

ATTACHMENT B:

# STATISTICAL ANALYSIS METHODOLOGY AND RESULTS

# TECHNICAL MEMORANDUM

To: Lonnie Burklund, PE, PTOE, Mark Lutjeharms, PE, PTOE (City of Lincoln)  
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Date: September 27, 2019  
Project: Lincoln School Zone Study  
Subject: Attachment B: Statistical Analysis Methodology and Results

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## INTRODUCTION

This memo summarizes the approach and findings from the vehicle speed study performed for 42 locations in Lincoln. This analysis was performed to evaluate the speed data characteristics associated with existing reduced-speed school zones.

## METHODOLOGY

The methodology for the statistical analysis of the vehicle speed data included data collection and data processing which is summarized below. Initial data collection efforts took place during the spring of 2018 with additional data collection during fall of 2018. Data collection included vehicle speed data and street characteristics.

## VEHICLE SPEED DATA

The City of Lincoln provided vehicle speed data collected through a data collection Consultant. Twenty-four (24) hours of vehicle speed data were collected at 42 locations throughout the City of Lincoln using stationary radar technology. The 42 locations were separated into 20 locations within a reduced-speed zone (active 30 minutes prior to arrival and 30 minutes after dismissal) and 22 control locations that were not within a reduced-speed zone. Specific locations were determined through discussions with and feedback from City staff. The locations were selected to cover a variety of street and land use contexts with a control zone to match the context of each reduced-speed zone.

Data collection activities were performed in conformance with the Institute of Transportation Engineers "Manual of Transportation Engineering Studies." The exact locations of the data collection within the reduced-speed zones and control zones were chosen to be as far away as possible from intersections in an attempt to obtain free-flow speeds which are not affected by vehicle movements (e.g., stops, turns).

Speed data was collected only on days when school was in session at the school most closely associated with the reduced-speed zone or control site. The City's street construction schedule was considered when scheduling

the data collection on specific locations to ensure the traffic patterns would not be impacted by nearby construction.

The data collection took place on weekdays (Monday through Friday) beginning on April 9, 2018 and ending on May 10, 2018 for the spring data collection and beginning on October 12, 2019 and ending on November 9, 2019 for the fall data collection. Data was collected for a consecutive 24-hours at each location.

## STREET CHARACTERISTICS

Fieldwork was performed on May 14 and 15, 2018 and March 27, 2019 to collect data on street characteristics within each reduced-speed zone and control zone. In preparation for the fieldwork some information was gathered using Google Earth. This data was confirmed in the field and any data that was not available was collected. Data collected regarding street characteristics included the following:

- Number of travel lanes
- Travel lane width
- Driveway density
- Posted speed limits & posted reduced-speed zone limits
- Start/end points for reduced-speed zone limits
- Sidewalks, crosswalks, and traffic signals

Traffic volume information about each site was also provided by the City of Lincoln. Street segments were divided into three categories:

- Low volume = ADT less than 10,000 vpd
- Medium volume = ADT greater than 10,000 and less than 20,000 vpd
- High volume = ADT greater than 20,000 vpd

## DATA PROCESSING

Vehicle speed data was provided by the Consultant in Excel format with an entry containing the date, time of day, direction, vehicle class, and vehicle speed for each vehicle in the 24-hour period. The data from these Excel sheets was processed and summarized using analysis software. The data summary includes the following:

- Average vehicle speed during the non-reduced speed period (base)
- Average vehicle speed during the reduced speed period
- 85<sup>th</sup> percentile vehicle speed during the non-reduced speed period
- 85<sup>th</sup> percentile vehicle speed during the reduced speed period
- Number of vehicles during the 24-hour count (this value represents one 24-hour sample which has not been factored to account for the day or month the data collection took place)
- Speed distribution plots

In addition to these summaries, t-tests were conducted comparing the mean vehicle speeds during the reduced speed period with the speeds during the non-reduced speed period. T-tests are statistical tests that compare the mean value of a given variable between two groups. The results of the t-tests are reported as t-statistics and p-values. Generally, a 5% significance level (i.e., p-value  $\leq$  0.05) is the standard for accepting a statistical test as showing an effect. However, this test alone does not tell whether the speed zones are “effective” – it simply indicates whether or not the difference between the mean speeds during the reduced speed period and the non-reduced speed period is due to chance alone. That is, the magnitude of the difference isn’t assessed.

To fully assess the speed data characteristics associated with the reduced-speed zones, the combination of all of the above factors must be weighed. Comparing the 85<sup>th</sup> percentile vehicle speed with the posted or reduced speed limit is a common standard for compliance with a speed limit. The speed distribution plots provide additional information beyond this simple statistic, showing how the observed vehicle speeds at each location compare with the speed limit during both time periods, with the speed limit under each condition depicted as the vertical dashed line. Generally, the more of the area under the curved line that lies to the left of the vertical line, the better the compliance.

## RESULTS

Appendix A summarizes the speed data collected at each of the 42 sites. The sites are numbered in order of posted speed limit and ADT. Table 1 includes a summary of the speed data for each of the control zones sites and Table 2 includes a summary of the speed data for each of the reduced-speed zone sites. Table 3 includes a summary of the overall speed data for the control zones and Table 4 includes a summary of the overall speed data for the reduced-speed zones.

**Table 1: Control Zone Speed summary (mph)**

Control Zone	Posted Speed Limit	ADT	Signal within Zone	Length of Zone (feet)	Distance to School (feet)	Base Average Speed	Reduced Speed Period <sup>1</sup> Average Speed	Change	Base 85 <sup>th</sup> Percentile Speed	Reduced Speed Period <sup>1</sup> 85 <sup>th</sup> %tile Speed	Change
1. Randolph Street near Lefler Middle	35	6,030	None	<500	<1,000	32	31	-1	36	36	0
2. Adams Street near Belmont Elementary	35	6,590	None	<500	<1,000	33	32	-1	36	36	0
3. S 17th Street near Trinity Methodist	35	7,220	None	<500	<1,000	28	26	-2	33	31	-2
4. W Fletcher Ave near Fredstrom Elementary	35	9,320	Mid-block	>1,000	<1,000	38	36	-2	43	41	-2
5. R Street near Culler Middle	35	9,880	Full	500-1,000	<1,000	33	32	0	37	37	0
6. S 40th Street near Bryan Community	35	11,090	None	500-1,000	Adjacent	34	34	-1	38	37	-1
7. S 48th Street near Zeman Elementary	35	13,260	Mid-block	>1,000	<1,000	36	34	-2	39	38	-1
8. A Street near Pius X Central High	35	14,510	None	500-1,000	Adjacent	28	28	0	35	35	0
9. S 40th Street near Lincoln Southeast High	35	15,100	Full	500-1,000	<1,000	35	35	1	39	39	0
10. Vine Street near Culler Middle	35	15,130	Mid-Block	<500	Adjacent	35	29	-7	40	35	-5
11. S 48th Street near Calvert Elementary	35	15,160	Full	500-1,000	<1,000	32	31	-1	36	35	-1
12. S 56th Street near Holmes Elementary	35	16,400	Mid-block	500-1,000	<1,000	35	33	-2	40	39	-1
13. S 10th Street near Saratoga Elementary	35	16,760	Full	<500	<1,000	32	32	0	38	38	0
14. Coddington Avenue near Roper Elementary	40	7,230	Mid-block	>1,000	Adjacent	38	39	1	43	44	1
15. Van Dorn Street near Lux Middle	40	8,510	Mid-Block	>1,000	<1,000	39	38	-1	43	42	-1
16. N 33rd Street near North Star High	40	8,540	Full	500-1,000	Adjacent	40	39	-1	45	43	-2
17. Normal Blvd near Christ Lutheran	40	22,250	None	500-1,000	<1,000	35	35	0	40	40	0
18. S 27th Street near Hill Elementary	40	23,830	Full	>1,000	<1,000	41	41	0	46	46	0
19. S 56th Street near College View Academy	40	24,720	None	500-1,000	<1,000	40	41	1	46	47	+1
20. S 70th Street near East High	40	29,780	Full	>1,000	Adjacent	39	38	-1	43	41	-2
21. NW 48th Street near Arnold Elementary	45	5,390	None	<500	Adjacent	42	35	-6	46	43	-3
22. N 84th Street near Kahoa Elementary	45	28,490	Full	500-1,000	<1,000	40	39	-1	47	47	0

<sup>1</sup> The Control Zone Reduced Speed Period includes the 30 minutes prior to arrival and 30 minutes after dismissal of the most closely associated school.

**Table 2: Reduced-Speed Zone Speed summary (mph)**

Reduced-Speed Zone	Posted Speed Limit	Reduced-Speed Zone Speed Limit	ADT	Signal within Zone	Length of Zone (feet)	Distance to School (feet)	Base Average Speed	Reduced Speed Period Average Speed	Change	Base 85 <sup>th</sup> Percentile Speed	Reduced Speed Period 85 <sup>th</sup> %tile Speed	Change
1. Q Street near Elliott Elementary	35	25	3,560	None	500-1,000	>1,000	29	26	-2	33	30	-3
2. Calvert Street near Calvert Elementary	35	25	5,630	Mid-block	500-1,000	<1,000	31	27	-4	35	30	-5
3. Van Dorn Street at Irving Middle	35	25	8,180	None	>1,000	Adjacent	32	27	-5	38	33	-5
4. S 33rd Street near Rousseau	35	25	9,130	Mid-block	500-1,000	Adjacent	33	22	-10	38	28	-10
5. S 40th Street near Randolph Elementary	35	25	9,590	Full	500-1,000	<1,000	30	27	-4	36	31	-5
6. Sheridan Blvd near Sheridan Elementary	35	25	10,840	Full	>1,000	>1,000	32	27	-5	37	32	-5
7. Adams Street at Huntington Elementary	35	25	12,300	Full & Mid-block	>1,000	Adjacent	33	27	-6	36	31	-5
8. S 13th Street near Saratoga Elementary	35	25	12,820	Mid-Block	500-1,000	Adjacent	33	27	-7	38	32	-6
9. Holdrege Street near Clinton Elementary	35	25	12,990	Mid-Block	>1,000	Adjacent	32	26	-6	36	30	-6
10. N 33rd Street at Hartley Elementary	35	25	14,690	Full	500-1,000	Adjacent	30	27	-4	34	31	-3
11. South Street near Saratoga Elementary	35	25	17,100	Full	<500	Adjacent	27	24	-3	34	30	-4
12. S 10th Street near Everett Elementary	35	25	17,240	Full	>1,000	<1,000	32	26	-6	37	31	-6
13. South Street near Prescott Elementary	35	25	18,190	Mid-Block	500-1,000	<1,000	35	27	-9	40	32	-8
14. N 48th Street near Riley Elementary	35	25	26,770	Mid-Block	500-1,000	<1,000	35	27	-7	39	34	-5
15. A Street near Pyrtle Elementary	40	25	11,980	Mid-Block	500-1,000	>1,000	39	29	-10	45	36	-9
16. S 56th Street near Zeman Elementary	40	25	22,690	Full	>1,000	<1,000	37	28	-9	43	34	-9
17. Superior Street near Campbell Elementary	40	25	25,600	Full	>1,000	Adjacent	37	26	-11	44	32	-12
18. S 70th Street near Morley Elementary	40	25	28,870	Mid-Block	>1,000	Adjacent	37	29	-8	43	35	-8
19. S 84th Street near Pyrtle Elementary	40	25	29,520	Full	500-1,000	>1,000	41	28	-13	46	34	-12
20. S 84th Street near Messiah Lutheran	40	25	29,880	Mid-Block	<500	Adjacent	42	27	-14	46	32	-14

**Table 3: Control Zone Average Speed summary (mph)**

Posted Speed Limit	Average Speed			85 <sup>th</sup> Percentile Speed		
	Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
<b>35</b>	33	32	<b>-1</b>	38	37	<b>-1</b>
<b>40</b>	39	39	<b>0</b>	44	43	<b>-1</b>
<b>45</b>	41	37	<b>-4</b>	47	45	<b>-2</b>

There were minimal changes in speeds in the control zones between the base period and the reduced speed period in zones with posted speed limits of 35 and 40 mph. Speed data was only collected at two control zones with posted speed limits of 45 mph. One of these zones, NW 48<sup>th</sup> Street near Arnold Elementary experienced a reduction of six mph in the reduced speed period average speed. This zone is located on the outskirts of the City, adjacent to the school which may contribute to the change of 4 mph for the 45 mph posted speed limit control zones. In the zones with posted speed limits of 35 mph and 40 mph, the average and 85<sup>th</sup> percentile speeds either stayed the same or dropped by one mph during the reduced speed period compared to the base period.

**Table 4: Reduced-Speed Zone Average Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Average Speed			85 <sup>th</sup> Percentile Speed		
		Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
<b>35</b>	25	32	26	<b>-6</b>	37	31	<b>-6</b>
<b>40</b>	25	39	28	<b>-11</b>	45	34	<b>-11</b>

At each of the 20 speed zone locations, average and 85<sup>th</sup> percentile speeds were lower during the reduced speed period than during the rest of the day. While speeds went down, the average speeds still exceeded the posted 25 mph speed at 18 of the 20 reduced speed zone locations and the 85<sup>th</sup> percentile still exceeded the posted 25 mph speed all 20 of the reduced speed zone locations. When grouped by posted speed limit, in 35 mph zones the reduced speed period average speed was still 26 mph and in 40 mph zones it was 28 mph.

# DATA ANALYSIS

The reduced-speed zone data was further analyzed to identify factors associated with lower speeds during the reduced-speed period or a greater change in speeds compared to the base period. The items listed below were evaluated for this association. All reduced-speed zones in this study are located on arterial streets. In all cases the data is separated by the base posted speed limit.

1. Police Enforcement
2. Proximity to School
3. Average Daily Traffic
4. Signalization within zone
5. Length of zone
6. Number of lanes

## POLICE ENFORCEMENT

The Lincoln Police Department conducts both end of the school year and beginning of the school year traffic enforcement projects within reduced-speed zones throughout the City. The time period of traffic enforcement locations overlapped with six data collection locations. These locations included:

1. S 13th Street near Saratoga Elementary
2. South Street near Prescott Elementary
3. N 48th Street near Riley Elementary
4. S 56th Street near Zeman Elementary
5. S 70th Street near Morley Elementary
6. S 84th Street near Pyrtle Elementary

The three 35 mph zones that overlapped with the traffic enforcement locations included the three reduced-speed zones with the highest base average speeds. Beginning with higher base speeds during the non-reduced speed period, the zones with the 35 mph posted speed limits and police enforcement resulted in a greater change in both average and 85<sup>th</sup> percentile speeds during the reduced speed period compared to the zones without police enforcement. In general, the reduced speed period speeds were similar in zones with or without police enforcement.

**Table 5: Police Enforcement Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Police Enforcement (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	Yes (3)	34	27	-7	39	33	-6
		No (11)	31	26	-5	36	31	-5
40	25	Yes (3)	38	28	-10	44	34	-10
		No (3)	39	28	-11	45	33	-12



## PROXIMITY TO SCHOOL

Reduced-speed zones can be located adjacent to school properties while others are located several blocks away from their associated school sites. As shown in Table 6, in both the 35 mph and 40 mph reduced-speed zones, the average speeds during the reduced speed period were lowest for zones adjacent to the school, followed by those less than 1,000 feet from the school, with the highest average speeds in zones greater than 1,000 feet from the school.

**Table 6: Proximity to School Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Proximity to School (feet) (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	Adjacent (7)	32	26	-6	36	31	-6
		<1,000 (5)	33	27	-6	37	32	-6
		>1,000 (2)	30	27	-3	35	31	-4
40	25	Adjacent (3)	39	28	-11	44	33	-11
		<1,000 (1)	37	28	-9	43	34	-9
		>1,000 (2)	40	29	-11	46	35	-11

## AVERAGE DAILY TRAFFIC

Based on the low, moderate, and high ADT thresholds given below, the average speeds grouped by ADT are given in Table 7.

- Low volume = ADT less than 10,000 vpd
- Medium volume = ADT greater than 10,000 and less than 20,000 vpd
- High volume = ADT greater than 20,000 vpd

In the 35 mph reduced-speed zones, the average and 85<sup>th</sup> percentile speeds during the reduced speed period were the lowest in the Low ADT category, followed by the Moderate ADT, with the highest speeds in the High ADT category. Five out of the six 40 mph reduced speed zones were in the High ADT category and had lower average and 85<sup>th</sup> percentile speeds during the reduced speed period than the one zone in the Moderate ADT category with similar base speeds.

**Table 7: Average Daily Traffic Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	ADT Category (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	Low (5)	31	26	-5	36	30	-6
		Moderate (8)	32	26	-6	37	31	-5
		High (1)	35	27	-8	39	34	-5
40	25	Moderate (1)	39	29	-10	45	36	-9
		High (5)	39	28	-11	44	33	-11

## SIGNALIZATION WITHIN ZONE

Although the exact locations of the data collection within the reduced-speed zones were chosen to be as far away as possible from intersections to properly capture free-flow speeds not affected by vehicle movements, the speeds differed between zones with no signalization, signalization for a mid-block crossing, and full signalization. One reduced-speed zone contained both a mid-block signal and a full signal and was included in both categories. In both the 35 mph and 40 mph zones, the highest base average and 85<sup>th</sup> percentile speeds occurred in the zones with mid-block crossing signals. In the 35 mph zones, the reduced speed period average and 85<sup>th</sup> percentile speeds were the highest in zones with no signalization. The frequency that a mid-block crossing signal is activated by a pedestrian may influence its impact on operating speeds, compared to zones with full traffic signals. The speeds during the reduced-speed period were all fairly similar across signalization strategies.

**Table 8: Signalization Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Signalization (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	None (2)	30	27	-3	36	32	-4
		Mid-block (7)	33	26	-7	38	31	-7
		Full (6)	31	26	-5	36	31	-5
40	25	Mid-block (3)	39	29	-10	45	34	-10
		Full (3)	38	28	-10	44	33	-11

## NUMBER OF LANES

The reduced speed zones were grouped by number of lanes that exist through the majority of the zone (2-3 and 4-5), and by one-way or two-way streets. In zones with a base speed limit of 35 miles per hour the reduced speed period average speeds were the lowest in zones with 2-3 lanes, and the same in zones with 4-5 lanes and one-way. All of the 40 mph zones had 4-5 lanes.

**Table 9: Number of Lanes Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Number of Lanes (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	One-way (2)	30	26	-4	35	31	-5
		2-3 (6)	32	26	-6	37	31	-6
		4-5 (6)	32	26	-6	37	32	-5
40	25	4-5 (6)	39	28	-11	45	34	-11

## LENGTH OF ZONE

According to the Reduced School Area Speed Limits Safe Routes to School Briefing Sheet from the Institute of Transportation Engineers, research has shown that speeds are approximately 1 mph higher for every 500 feet driven within a school zone.<sup>2</sup> Although the data collected in Lincoln is not an exact match to this research, in reduced speed zones with a base speed limit of 35 mph, the reduced speed period average speeds are the lowest in zones less than 500 feet, followed by zones between 500 and 1,000 feet, with the highest average speeds in zones greater than 1,000 feet. In reduced speed zones with a base speed limit of 40 mph, the reduced speed period average speeds are the lowest in zones less than 500 feet, followed by zones greater than 1,000 feet, with the highest average speeds in zones between 500 and 1,000 feet. The 85<sup>th</sup> percentile speed follow these same trends.

**Table 10: Length of Zone Speed summary (mph)**

Posted Speed Limit	Reduced-Speed Zone Speed Limit	Length of Zone (feet) (# of sites)	Average Speed			85 <sup>th</sup> Percentile Speed		
			Base	Reduced Speed Period	Change	Base	Reduced Speed Period	Change
35	25	<500 (2)	28	25	-3	34	30	-4
		500-1,000 (7)	32	26	-6	37	31	-6
		>1,000 (5)	32	27	-5	37	31	-5
40	25	<500 (1)	42	27	-15	46	32	-14
		500-1,000 (2)	40	29	-11	46	35	-11
		>1,000 (3)	37	28	-9	43	34	-10

<sup>2</sup> Fitzpatrick, K., M.A. Brewer, K.O. Obeng-Boampong, E. Park., and N.D. Trout. Speeds in School Zones. Report No. 0-5470-1. College Station, TX, USA: Texas A&M Transportation Institute, 2009.

## CONCLUSION

Based on the data collected at 20 reduced speed zones in Lincoln, only two of the zones exhibited reduced speed period average speeds under the posted speed limit of 25 mph (S 33rd Street near Rousseau Elementary and South Street near Saratoga Elementary). A common factor between these two zones is that they are both adjacent to their school sites. Across all of the reduced-speed zone sites, the average speeds during the reduced speed period were lowest for zones adjacent to the school, with the highest average speeds in zones greater than 1,000 feet from the school.

It is known that higher speeds increase stopping distance, decrease a driver's cone of vision, and increase the likelihood of fatality or severe injury in the event of a crash. With the number of factors that influence operating speed and just two zones operating with reduced speed period average speeds under the posted speed limit and none operating with 85<sup>th</sup> percentile speeds under the posted speed limit, this analysis cannot determine whether any reduced-speed zones on its own can be defined as effective. However, the analysis revealed that reduced-speed zones adjacent to schools result in the lowest speeds, indicating they are more effective than those farther from the school sites. Reduced-speed zones adjacent to schools also impact the greatest number of students as they travel to and from schools. Therefore, reduced-speed zones should only be implemented on streets directly adjacent to schools.

The analysis above was performed to identify the characteristics of zones that have lower reduced speed period average speeds in the City of Lincoln. The conclusions drawn from this data analysis will be combined with best practices research and carried into the City of Lincoln School Zone Standards.

**APPENDIX A**

**SPEED DATA COLLECTION**

**LOCATION DETAILS**

## CONTROL 1. RANDOLPH STREET NEAR LEFLER MIDDLE SCHOOL (CONTROL)

The control zone location on Randolph Street near Lefler Middle School, shown in Figure A1, is on a low volume street with an ADT of 6,030 vehicles. There is a marked crosswalk in the east end of the control zone. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A1. The speed distributions compared to the posted speed limits are shown in Figure A2. There was a decrease of 1.2 mph for the average vehicle speed during the reduced speed period. The t-test value is -3.01 and the p-value is 0.000, meaning that this speed reduction is statistically significant.



Figure A1: Randolph Street near Lefler Middle School Control Zone

Table A1: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.0	Non-reduced speed period	36
Reduced-speed	NA	Reduced speed period	30.8	Reduced speed period	36
Difference	NA	<b>Difference</b>	<b>-1.2</b>	<b>Difference</b>	<b>0</b>

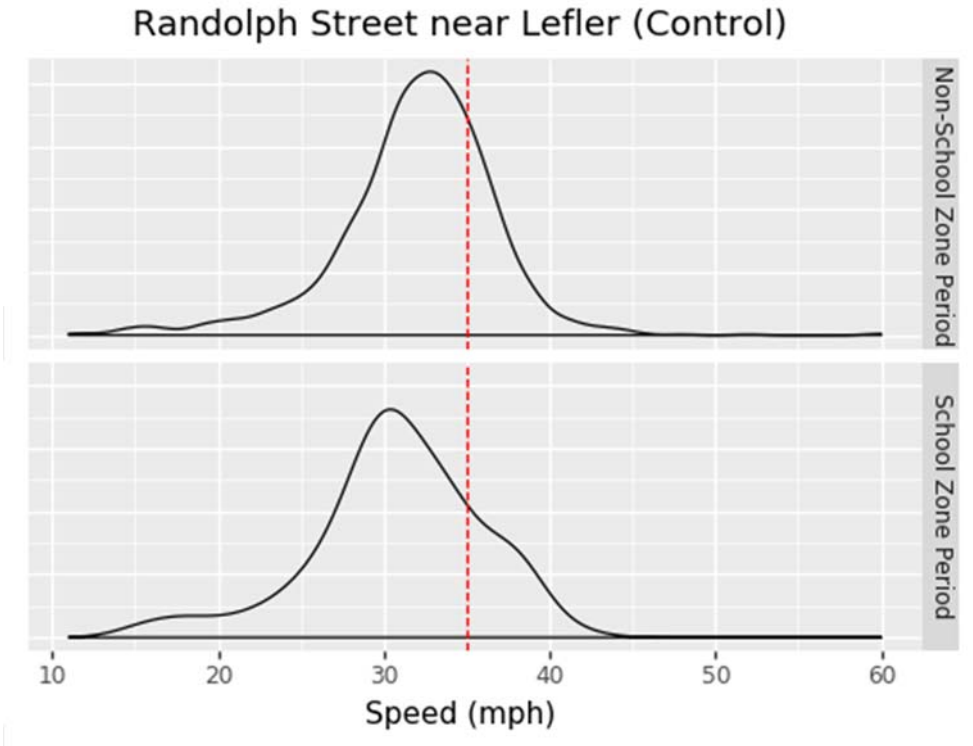


Figure A2: Speed distribution plots

## CONTROL 2. ADAMS STREET NEAR BELMONT ELEMENTARY SCHOOL (CONTROL)

The control zone location on Adams Street near Belmont Elementary School, shown in Figure A3, is on a low volume street with an ADT of 6,590 vehicles. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A2. The speed distributions compared to the posted speed limits are shown in Figure A4. There was a decrease of 1.0 mph for the average vehicle speed during the reduced speed period. The t-test value is -5.41 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

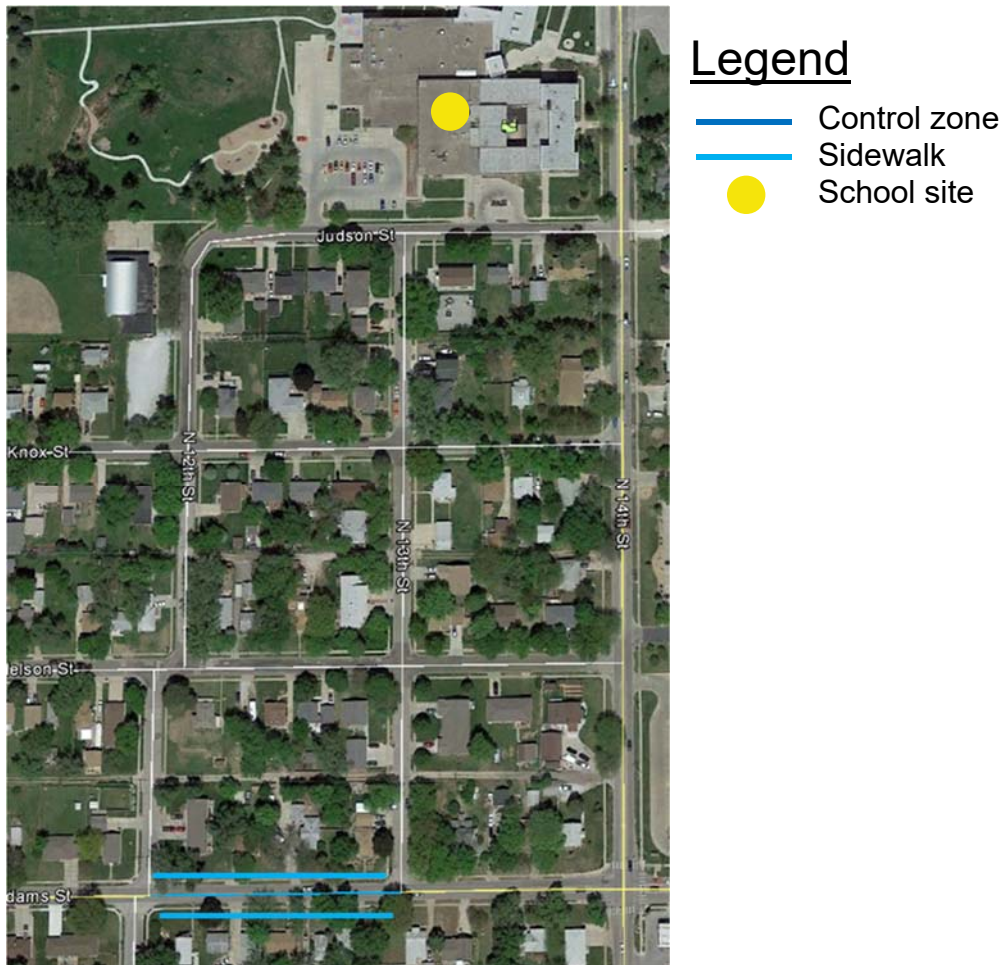


Figure A3: Adams Street near Belmont Elementary School Control Zone



Table A2: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	30	Non-reduced speed period	32.6	Non-reduced speed period	36
Reduced-speed	NA	Reduced speed period	31.6	Reduced speed period	36
Difference	NA	<b>Difference</b>	<b>-1.0</b>	<b>Difference</b>	<b>0</b>

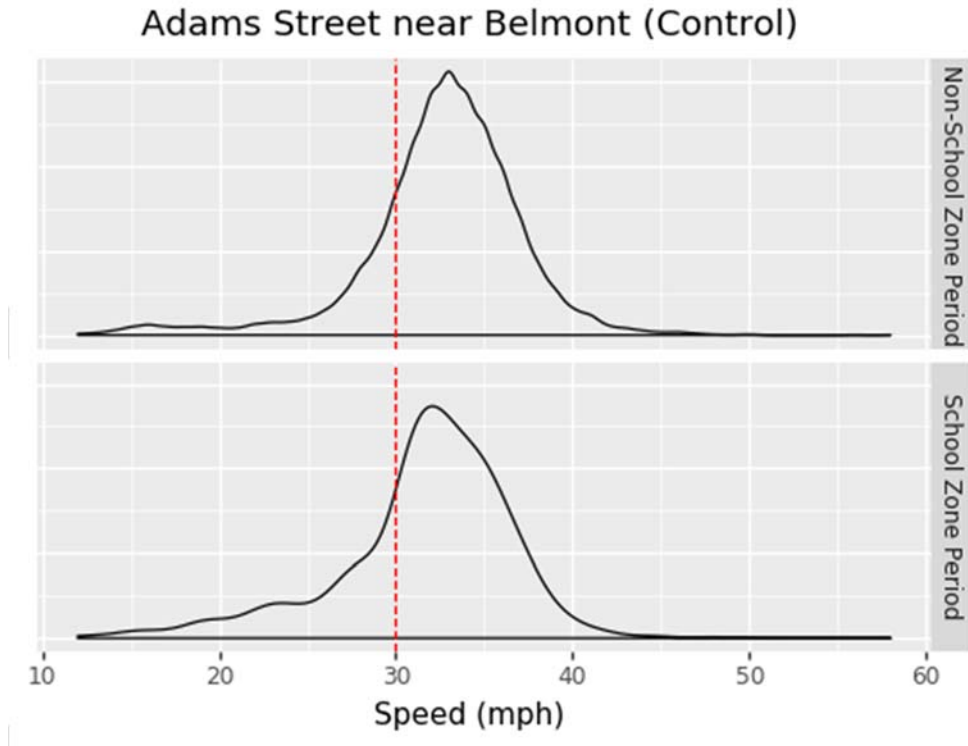


Figure A4: Speed distribution plots

## CONTROL 3. S 17TH STREET NEAR TRINITY METHODIST (CONTROL)

The control zone location on S 17th Street near Trinity Methodist, shown in Figure A5, is on a low volume street with an ADT of 7,220 vehicles. The control zone is located adjacent to a grocery store with sidewalks on both sides of the street and on-street parking. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A3. The speed distributions compared to the posted speed limits are shown in Figure A6. There was a decrease of 1.7 mph for the average vehicle speed during the reduced speed period. The t-test value is -6.82 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

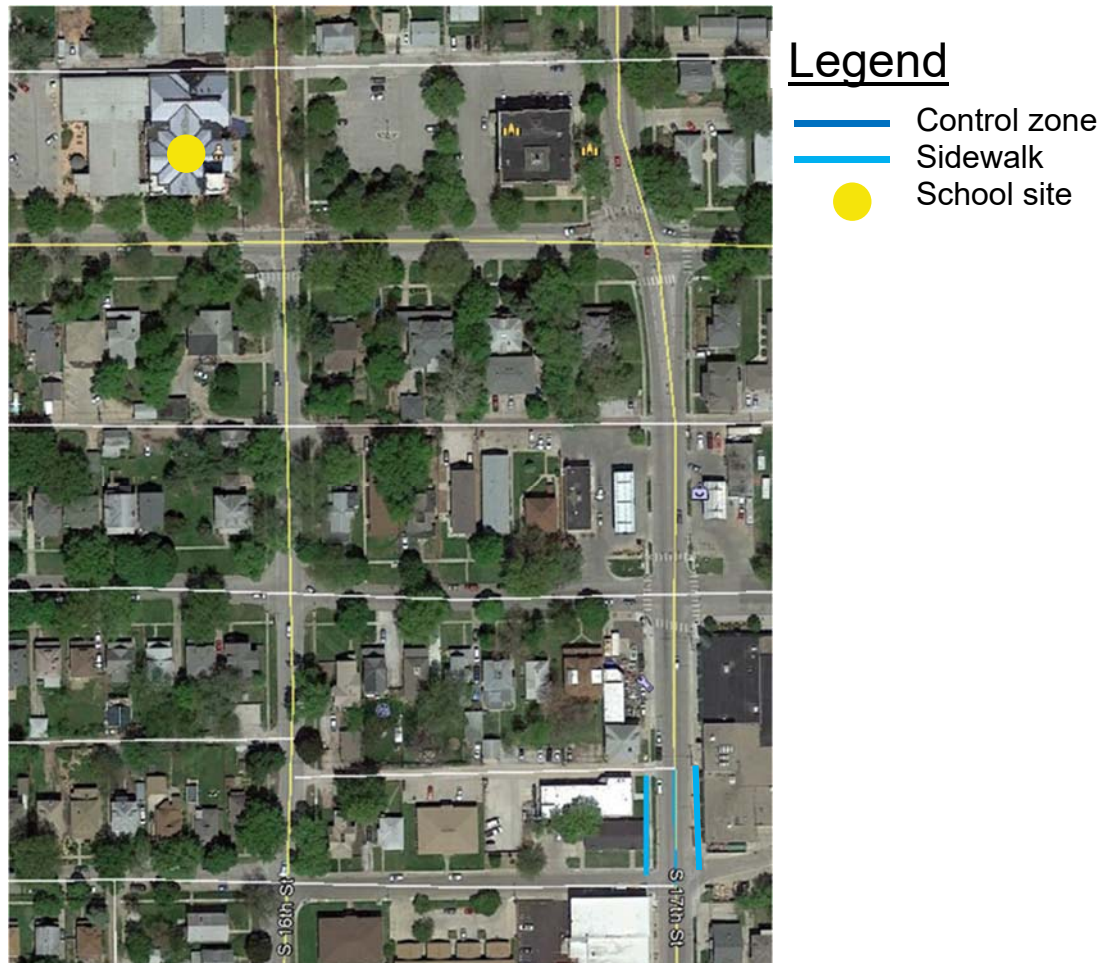


Figure A5: S 17th Street near Trinity Methodist Control Zone

Table A3: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	27.6	Non-reduced speed period	33
Reduced-speed	NA	Reduced speed period	25.9	Reduced speed period	31
Difference	NA	<b>Difference</b>	<b>-1.7</b>	<b>Difference</b>	<b>-2</b>

17th Street near Trinity Methodist (Control)

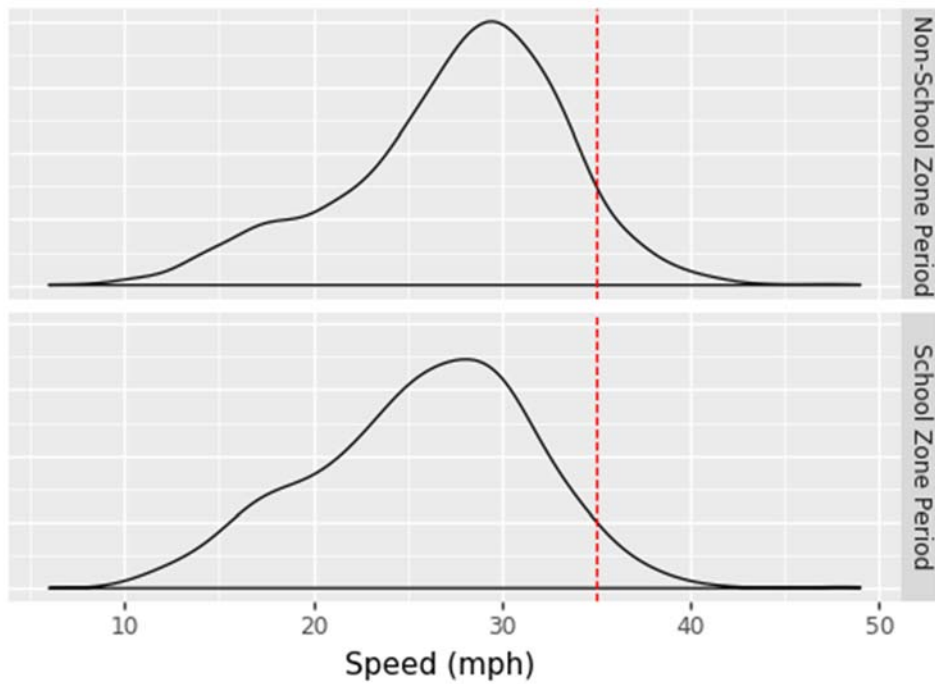


Figure A6: Speed distribution plots

## CONTROL 4. W FLETCHER AVE NEAR FREDSTROM ELEMENTARY (CONTROL)

The control zone location on W Fletcher Ave near Fredstrom Elementary School, shown in Figure A2, is on a low volume street with an ADT of 9,320 vehicles. The control zone has a pedestrian crossing signal at NW 7<sup>th</sup> Street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A4. The speed distributions compared to the posted speed limits are shown in Figure A8. There was a decrease of 2.0 mph for the average vehicle speed during the reduced speed period. The t-test value is -4.55 and the p-value is 0.000, meaning that this speed reduction is statistically significant.



