ENGINEERING

&

TRAFFIC STUDY

for

Upper Providence Township

Study Location:
Farnum Road

July 26, 2022

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TRAFFIC STUDY

Pursuant to your request our office has performed a Traffic Calming Study to determine whether Farnum Road would benefit from implementation of traffic calming measures. In following the guidelines set forth in Pennsylvania's Traffic Calming Handbook PennDOT Publication 383, the determination of a roads traffic calming eligibility focuses largely on Average Daily Traffic volume and speeding.

Roadway data:

Farnum Road (T-354)
Local Road
Residential Use
Posted speed limit: 25mph
Roadway Width: Approximately 20-feet
Roadway Length: 1.03 miles
Properties along roadway: 76
ADT: <1000

5-Year Crash Data:

Date	Description	Severity	Cause
9/8/2020	1 vehicle hit mailbox	No Injury	Sun Glare
2/2/2021	1 vehicle hit utility pole	No Injury	Sun Glare
5/1/2021	Operator hit 2 parked vehicles	1 Injury	DUI Related (Operator became unconscious)
12/16/2021	2 vehicle accident	No Injury	DUI Related
*12/29/2004	1 vehicle roll over	1 Injury	

*Older than last 5-years

Local municipalities are authorized by the Vehicle Law of Pennsylvania (Title 75) to install speed limit signs and other traffic control devices on any roadway within their geographical boundaries. However, these devices can only be installed after the required engineering and traffic studies have been completed. The study criteria and procedures required for the implementation of the various traffic restrictions such as lower speed limit signs on a public roadway are described in the Pennsylvania Department of Transportation (PennDOT) Engineering and Traffic Studies (67 PA Code, Chapter 212). Section 212.108 - Speed Limits, defines the elements of engineering and traffic studies needed to warrant a speed reduction on a public roadway.

Speed limits shall be established in accordance with 75 Pa.C.S. § 3363. The speed limit may be established in multiples of 5 miles per hour up to the maximum lawful speed. The speed limit should be within 5 miles per hour of the average 85th percentile speed or the safe-running speed on the section of highway, except the speed limit may be reduced up to 10 miles per hour below either of these values if one or more of the following conditions are satisfied:

1. A major portion of the highway has insufficient stopping sight distance if traveling at the 85th percentile speed or the safe-running speed.
2. The available corner sight distance on side roads is less than the necessary stopping sight distance values for through vehicles.
3. The majority of crashes are related to excessive speed and the crash rate during a minimum 12-month period is greater than the applicable rate in the most recent high-crash rate or high-crash

severity rate table included in the appendix of Official Traffic-Control Devices (Department Publication 212). Crashes related to excessive speed include those crashes with causation factors of driving too fast for conditions, turning without clearance or failing to yield right-of-way

In order to determine the current 85th percentile speed a Spot Speed study[1] was performed at the following locations as indicated on the enclosed location map and spot speed study layout diagram:

- Intersection of Farnum Road and Dogwood Road (Date: 2022-6-17).
- Intersection of Farnum Road and Dyanna Lane (Date: 2022-6-24).

The study was performed during both the pm peak traffic intervals with a total of 100 speed observations recorded along Farnum Road. During the study minimal pedestrian activity was observed.

The tables shown below summarizes the statistical speed values that were used to determine if a traffic problem exists:

Spot Speed Study Data		
Observation Location	**Time Mean Speed (mph)**	**85th Percentile Speed (mph)**
Farnum Road and Dogwood Road	25.5	30.7
Farnum Road and Dyanna Lane	25.6	30.2

Speed data gathered by posted radar display sign:

Location: Farnum Road - Eastbound
Address: Farnum Road
Speed Limit: From schedule 25 mph
Report Period: 2022-03-07 to 2022-07-19
Total Vehicle Count: 31992

Month	Total Vehicle	% of Speed Violations	Average Speed (mph)	50% Speed (mph)	85% Speed (mph)
March	5613	39 %	23	H 24	H 29
April	7278	37 %	23	H 24	H 29
May	H 7617	38 %	23	H 24	H 29
June	7318	37 %	23	H 24	28
July	4166	H 42 %	H 24	H 24	H 29
Summary	SUM: 31992	AVG: 39 %	AVG: 23 mph	AVG: 24 mph	AVG: 29 mph

H - highest value in the column, bolded H is highest H value in report

** "n/a" - means the sign did not collect any data at the time stipulated in the report. "n/a" values are NOT included in calculations.

