



October 2013

**LEFT TURN LANE INVESTIGATION
FOR VALLEY VISTA DRIVE
Patton Township, Centre County, Pennsylvania**

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FOR VALLEY VISTA DRIVE
Patton Township, Centre County, Pennsylvania**

EXECUTIVE SUMMARY

General Overview of Project

- Operational Efficiency, Safety, Left and Right Turn Lane Warrants and Signal warrants were investigated for four (4) intersections on Valley Vista Drive.

List of Study Intersections

- Valley Vista Drive and Devonshire Drive
- Valley Vista Drive and Sandy Ridge Drive/Church Entrance
- Valley Vista Drive and Oakley Drive/Private Driveway
- Valley Vista Drive and Amblewood Way

Turn Lane Warrants Met

Turn lane warrant analysis was performed for both left and right turns for the four study intersections along Valley Vista Drive. The following intersection approaches met warrants under existing conditions:

- Southbound Valley Vista Drive at Devonshire Drive met the left turn lane warrant for both AM and PM existing peak hours. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Devonshire Drive met the right turn lane warrant for the PM peak hour. A lane with 75 feet of storage is warranted.
- Southbound Valley Vista Drive at Oakley Drive met the left turn lane warrant for the PM existing peak hour. A lane with 75 feet of storage is warranted.
- Southbound Valley Vista Drive at Amblewood Way met the left turn lane warrant for both AM and PM existing peak hours. A lane with 75 feet of storage is warranted.

The above mentioned warrants are continued to be met under 2023 conditions and with the projected traffic the following additional warrants are anticipated to be met:

- Northbound Valley Vista Drive at Sandy Ridge Drive met the left turn lane warrant for the 2023 PM peak hour. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Oakley Drive met the right turn lane warrant for the 2023 PM peak hour. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Amblewood Way met the right turn lane warrant for the 2023 AM peak hour. A lane with 75 feet of storage is warranted.

Signal Warrants Met

- Under existing conditions no intersection meet signal warrants.
- Under 2023 conditions, the intersection of Valley Vista Drive and Devonshire Drive during the AM Peak Hour.

LEFT TURN LANE INVESTIGATION FOR VALLEY VISTA DRIVE

Patton Township, Centre County, Pennsylvania

Trans Associates (TA) has completed the Left Turn Lane Investigation for Valley Vista Drive.

The following sections of this report contain a project description, data collection, roadway descriptions, projected traffic volumes, analysis, and conclusions and recommendations.

PROJECT DESCRIPTION/DATA COLLECTION/EXISTING ROADWAY DESCRIPTIONS

Project Description

As shown in **Figure 1**, the analysis consists of four (4) study intersections located along Valley Vista Drive in Patton Township, Centre County, PA.

In accordance with a scope of study developed through discussions with Patton Township, the following intersections were selected for study:

- Amblewood Way
- Oakley Drive/Private Driveway
- Sandy Ridge Drive/Church Entrance
- Devonshire Drive

Data Collection

Manual turning movement counts were performed by TA at each of the existing study intersections/driveways from 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. in September 2013. The results of the manual turning movement counts performed are presented in **Figure 2**. Summaries of the data collected during the manual turning movement counts at each of the study intersections has been included in **Appendix A** to this report.

The overall peak hours determined from these counts are as follows:

- A.M. Peak Hour – 7:30 A.M. to 8:30 A.M.
- P.M. Peak Hour – 4:30 P.M. to 5:30 P.M.

During the counts, notes were made concerning the operations of the intersections. They are as follows:

1. **Amblewood Way:** This intersection experienced a large amount of queuing on the southbound approach. Queues in excess of 5 cars were observed. Drivers occasionally went around the queue on the shoulder. Traffic on Amblewood experienced significant delays due to sparsely spaced sufficient gaps. A few drivers were observed aggressively darting into the intersection from Amblewood Way during very small gaps, nearly causing a crash.
2. **Oakley Drive:** Minimal turning movements at this intersection, therefore, no observations of note were made at this intersection.
3. **Sandy Ridge Drive / Church Driveway:** During the AM peak, a few short queues were observed for the southbound left. The westbound and eastbound approaches had minimal delays. Drivers at this intersection did not go around stopped vehicles. During the PM peak, the church driveway saw only one vehicle. The Sandy Run Rd. approach had a few turning vehicles, which experienced minimal delays due to Valley Vista Drive traffic.
4. **Devonshire Drive:** At this intersection, there were queues of 2 or 3 vehicles observed for the southbound approach in both the AM and PM peak hours. However, many drivers bypassed the left turning vehicle by driving onto the shoulder and the grass. Thereby,

reducing the number of vehicles queued and the frequency of queues observed. A picture of the shoulder is shown in **Appendix B**, Photo #15. Westbound approach had minor delays due to traffic on Valley Vista Drive.