### Legend

- Control zone
- Sidewalk
- Marked crosswalk
- Traffic signal
- School site

Figure A7: W Fletcher Ave near Fredstrom Elementary School Control Zone

Table A4: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	38.0	Non-reduced speed period	43
Reduced-speed	NA	Reduced speed period	36.0	Reduced speed period	41
Difference	NA	<b>Difference</b>	<b>-2.0</b>	<b>Difference</b>	<b>-2</b>

W Fletcher Avenue near Fredstrom (Control)

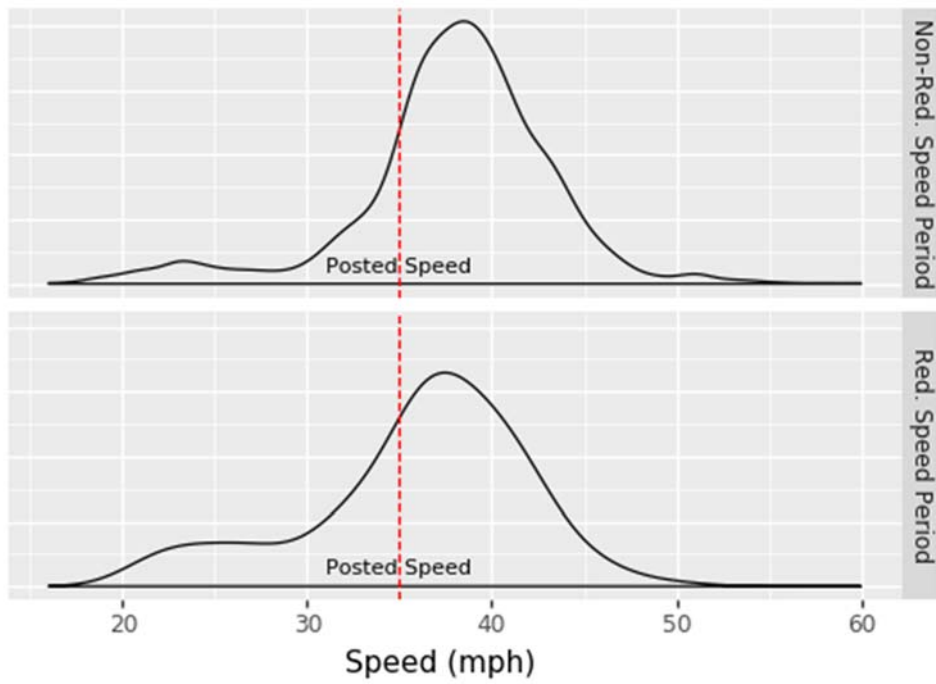


Figure A8: Speed distribution plots

## CONTROL 5. R STREET NEAR CULLER MIDDLE SCHOOL (CONTROL)

The control zone location on R Street near Culler Middle School, shown in Figure A9, is on a low volume street with an ADT of 9,880 vehicles. There is a full traffic signal with two marked crosswalks at a three-way intersection on the east end of the control zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A5. The speed distributions compared to the posted speed limits are shown in Figure A10. There was a decrease of 0.4 mph for the average vehicle speed during the reduced speed period. The t-test value is -2.12 and the p-value is 0.035, meaning that this speed reduction is statistically significant.

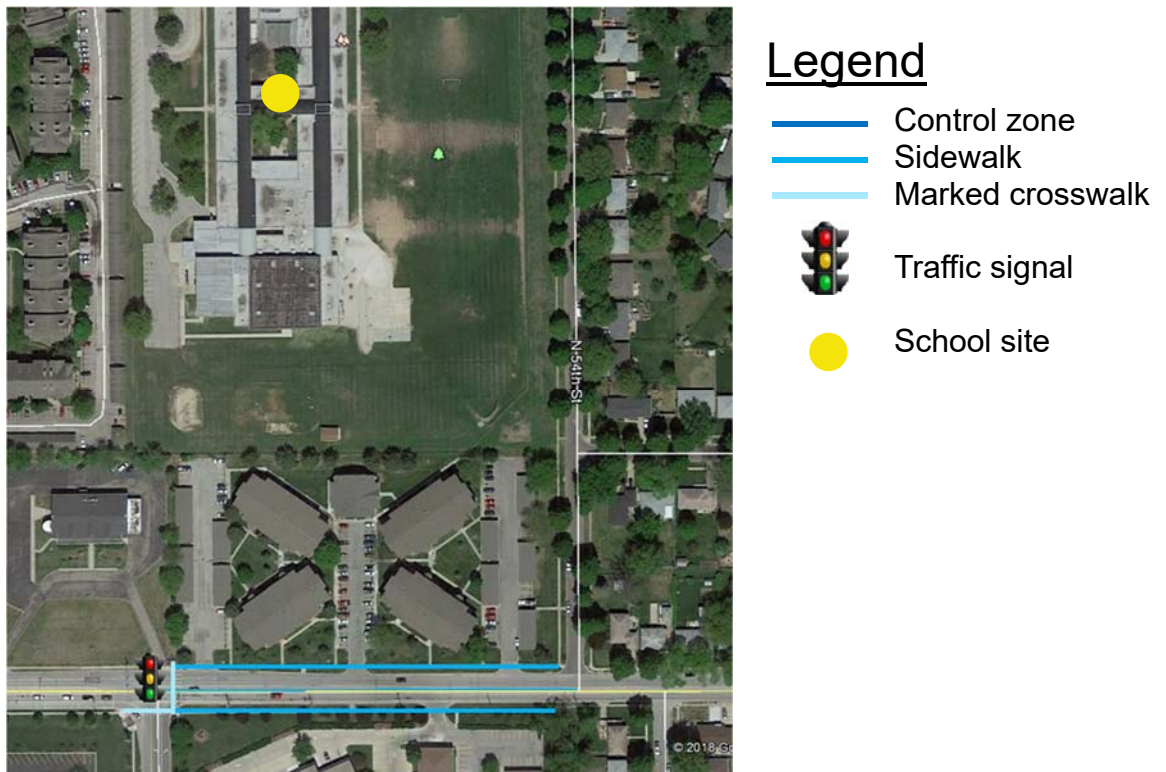


Figure A9: R Street near Culler Middle School Control Zone

Table A5: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.8	Non-reduced speed period	37
Reduced-speed	NA	Reduced speed period	32.4	Reduced speed period	37
Difference	NA	<b>Difference</b>	<b>-0.4</b>	<b>Difference</b>	<b>0</b>

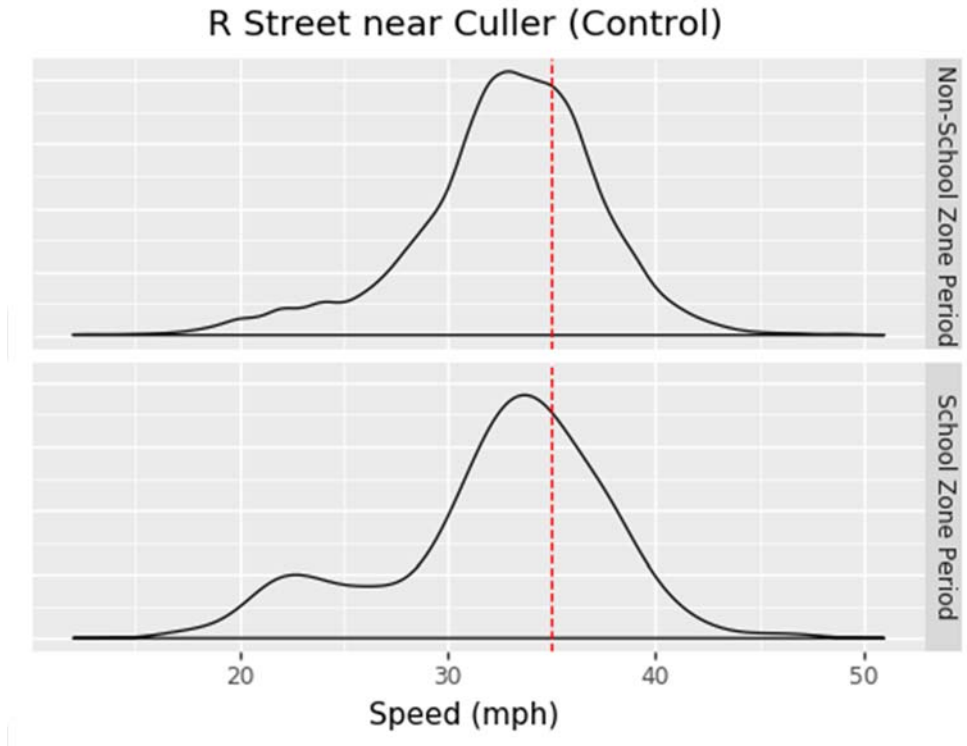


Figure A10: Speed distribution plots

## CONTROL 6. S 40TH STREET NEAR BRYAN COMMUNITY BEHAVIORAL (CONTROL)

The control zone location on S 40th Street near Bryan Community Behavioral, shown in Figure A11, is on a moderate volume street with an ADT of 11,090 vehicles. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A6. The speed distributions compared to the posted speed limits are shown in Figure A11. There was a decrease of 0.5 mph for the average vehicle speed during the reduced speed period. The t-test value is -2.88 and the p-value is 0.004, meaning that this speed reduction is statistically significant.

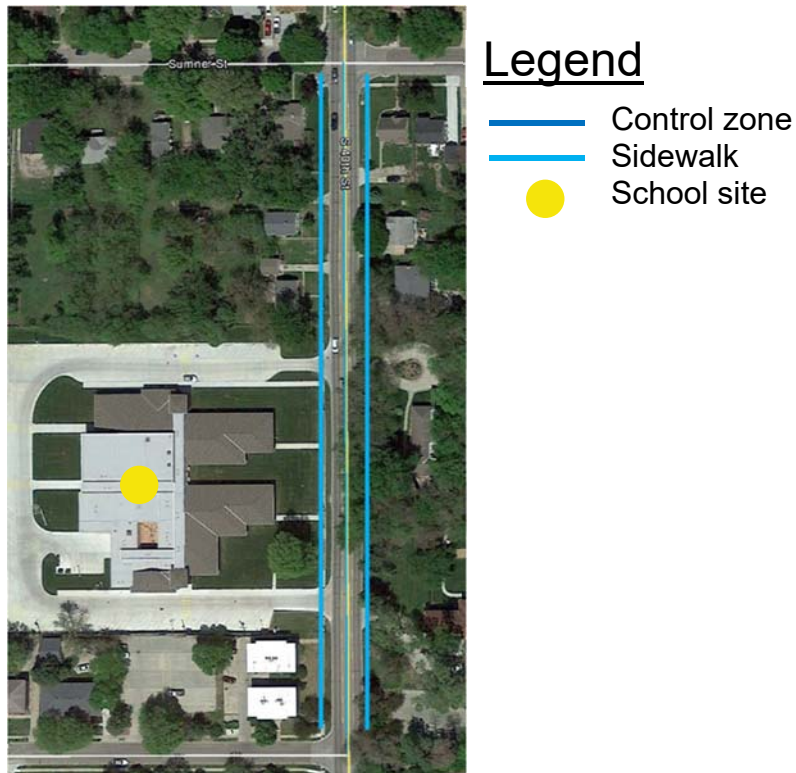


Figure A11: S 40th Street near Bryan Community Behavioral Control Zone



Table A6: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	34.2	Non-reduced speed period	38
Reduced-speed	NA	Reduced speed period	33.7	Reduced speed period	37
Difference	NA	<b>Difference</b>	<b>-0.5</b>	<b>Difference</b>	<b>-1</b>

40th Street near Bryan Community (Control)

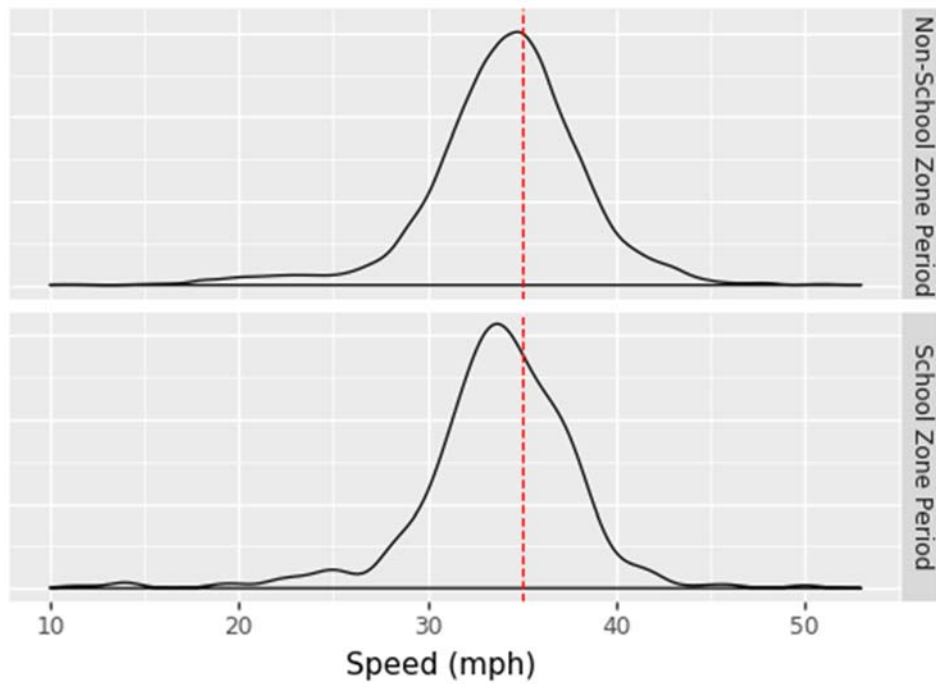


Figure A12: Speed distribution plots

## CONTROL 7. S 48TH STREET NEAR ZEMAN ELEMENTARY (CONTROL)

The control zone location on S 48th Street near Zeman Elementary School, shown in Figure A13, is on a moderate volume street with an ADT of 13,260 vehicles. There is a marked crosswalk in the north end of the control zone and a mid-block pedestrian crossing signal at the south end. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A7. The speed distributions compared to the posted speed limits are shown in Figure A14. There was a decrease of 1.9 mph for the average vehicle speed during the reduced speed period. The t-test value is -14.34 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

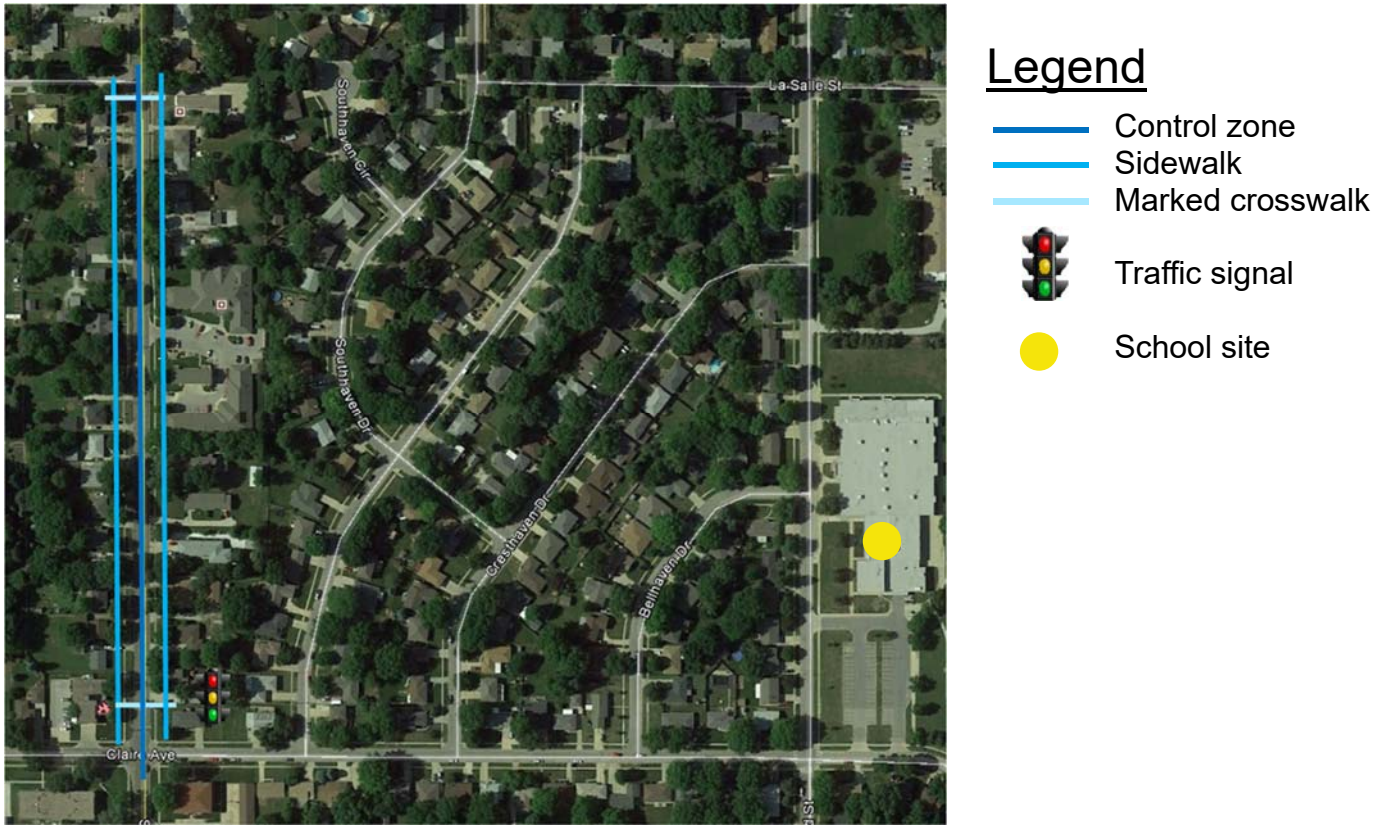


Figure A13: S 48th Street near Zeman Elementary School Control Zone

Table A7: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	35.9	Non-reduced speed period	39
Reduced-speed	NA	Reduced speed period	34.0	Reduced speed period	38
Difference	NA	<b>Difference</b>	<b>-1.9</b>	<b>Difference</b>	<b>-1</b>

48th Street near Zeman (Control)

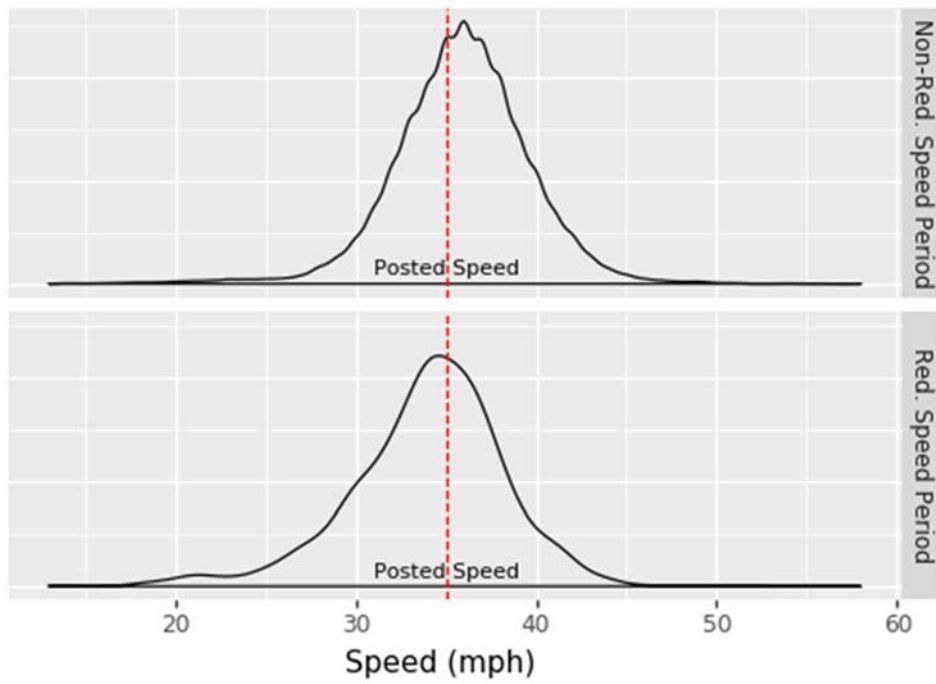
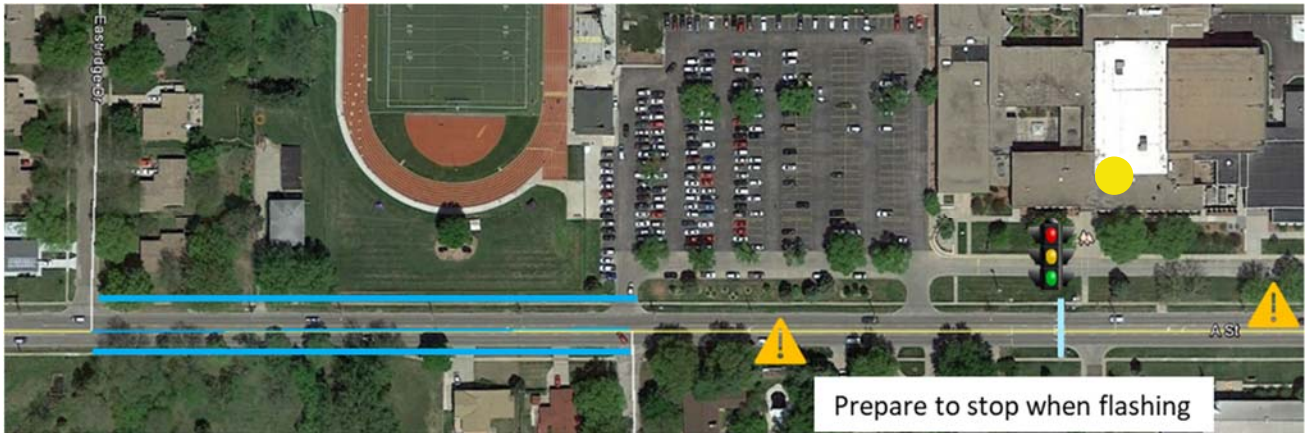


Figure A14: Speed distribution plots

## CONTROL 8. A STREET NEAR PIUS X CENTRAL HIGH (CONTROL)

The control zone location on S A Street near Pius X Central High School, shown in Figure A15, is on a moderate volume street with an ADT of 14,510 vehicles. The control zone has sidewalks on both sides of the street. Just east of the control zone is a mid-block pedestrian crossing signal with prepare to stop when flashing signage. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A8. The speed distributions compared to the posted speed limits are shown in Figure A16. There was an increase of 0.3 mph for the average vehicle speed during the reduced speed period. The t-test value is 0.84 and the p-value is 0.401, meaning that this speed increase is not statistically significant.



### Legend

-  Control zone
-  Sidewalk
-  Marked crosswalk
-  Traffic signal
-  Prepare to stop
-  School site

Figure A15: A Street near Pius X Central High Control Zone

Table A8: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	28.0	Non-reduced speed period	35
Reduced-speed	NA	Reduced speed period	28.3	Reduced speed period	35
Difference	NA	<b>Difference</b>	<b>+ 0.3</b>	<b>Difference</b>	<b>0</b>

A Street near Pius X (Control)

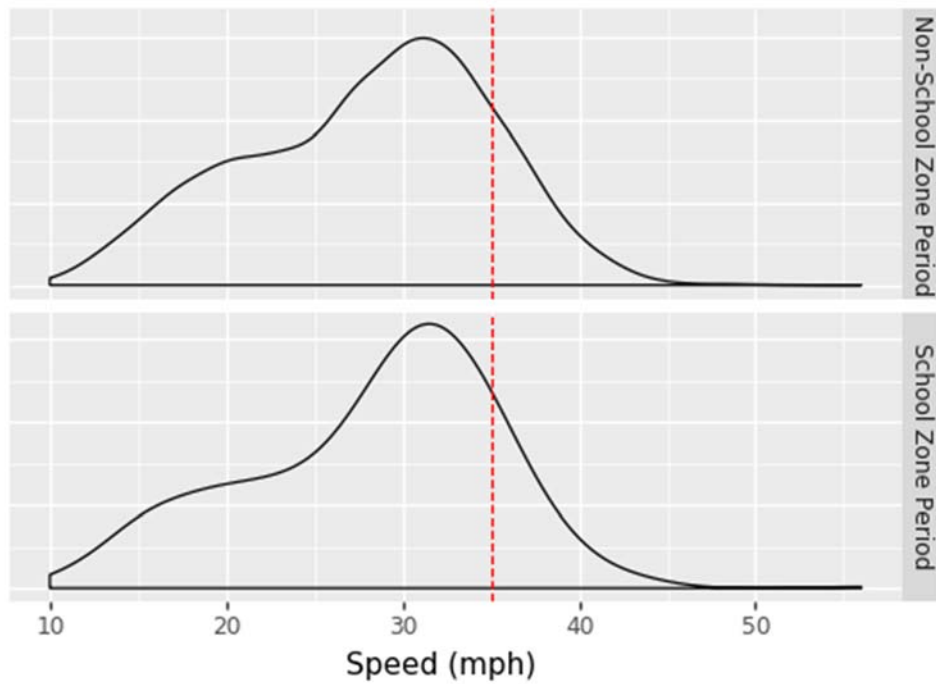


Figure A16: Speed distribution plots

## CONTROL 9. S 40TH STREET NEAR LINCOLN SOUTHEAST HIGH SCHOOL (CONTROL)

The control zone location on S 40th Street near Lincoln Southeast High School, shown in Figure A17, is on a moderate volume street with an ADT of 15,100 vehicles. There is a full traffic signal with four marked crosswalks at the south end of the zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A9. The speed distributions compared to the posted speed limits are shown in Figure 18. There was an increase of 0.6 mph for the average vehicle speed during the reduced speed period. The t-test value is 2.69 and the p-value is 0.007, meaning that this speed difference is statistically significant.