CONCLUSIONS AND RECOMMENDATIONS

In summary, the traffic study and engineering analysis indicates that the posted 25 mph speed limit is within range of the 85th Percentile Speed and the average daily traffic is less than 1,000 therefore any significant traffic calming measures are not warranted. In order to maintain the current drivers speed limit and prevent future speeding we recommend less impactful traffic calming measures. Traffic calming measures to be considered are as follows:

- Educate the community with newsletters containing information on speeding fines, pedestrian and

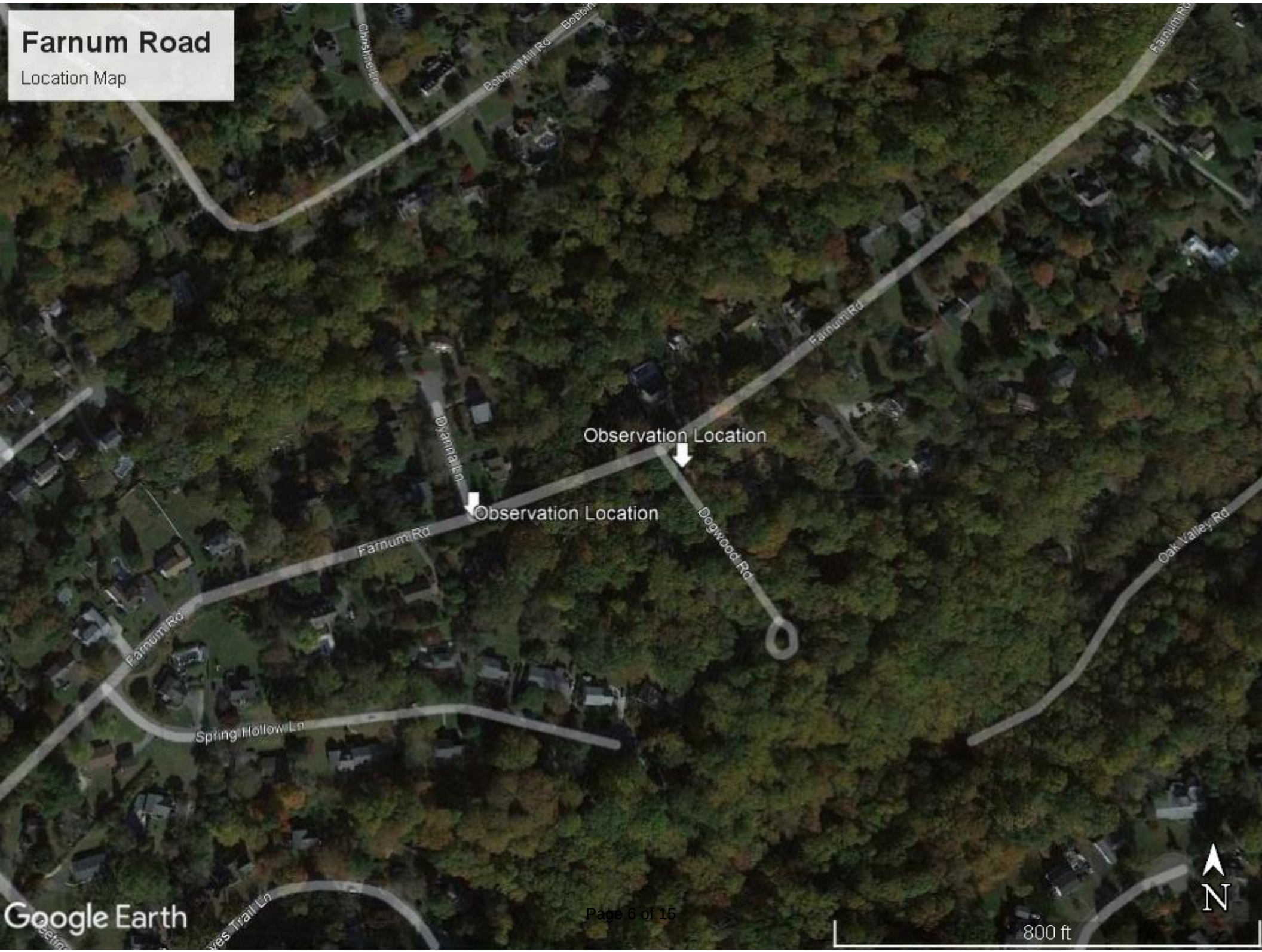
[1] A Spot speed is the instantaneous measure of travel speeds at a specific location.

