

Traffic Safety Improvement Program

Applications for Traffic Control Devices FY 2017



Received August 15, 2015

Traffic Control Devices

FY 2017

Page No.	Applicant	Title/Subject	\$\$\$	
			Project	Request
4	Iowa DOT	Overhead Red-Yellow Flashing Beacon Replacement Program	\$100,000	\$100,000
7	Iowa DOT	Traffic Sign Inventory/Traffic Sign Replacement Program	\$275,000	\$275,000
10	Iowa DOT	Signing & Painting of Slip-Roadway Connections & Wrong Way Arrows at Folded Diamond Interchanges	\$350,000	\$165,000
17	City of Urbandale	94 pedestrian signal countdown displays at 15 existing signalized intersections	\$89,300	\$61,100
31	City of West Des Moines	7 existing signalized intersections – traffic signal detector units	\$161,000	\$161,000
46	City of Garnavillo	Hwy 52/VanBuren St/Centre St – traffic speed control devices	\$11,915	\$11,200
63	City of Council Bluffs	9 signalized intersections – battery back-up systems	\$49,453	\$44,305
72	Pottawattamie County	County to city transition zone improvements	\$94,635	\$94,635
168	Ringgold County	175 sites in the NW quadrant of the county – stop ahead sign replacements	\$17,500	\$9,975
174	Green Valley State Park	Green Valley State Park – Install radar speed sign	\$2,600	\$2,600
	TOTAL	10 PROJECTS	\$ 1,151,403	\$ 924,815

Statewide TCD Applications



Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: 7/10/15

Location / Title of Project Replacement of Overhead Flashing Beacons

Applicant Iowa DOT - Office of Traffic and Safety

Contact Person Steven Schroder Title Transportation Engineer

Complete Mailing Address 800 Lincoln Way
Ames, IA 50010

Phone 515-239-1623 E-Mail steven.schroder@dot.iowa.gov
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type
Site Specific
Traffic Control Device
Safety Study

Funding Amount

Total Project Cost \$ 100,000

Safety Funds Requested \$ 100,000

- A. Not applicable
- B. In the past, one mitigation for crashes at rural, two-way stop controlled intersections was to install overhead red and yellow flashing beacons over the center of the intersection. The red flashing lights face the stop-controlled minor approach and the yellow flashing lights face the through traffic on the major road approaches.

Research and experience has shown that this arrangement can lead to driver error when minor road drivers see the overhead flashing red beacon and incorrectly assume that all the beacons are flashing red and the entire intersection is all-way stop controlled. The result can be an increase in minor road “failed to yield from stop sign” crashes.

An alternative to overhead flashing red and yellow beacons is to mount red flashing beacons on the top of the stop signs, and mount the yellow flashing beacons on top of intersection ahead warning signs in advance of the intersection.

These funds will be used to replace overhead red-yellow flashing beacons with sign-mounted signs as described previously. Replacement sites will be prioritized based on applicable crash history and traffic volumes.

- C. All of the current funding has been obligated. Applicants who wish to participate in the Overhead Flashing Beacon Program are being put on a waiting list until additional funding is secured. Additional funding will allow the program to continue.
- D. There is no application deadline. Counties and cities may apply for funds year-round. Funding is limited and applications are received and process on a first-come, first-funded basis.

Applicant

Steven Schroder
Iowa DOT, Office of Traffic & Safety



Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: July 13, 2015

Location / Title of Project Traffic Sign Inventory / Traffic Sign Replacement Program

Applicant Iowa Department of Transportation

Contact Person John E. Dostart, P.E. Title Urban Engineer

Complete Mailing Address 800 Lincoln Way
Ames, IA 50010

Phone (515) 239-1291 E-Mail John.Dostart@dot.iowa.gov
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- Site Specific
- Traffic Control Device
- Safety Study

Funding Amount

Total Project Cost \$ \$275,000

Safety Funds Requested \$ \$275,000

IOWA DEPARTMENT OF TRANSPORTATION

To Office	Traffic and Safety	Date	July 13, 2015
Attention	Donna Matulac, P.E.	Ref. No.	800
From	John Dostart, P.E.		
Office	Local Systems		
Subject	Funding Request for City Sign Replacement Program, FY 2016		

Action Requested: Approval of \$275,000 from Traffic Safety Improvement Funds (Traffic Control Devices Category)

Background: The Iowa DOT started the subject program in 1991 at a funding level of \$120,000. Since FY07, this program was continued at an increased level of funding of \$250,000 in the Traffic Control Devices as part of Traffic Safety Improvement Funds. The program had been structured such that all communities with a population of 5,000 or less are eligible to apply. The focus of this program has been replacing STOP (R1-1), YIELD (R1-2), STOP AHEAD (W3-1), DO NOT ENTER (R5-1), single headed arrow (W1-6), and double headed arrow (W1-7) signs only. The program has been opened up to all Iowa cities and additional signs are now eligible under the program. The Office of Traffic and Safety administers the program. Additional details can be found on their website at: <http://www.iowadot.gov/traffic/signreplacementprogram.htm>. Last year the program was not funded due to the program having a large balance. In FY 2015 the program funded sign replacement in 43 cities and at a cost of over \$90,000.

Application Process: Eligible communities will submit applications requesting replacement of regulatory or warning signs determined by the Office of Traffic and Safety to be necessary. The signs to be replaced shall be in poor condition or those that are obsolete. This application will be submitted to the Iowa DOT Office of Traffic and Safety along with a resolution approved by their city council. When an application from a community is received, evaluated, and approved, the Iowa DOT will arrange for production and delivery. The approved signs, posts, and hardware, up to a maximum of \$5,000 in materials, will be delivered to an Iowa DOT maintenance facility near the city's location. The applicant is responsible for picking up and installing the signs according to guidance for proper installation provided with the application.

Program Needs: This program is extremely popular with Iowa communities due to their expressed need to replace obsolete signs. In addition to replacing obsolete signs, this program allows Iowa's communities the ability to update their traffic control devices to comply with the current requirements in the Manual of Uniform Traffic Control Devices (MUTCD).

In view of the expected demand, we request your approval of \$275,000 from Traffic Safety Improvement Funds to continue this program in the next fiscal year. This amount is anticipated to be necessary to meet the demand from expanding the program to cover all cities. The increased demand in the program has resulted in a likely shortfall for this program in FY 2016. This request will provide enough funding to backfill the expected FY 2016 shortfall and continue the program at the full funding level in FY 2017.

Please contact John Dostart if you have any questions.

Attachment

cc: Jan Laaser-Webb, P.E.
Ron McDaniel
Steve Gent, P.E.
Charlie Purcell, P.E.



Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: August 14, 2015

Location / Title of Project Signing & Painting of Slip-Roadway Connections & Wrong Way Arrows at Folded Diamond Interchanges

Applicant Iowa DOT, Office of Traffic & Safety

Contact Person Willy Sorenson, P.E. Title Special Projects Engineer

Complete Mailing Address 800 Lincoln Way, North Annex
Ames, Iowa 50010

Phone 515-239-1212 E-Mail willy.sorenson@dot.iowa.gov
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Adair, Benton, Buena Vista, Butler, Clayton, Floyd, Grundy, Hamilton,
Hardin, Henry, Iowa, Kossuth, Linn, Monroe, Palo Alto, Pottawattamie,
Co-Applicant(s) Ringgold, Sac, Sioux, Van Buren, Winnebago and Worth

Contact Person Varies Title County Engineer

Complete Mailing Address Varies

Phone Varies E-Mail Varies
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

Site Specific
Traffic Control Device
Safety Study

Funding Amount

Total Project Cost \$ 350,000

Safety Funds Requested

\$ \$165,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the Office of Traffic & Safety, Iowa DOT

Signed:  8/14/15
Signature Date Signed

Willy Sorenson, P.E.
Typed Name

Attest:  8-14-15
Signature Date Signed

Scott Groat
Typed Name

Traffic Control Device

TSF Application – Supporting Documentation

Section A: Certifications or Resolutions – Does not apply. This is an Iowa DOT application. 22 counties are named as co-applicants because some of the work required would normally be a county cost. Per Local System’s IM 2.110, work on the county road approach to a primary roadway (with the exception of Stop signs, Stop bar painting and islands) is the responsibility of the county. This would include centerline painting and advance signing treatments.

Section B: Narrative – This project is comprised of two separate types of work.

1) Signing and painting of slip-roadway connections to primary highways. A crash in April 2015 in Urbana, Iowa claimed the lives of five people. Upon review of the intersection, it was suggested to add additional signs and modify the centerline and stop island pavement markings. This project would take the same treatments and apply them systematically to 29 similar intersections across the state.

2) Signing and painting of wrong-way arrows on all folded diamond interchanges in Iowa. Folded diamond interchanges have been found to have a higher ‘point of entry’ of wrong way driver than other types of interchanges. Iowa DOT has performed a review of signing and pavement markings at all folded diamond interchanges and found a variety of signing combinations. This project would bring all folded diamond interchanges to a uniform signing template and add wrong way arrow pavement markings.

Section C: Cost –

	Sites	Signing			Pavement Markings		
		Average # of Signs/Site	Approx # of Signs Total	Approx Sign Costs Total	Average # of Stations or Symbols	Approx # of Sta./Sym. Total	Approx Marking Costs Total
Slip-Roadway Connections	27	1	27	\$ 3,780	13	351	\$ 52,650
Folded Diamond/Wrong Way Arrows	107	3	321	\$ 44,940	3	321	\$ 64,200
			Total Sign Material Cost:	\$ 48,720		Total Pavement Marking Material Cost:	\$ 116,850
			Use	\$50,000		Use	\$115,000
Approx. Material Cost per Sign w/ Post & Ft	\$ 140						
Approx. Material Cost of 1 Station of Intersection Marking Tape	\$ 150						
Approx. Material Cost of 1 Symbol of Intersection Marking Tape	\$ 200						
					Total project estimate		\$ 165,000

Section D: Time Schedule – Work will be completed during FY 2017.

Section E: Maps and Photos – See attached

Traffic Control Device

TSF Application – Supporting Documentation

Section A: Certifications or Resolutions – Does not apply. This is an Iowa DOT application. 22 counties are named as co-applicants because some of the work required would normally be a county cost. Per Local System’s IM 2.110, work on the county road approach to a primary roadway (with the exception of Stop signs, Stop bar painting and islands) is the responsibility of the county. This would include centerline painting and advance signing treatments.

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1) Signing and painting of slip-roadway connections to primary highways. A crash in April 2015 in Urbana, Iowa claimed the lives of five people. Upon review of the intersection, it was suggested to add additional signs and modify the centerline and stop island pavement markings. This project would take the same treatments and apply them systematically to 27 similar intersections across the state.

2) Signing and painting of wrong-way arrows on all folded diamond interchanges in Iowa. Folded diamond interchanges have been found to have a higher ‘point of entry’ of wrong way driver than other types of interchanges. Iowa DOT has performed a review of signing and pavement markings at all folded diamond interchanges and found a variety of signing combinations. This project would bring all folded diamond interchanges to a uniform signing template and add wrong way arrow pavement markings.

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Approx. Material Cost of 1 Symbol of Intersection Marking Tape	\$ 200						
					Total project estimate		\$ 165,000

Section D: Time Schedule – Work will be completed during FY 2017.

Section E: Maps and Photos – See attached

Typical Slip-Roadway connection



Typical Folded Diamond signing and pavement marking treatments



District 1

APPLICATION, CERTIFICATION & RESOLUTION

A

APPLICATION:

Rev. 5/15


Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION DATE: August 14, 2015

Location / Title of Project Pedestrian Signal Countdown Displays

Applicant City of Urbandale

Contact Person David J. McKay Title Director of Engineering and Public Works

Complete Mailing Address 3600 86th Street
Urbandale, IA 50322

Phone 515-278-3950 E-Mail dmckay@urbandale.org
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type Site Specific
Traffic Control Device
Safety Study

Funding Amount

Total Project Cost	\$ <u>89,300</u>
Safety Funds Requested	\$ <u>61,100</u>

CERTIFICATION:

A

Rev. 5/15

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the City of Urbandale

Signed:  8-14-15
Signature Date Signed

David J. McKay, P.E.
Typed Name

Attest:  8/14/15
Signature Date Signed

John B. Larson, P.E.
Typed Name

RESOLUTION:

A

RESOLUTION 146-2015

A RESOLUTION AUTHORIZING THE CITY OF URBANDALE, IOWA, TO MAKE AN APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM FOR THE FUNDING FOR THE PURCHASE OF COUNTDOWN PEDESTRIAN SIGNAL HEADS AND THE ASSOCIATED SIGNS AND FURTHER APPROVING THE APPLICATION WHICH OBLIGATES THE CITY TO MAINTAIN THE FUNDED IMPROVEMENTS.

WHEREAS, the Iowa Department of Transportation Traffic Safety Improvement operates under the rules of the Iowa Administrative Code 761 – Ch.164; and

WHEREAS, said program allows for the distribution of traffic safety funds to cities, counties and the Iowa DOT for roadway safety improvements, research, studies, or public information initiatives.; and

WHEREAS, the City of Urbandale has determined that by providing countdown heads for these traffic signals there will be improved safety at the intersections;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF URBANDALE, IOWA, THAT:

1. The City Council supports and approves the attached application for Iowa Department of Transportation Traffic Safety Improvement Program funding.
2. The City Council hereby commits to accepting and maintaining these improvements.
3. The Mayor is hereby authorized to execute the application on behalf of the City.

PASSED AND APPROVED this 4th day of August, 2015.


Robert D. Andeweg, Mayor

Attest:


Debra Mains, City Clerk

NARRATIVE**B.****Pedestrian Signal Countdown Display – Multiple Locations
Urbandale, Iowa**

The City of Urbandale is submitting this application for Traffic Safety Improvement Program Funds under the Traffic Control Device category. The funding request is to provide traffic signal equipment for the installation of 94 pedestrian signal countdown displays at 15 existing signalized intersections along the 86th Street corridor from Hickman Road to Interstate 35/80, the Douglas Avenue corridor from 66th Street to 128th Street and 2 locations on Aurora Avenue. The City of Urbandale is responsible for the operation and maintenance of the requested signalized intersections.

In 2010 the City of Urbandale began to add pedestrian signal countdown displays to new signalized intersections. Currently, the City of Urbandale maintains 41 signalized intersections; the majority of them have pedestrian signal heads.

The 86th Street Corridor runs north-south through Urbandale from Hickman Road to Interstate 35/80. This corridor is a mixture of business and residential areas. Along this corridor is the City of Urbandale Library, Administration building and Police Department located at 86th Street and Colby Parkway. At the intersection of 86th Street and Douglas Avenue, Hy-Vee is located in the NW corner. There are several residential areas that use 86th Street and Douglas Avenue to access Hy-Vee. 86th Street and Aurora Avenue is a major pedestrian crossing. The Urbandale Middle School and High School are located a few blocks east of the intersection. There is a bank, Walgreens, grocery store, and fast food located by the 86th Street and Meredith Drive intersection which increases the pedestrian activity. All along this corridor is a mix of business and residential. This corridor has approximately 25,000 vehicles per day based on the Iowa DOT 2012 Traffic Flow Map.

The Douglas corridor starts at Merle Hay Road and runs east-west through Urbandale to 156th Street. This corridor is a mixture of business and residential areas. From Merle Hay Road to 66th Street there is a mall with businesses and residential areas around the mall. From 66th Street to 72nd Street is Urbandale's business district. There is a Fire Station located at 7100 Douglas Avenue. There are businesses along the corridor, with residential and apartment complexes located within a block of Douglas Avenue from 100th Street to 121st Street. Homemakers Furniture is located at 104th Street and Douglas Avenue. 128th Street to 156th Street is a residential area with Des Moines Christian School located to the west of 128th Street. All along this corridor there are several trails that pedestrians and bikers use daily. This corridor ranges from 9,000 to 25,000 vehicles per day based on the Iowa DOT 2012 Traffic Flow Map.

Pedestrian Countdown Displays are planned for 2 other locations at 72nd Street and Aurora Avenue and 66th Street and Aurora Avenue. The Urbandale High School, Urbandale Senior Center, Urbandale Swimming Pool and Lions Park are located by the intersection of 72nd Street and Aurora Avenue. The Urbandale Middle School is 4 blocks west of this location. At 66th Street and Douglas Avenue, the signal is used to aid

students crossing Aurora Avenue to an elementary school. At both locations there are numerous children walking in this area. The City of Urbandale has installed Flashing Beacons at several locations for school crossings. This corridor ranges from 3,500 to 6,000 vehicles per day based on the Iowa DOT 2012 Traffic Flow Map.

The Manual on Uniform Traffic Control Devices (MUTCD) includes the pedestrian countdown display as a requirement for signalized intersections using pedestrian signal heads. The MUTCD states, **all pedestrian signal heads used at crosswalks where the pedestrian change interval is more than 7 seconds shall include a pedestrian change interval countdown display in order to inform pedestrians of the number of seconds remaining in the pedestrian change interval.**

The pedestrian countdown display provides information to the pedestrian regarding the amount of time remaining to safely cross the street. The meaning of the pedestrian countdown has been shown to be more easily understood than the flashing upraised hand symbol display. The pedestrian countdown display has also been shown to discourage pedestrians from crossing at the end of the pedestrian clearance interval and encourages pedestrians to accelerate their walking speed toward the end of the pedestrian clearance interval. Both of these behaviors are due to the fact that the pedestrian is provided with real-time information as to how much time is remaining in the pedestrian clearance interval. They can then make the decision to remain on the curb and not begin crossing the street or if they are already crossing to move faster across the street.

For the past five years, pedestrians crossing the street at some of the signalized intersections in the City of Urbandale have had the benefit of the information provided by real-time pedestrian countdown display. This information has allowed them to make educated decisions during their street crossing. The city's proposed Traffic Safety Improvement Program project would provide this real-time information to pedestrians by installing 94 pedestrian countdown displays along two of Urbandale's busiest corridors that currently have pedestrian signals without the countdown display.

ITEMIZED BREAKDOWN OF COSTS

C.

Intersection	Number of Heads	Heads Material	Total Cost	Head Installation	Total Cost	Signs Material	Total Cost	Sign Installation	Total Cost
86th & New York	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
86th & Douglas	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
86th & Aurora	6	\$600	\$3,600	\$200	\$1,200	\$50	\$300	\$100	\$600
86th & Meredith	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
86th & Plum	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
66th & Douglas	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
70th & Douglas	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
72nd & Douglas	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
Douglas & Mary Lynn	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
Douglas & 104th	2	\$600	\$1,200	\$200	\$400	\$50	\$100	\$100	\$200
Douglas & 111th	2	\$600	\$1,200	\$200	\$400	\$50	\$100	\$100	\$200
Douglas & 121st	2	\$600	\$1,200	\$200	\$400	\$50	\$100	\$100	\$200
Douglas & 128th	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
72nd & Aurora	8	\$600	\$4,800	\$200	\$1,600	\$50	\$400	\$100	\$800
66th & Aurora	2	\$600	\$1,200	\$200	\$400	\$50	\$100	\$100	\$200
	94		\$56,400		\$18,800		\$4,700		\$9,400
Total Cost of Project			\$89,300						
Safety Funds			\$61,100						

*Unit prices are based on previously received contractor's bid for installation and material costs provided by suppliers adjusted for the 2016 construction schedule.

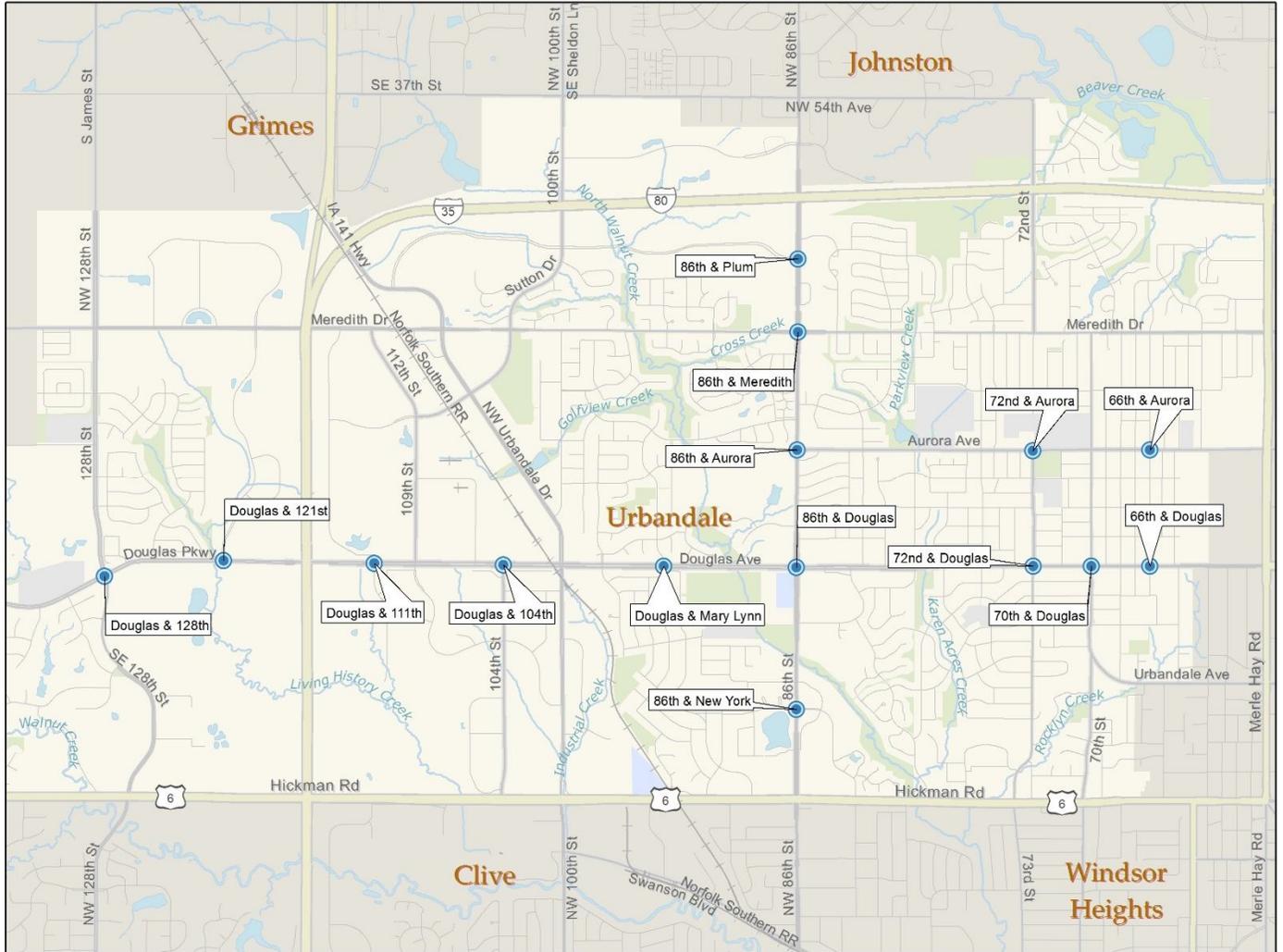
TIME SCHEDULE

D.

TSIP Funding Application Due	August 2015
TSIP Notification of Award	December 2015
TSIP Funding Available	July 2016
Project Letting	August 2016
Project Construction	August - November 2016
Project Completion	November 2016

LOCATION

E.



PICTURES

F.



Pedestrian Single Section Countdown Display



Pedestrian Two-Section Countdown Display



Single Section Pedestrian Head with Hand/Walking Person Overlay

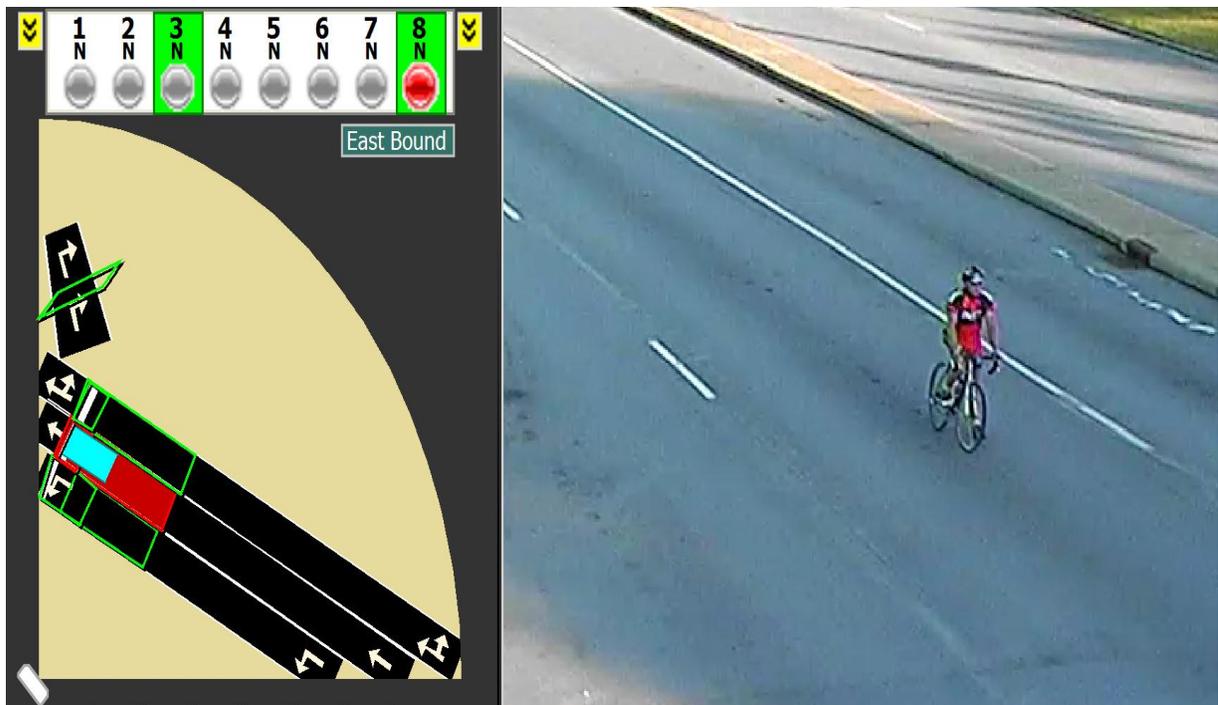
No Pedestrian Countdown Display



**Two Section Pedestrian Head With Hand/Walking Person Overlay
No Pedestrian Countdown Display in Lower Section**

City of West Des Moines

Traffic Safety Improvement Program Application - 2015



Radar Technology Traffic Signal
Detector Units

August 14, 2015



Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: August 14, 2015

Location / Title of Project Radar Technology Traffic Signal Detector Units

Applicant City of West Des Moines, Iowa

Contact Person Jim Dickinson, PE Title Principal Engineer - Traffic

Complete Mailing Address 560 South 16th Street
 West Des Moines, Iowa 50265

Phone 515-222-3480 E-Mail Jim.Dickinson@wdm.iowa.gov
 (Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
 (Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- Site Specific
- Traffic Control Device
- Safety Study

Funding Amount

Total Project Cost \$ 161,000

Safety Funds Requested \$ 161,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the City of West Des Moines, Iowa

Signed: Bret Hodne 8-3-15
Signature Date Signed

Bret Hodne, Director of Public Works
Typed Name

Attest: Jim Dickinson PE 8-3-15
Signature Date Signed

Jim Dickinson, Principal Engineer-Traffic
Typed Name

**RESOLUTION APPROVING GRANT APPLICATION
FOR TRAFFIC SIGNAL IMPROVEMENT PROGRAM (TSIP) FUNDS**

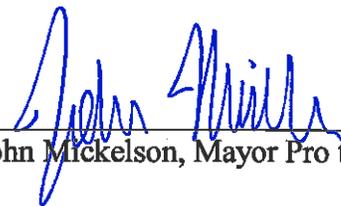
WHEREAS, the City Council of the City of West Des Moines strongly promotes the reduction of traffic congestion and the safe, continuous operation of the city's traffic control signals,

therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WEST DES MOINES, IOWA, authorization is given to apply for Traffic Safety Improvement Program (TSIP) Funds.

