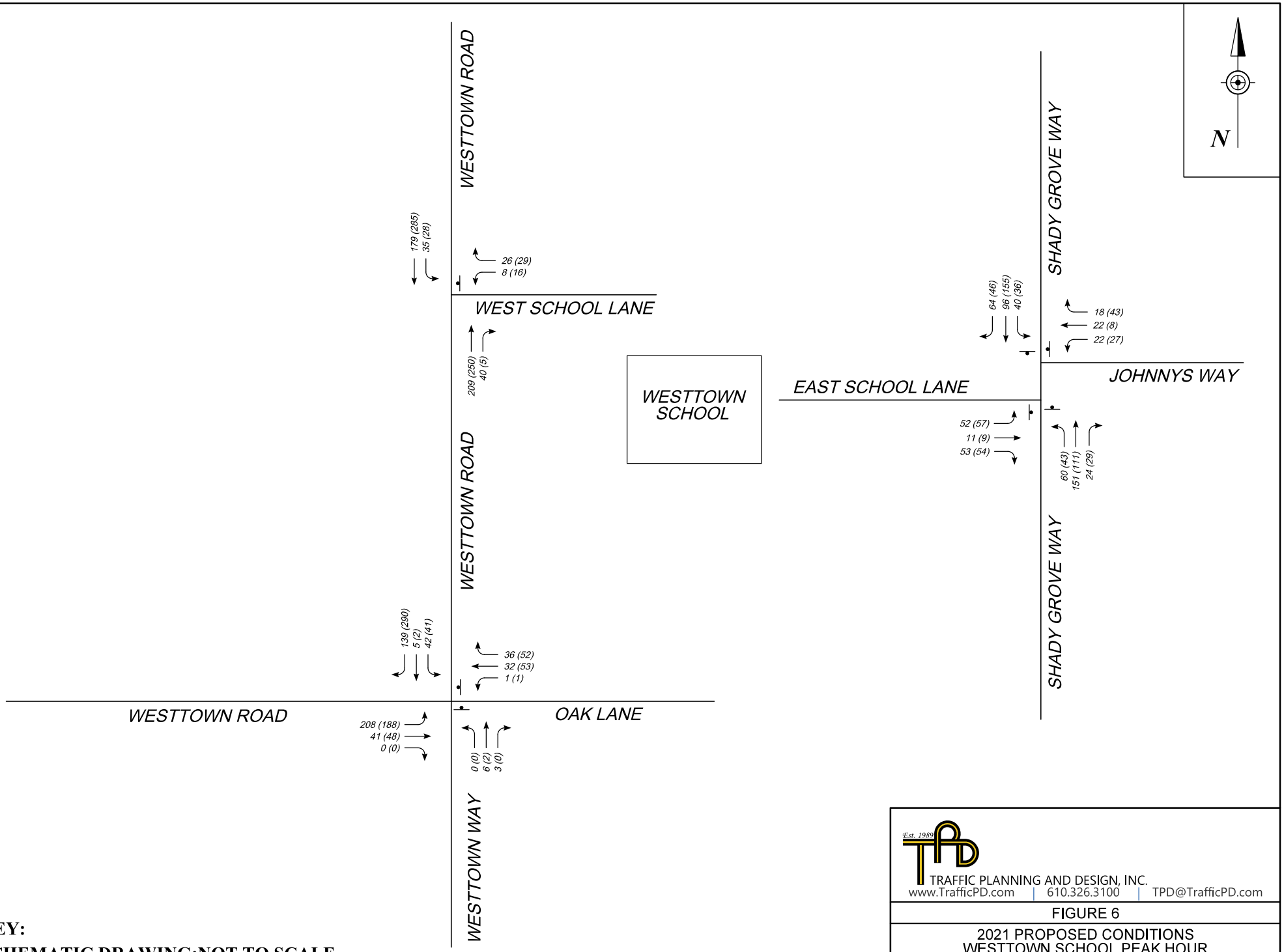

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FIGURE 6

2021 PROPOSED CONDITIONS
WESTTOWN SCHOOL PEAK HOUR
VEHICULAR VOLUMES

Appendix A

Project Correspondence

GOSHEN FIRE COMPANY

1320 Park Avenue • West Chester, Pennsylvania 19380

Wednesday, November 07, 2018

Timothy B. Barnard, Esquire
Barnard, Mezzanotte, Pinnie & Seelaus
218 W. Front Street
Media, PA 19063