bicycle safety tips, and information on average speeds throughout the neighborhood;

- Increase enforcement;
- White edge striping (Traffic Calming Handbook, Publication 383, Chapter 6 Use of Signs and Pavement Markings for Traffic Calming);
- Restripe the existing speed hump to comply with the current Manual of Traffic Control Devices;
- Relocate the existing radar display sign to the intersection of Farnum Road and Dyanna Lane to provide better visibility;

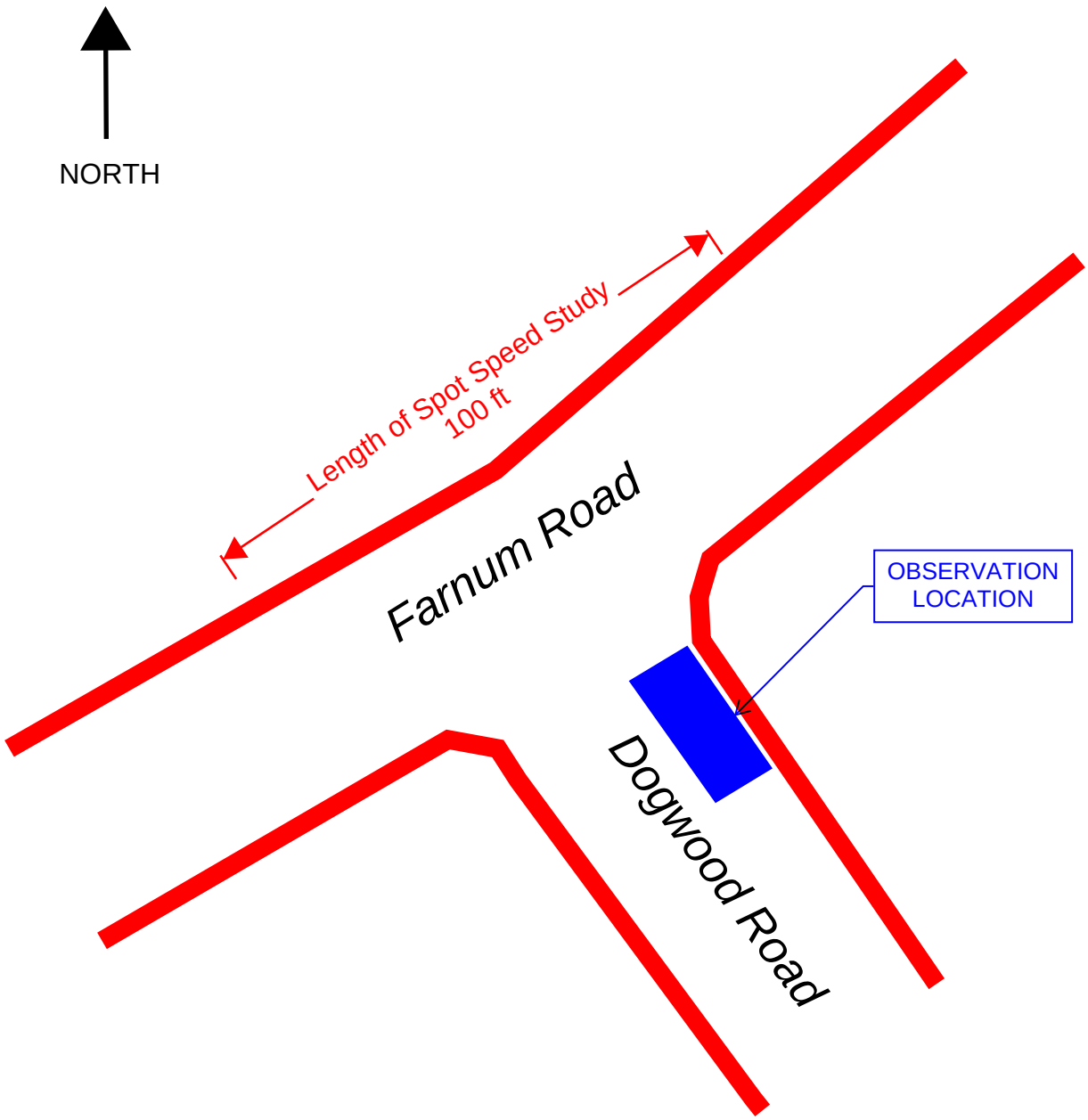
Please contact our office if you should have any questions.