Figure A17: S 40th Street near Lincoln Southeast High School Control Zone

Table A9: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	34.5	Non-reduced speed period	39
Reduced-speed	NA	Reduced speed period	35.1	Reduced speed period	39
Difference	NA	<b>Difference</b>	<b>+ 0.6</b>	<b>Difference</b>	<b>0</b>

40th Street near Lincoln Southeast (Control)

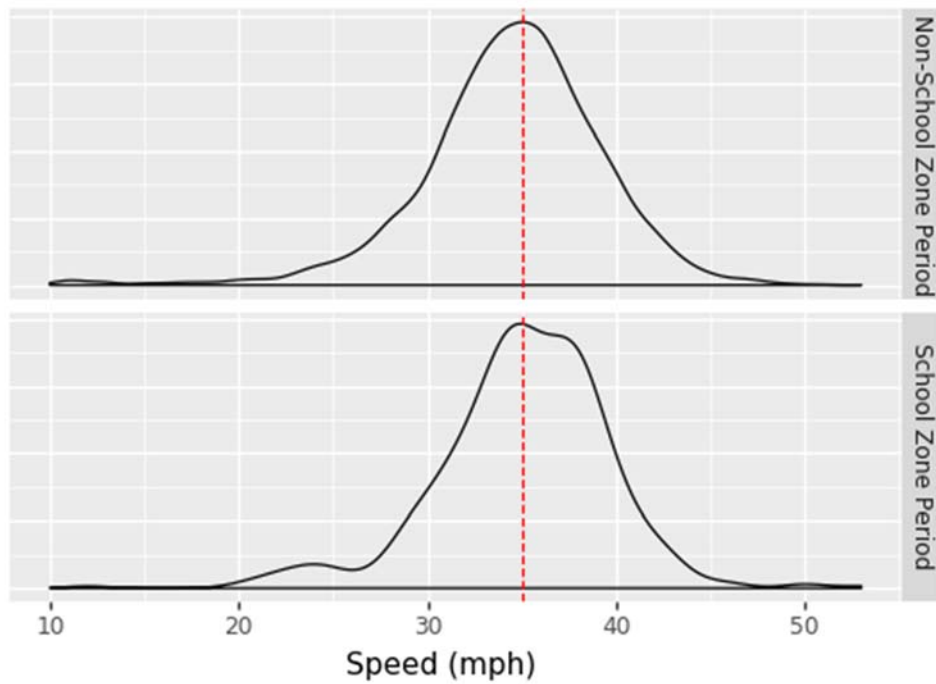


Figure A18: Speed distribution plots

## CONTROL 10. VINE STREET NEAR CULLER MIDDLE SCHOOL (CONTROL)

The control zone location on Vine Street near Culler Middle School, shown in Figure A19, is on a moderate volume street with an ADT of 15,130 vehicles. The control zone has a mid-block pedestrian crossing signal with prepare to stop when flashing signage. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A10. The speed distributions compared to the posted speed limits are shown in Figure A20. There was a decrease of 6.8 mph for the average vehicle speed during the reduced speed period. The t-test value is -24.44 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

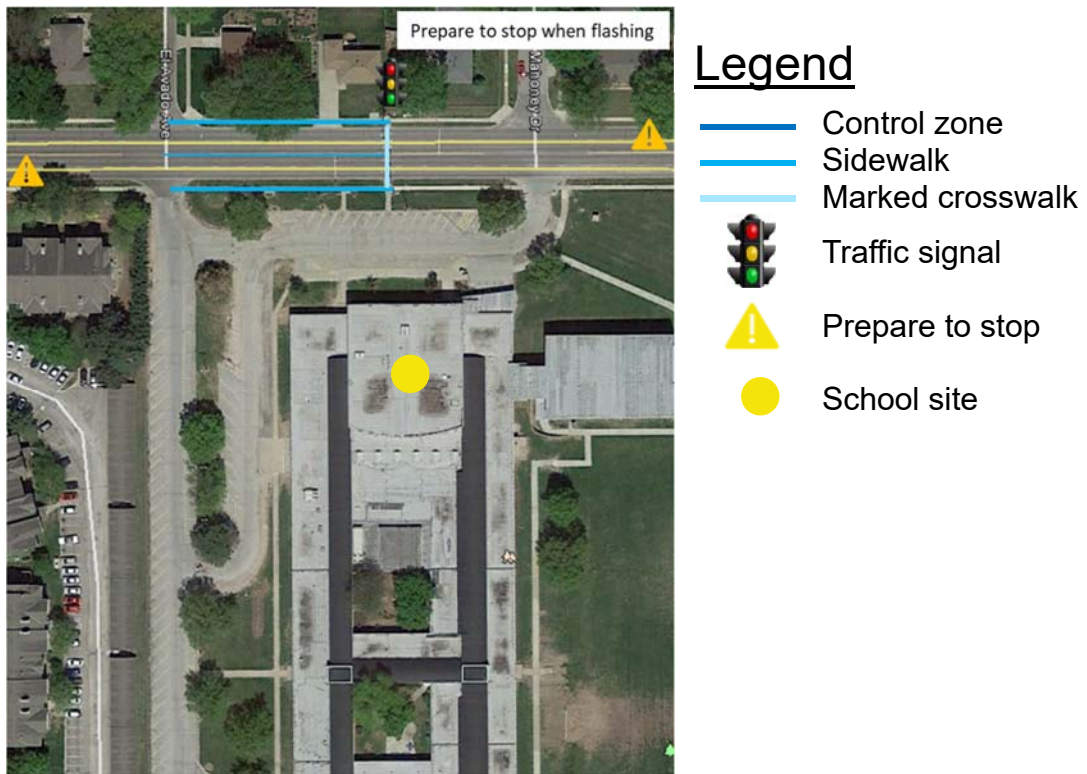


Figure A19: Vine Street near Culler Middle School Control Zone



Table A10: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	35.4	Non-reduced speed period	40
Reduced-speed	NA	Reduced speed period	28.6	Reduced speed period	35
Difference	NA	<b>Difference</b>	<b>-6.8</b>	<b>Difference</b>	<b>-5</b>

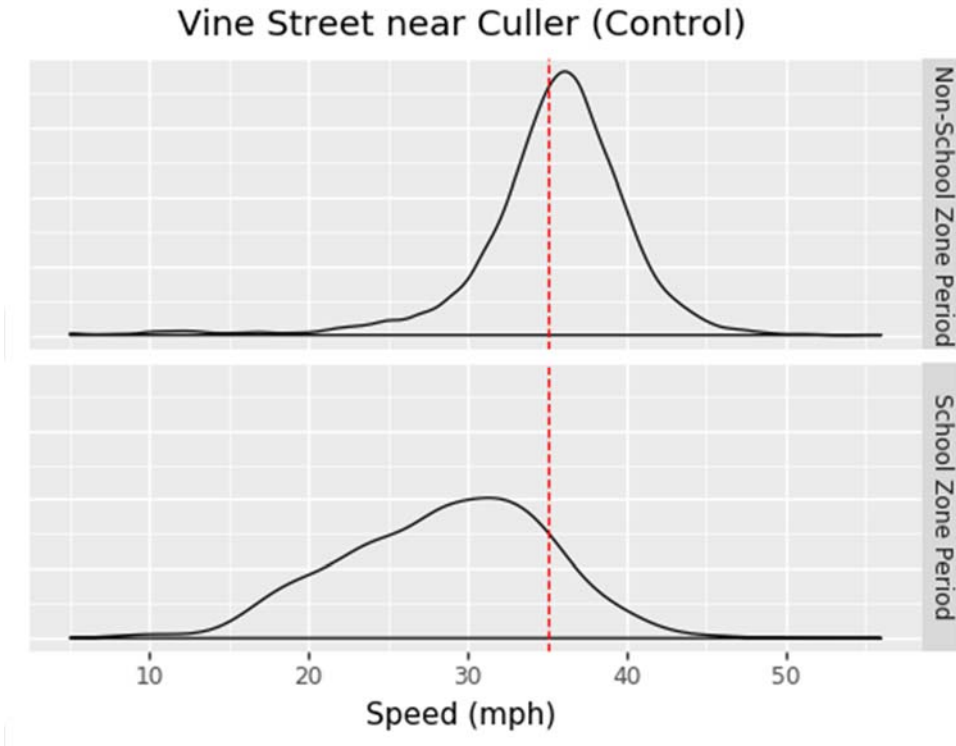


Figure A20: Speed distribution plots

## CONTROL 11. S 48TH STREET NEAR CALVERT ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The control zone location on S 48th Street near Calvert Elementary School, shown in Figure A21, is on moderate volume street with an ADT of 15,160 vehicles. The posted speed limit is 35 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone and sidewalks on both sides of the street with one segment missing adjacent to the signal. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A11. The speed distributions compared to the posted speed limits are shown in Figure A22. The average speed during the non-reduced speed period was 31.9 miles per hour while the average speed during the reduced speed period was 31.3 miles per hour, a decrease of 0.6 miles per hour. The t-statistic for these values is -3.15 and the p-value is 0.002, meaning that this speed reduction is statistically significant.

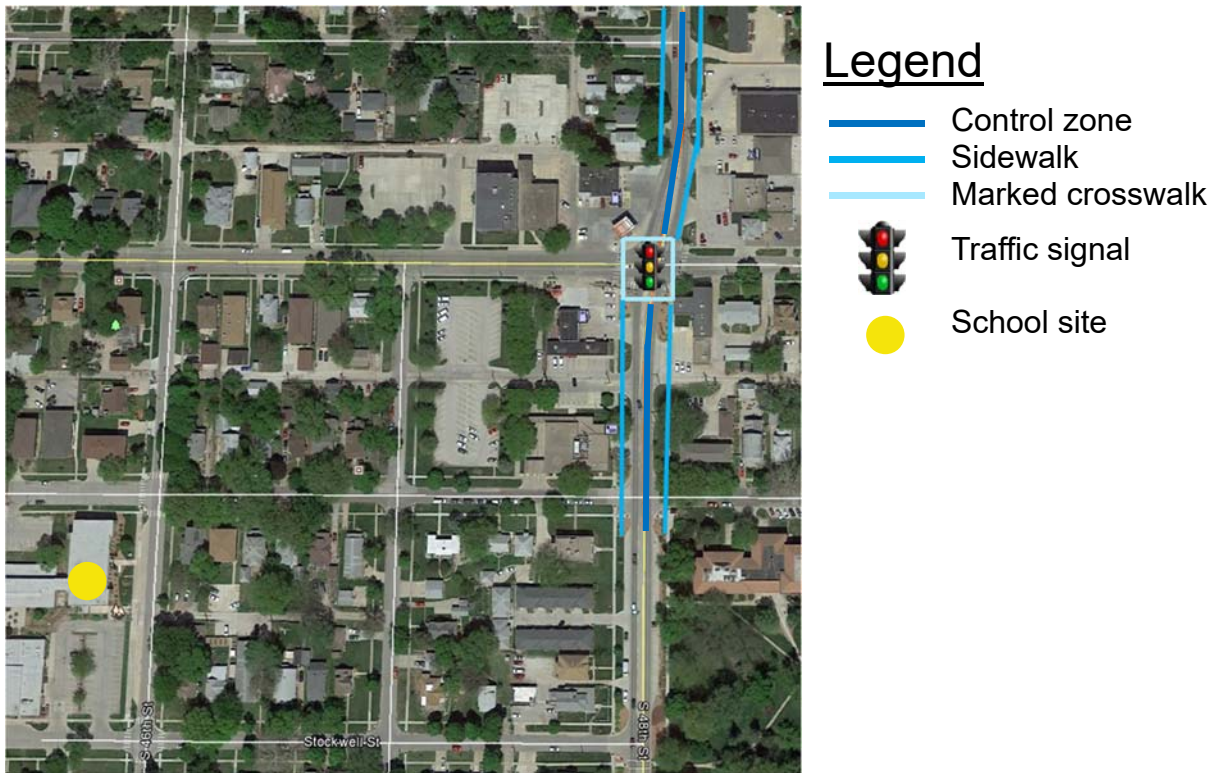


Figure A21: S 48th Street near Calvert Elementary Reduced-Speed Zone

Table A11: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	31.9	Non-reduced speed period	36
Reduced-speed	NA	Reduced speed period	31.3	Reduced speed period	35
Difference	NA	<b>Difference</b>	<b>-0.6</b>	<b>Difference</b>	<b>-1</b>

48th Street near Calvert (School Zone)

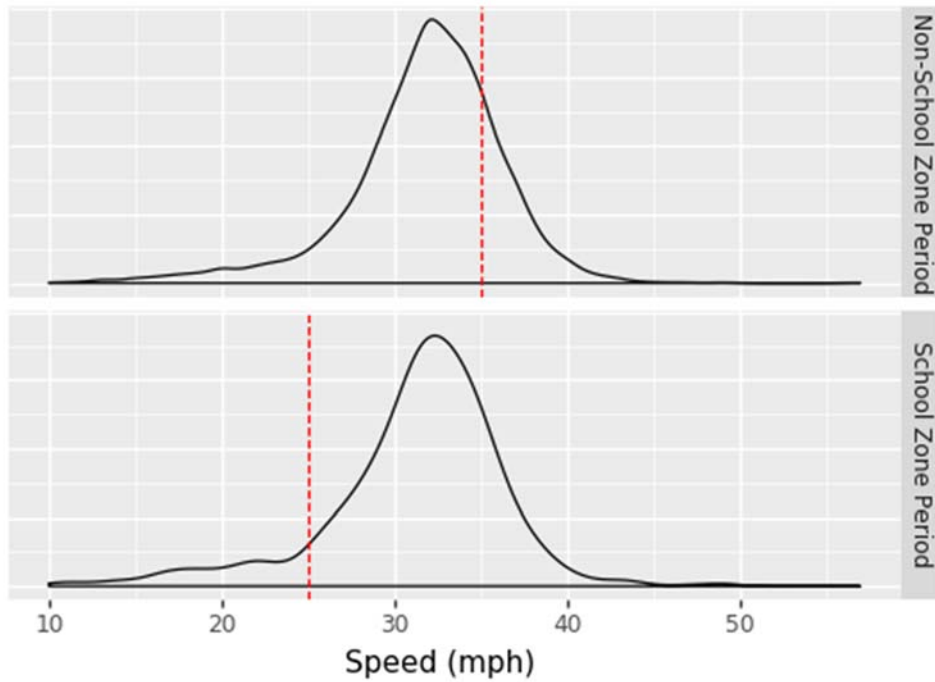


Figure A22: Speed distribution plots

## CONTROL 12. S 56TH STREET NEAR HOLMES ELEMENTARY (CONTROL)

The control zone location on S 56th Street near Holmes Elementary School, shown in Figure A23, is on a moderate volume street with an ADT of 16,400 vehicles. There is a mid-block pedestrian crossing signal in the control zone. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A12. The speed distributions compared to the posted speed limits are shown in Figure A24. There was a decrease of 1.8 mph for the average vehicle speed during the reduced speed period. The t-test value is -11.22 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

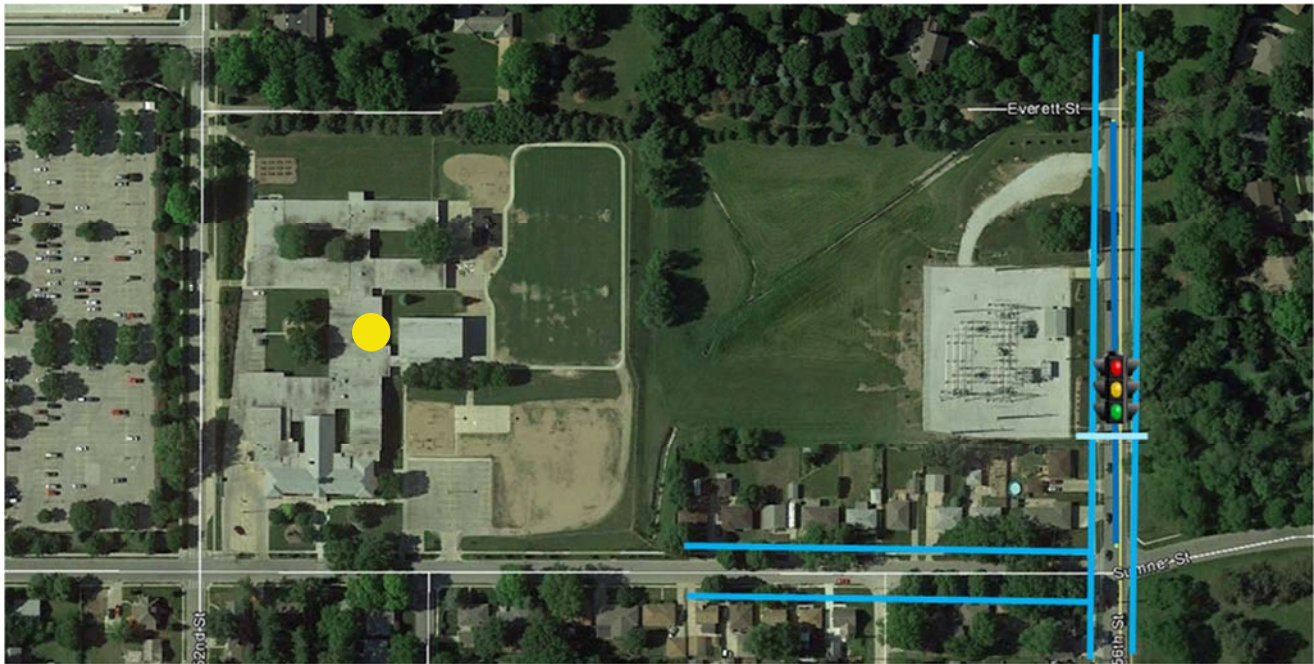


Figure A23: S 56th Street near Holmes Elementary School Control Zone

### Legend




-  Control zone
-  Sidewalk
-  Marked crosswalk
-  Traffic signal
-  School site

Table A12: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	35.2	Non-reduced speed period	40
Reduced-speed	NA	Reduced speed period	33.4	Reduced speed period	39
Difference	NA	<b>Difference</b>	<b>-1.8</b>	<b>Difference</b>	<b>-1</b>

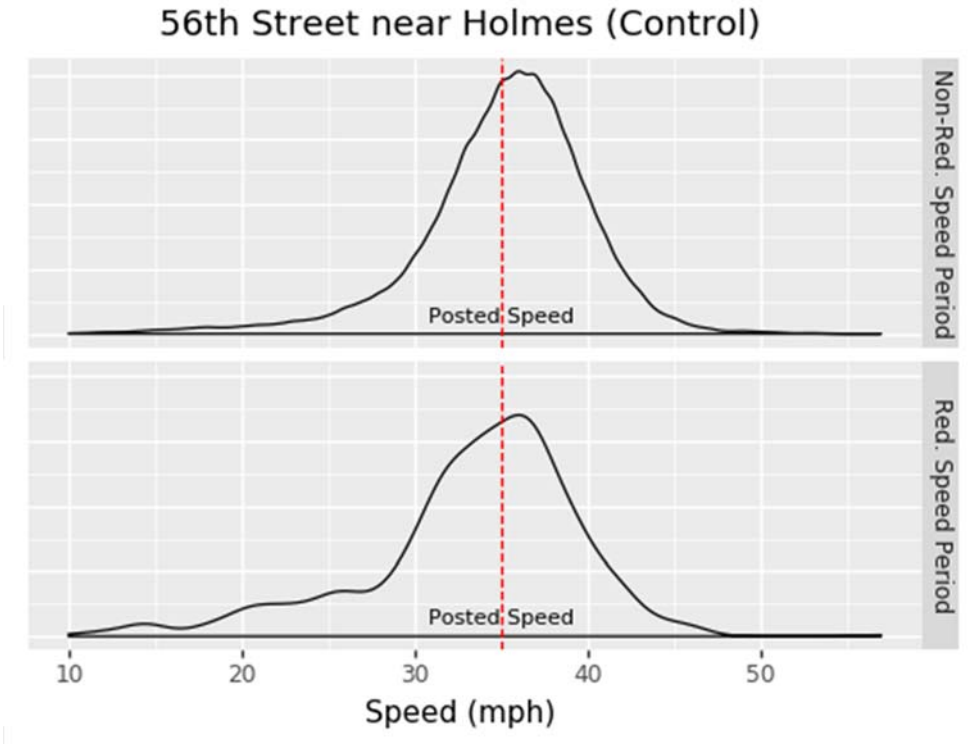


Figure A24: Speed distribution plots

## CONTROL 13. S 10TH STREET NEAR SARATOGA ELEMENTARY SCHOOL (CONTROL)

The control zone location on S 10th Street near Saratoga Elementary School, shown in Figure A25, is on a moderate volume street with an ADT of 16,760 vehicles. There is a full traffic signal with four marked crosswalks on the south end of the zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A13. The speed distributions compared to the posted speed limits are shown in Figure A26. There was no difference for the average vehicle speed during the reduced speed period.

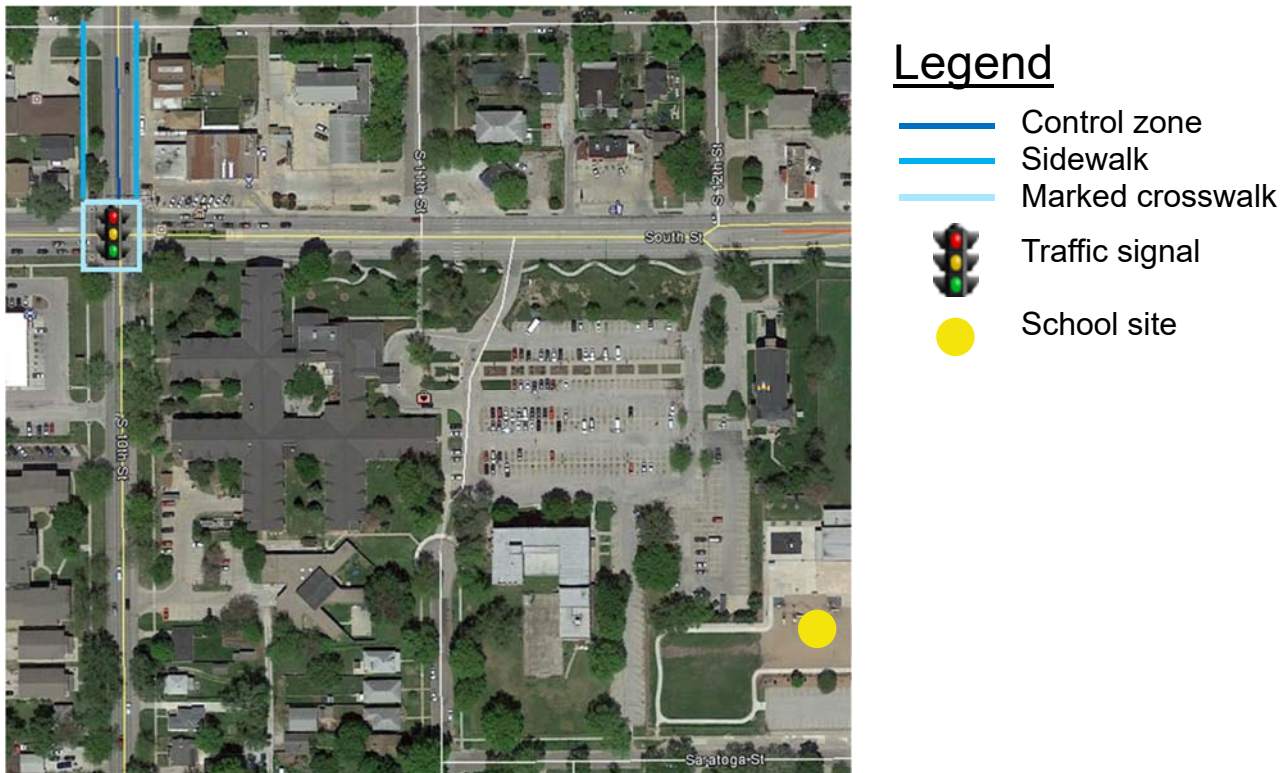


Figure A25: S 10th Street near Saratoga Elementary School Control Zone

Table A13: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	31.8	Non-reduced speed period	38
Reduced-speed	NA	Reduced speed period	31.8	Reduced speed period	38
Difference	NA	<b>Difference</b>	<b>0.0</b>	<b>Difference</b>	<b>0</b>

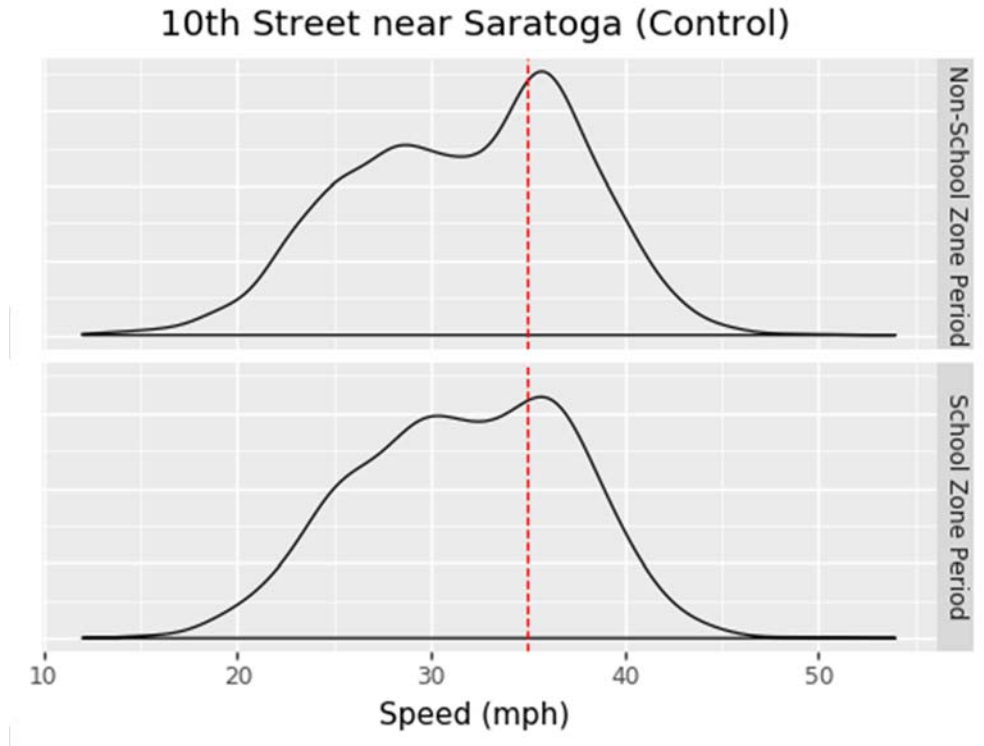


Figure A26: Speed distribution plots

## CONTROL 14. CODDINGTON AVENUE NEAR ROPER ELEMENTARY (CONTROL)

The control zone location on Coddington Avenue near Roper Elementary School, shown in Figure A27, is on a low volume street with an ADT of 7,230 vehicles. There is a mid-block pedestrian crossing signal in the control zone. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A14. The speed distributions compared to the posted speed limits are shown in Figure A28. There was an increase of 1.1 mph for the average vehicle speed during the reduced speed period. The t-test value is 3.60 and the p-value is 0.000, meaning that this speed increase is statistically significant.

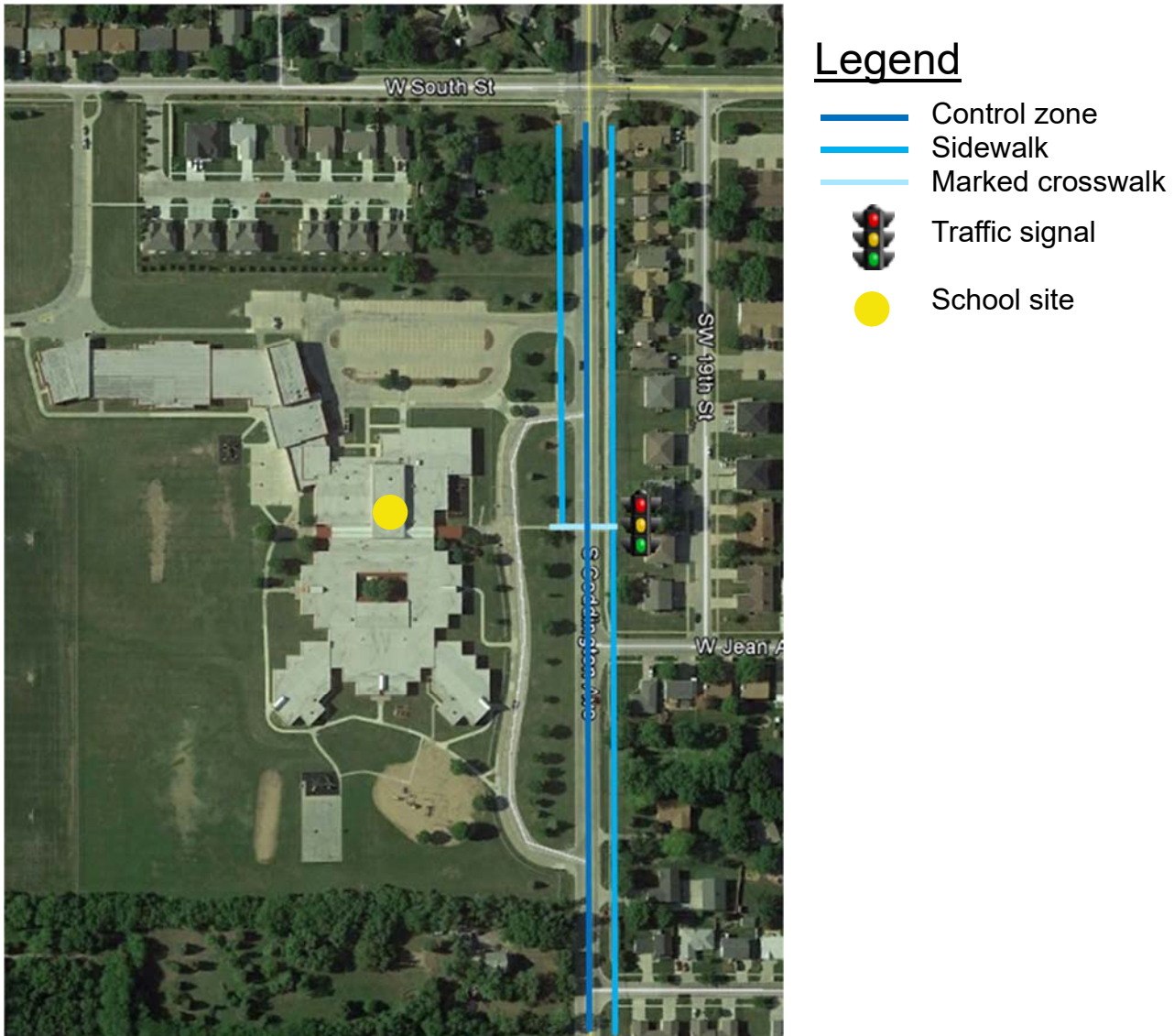


Figure A27: Coddington Avenue near Roper Elementary School Control Zone



Table A14: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	38.1	Non-reduced speed period	43
Reduced-speed	NA	Reduced speed period	39.2	Reduced speed period	44
Difference	NA	<b>Difference</b>	<b>+1.1</b>	<b>Difference</b>	<b>+1</b>

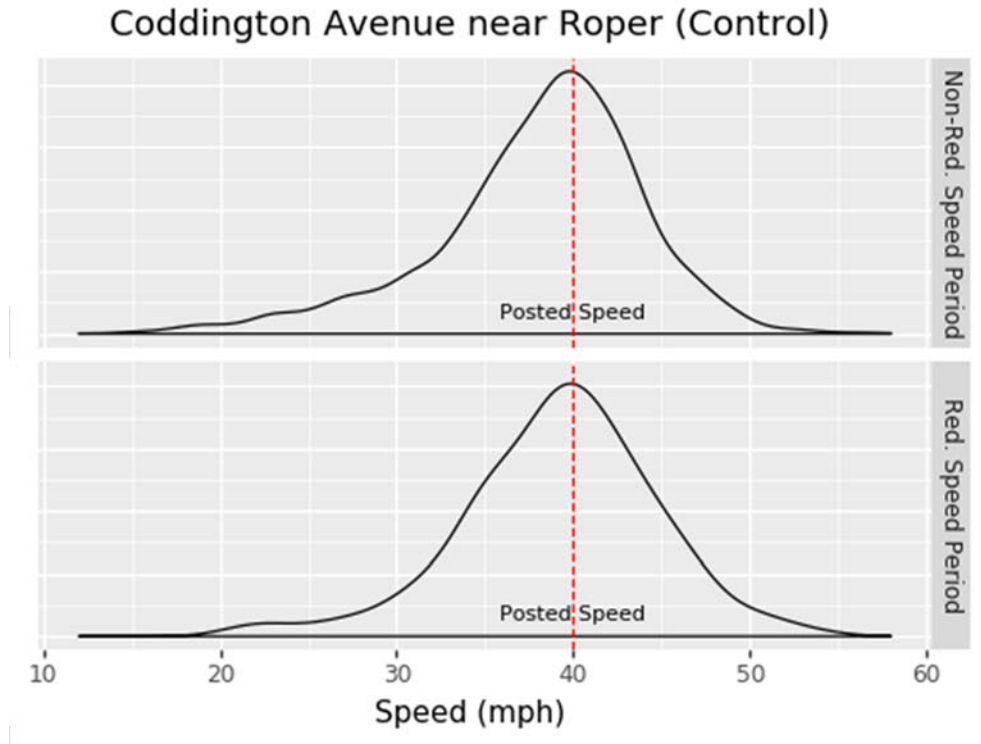


Figure A28: Speed distribution plots

## CONTROL 15. VAN DORN STREET NEAR LUX MIDDLE SCHOOL (CONTROL)

The control zone location on Van Dorn Street near Lux Middle High School, shown in Figure A29, is on a low volume street with an ADT of 8,510 vehicles. The control zone has a mid-block pedestrian crossing signal with prepare to stop when flashing signage. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A15. The speed distributions compared to the posted speed limits are shown in Figure A30. There was an increase of 0.8 mph for the average vehicle speed during the reduced speed period. The t-test value is -5.53 and the p-value is 0.000, meaning that this speed decrease is statistically significant.