BE IT FURTHER RESOLVED, that if the projects are funded, the City of West Des Moines will adequately maintain the completed project for its intended public use following project completion.

PASSED AND APPROVED this 10th day of August, 2015.



John Mickelson, Mayor Pro tem

ATTEST:



Ryan T. Jacobson
City Clerk

15-08-10-02

COUNCIL ACTION	YEAS	NAYS	ABST.	ABSENT
TREYBURN	✓			
MICKELSON	✓			
TRIMBLE	✓			
MESSERSCHMIDT	✓			
SANDAGER	✓			
MOTION BY <i>Messerschmidt</i>				
SECOND BY: <i>Sandager</i>				
ROLL CALL # <i>15-331</i>				

NARRATIVE**Radar Technology Traffic Signal Detector Units
West Des Moines, Iowa**

The City of West Des Moines is submitting this application for Traffic Safety Improvement Program funds under the Traffic Control Device category. The funding request is to provide for the purchase of traffic signal equipment required for the installation of radar technology traffic signal detector units on the approaches of seven existing signalized intersections in the City. The City of West Des Moines is responsible for the operation and maintenance of the signalized intersections.

In 2012, the City of West Des Moines started to designate bicycle routes by placing Shared Lane Markings, or sharrows, along some streets to indicate a shared lane environment for bicycles and automobiles. These on-street bicycle routes are being used to provide a connection between the off-street city trail systems. Currently there are over nine miles of city streets designated as sharrow routes.

Bicyclists, like vehicle drivers, are often forced to wait at signalized intersections for a green signal. The signalized intersections in West Des Moines are fully actuated and are set up to give green light preference to the main street with the heavy traffic flow. The signal will only change to the side street when a vehicle is detected and triggers the call. The problem is, most detection technologies do not always detect bicycles. Unless bicyclists have a vehicle in their lane to trigger the signal for them, they could wait undetected for a long period of time before the signal turns green. As a result, bicyclists often choose to run the red light, which is a choice that can be very unsafe.

The many of signalized intersections in West Des Moines use loop detector technology and they require a certain amount of metal to be present in order to properly detect passing vehicles. Modern bicycles, which are increasingly manufactured from non-metallic materials like carbon fiber, may not be detected. With even a metallic bicycle, unless the bicycle is properly over the loop, they may not be detected. Again, this creates a situation where the undetected bicyclist has to wait for a vehicle to arrive, dismount and go over to push the pedestrian button, or cross illegally.

In 2012, the City of West Des Moines started using radar technology traffic signal detector units at signalized intersections. These units provided very reliable detection of vehicles with the advantage of not distressing the pavement by sawing in detector loops. With the city's intensive pavement management program, crack sealing, patching, or overlay projects will not impact and disrupt the radar technology detection units like it does for the in pavement detector loops.

Currently 19 of our 111 signalized intersections are equipped with the radar traffic signal detection units. Along with providing detection of cars and trucks, it also provides detection of bicycles so that all vehicles using the roadway are detected. In Figure 1, the detection of a bicyclist on the eastbound approach at 50th Street and EP True Parkway is shown.

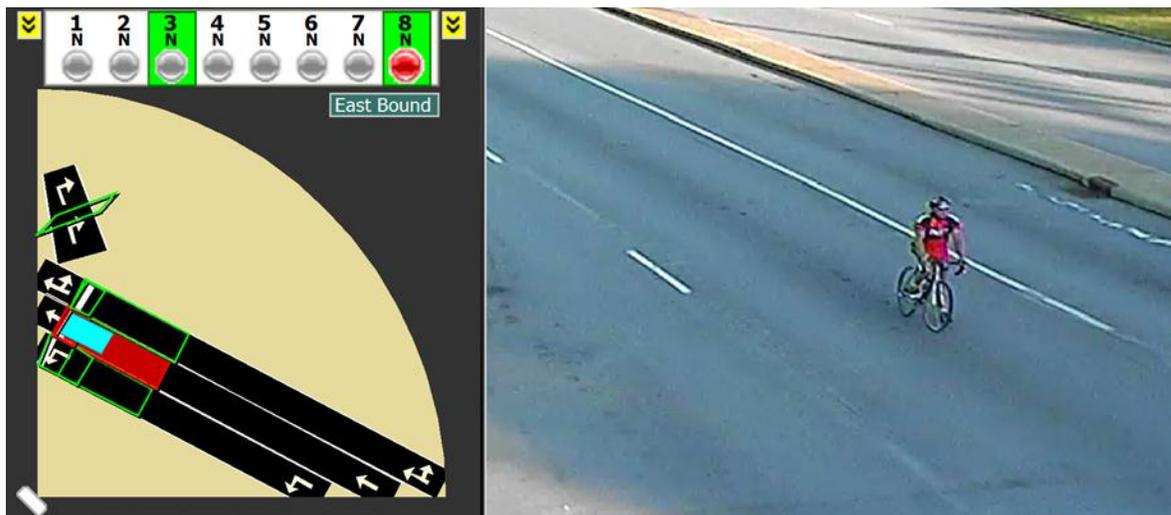


Figure 1 Detection of Bicyclist with Radar Traffic Signal Detection Unit

The image on the right side of the picture is from one of the city's traffic monitoring cameras which shows the bicyclist waiting in the inside through lane for the signal to change. The image on the left side of the picture is from the display screen of the radar traffic signal detection unit for the eastbound approach. The blue rectangle in the inside lane is the symbol for the object detected by the unit. The red rectangle is the detection area and indicates that the bicyclist is placing a call since he is within that detection zone for that lane. At the top of the screen there is a red indication under the number 8. This indicates that a detection call is being placed to the controller on signal Phase 8 which is the westbound through movement.

The City of West Des Moines Bicycle Advisory Commission has been actively promoting bicycling in the city. As a result, over nine miles of city streets have been designated as shared bike routes with sharrow pavement markings and bike route signing installed on the streets. Currently there are seven existing signalized intersections on the sharrow routes with detector loops as the method of detecting vehicles. The detector loops work well for larger vehicles but do not work well for detecting bicycles. This non-detection of bicycles causes many bicyclists to “run the red” if no vehicle pulls up behind them to trigger the detector and change the traffic signal from red to green. This creates a traffic safety issue for both the bicyclist crossing the street on red and the motorist traveling on the intersecting street entering the intersection on green.

With this project, the City of West Des Moines proposes to install radar technology traffic signal detector units at the seven intersections with sharrow routes. The radar detector unit will not only detect the larger vehicles but will also detect the bicycles as we saw in Figure 1 on the previous page. The bicyclist does not have to be concerned about correct positioning in the lane since they will trigger a detector anywhere in the detection zone.

Providing a safe traveling environment, for all forms of transportation, is a goal that we strive for. The proposed project, installing radar technology traffic signal detector units at the seven signalized intersections, will go a long way to provide a safer traveling environment for the bicyclists, of all ages, that use the sharrow bicycle routes in the City of West Des Moines.

ITEMIZED BREAKDOWN OF COST

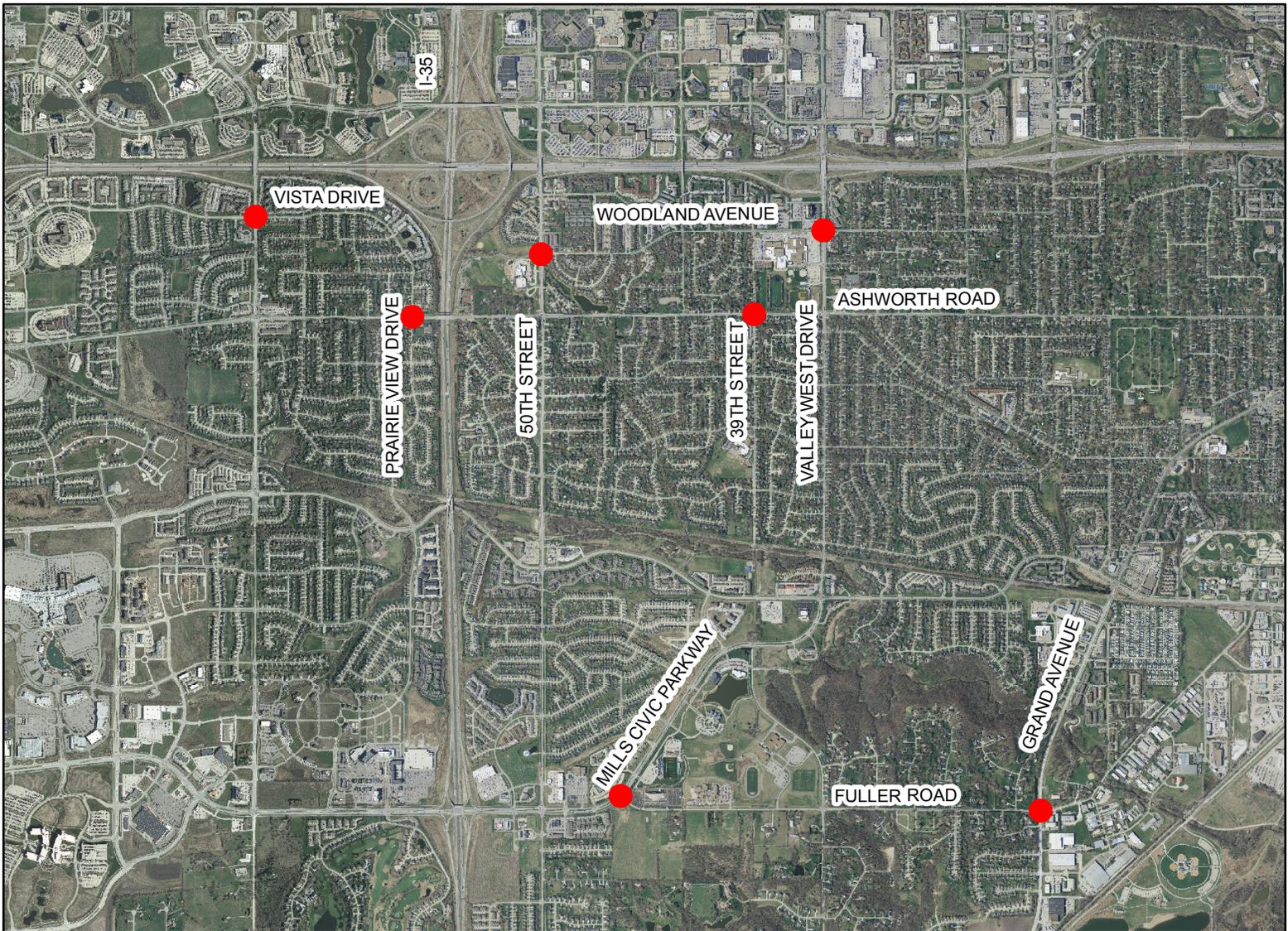
Radar Technology Traffic Signal Detector Units

West Des Moines, Iowa

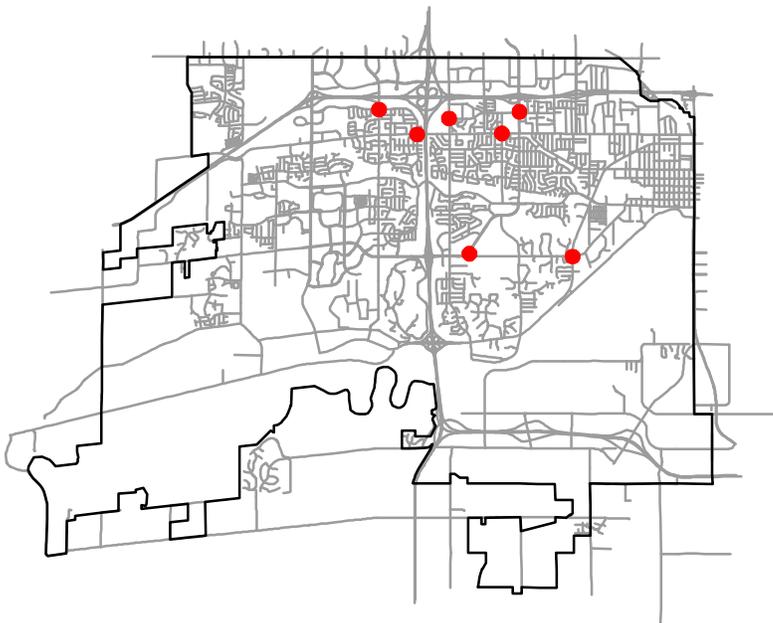
<u>Description</u>		<u>Cost</u>
Radar Technology Traffic Signal Detector Units	7 Intersections @ \$23,000 each =	\$161,000

TIME SCHEDULE**Radar Technology Traffic Signal Detector Units****West Des Moines, Iowa**

TSIP Funding Application	August, 2015
TSIP Project Selection	December, 2015
TSIP Funding Available	July, 2016
Project Letting - Equipment	August, 2016
Start Project Installation	October, 2016
Project Completion	October, 2017



VICINITY MAP



LEGEND

N

PROJECT LOCATION ●



**DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION**

560 S. 16TH STREET (515)222-3475
WEST DES MOINES, IOWA 50265
FAX NO. (515)222-3478

PROJECT:

TSIP Funding

LOCATION:

Various Locations Within West Des Moines

DRAWN BY: REF

DATE: 8/10/2015

SHT. 1 OF 1

PICTURES

Radar Technology Traffic Signal Detector Units

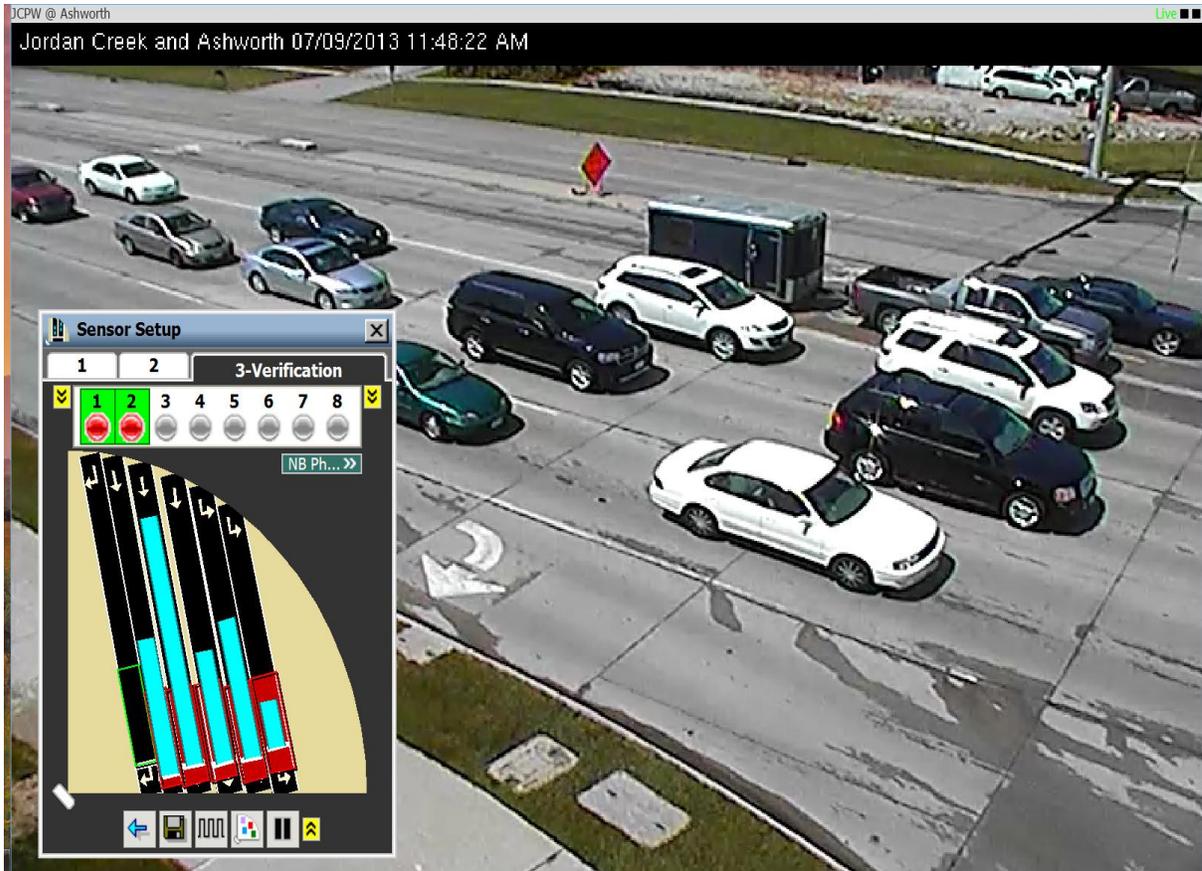
West Des Moines, Iowa



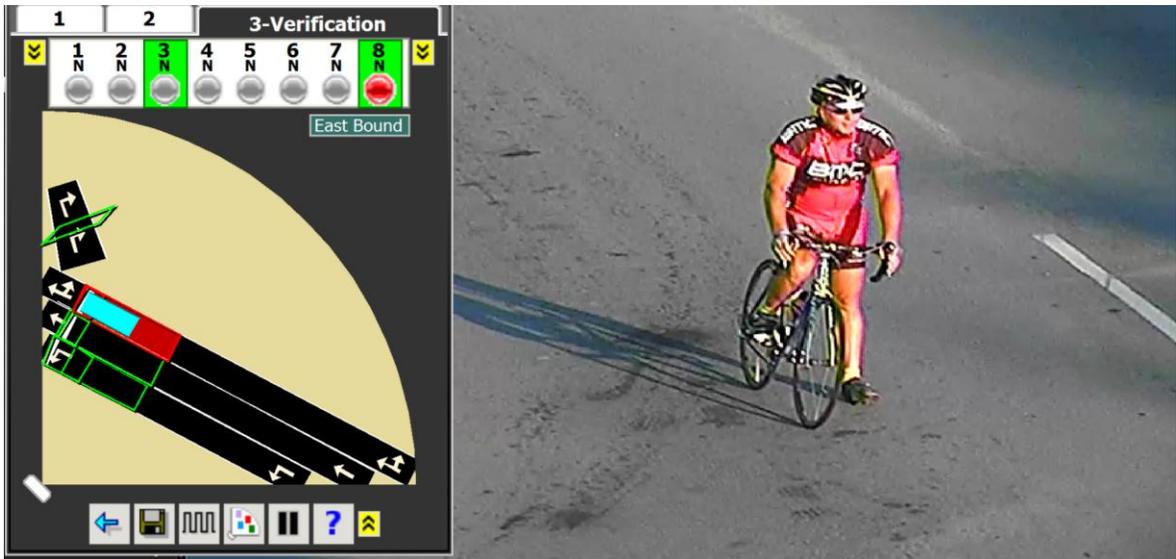
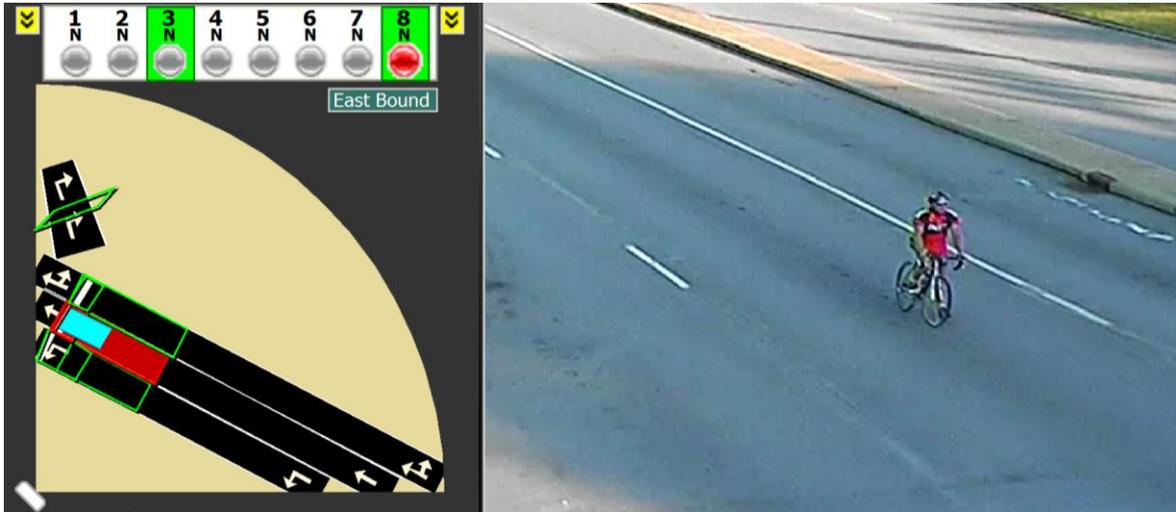
**Radar Technology Detector Antenna -
One Antenna Covers An Intersection Approach**



**Radar Technology Detector Antenna -
Top View**



**Vehicle Detection with Radar Technology Detector Units –
Vehicles Being Detected by Lane**



**Bicycle Detection with Radar Technology Detector Units –
Bicycle Being Detected by Lane**

TRAFFIC VOLUMES**Radar Technology Traffic Signal Detector Units****West Des Moines, Iowa**

	2014
INTERSECTION	COUNT
60th Street	19,531
Vista Drive	2,801
Prairie View Drive	2,573
Ashworth Road	15,378
50th Street	20,857
Woodland Avenue	1,956
39th Street	1,853
Ashworth Road	10,181
Valley West Drive	15,367
Woodland Avenue	4,468
Mills Civic Parkway	8,420
Fuller Road	6,261
Grand Avenue	6,590
Fuller Road	5,363

District 2



Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: 08/13/15

Location / Title of Project Hwy 52/Van Buren St/Centre St/Traffic Speed Control Devices

Applicant City of Garnavillo

Contact Person Denise Schneider Title City Admin/Clerk

Complete Mailing Address PO Box 14
Garnavillo, IA 52049

Phone 563-964-2331 E-Mail garnavillo@gmail.com
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- Site Specific
- Traffic Control Device
- Safety Study

Funding Amount

Total Project Cost \$ 11,915.38

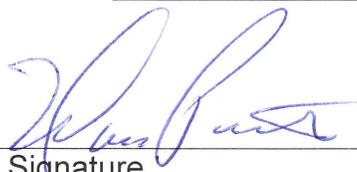
Safety Funds Requested \$ 11,200.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the City of Garnavillo

Signed:  8/12/13
Signature Date Signed

Mark Priebe, Mayor
Typed Name

Attest:  8/12/13
Signature Date Signed

Denise Schneider, City Admin/Clerk
Typed Name

Garnavillo is a small city of about 800 people. We have a lot of traffic through our city. State Highway 52 runs North and South through the middle of Garnavillo, also serving as our Main Street. The heavy traffic poses difficulty for pedestrians trying to cross Main Street/Highway 52. We also host 2 other very busy farm to market roads on the East and West sides of our city. West Centre street is very readily used by large farm corporations to the west of us. Our school is also located on this street. East Van Buren Street (AKA the Clayton Highway) hosts a large amount of traffic from people going to and from the Great River Road. There is also a large river grain terminal and sand mine East of Garnavillo that produces a major portion of our traffic on Van Buren Street in the form of semi-trucks transporting grain and sand. This route through Garnavillo provides drivers a most direct paved route to Highway 52 for traffic heading north and south to Highways 18 and 20. We also have a school crossing on Main Street for children crossing from the East to West side of town to attend school. An assisted living center, is located ½ block to the West off the highway and houses individuals that cross the highway to get to the post office, other businesses, and the city park on the West side of the highway. Our very popular and busy city park is located in the middle of town on Main Street/Highway 52. We have a very limited police budget that provides for part-time police coverage only. We have used a speed trailer at various locations and know that these types of devices do in fact slow traffic down. We receive numerous complaints each year on the speed of traffic through our city. We propose to install solar operated speed warning/monitoring devices on the North, East, South, and West entrances into town. We know from the use of a speed trailer and from talking to other cities that have these types of traffic devices that they work. These devices would tell motorist the speed limit and how fast they are going, and the device would flash at them if they are speeding. There have been many occasions that people, mainly elderly and children, have almost been hit on our busy routes due to the speed of traffic on these popular thoroughfares. We know that these devices would make these routes safer for our residents, school children, and visitors to our community. We would also be able to obtain traffic and safety information including traffic speeds with these devices so we will know better where to concentrate our limited police patrol hours at. According to the 2013 IDOT Annual Traffic Count, there are about 3,310 vehicles a day traveling on Highway 52 North, 2,990 on Highway 52 South, 670 on East Van Buren Street, and 330 on West Centre Street. Manual traffic counts at the intersection of Highway 52 and Van Buren Street host counts of 850 for East Van Buren Street, 3,310 for South Highway 52, & 3,590 for North Highway 52. I have also attached a spread sheet with some sample traffic counts/speeds that was completed by our Chief of Police. The speed signs we are going to install will have break-away post so there will be no clear zone issues with them. Please help us make our city safer. Thank you for the opportunity to apply for this funding.

IDOT Application for Traffic Safety Funds (TSIP)

C

Itemized Breakdown of Cost

Cost Breakdown:

SafePace 100 Traffic Control Device (See attached invoice)	\$11,187.00
Speed Limit Signs/Post (See attached estimated from IPI)	\$ 248.60
City Labor 2 Employees – Estimate	\$ 246.18
Inflation Factor (2%) for estimated increase in product/labor cost	<u>\$ 233.60</u>
TOTAL EST. COST:	\$11,915.38

Revenues:

City of Garnavillo General Fund	\$ 715.38
IDOT Traffic Safety Improvement Program Funds	<u>\$11,200.00</u>
TOTAL EST. REVENUES:	\$11,915.38



Traffic Logix Inc.
 3 Harriet Lane, Spring Valley, NY 10977
 Tel: 1-866-915-6449, Fax: 1-866-995-6449
www.trafficlogix.com

Price Quote

NUMBER
1508000001

DATE
8/12/2015
 QUOTE VALID FOR 30 DAYS

S Denise Schneider
 O City Administrator/Clerk
 L City of Garnavillo
 D PO Box 14
 106 E. Chestnut St
 T Garnavillo, IA, 52049-0014
 O garnavillo@gmail.com
 563-964-2331

S City of Garnavillo
 H 106 E. Chestnut St.
 I Garnavillo, IA
 P 52049-0014

CUSTOMER ACCOUNT	CUSTOMER ORDER	SALES REP	TERMS
DATE ORDERED 8/12/2015	SHIP VIA GRND	Gabriela Villanueva FOB	1% 10 days - Net 30
			We also accept VISA - MC - AMEX

LINE	QUANTITY			PART NUMBER	DESCRIPTION	WHS	UNIT PRICE	EXTENSION
	Ordered	Shipped	BO					
01	4				<u>SafePace™100 Solar with 3-cell back up battery *</u> <u>Includes:</u> (23" X 29") "YOUR SPEED" Face Plate in WHITE 11"(h) x 5.6"(w) digits, 98 LEDs per digit 20 W Solar Panel 3-cell, 9.6V, 10Ah Lithium Battery Sing enclosure key Standard mounting bracket (post not included) Solar Panel Bracket Bluetooth adapter Range of detection of over 350 feet Programmable Speed Violator Strobe Light 1/4" durable aluminum protective cover Individual optical lenses shielding each LED Software to optimize brightness / power SafePace Pro Management Software		\$2,399.00	\$9,596.00
02	4				<u>Data Collection Software *</u> Reports: Vehicle speeds, counts, 85th percentile of speed Number of Speed Violators <i>* Special pricing.</i> Includes all installation materials, booking fee and <u>Freight to:</u> Garnavillo, IA		\$350.00	\$1,400.00
					THIS MUST BE FILLED OUT BEFORE THE ORDER CAN BE PROCESSED: 1) Do you have a loading dock YES _____ NO _____ 2) Do you have a forklift YES _____ NO _____ 3) Can you accommodate a 53' delivery truck YES _____ NO _____ 4) Will this order be delivered to a job site YES _____ NO _____			
					Total in USD			\$11,187.00
Two year limited warranty on sign, one year in batteries.								
					TAX EXEMPT			
Please provide Tax Exempt certificate with order								
					SELF ASSESSED			
Please provide Self Assessment Cert. & Rate								

SIGNATURE: _____ DATE: 8/12/2015

To place order, please send a signed copy to:
 Email: gvillanueva@trafficlogix.com or Fax: 866 915 6449

Your Shopping Cart - 8 Item(s) \$226.00

Product Description	Unit Price	Quantity	Total
 R2-1: SPEED LIMIT (#) 18X24 FR2-118X24DA Sign Configuration: .080 Aluminum Diamond Grade Reflective Speed (#): 25	\$24.90	3	\$74.70

 R2-1: SPEED LIMIT (#) 18X24 FR2-118X24DA Sign Configuration: .080 Aluminum Diamond Grade Reflective Speed (#): 20	\$24.90	1	\$24.90
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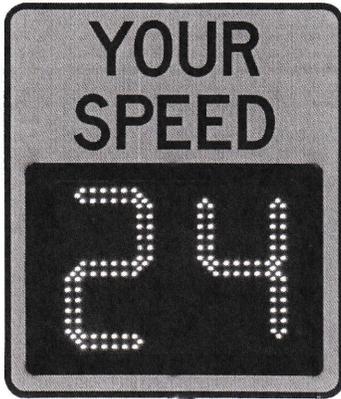
 POST SQUARE 10' X 2-1/4" 12 GA FPOSTSQ10X2-1/4	\$31.60	4	\$126.40
--	---------	---	----------

Subtotal
 \$226.00
 10% Estimated Shipping Fee \$22.60

Estimated Total
\$248.60

TRAFFIC LOGIX

SafePace 100 Radar Speed Sign



The Traffic Logix SafePace 100 is the radar speed sign that fits your budget. This compact radar speed sign offers exceptional visibility and power efficiency in a lightweight and portable solution. Featuring the options you need at remarkably affordable pricing, the SafePace 100 is the sign you'll want to use again and again to keep your neighborhoods safe.