APPENDIX A
Location Map


Farnum Road
Location Map
Bobbie Mill Rd
Farnum Rd
Observation Location
Observation Location
Farnum Rd
Dogwood Rd
Oak Valley Rd
Farnum Rd
Spring Hollow Ln
Google Earth
800 ft
N

APPENDIX B
Speed Distribution Analysis

Spot Speed Study Site Layout



Spot Speed Study Distribution Table

Speed (mph)	Frequency of Vehicles	Cummulative Frequency	Total Speed	Cummulative Percent	Speed Percentile
11.4	0	0	0	0%	
11.8	0	0	0	0%	
12.2	0	0	0	0%	
12.6	0	0	0	0%	
13.1	0	0	0	0%	
13.7	0	0	0	0%	
14.2	0	0	0	0%	
14.8	0	0	0	0%	
15.5	3	3	46.5	3%	
16.2	0	3	0	3%	
17.1	5	8	85.5	8%	
18	4	12	72	12%	
18.9	8	20	151.2	20%	
20.1	7	27	140.7	27%	
21.3	5	32	106.5	32%	
22.7	10	42	227	42%	50%
24.3	13	55	315.9	55%	
26.2	14	69	366.8	69%	
28.4	8	77	227.2	77%	85%
31	9	86	279	86%	
34.1	8	94	272.8	94%	
37.8	3	97	113.4	97%	
42.6	0	97	0	97%	
48.6	3	100	145.8	100%	
56.7	0	100	0	100%	
68.1	0	100	0	100%	
Total	100		2550.3		