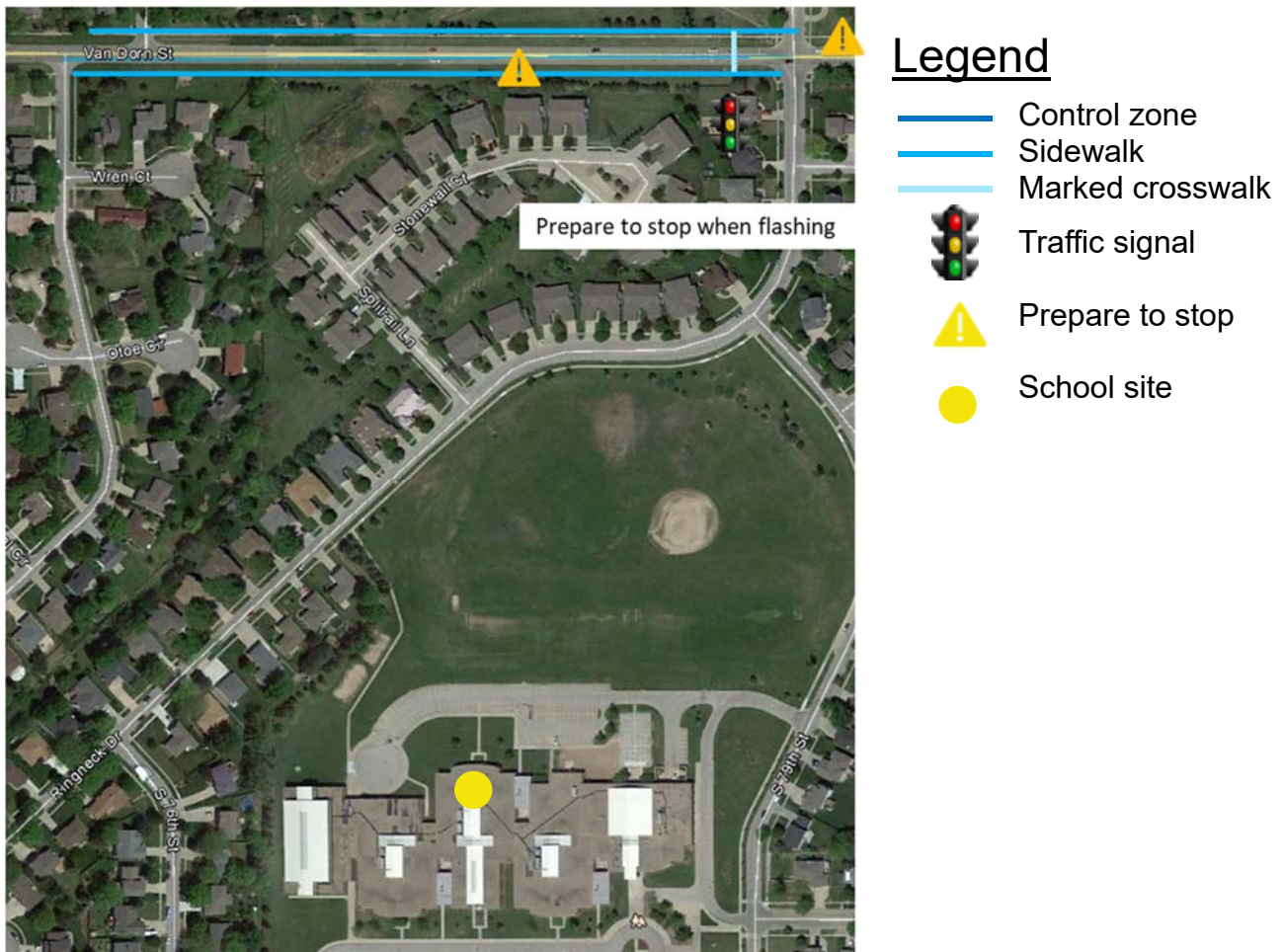


Figure A29: Van Dorn Street near Lux Middle School Control Zone

Table A15: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	38.9	Non-reduced speed period	43
Reduced-speed	NA	Reduced speed period	38.1	Reduced speed period	42
Difference	NA	<b>Difference</b>	<b>-0.8</b>	<b>Difference</b>	<b>-1</b>

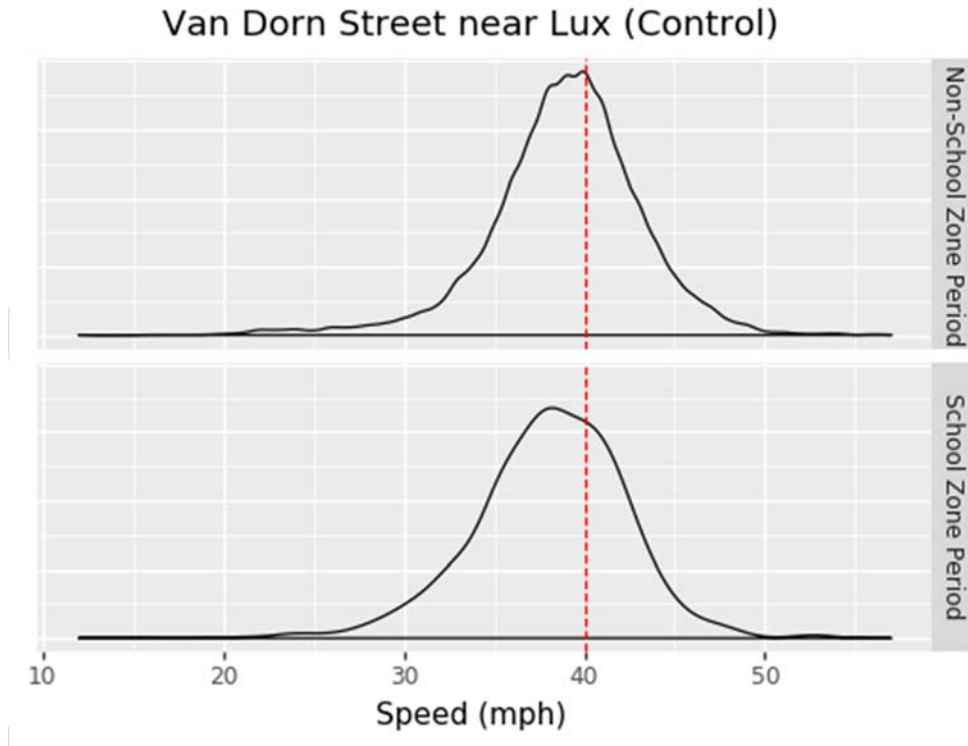


Figure A30: Speed distribution plots

## CONTROL 16. N 33RD STREET NEAR NORTH STAR HIGH SCHOOL (CONTROL)

The control zone location on N 33rd Street near North Star High School, shown in Figure A31, is on a low volume street with an ADT of 8,540 vehicles. The control zone is located on the north side of the city. There is a full traffic signal with four marked crosswalks on the north end of the zone. A sidewalk covers the entire south side of the zone while the north side of the zone is covered halfway with a sidewalk. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A16. The speed distributions compared to the posted speed limits are shown in Figure A32. There was a decrease of 1.3 mph for the average vehicle speed during the reduced speed period. The t-test value is -3.75 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

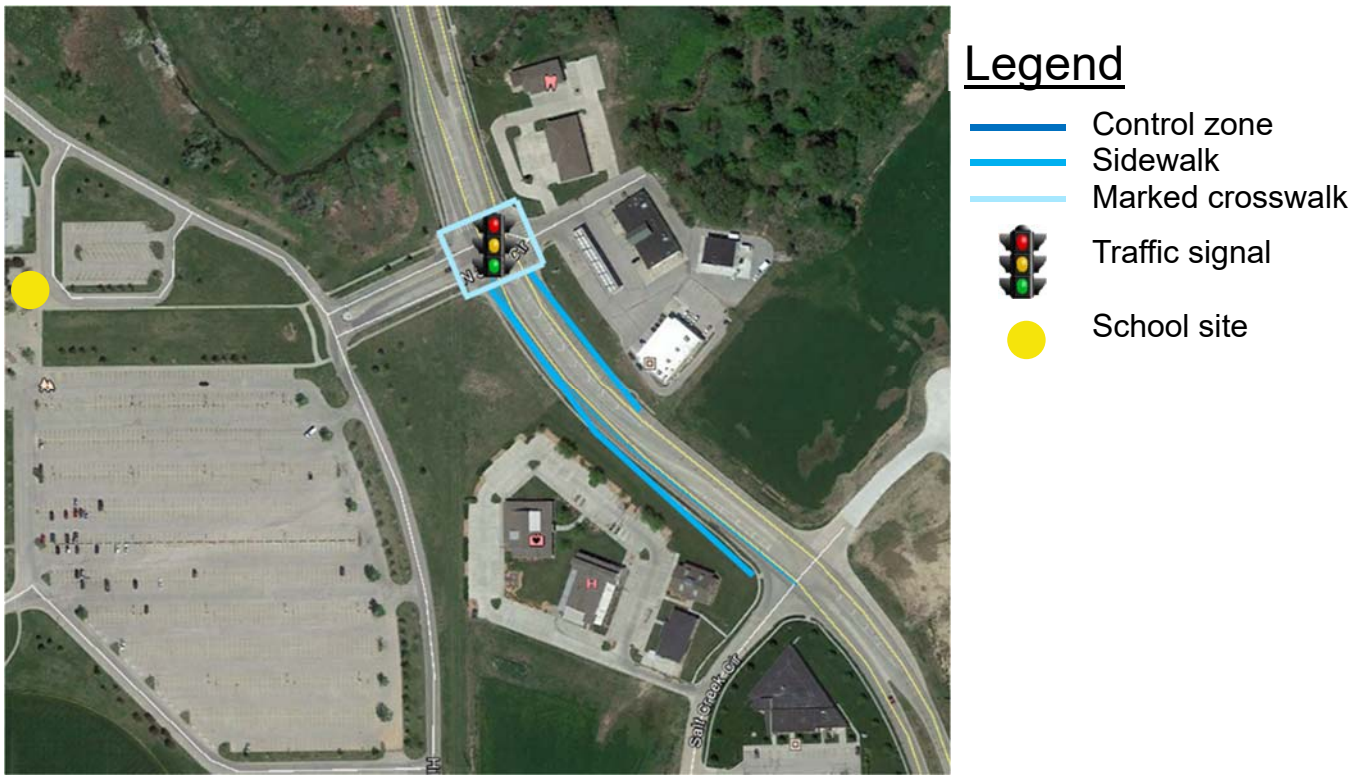


Figure A31: N 33rd Street near North Star High School Control Zone

Table A16: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	39.8	Non-reduced speed period	45
Reduced-speed	NA	Reduced speed period	38.5	Reduced speed period	43
Difference	NA	<b>Difference</b>	<b>-1.3</b>	<b>Difference</b>	<b>-2</b>

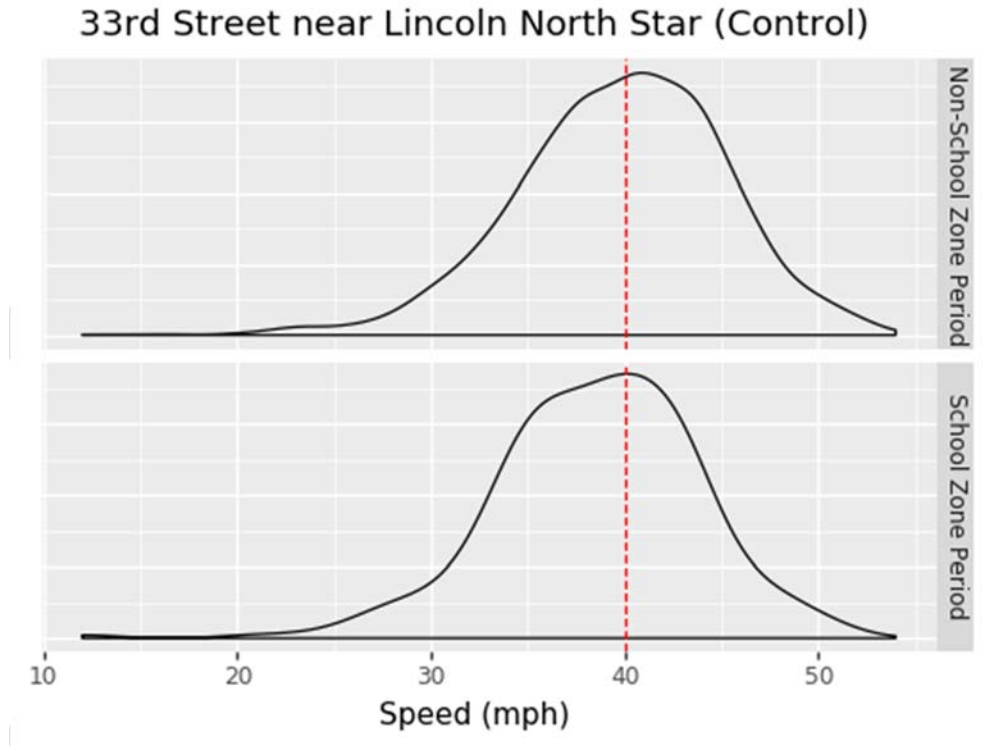


Figure A32: Speed distribution plots

## CONTROL 17. NORMAL BOULEVARD NEAR CHRIST LUTHERAN SCHOOL (CONTROL)

The control zone location on Normal Boulevard near Christ Lutheran School, shown in Figure A33, is on a high-volume street with an ADT of 22,250 vehicles. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A17. The speed distributions compared to the posted speed limits are shown in Figure A34. There was a decrease of 0.2 mph for the average vehicle speed during the reduced speed period. The t-test value is -0.77 and the p-value is 0.443, meaning that this speed reduction is not statistically significant.

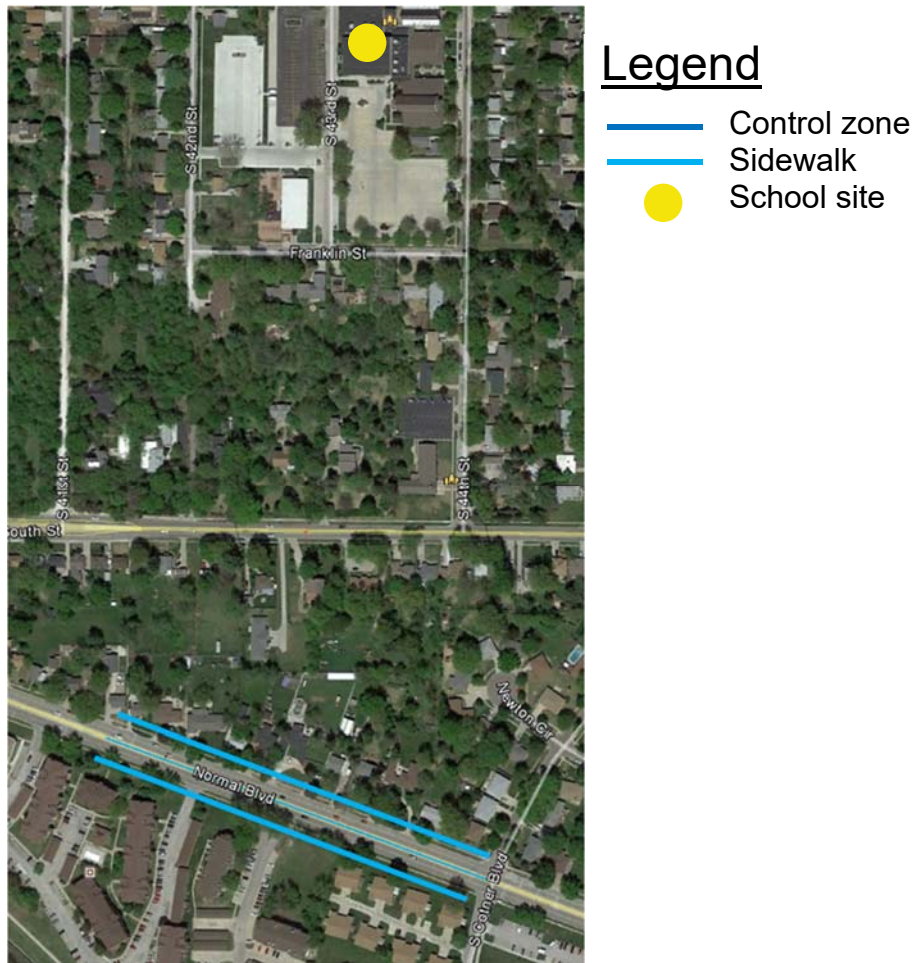


Figure A33: Normal Boulevard near Christ Lutheran School Control Zone

Table A17: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	34.9	Non-reduced speed period	40
Reduced-speed	NA	Reduced speed period	34.7	Reduced speed period	40
Difference	NA	<b>Difference</b>	<b>-0.2</b>	<b>Difference</b>	<b>0</b>

Normal Blvd near Christ Lutheran (Control)

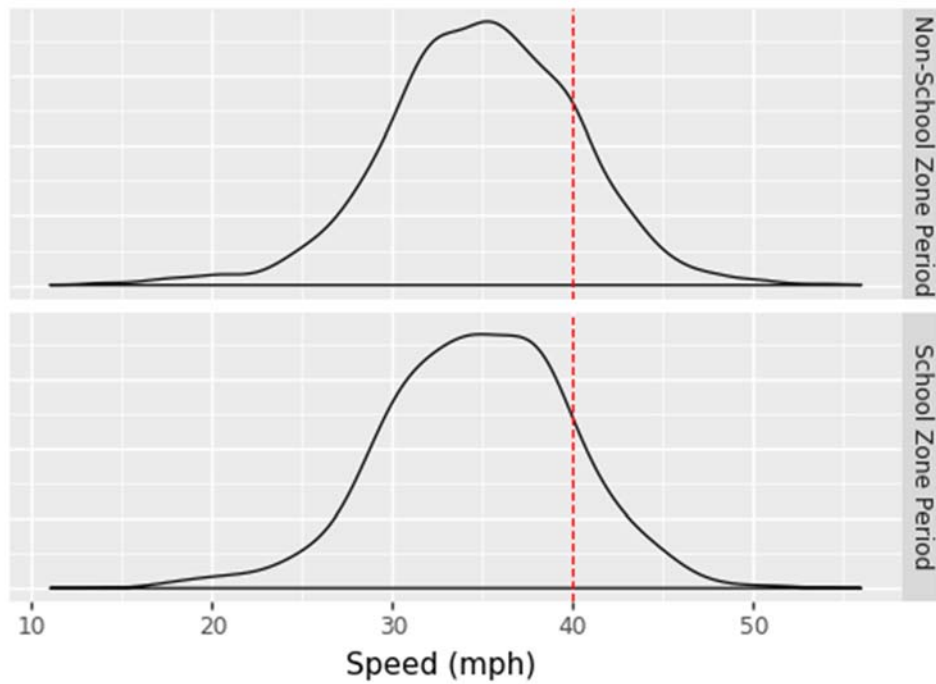


Figure A34: Speed distribution plots

## CONTROL 18. S 27TH STREET NEAR HILL ELEMENTARY (CONTROL)

The control zone location on S 27th Street near Hill Elementary School, shown in Figure A35, is on a high-volume street with an ADT of 23,830 vehicles. There is a full traffic signal in the control zone. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A18. The speed distributions compared to the posted speed limits are shown in Figure A36. There was a decrease of 0.3 mph for the average vehicle speed during the reduced speed period. The t-test value is -1.63 and the p-value is 0.104, meaning that this speed reduction is not statistically significant.



Figure A35: S 27th Street near Hill Elementary School Control Zone



Table A18: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	41.4	Non-reduced speed period	46
Reduced-speed	NA	Reduced speed period	41.1	Reduced speed period	46
Difference	NA	<b>Difference</b>	<b>-0.3</b>	<b>Difference</b>	<b>0</b>

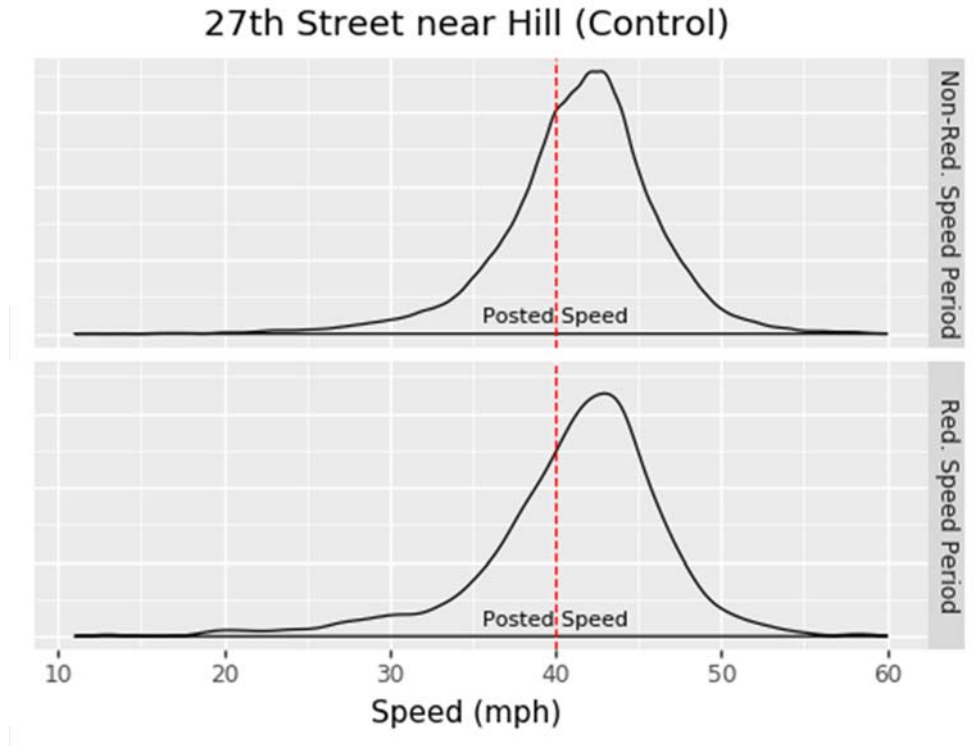


Figure A36: Speed distribution plots

## CONTROL 19. S 56TH STREET NEAR COLLEGE VIEW ACADEMY (CONTROL)

The control zone location on S 56th Street near College View Academy, shown in Figure A37, is on a high-volume street with an ADT of 24,720 vehicles. The control zone has sidewalks on both sides and is north of a full traffic signal with four marked crosswalks. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A19. The speed distributions compared to the posted speed limits are shown in Figure A38. There was an increase of 0.8 mph for the average vehicle speed during the reduced speed period. The t-test value is 4.08 and the p-value is 0.000, meaning that this speed increase is statistically significant.

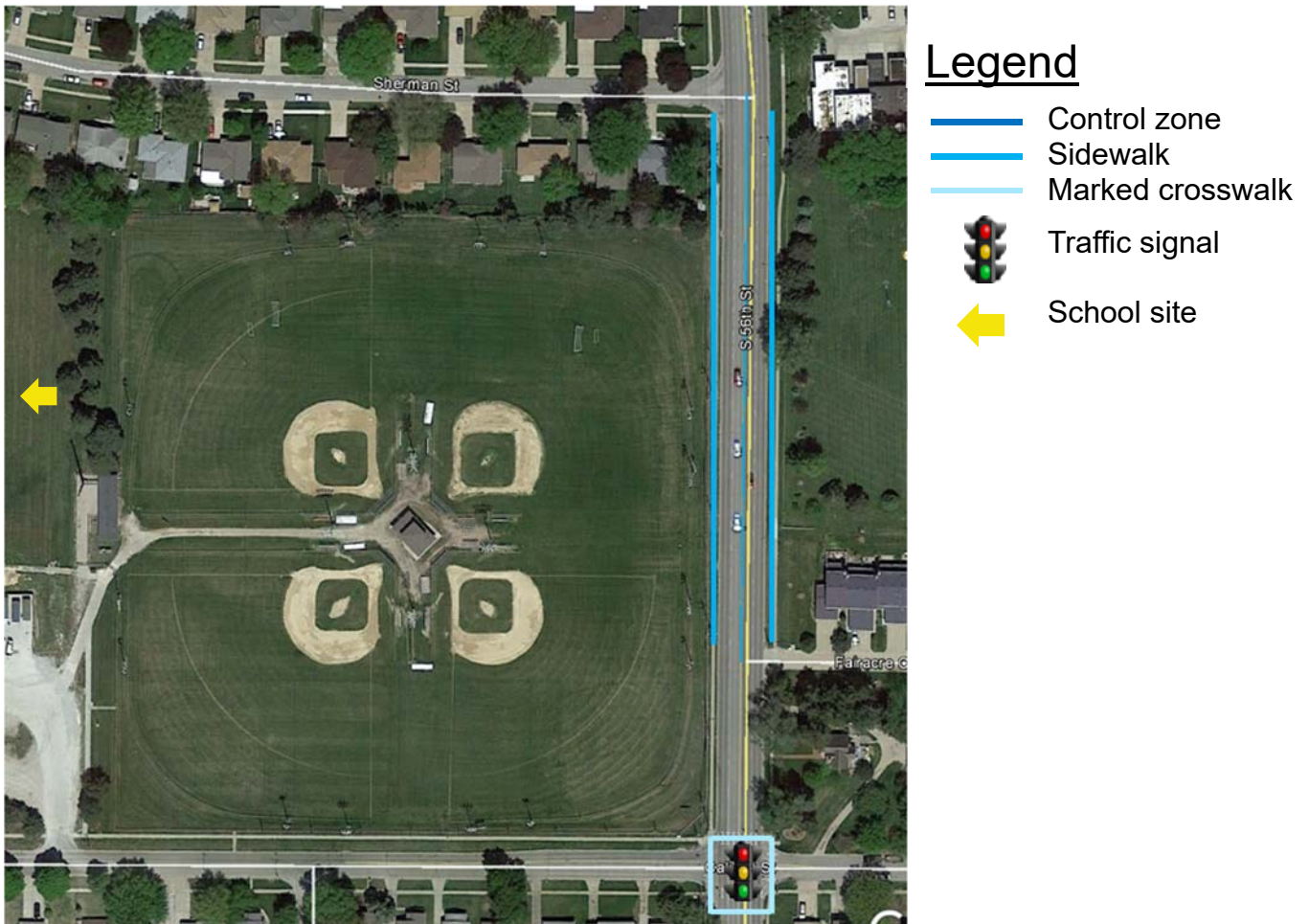


Figure A37: S 56th Street near College View Academy Control Zone

Table A19: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	39.8	Non-reduced speed period	46
Reduced-speed	NA	Reduced speed period	40.6	Reduced speed period	47
Difference	NA	<b>Difference</b>	<b>+0.8</b>	<b>Difference</b>	<b>+1</b>

56th Street near College View Academy (Control)

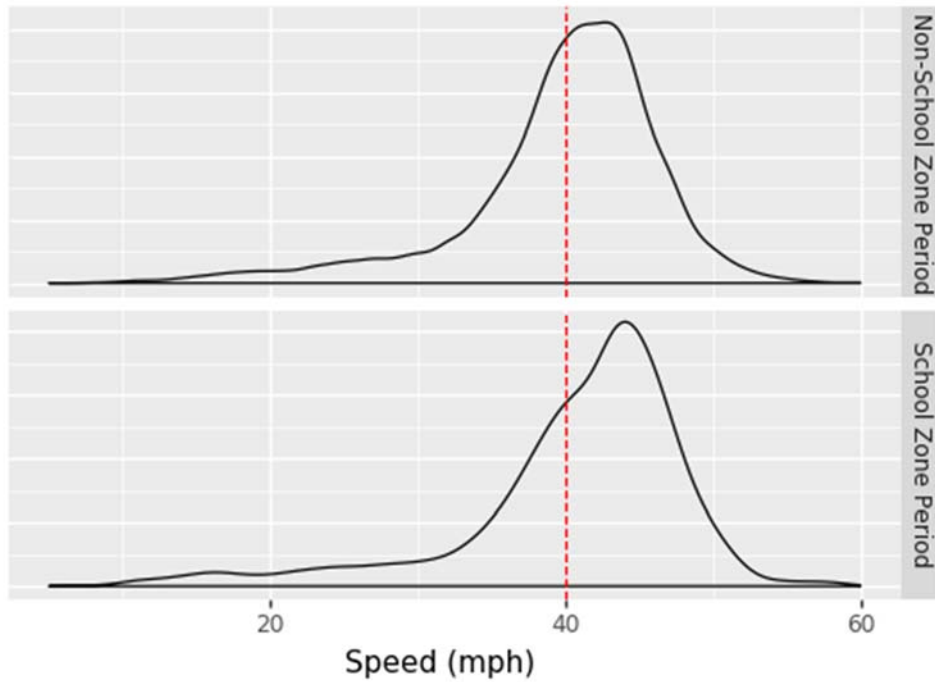


Figure A38: Speed distribution plots

## CONTROL 20. S 70TH STREET NEAR LINCOLN EAST HIGH SCHOOL (CONTROL)

The control zone location on S 70th Street near Lincoln East High School, shown in Figure A39, is on a high-volume street with an ADT of 29,780 vehicles. There is a full traffic signal with four marked crosswalks on each end of the control zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A20. The speed distributions compared to the posted speed limits are shown in Figure A40. There was a decrease of 1.3 mph for the average vehicle speed during the reduced speed period. The t-test value is -7.71 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

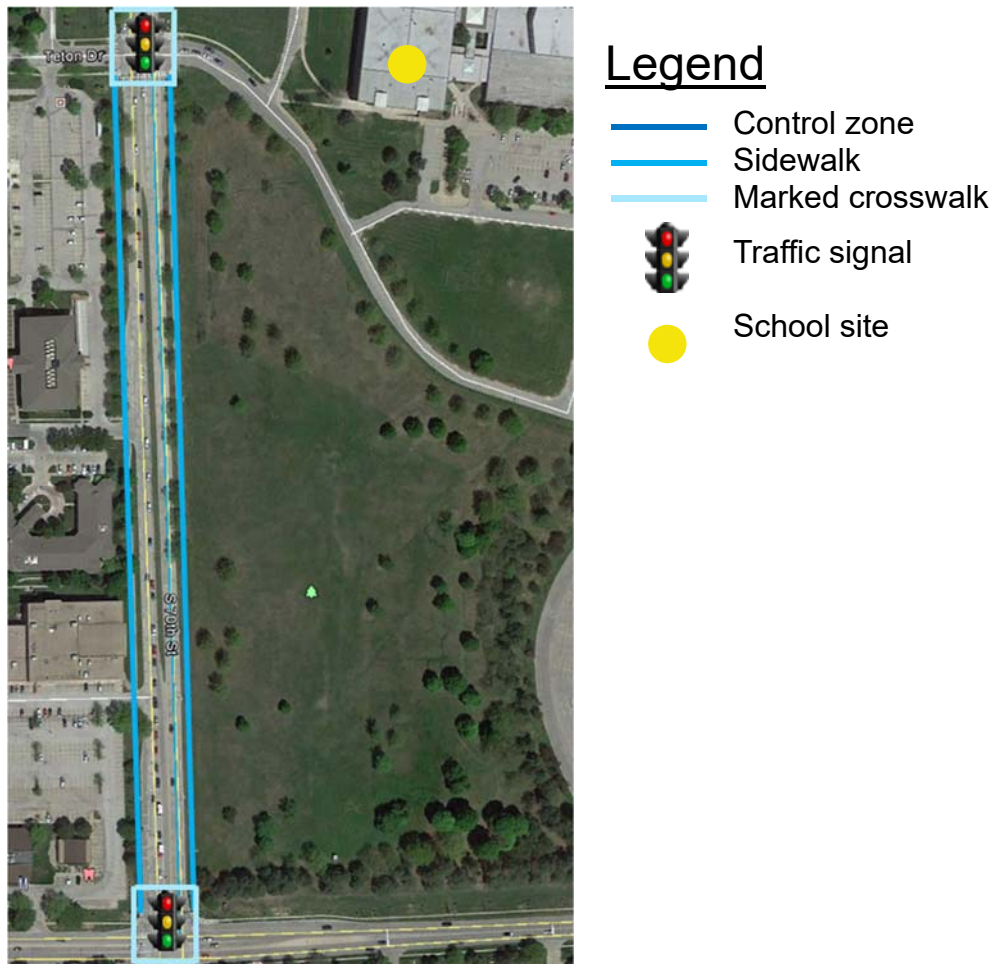


Figure A39: S 70th Street near Lincoln East High School Control Zone

Table A20: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	39.0	Non-reduced speed period	43
Reduced-speed	NA	Reduced speed period	37.7	Reduced speed period	41
Difference	NA	<b>Difference</b>	<b>-1.3</b>	<b>Difference</b>	<b>-2</b>

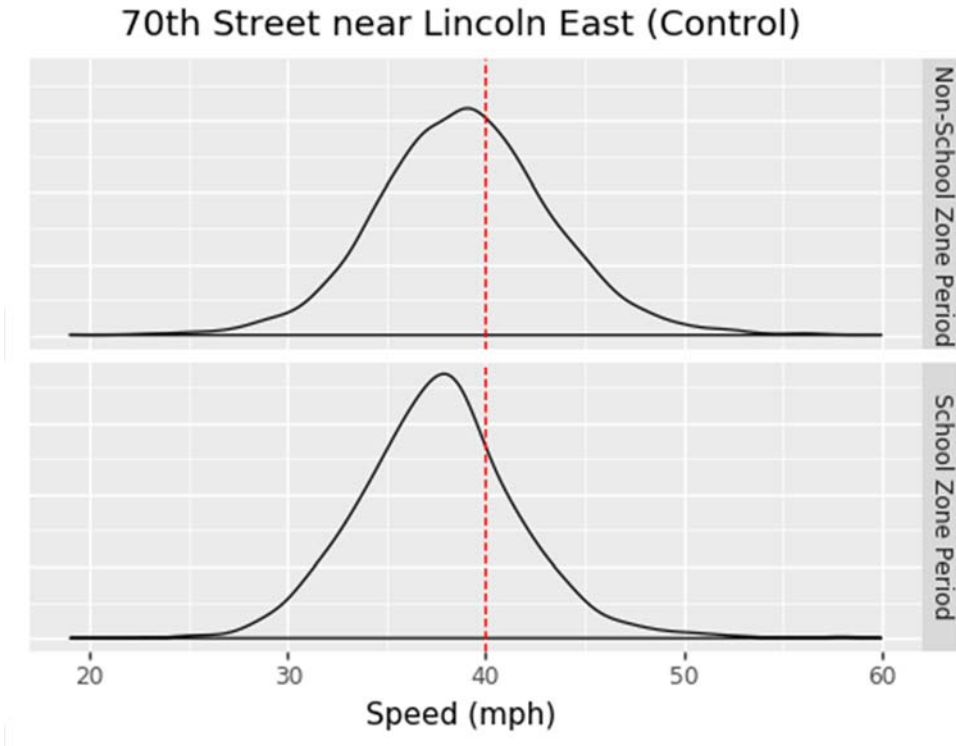


Figure A40: Speed distribution plots

## CONTROL 21. NW 48TH STREET NEAR ARNOLD ELEMENTARY SCHOOL (CONTROL)

The control zone location on NW 48th Street near Arnold Elementary School, shown in Figure A41, is on a low volume street with an ADT of 5,390 vehicles. The control zone is on the western edge of the city and there are no sidewalks on either side of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A21. The speed distributions compared to the posted speed limits are shown in Figure A42. There was a decrease of 6.3 mph for the average vehicle speed during the reduced speed period. The t-test value is -13.34 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