Features

- **Affordable:** Priced low enough for any budget.
- **Portable:** At 21 lbs, the lightweight sign is quick and simple to transport and can be mounted in minutes.
- **Energy Efficient:** The ultra low power sign utilizes the most power-efficient radar technology available. The sign can function up to four weeks autonomously with optional battery power.
- **Optimal Visibility:** Unique light enhancing, anti-glare lens system as well as automatic ambient light adjustment provide brilliant visibility even in poor lighting conditions.
- **User Friendly Software Interface:** Easy-to-use management



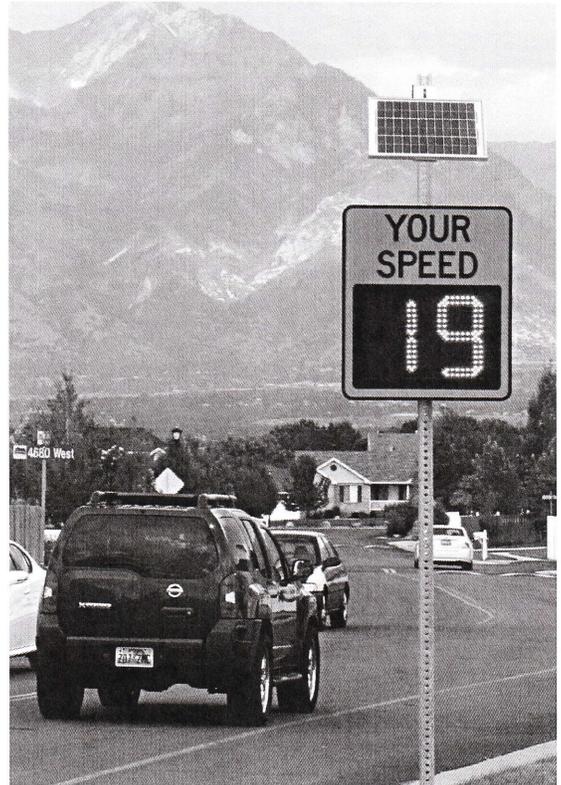
software lets you set sign parameters, download traffic data, and generate statistical reports.

• **On-Sign Programming:** Commonly used settings, such as display speed range and digit/strobe flashing threshold speed, can be programmed directly on

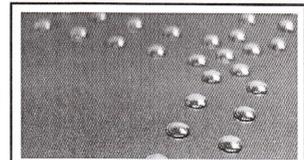
sign with a convenient on-board switch.

Ideal for use in:

- Residential neighborhoods
- Private communities
- School zones
- Shopping centers
- Corporate campuses
- Construction zones



- **Vandalism Resistant:** With a 1/4" durable aluminum protective cover and individual optical lenses shielding each LED, the sign is well protected against theft or vandalism.



Individual Protective Lenses
Close-up View of Sign Digit

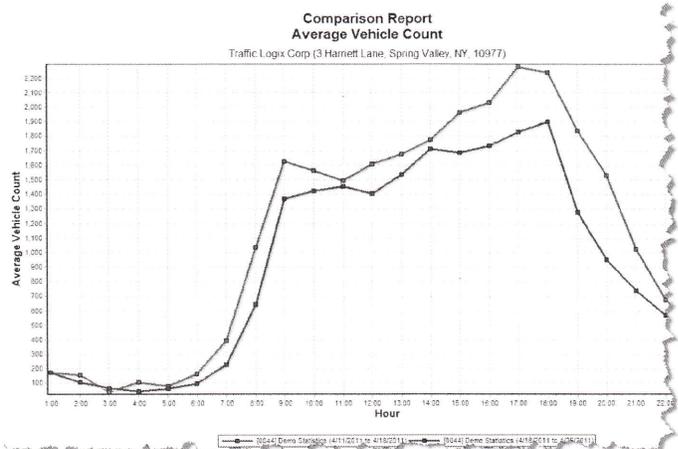
- **Stealth Mode:** Collect baseline traffic data while speed display appears blank to motorists.
- **Speed Violator Strobe:** Programmable flashing strobe to alert speeding drivers comes standard with every sign.



Data Collection, Analysis & Reporting

Accurate Traffic Statistics at Your Fingertips

With the SafePace 100 data collection feature, capture important traffic data such as vehicle count, speed, date and time. Stored data can be easily downloaded and generated into statistical reports and charts for analysis. Data can be stored by location, making the SafePace 100 the perfect choice when selecting a radar sign with data collection for use in single or multiple locations.



Period Comparison Graph

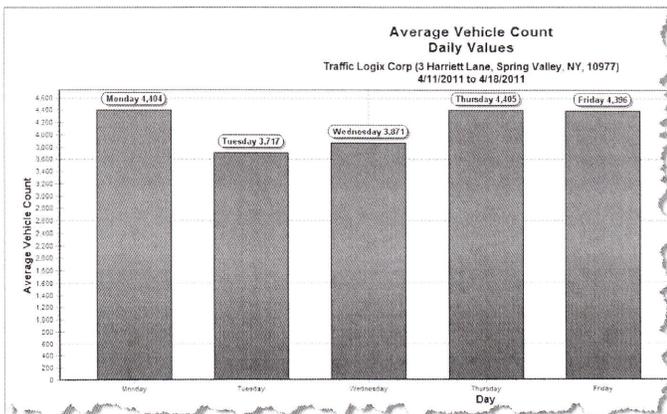
Statistics Summary Report

Location: Traffic Logix Corp Data Session: Demo Statistics
Address: 3 Harriett Lane, Spring Valley, NY, 10977 Report Period: 4/4/2011 to 4/10/2011
Speed Limit: 25 Total Vehicle Count: 23,966

Hour	Total Vehicles	Average Vehicles	Total Violations	% Violations	Min. Speed	Max. Speed	Avg. Speed	85% Speed
00-01	163	23	161	99%	18	43	32	32
01-02	95	14	95	100%	29	43	32	37
02-03	57	8	52	92%	8	38	30	32
03-04	36	5	33	92%	18	38	32	37
04-05	34	5	24	76%	8	38	28	37
05-06	98	14	65	74%	13	53	30	32
06-07	290	41	207	75%	13	43	29	32
07-08	926	132	703	82%	8	49	30	32
08-09	1,524	218	1,274	86%	8	48	31	32
09-10	1,536	219	1,180	80%	8	48	29	32
10-11	1,442	206	1,172	83%	13	48	30	32
11-12	1,535	219	1,271	84%	8	48	30	32
12-13	1,661	237	1,398	85%	8	48	30	32
13-14	1,660	237	1,387	84%	8	43	29	32

Traffic Statistics Report

- Traffic data collected and stored by location
- Statistical reports & charts
 - Summary report
 - Weekly report
 - Period comparison report
 - Variety of report parameters including:
 - Average/total vehicle count, speed & number of violations
 - Percentage of speed violations
 - 85th percentile speed
 - Minimum & maximum speed
 - Vehicle count by speed
- Reports can be printed directly or exported into CSV format, MS Excel, Adobe Acrobat PDF, HTML, and Bitmap image formats



Average Vehicle Count



Sign Options

Data Collection: Built-in data engine collects traffic statistics including vehicle speed and count, allowing you to create valuable reports for analysis

Universal Mounting Bracket: Optional bracket makes mounting quick and easy, allowing you to use one sign at multiple locations. Bracket locks and unlocks with the turn of a key.

Battery Power: Lithium ion batteries offers extended operation with choice of 9.6V, 10Ah battery for two week performance or 12.8V, 15Ah battery for four week performance before recharge under normal operating conditions.



Folding Sign Plate

Solar Power: Complete and compact solar power system available.

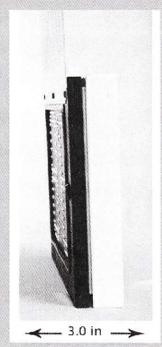
Folding Sign Plate: Sign is available with smaller "Your Speed" sign plate that folds compactly for convenient relocation.



Universal mounting bracket

Specifications

- Sign size with full "Your Speed" sign plate: 23.0" (w) x 29.0" (h)
- Sign size with foldable "Your Speed" sign plate: 21.5" (w) x 30.3" (h)
- Digit height: 11.0"
- Sign depth: 3.0"
- Protective aluminum cover thickness: 0.25"
- Range: 300-400 ft
- Sign weight: 21.0 lbs with AC Power
- Power supply: AC Power (standard), Battery or Solar Power Optional
- Operating temperature: -40F - 185F



About Traffic Logix

Established in 2004 to provide traffic calming solutions to slow traffic on residential streets, Traffic Logix has since become a market leader and innovator.

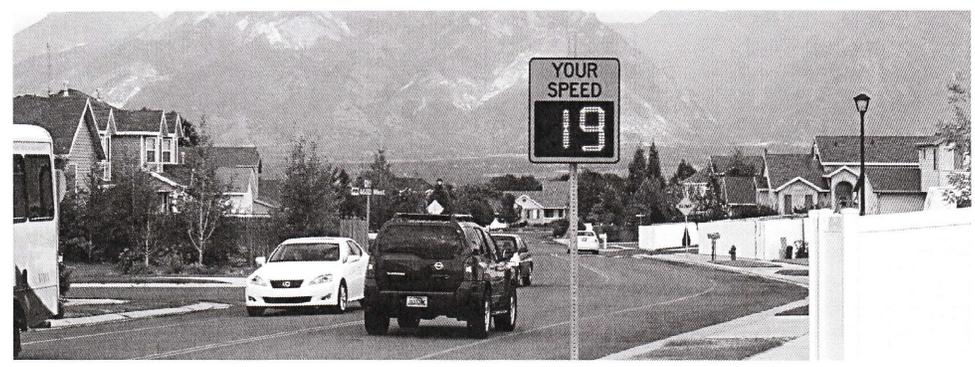
Our dynamic line of products has evolved to include a complete line of interlocking rubber solutions such as speed humps, tables, and cushions, flexible rubber curbing, and a range of radar speed signs and options including driver feedback signs, variable message signs, a school zone system, variable speed limit signs, and now the compact, portable SafePace 100.

Traffic Logix is the only company of its kind offering a complete toolbox of traffic calming solutions including both rubber and radar products.

With solutions installed on thousands of streets across North America, Mexico, and Europe, Traffic Logix continues to lead the way to protect our streets on which we live.



3 Harriet Lane, Spring Valley, New York 10977
PHONE (866)915-6449 | FAX (866)995-6449
www.trafficlogix.com | info@trafficlogix.com



IDOT Application for Traffic Safety Funds (TSIP)

D

Time Schedule

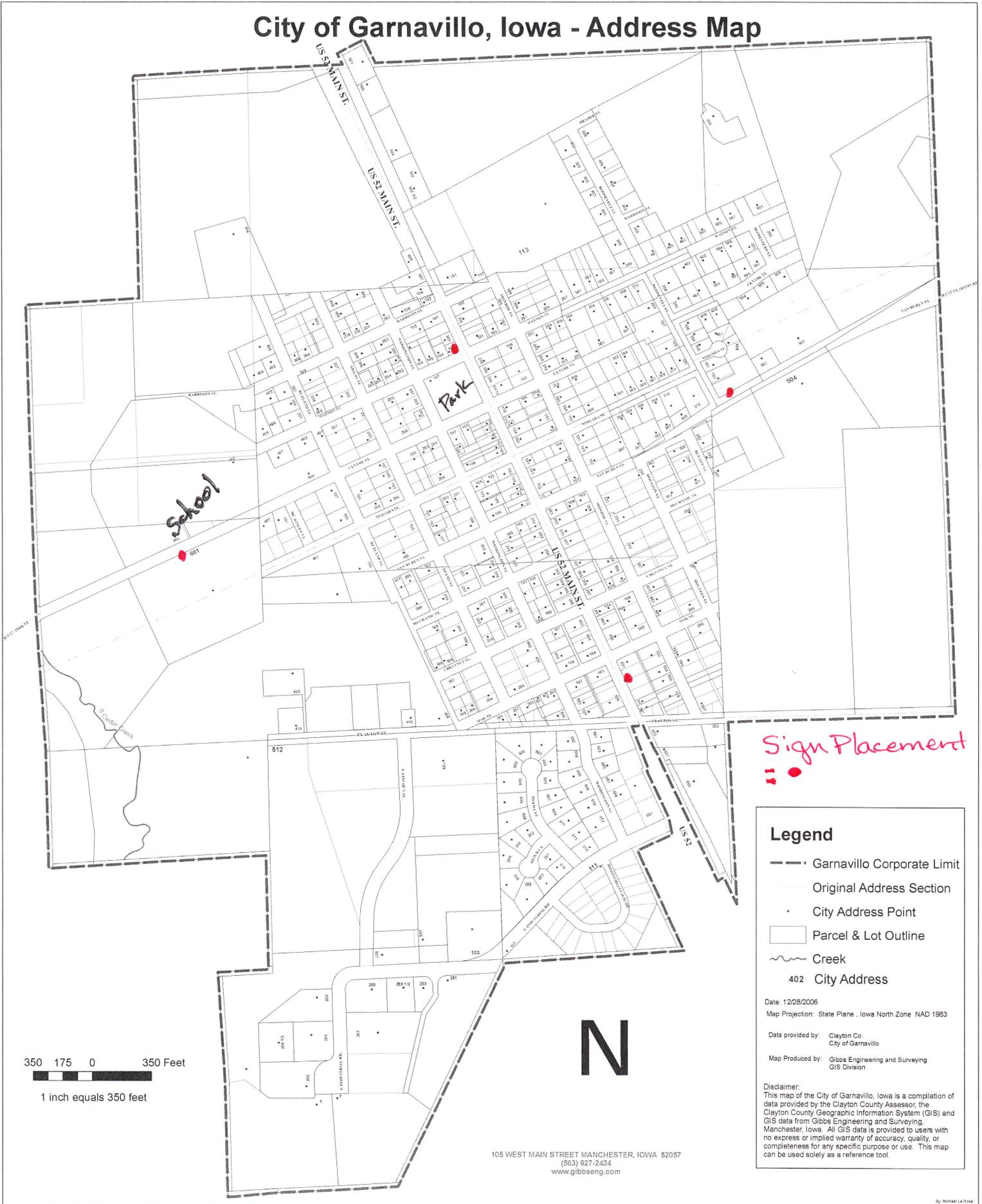
Mid-December 2015 IDOT notification of award

January-March 2016 Work with IDOT staff on finalizing details for traffic control device order & required IDOT permits

July 1, 2016 Order traffic control devices

August 2016 Install traffic control devices per manufacturer specifications & IDOT specifications

City of Garnavillo, Iowa - Address Map



Sign Placement
•

Legend

- Garnavillo Corporate Limit
- Original Address Section
- City Address Point
- Parcel & Lot Outline
- ~ Creek
- 402 City Address

Date: 12/28/2006
Map Projection: State Plane - Iowa North Zone NAD 1983

Data provided by: Clayton Co.
City of Garnavillo

Map Produced by: Gibbs Engineering and Surveying
GIS Division

Disclaimer:
This map of the City of Garnavillo, Iowa is a compilation of data provided by the Clayton County Assessor, the Clayton County Geographic Information System (GIS) and GIS data from Gibbs Engineering and Surveying, Manchester, Iowa. All GIS data is provided to users with no express or implied warranty of accuracy, quality, or completeness for any specific purpose or use. This map can be used solely as a reference tool.

350 175 0 350 Feet
1 inch equals 350 feet



105 WEST MAIN STREET MANCHESTER, IOWA 52057
(563) 927-2434
www.gibbseng.com



South Hwy 52/South Main Street



West Centre Street

X = Sign Placement



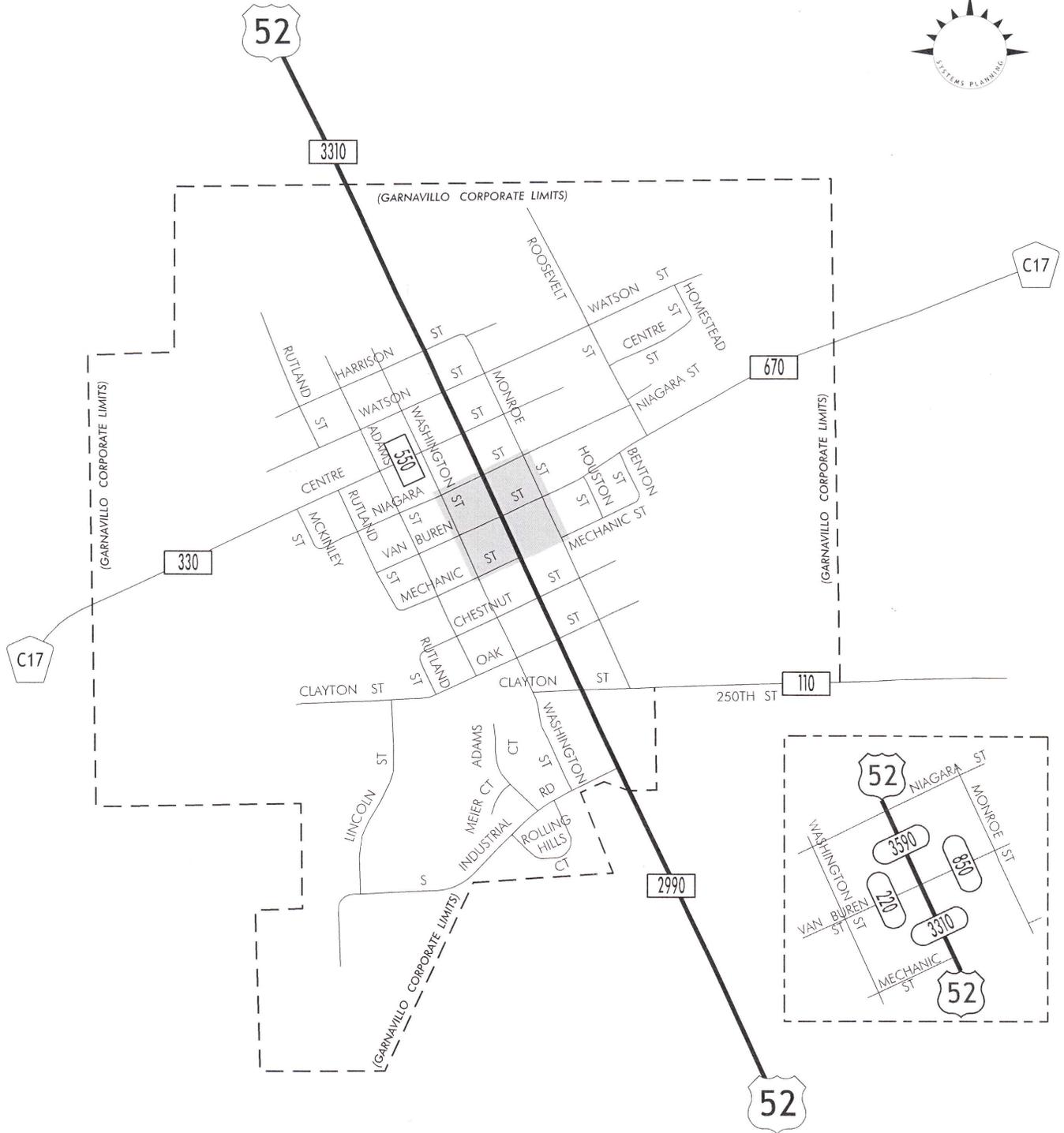
East Van Buren Street



North Hwy 52/North Main Street

X = Sign/Device Placement

TRAFFIC FLOW MAP OF
GARNAVILLO
CLAYTON COUNTY
2013 ANNUAL AVERAGE DAILY TRAFFIC



SPEED TRAILER DATA

Date	Time	Location	Direction	Count	Zone	50th percentile	85th percentile	number speeding	percent speeding
sorted by location									
Main St southbound									
July 2, 2012	10 AM to 11 PM	Main St at S. 100 blk	southbound	1124	20	21 mph	25 mph	670	59.6%
July 9 2012	11 AM to 10 PM	Main St at N. 200 blk	southbound	944	20	21 mph	25 mph	547	57.9%
July 1 2013	7 AM to 10 PM	Main St at N. 200 blk	southbound	1474	20	21 mph	26 mph	823	55.8%
July 31, 2013	6 AM to 9 PM	Main St at N. 200 blk	southbound	1350	20	24 mph	27 mph	1181	87.5%
Aug 1 to 7, 2014	6 days	Main St at N. 200 blk	southbound	10663	20	22 mph	26 mph	6586	61.8%
May 18 to 21, 2015	3 days	Main St at N. 200 blk	southbound	5878	20	22 mph	26 mph	3556	60.5%
Jun 24 to Jul 1, 2015	8 days	Main St at N. 200 blk	southbound	11994	20	21 mph	25 mph	7044	58.7%
Jul 16 to 23, 2015	7 days	Main St at N. 200 blk	southbound	12570	20	21 mph	25 mph	6648	52.9%
Main St Northbound									
May 6 to 8th, 2014	50 hrs	Main St at S. 300 blk	northbound	3181	25	26 mph	42 mph	1848	58.1%
June 11 to 18, 2014	7 days	Main St at Mill	northbound	9686	25	33 mph	42 mph	7814	80.7%
July 9 to 15, 2015	6 days	Main St at S. 300 blk	northbound	8372	25	24 mph	28 mph	3074	36.7%
E Van Buren westbound									
Jun 13 to 22, 2015	9 days	E Van Buren 300 blk	westbound	6612	25	28 mph	37 mph	4285	64.8%
July 30 to Aug 6, 2015	7 days	E Van Buren 300 blk	westbound	4616	25	28 mph	33 mph	3332	72.2%
W Centre St eastbound									
November 12, 2012	11 AM to 10 PM (11 hrs)	W Centre St 300-500 blk	eastbound	170	25	28 mph	35 mph	98	57.6%
Aug 21 to 27, 2014	5 1/2 days	W Centre St 300-500 blk	eastbound	1204	25	27 mph	34 mph	694	57.6%
July 24 to 29, 2015	5 days	W Centre St 300-500 blk	eastbound	852	25	29 mph	35 mph	562	66.0%

Date	Time	Location	Direction	Count	Zone	50th percentile	85th percentile	number speeding	percent speeding
Broken down by some individual days									
June 14, 2015	9 AM to 5 PM (8 hrs)	E Van Buren St 300 blk	westbound	307	25	31 mph	39 mph	251	81.8%
June 15, 2015	9 AM to 5 PM (8 hrs)	E Van Buren St 300 blk	westbound	339	25	29 mph	36 mph	247	72.9%
June 16, 2015	9 AM to 5 PM (8 hrs)	E Van Buren St 300 blk	westbound	338	25	30 mph	38 mph	244	72.2%
June 18, 2015	9 AM to 5 PM (8 hrs)	E Van Buren St 300 blk	westbound	352	25	30 mph	38 mph	251	71.3%
June 19, 2015	9 AM to 5 PM (8 hrs)	E Van Buren St 300 blk	westbound	339	25	30 mph	40 mph	253	74.6%
July 25, 2015	8 AM to 4 PM (8 hrs)	W Centre St 300-500 blk	eastbound	97	25	31 mph	38 mph	67	69.1%
July 26, 2015	8 AM to 4 PM (8 hrs)	W Centre St 300-500 blk	eastbound	71	25	29 mph	35 mph	46	64.8%
July 27, 2015	8 AM to 4 PM (8 hrs)	W Centre St 300-500 blk	eastbound	128	25	28 mph	35 mph	81	63.3%
July 29, 2015	8 AM to 4 PM (8 hrs)	W Centre St 300-500 blk	eastbound	81	25	31 mph	38 mph	64	79.0%
May 24, 2015	9 AM to 5 PM (8 hrs)	Main St at N. 200 blk	southbound	790	20	23 mph	27 mph	564	71.4%
June 7, 2015	9 AM to 5 PM (8 hrs)	Main St at N. 200 blk	southbound	842	20	22 mph	26 mph	526	62.5%
June 27, 2015	9 AM to 5 PM (8 hrs)	Main St at N. 200 blk	southbound	923	20	22 mph	26 mph	560	60.7%
June 28, 2015	9 AM to 5 PM (8 hrs)	Main St at N. 200 blk	southbound	819	20	22 mph	26 mph	555	67.8%
July 19, 2015	9 AM to 5 PM (8 hrs)	Main St at N. 200 blk	southbound	830	20	22 mph	26 mph	532	64.1%
May 6, 2014	1 PM to 9 PM (8 hrs)	Main St at S 300 blk	northbound	720	25	26 mph	40 mph	399	55.4%
May 7, 2014	9 AM to 5 PM (8 hrs)	Main St at S 300 blk	northbound	781	25	27 mph	43 mph	465	59.5%
May 3, 2015	6 Am to 6 PM (12 hrs)	Main St at S 300 blk	northbound	885	25	25 mph	29 mph	377	42.6%
May 6, 2015	6 Am to 6 PM (12 hrs)	Main St at S 300 blk	northbound	1163	25	25 mph	29 mph	493	42.4%
July 11, 2015	6 Am to 6 PM (12 hrs)	Main St at S 300 blk	northbound	1064	25	25 mph	29 mph	430	40.4%
July 12, 2015	6 Am to 6 PM (12 hrs)	Main St at S 300 blk	northbound	894	25	25 mph	30 mph	435	48.7%

District 4



A

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: August 7, 2015

Location / Title of Project Council Bluffs/Battery Back-Up Systems 2017

Applicant City of Council Bluffs

Contact Person Mark Franz Title Traffic Superintendent

Complete Mailing Address 1001 10th Avenue
Council Bluffs, IA 51501

Phone 712-328-4645 E-Mail mfranz@councilbluffs-ia.gov
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type
Site Specific
Traffic Control Device
Safety Study

Funding Amount

Total Project Cost \$ 49,453.00

Safety Funds Requested \$ 44,305.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

A

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the City of Council Bluffs

Signed: Gregory W. Reeder 8/5/15
Signature Date Signed

Gregory W. Reeder
Typed Name

Attest: Matthew S. Cox 8/5/15
Signature Date Signed

Matthew S. Cox
Typed Name

TSIP Application, City of Council Bluffs Battery Back-Up Systems

The City of Council Bluffs is requesting Traffic Safety Improvement funds to purchase Traffic Signal Battery Back-Up Systems (BBS) to improve safety at 9 signalized intersections.