Sight Distance Measurements were performed at each intersection to determine the adequacy of sight at each intersection for the following movements:

1. Left Turn from Minor Street entering Major Street;
2. Right Turn from Minor Street entering Major Street;
3. Vehicle approaching Left Turning Vehicle from behind on Major Street, and
4. Vehicle approaching Left Turning Vehicle from opposing direction on Major Street.

In order to properly measure the prevailing sight distance needed, the 85th percentile speed (the speed at which 85 percent of the vehicles identified during the conduct of the study were traveling at or below) was determined for each of the intersections. The 85th percentile sheets can be found in **Appendix B**. In most cases the 85th percentile speed exceeded the posted speed limit of 35 MPH. The maximum 85th percentile score was 45 MPH and was observed on the southbound approach to Devonshire Drive.

This 85th percentile is also used to calculate the required sight distance. **Table 1** presents the sight distance requirements and measurements. As presented in the table, looking left from Sandy Ridge Drive onto Valley Vista Drive and a vehicle approaching a left turning vehicle from the opposing direction on Valley Vista Drive are both deficient in sight distance. This is largely due to the fence located on the southwest corner and the overgrown trees and vegetation. A picture of the fence is shown in **Appendix B**, Photo #5.

Crash History Examination

Crash data for the four (4) intersections were requested from Patton Township. The reports analyzed included the five (5) most recent years of crashes reported.

Based on the crash reports received, there have been a total of four (4) reportable and non-reportable crashes that have occurred over the previous five (5) calendar years. A listing is provided below:

1. 8/10/2009, 0837, Valley Vista Drive @ Oakley Drive REPORTABLE

Vehicle traveling on Valley Vista Drive swerved to avoid a vehicle pulling out from Oakley Drive, left roadway and struck a tree.

No citations. Towing required for 1 vehicle. No injuries.

2. 10/26/2009, 0706, Valley Vista Drive @ Amblewood Way NON-REPORTABLE

Unit #2 stopped on Valley Vista Drive to turn left onto Amblewood Way. Unit #1 rear ended Unit #2.

No citations. No towing required. No injuries reported.

3. 4/12/2011, 0836, Valley Vista Drive @ Devonshire Drive NON-REPORTABLE

Unit #2 stopped behind vehicles waiting to turn left onto Devonshire Drive was rear ended by Unit #1.

No citations. No towing required. No injuries reported.

4. 8/26/2011, 1350, Valley Vista Drive @ Amblewood Way REPORTABLE

Unit #2 was stopped, waiting to turn left onto Amblewood Way when it was rear ended by Unit #1.

Driver #1 cited for Failure to Drive Vehicle at Safe Speed. Both vehicles towed. One minor injury - self transport to ER. Combining these records with the reported crashes at S.R. 0879 and the S.R. 8009 On/Off ramps yields a total of twenty-two crashes.

In accordance with Pennsylvania Department of Transportation (PennDOT) Publication 212, *Official Traffic Control Devices*, 2006, a crash problem does not exist unless five (5) or more reportable crashes with similar causation factors occur during a continuous 12-month period. This does not occur at any of the study intersections.

Existing Roadway Descriptions

A field reconnaissance of the study area was conducted by TA to obtain information on roadway widths, roadway grades, and posted speed limits within the environs of each of the study intersections. A description of the study roadways is as follows:

Valley Vista Drive – At its intersection with Devonshire Drive, Valley Vista Drive provides a 30-foot cartway with 4' northbound and southbound shoulders. Valley Vista Road provides an 11' one (1) lane approach to Devonshire Drive (shared through and right), and an 11' one (1) lane approach southbound (shared left and through). Valley Vista Drive is curbed on the northbound side. The posted speed limit of Valley Vista Road is 35 miles per hour.

At its intersection with Sandy Ridge Drive/Church Driveway, Valley Vista Drive provides a 30-foot cartway with 4' northbound and southbound shoulders. Valley Vista Road provides an 11' one (1) lane approach to Sandy Ridge Drive/Church Driveway (shared left, through and right), and an 11' one (1) lane approach southbound (shared left, through and right). Valley Vista Drive is curbed on the northbound side. The posted speed limit of Valley Vista Road is 35 miles per hour.

At its intersection with Oakley Drive/Private Driveway, Valley Vista Drive provides a 30-foot cartway with 4' northbound and southbound shoulders. Valley Vista Road provides an 11' one (1) lane approach to Sandy Ridge Drive/Church Driveway (shared left, through and right), and an 11' one (1) lane approach southbound (shared left, through and right). Valley Vista Drive is curbed on the northbound side. However, traveling northbound after the intersection the roadway is uncurbed on both sides. The posted speed limit of Valley Vista Road is 35 miles per hour. This intersection is situated on a steep grade of +10% southbound and -11% northbound.