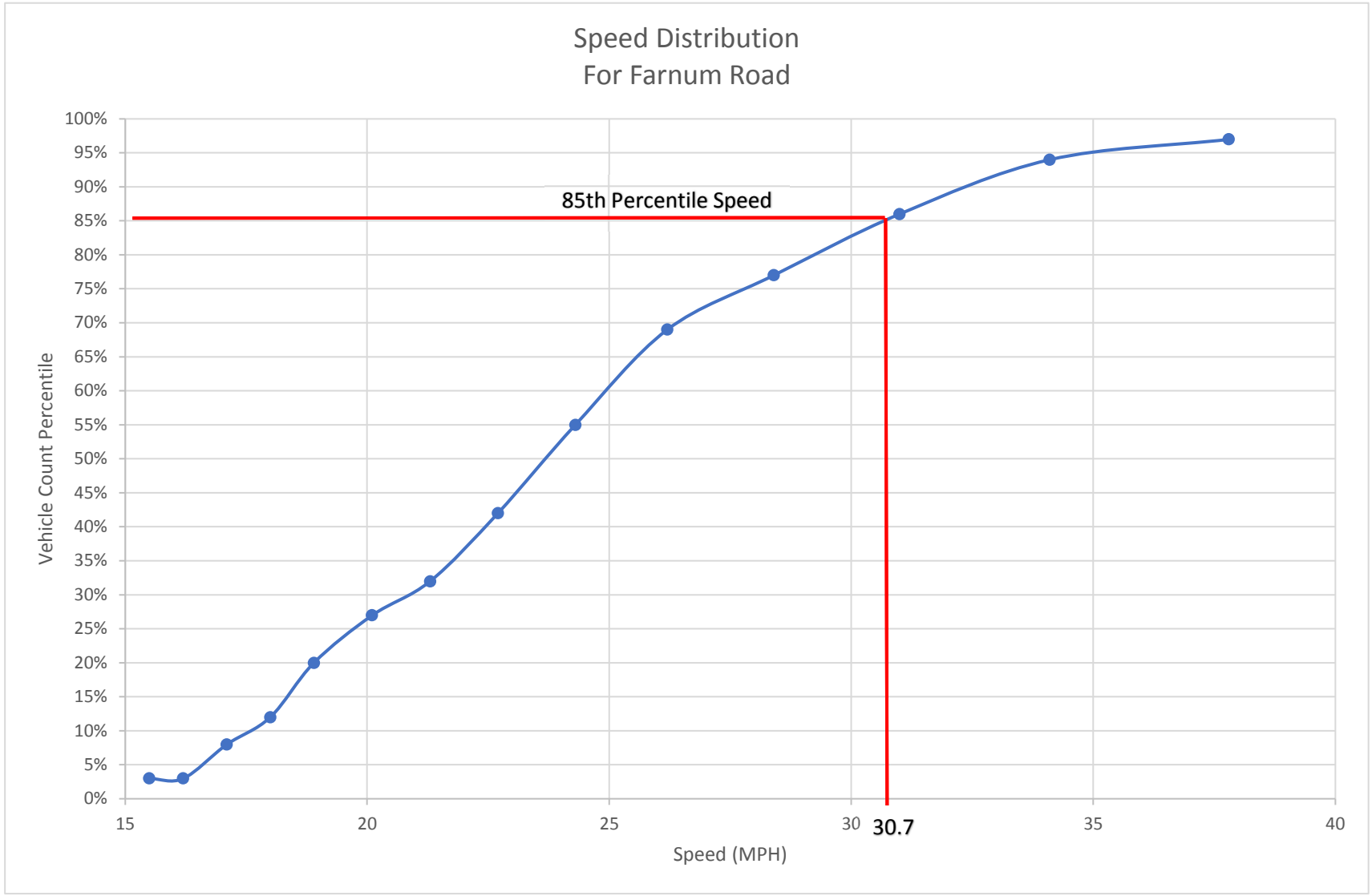
$$S_D = \frac{P_D - P_{min}}{P_{max} - P_{min}} (S_{max} - S_{min}) + S_{min}$$

S_D	Speed at P_D
P_D	Percentile Desired
P_{max}	Higher Cummulative Percent
P_{min}	Lower Cummulative Percent
S_{max}	Higher Speed
S_{min}	Lower Speed