Enclosed are the specified documents for the City's Traffic Safety Improvement grant application.

Narrative

Power disturbances at busy traffic intersections can have far reaching consequences. Power loss to traffic signals can immediately gridlock an intersection and create congestion on arterials and outlying intersections dramatically increasing the likelihood of accidents. In a power outage, Public Works workers must be called out to set up stop signs, which can take up to two hours. According to the 2000 D.O.T. US Intersection Report, over 29,000 automobile accidents occurred when traffic control systems failed, resulting in an estimated cost of \$150 billion to the economy.

Due to the low power requirements of LED traffic signals, traffic signals are usually capable of normal operation for up to two hours, which is often longer than the power outage.

The City of Council Bluffs currently has 76 signalized intersections either equipped with battery back-up or in the process of having it installed. This project would add battery back-up to the 9 remaining traffic signals capable of utilizing it.

Battery Back-Up systems for traffic signals require all signal indications to be LED. The 9 traffic signals at which these battery back-up systems would be installed do not have LED yellow or LED yellow arrow displays. This application includes a request for funds to purchase those yellow LED and yellow LED arrow displays.

TSIP Application, City of Council Bluffs Battery Back-Up Systems

C

Cost Breakdown					
Materials					
	Qty	Cost Each	Cost	Funding Source	
Battery Back-Up System	9	\$4,545.00	\$ 40,905.00	Grant Funds	
LED Yellow ball indication	59	\$55.00	\$ 3,245.00	Grant Funds	
LED Yellow arrow indication	2	\$77.50	\$ 155.00	Grant Funds	
Total Cost of Materials			\$ 44,305.00		
Labor					
Man/hours - 8.0 per system	72	\$50.00	\$ 3,600.00	City General Funds	
Equipment					
AR150 Bucket Truck - hours	36	\$43.00	\$ 1,548.00	City General Funds	
Total Project Cost			\$ 49,453.00		
TSIP Funds Requested			\$ 44,305.00		

TSIP Application, City of Council Bluffs Battery Back-Up Systems

C

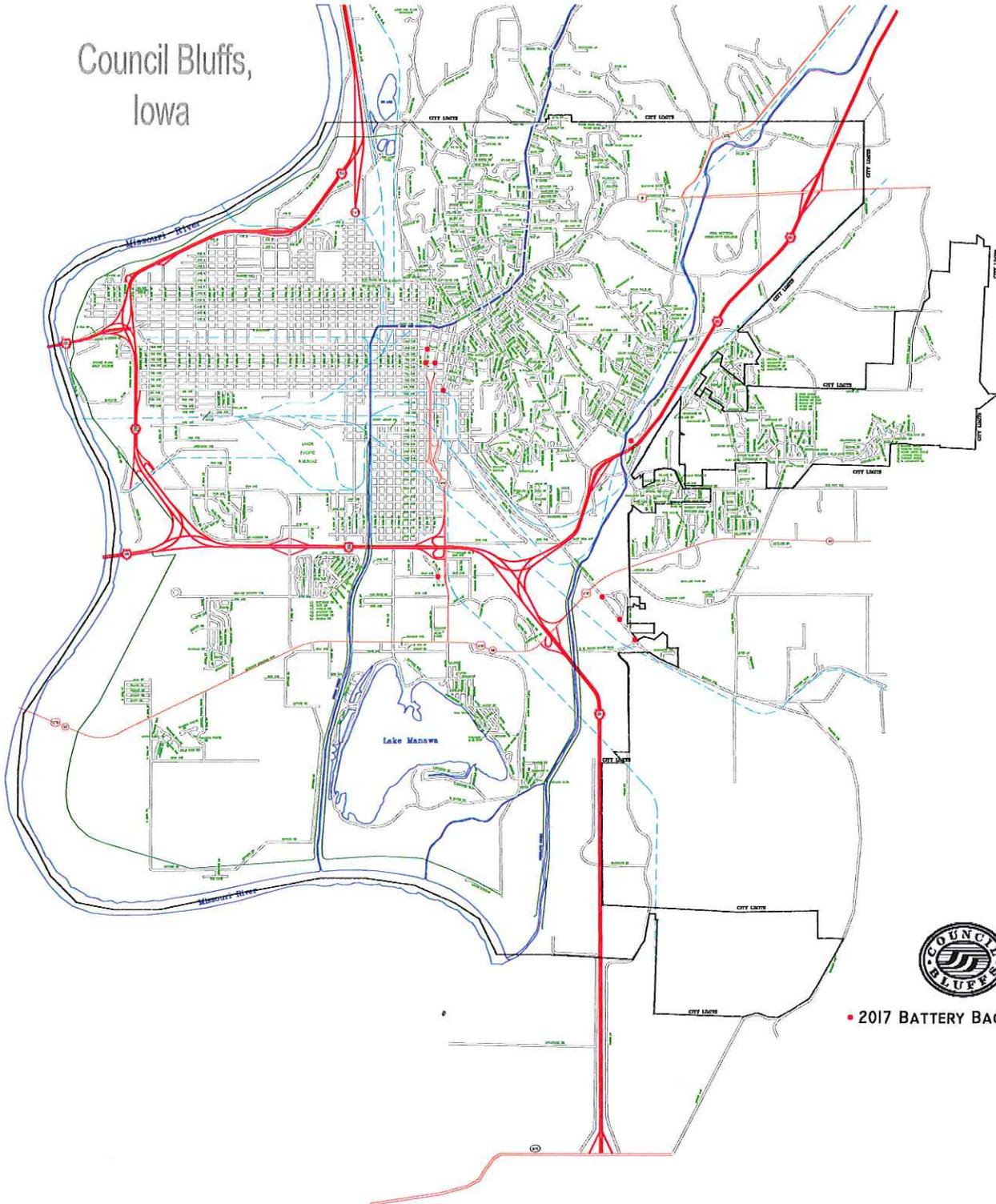
Locations for BBS Systems	LED Yellows Needed	LED Yellow Arrows Needed
6th St & 5th Ave	6	0
7th St & 32nd Ave	11	0
7th St & 5th Ave	6	0
7th St & Willow Ave	6	0
9th Ave & Main St	0	0
Langdon Blvd & E. S. Omaha Bridge Rd.	10	1
Langdon Blvd & L.C. High School Entrance	10	1
Langdon Blvd & L.C. Mid School Entrance	10	0
Mall Dr & Valley View Dr	0	0
<hr/>		
9 traffic signals	59	2

**TSIP Application, City of Council Bluffs
Battery Back-Up Systems**

Time Schedule

1 January 2016	Notification of Approval
1 July 2016	Funds become available
1 July 2016	Request for Quotes
1 August 2016	Materials received and work begins
1 June 2017	Project completion

Council Bluffs, Iowa



• 2017 BATTERY BACK-UP LOCATIONS

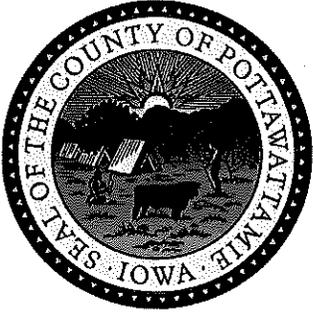
TSIP Application, Council Bluffs Battery Back-Up Systems 2017



Internal View Battery Back-up System



External Cabinet Battery Back-up System



Pottawattamie County Secondary Roads
223 South 6TH Street
Council Bluffs, Iowa, 51501

Tel: 712.328.5608
Fax: 712.328.4751

July 22, 2015

To:

Office of Traffic and Safety
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

Subject: TSIP 2016 application for traffic control devices

Attention: Donna Matulac

The attached document is Pottawattamie County's TSIP application for traffic control devices for 2016. A recent traffic study conducted by our department has identified 16 high risk sections of roadway that are characterized by a high percentage of speed violations and above average crash densities in comparison to similar roads in Iowa. The study identifies an urgent need to address these high risk locations in which we are requesting a total of \$94,635.00 to assist the funding of the proposed countermeasures described herein.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel J. Zimny", is written over a horizontal line.

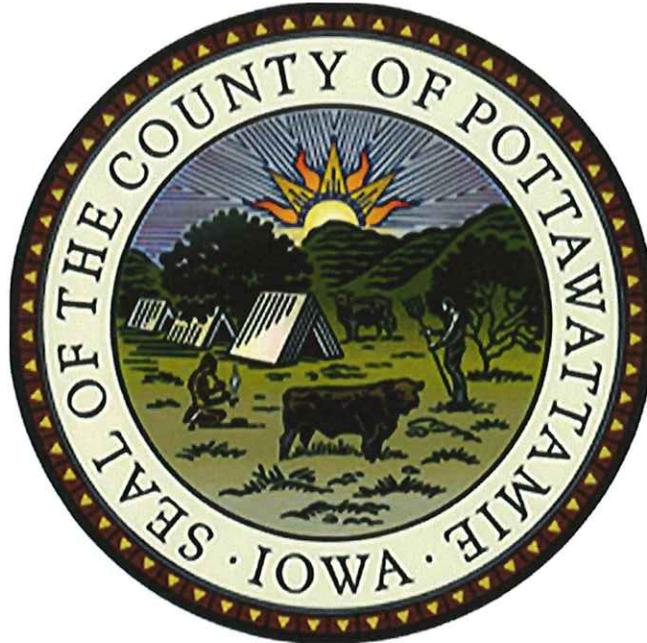
Daniel J. Zimny, EIT
Assistant Engineer

**Traffic Safety Improvement Program Application
Traffic Control Devices**

for

Pottawattamie County, Iowa

July 22nd, 2015



Prepared for:

Office of Traffic and Safety
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

Attention: Donna Matulac

Prepared by:

Pottawattamie County Secondary Roads Department
223 South 6th Street
Council Bluffs, IA 51501
712.328.5608

A handwritten signature in black ink, appearing to read "Daniel Zimny", is written over a horizontal line.

Daniel Zimny, EIT
Assistant Engineer

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Appendices

Appendix A *G37 Recessed Pavement Marker Plan Sheets*

Appendix B *Material Data Sheets*

- *MUTCD advanced warning sign*
- *Driver feedback sign*
- *Recessed markers*
- *Binder bitumen pads*

Appendix C *Annual traffic count sheet from driver feedback signs*

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project County to City Transition Zone ImprovementsApplicant Pottawattamie County Secondary Road DepartmentContact Person Daniel Zimny Title Assistant EngineerComplete Mailing Address 223 South 6th Street
Council Bluffs, Iowa 51501Phone (712)-328-5608 E-Mail dzimny@pottcounty.com
(Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____
_____Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

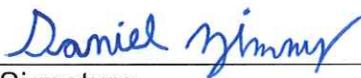
Application TypeSite Specific
Traffic Control Device
Safety Study **Funding Amount**Total Project Cost \$ 94,635.00**Safety Funds Requested** \$ 94,635.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

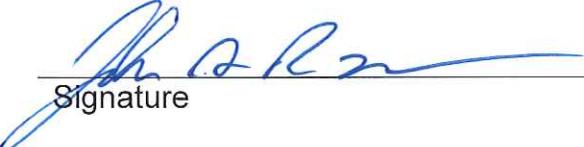
To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the Pottawattamie County Secondary Roads Department

Signed:  7/22/15
Signature Date Signed

Daniel Zimny, Assistant Engineer
Typed Name

Attest:  7/23/15
Signature Date Signed

John Rasmussen, County Engineer
Typed Name

Project Narrative

(B)

Existing Conditions

A public concern that is consistent throughout our county's incorporated cities and surrounding areas are the high traffic speeds of vehicles that enter their city limits via county farm to market routes that are paved and have a function classification of a Rural Major Collectors. These roads for the most part are straight and built with wide driving lanes and large shoulders to accommodate large equipment used for agricultural. When these routes enter urbanized areas, such as school zones, business districts and neighborhoods, road geometry and design speed for the most part remain constant but by prima facie conditions set by the Iowa administrative code, the enforced speed limit is dramatically reduced when entering these districts. In the past we have established transition zones on the approach to these small communities to provide drivers an advanced warning and adequate distance to reduce their travel speed to the city limit. We define this zone, highlighted on the site maps in Section F, to range between the first advanced warning sign to the final enforced speed posting when entering the town, often over the course of several hundred feet. Despite these efforts to calm traffic, concerned members of the public claim these zones are ineffective and that drivers are maintaining their high speeds into the city limits. Using these complaints as an indication of a potential safety problem, we used the FHWA *"Roadway Departure Safety Manual for Local Rural Road Owners"* and the *"Handbook of Simplified Practice for Traffic Studies"* provided by Iowa State's Center of Transportation Research Education as guides to analyze these transition points from high speed rural roads to slower urban service streets.

In the winter and spring of 2015 we conducted week long spot speed studies on sixteen transition zones throughout the county that were chosen by compliant history, crash history, and engineering judgement. Speed data was collected by the procedure listed in the FHWA manual on *"Methods and Practices for Setting Speed Limits"* to determine the existing conditions of our roadways. Table 1 presents the number of incorporated cities, number of transition zones in each city, and the county road of interest at each location in the study. A driver feedback sign was purchased to collect traffic data at these locations. The sign was

placed at the end of each transition zone, last enforceable speed posting when entering the town, and operated in “stealth” mode so that data was collected without giving feedback to the driver as this would impede speed. Car count, time of count, and average speed of each vehicle exiting the transition zone and entering the city district was collected at each location providing a week’s worth of data. From this input we were able to compute the average, high, low, pace, and 85 percentile speeds at each location which was then compared to the existing enforced speed limit. The results for each location are summarized in [Section G](#).

Table 1: Spot Speed Study Locations throughout County

Incorporated City	Number of Spot Speed Studies	County Road
Crescent	3	L20 (2), G37 (1)
Underwood	3	G30(1), G8L(2)
Neola	2	G8L
Minden	3	L66(1), G18(2)
Treynor	1	L55
Macedonia	2	G66
Hancock	1	G18
Avoca	1	G30

A crash density was calculated for each transition zone to compliment the speed data collected by the driver feedback unit. Crash Mapping Analysis Tool, CMAT, was downloaded from the Iowa DOT website to determine the crash history of the transition zone and city zone portion of each farm to market route in the study. Although, not all accidents may be directly associated with speeding, the main purpose of the crash study was to determine if there was a long crash history accompanied with a high percentage of speed violations at these locations. Crash history dated back to 2004 and provided a ten year history for each transition segment. The length of each transition zone was measured and the crash density was determined and compared to the crash density of major rural collectors in Iowa listed in *“Crash Rates and Crash Densities on Secondary Roads in Iowa by Functional Class”* provided by the Iowa DOT. Densities for each transition zone are summarized in [Section G](#). The 16 study locations combined for a

crash density of 1.77 crashes/mile/year, which is far greater than the state average of 0.37 crashes/mile/year for major collectors on secondary roads.

Data Analysis

Data summaries for each individual site are tabulated in Section G. Daily data is tabulated from to show the variance in speeds and car volume throughout the week. This table shows a side by side comparison of vehicles observing the speed limit, violating the speed limit, and traveling within 5 mph of the enforced speed limit which tends to be a tolerable limit for law enforcement. A graphical representation comparing the abundance of speed violations to those observing the enforced limit is also shown in this section. Percentage of vehicles exceeding the posted speed limit and the crash density for each site was then tabulated and ranked, as shown in table 2, to determine the at most risk transition zones in the county. By using these two variables, the average annual daily traffic and the speed reduction in each transition zone had no impact on how the locations ranked. The site posing as the highest safety risk, Old Lincoln Hwy (L20) southbound into the city of Crescent recoded the third highest speed violation rate, 97%, and a crash density more than 10 times the state average for this classification of road. L55 Southbound into Treynor, which ranked 1st in violations, recorded an 85th percentile of 48 mph which is classified as reckless driving in its 20 mph speed zone. Normally the 85th percentile is used to set enforceable speed limits, but these speed zones are controlled by the district classifications set by prima facie and cannot be raised under Iowa Code. Upon review of this data, we find the local residents concern for safety justified as these transition zones pose a high risk to the traveling public and are in urgent need of traffic calming countermeasures.

Table 2: Rank of Highest at Risk Transition Zones

Overall Rank	Location	% Speed Violations	Rank	Crash Density	Rank
1	L20 SB to Crescent	97	3	3.92	2
2	G18 EB to Avoca	99.9	1	2.46	5
3	L55 SB to Treynor	99.9	1	2	6
4	L20 NB to Crescent	96	4	3.47	4
5	G66 WB to Macedonia	96	4	1.75	8
6	G37 EB to Crescent	79	12	5.04	1
7	G8L NB to Underwood	81	10	3.74	3
8	G66 EB to Macedonia	95	6	0.49	11
9	L66 SB to Minden	80	11	1.78	7
10	G8L SB to Underwood	88	7	0	14
11	G30 EB to Hancock	85	8	0	14
12	G18 EB to Minden	75	14	1.22	9
13	G8L NB to Neola	84	9	0	14
14	G8L SB to Neola	76	13	0.27	13
15	G30 EB to Underwood	74	15	0.49	11
16	G18 WB to Minden	30	16	0.51	10

Proposed Countermeasures

Possible countermeasures were evaluated and selected using Iowa State University Center for Transportation Research and Education’s *“Evaluation of Gateway and Low Cost Traffic Calming Treatments for Major Routes in Small, Rural Communities”* and the FHWA *“Roadway Departure Safety A Manual for Local Rural Road Owners”*. Although the most effective form of traffic calming is to adjustments to the road geometry and shape, we did not consider these countermeasures as we were seeking low cost calming measures that could be installed at each study location. We selected and are seeking assistance in funding three countermeasures, described in the following sections to meet the goal of reducing the number of speed violations and reducing the crash density at each study location.

Transition Zone Reinforcement

Two locations, L55 Southbound to Treynor and G66 West Bound to Macedonia, were found to have insufficient signage to be considered an effective transition zone and may be the leading reason why these sites registered a high speed violation volume. Funding will go to purchasing and furnishing two MUTCD# W3-5 advanced warning signs to better define these transitions.

We have found these particular signs to be more effective than the “Reduce speed ahead” signs and would like to install them at the appropriate distance specified in MUTCD Chapter 2C to give the traveling public adequate time to reduce their speed. The G66 transition zone for example currently reduces speed from 55 mph to 25 mph in just 302’. Although current transition zones in our county mostly appear to be ineffective, we cannot enforce traffic calming measures without properly defining a reasonable transition zone on the approaches into these towns.

Driver Feedback Speed Displays

Signage in well establish transition zones in our county appear to have little effect on the self-policing efforts of the traveling public, “whom will continue to travel at high speeds until acted upon by an outside force which causes a level of discomfort to the driver leading them to reduce their speed” (Us Department of Transportation, 2011). Driver feedback displays, much like the one used to collect data for this study, are a proven calming technique that can cause this level of discomfort to the driver reducing 85th percentile speeds up to 10 mph (Center for Transportation Research and Education Iowa State University, 2007). Signs will be reinstalled at the same location where the spot speed study took place since the data collected from the preliminary study reveals a preexisting speeding problem. All signs will have data collection capabilities that will be a resource in future planning, designing, and coordination of law enforcement movements; providing an overall benefit across multiple county departments and the County Local Road Safety Plan. Appendix C shows the annual traffic count collection form that will be utilized by city/county board members, planners, and engineers should the funding for these signs become available. Vandalism to the units will be discouraged with their location inside urban centers. Signs will also be programed to only display up to the maximum display threshold listed in Table 8 of the FHWA guide “*Methods and Practices for Setting Speed Limits*”. No speeds or messages will be displayed when drivers exceed this threshold to prevent reckless drivers from attempting to record the highest speed possible. In addition, no display will be given when vehicles observe the posted limit to reward good driving behavior. Appendix B

includes the material data sheets for the units we are proposing to install. Assistance in funding will go towards purchasing and installing these signs, posts, and footings.

Centerline Improvements on G37

The transition zone on Old Mormon Bridge Road (G37) west bound into the city of Crescent has one of the highest crash densities in our county. While this road is relatively straight, we believe a majority of these accidents are caused by the speed transition from I-29 off ramps and the conversion of I-680 east bound into county road G37. Speeds are reduced from 70 mph off the highways to 55 mph on G37 and then to 35 mph within Crescents city limits. Local drivers are also aware that this stretch of road is the last chance they may have to pass slower traffic before they turn onto Old Lincoln Hwy (L20) which meanders through the loess hills offering limited passing zone opportunities. In the summer of 2015, this section of G37 was changed to a no passing zone to help reduce the high number of centerline related accidents, 7 since 2004. We are now seeking assistance to fund the installation of 130 double sided yellow reflectors within this road segment to assist drivers in identifying centerline throughout all times of day and night. Reflectors will be placed in a 7' long by 6" wide milled out strip to prevent them from being removed by snowplows in the winter months. This practice, known as recessed pavement markers (RPMs), are used in our neighboring state Illinois but have yet to be implemented in our area. RPMs will be compliant with MUTCD Section 3B-11(US Department of Transportation, 2012) since the Iowa DOT does not have any specs or standards for permanent RPMs. See Appendix A for the proposed plan sheets for this safety upgrade. Appendix B includes the manufacture data sheets of the materials that were are proposing to use in this project. Washington State DOT specifications were referenced to provide a standard for materials and design. A local letting will be used to hire a contractor to furnish the markers.

Engineers Estimate

(C)

COUNTY TO CITY TRANSITION ZONE SAFTEY IMPROVEMENTS					
Item NO.	Item	Units	Unit Price	Quantity	Total
1	MUTCD W3-5 Sign 36" X 48"	EA	\$100.00	2	\$200.00
2	4" x 4" Wood Post for Sign for Type A or B Sign	EA	\$30.00	2	\$60.00
3	15" LED Driver Feedback Display, Solar Powered Sign	EA	\$5,500.00	16.00	\$88,000.00
4	Bituminous Fog Seal (Pavement)	Gal	\$50.00	5.05	\$252.50
5	Perminate Double Sided Yellow Raised Pavement Markers	EA	\$7.00	130.00	\$910.00
6	Traffic Control	LS	\$1,000.00	1.00	\$1,000.00
7	Grooving for Pavement Markers	SY	\$15.00	40.83	\$612.50
8	Pilot Car	EA	\$500.00	1.00	\$500.00
9	Flaggers	EA	\$300.00	2.00	\$600.00
10	Mobilization	LS	\$2,500.00	1	\$2,500.00
				Total:	\$94,635.00

Project Schedule

(D)

Task	2015								2016							
	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	MAY	JUNE	JULY	AUG.				
Application submittal																
Application review																
Application approval																
Purchase order for driver feedback and MUTCD W3-5 signs																
Down time of sign fabrication and shipping																
Bid Letting of Recessed Pavement Markings Installation																
Construction of Recessed Pavement Markings																
Installation of driver feedback and MUTCD W3-5 signs																

TSIP DriverFeedback Data Collection
Traffic Study Schedule

(D)

Week	Location	Installation Date	Time	Data Collection Date	Time
1	McPherson Ave (test run)	5-Mar-15	1:30 PM	10-Mar-15	9:30 AM
2	L55 SB to Treynor	10-Mar-15	10:00 AM	17-Mar-15	8:00 AM
3	G66 EB to Macedonia	17-Mar-15	10:00 AM	24-Mar-15	8:00 AM
4	G66 WB to Macedonia	24-Mar-15	9:00 AM	31-Mar-15	8:15 AM
5	G30 EB to Hancock	31-Mar-15	9:45 AM	7-Apr-15	8:15 AM
6	G18 EB to Avoca	7-Apr-15	9:20 AM	14-Apr-15	8:30 AM
7	G18 WB to Minden	21-Apr-15	9:50 AM	28-Apr-15	8:30 AM
8	G18 L66 SB to Minden	28-Apr-15	10:10 AM	5-May-15	8:45 AM
9	G18 EB to Minden	5-May-15	9:45 AM	12-May-15	8:40 AM
10	G8L SB to Neola	12-May-15	9:55 AM	19-May-15	8:12 AM
11	G8L NB to Neola	19-May-15	9:22 AM	26-May-15	8:45 AM
12	G8L SB to Underwood	26-May-15	9:00 AM	2-Jun-15	8:49 AM
13	G30 EB to Underwood	2-Jun-15	9:54 AM	9-Jun-15	7:35 AM
14	G8L NB to Underwood	9-Jun-15	10:52 AM	16-Jun-15	7:51AM
15	L20 NB to Crescent	16-Jun-15	10:00 AM	23-Jun-15	8:05AM
16	L20 SB to Crescent	23-Jun-15	9:33 AM	30-Jun-15	6:30 AM
17	G37 EB to Crescent	30-Jun-15	8:50 AM	7-Jul-15	8:15 AM
Total:				86 Calendar Days	

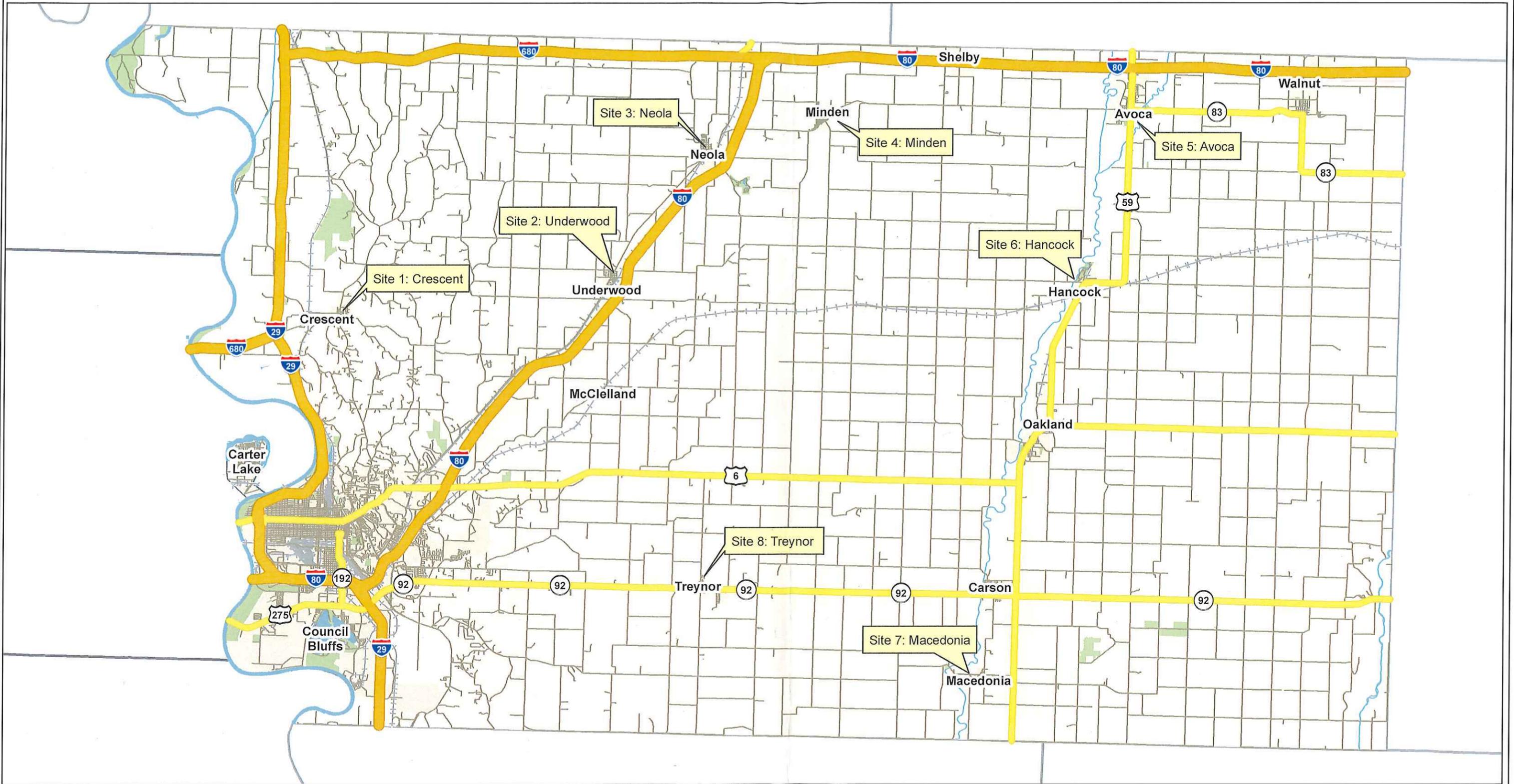
Sampling Start: 5-Mar-15
 Early Sampling Completion: 30-Jun-15
 Max. Potential Down Time: 2 weeks
 Latest Possible Completion: 14-Jul-15