At its intersection with Amblewood Way, Valley Vista Drive provides a 30-foot cartway with 4' northbound and southbound shoulders. Valley Vista Road provides an 11' one (1) lane approach to Sandy Ridge Drive/Church Driveway (shared left, through and right), and an 11' one (1) lane approach southbound (shared left, through and right). Valley Vista Drive is uncurbed on both sides of the roadway. The posted speed limit of Valley Vista Road is 35 miles per hour. This intersection is situated on a steep grade of +10% southbound and -11% northbound.

Photographs and sketches of each of the intersections have been included in **Appendix B** to this report.

EXISTING 2013 CONDITION CAPACITY ANALYSIS

Capacity calculations were performed for 2013 existing conditions at the study intersections during the A.M. and P.M. peak hours using the methodologies published in the *Highway Capacity Manual* 2010, by the Transportation Research Board, through the use of Synchro Traffic Signal Coordination Software, Version 7 for the signalized intersections, and the Highway Capacity Software for the

unsignalized intersections. This methodology determines how well an intersection, approach to an intersection, or movement at an intersection operates, and assigns to it a Level of Service (LOS) A through F, with LOS A representing the best operating conditions and LOS F, the worst.

The results of the capacity calculations performed using existing 2013 traffic volumes are presented in **Table 2** for the weekday A.M. and P.M. peak hours. Both LOS and delay for each approach are summarized for the A.M. and P.M. peak hours.

The results of the capacity analysis performed using existing 2013 conditions revealed that each of the study intersections currently operates at an overall intersection Level of Service A during both the A.M. and P.M. peak hours. However, the westbound approach of Amblewood Way and Oakley Drive operate at LOS E.

Copies of the capacity analysis performed using existing 2013 conditions are included in **Appendix C** to this report.

PROJECTED 2023 TRAFFIC VOLUMES

Analyses of the conditions within the study area on Valley Vista Drive were projected 10 years into the future. In order to generate an accurate rate of traffic growth, PennDOT Traffic Planning was contacted to obtain historical records from a counting station located on Valley Vista Drive, located just north of Bachman Lane.

The information obtained and the calculation of a rate to use can be found in **Appendix D**. From 2000 to 2013 there has been a 3,614 increase in vehicular traffic amounting to a 44% increase. Over a 13 year period this yields 3.4% increase per year. In consideration of the side streets, no increase was made to the side street traffic given that the lots which access the side streets are built out and developed.

The growth rate was applied to the existing 2013 traffic volumes to estimate the forecasted 2023 traffic volumes. The resultant forecasted 2023 traffic volumes are presented in **Figure 3**.

PROJECTED 2023 CONDITION CAPACITY ANALYSIS

Capacity calculations were performed using forecasted 2023 condition traffic volumes during the weekday A.M and P.M. peak hours. The results of the capacity calculations performed using forecasted 2023 condition traffic volumes are presented in **Table 2**.

The results of the capacity analysis performed using forecasted 2023 traffic volumes revealed that each of the study intersections will continue to operate at an overall intersection LOS A. However, several approaches degrade.

In the AM Peak Hour:

- The westbound approach of Amblewood Way degrades from a LOS E with 39.5 seconds of delay to LOS F with 132.2 seconds of delay.
- The eastbound approach of Private Drive at Oakley Drive degrades from a LOS E with 44.7 seconds of delay to LOS F with 98.0 seconds of delay.
- The westbound approach of Oakley Drive degrades from a LOS C with 22.4 seconds of delay to LOS E with 44.3 seconds of delay.
- The eastbound approach of Sandy Ridge Drive degrades from a LOS C with 22.8 seconds of delay to LOS E with 41.3 seconds of delay.
- The eastbound approach of Devonshire Drive degrades from a LOS D with 28.2 seconds of delay to LOS F with 78.0 seconds of delay.

In the PM Peak Hour:

- The westbound approach of Amblewood Way degrades from a LOS E with 35.7 seconds of delay to LOS F with 91.7 seconds of delay.
- The westbound approach of Oakley Drive degrades from a LOS C with 21.5 seconds of delay to LOS E with 37.3 seconds of delay.
- The eastbound approach of Sandy Ridge Drive degrades from a LOS C with 23.8 seconds of delay to LOS E with 46.5 seconds of delay.
- The eastbound approach of Devonshire Drive degrades from a LOS D with 27.6 seconds of delay to LOS F with 57.3 seconds of delay.

The degradations are a direct result of the forecasted traffic on Valley Vista Drive.

Copies of the capacity analysis performed using 2023 conditions are included in **Appendix E** to this report.

ADDITIONAL ANALYSIS

Additional analyses performed included a traffic signal warrant evaluation, an auxiliary turn lane warrant evaluation, a queuing analysis, a left turn signal phasing analysis, and a sight distance evaluation.