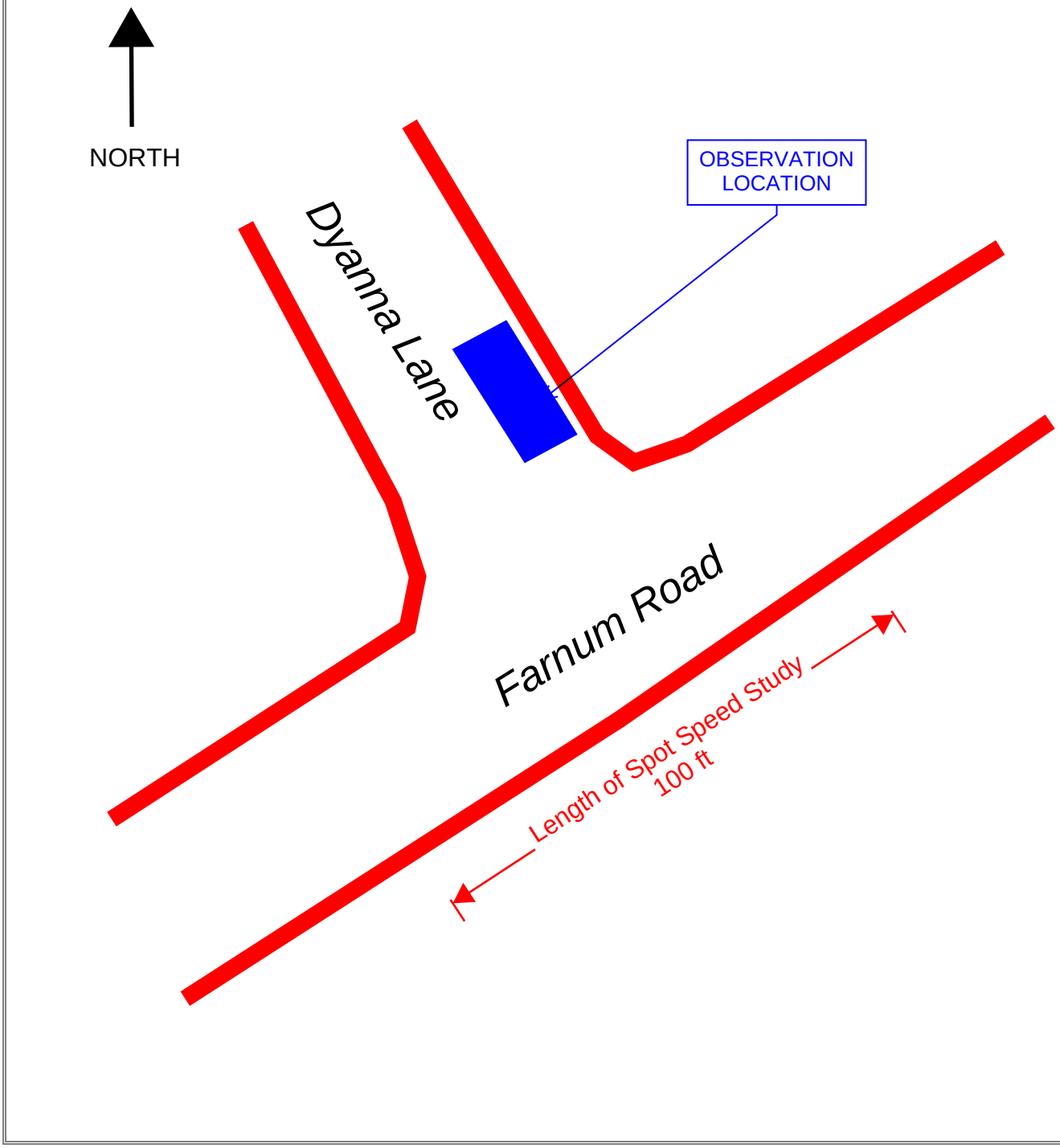
S_{D50} = 23.68

S_{D85} = 30.71

Time Mean Speed
(Average Speed) 25.5 mph
85th Percentile 30.7 mph


Speed Distribution
For Farnum Road
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Vehicle Count Percentile
85th Percentile Speed
15
20
25
30
30.7
35
40
Speed (MPH)