Application Due Date: **15-Aug-15**
 Funds Approval Date: Mid-December 2015
 Funds Become Available: July 1, 2016 at the latest

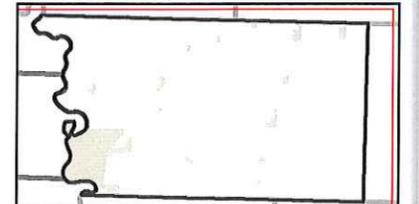
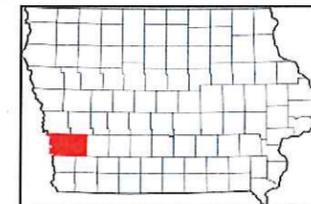
Collected Data: Car Counts
 Average speed
 Max/min Speed
 85% speed
 % traffic violations
 % traffic respecting limits
 Traffic density (15 Minute Intervals)

Traffic Study Location Map

(E)



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223 S 6 St
Council Bluffs, IA 51501
712.328.4885
gis@pottcounty.com
www.gis.pottcounty.com
Map Published: 7/9/2015
Aerial Photography:
Source: Pottawattamie GIS



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Crescent Site Map

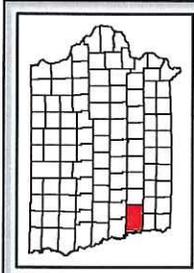
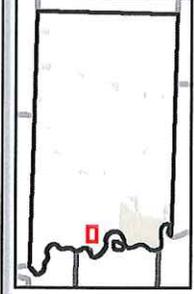
F.1



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www.gis.pottcounty.com
 Map Published: 7/30/2015
 Data Provided by:
 Source: Potomac/GIS



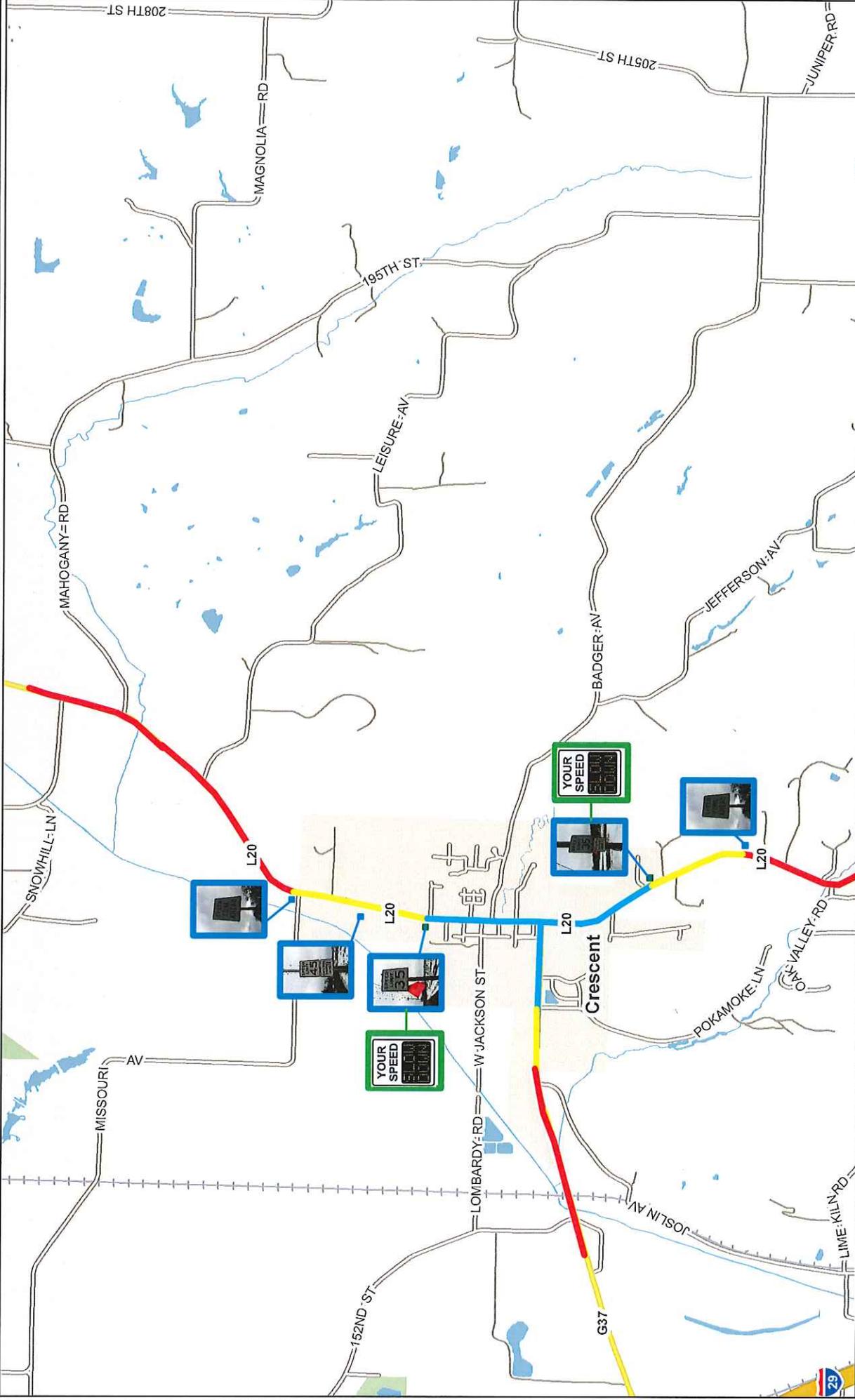
- Interstate Highspeed Road
- Local High Speed Rural Road, 55mph
- Speed Transition Zone, 45 mph
- City Limit Speed, 45 mph
- Existing Sign
- Existing Sign with Proposed Driver Feedback



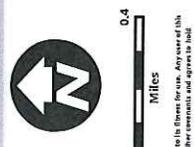
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Crescent Site Map

F.1.1.b



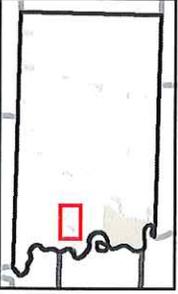
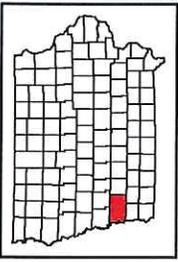
- Local High Speed Rural Road, 55mph
- Speed Transition Zone, 45 mph
- City Limit Speed, 35 mph
- Existing Sign
- Existing Sign with Proposed Driver Feedback



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 223 S 6 St
 Council Bluffs, IA 51501
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 Map Published: 7/10/2015
 Author: GIS Department
 Source: PotlatchStarline GIS



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G.1**Crescent Traffic Analysis**

Population (2013): 612
 Farm to Market (FM) routes within city limits: L20 and G36
 Daily entering volume from FM routes: 3264 VPD
 Crashes on FM routes within city limits since 2004: 22 accidents, 1 major

G36 East Bound Into Crescent

Federal functional classification	Major Collector
Speed limit within city	35 mph
Vehicles per day (7 day average)	771 VPD
Average number of speed violations per day	599
85th speed percentile of 7 day sample	58 MPH
Length of defined transition zone	2096 feet
Speed reduction within transition zone	20 mph (55-35 mph)
Accidents in transition zone (2004-2014)	20 accidents, 1 major, 7 centerline related, 1 fatality
Largest variance in recorded speeds	55 MPH
Crash density in transition zone	5.04 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

L20 South Bound Into Crescent

Federal functional classification	Major Collector
Speed limit within city	35 mph
Vehicles per day (7 day average)	1238 VPD
Average number of speed violations per day	1198
85th speed percentile of 7 day sample	55 MPH
Length of defined transition zone	2692 feet
Speed reduction within transition zone	15 mph (50-35 mph)
Accidents in transition zone (2004-2014)	20 accidents, 1 fatality, 1 major
Largest variance in recorded speeds	49 MPH
Crash density in transition zone	3.92 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

L20 North Bound Into L20

Federal functional classification	Major Collector
Speed limit within city	35 mph
Vehicles per day (7 day average)	1255 VPD
Average number of speed violations per day	1200
85th speed percentile of 7 day sample	57 mph
Length of defined transition zone	1520 feet
Speed reduction within transition zone	15 mph (50-35 mph)
Accidents in transition zone (2004-2014)	10 accidents, 1 major
Largest variance in recorded speeds	64 MPH
Crash density in transition zone	3.47 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.1.2.a

Daily Data From Spot Speed Study

Date: 6/16/2015-7/7/2015

Location: G37 EB to Crescent

Data Recording Date: 6/30/2015

Time: 10:33 AM

Site #: 1

Data Download Date: 7/7/2015

Time: 8:15 AM

Description: Data from 45 mph speed post at end of transition zone

Posted Speed: 45 mph

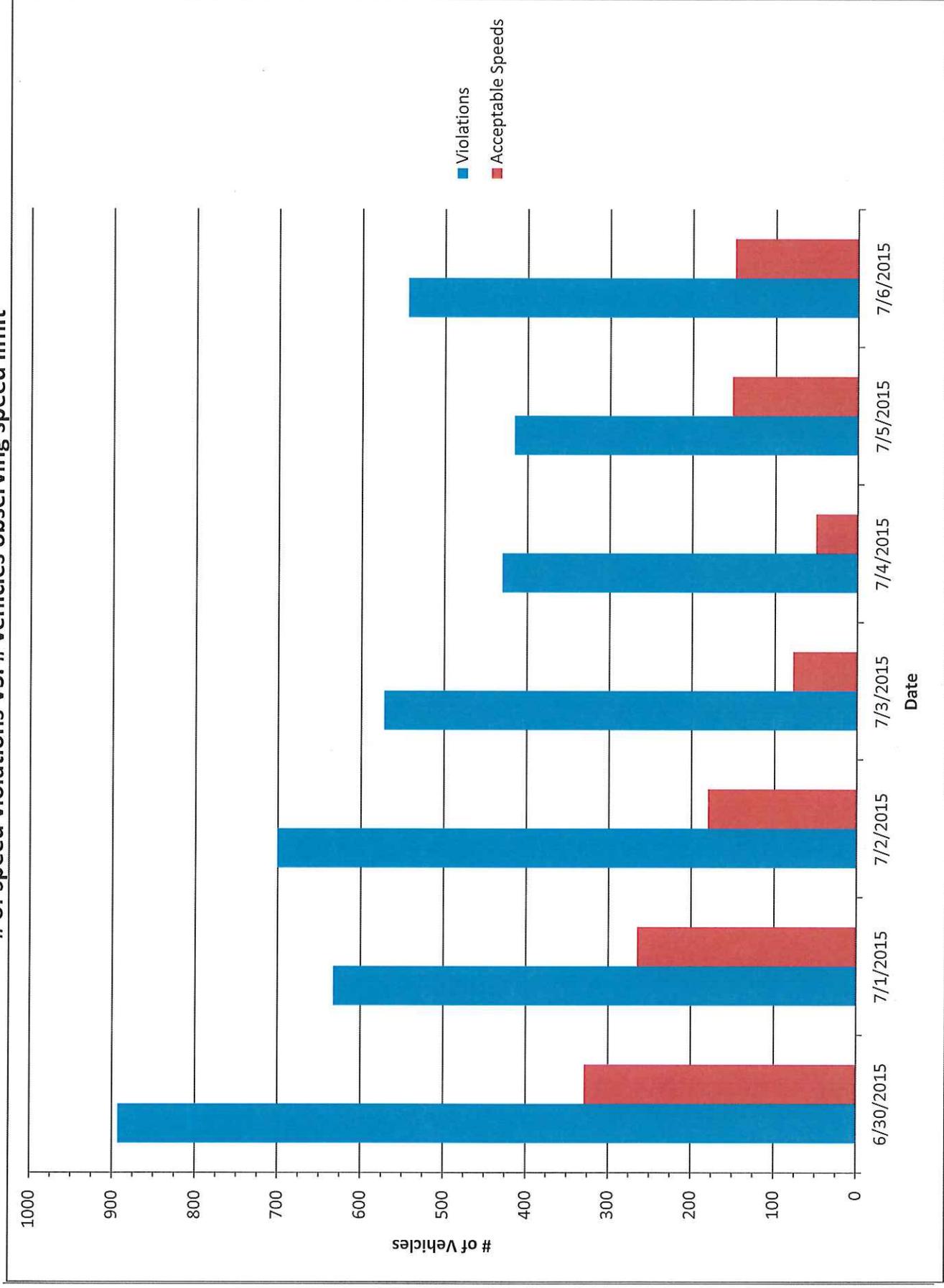
Tolerable Speed: 50 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
6/30/2015	1222	893	329	358	73%	48	75	22	53	51	58
7/1/2015	898	633	265	209	70%	47	73	12	61	51	58
7/2/2015	881	701	180	207	80%	49	67	18	49	53	58
7/3/2015	651	573	78	162	88%	51	68	13	55	53	59
7/4/2015	481	430	51	132	89%	52	68	31	37	53	59
7/5/2015	568	416	152	130	73%	44	66	5	61	51	58
7/6/2015	694	545	149	146	79%	48	70	5	65	51	58
Total	5395	4191	1204	1344							
Average	771	599	172	192	79%	48	70	15	55	52	58

*Note: Data collected on 7/7/15 combined with data on 6/30/15 to make one full day of data

** Results may have been influenced by Fourth of July holiday weekend

of speed violations VS. # vehicles observing speed limit



G37 EB into Crescent Site Pictures

(H.1.a)



Figure 1 G37 West of Crescent looking West bound, 55 mph



Figure 2 G37 West of Crescent looking East bound, 45 mph

G.1.2.b

Daily Data From Spot Speed Study

Date: 6/16/2015-7/7/2015

Location: G37 SB to Crescent

Data Recording Date: 6/23/2015

Time: 9:33AM

Site #: 1

Data Download Date: 6/30/2015

Time: 6:30 AM

Description: Data from 35MPH speed post at end of transition zone

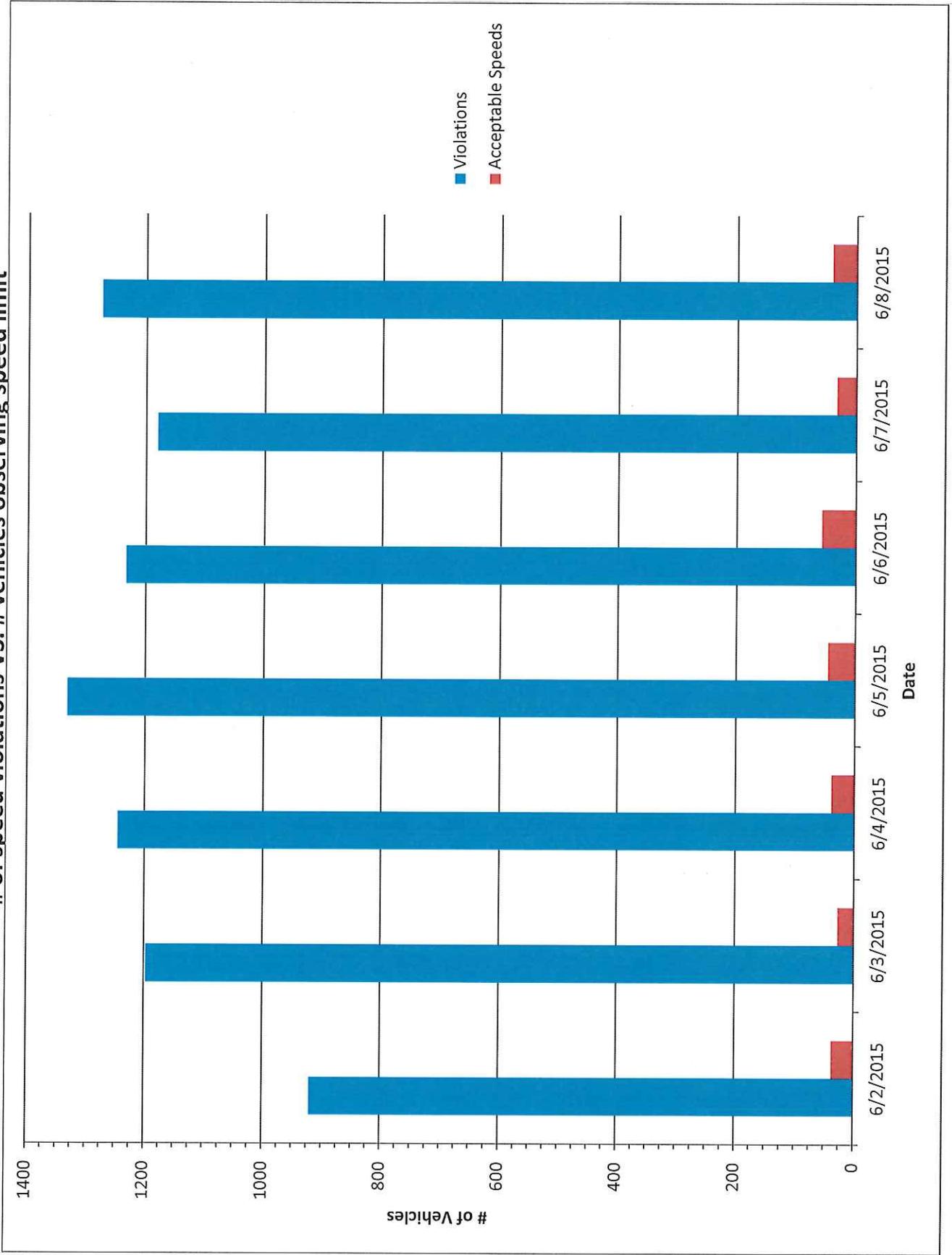
Posted Speed: 35 mph

Tolerable Speed: 40 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
6/23/2015	957	920	37	131	96%	46	78	12	66	47	55
6/24/2015	1224	1197	27	147	98%	46	68	6	62	47	55
6/25/2015	1284	1245	39	185	97%	46	67	9	58	47	55
6/26/2015	1378	1332	46	168	97%	46	67	9	58	47	55
6/27/2015	1290	1233	57	219	96%	45	71	12	59	46	55
6/28/2015	1214	1181	33	153	97%	46	67	17	50	47	55
6/29/2015	1316	1275	41	162	97%	46	73	14	59	47	55
Total	8663	8383	280	1165							
Average	1238	1198	40	166	97%	46	70	11	49	47	55

*Note: Data collected on 6/30/15 combined with data on 6/23/15 to make one full day of data

of speed violations VS. # vehicles observing speed limit



L20 SB into Crescent Site Pictures

(H.1.b)



Figure 3 L20 North of Crescent looking, North bound, 55 mph



Figure 4 L20 North of Crescent looking, South bound, 35 mph

G.1.2.c

Daily Data From Spot Speed Study

Date: 6/16/2015-7/7/2015

Location: L20 NB to Crescent

Data Recording Date: 6/16/2015

Time: 10:00 AM

Site #: 1

Data Download Date: 6/23/2015

Time: 8:05 AM

Description: Data from 35 MPH sign post at end of transition zone

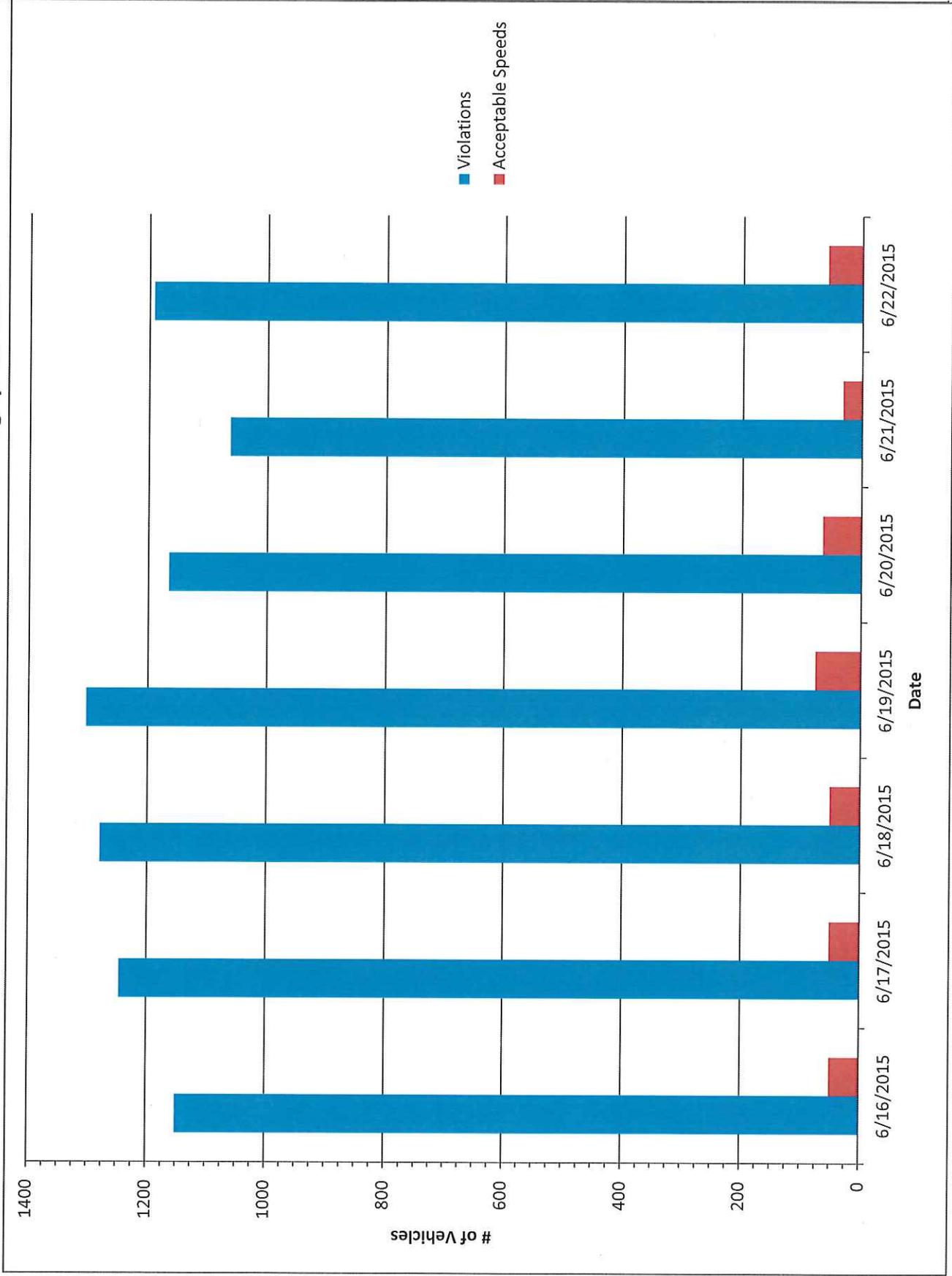
Posted Speed: 35 mph

Tolerable Speed: 40 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
6/16/2015	1201	1151	50	45	96%	48	67	12	55	50	57
6/17/2015	1297	1246	51	54	96%	48	71	5	66	50	57
6/18/2015	1330	1279	51	52	96%	48	67	5	62	50	58
6/19/2015	1380	1303	77	57	94%	47	74	5	69	51	58
6/20/2015	1230	1165	65	44	95%	49	84	5	79	50	57
6/21/2015	1095	1063	32	48	97%	48	68	9	59	50	57
6/22/2015	1250	1192	58	10	95%	49	65	5	60	50	57
Total	8783	8399	384	310		48					
Average	1255	1200	55	44	96%	48	71	7	64	50	57

*Note: Data collected on 6/23/15 combined with data on 6/16/15 to make one full day of data

L20 NB to Crescent # of speed violations VS. # vehicles observing speed limit



L20 NB into Crescent Site Pictures

(H.1.c)



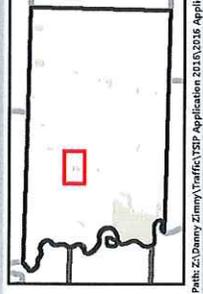
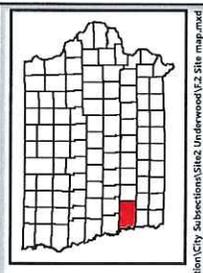
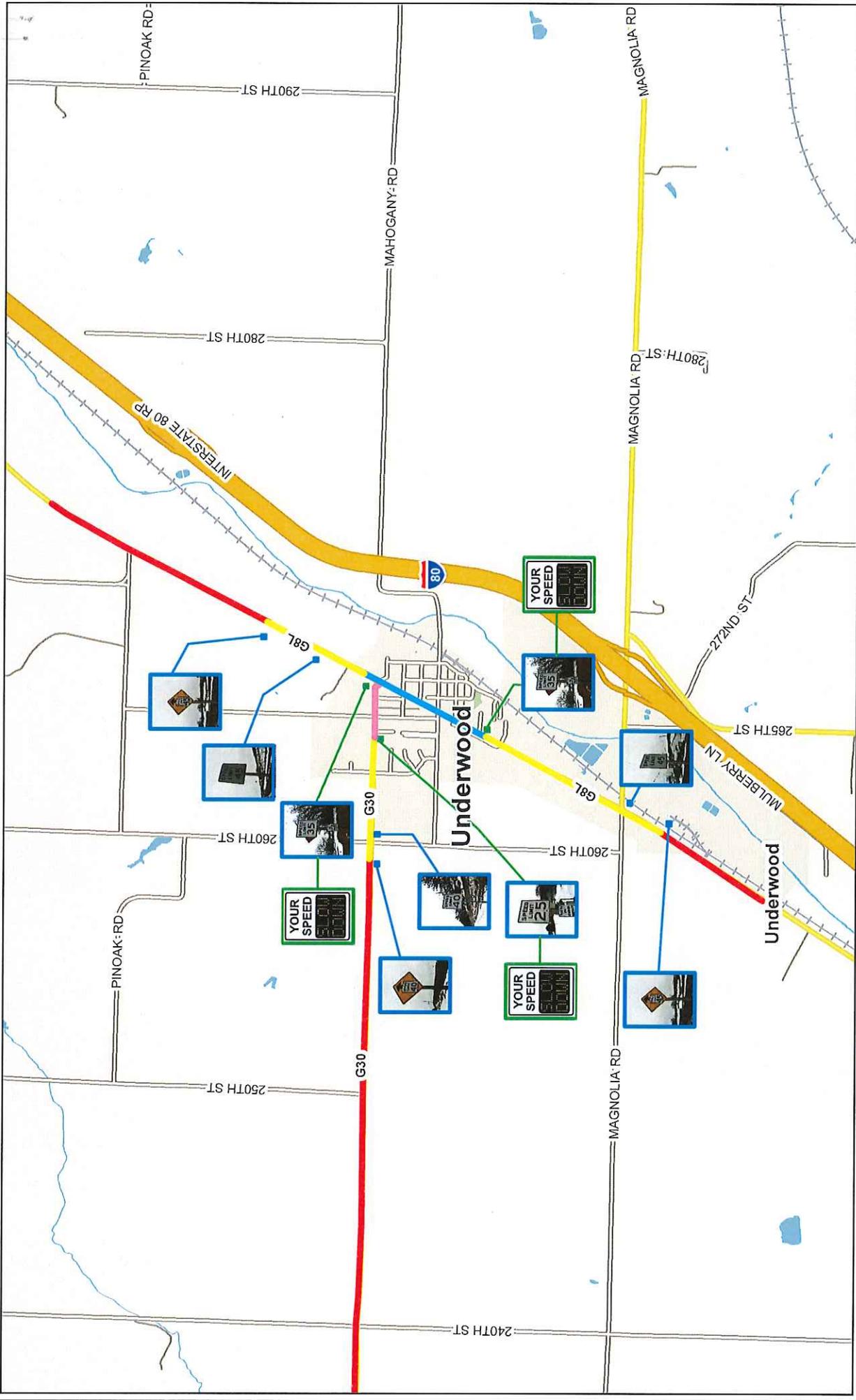
Figure 5 L20 South of Crescent looking, South bound, 50 mph