Re: Westtown School parking lot

Mr. Barnard:

I've reviewed the scale drawing of the plans for a new parking lot that Westtown School would like to construct. After examining the entrance and egress paths to the parking lot, I've found those plans compatible with the needs and expectations of the Fire Company.

Should you require any additional information, please do not hesitate to contact me.

Cordially,

Gerald R. DiNunzio, Jr
Deputy Chief
Goshen Fire Company
Cell: (484) 645-0610
Email: Gerry.dinunzio@goshenfireco.org

Appendix B

Oak Lane Sight Distance Measurements

TPD DRIVEWAY CHECKLIST

(02-20-09 Revised Version)

MEASURED SIGHT DISTANCE

29. Sight Distances for exiting vehicle measured 10 feet back from proposed edge of (Figure 1) travel lane at a $3^1/_2$ ft eye and object height: __630'__ **ft. Left** __750'+*__ **ft. Right**

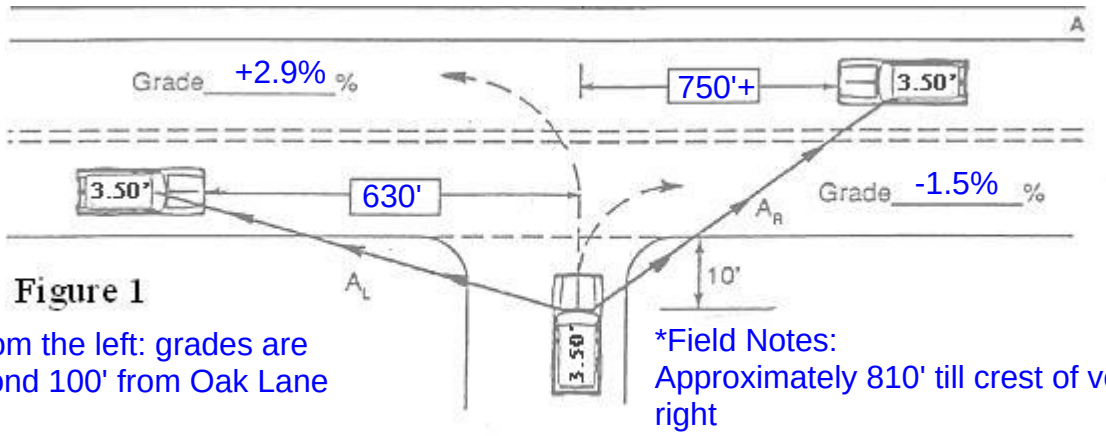


Figure 1

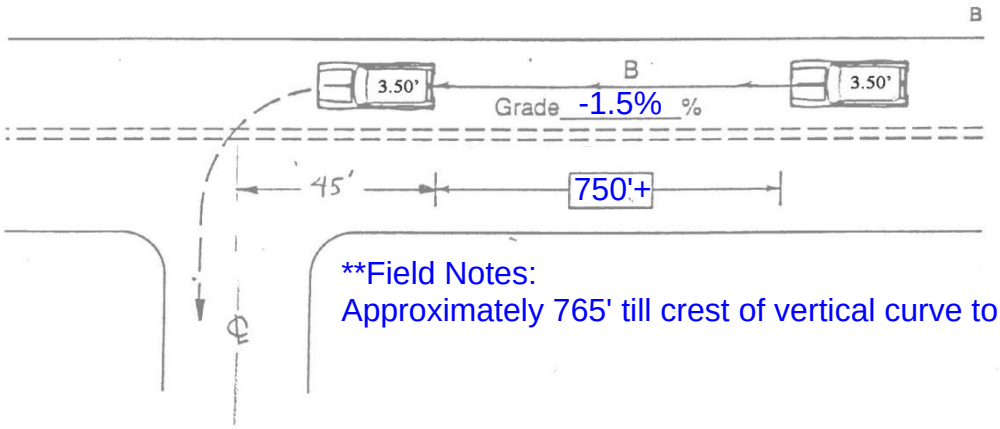
*Grade Notes:
Approaching from the left: grades are +4 to +6% beyond 100' from Oak Lane