Traffic Signal Warrant Analysis

Existing and forecasted traffic volumes at each of the unsignalized study intersections were compared with PennDOT warrants for the installation of traffic signal control. The Peak Hour Volume warrant was used to determine whether warrants for the installation of traffic signal control are satisfied.

No intersections are anticipated to warrant a signal under any peak hour or scenario studied with the exception of Devonshire Drive under 2023 AM Peak conditions. Given that the peak hour was warranted at this intersection, TA investigated the 4-Hour warrant for this intersection to further define the legitimacy of traffic signal installation at this intersection. The 4-Hour warrant was not met. Therefore, signal installation under the scenarios studied, cannot be justified.

Worksheets used to evaluate the warrants for the installation of traffic signal control are included in **Appendix F** of this report.

Auxiliary Turn Lane Warrant Analysis

Existing and forecasted traffic volumes at each of the study intersections were compared with PennDOT guidelines for the consideration of the installation of auxiliary turn lanes. These warrants are found in PennDOT Publication 46, *Traffic Engineering Manual*, 2013.

Turn lane warrant analysis was performed for both left and right turns for the four study intersections along Valley Vista Drive. The following intersection approaches met warrants under existing conditions:

- Southbound Valley Vista Drive at Devonshire Drive met the left turn lane warrant for both AM and PM existing peak hours. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Devonshire Drive met the right turn lane warrant for the PM peak hour. A lane with 75 feet of storage is warranted.
- Southbound Valley Vista Drive at Oakley Drive met the left turn lane warrant for the PM existing peak hour. A lane with 75 feet of storage is warranted.

- Southbound Valley Vista Drive at Amblewood Way met the left turn lane warrant for both AM and PM existing peak hours. A lane with 75 feet of storage is warranted.

The above mentioned warrants are continued to be met under 2023 conditions and with the projected traffic the following additional warrants are anticipated to be met:

- Northbound Valley Vista Drive at Sandy Ridge Drive met the left turn lane warrant for the 2023 PM peak hour. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Oakley Drive met the right turn lane warrant for the 2023 PM peak hour. A lane with 75 feet of storage is warranted.
- Northbound Valley Vista Drive at Amblewood Way met the right turn lane warrant for the 2023 AM peak hour. A lane with 75 feet of storage is warranted.

Worksheets used to evaluate the need for auxiliary turn lanes, including the graphs upon which the need for auxiliary turn lanes are based, have been included in **Appendix G** of this report. Furthermore, a table depicting what and when warrants are met is included in **Table 3**.