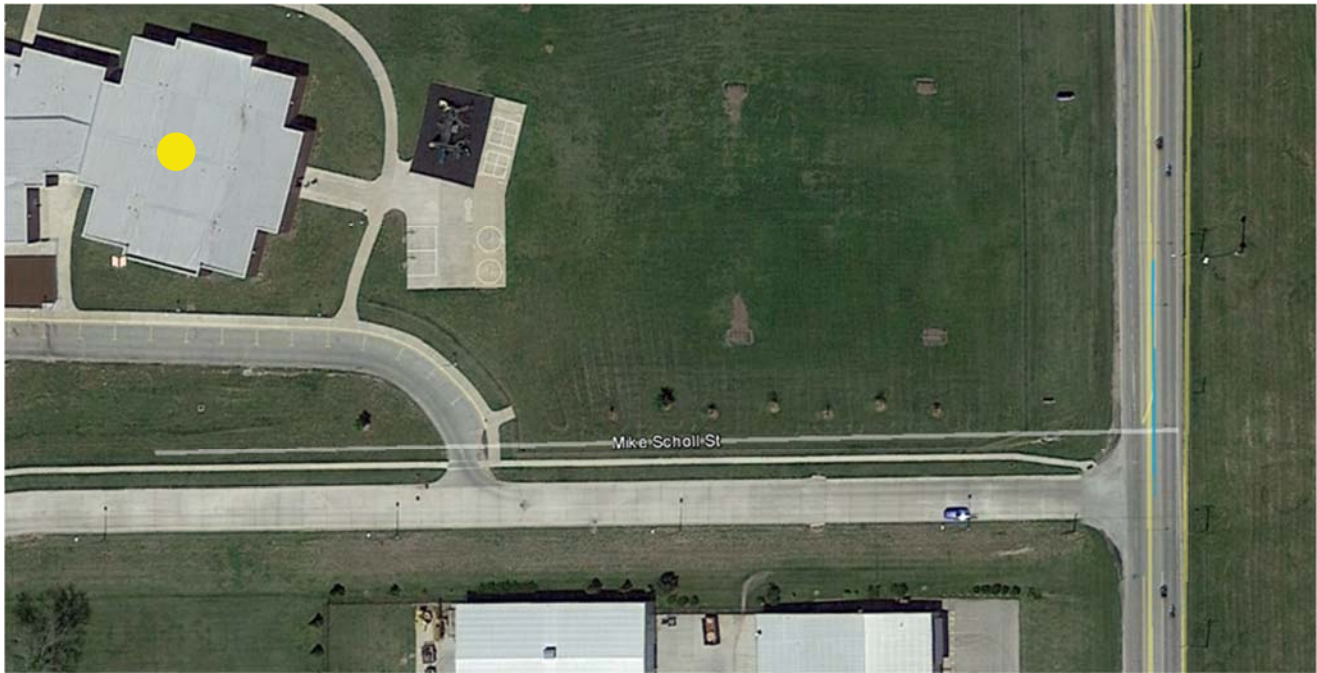


Figure A41: NW 48th Street near Arnold Elementary School Control Zone

### Legend



-  Control zone
-  School site

Table A21: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	45	Non-reduced speed period	41.7	Non-reduced speed period	46
Reduced-speed	NA	Reduced speed period	35.4	Reduced speed period	43
Difference	NA	<b>Difference</b>	<b>-6.3</b>	<b>Difference</b>	<b>-3</b>

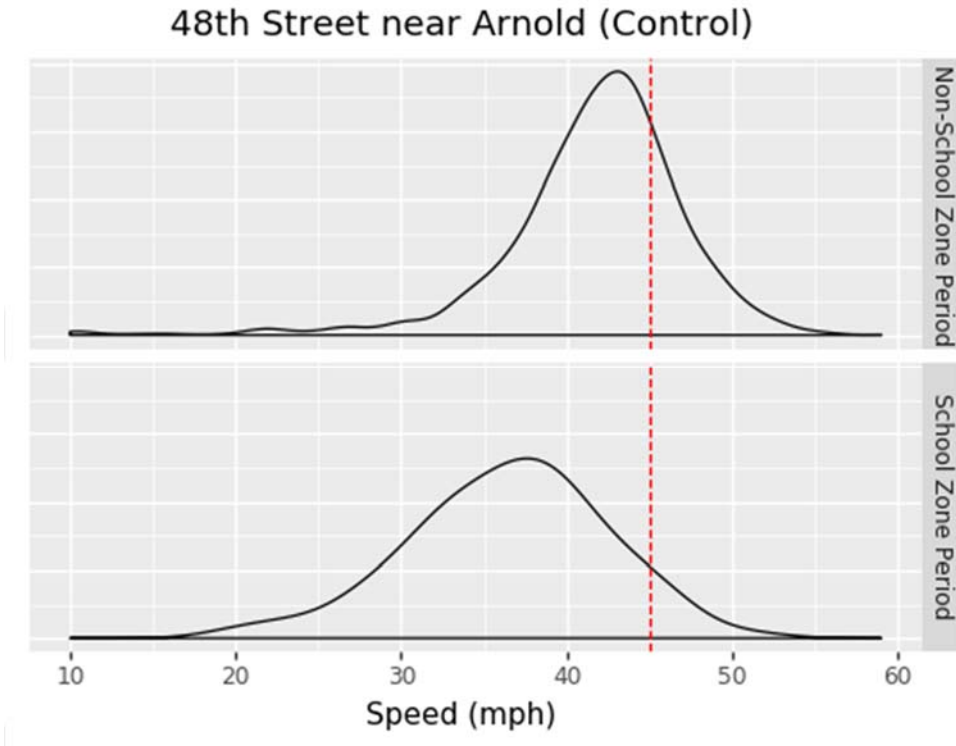


Figure A42: Speed distribution plots

## CONTROL 22. N 84TH STREET NEAR KAHOA ELEMENTARY (CONTROL)

The control zone location on N 84th Street near Kahoa Elementary School, shown in Figure A43, is on a high-volume street with an ADT of 28,490 vehicles. There is a full traffic signal in the control zone. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A22. The speed distributions compared to the posted speed limits are shown in Figure A44. There was a decrease of 0.7 mph for the average vehicle speed during the reduced speed period. The t-test value is -3.89 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

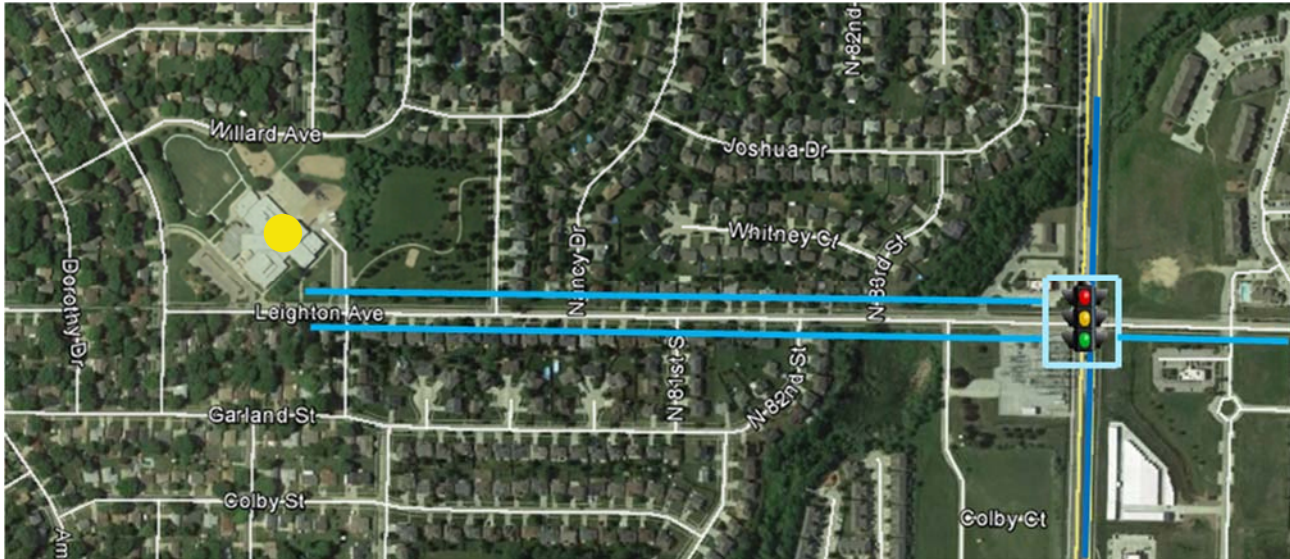


Figure A43: N 84th Street near Kahoa Elementary School Control Zone

### Legend

- Control zone
- Sidewalk
- Marked crosswalk
- Traffic signal
- School site



Table A22: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	45	Non-reduced speed period	39.9	Non-reduced speed period	47
Reduced-speed	NA	Reduced speed period	39.2	Reduced speed period	47
Difference	NA	<b>Difference</b>	<b>-0.7</b>	<b>Difference</b>	<b>0</b>

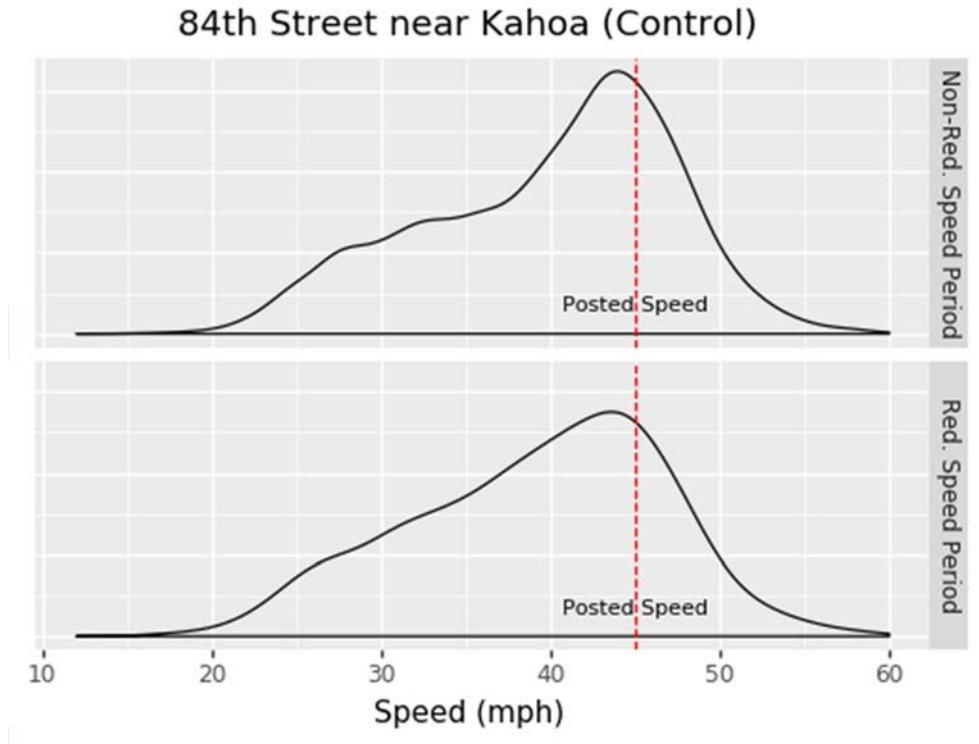


Figure A44: Speed distribution plots

## RSZ 1. Q STREET NEAR ELLIOTT ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on Q Street near Elliot Elementary School, shown in Figure A45, is on a low volume street with an ADT of 3,560 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A23. The speed distributions compared to the posted speed limits are shown in Figure A46. The average speed during the non-reduced speed period was 28.7 miles per hour while the average speed during the reduced speed period was 26.4 miles per hours, a decrease of 2.3 miles per hour. The t-statistic for these values is -6.44 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

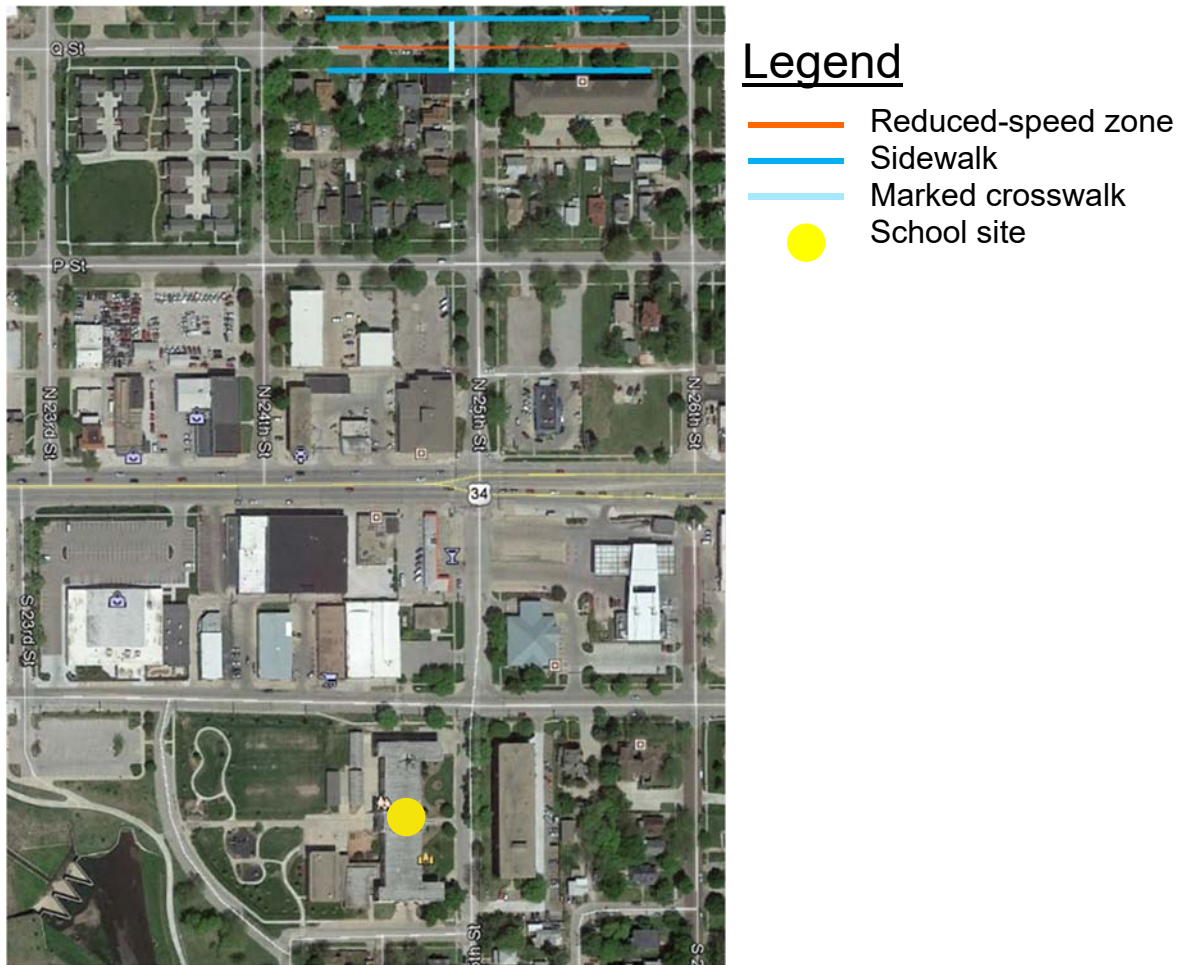


Figure A45: Q Street near Elliott Elementary Reduced-Speed Zone

Table A23: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	28.7	Non-reduced speed period	33
Reduced-speed	25	Reduced speed period	26.4	Reduced speed period	30
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-2.3</b>	<b>Difference</b>	<b>-3</b>

Q Street near Elliot (School Zone)

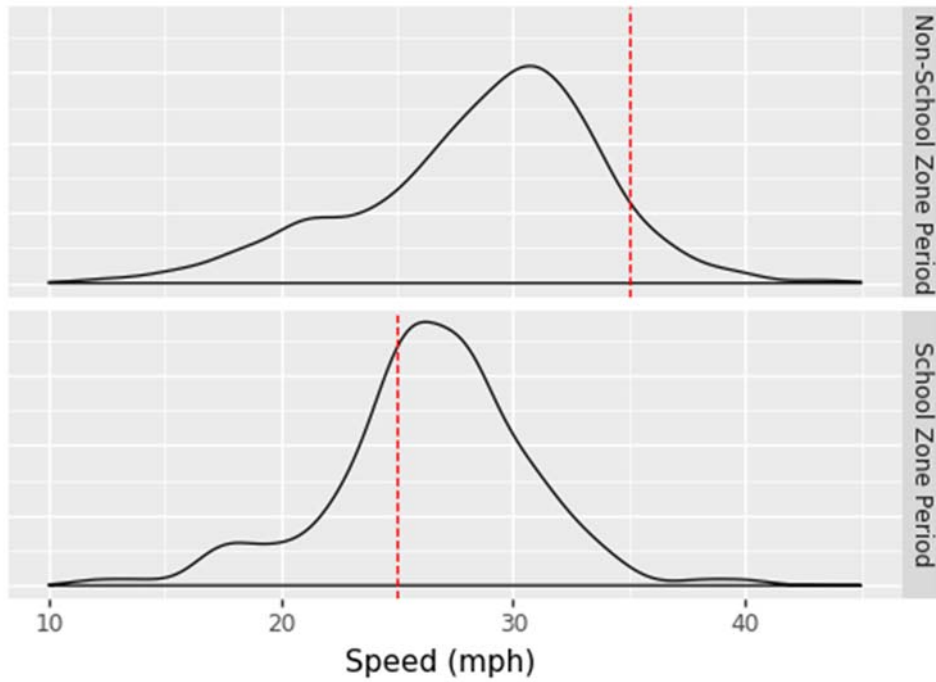


Figure A46: Speed distribution plots

## RSZ 2. CALVERT STREET NEAR CALVERT ELEMENTARY (REDUCED-SPEED ZONE)

The reduced-speed zone location on Calvert Street near Calvert Elementary School, shown in Figure A47, is on a low volume street with an ADT of 5,630 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a mid-block pedestrian crossing signal within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A24. The speed distributions compared to the posted speed limits are shown in Figure A48. The average speed during the non-reduced speed period was 30.8 miles per hour while the average speed during the reduced speed period was 26.8 miles per hour, a decrease of 4.0 miles per hour. The t-statistic for these values is -18.97 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

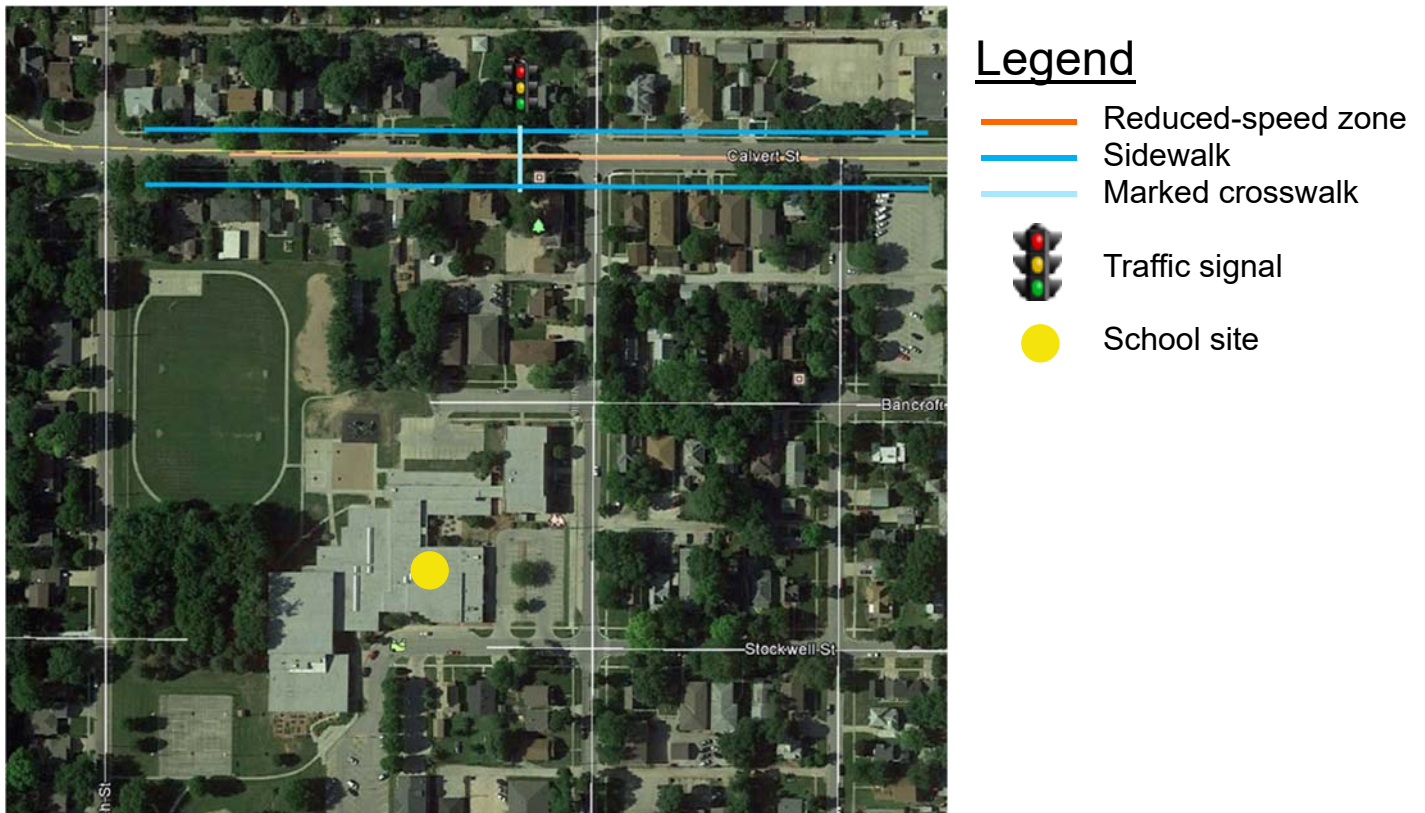


Figure A47: Calvert Street near Calvert Elementary Reduced-Speed Zone

Table A24: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	30.8	Non-reduced speed period	35
Reduced-speed	25	Reduced speed period	26.8	Reduced speed period	30
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-4.0</b>	<b>Difference</b>	<b>-5</b>

Calvert Street near Calvert (School Zone)

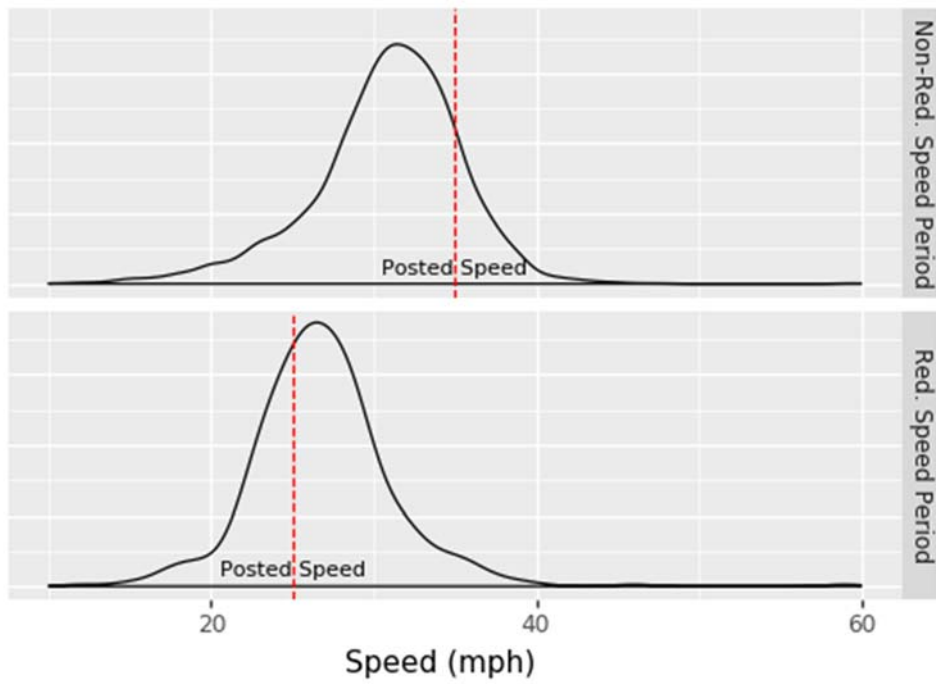


Figure A48: Speed distribution plots

### RSZ 3. VAN DORN STREET AT IRVING MIDDLE (REDUCED-SPEED ZONE)

The reduced-speed zone location on Van Dorn Street at Irving Middle School, shown in Figure A49, is on a low volume street with an ADT of 8,180 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There are two marked crosswalks within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A25. The speed distributions compared to the posted speed limits are shown in Figure A50. The average speed during the non-reduced speed period was 31.9 miles per hour while the average speed during the reduced speed period was 27.1 miles per hour, a decrease of 4.8 miles per hour. The t-statistic for these values is -19.02 and the p-value is 0.000, meaning that this speed decrease is statistically significant.



Figure A49: Van Dorn Street at Irving Middle Reduced-Speed Zone

#### Legend

- Reduced-speed zone
- Sidewalk
- Marked crosswalk
- School site

Table A25: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	31.9	Non-reduced speed period	38
Reduced-speed	25	Reduced speed period	27.1	Reduced speed period	33
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-4.8</b>	<b>Difference</b>	<b>-5</b>

Van Dorn Street near Irving (School Zone)

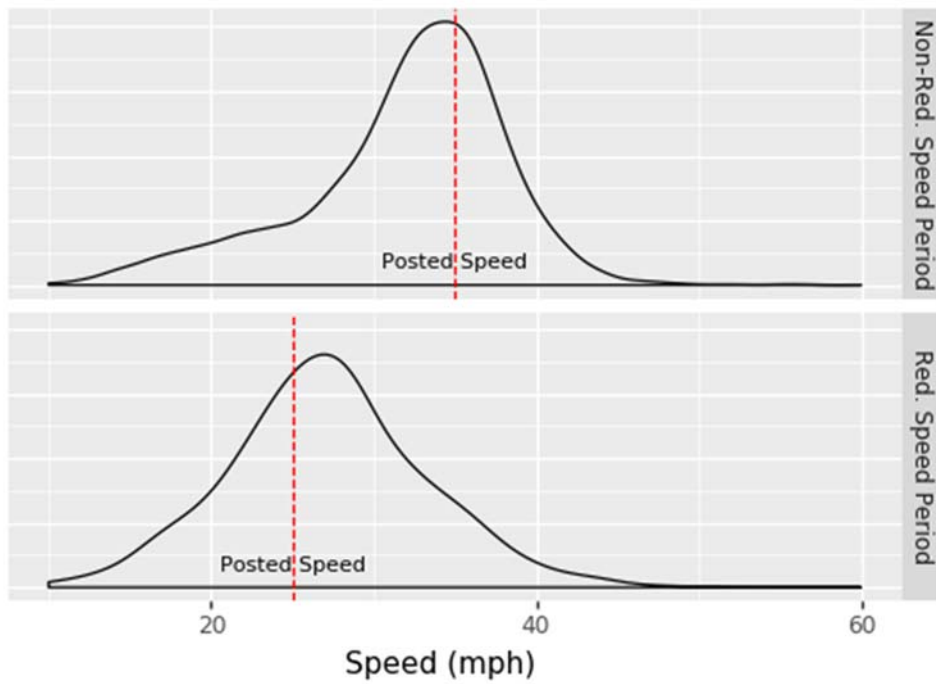


Figure A50: Speed distribution plots

## RSZ 4. S 33RD STREET NEAR ROUSSEAU ELEMENTARY (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 33rd Street near Rousseau Elementary School, shown in Figure A51, is on a low volume street with an ADT of 9,130 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a mid-block pedestrian crossing signal within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A26. The speed distributions compared to the posted speed limits are shown in Figure A52. The average speed during the non-reduced speed period was 32.5 miles per hour while the average speed during the reduced speed period was 22.3 miles per hour, a decrease of 10.2 miles per hour. The t-statistic for these values is -53.90 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

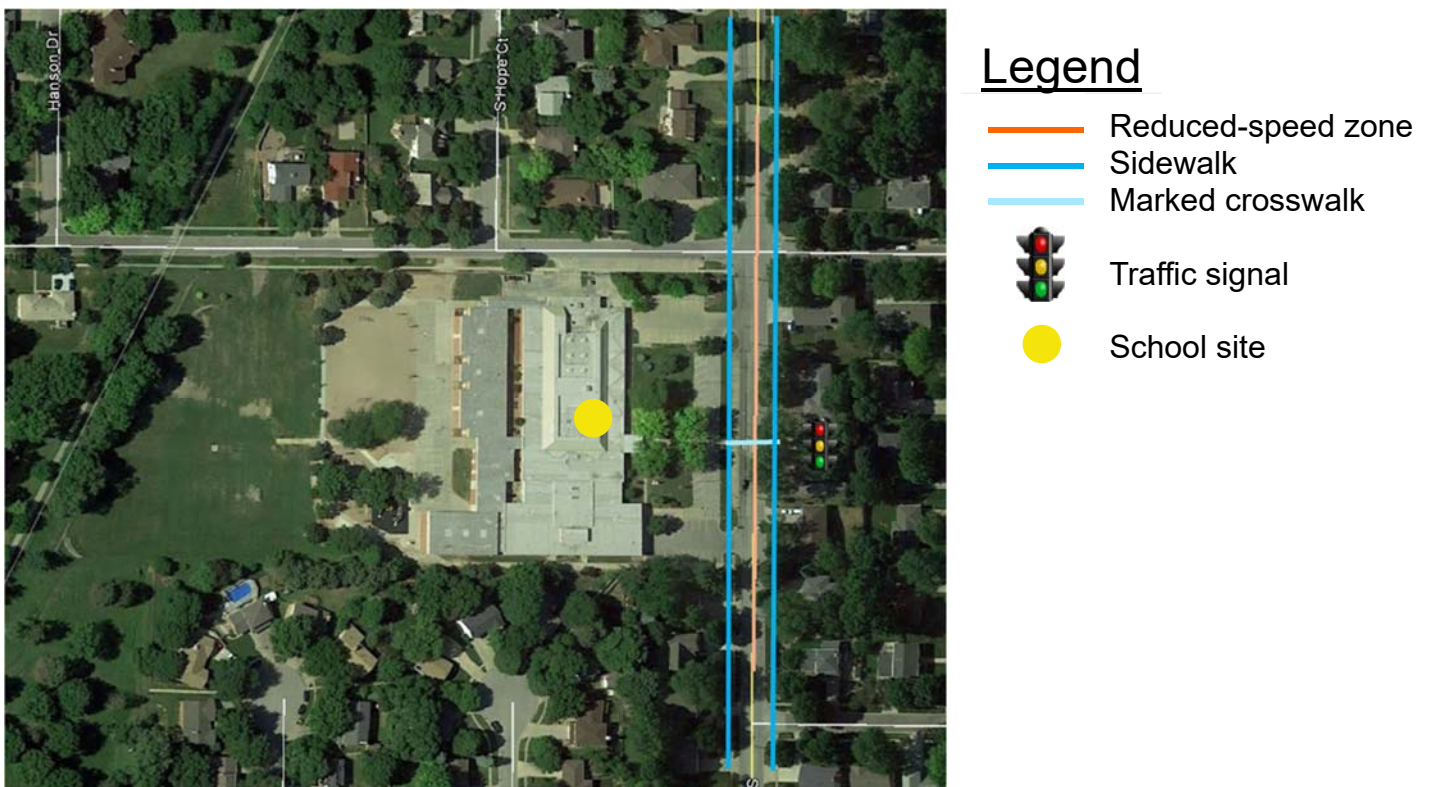


Figure A51: S 33rd Street near Rousseau Elementary Reduced-Speed Zone



Table A26: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.5	Non-reduced speed period	38
Reduced-speed	25	Reduced speed period	22.3	Reduced speed period	28
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-10.2</b>	<b>Difference</b>	<b>-10</b>

33rd Street near Rousseau (School Zone)