Approaching from the right: grades are -4 to -6% beyond 350' from Oak Lane

*Field Notes:
Approximately 810' till crest of vertical curve to the right

Approximately 630' till horizontal curve to the left

30. Sight distance from an oncoming vehicle measured at $3^1/_2$ ft eye height to a 3.5 foot object height of a vehicle waiting to turn left into a site measured 45 feet back from the centerline of driveway, __750'+**__ **feet.**



**Field Notes:
Approximately 765' till crest of vertical curve to the right

**** Use 35' for Minimum Use Dwy's in Dist 6-0****

*** Please note of any inlets and utility poles near the proposed driveway location and make note of them on the diagram sketch attached (last sheet).

TPD DRIVEWAY CHECKLIST

(02-20-09 Revised Version)

31. Sight distance of vehicle **A** waiting to turn left into a site, measured at $3^{1}/_{2}$ ft eye height 35 feet in advance of driveway centerline to an oncoming vehicle **B** approaching from the **opposite** direction measured at a 3.5 ft. object height, 330'* **feet**.

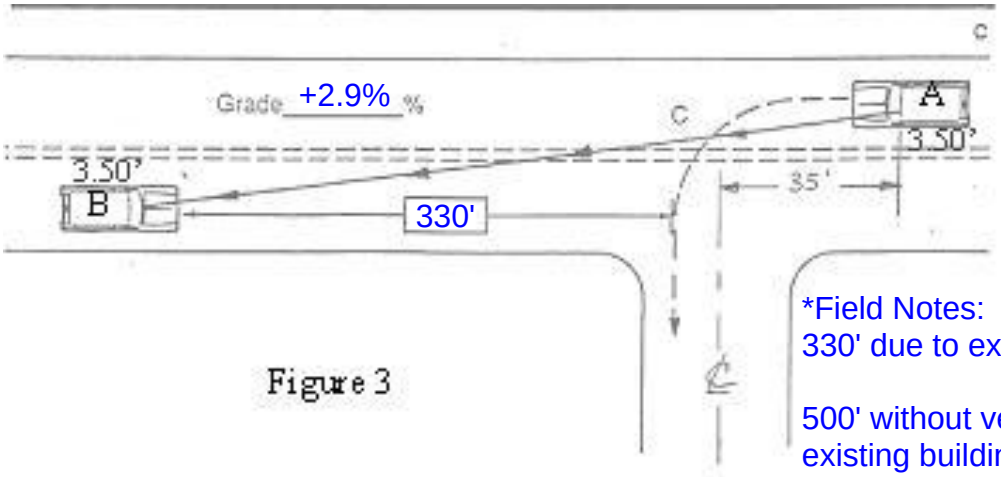


Figure 3

*Field Notes:
330' due to existing vegetation

500' without vegetation but with existing building and horizontal curve

TPD DRIVEWAY CHECKLIST

(02-20-09 Revised Version)

"DESIRABLE" SIGHT DISTANCE STANDARDS

Table 1 --- Safe Sight Distance for passenger cars and single unit trucks exiting from driveways onto two lane roads.

Posted Speed (mph)	Safe Sight Distance ---LEFT[1] (feet)	Safe Sight Distance -- Right[1] (feet)
25	250	195
30	345	273
35	440	350
40	538	460
45	635	570
50	740	723
55	845	875

Note: When Grade Exceeds 3%

The sight distances in table 1 through 4 apply only when highway grades are zero to 3.0%, either up or down.