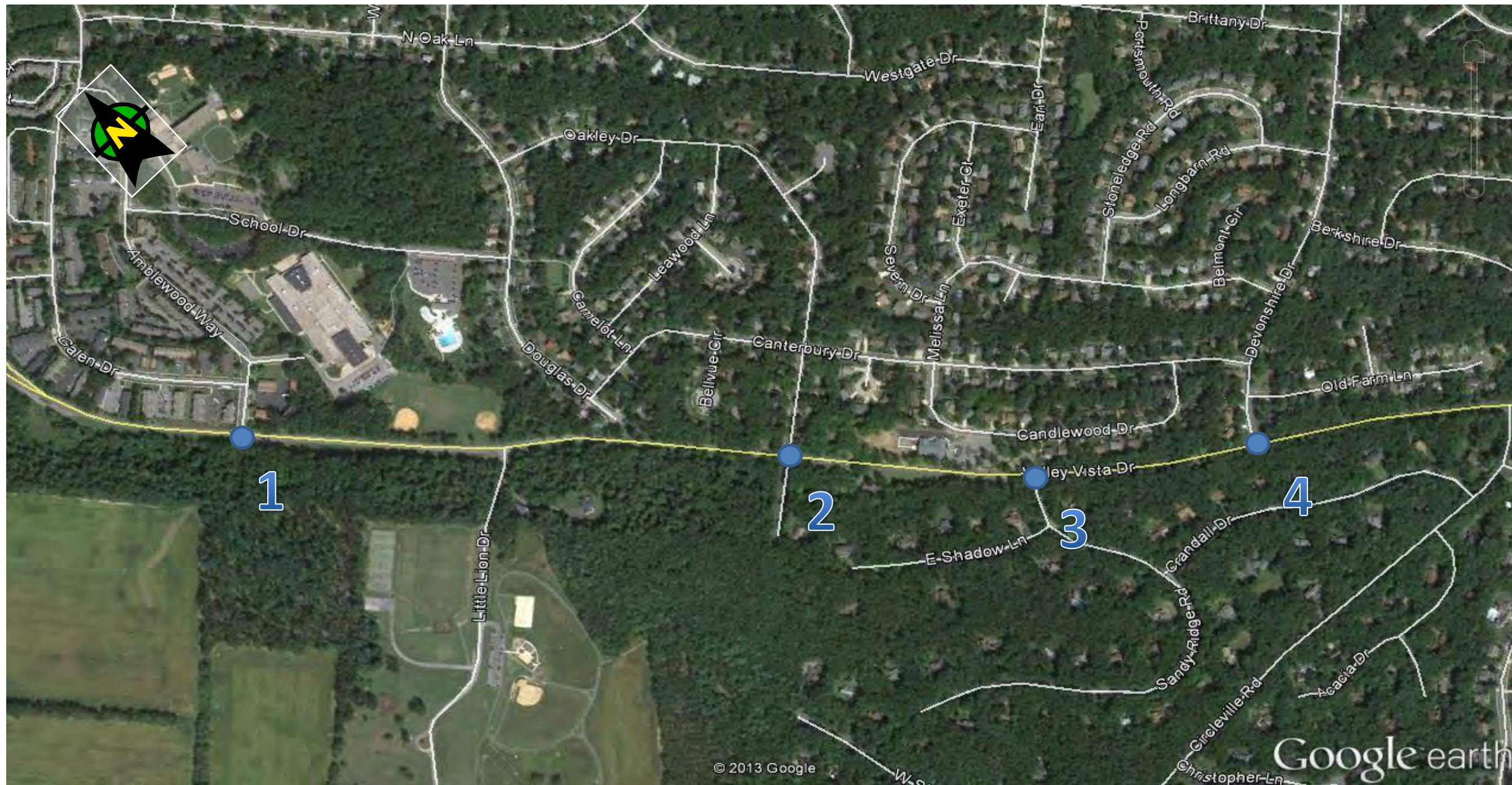
CONCLUSIONS/RECOMMENDATIONS

In consideration of the turn lanes warranted, a scale of priority has been made to determine the first intersection to receive improvements. The scale is based on several factors, such as:

- Crash History;
- Field Observations;
- Sight Distance;
- Scenarios Met, and
- Degree that the turn lanes are met.


Table 4 presents a matrix depicting the priorities. In review of the above factors, the southbound left on Valley Vista Drive at Amblewood Way should be given the highest priority for installation. In addition to the factors analyzed, another safety factor plays a role at