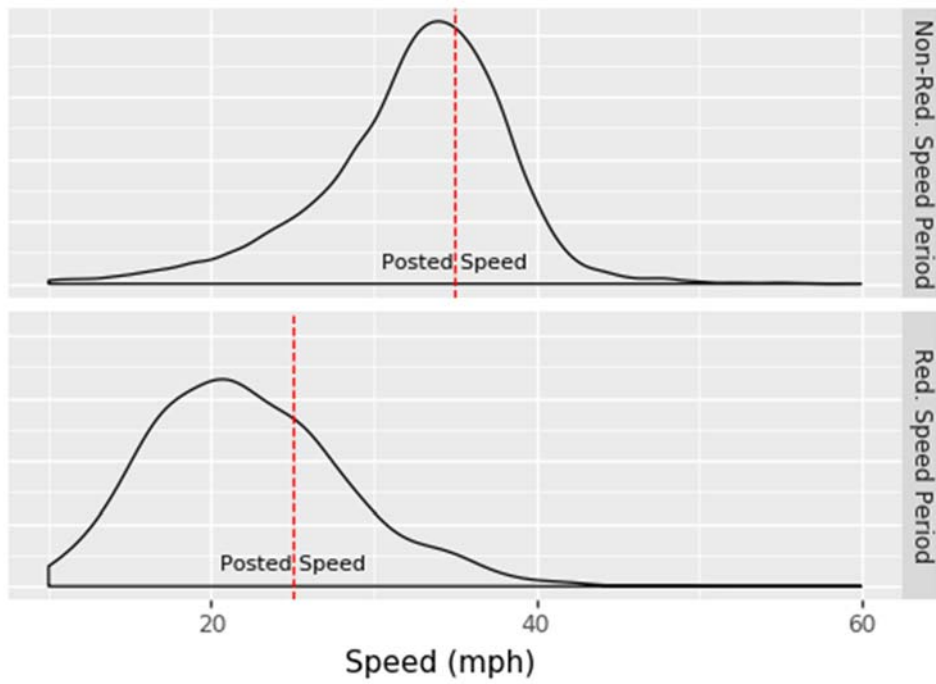


Figure A52: Speed distribution plots

## RSZ 5. S 40TH STREET NEAR RANDOLPH ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 40th Street near Randolph Elementary School, shown in Figure A53, is on a low volume street with an ADT of 9,590 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone and sidewalks on one side of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A27. The speed distributions compared to the posted speed limits are shown in Figure A54. The average speed during the non-reduced speed period was 30.3 miles per hour while the average speed during the reduced speed period was 26.5 miles per hour, a decrease of 3.8 miles per hour. The t-statistic for these values is -18.70 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

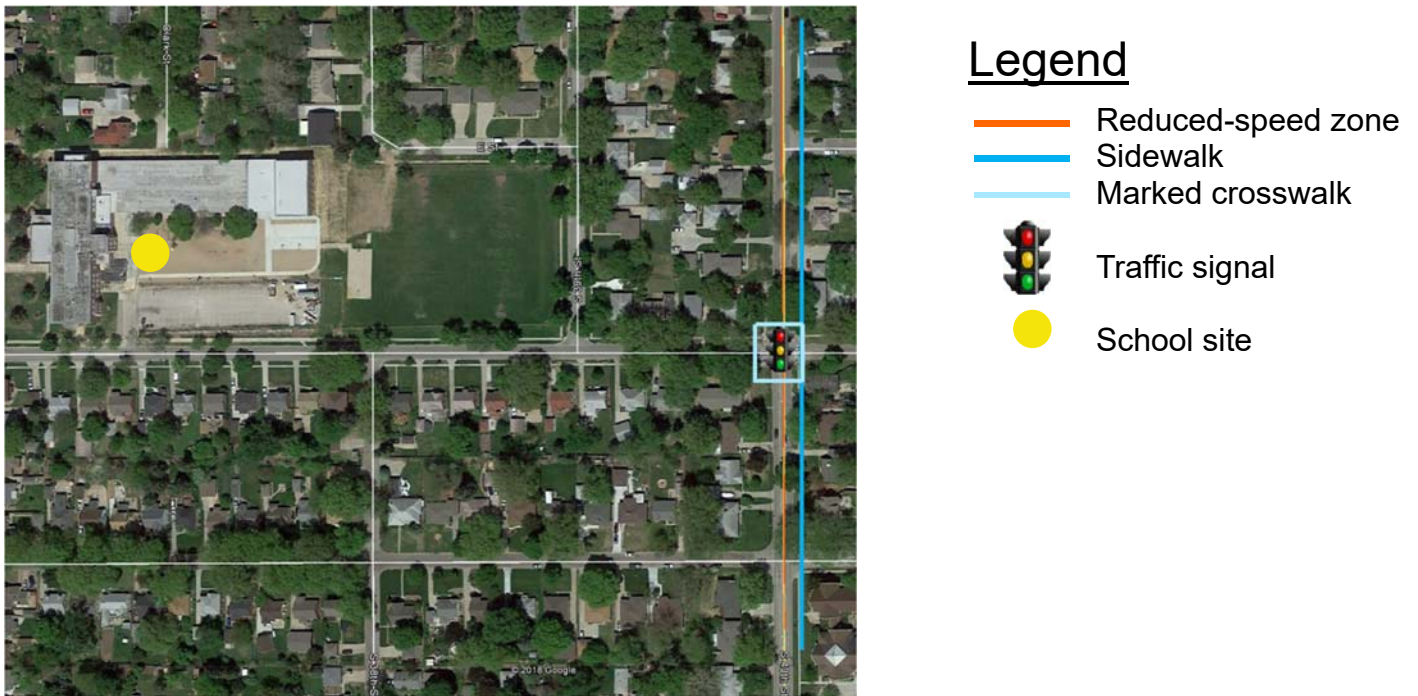


Figure A53: S 40th Street near Randolph Elementary Reduced-Speed Zone

Table A27: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-School Zone Period	30.3	Non-reduced speed period	36
Reduced-speed	25	Reduced speed period	26.5	Reduced speed period	31
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-3.8</b>	<b>Difference</b>	<b>-5</b>

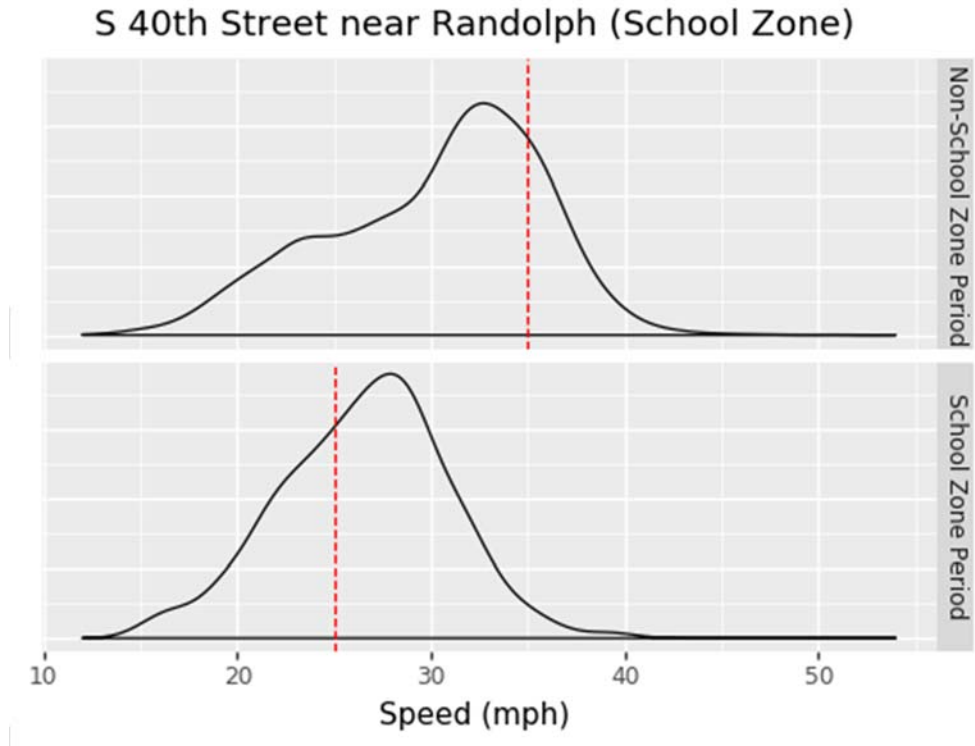


Figure A54: Speed distribution plots

## RSZ 6. SHERIDAN BLVD NEAR SHERIDAN ELEMENTARY (REDUCED-SPEED ZONE)

The reduced-speed zone location on Sheridan Blvd near Sheridan Elementary School, shown in Figure A55, is on a moderate volume street with an ADT of 10,840 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A28. The speed distributions compared to the posted speed limits are shown in Figure A56. The average speed during the non-reduced speed period was 32.0 miles per hour while the average speed during the reduced speed period was 27.3 miles per hour, a decrease of 4.7 miles per hour. The t-statistic for these values is -18.48 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

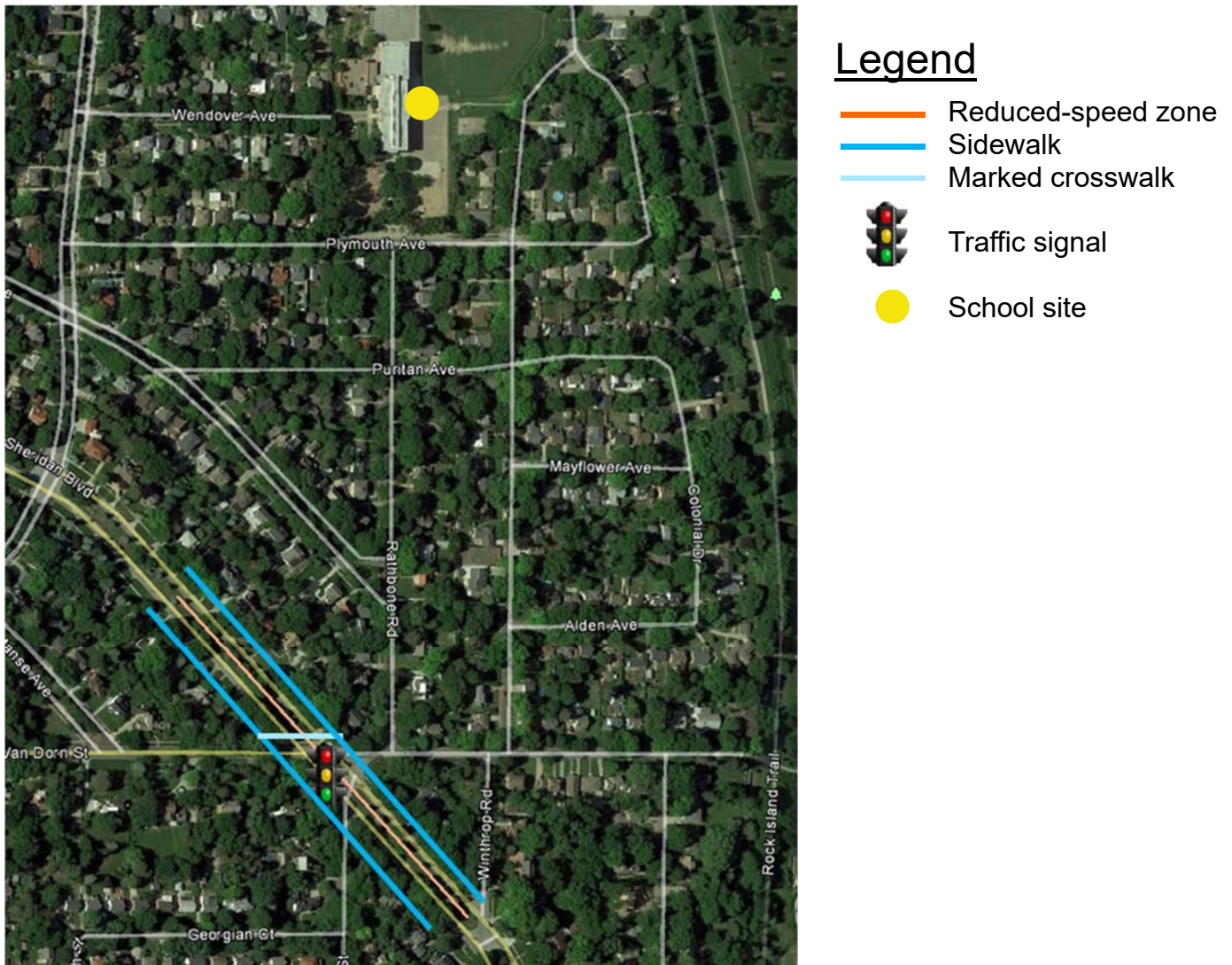


Figure A55: Sheridan Blvd near Sheridan Elementary Reduced-Speed Zone

Table A28: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.0	Non-reduced speed period	37
Reduced-speed	25	Reduced speed period	27.3	Reduced speed period	32
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-4.7</b>	<b>Difference</b>	<b>-5</b>

Sheridan Boulevard near Sheridan (School Zone)

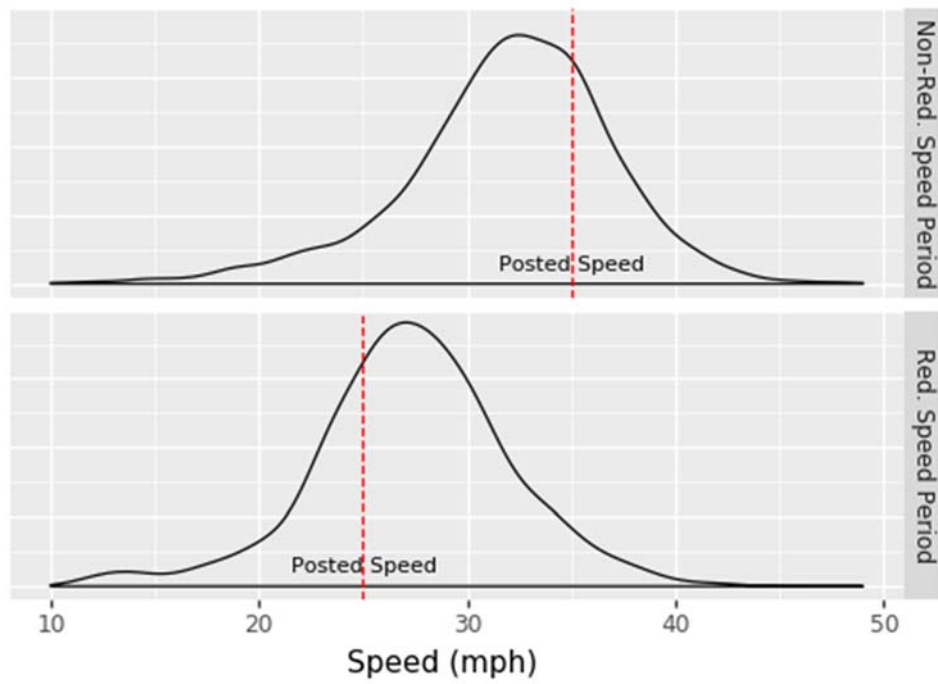


Figure A56: Speed distribution plots

## RSZ 7. ADAMS STREET NEAR HUNTINGTON ELEMENTARY (REDUCED-SPEED ZONE)

The reduced-speed zone location on Adams Street near Huntington Elementary School, shown in Figure A57, is on a moderate volume street with an ADT of 12,300 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a mid-block pedestrian crossing signal and a full traffic signal within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A29. The speed distributions compared to the posted speed limits are shown in Figure A58. The average speed during the non-reduced speed period was 32.5 miles per hour while the average speed during the reduced speed period was 26.9 miles per hour, a decrease of 5.6 miles per hour. The t-statistic for these values is -32.7 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

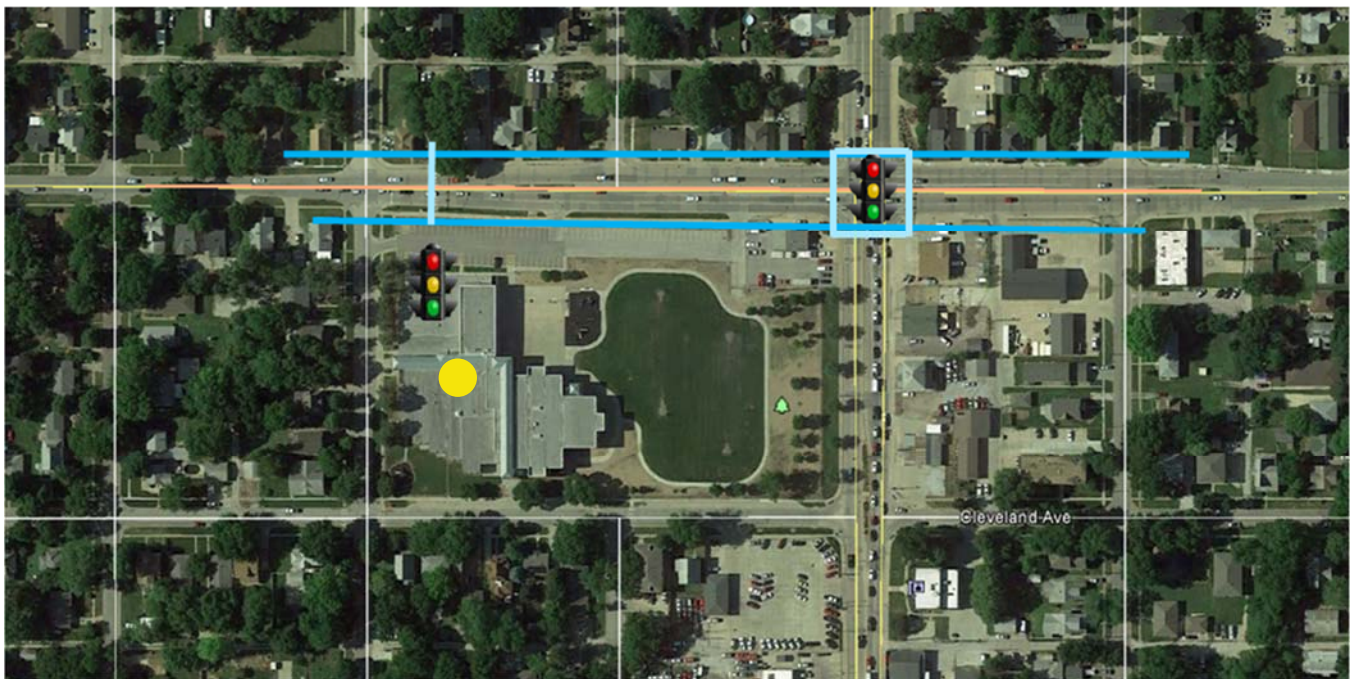


Figure A57: Adams Street at Huntington Elementary Reduced-Speed Zone

### Legend

- Reduced-speed zone
- Sidewalk
- Marked crosswalk
- Traffic signal
- School site

Table A29: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.5	Non-reduced speed period	36
Reduced-speed	25	Reduced speed period	26.9	Reduced speed period	31
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-5.6</b>	<b>Difference</b>	<b>-5</b>

Adams Street near Huntington (School Zone)

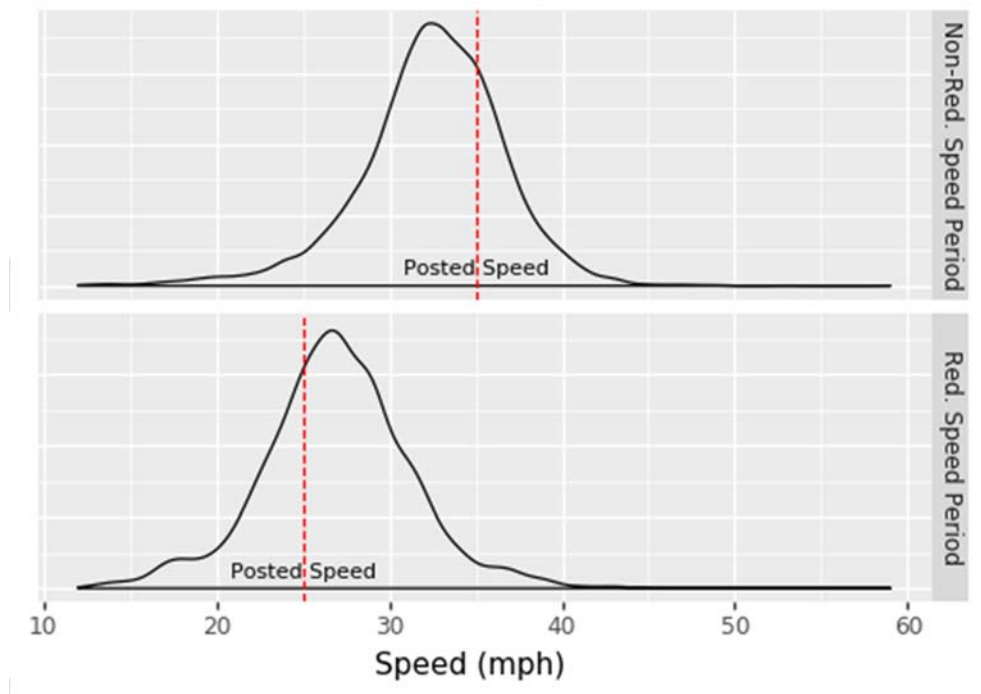


Figure A58: Speed distribution plots

## RSZ 8. S 13TH STREET NEAR SARATOGA ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 13th Street near Saratoga Elementary School, shown in Figure A59, is on a moderate volume street with an ADT of 12,820 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing signal within the reduced-speed zone and sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A30. The speed distributions compared to the posted speed limits are shown in Figure A60. The average speed during the non-reduced speed period was 33.3 miles per hour while the average speed during the reduced speed period was 26.6 miles per hour, a decrease of 6.7 miles per hour. The t-statistic for these values is -29.59 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

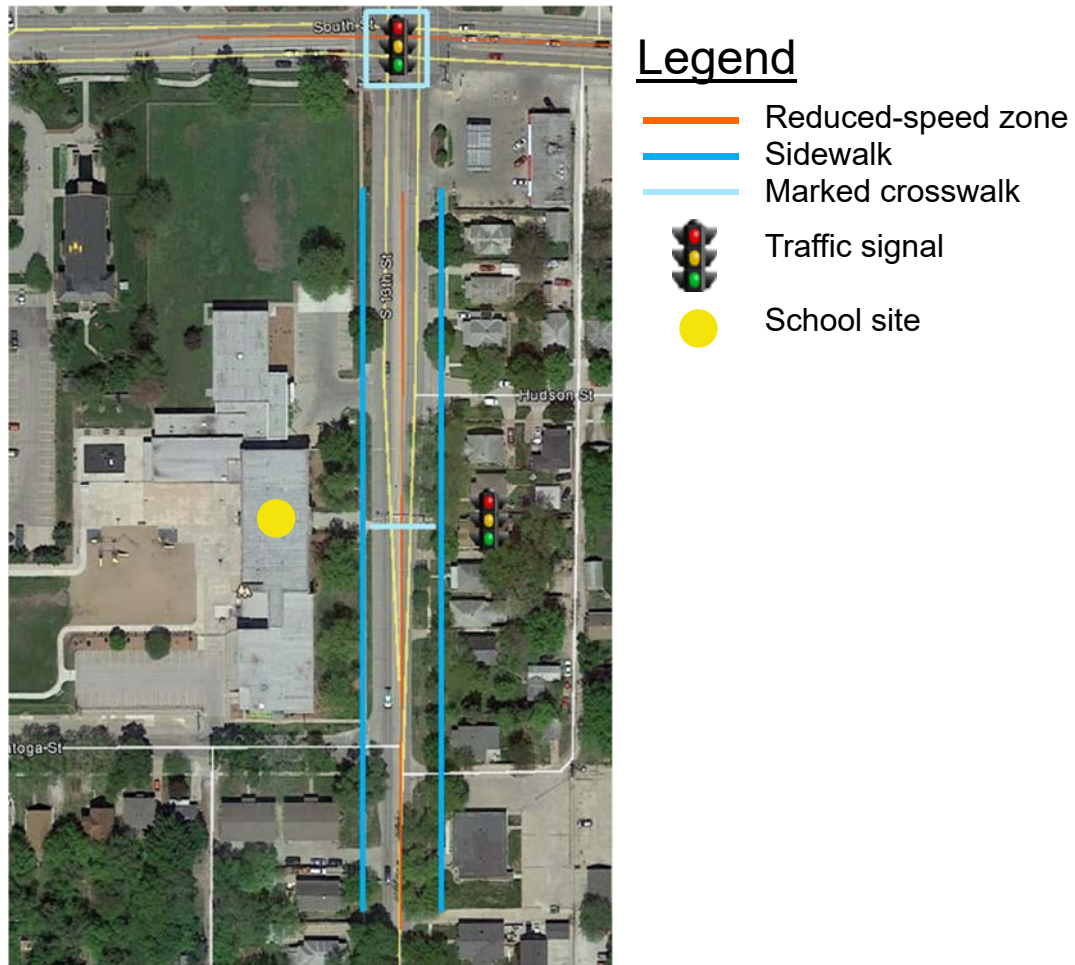


Figure A59: S 13th Street near Saratoga Elementary Reduced-Speed Zone



Table A30: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	33.3	Non-reduced speed period	38
Reduced-speed	25	Reduced speed period	26.6	Reduced speed period	32
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-6.7</b>	<b>Difference</b>	<b>-6</b>

13th Street near Saratoga (13th St) (School Zone)

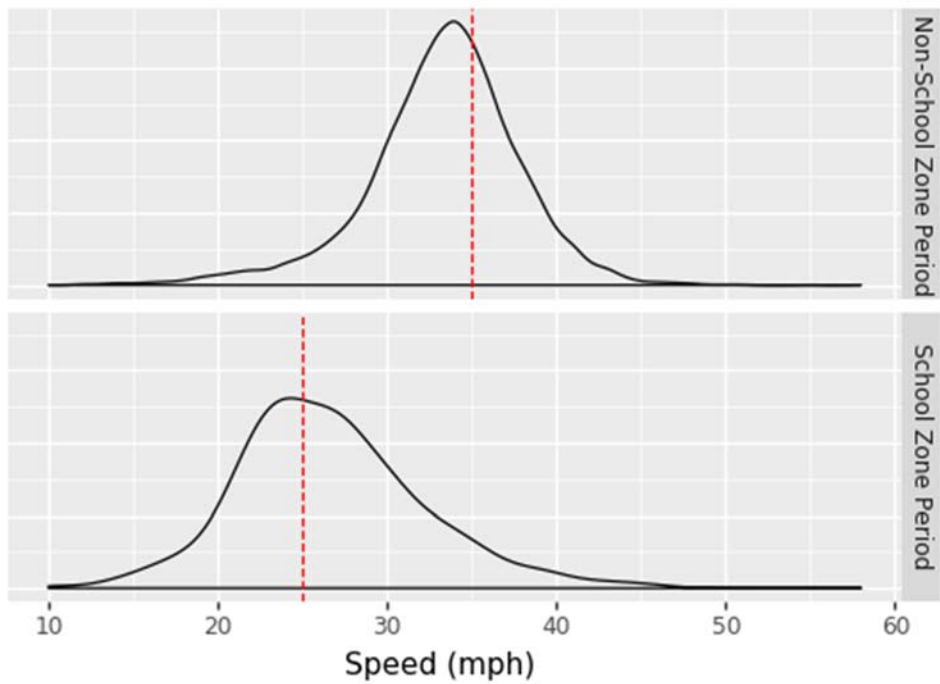


Figure A60: Speed distribution plots

## RSZ 9. HOLDREGE STREET NEAR CLINTON ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on Holdrege Street near Clinton Elementary School, shown in Figure A61, is on a moderate volume street with an ADT of 12,990 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing signal within the reduced-speed zone and sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A31. The speed distributions compared to the posted speed limits are shown in Figure A62. The average speed during the non-reduced speed period was 32.4 miles per hour while the average speed during the reduced speed period was 26.0 miles per hour, a decrease of 6.4 miles per hour. The t-statistic for these values is -38.39 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

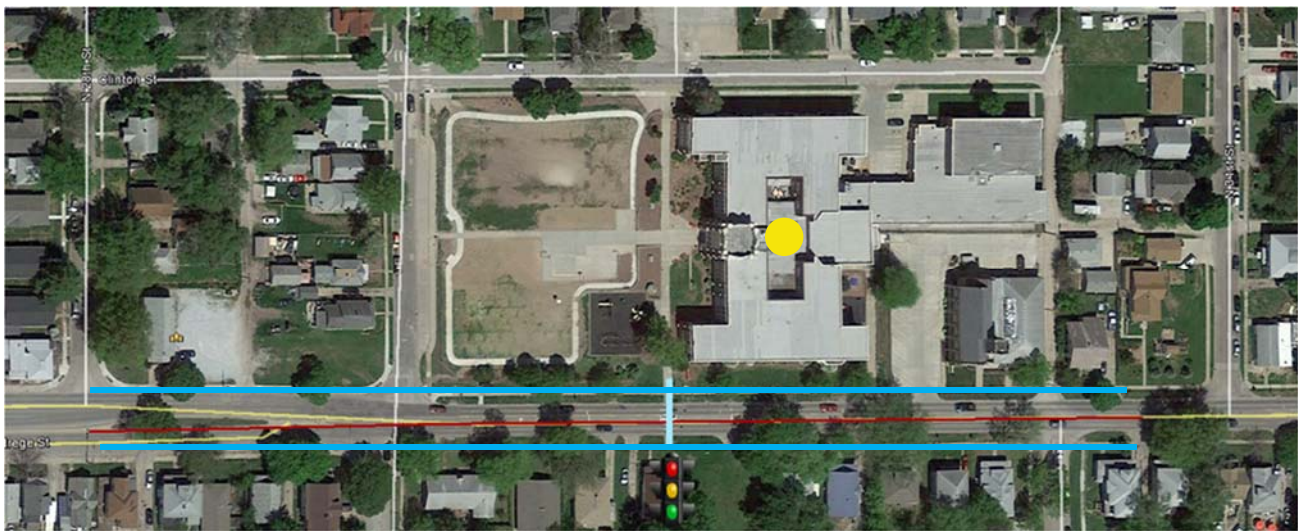


Figure A61: Holdrege Street near Clinton Elementary Reduced-Speed Zone

### Legend






-  Reduced-speed zone
-  Sidewalk
-  Marked crosswalk
-  Traffic signal
-  School site

Table A31: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.4	Non-reduced speed period	36
Reduced-speed	25	Reduced speed period	26.0	Reduced speed period	30
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-6.4</b>	<b>Difference</b>	<b>-6</b>

Holdrege Street near Clinton (School Zone)

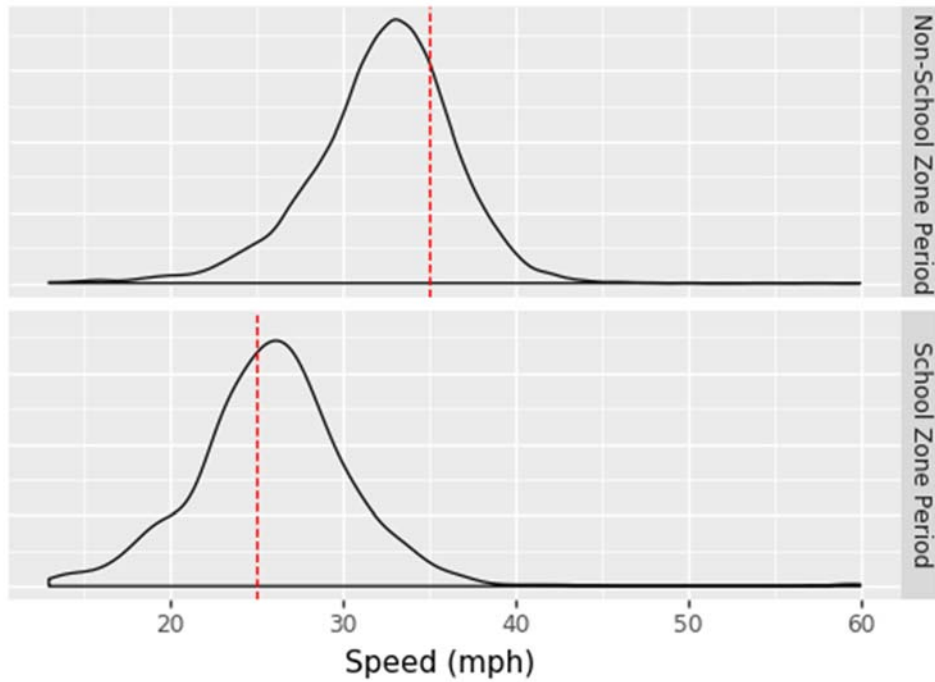


Figure A62: Speed distribution plots

## RSZ 10. N 33RD STREET NEAR HARTLEY ELEMENTARY (REDUCED-SPEED ZONE)

The reduced-speed zone location on N 33rd Street near Hartley Elementary School, shown in Figure A63, is on a moderate volume street with an ADT of 14,690 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal within the reduced-speed zone and sidewalks on both sides on the road. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A32. The speed distributions compared to the posted speed limits are shown in Figure A64. The average speed during the non-reduced speed period was 30.3 miles per hour while the average speed during the reduced speed period was 26.8 miles per hour, a decrease of 3.5 miles per hour. The t-statistic for these values is -20.54 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