(A) When the highway grade in the section to be used for acceleration, after leaving the driveway, ascends at 3.0 -- 5.0%, the sight distance in the direction of approaching ascending traffic may be increased by a factor of 1.4.

(B) When the highway grade ascends at greater than 5.0%, sight distance in the direction of approaching ascending traffic may be increased by a factor of 1.7.

(C) When the highway grade in the section to be used for acceleration after leaving the driveway descends at 3.0 -- 5.0%, sight distance in the direction of approaching descending highway traffic may be reduced by a factor of - 0.6.

(D) When the road descends at greater than 5.0%, sight distance may be reduced by a factor of 0.5.

Table 3 --- Safe Sight Distance for passenger cars and single unit trucks exiting from driveways onto four and six lane roads.

Posted Speed (mph)	Safe Sight Distance ---LEFT[1] (feet)	Safe Sight Distance -- Right[2] (feet)
25	175	195
30	238	273
35	300	350
40	400	460
45	500	570
50	643	723
55	785	875

Table 5 --- Safe Sight Distance for passenger cars and single unit trucks entering driveways by left turns.

Posted Speed (mph)	Safe Sight Distance in Feet[1]		
	2 - Lane	4 - Lane	6 – Lane
25	190	205	220
30	245	263	283
35	300	320	345
40	373	395	418
45	445	470	500
50	528	558	590
55	610	645	680