Amblewood Way, Park Forest Middle School. This intersection directly handles a large amount of school buses, student pickups and drop offs. In turn, this makes installation of the southbound left at Amblewood Way at Valley Vista Drive the highest priority for Patton Township to install with the southbound left at Devonshire next followed by the northbound left at Sandy Ridge Road.

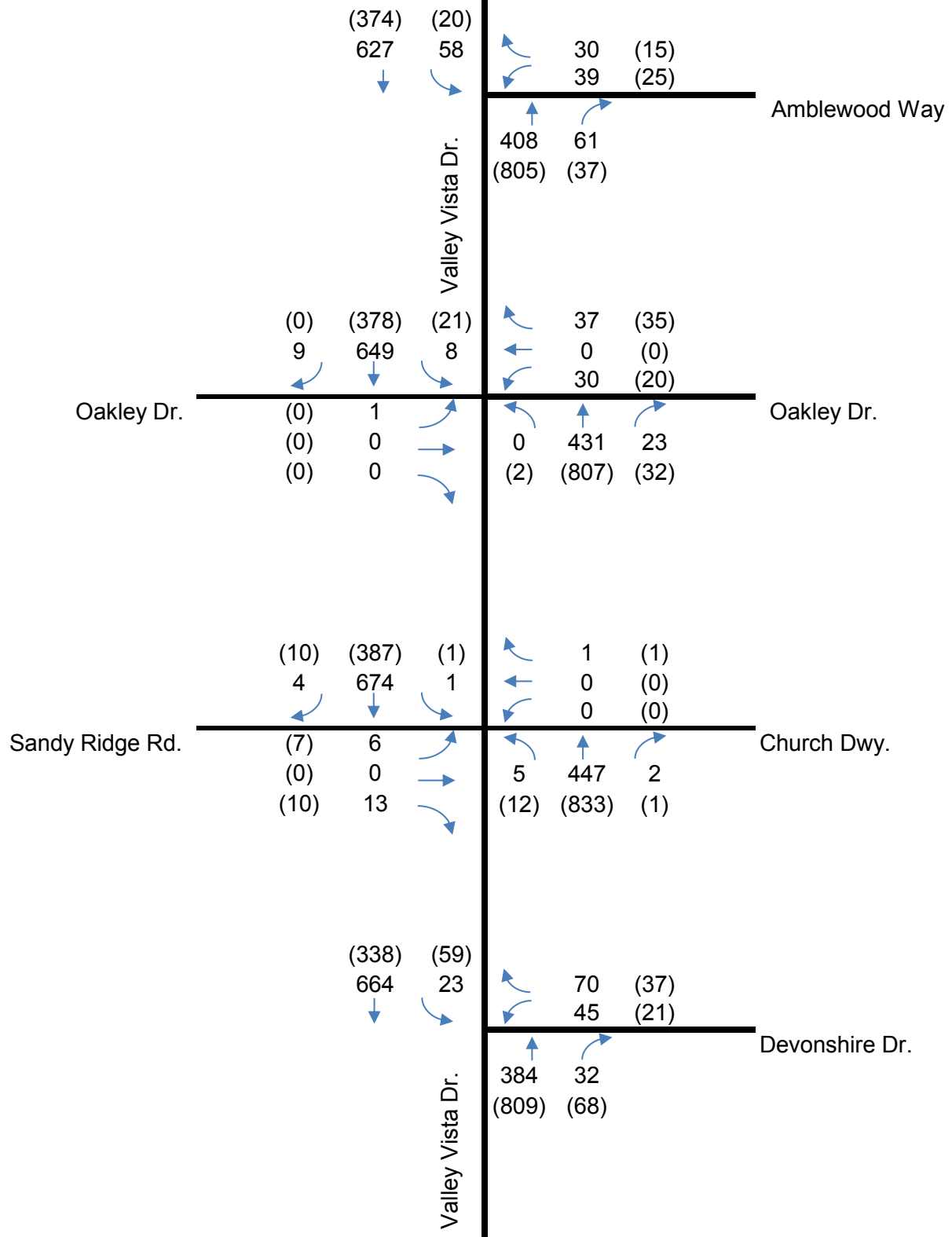
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- 1. Valley Vista Drive and Amblewood Way
- 2. Valley Vista Drive and Oakley Drive
- 3. Valley Vista Drive and Sandy Ridge Drive
- 4. Valley Vista Drive and Devonshire Drive