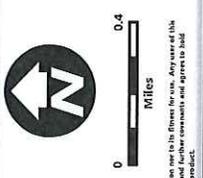
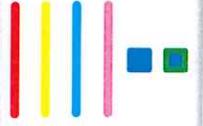
Figure 6 L20 South of Crescent looking North bound, 35 mph

Underwood Site Map

F.2



- █ Local High Speed Rural Road, 55 mph
- █ Transition Zone, 40-45 mph
- █ City Speed Limit, 35 mph
- █ School Zone, 25 mph
- █ Existing Sign
- █ Existing Sign with Proposed Driver Feedback



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 Council Bluffs, IA 51501
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 www.gis-pottcounty.com
 Map Published: 7/10/2015
 Aerial Photography:
 Source: Pottawatomie GIS



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G.2

Underwood Traffic Analysis

Population (2013): 932
 Farm to Market (FM) routes within city limits: G8L and G30
 Daily entering volume from FM routes: 3290
 Crashes on FM routes within city limits since 2004: 10 *Excludes Transition Zones*

G30 East Bound Into Underwood

Federal functional classification	Major Collector
Speed limit within city (school zone)	25 mph
Vehicles per day(7 day average)	335 VPD
Average number of speed violations per day	240
85th speed percentile of 7 day sample	43 mph
Length of defined transition zone	2167 feet
Speed reduction within transition zone	30 mph (55-25 mph)
Accidents in transition zone (2004-2014)	2 accidents
Largest variance in recorded speeds (max-min)	50 mph
Crash density in transition zone	0.49 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G8L North Bound Into Underwood

Federal functional classification	Major Collector
Speed limit within city	35 mph
Vehicles per day(7 day average)	1966 vpd
Average number of speed violations per day	1555
85th speed percentile of 7 day sample	48 mph
Length of defined transition zone	3105 feet
Speed reduction within transition zone	20 mph (55-35 mph)
Accidents in transition zone (2004-2014)	22 accidents (1 major)
Largest variance in recorded speeds (max-min)	56 mph
Crash density in transition zone	3.74 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G8L South Bound Into Underwood

Federal functional classification	Major Collector
Speed limit within city	35 mph
Vehicles per day(7 day average)	989 VPD
Average number of speed violations per day	873
85th speed percentile of 7 day sample	50 mph
Length of defined transition zone	1300 feet
Speed reduction within transition zone	20 mph (55-35 mph)
Accidents in transition zone (2004-2014)	No accidents on record
Largest variance in recorded speeds (max-min)	54 mph
Crash density in transition zone	0 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.2.2.a

Daily Data From Spot Speed Study

Date: 5/26/2015-6/16/2015

Location: G30 EB to Underwood

Data Recording Date: 6/2/2015

Time: 9:54AM

Site #: 2

Data Download Date: 6/9/2015

Time: 7:35 AM

Description: Data from 25MPH speed post at end of transition zone

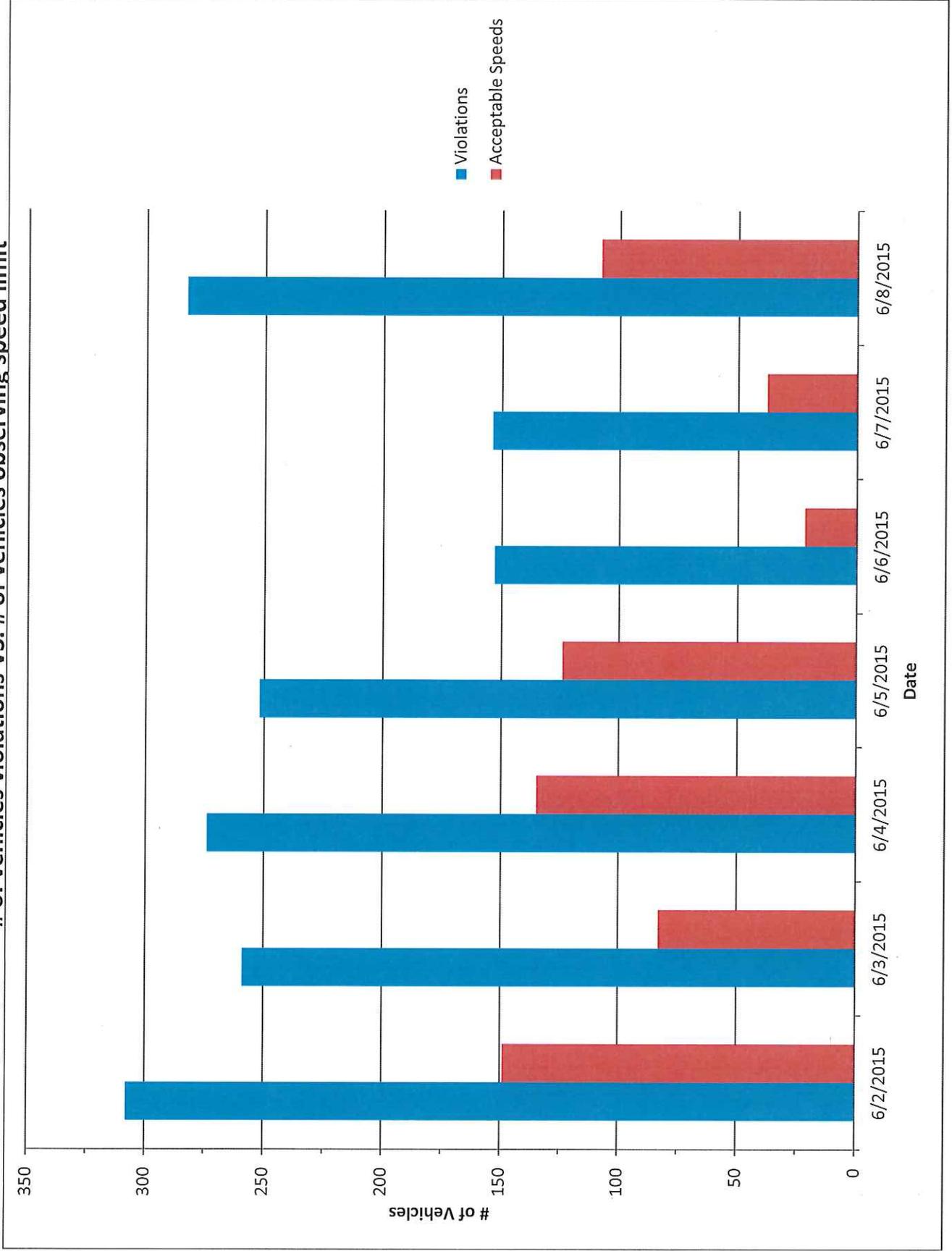
Posted Speed: 25 mph

Tolerable Speed: 30 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
6/2/2015	457	308	149	73	67%	33	61	5	56	33	45
6/3/2015	342	259	83	63	76%	33	56	9	47	34	45
6/4/2015	409	274	135	89	67%	29	59	9	50	29	39
6/5/2015	376	252	124	56	67%	31	55	6	49	32	44
6/6/2015	175	153	22	20	87%	35	56	5	51	36	46
6/7/2015	192	154	38	32	80%	30	60	5	55	31	39
6/8/2015	391	283	108	79	72%	30	53	7	46	31	41
Total	2342	1683	659	412							
Average	335	240	94	59	74%	32	57	7	50	32	43

*Note: Data collected on 6/9/15 combined with data on 6/2/15 to make one full day of data

G30 EB to Underwood
of vehicles violations VS. # of vehicles observing speed limit



G30 EB into Underwood Site Pictures

(H.2.a)



Figure 7 G30 West of Underwood looking West bound, 55 mph zone



Figure 8 G30 West of Underwood looking East bound, 25 mph zone

G.2.2.b

Daily Data From Spot Speed Study

Date: 5/26/2015-6/16/2015

Location: G8L NB to Underwood

Data Recording Date: 6/9/2015

Time: 10:52 AM

Site #: 2

Data Download Date: 6/16/2015

Time: 7:51 AM

Description: Data from 35 mph speed post at end of transition zone

Posted Speed: 35 mph

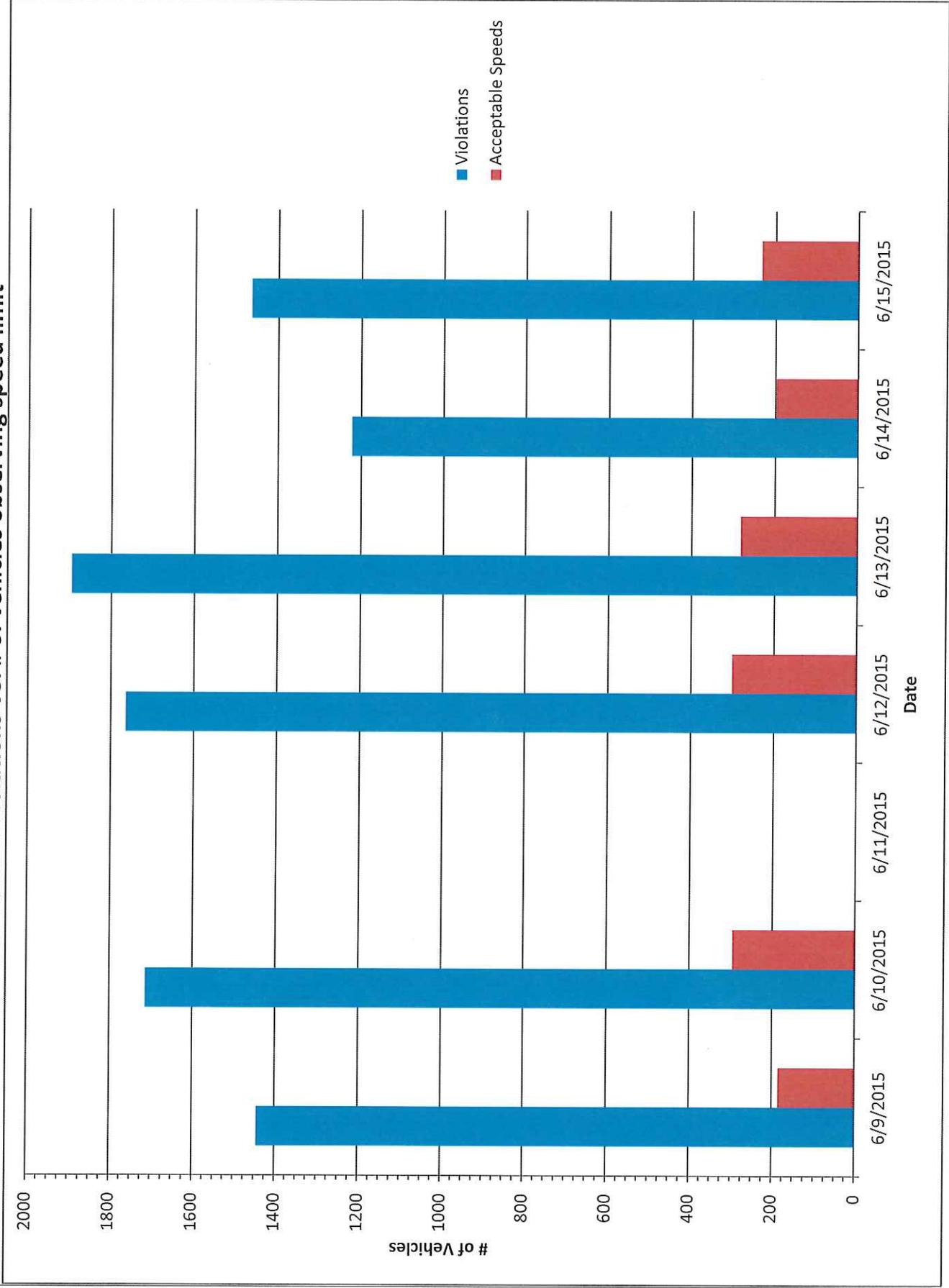
Tolerable Speed: 40 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
6/9/2015	1629	1444	185	531	89%	40	63	21	42	42	49
6/10/2015	2009	1713	296	735	85%	40	60	5	55	42	48
6/11/2015	2762	1380	1382	548	50%	26	64	5	59	33	46
6/12/2015	2065	1764	301	726	85%	40	60	5	55	42	48
6/13/2015	2178	1896	282	749	87%	41	62	5	57	42	48
6/14/2015	1420	1222	198	473	86%	40	72	5	67	43	49
6/15/2015	1698	1464	234	605	86%	40	62	5	57	42	48
Total	13761	10883	2878	4367							
Average	1966	1555	411	624	81%	38	63	7	56	41	48

*Note: Data collected on 6/16/15 combined with data on 6/9/15 to make one full day of data

** Construction occurred within the study area on 6/11/2015 producing nonrepresentative results

of vehicles violations VS. # of vehicles observing speed limit



G8L NB into Underwood Site Pictures

(H.2.b)



Figure 9 G8L South of Underwood looking South bound, 55 mph zone



Figure 10 G8L South of Underwood looking North bound, 35 mph zone

G.2.c

Daily Data From Spot Speed Study

Date: 5/26/2015-6/16/2015

Location: G8L SB to Underwood

Data Recording Date: 5/26/2015

Time: 9:00 AM

Site #: 2

Data Download Date: 6/2/2015

Time: 8:49 AM

Description: Data from 35 MPH sign post at end of transition zone

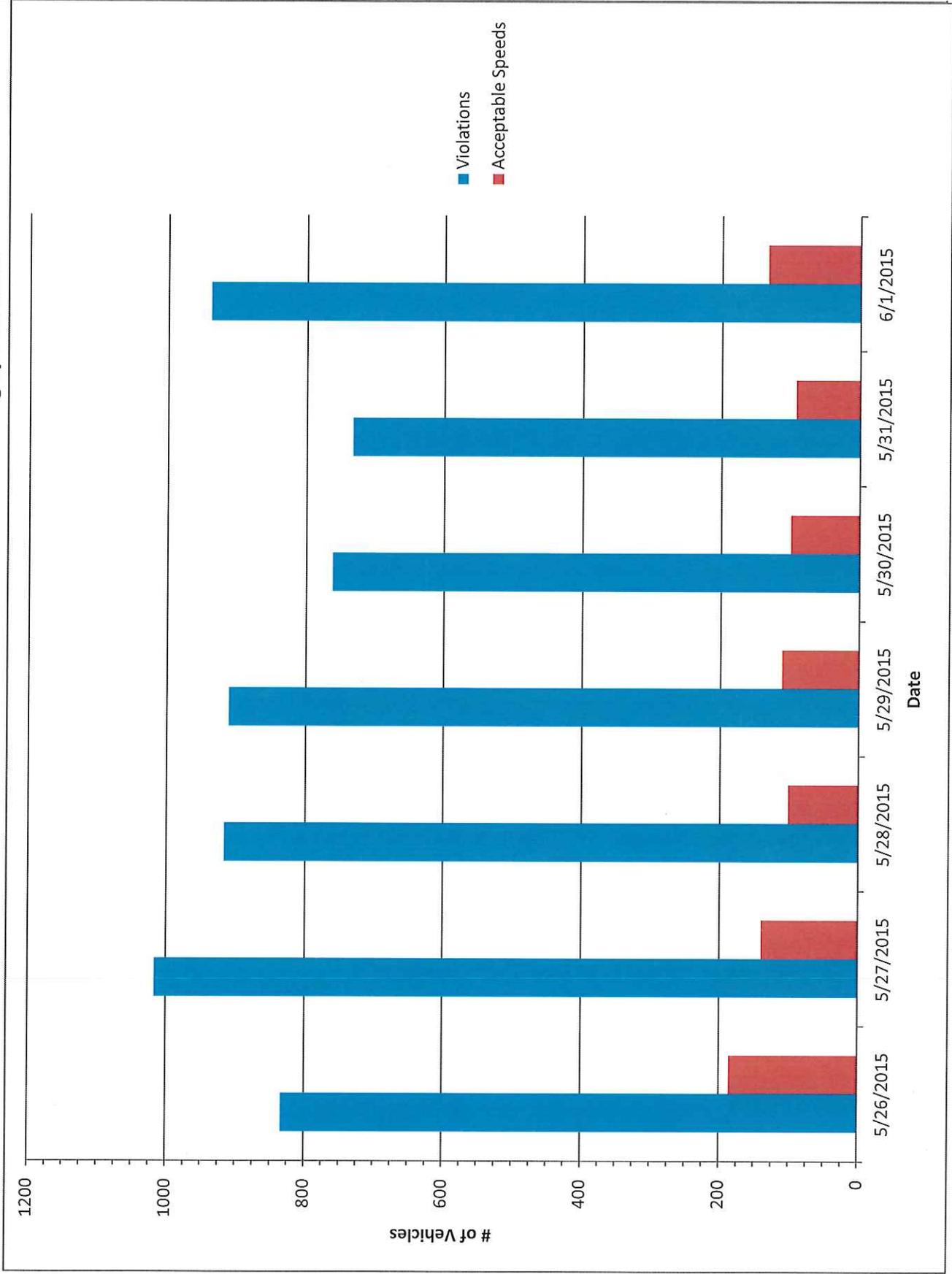
Posted Speed: 35 mph

Tolerable Speed: 40 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
5/26/2015	965	834	186	244	86%	42	63	5	58	44	50
5/27/2015	1157	1017	140	323	88%	42	70	12	58	44	50
5/28/2015	1019	917	102	281	90%	42	59	11	48	44	49
5/29/2015	1023	911	112	293	89%	37	65	6	59	42	49
5/30/2015	862	762	100	196	88%	43	67	17	50	44	50
5/31/2015	826	733	93	257	89%	42	73	12	61	43	50
6/1/2015	1073	939	134	308	88%	41	58	12	46	43	49
Total	6925	6113	867	1902							
Average	989	873	124	272	88%	41	65	11	54	43	50

*Note: Data collected on 6/2/15 combined with data on 5/26/15 to make one full day of data

G8L SB to Underwood # of vehicles violations VS. # of vehicles observing speed limit



G8L SB to Underwood Site Pictures

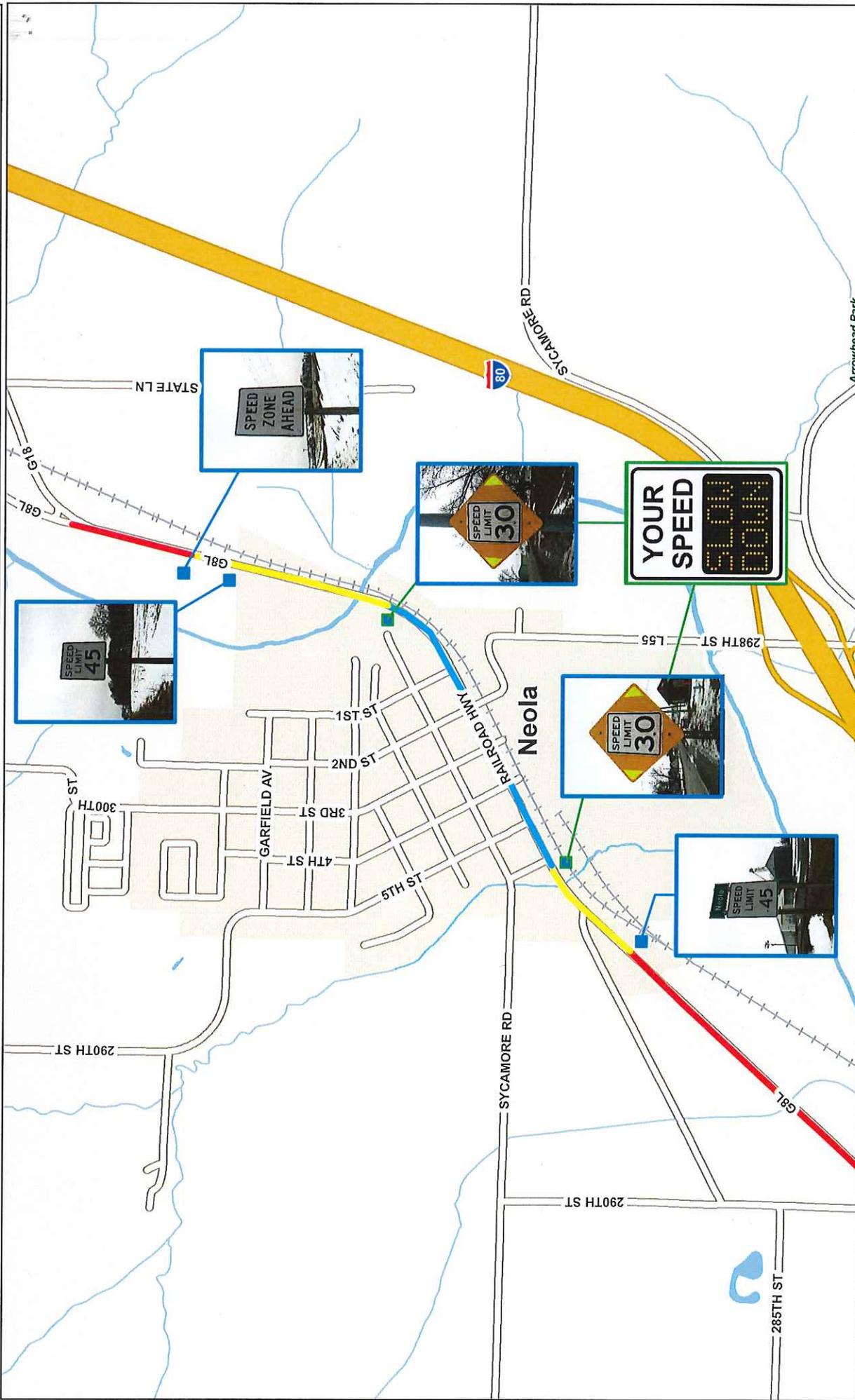
(H.2.c)



Figure 11 G8L North of Underwood looking North bound, 55 mph zone



Figure 12 G8L North of Underwood looking South bound, 35 mph zone

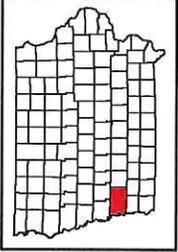
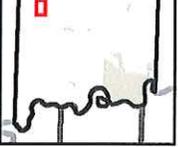


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 Map Published: 7/30/2015
 Source: Pottawatomie GIS



- High Speed Local Road, 55 mph
- Transition Zone, 45 mph
- City Speed Limit, 30 mph
- Existing Sign
- Proposed Sign

YOUR SPEED
 30



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G.3

Neola Traffic Analysis

Population (2013): 852
 Farm to Market (FM) routes within city limits: G8L
 Daily entering volume from FM routes: 2409 Vehicle per day average
 Crashes on FM routes within city limits since 2004: 14 *Excludes Transition Zones*

G8L South Bound Into Neola

Federal functional classification	Major Collector
Posted speed limit in city	30 mph
Vehicles per day (7 day average)	1484 VPD
Average number of speed violations per day	1131
85th speed percentile of 7 day sample	45 MPH
Length of speed transition zone	1958 feet
Speed reduction within transition zone	25 mph (55-30 mph)
Accidents in transition zone (2004-2014)	1 accident
Largest variance in recorded speeds (max-min)	54 mph
Crash density in transition zone	0.27 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G8L North Bound Into Neola

Federal functional classification	Major Collector
Posted speed limit in city	30 mph
Vehicles per day (7 day average)	925 VPD
Average number of speed violations per day	774
85th speed percentile of 7 day sample	46 mph
Length of speed transition zone	1251 feet
Speed reduction within transition zone	25 mph (55-30 mph)
Accidents in transition zone (2004-2014)	No accidents on record
Largest variance in recorded speeds (max-min)	46 mph
Crash density in transition zone	0 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.3.a