ACCEPTABLE SIGHT DISTANCE REQUIREMENTS FOR 85TH PERCENTILE SPEEDS

02-2009

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
M.P.H.																					
15	74	74	73	75	73	75	73	76	72	77	72	77	71	78	71	79	71	79	70	80	70
16	80	81	80	81	79	82	79	83	78	83	78	84	77	85	77	86	77	86	76	87	76
17	87	87	86	88	85	89	85	89	84	90	84	91	83	92	83	93	83	94	82	95	82
18	93	94	93	95	92	95	91	96	91	97	90	98	90	99	89	100	89	101	88	102	88
19	100	101	99	102	99	102	98	103	97	104	97	105	96	106	95	107	95	109	94	110	94
20	107	108	106	109	105	110	105	111	104	112	103	113	103	114	102	115	101	117	101	118	100
21	114	115	113	116	112	117	111	118	111	119	110	120	109	122	109	123	108	125	107	126	107
22	122	123	121	125	120	126	119	127	118	128	118	130	117	131	116	133	115	135	115	137	114
23	130	131	129	132	128	134	127	135	126	136	125	138	124	140	123	141	122	143	121	145	121
24	139	140	137	142	136	143	135	145	134	146	133	148	132	150	131	152	130	154	129	157	128
25	147	148	145	150	144	151	143	153	142	155	140	157	139	159	138	161	137	164	136	166	135
26	157	158	155	160	153	162	152	164	151	166	149	168	148	171	147	173	146	176	145	179	144
27	165	167	163	169	162	171	160	173	159	175	157	178	156	180	155	183	153	186	152	189	151
28	176	178	174	180	172	182	170	185	168	187	167	190	165	193	164	196	162	200	161	203	160
29	184	187	182	189	180	192	179	194	177	197	175	200	173	203	172	207	170	210	169	214	168
30	196	199	194	201	191	204	189	207	187	210	185	214	183	217	182	221	180	226	178	230	177
31	205	208	203	211	201	214	198	217	196	221	194	224	192	228	190	233	188	237	187	242	185
32	215	218	212	221	210	224	207	228	205	231	203	235	201	240	199	244	197	249	195	254	194
33	228	231	225	235	222	238	219	242	217	246	214	251	212	256	210	261	208	267	206	273	204
34	238	242	235	245	232	249	229	253	226	258	224	263	221	268	219	273	217	279	215	286	213
35	249	252	245	256	242	260	239	265	236	269	233	275	231	280	228	286	226	292	224	299	221
36	259	263	256	267	252	272	249	276	246	281	243	287	240	292	238	299	235	305	233	312	231
37	274	279	270	283	266	288	263	293	259	299	256	305	253	312	250	319	247	326	245	334	242
38	286	290	281	295	277	300	273	306	270	312	266	318	263	325	260	332	257	340	254	349	252
39	302	307	297	312	292	318	288	324	284	331	280	338	277	346	273	355	270	364	267	374	264
40	314	319	309	325	304	331	299	338	295	345	291	352	287	360	284	369	280	379	277	389	274
41	326	331	321	338	316	344	311	351	306	358	302	366	298	375	294	384	291	394	287	405	284
42	338	344	333	350	327	357	322	364	318	372	313	381	309	390	305	399	301	410	298	422	294
43	357	364	351	371	345	378	339	386	334	395	329	405	325	415	320	426	316	438	312	452	308
44	370	377	363	384	357	392	352	401	346	410	341	420	336	431	332	442	327	455	323	469	319
45	383	390	376	398	370	406	364	415	358	425	353	435	348	447	343	459	339	472	334	487	330
46	397	404	390	412	383	421	377	430	371	440	365	451	360	463	355	476	350	490	345	505	341
47	410	418	403	427	396	436	389	445	383	456	377	467	372	480	367	493	362	507	357	523	352
48	432	441	424	451	416	461	409	472	402	484	396	496	390	510	384	526	379	542	373	560	368
49	447	456	438	466	430	477	423	488	416	500	409	514	402	528	396	544	391	561	385	580	380
50	462	471	453	481	444	492	436	504	429	517	422	531	415	546	409	563	403	581	397	600	392
51	476	486	467	497	458	509	450	521	442	534	435	549	428	564	422	582	416	600	410	621	404
52	492	502	482	513	473	525	464	538	456	552	449	567	442	583	435	601	428	620	422	642	416
53	507	518	497	529	487	542	479	555	470	569	462	585	455	602	448	620	441	641	435	663	429
54	523	534	512	546	502	559	493	572	484	587	476	604	469	621	461	640	454	661	448	685	442
55	538	550	527	562	517	576	508	590	499	606	490	622	482	641	475	661	468	682	461	706	454
56	554	566	543	579	533	593	523	608	513	624	505	641	496	660	488	681	481	704	474	729	467
57	571	583	559	596	548	611	538	626	528	643	519	661	510	680	502	702	495	725	487	751	480
58	600	614	587	629	575	644	564	662	553	680	543	701	534	723	525	747	516	774	508	803	501
59	617	631	604	647	591	663	579	681	568	700	558	721	548	744	539	769	530	797	522	828	514
60	634	649	621	665	608	682	596	701	584	721	573	742	563	766	554	792	545	821	536	852	528
61	652	667	638	684	624	701	612	720	600	741	589	764	579	788	569	815	559	844	551	877	542
62	670	686	655	702	641	721	628	740	616	762	605	785	594	810	584	838	574	869	565	902	556
63	688	704	673	722	658	740	645	761	632	783	621	807	610	833	599	862	589	893	580	928	571
64	706	723	690	741	676	760	662	781	649	804	637	829	625	856	615	885	604	918	595	954	585
65	725	742	708	761	693	781	679	802	666	826	653	851	641	879	630	910	620	943	610	980	600
66	761	780	743	801	727	823	711	848	696	874	683	903	670	934	657	969	646	1007	635	1049	625
67	781	800	762	822	745	845	729	870	714	897	700	926	686	959	674	994	662	1034	651	1078	640
68	800	821	781	843	764	866	747	892	732	920	717	951	703	984	690	1021	678	1061	667	1106	656
69	820	841	801	864	783	888	766	915	750	944	735	975	720	1009	707	1047	694	1089	683	1135	671
70	841	862	821	886	802	911	784	938	768	967	752	1000	738	1035	724	1074	711	1117	699	1165	687

Consistent with PennDOT form M-950S
2.5 second reaction time
Utilizes variable coefficient of friction