Spot Speed Study Site Layout



Spot Speed Study Distribution Table

Speed (mph)	Frequency of Vehicles	Cummulative Frequency	Total Speed	Cummulative Percent	Speed Percentile
11.4	0	0	0	0%	
11.8	0	0	0	0%	
12.2	0	0	0	0%	
12.6	0	0	0	0%	
13.1	0	0	0	0%	
13.7	0	0	0	0%	
14.2	0	0	0	0%	
14.8	0	0	0	0%	
15.5	0	0	0	0%	
16.2	4	4	64.8	4%	
17.1	4	8	68.4	8%	
18	0	8	0	8%	
18.9	6	14	113.4	14%	
20.1	4	18	80.4	18%	
21.3	7	25	149.1	25%	
22.7	13	38	295.1	38%	50%
24.3	13	51	315.9	51%	
26.2	16	67	419.2	67%	
28.4	11	78	312.4	78%	85%
31	10	88	310	88%	
34.1	6	94	204.6	94%	
37.8	6	100	226.8	100%	
42.6	0	100	0	100%	
48.6	0	100	0	100%	
56.7	0	100	0	100%	
68.1	0	100	0	100%	
Total	100		2560.1		

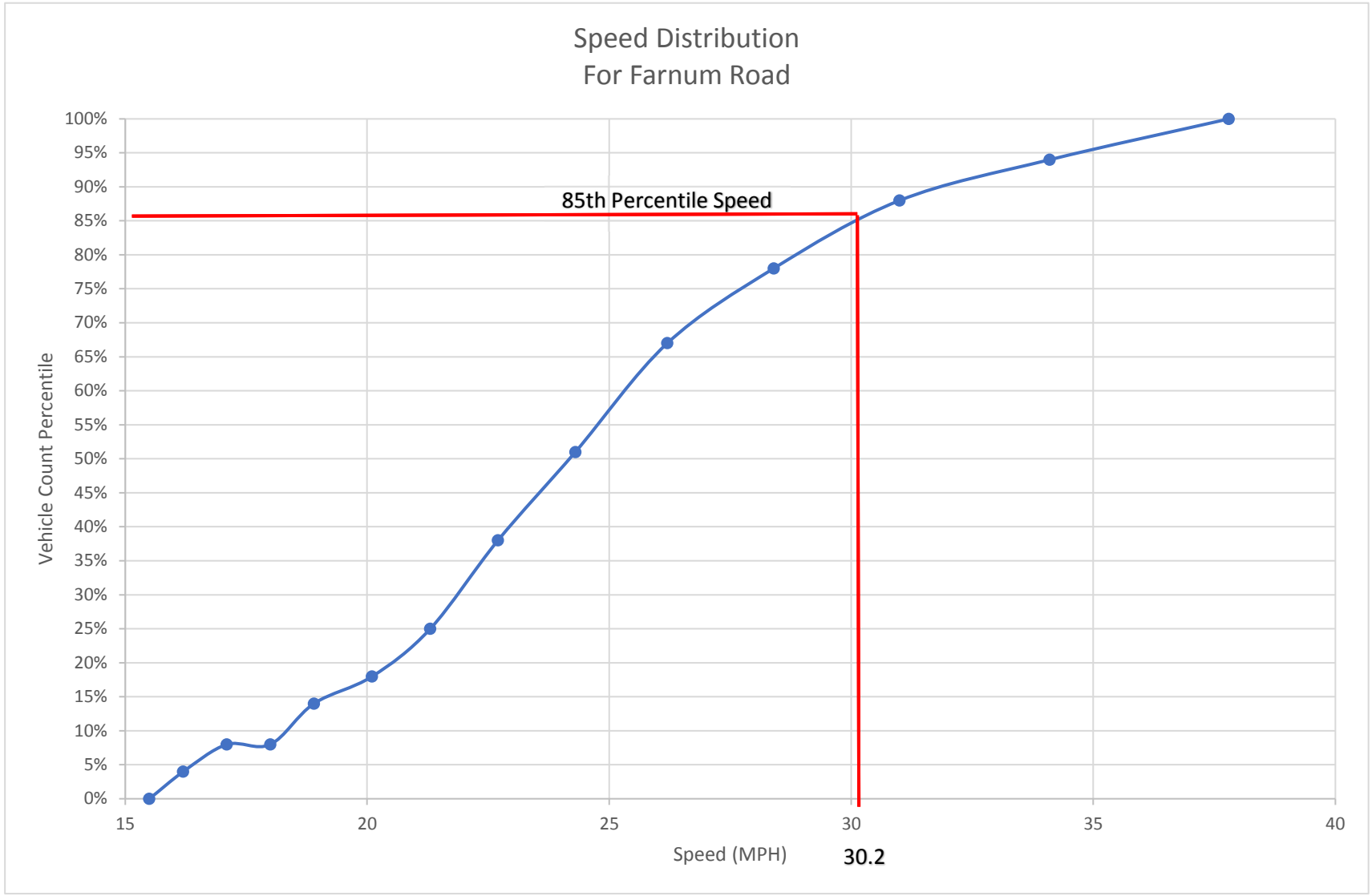
$$S_D = \frac{P_D - P_{min}}{P_{max} - P_{min}} (S_{max} - S_{min}) + S_{min}$$