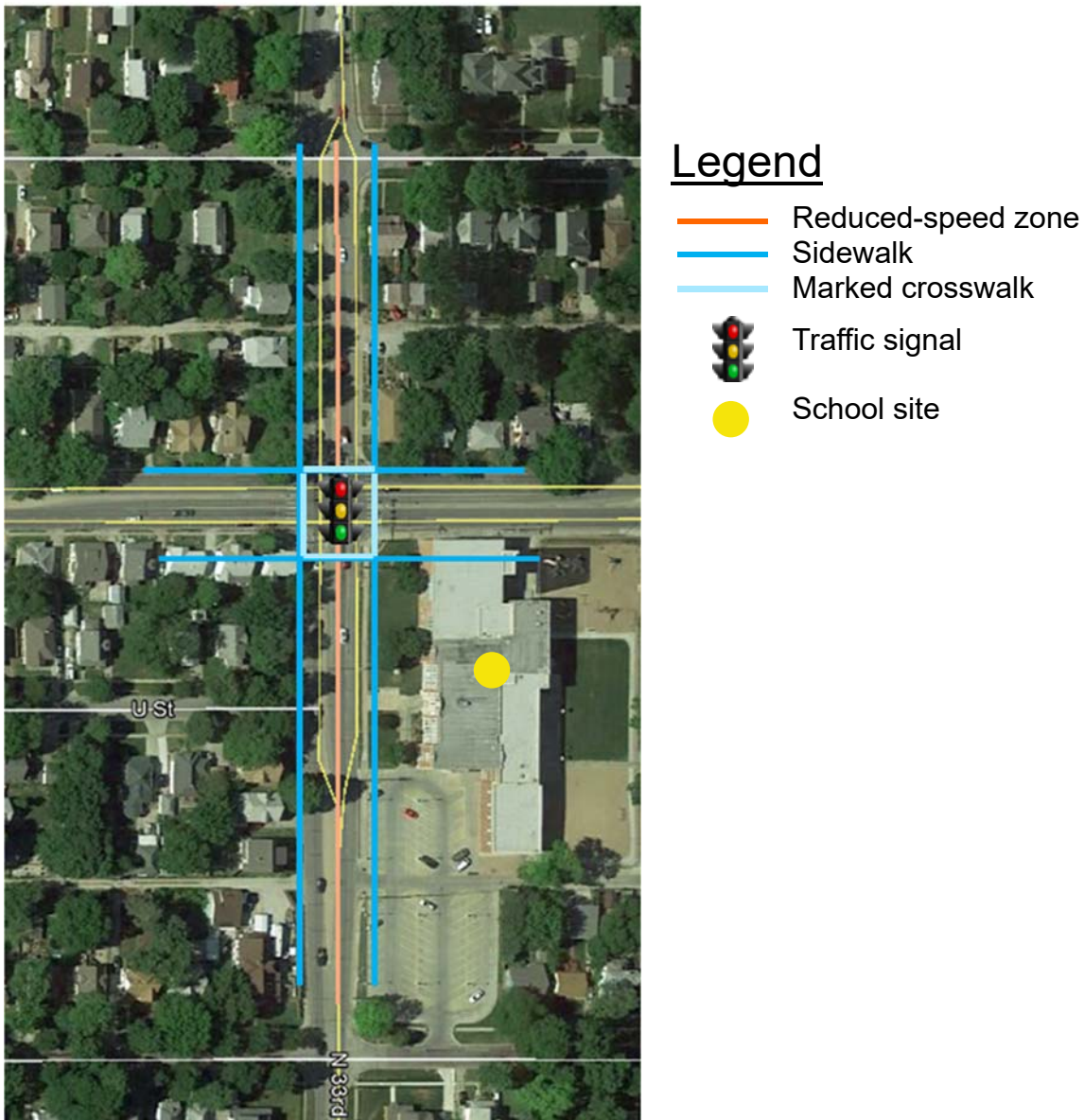


Figure A63: N 33rd Street at Hartley Elementary Reduced-Speed Zone

Table A32: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	30.3	Non-reduced speed period	34
Reduced-speed	25	Reduced speed period	26.8	Reduced speed period	31
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-3.5</b>	<b>Difference</b>	<b>-3</b>

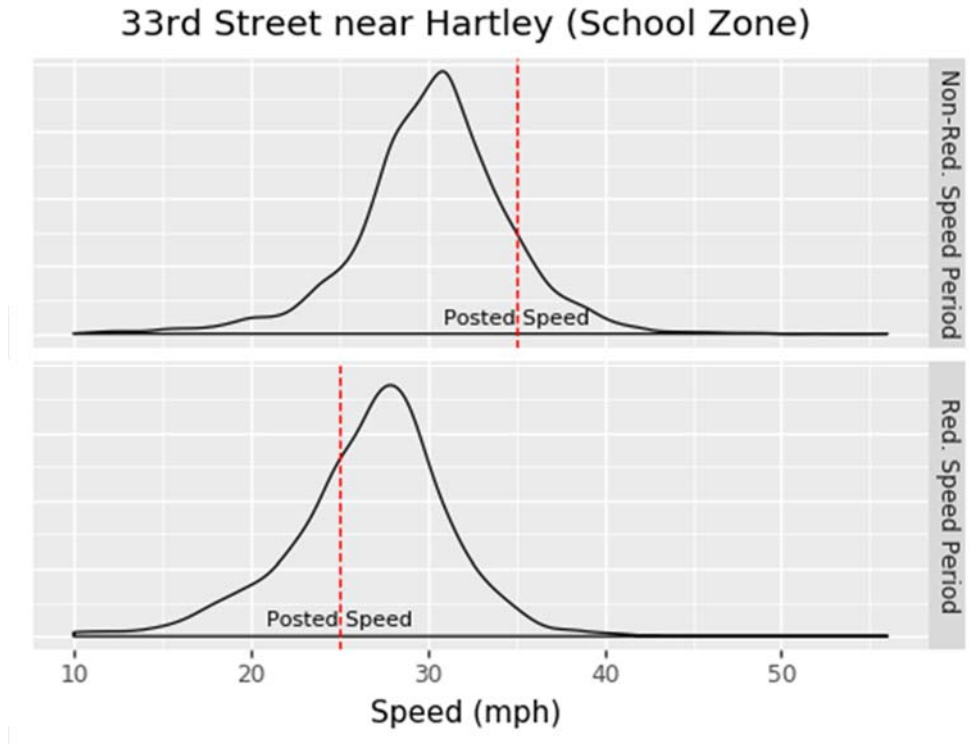


Figure A64: Speed distribution plots

## RSZ 11. SOUTH STREET NEAR SARATOGA ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on South Street near Saratoga Elementary School, shown in Figure A65, is on a moderate volume street with an ADT of 17,100 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone and sidewalks on both sides of the street with a segment missing in front of a gas station. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A33. The speed distributions compared to the posted speed limits are shown in Figure A66. The average speed during the non-reduced speed period was 27.4 miles per hour while the average speed during the reduced speed period was 24.3 miles per hour, a decrease of 3.1 miles per hour. The t-statistic for these values is -14.17 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

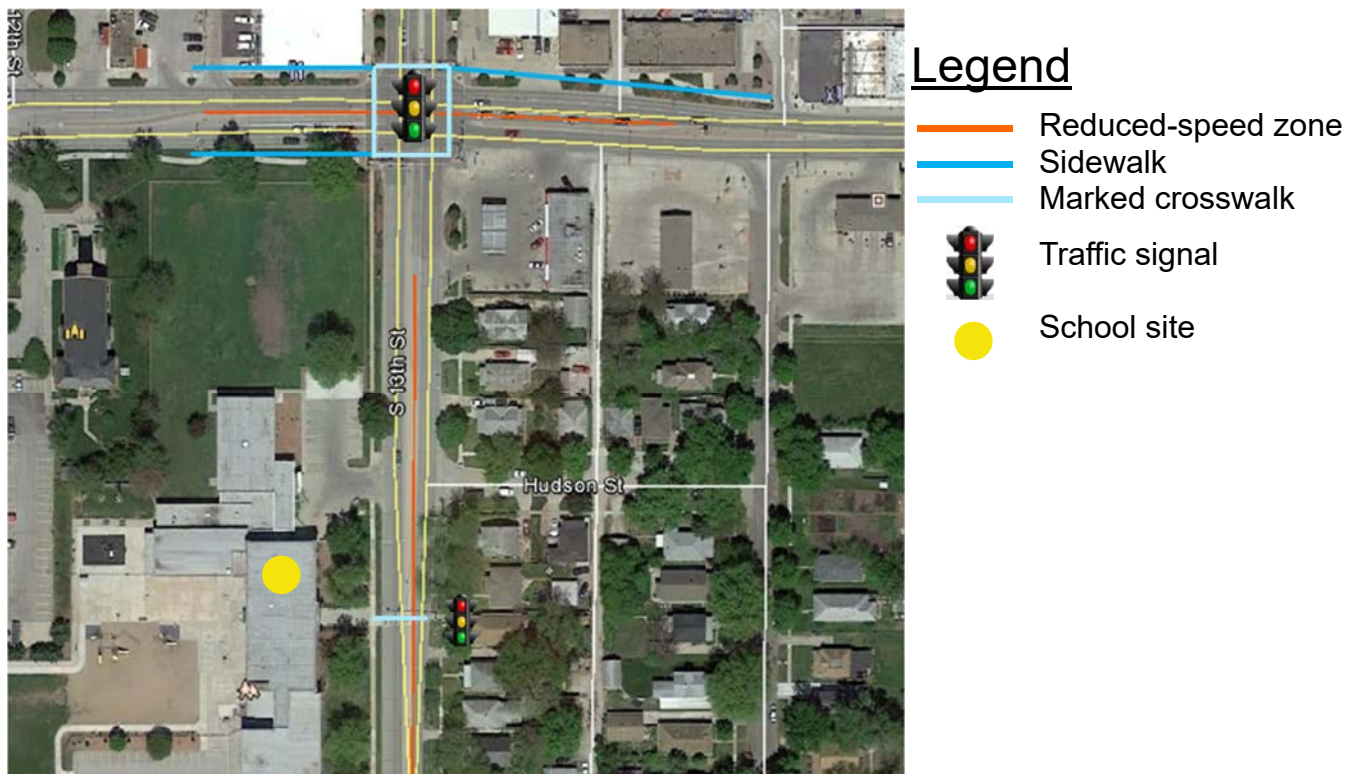


Figure A65: South Street near Saratoga Elementary Reduced-Speed Zone

Table A33: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	27.4	Non-reduced speed period	34
Reduced-speed	25	Reduced speed period	24.3	Reduced speed period	30
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-3.1</b>	<b>Difference</b>	<b>-4</b>



Figure A66: Speed distribution plots

## RSZ 12. S 10TH STREET NEAR EVERETT ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 10th Street near Everett Elementary School, shown in Figure A67, is on a moderate volume street with an ADT of 17,240 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone and sidewalks on both sides of the street. A crossing guard was located between the reduced-speed zone and the elementary school. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A34. The speed distributions compared to the posted speed limits are shown in Figure A68. The average speed during the non-reduced speed period was 32.1 miles per hour while the average speed during the reduced speed period was 26.4 miles per hour, a decrease of 5.7 miles per hour. The t-statistic for these values is -26.42 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

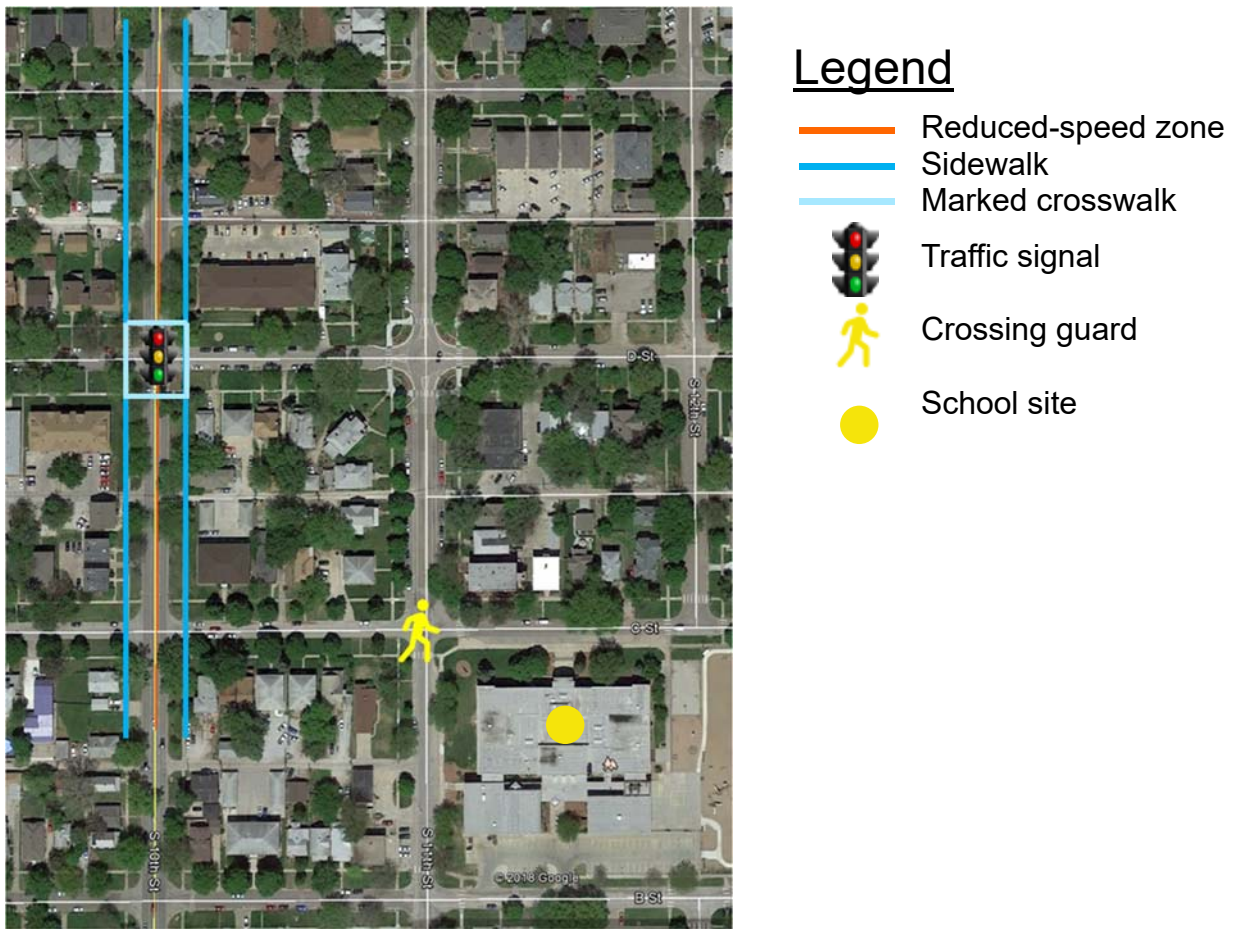


Figure A67: S 10th Street near Everett Elementary Reduced-Speed Zone



Table A34: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	32.1	Non-reduced speed period	37
Reduced-speed	25	Reduced speed period	26.4	Reduced speed period	31
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-5.7</b>	<b>Difference</b>	<b>-6</b>

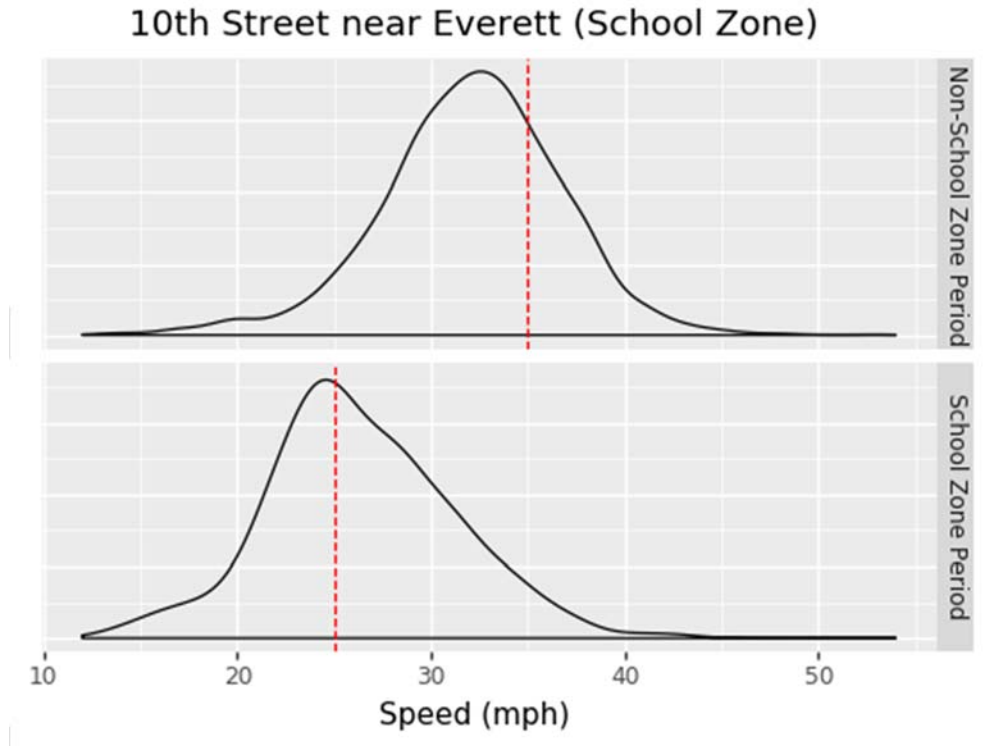


Figure A68: Speed distribution plots

## RSZ 13. SOUTH STREET NEAR PRESCOTT ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on South Street near Prescott Elementary School, shown in Figure A69, is on a moderate volume street with an ADT of 18,190 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing signal and dynamic no right-turn and no left-turn signs when the signal is activated within the reduced-speed zone. There are sidewalks on both sides of the street and a crossing guard was located north of the zone, in front of the school. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A35. The speed distributions compared to the posted speed limits are shown in Figure A70. The average speed during the non-reduced speed period was 35.3 miles per hour while the average speed during the reduced speed period was 26.6 miles per hour, a decrease of 8.7 miles per hour. The t-statistic for these values is -44.48 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

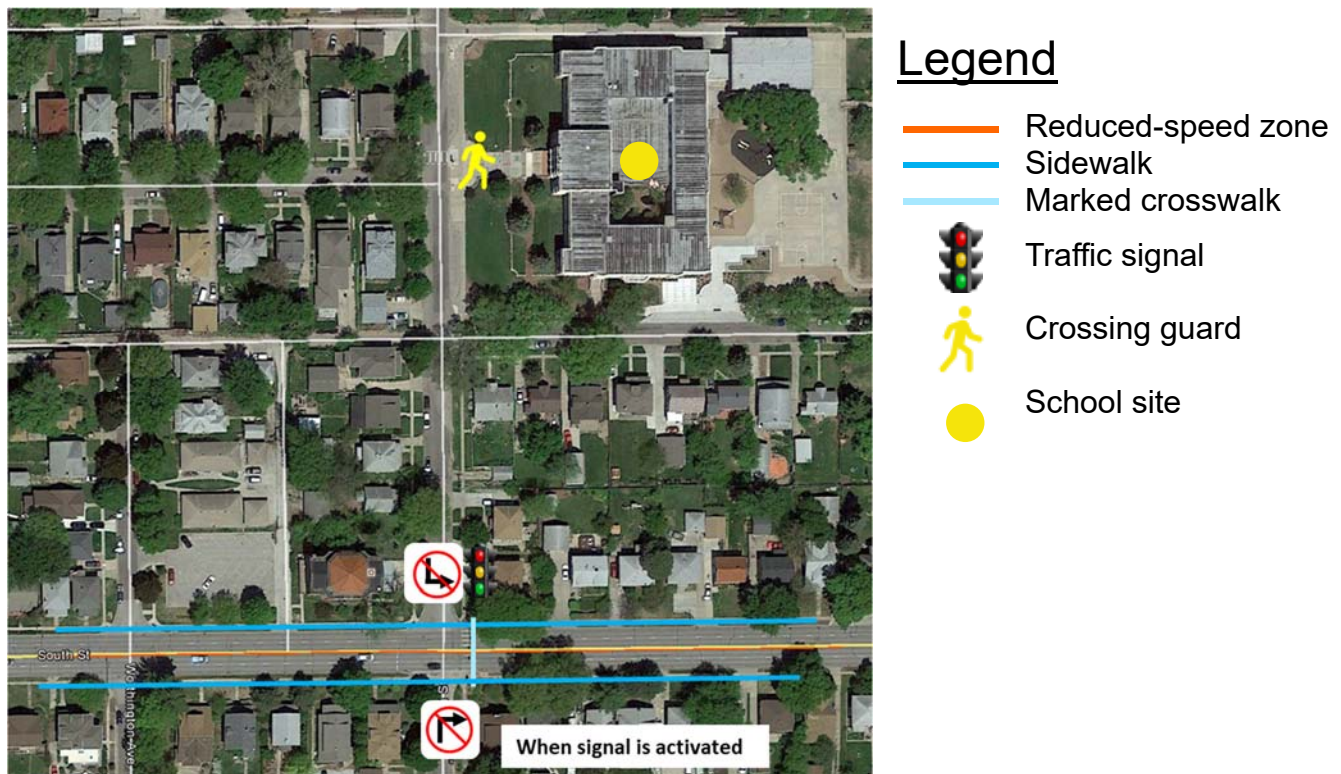


Figure A69: South Street near Prescott Elementary Reduced-Speed Zone

Table A35: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	35.3	Non-reduced speed period	40
Reduced-speed	25	Reduced speed period	26.6	Reduced speed period	32
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-8.7</b>	<b>Difference</b>	<b>-8</b>

South Street near Prescott (School Zone)

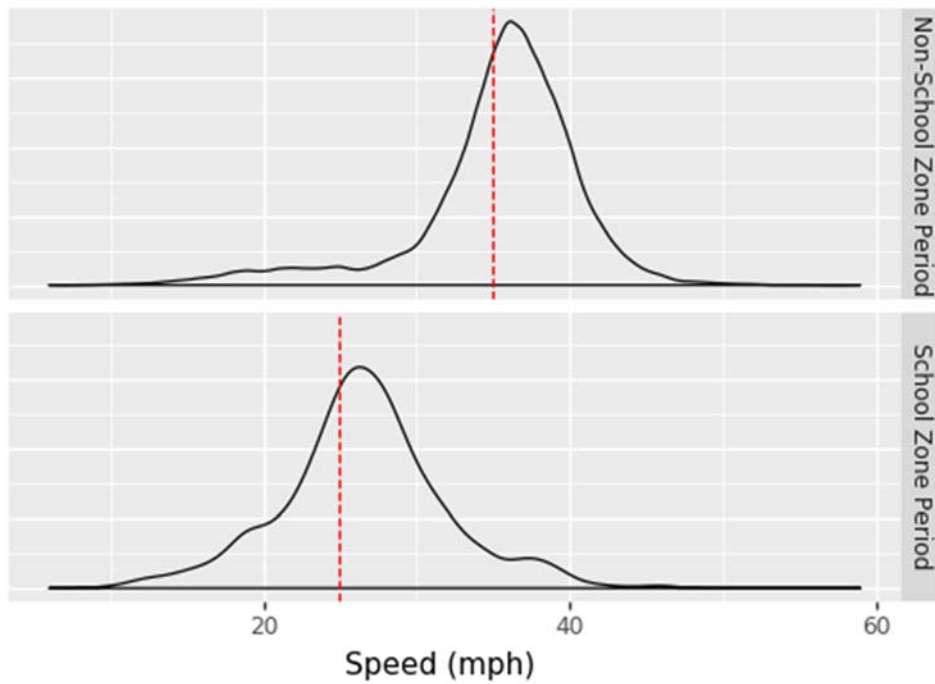


Figure A70: Speed distribution plots

## RSZ 14. N 48TH STREET NEAR RILEY ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on N 48th Street near Riley Elementary School, shown in Figure A71, is on a high-volume street with an ADT of 26,770 vehicles. The posted speed limit is 35 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing signal within the reduced-speed zone and sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A36. The speed distributions compared to the posted speed limits are shown in Figure A72. The average speed during the non-reduced speed period was 34.6 miles per hour while the average speed during the reduced speed period was 27.2 miles per hour, a decrease of 7.4 miles per hour. The t-statistic for these values is -24.69 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

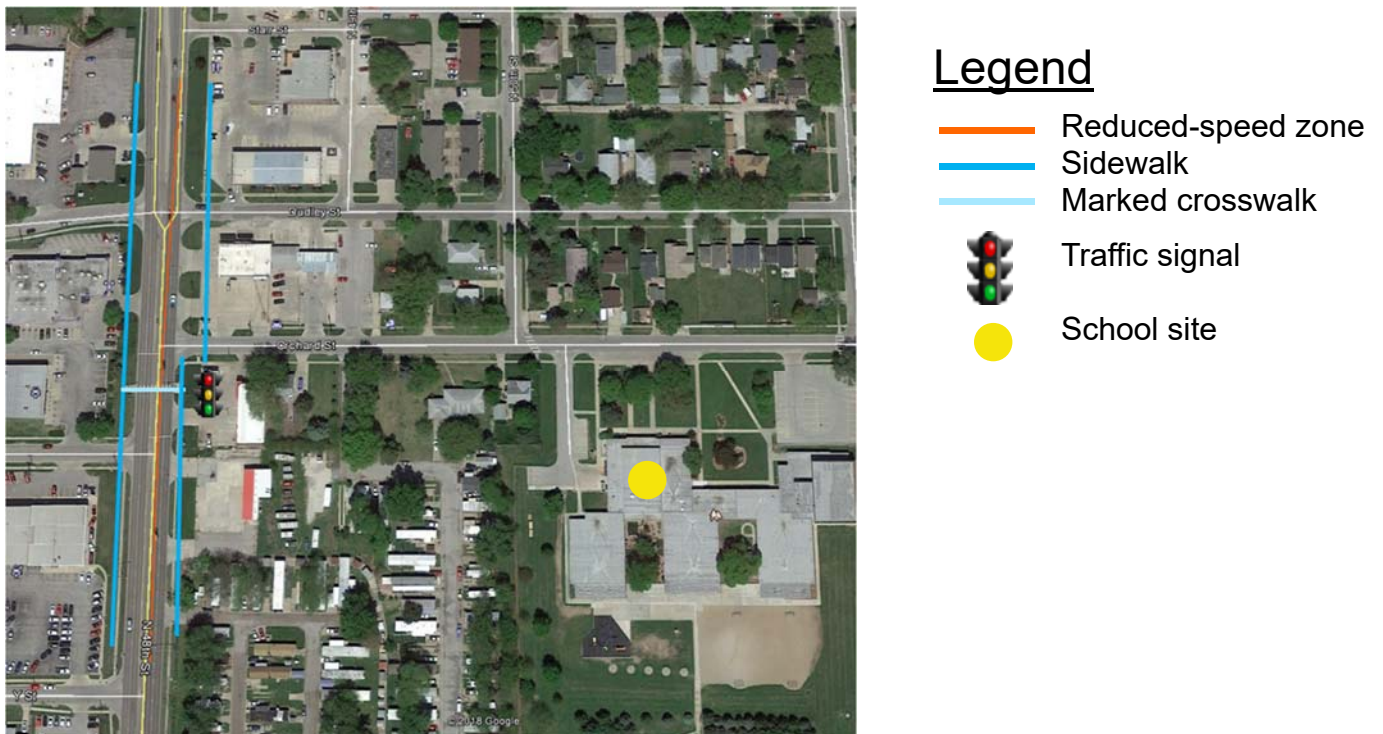


Figure A71: N 48th Street near Riley Elementary Reduced-Speed Zone

Table A36: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	35	Non-reduced speed period	34.6	Non-reduced speed period	39
Reduced-speed	25	Reduced speed period	27.2	Reduced speed period	34
<b>Difference</b>	<b>-10</b>	<b>Difference</b>	<b>-7.4</b>	<b>Difference</b>	<b>-5</b>

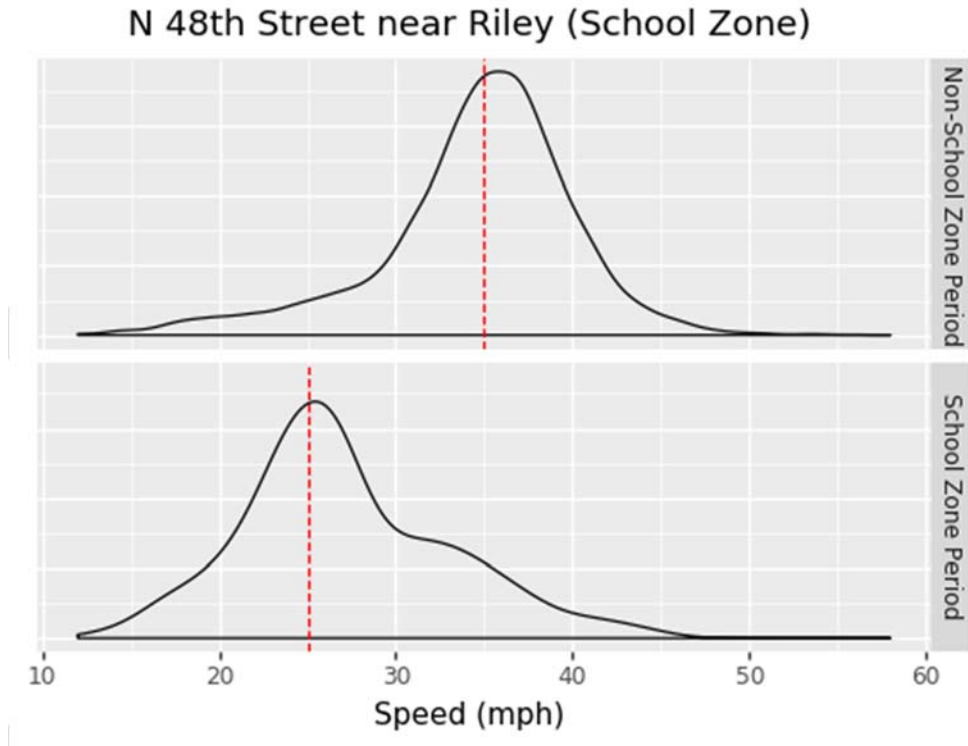


Figure A72: Speed distribution plots

## RSZ 15. A STREET NEAR PYRTLLE ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on A Street near Pyrtle Elementary School, shown in Figure A73, is on a moderate volume street with an ADT of 11,980 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A37. The speed distributions compared to the posted speed limits are shown in Figure A74. The average speed during the non-reduced speed period was 38.9 miles per hour while the average speed during the reduced speed period was 29.3 miles per hours, a decrease of 9.6 miles per hour. The t-statistic for these values is -29.03 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

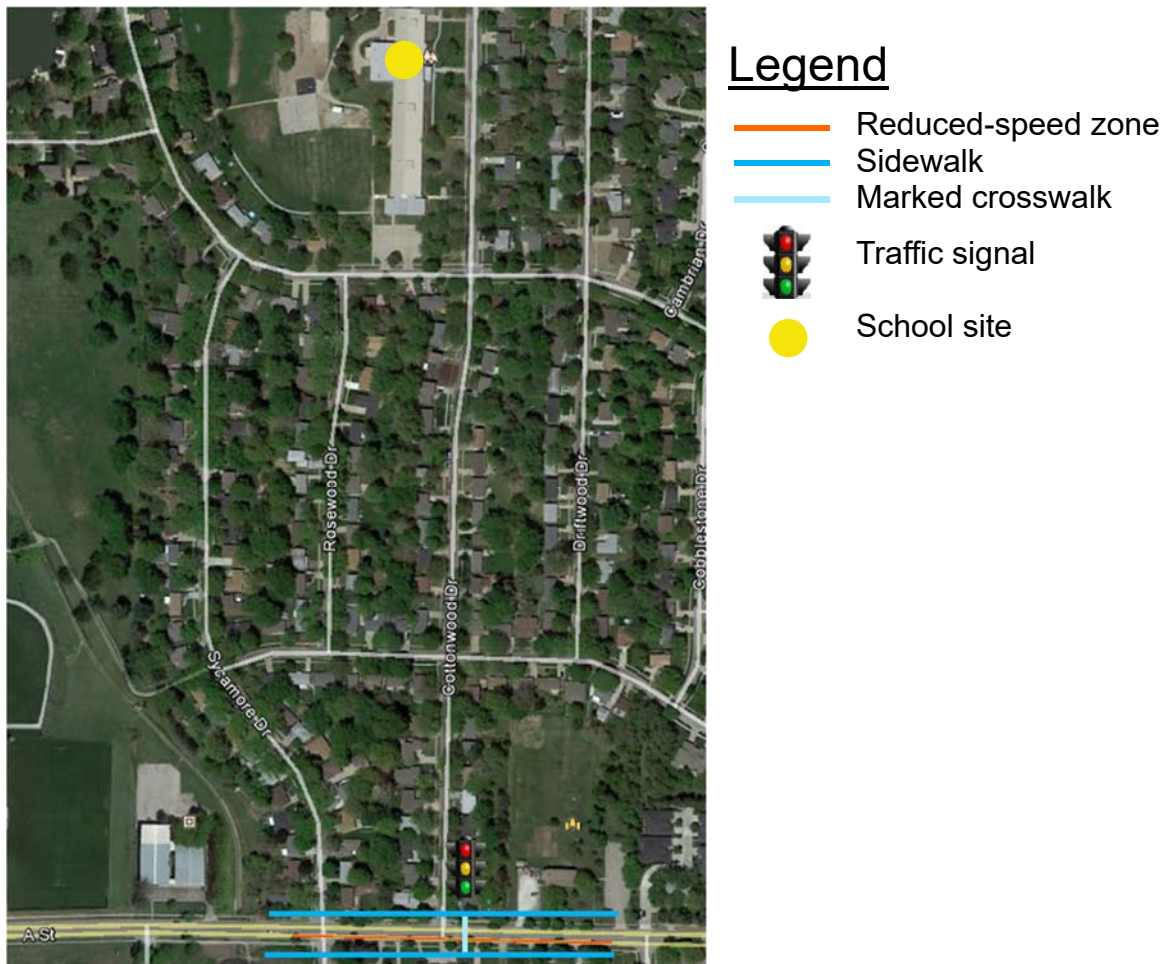


Figure A73: A Street near Pyrtle Elementary Reduced-Speed Zone

Table A37: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	38.9	Non-reduced speed period	45
Reduced-speed	25	Reduced speed period	29.3	Reduced speed period	36
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-9.6</b>	<b>Difference</b>	<b>-9</b>