Daily Data From Spot Speed Study

Date: 5/12-26/2015

Location: G8L SB to Neola

Data Recording Date: 5/12/2015

Time: 9:55 AM

Site #: 3

Data Download Date: 5/19/2015

Time: 8:12 AM

Description: Data recorded from post inside city limits

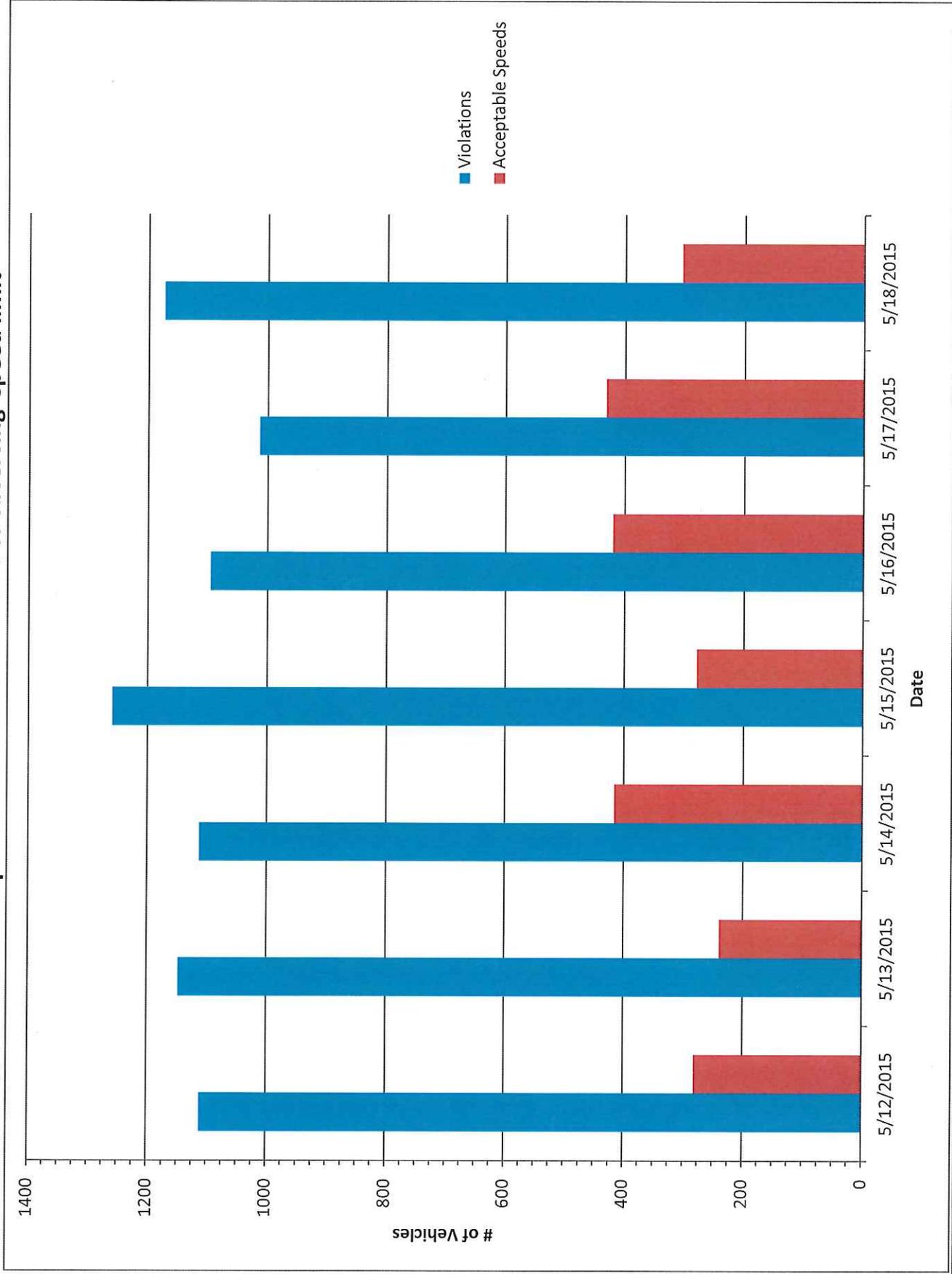
Posted Speed: 30 mph

Tolerable Speed: 35 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
5/12/2015	1393	1112	281	343	80%	34	58	5	53	37	46
5/13/2015	1487	1148	239	403	77%	33	53	5	48	36	44
5/14/2015	1529	1113	416	388	73%	31	53	5	48	35	44
5/15/2015	1537	1259	278	388	82%	34	65	5	60	36	45
5/16/2015	1516	1096	420	347	72%	31	59	5	54	35	44
5/17/2015	1446	1014	432	319	70%	30	50	5	45	35	44
5/18/2015	1479	1174	305	408	79%	33	73	5	68	36	45
Total	10387	7916	2371	2596							
Average	1484	1131	339	371	76%	32	59	5	54	36	45

*Note: Data collected on 5/19/15 combined with data on 5/12/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G8L SB to Neola Site Pictures

(H.3.a)



Figure 13 G8L North of Neola looking North bound, 55 mph zone



Figure 14 G8L North of Neola looking South bound, 30 mph zone

G.3.b

Daily Data From Spot Speed Study

Date: 5/12-26/2015

Location: G8L NB to Neola

Data Recording Date: 5/19/2015

Time: 9:22 AM

Site #: 3

Data Download Date: 5/26/2015

Time: 8:45 AM

Description: Data recorded from 30 mph speed post at end of transition zone

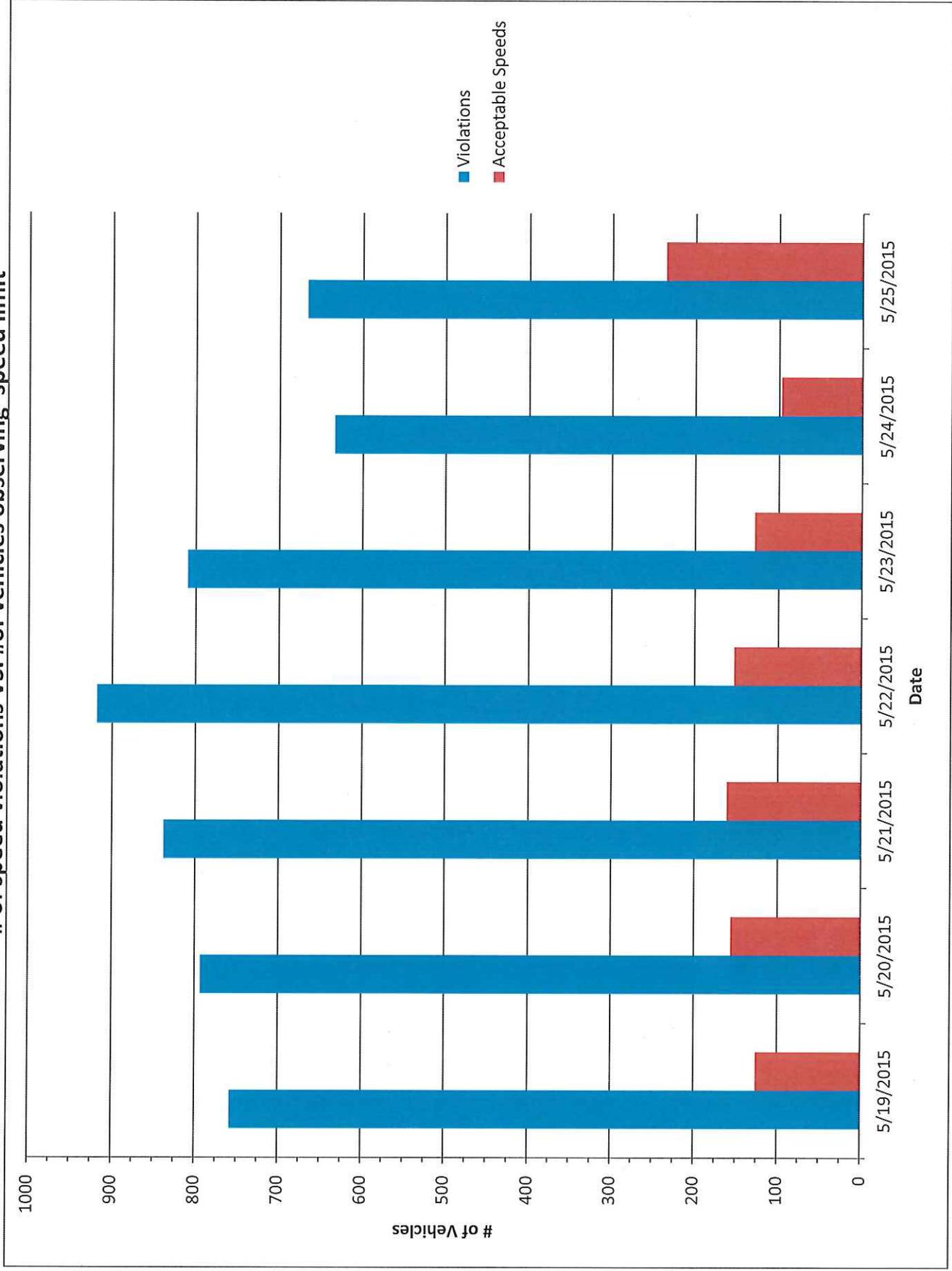
Posted Speed: 30 mph

Tolerable Speed: 35 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
5/19/2015	884	758	126	190	86%	34	62	12	50	37	45
5/20/2015	949	793	156	227	84%	36	55	7	48	37	46
5/21/2015	999	838	161	194	84%	36	57	10	47	37	46
5/22/2015	1071	918	153	236	86%	36	52	6	46	37	46
5/23/2015	939	810	129	178	86%	37	57	10	47	37	46
5/24/2015	731	634	97	174	87%	36	54	17	37	37	46
5/25/2015	903	667	236	174	74%	33	57	5	52	36	45
Total	6476	5418	1058	1373							
Average	925	774	151	196	84%	35	56	10	46	37	46

*Note: Data collected on 5/26/15 combined with data on 5/19/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G8L NB to Neola Site Pictures

(H.3.b)



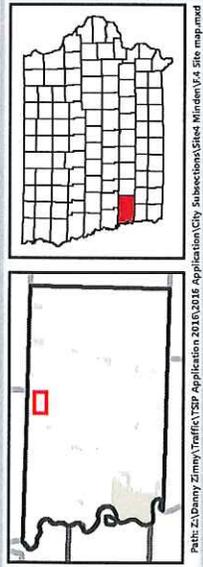
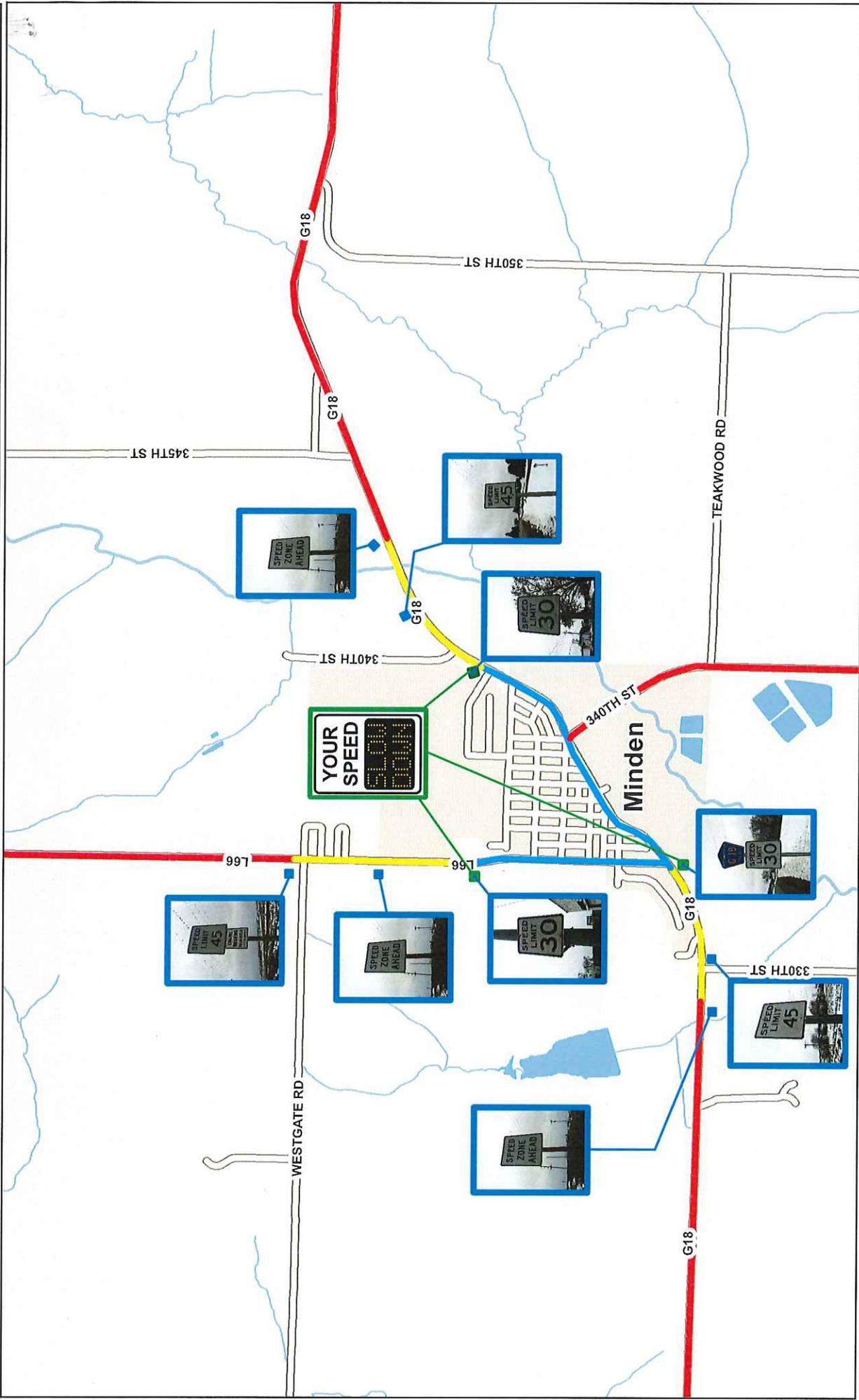
Figure 15 G8L South of Neola looking South bound, 55 mph zone



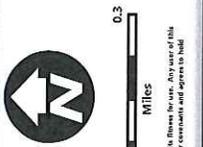
Figure 16 G8L South of Neola looking North bound, 30 mph zone

Minden Site Map

F.4



- Local High Speed Rural Road, 55mph
- Speed Transition Zone, 45 mph
- City Speed Limit, 30 mph
- Existing Sign
- Proposed Sign



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 Source: PotNet/Trimble GIS

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G.4

Minden Traffic Summary

Population (2013): 589
 Farm to Market (FM) routes within city limits: G18 and L66
 Avg. daily entering volume from FM routes: 1668 *L66 NB into city limits not included*
 Crashes on FM routes within city limits since 2004: 6 (1 fatal, 1 major) *Excludes Transition Zones*

L66 South Bound Into City Limit

Federal functional classification	Major Collector
Posted speed limit in city	30 mph
Vehicles per day (7 day average)	724
Average number of speed violations per day	574
85th speed percentile of 7 day sample	50 mph
Length of defined transition zone	2665 feet
Posted speed reduction within transition zone	25 mph (55-30 mph)
Largest variance in recorded speeds (max-min)	60 mph
Accidents in transition zone (2004-2014)	9 accidents
Crash density in transition zone	1.78 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G18 East Bound Into City Limit

Federal functional classification	Major Collector
Posted speed limit in city	30 mph
Vehicles per day (7 day average)	524
Average number of speed violations per day	390
85th speed percentile of 7 day sample	58 mph
Length of defined transition zone	1725 feet
Posted speed reduction within transition zone	25 mph (55-30 mph)
Largest variance in recorded speeds (max-min)	66
Accidents in transition zone (2004-2014)	4 accidents
Crash density in transition zone	1.22 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G18 West Bound Into City Limit

Federal functional classification	Major Collector
Posted speed limit in city	30 mph
Vehicles per day (7 day average)	420
Average number of speed violations per day	129
85th speed percentile of 7 day sample	35
Length of defined transition zone	2072 feet
Posted speed reduction within transition zone	25 mph (55-30 mph)
Largest variance in recorded speeds (max-min)	37 mph
Accidents in transition zone (2004-2014)	2 accidents
Crash density in transition zone	0.51 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.4.a

Daily Data From Spot Speed Study

Date: 4/21/2015-5/12/2015

Location: L66 SB into Minden

Data Recording Date: 4/28/2015

Time: 10:10 AM

Site #: 4

Data Download Date: 5/5/2015

Time: 8:45 AM

Description: Data collected from first 35 mph post at end of transition zone

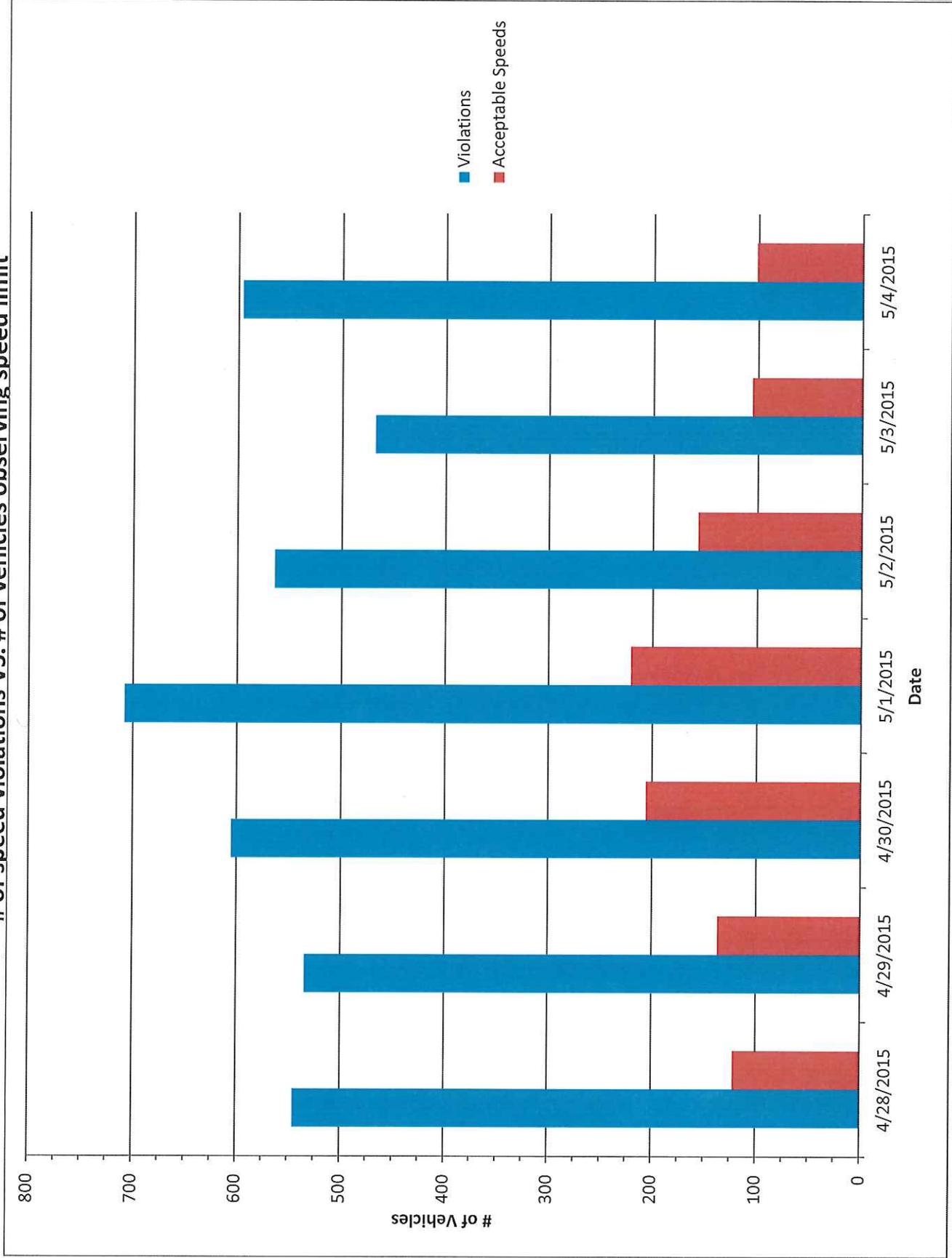
Posted Speed: 30 mph

Tolerable Speed: 35 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
4/28/2015	667	545	122	144	82%	41	68	5	63	43	50
4/29/2015	671	534	137	148	80%	41	65	5	60	43	51
4/30/2015	811	605	206	188	75%	39	62	5	57	42	49
5/1/2015	929	708	221	213	76%	39	63	5	58	42	49
5/2/2015	721	564	157	168	78%	40	67	5	62	43	50
5/3/2015	574	468	106	144	82%	40	60	6	54	43	49
5/4/2015	698	596	102	134	85%	41	73	8	65	44	50
Total	5071	4020	1051	1139							
Average	724	574	150	163	80%	40	65	6	60	43	50

*Note: Data collected on 5/5/15 combined with data on 4/28/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



L66 SB to Minden Site Pictures

(H.4.a)



Figure 17 L66 North of Minden looking North bound, 55 mph zone



Figure 18 L66 North of Minden looking South bound, 30 mph zone

G.4.b

Daily Data From Spot Speed Study

Date: 4/21/2015-5/12/2015

Location: G18 EB into Minden

Data Recording Date: 5/5/2015

Time: 9:45 AM

Site #: 4

Data Download Date: 5/12/2015

Time: 8:40 AM

Description: Data from 45 mph speed post at start of transition zone

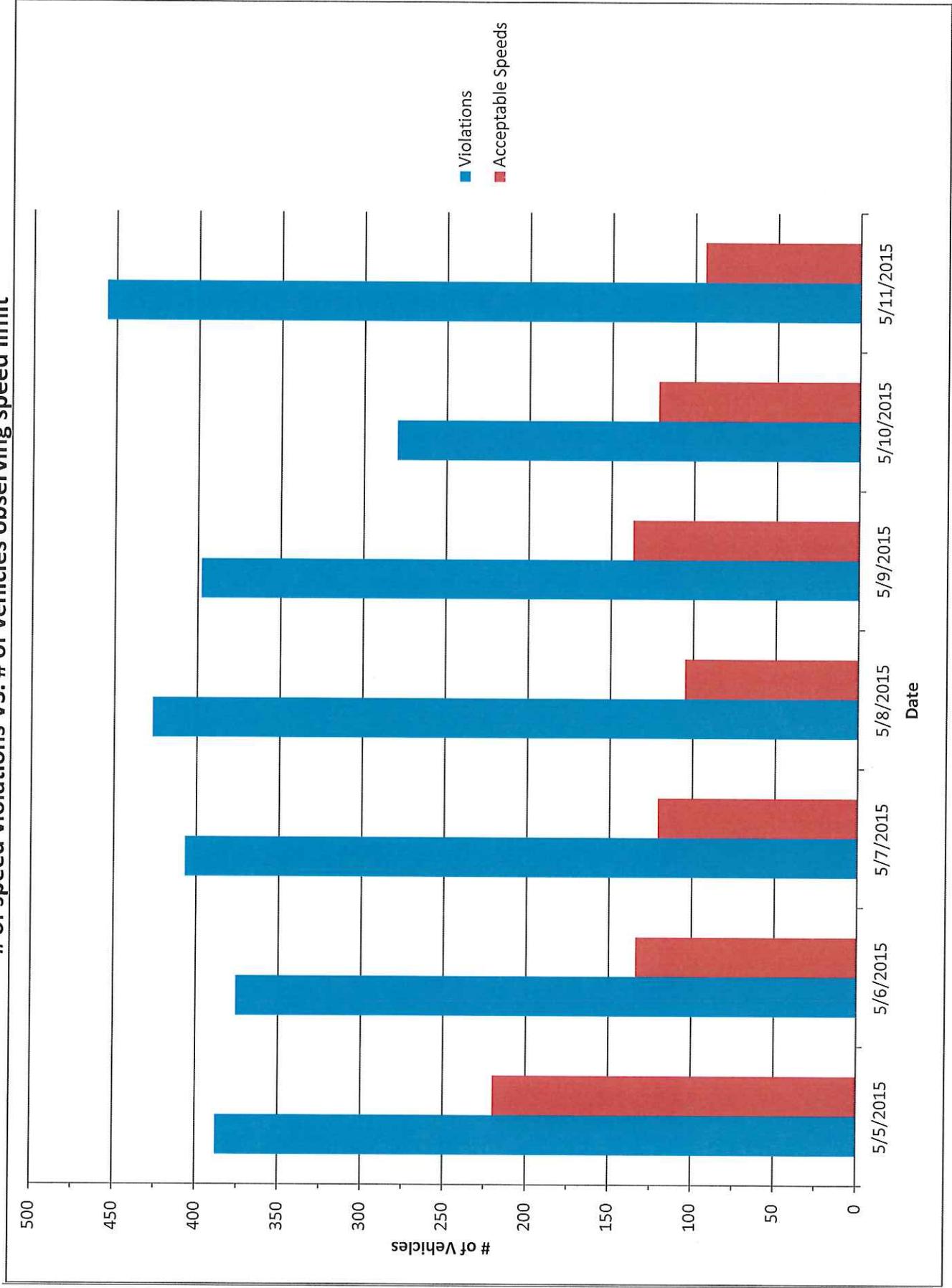
Posted Speed: 45 mph

Tolerable Speed: 50 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
5/5/2015	608	388	220	120	64%	48	71	5	66	51	58
5/6/2015	510	376	134	114	74%	46	71	5	66	52	58
5/7/2015	528	407	121	87	77%	47	78	5	73	49	58
5/8/2015	532	427	105	109	80%	40	68	5	63	53	59
5/9/2015	535	398	137	130	74%	48	73	5	68	51	58
5/10/2015	402	280	122	81	70%	49	68	5	63	51	58
5/11/2015	550	456	94	108	83%	45	69	5	64	54	60
Total	3665	2732	933	749							
Average	524	390	133	107	75%	46	71	5	66	52	58

*Note: Data collected on 5/12/15 combined with data on 5/5/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G18 EB to Minden Site Pictures

(H.4.b)



Figure 19 G18 West of Minden looking West bound, 55 mph zone



Figure 20 G18 West of Minden looking East bound, 30 mph zone

G.4.c

Daily Data From Spot Speed Study

Date: 4/21/2015-5/12/2015

Location: G18 WB into Minden

Data Recording Date: 4/21/2015

Time: 9:50 AM

Site #: 4

Data Download Date: 4/28/2015

Time: 8:30 AM

Description: Data from sign post within city limits

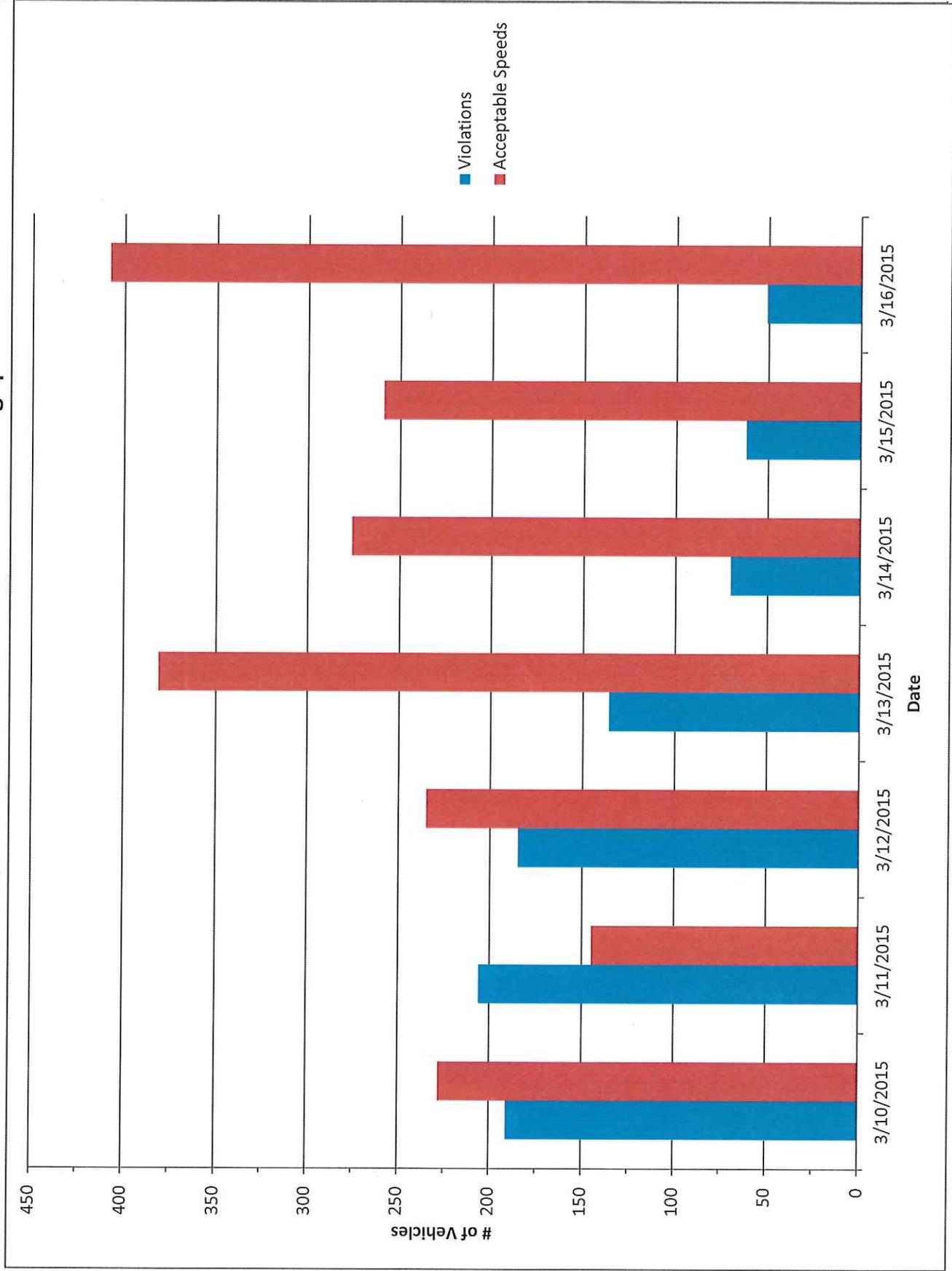
Posted Speed: 30 mph

Tolerable Speed: 35 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
4/21/2015	419	191	228	140	46%	24	42	6	36	29	35
4/22/2015	458	206	252	145	45%	24	45	9	36	26	32
4/23/2015	420	185	235	41	44%	26	48	5	43	28	35
4/24/2015	517	136	381	107	26%	25	42	5	37	27	33
4/25/2015	346	70	276	61	20%	28	45	7	38	31	38
4/26/2015	321	62	259	56	19%	27	43	9	34	30	35
4/27/2015	459	51	408	45	11%	28	45	8	37	30	38
Total	2940	901	2039	595							
Average	420	129	291	85	30%	26	44	7	37	29	35