S_D	Speed at P_D
P_D	Percentile Desired
P_{max}	Higher Cummulative Percent
P_{min}	Lower Cummulative Percent
S_{max}	Higher Speed
S_{min}	Lower Speed

S_{D50} = 24.18

S_{D85} = 30.22

Time Mean Speed
(Average Speed) 25.6 mph
85th Percentile 30.2 mph


Speed Distribution
For Farnum Road
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Vehicle Count Percentile
85th Percentile Speed
15
20
25
30
35
40
Speed (MPH)
30.2

APPENDIX C
Raw Data Collection Forms

Speed Data Collection Form

Date of Study:	6/17/2022	**Start Time:**		3:00pm
Person Conducting Study:	Matthew Burns, PE	**End Time:**		5:00pm
Location:	Farnum Rd & Dogwood Rd	**Interupted Time:**		
Speed Limit:	25 mph	**Weather:**		Clear

Study Length (ft):	100

Seconds	mph for study length	Passenger Vehicles Record	No.	Buses Record	No.	Heavy Trucks Record	No.	Total
1.0	68.1							0
1.2	56.7							0
1.4	48.6	3						3
1.6	42.6							0
1.8	37.8	3						3
2.0	34.1	8						8
2.2	31.0	9						9
2.4	28.4	8						8
2.6	26.2	14						14
2.8	24.3	13						13
3.0	22.7	10						10
3.2	21.3	5						5
3.4	20.1	7						7
3.6	18.9	8						8
3.8	18.0	4						4
4.0	17.1	5						5
4.2	16.2							0
4.4	15.5	3						3
4.6	14.8							0
4.8	14.2							0
5.0	13.7							0
5.2	13.1							0
5.4	12.6							0
5.6	12.2							0
5.8	11.8							0
6.0	11.4							0
Total								100

NOTES:

Speed Data Collection Form

Date of Study:	6/24/2022	**Start Time:**		**1:45pm**	
Person Conducting Study:	Matthew Burns, PE	**End Time:**		**3:45pm**	
Location:	Farnum Rd & Dyanna Ln	**Interupted Time:**			
Speed Limit:	25 mph	**Weather:**		Clear	

Study Length (ft):	100

Seconds	**mph for study length**	**Passenger Vehicles** Record	No.	**Buses** Record	No.	**Heavy Trucks** Record	No.	**Total**
1.0	68.1							0
1.2	56.7							0
1.4	48.6							0
1.6	42.6							0
1.8	37.8	6						6
2.0	34.1	6						6
2.2	31.0	10						10
2.4	28.4	11						11
2.6	26.2	16						16
2.8	24.3	13						13
3.0	22.7	13						13
3.2	21.3	7						7
3.4	20.1	4						4
3.6	18.9	6						6
3.8	18.0							0
4.0	17.1	4						4
4.2	16.2	4						4
4.4	15.5							0
4.6	14.8							0
4.8	14.2							0
5.0	13.7							0
5.2	13.1							0
5.4	12.6							0
5.6	12.2							0
5.8	11.8							0
6.0	11.4							0
Total								100

NOTES:

Speed study was performed in an earlier portion of the day to attempt to catch delivery trucks after discussions with the local neighbors whom indicated that UPS/FedEx are the major speeders.

Pedestrians: 5