● STUDY INTERSECTION

Trans Project No.13311	VALLEY VISTA DRIVE LEFT TURN LANE INVESTIGATION STUDY	FIGURE 1
	Patton Township, Centre County, PA	SITE LOCATION MAP



X - AM Peak Hour
(X) - PM Peak Hour



Transportation Solutions for Today and Tomorrow
301 Science Park Road, Suite 126
State College, Pennsylvania 16803

SCALE: N.T.S.

PROJECT NO. Patto00 - 13311

PROJECT:

Valley Vista Improvements Study

TITLE:

2013 Existing Traffic Volumes

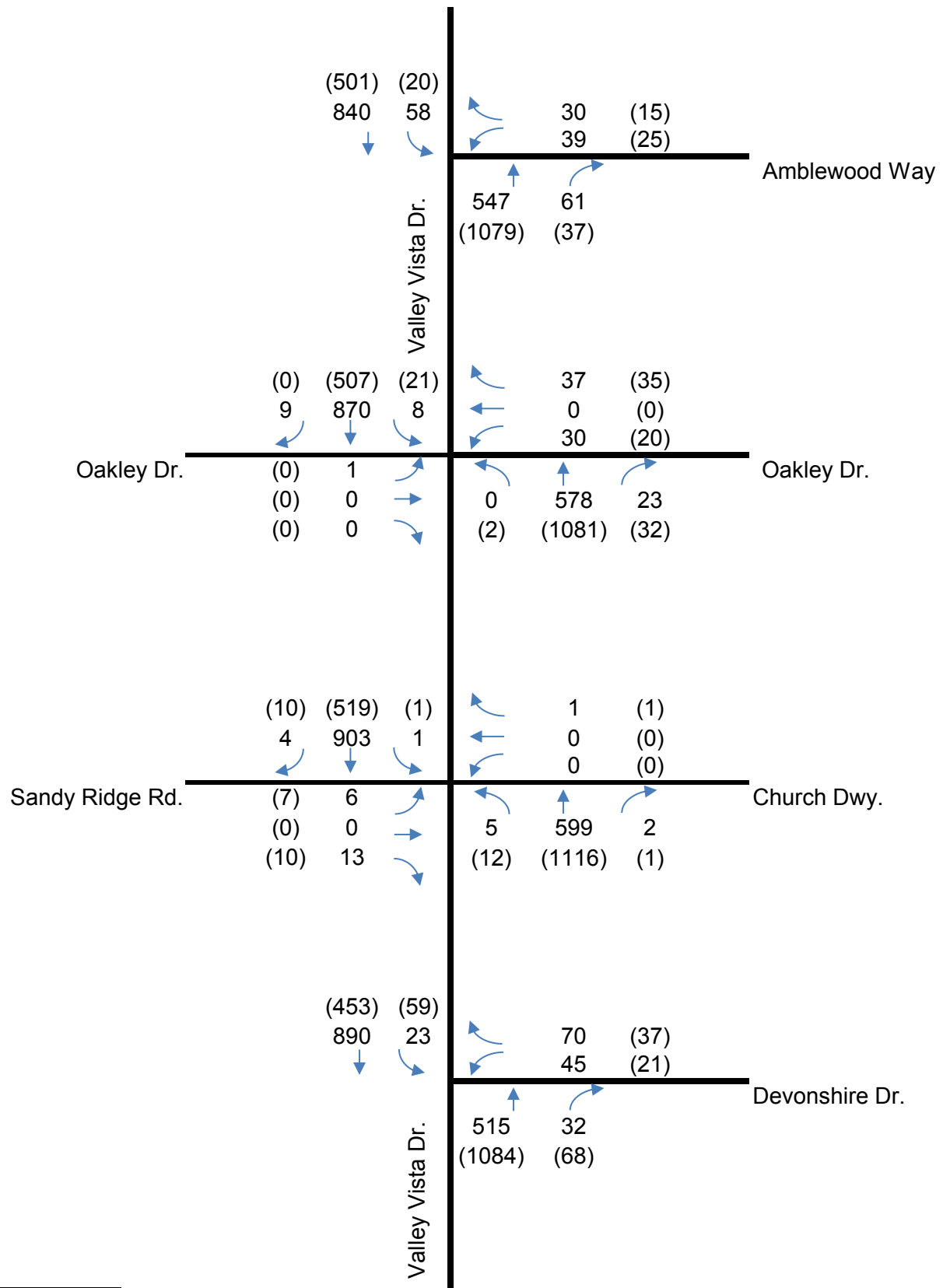
FIGURE

2

D.B. WRR

C.B.

REV.



X - AM Peak Hour
 (X) - PM Peak Hour



		PROJECT NO. Patto00 - 13311	FIGURE
		PROJECT: Valley Vista Improvements Study	3
SCALE: N.T.S.	Transportation Solutions for Today and Tomorrow 301 Science Park Road, Suite 126 State College, Pennsylvania 16803	TITLE: 2023 Traffic Volumes	D.B. WRR
			C.B.
			REV.

TABLE 1
SIGHT DISTANCE SUMMARY
Valley Vista Improvements Study
Patton Township, Centre County, Pennsylvania

Location	85th Percentile Speed (mph)	Approaching Roadway Grade (%)	Measured Sight Distance ⁽¹⁾	Required Sight Distance ⁽²⁾ (ft)	Sufficient?
Valley Vista Rd. at Amblewood Way					
Looking Left from Amblewood Way	43 MPH	-3	421	352	YES
Looking Right from Amlewood Way	43 MPH	1	592	330	YES
Rear approaching vehicle	43 MPH	1	666	330	YES
Left-turning vehicle	43 MPH	-3	430	352	YES
Valley Vista Rd. at Oakley Dr.					
Looking Left from Oakley Dr. (NB)	36 MPH	-11	455	314	YES
Looking Right from Oakley Dr. (SB)	42 MPH	9	800	289	YES
Rear approaching vehicle	42 MPH	9	800	289	YES
Left-turning vehicle	36 MPH	-11	455	314	YES
Valley Vista Rd. at Sandy Ridge Rd.					
Looking Left from Sandy Ridge (SB)	42 MPH	-3	325	339	NO
Looking Right from Sandy Ridge (NB)	42 MPH	6	810	299	YES
Rear approaching vehicle	42 MPH	6	553	299	YES
Left-turning vehicle	42 MPH	-3	335	339	NO
Valley Vista Rd. at Church Driveway					
Looking Left from Driveway (NB)	42 MPH	6	345	299	YES
Looking Right from Driveway (SB)	42 MPH	-3	375	339	YES
Rear approaching vehicle	42 MPH	-3	375	339	YES
Left-turning vehicle	42 MPH	6	807	299	YES
Valley Vista Rd. at Devonshire Dr.					
Looking Left from Devonshire (NB)	45 MPH	6	510	331	YES
Looking Right from Devonshire (SB)	40 MPH	-6	570	332	YES
Rear approaching vehicle	40 MPH	-6	900	332	YES
Left-turning vehicle	45 MPH	6	518	331	YES

(1) Measured safe stopping sight distances determined in accordance with PennDOT M950-S form at 14.5' back from the edge of traveled way.

(2) Minimum required safe stopping sight distances determined in accordance with AASHTO Green Book, 2004.