A Street near Pyrtle (A St) (School Zone)

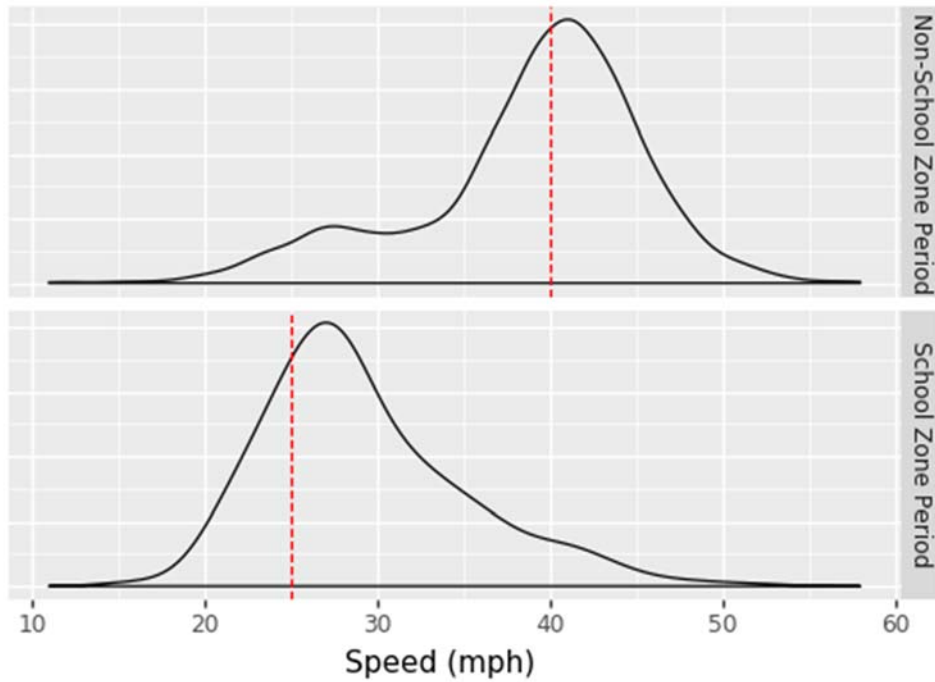


Figure A74: Speed distribution plots

## RSZ 16. S 56TH STREET NEAR ZEMAN ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 56th Street near Zeman Elementary School, shown in Figure A75, is on a high-volume street with an ADT of 22,690 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A38. The speed distributions compared to the posted speed limits are shown in Figure A76. The average speed during the non-reduced speed period was 36.8 miles per hour while the average speed during the reduced speed period was 27.7 miles per hour, a decrease of 9.1 miles per hour. The t-statistic for these values is -45.81 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

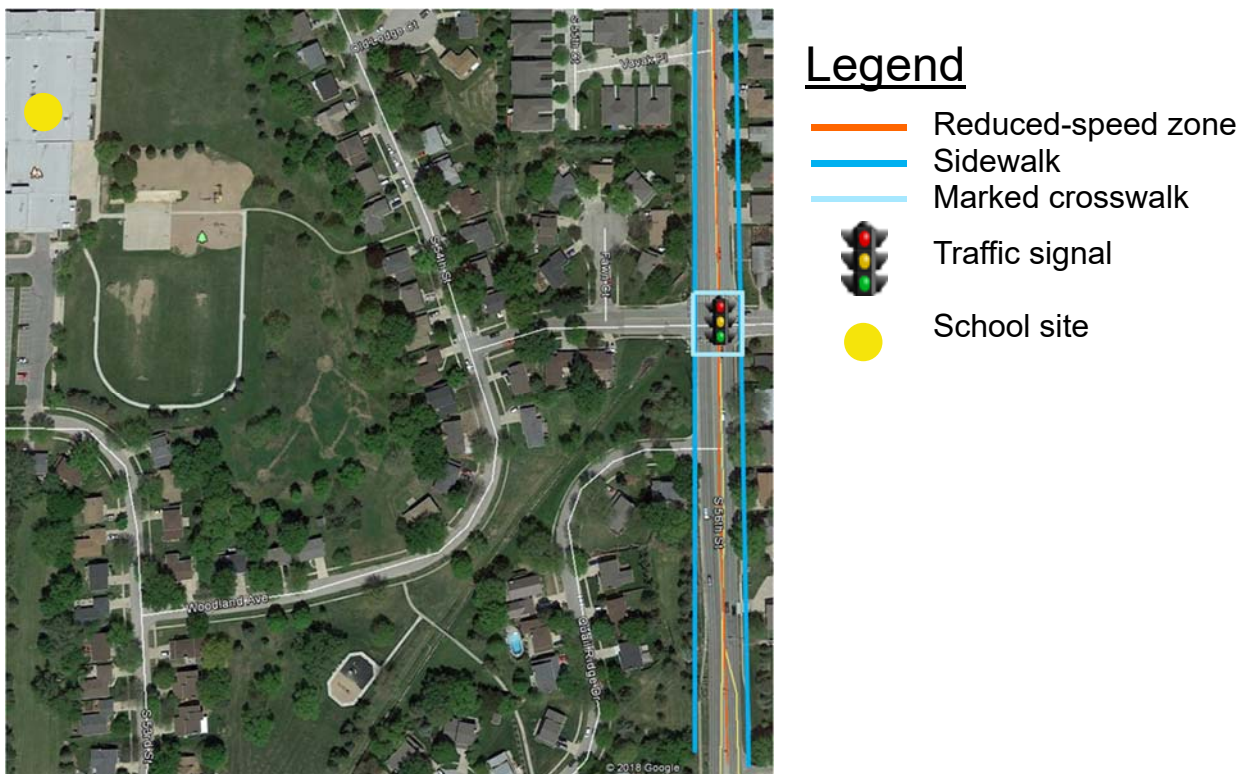


Figure A75: S 56th Street near Zeman Elementary Reduced-Speed Zone



Table A38: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	36.8	Non-reduced speed period	43
Reduced-speed	25	Reduced speed period	27.7	Reduced speed period	34
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-9.1</b>	<b>Difference</b>	<b>-9</b>

S 56th Street near Zeman (School Zone)

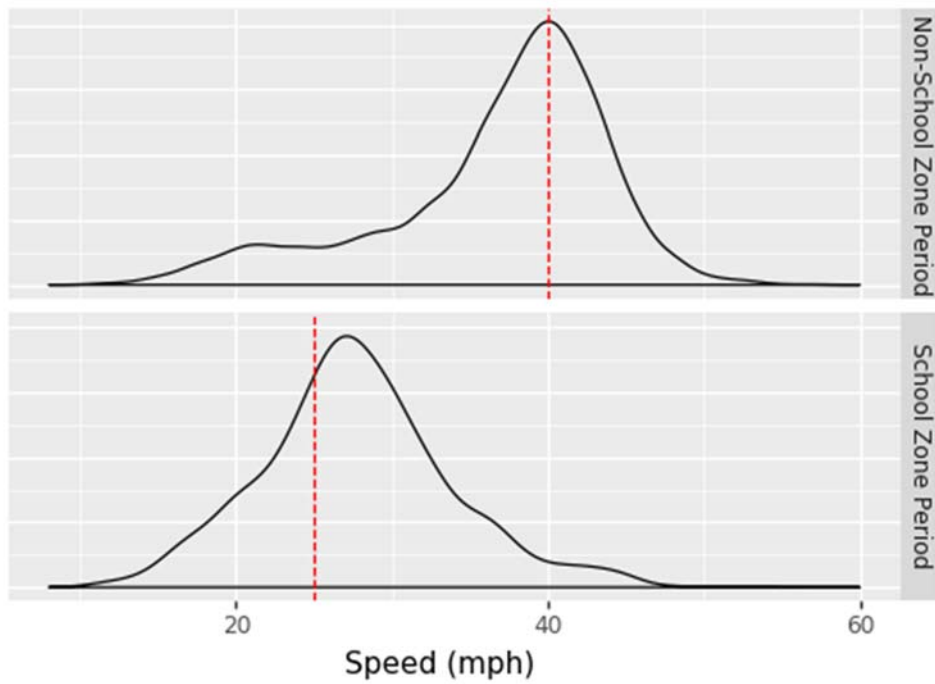


Figure A76: Speed distribution plots

## RSZ 17. SUPERIOR STREET NEAR CAMPBELL ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on Superior Street near Campbell Elementary School, shown in Figure A77, is on a high-volume street with an ADT of 25,600 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal at a T-intersection with two marked crosswalks within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A39. The speed distributions compared to the posted speed limits are shown in Figure A78. The average speed during the non-reduced speed period was 37.1 miles per hour while the average speed during the reduced speed period was 26.3 miles per hour, a decrease of 10.8 miles per hour. The t-statistic for these values is -35.05 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

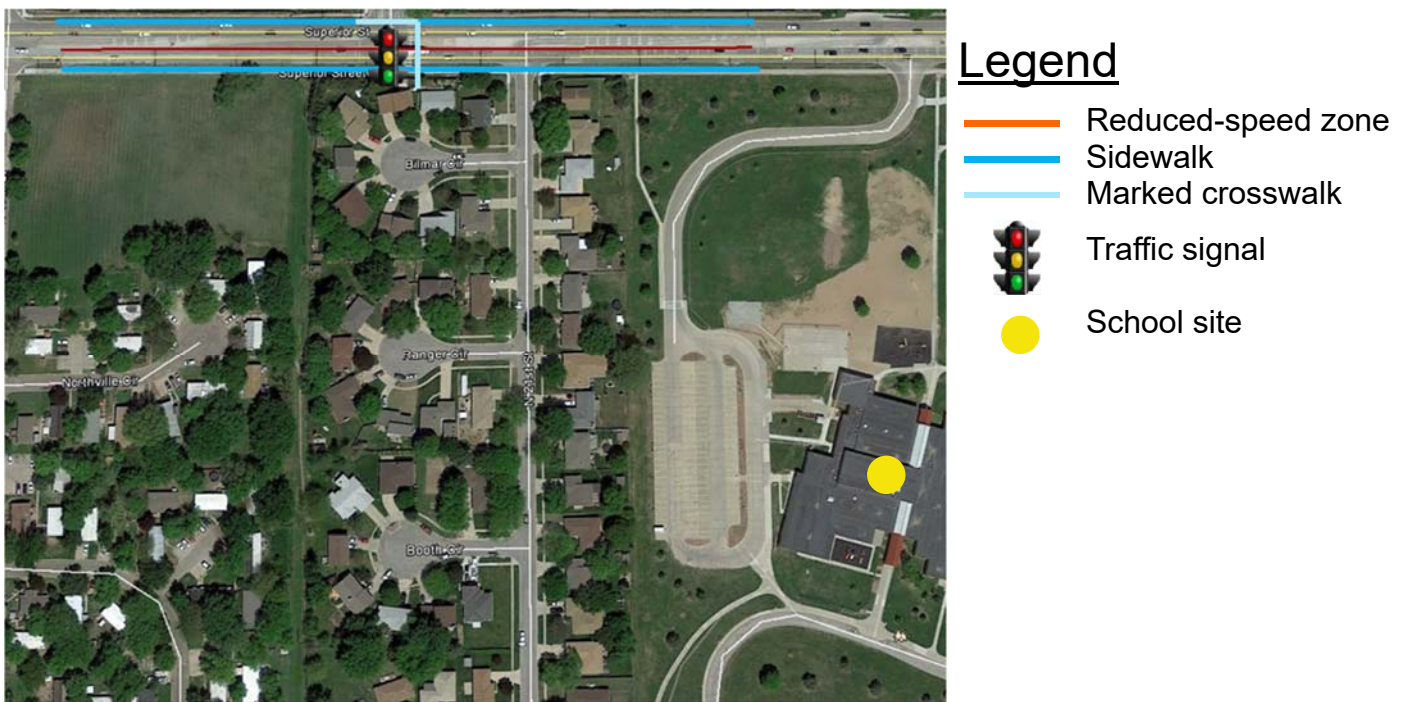


Figure A77: Superior Street near Campbell Elementary Reduced-Speed Zone

Table A39: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	37.1	Non-reduced speed period	44
Reduced-speed	25	Reduced speed period	26.3	Reduced speed period	32
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-10.8</b>	<b>Difference</b>	<b>-12</b>

Superior Street near Campbell (School Zone)

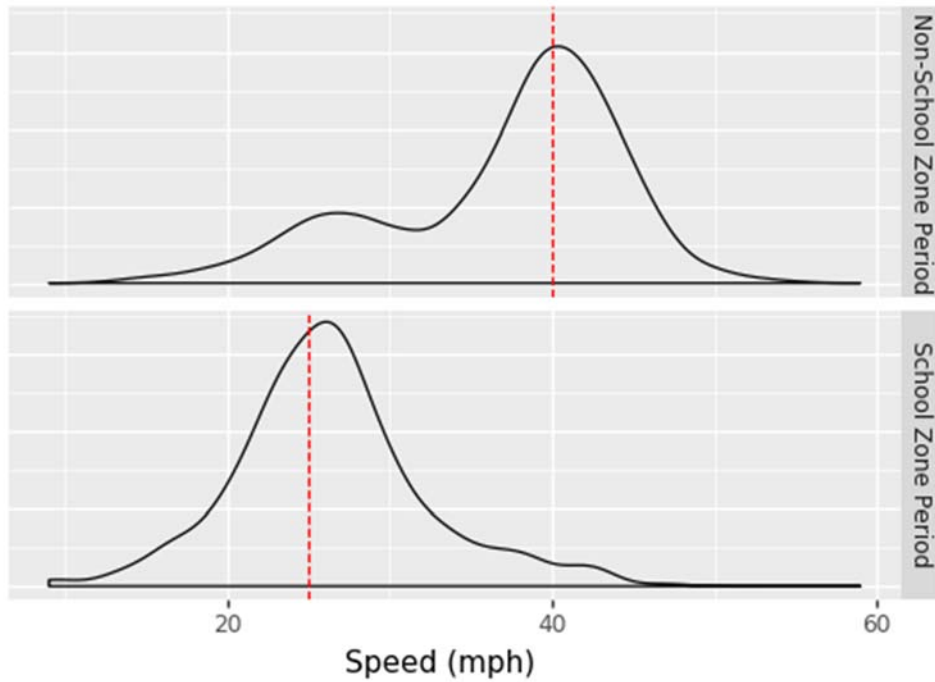


Figure A78: Speed distribution plots

## RSZ 18. S 70TH STREET NEAR MORLEY ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 70th Street near Morley Elementary School, shown in Figure A79, is on a high-volume street with an ADT of 28,870 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk with a pedestrian crossing signal within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A40. The speed distributions compared to the posted speed limits are shown in Figure A80. The average speed during the non-reduced speed period was 37.1 miles per hour while the average speed during the reduced speed period was 28.9 miles per hour, a decrease of 8.2 miles per hour. The t-statistic for these values is -33.54 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

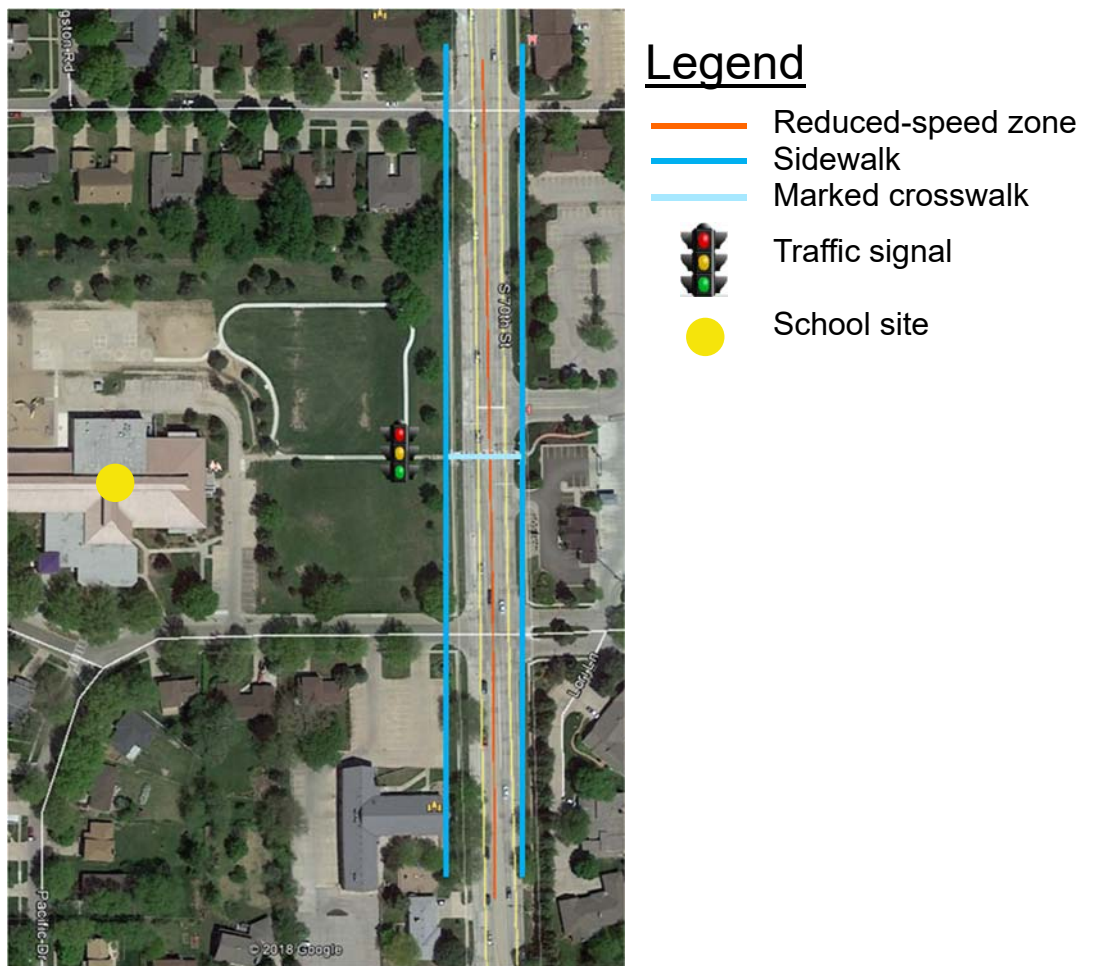


Figure A79: S 70th Street near Morley Elementary Reduced-Speed Zone

Table A40: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	37.1	Non-reduced speed period	43
Reduced-speed	25	Reduced speed period	28.9	Reduced speed period	35
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-8.2</b>	<b>Difference</b>	<b>-8</b>

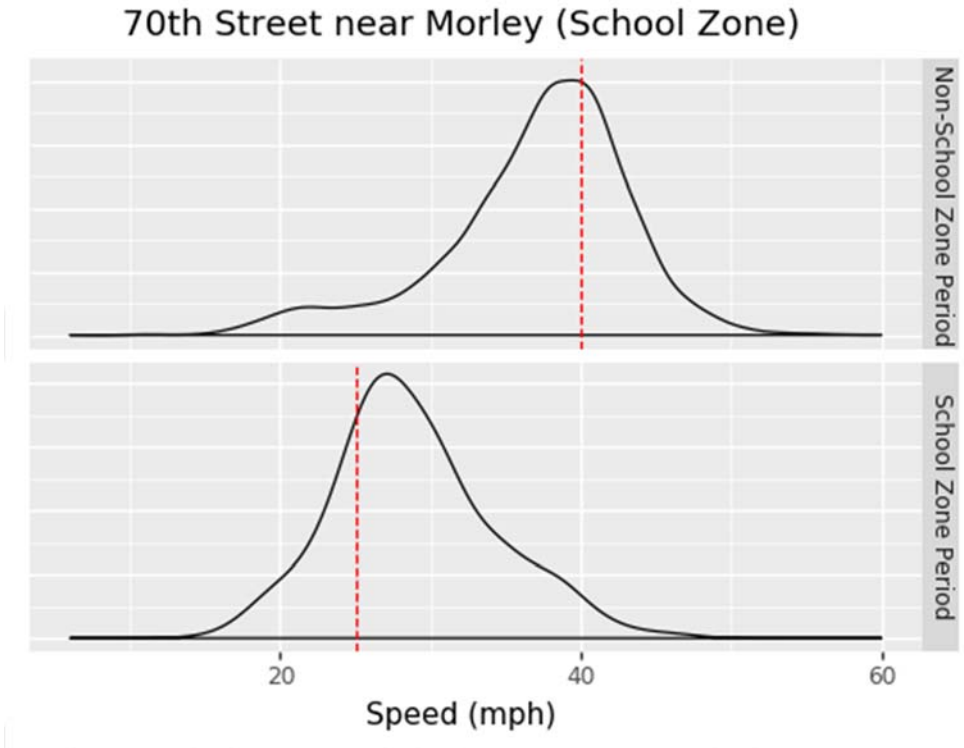


Figure A80: Speed distribution plots

## RSZ 19. S 84TH STREET NEAR PYRTLLE ELEMENTARY SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 84th Street near Pyrtle Elementary School, shown in Figure A81, is on a high-volume street with an ADT of 29,520 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a full traffic signal with four marked crosswalks within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A41. The speed distributions compared to the posted speed limits are shown in Figure A82. The average speed during the non-reduced speed period was 41.1 miles per hour while the average speed during the reduced speed period was 28.4 miles per hour, a decrease of 12.7 miles per hour. The t-statistic for these values is -42.24 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

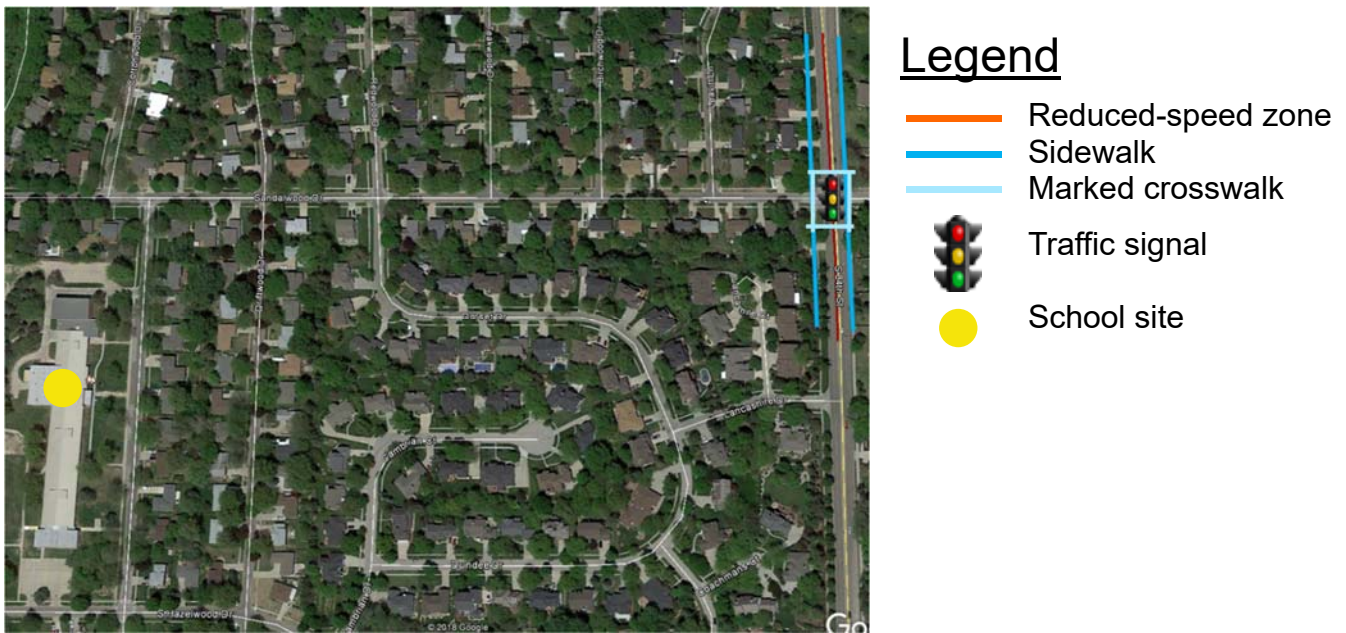


Figure A81: S 84th Street near Pyrtle Elementary Reduced-Speed Zone

Table A41: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	41.1	Non-reduced speed period	46
Reduced-speed	25	Reduced speed period	28.4	Reduced speed period	34
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-12.7</b>	<b>Difference</b>	<b>-12</b>

84th Street near Pyrtle (84th St) (School Zone)

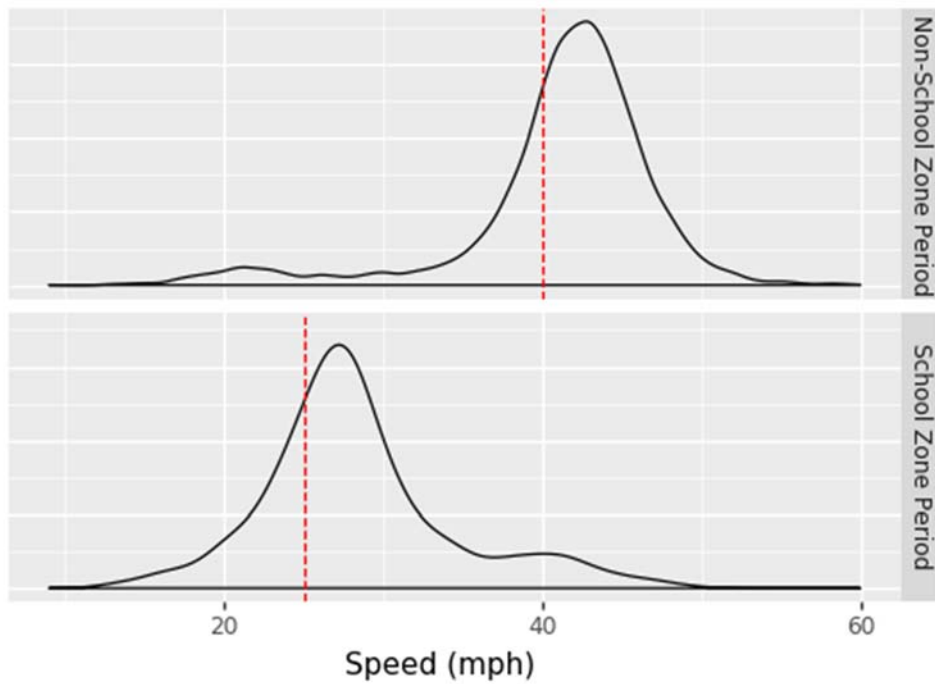


Figure A82: Speed distribution plots

## RSZ 20. S 84TH STREET NEAR MESSIAH LUTHERAN SCHOOL (REDUCED-SPEED ZONE)

The reduced-speed zone location on S 84th Street near Messiah Lutheran School, shown in Figure A83, is on a high-volume street with an ADT of 29,880 vehicles. The posted speed limit is 40 miles per hour and the reduced-speed zone speed limit is 25 miles per hour. There is a marked crosswalk within the reduced-speed zone. There are sidewalks on both sides of the street. Posted, average speeds, and 85<sup>th</sup> percentile vehicle speeds are shown in Table A42. The speed distributions compared to the posted speed limits are shown in Figure A84. The average speed during the non-reduced speed period was 41.6 miles per hour while the average speed during the reduced speed period was 27.3 miles per hour, a decrease of 14.3 miles per hour. The t-statistic for these values is -61.10 and the p-value is 0.000, meaning that this speed reduction is statistically significant.

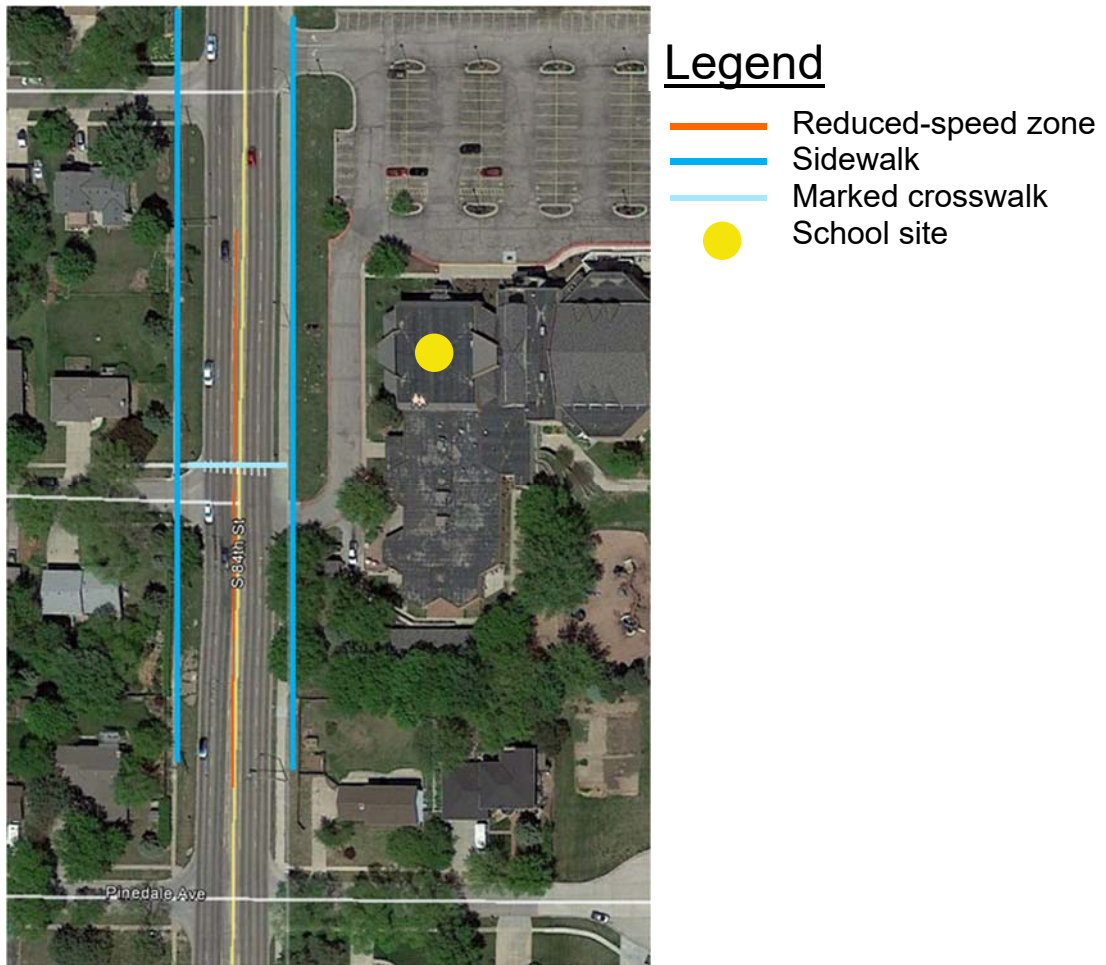


Figure A83: S 84th Street near Messiah Lutheran Reduced-Speed Zone



Table A42: Speed summary (mph)

Speed Limit		Average Speed		85 <sup>th</sup> Percentile Speed	
Posted	40	Non-reduced speed period	41.6	Non-reduced speed period	46
Reduced-speed	25	Reduced speed period	27.3	Reduced speed period	32
<b>Difference</b>	<b>-15</b>	<b>Difference</b>	<b>-14.3</b>	<b>Difference</b>	<b>-14</b>

84th Street near Messiah Lutheran (School Zone)

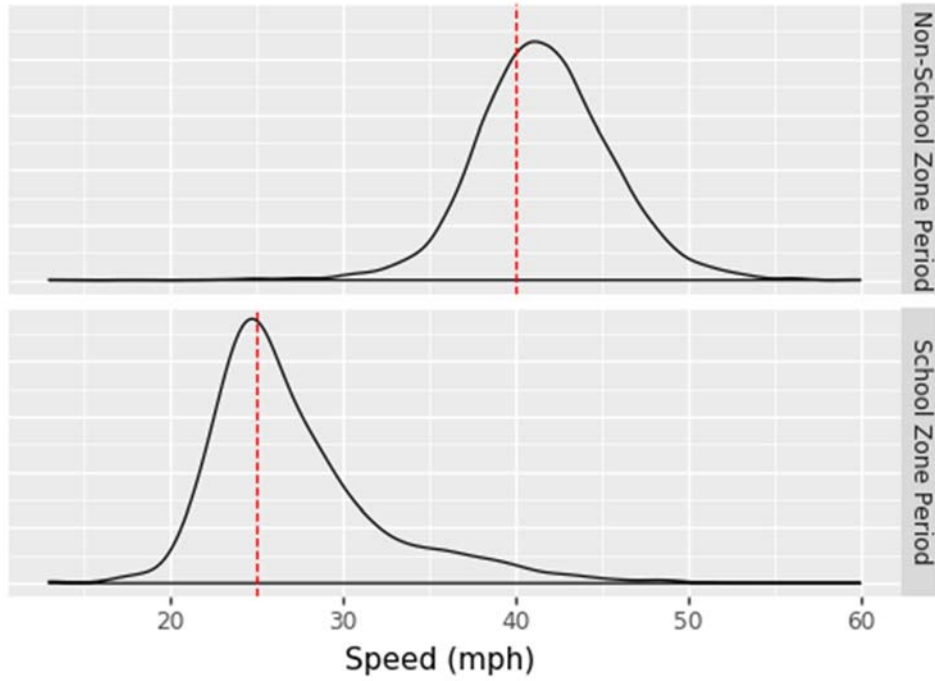


Figure A84: Speed distribution plots