TABLE 2
LEVEL OF SERVICE SUMMARY
Turn Lane Investigation for Valley Vista Drive
Patton Township, Centre County, Pennsylvania

Node	Intersection	Direction	Movement/ Approach	Level of Service (Delay) ⁽¹⁾			
				A.M. Peak Hour		P.M. Peak Hour	
				2013 Existing	2023 Conditions	2013 Existing	2023 Conditions
1	Valley Vista Dr. at Amblewood Way	Westbound <i>Amblewood Way</i>	Approach	E (39.5)	F (132.2)	E (35.7)	F (91.7)
		Northbound <i>Valley Vista Dr.</i>	Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Southbound <i>Valley Vista Dr.</i>	Approach	A (0.7)	A (0.6)	A (0.5)	A (0.5)
		Overall Intersection		A (2.6)	A (6.1)	A (1.3)	A (2.3)
2	Valley Vista Dr. at Oakley Dr.	Eastbound <i>Private Dr.</i>	Approach	E (44.7)	F (98.0)	0	0
		Westbound <i>Oakley Dr.</i>	Approach	C (22.4)	E (44.3)	C (21.5)	E (37.3)
		Northbound <i>Valley Vista Dr.</i>	Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Southbound <i>Valley Vista Dr.</i>	Approach	A (0.1)	A (0.1)	A (0.5)	A (0.5)
		Overall Intersection		A (2.2)	A (3.3)	A (3.0)	A (4.0)
3	Valley Vista Dr. at Sandy Ridge Rd. and Church Driveway.	Eastbound <i>Sandy Ridge Rd.</i>	Approach	C (22.8)	E (41.3)	C (23.8)	E (46.5)
		Westbound <i>Church Driveway.</i>	Approach	B (11.6)	B (13.3)	C (16.2)	C (22.2)
		Northbound <i>Valley Vista Dr.</i>	Approach	A (0.1)	A (0.1)	A (0.1)	A (0.1)
		Southbound <i>Valley Vista Dr.</i>	Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Overall Intersection		A (0.4)	A (0.6)	A (0.4)	A (0.6)
4	Valley Vista Dr. at Devonshire Dr.	Eastbound <i>Devonshire Dr.</i>	Approach	D (28.2)	F (78.0)	D (27.6)	F (57.3)
		Northbound <i>Valley Vista Dr.</i>	Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Southbound <i>Valley Vista Dr.</i>	Approach	A (0.3)	A (0.2)	A (1.5)	A (1.4)
		Overall Intersection		A (2.8)	A (5.8)	A (1.6)	A (2.3)

(1) Level of Service and vehicular delay calculated using methodologies published in *Highway Capacity Manual 2010*, published by the Transportation Research Board, 2010.

TABLE 3
WARRANT SUMMARY
Turn Lane Investigation for Valley Vista Drive
Patton Township, Centre County, Pennsylvania

Intersection	Movement				
		2013		2023	
		AM	PM	AM	PM
Valley Vista Dr. at Devonshire Drive	Southbound Left <i>Valley Vista Dr.</i>	YES	YES	YES	YES
	Northbound Right <i>Valley Vista Dr.</i>	NO	YES	NO	YES
	Signal	NO	NO	YES	NO
Valley Vista Dr. at Sandy Ridge Rd. and Church Driveway.	Northbound Left <i>Valley Vista Dr.</i>	NO	NO	NO	YES
	Southbound Left <i>Valley Vista Dr.</i>	NO	NO	NO	NO
	Northbound Right <i>Valley Vista Dr.</i>	NO	NO	NO	NO
	Southbound Right <i>Valley Vista Dr.</i>	NO	NO	NO	NO
	Signal	NO	NO	NO	NO
Valley Vista Dr. at Oakley Drive	Northbound Left <i>Valley Vista Dr.</i>	NO	NO	NO	NO
	Southbound Left <i>Valley Vista Dr.</i>	NO	YES	NO	YES
	Northbound Right <i>Valley Vista Dr.</i>	NO	NO	NO	YES
	Southbound Right <i>Valley Vista Dr.</i>	NO	NO	NO	NO
	Signal	NO	NO	NO	NO
Valley Vista Dr. at Amblewood Way	Southbound Left <i>Valley Vista Dr.</i>	YES	YES	YES	YES
	Northbound Right <i>Valley Vista Dr.</i>	NO	YES	YES	YES
	Signal	NO	NO	NO	NO

TABLE 4
Priority Scale for Left Turn Lane
Turn Lane Investigation for Valley Vista Drive
Patton Township, Centre County, Pennsylvania

Intersection	Movement	Priority Factors					
		Crash History	Field Observations	Sight Distance	Degree of Warrant Met	Scenarios Met	Overall
Valley Vista Dr. at Ambewood Way	Southbound Left <i>Valley Vista Dr.</i>	2	>5 car queue SB, but since no curb, cars drive around stopped vehicles	Met	54% higher	4 of 4	1
Valley Vista Dr. at Oakley Driveway	Northbound Left <i>Valley Vista Dr.</i>	0	0 car queue	Not Met	13% higher	1 of 4	3
Valley Vista Dr. at Devonshire Drive	Southbound Left <i>Valley Vista Dr.</i>	1	<3 car queue SB, but since no curb, cars drive around stopped vehicles	Met	49% higher	4 of 4	2