*Note: Data collected on 4/21/15 combined with data on 4/28/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G18 WB to Minden Site Pictures

(H.4.c)



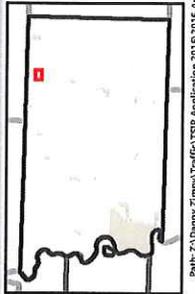
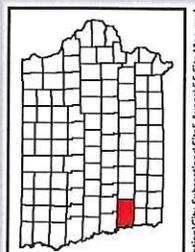
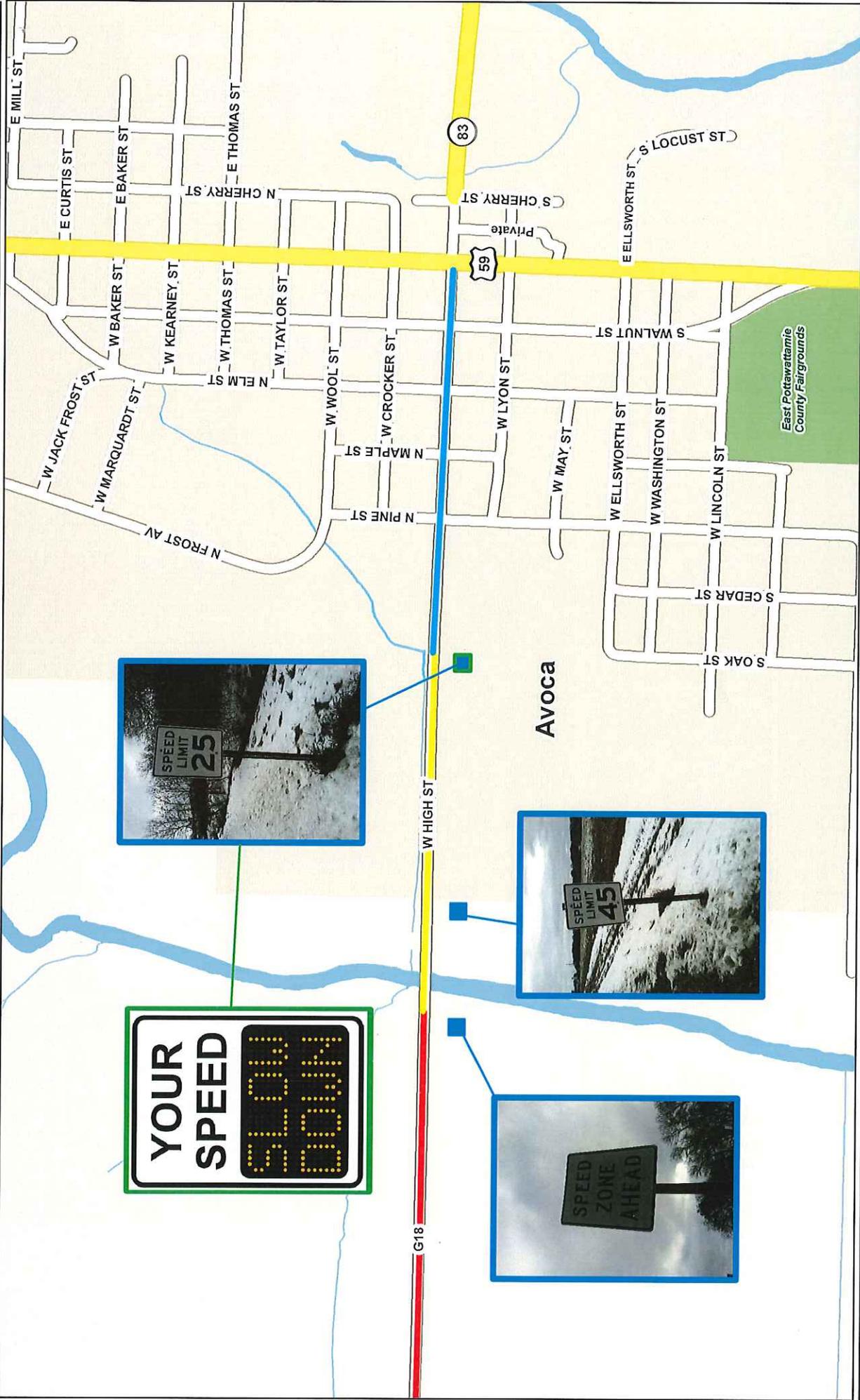
Figure 21 G18 East of Minden looking East bound, 55 mph zone



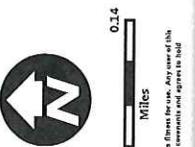
Figure 22 G18 East of Minden looking West bound, 30 mph zone

Avoca Site Map

F.5



- Local High Speed Rural Road, 55 mph
- Speed Transition Zone, 45 mph
- City Speed Limit, 25 mph
- Existing Sign
- Existing Sign with Proposed Driver Feedback



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 Map Published: 7/10/2015
 Aerial Photography:
 Source: Pottawattamie GIS



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G.5

Avoca Traffic Analysis

Population (2013)	1497	
Farm to Market (FM) routes within city limits	G18	
Daily entering volume from FM routes	498	
Crashes on FM routes within city limits since 2004	20	<i>Excludes transition zone Includes intersection with I83 and I59</i>

G18 East Bound Into Avoca

Federal functional classification	Major Collector
Posted speed limit in city	25 mph
Vehicles per day (7 day average)	498 VPD
Average number of speed violations per day	415
85th speed percentile of 7 day sample	60 mph
Length of defined transition zone	2359 feet
Posted speed reduction within transition zone	30 mph (55-25 mph)
Largest variance in recorded speeds (max-min)	55 mph
Accidents in transition zone (2004-2014)	11 accidents, 1 major
Crash density in transition zone	2.46 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.5.a

Daily Data From Spot Speed Study

Date: 4/7-14/2015

Location: G18 EB to Avoca

Data Recording Date: 4/7/2015

Time: 9:20 AM

Site #: 5

Data Download Date: 4/14/2015

Time: 8:30 AM

Description: Data collected from 45 mph post at start of transition zone

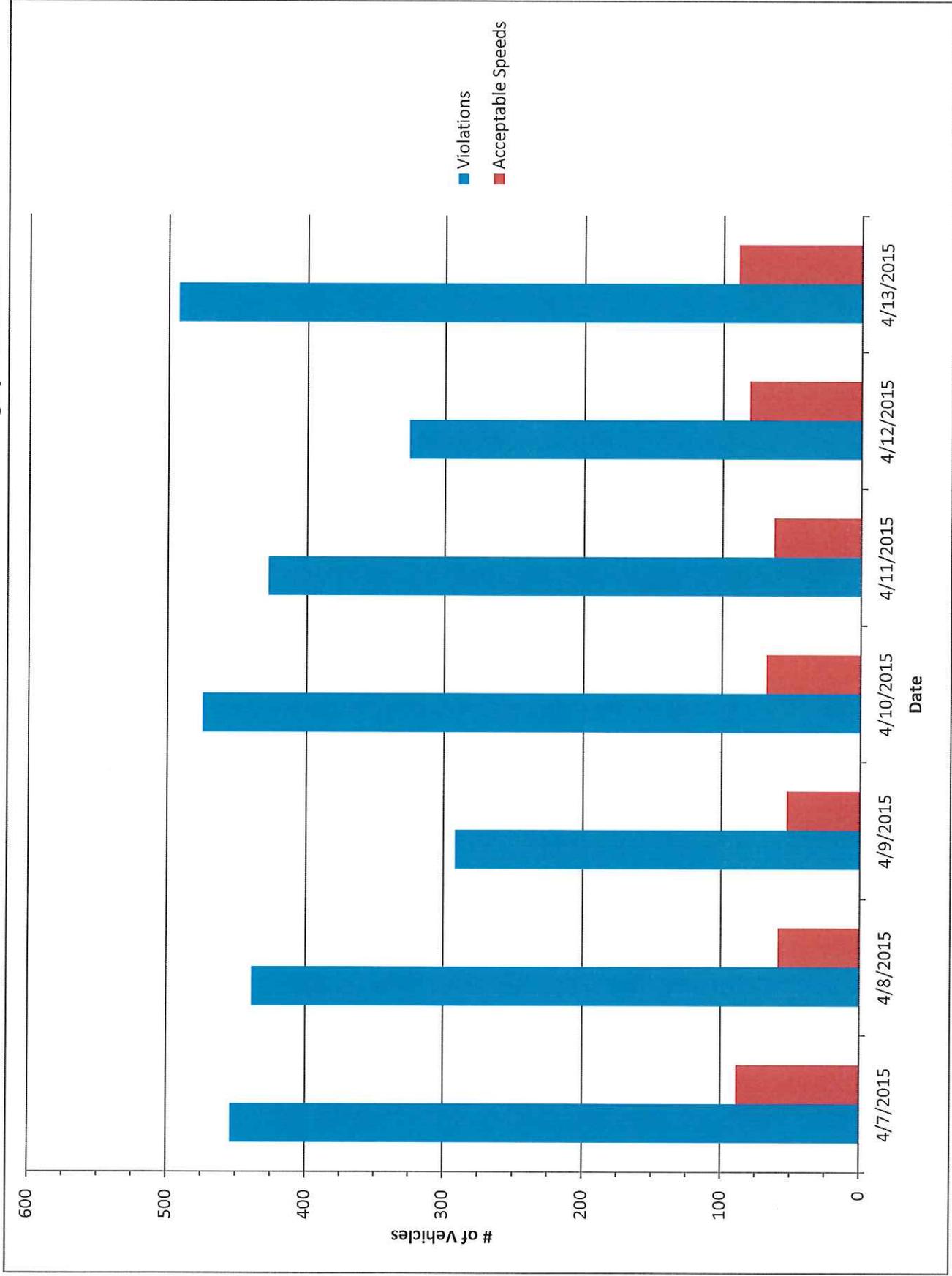
Posted Speed: 45 mph

Tolerable Speed: 50 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Range	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
4/7/2015	554	454	89	95	82%	48	91	33	58	53	60
4/8/2015	498	439	59	92	88%	52	80	27	53	54	60
4/9/2015	408	292	53	95	72%	51	71	30	41	53	60
4/10/2015	543	475	68	107	87%	52	75	25	50	54	60
4/11/2015	491	428	63	94	87%	52	71	21	50	54	59
4/12/2015	407	326	81	106	80%	47	75	19	56	50	60
4/13/2015	582	493	89	97	85%	52	85	11	74	54	60
Total	3483	2907	502	686							
Average	498	415	72	98	99.9	51	78	24	55	53	60

*Note: Data collected on 4/14/15 combined with data on 4/7/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limits



G18 EB to Avoca Site Pictures

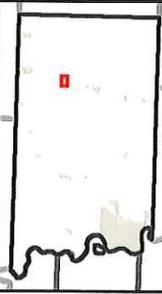
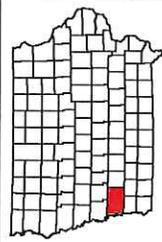
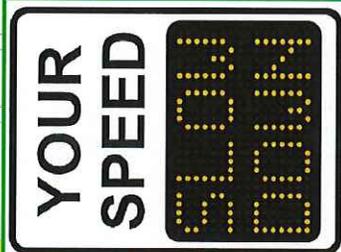
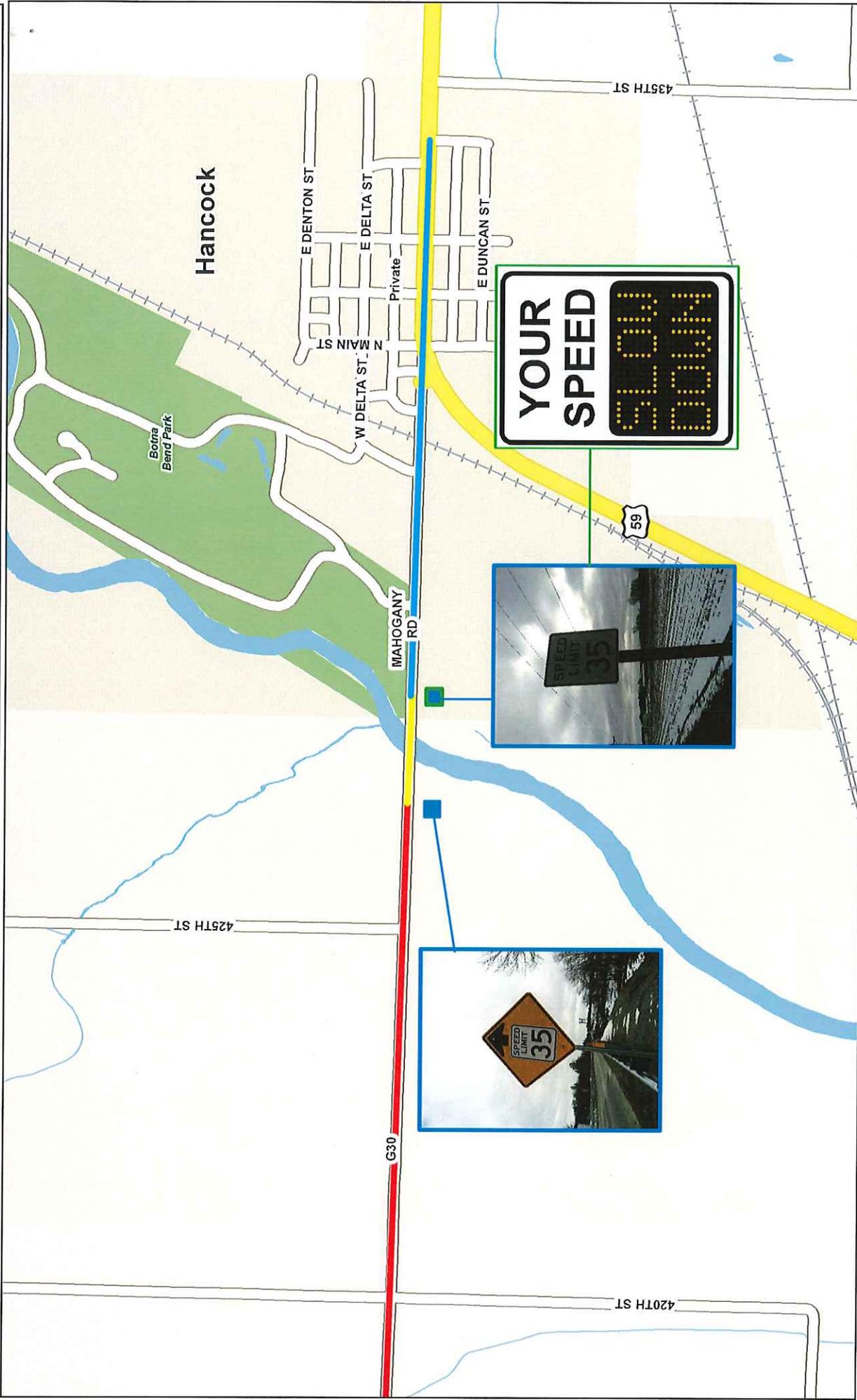
(H.5.a)



Figure 23 G18 West of Avoca looking West, 45 mph zone



Figure 24 G18 West of Avoca looking East, 25 mph city speed limit



- Local High Speed Rural Road, 55 mph
- Transition Speed Zone, 35 mph
- City Speed Limit, 35 mph
- Existing Sign
- Existing Sign with Proposed Driver Feedback



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 Map Published: 7/10/2015
 Aerial Photography:
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G.6

Hancock Traffic Summary

Population (2013): 194
 Farm to Market (FM) routes within city limits: G30
 Daily entering volume from FM routes: 218 Vehicle per day average
 Crashes on FM route within city limits since 2004: 0 *Excluding Transition Zone*

L55 South Bound Into Treynor

Federal functional classification	Major Collector
Posted speed limit in city	35 mph
Vehicles per day (7 day average)	218
Average number of speed violations per day	189
85th speed percentile of 7 day sample	43 mph
Length of defined transition zone	810 feet
Posted speed reduction within transition zone	20 mph (55-35 mph)
Largest variance in recorded speeds (max-min)	48 mph
Accidents in transition zone (2004-2014)	0 accidents
Crash density in transition zone	0 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.6.a

Daily Data From Spot Speed Study

Date: 3/31/2015- 4/7/2015

Location: G30 EB into Hancock

Data Recording Date: 3/31/2015

Time: 9:45AM

Site #: 6

Data Download Date: 4/7/2015

Time: 8:00 AM

Description: Data from first Speed Posting within City Limits

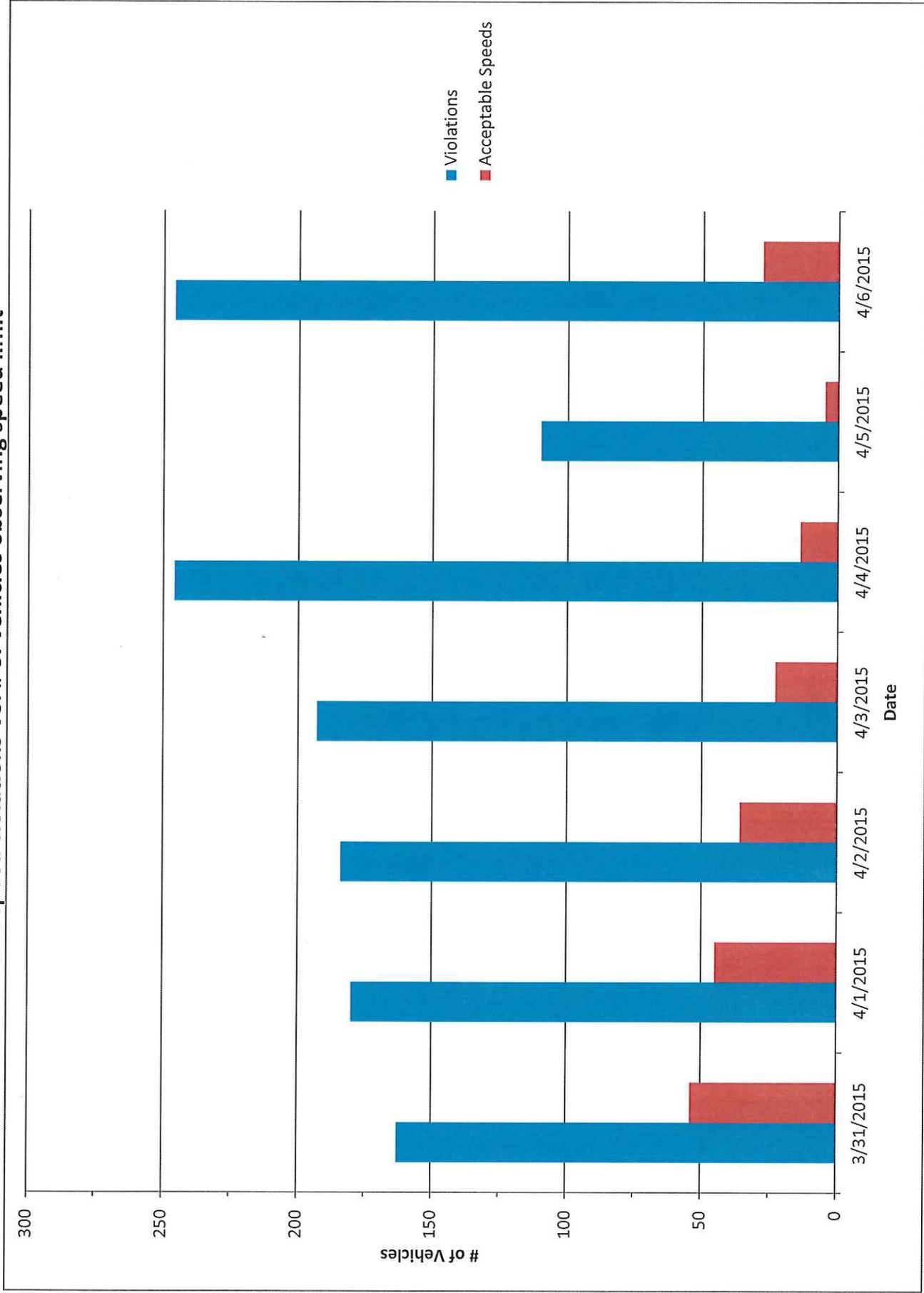
Posted Speed: 35 mph

Tolerable Speed: 45 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
3/31/2015	217	163	54	44	71	35	62	16	46	36	46
4/1/2015	225	180	45	47	75	36	64	23	41	39	45
4/2/2015	220	184	36	47	81	39	63	19	44	41	50
4/3/2015	216	193	23	33	89	44	64	24	40	45	54
4/4/2015	260	246	14	12	95	42	66	14	52	43	53
4/5/2015	115	110	5	4	96	44	67	19	48	45	55
4/6/2015	274	246	28	8	90	41	71	8	63	43	51
Total	1527	1322	205	195							
Average	218	189	29	28	85	40	65	18	48	42	51

*Note: Data collected on 4/7/15 combined with data on 3/31/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G30 EB to Hancock Site Pictures

(H.6.a)



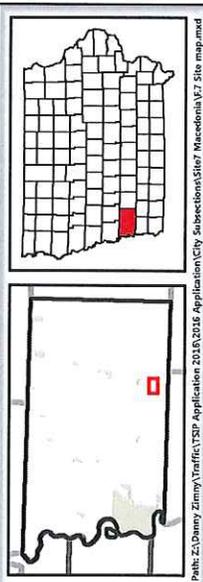
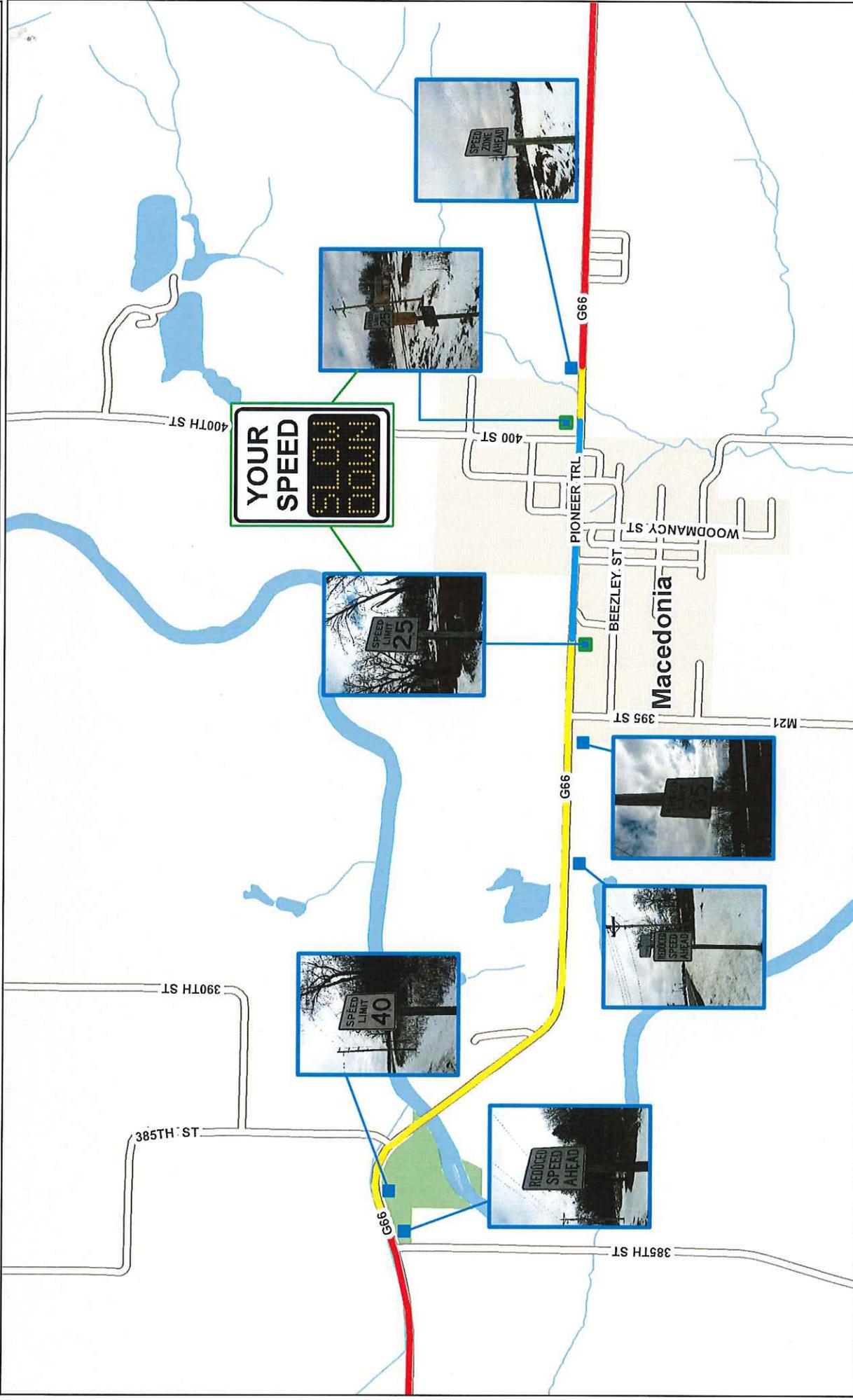
Figure 25 G30 West of Hancock looking West, 55 mph zone



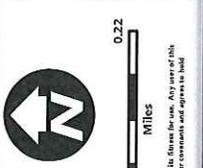
Figure 26 G30 West of Hancock looking East, 35 mph zone

Macedonia Site Map

F.7



- Local Highspeed Rural Road, 55 mph
- Speed Transition Zone, 40 mph
- City Speed Limit, 25 mph
- Existing Sign
- Proposed Sign



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 Map Published: 7/20/2015
 Source: Polk County GIS

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G.7

Macedonia Traffic Analysis

Population (2013): 244
 Farm to Market (FM) routes within city limits: G66
 Daily entering volume from FM routes: 446 Vehicle per day average
 Crashes on FM routes within city limits since 2004: 1 *Excludes Transition Zones*

G66 East Bound Into Macedonia

Federal functional classification	Major Collector
Posted speed limit in city	25 mph
Vehicles per day (7 day average)	295
Average number of speed violations per day	279
85th speed percentile of 7 day sample	43 mph
Length of speed transition zone	6484 feet
Speed reduction within transition zone	30 mph (55-25 mph)
Accidents in transition zone (2004-2014)	6 accidents, 1 major
Largest variance in recorded speeds (max-min)	38 mph
Crash density in transition zone	0.49 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G66 West Bound Into Macedonia

Federal functional classification	Major Collector
Posted speed limit in city	25 mph
Vehicles per day (7 day average)	151
Average number of speed violations per day	145
85th speed percentile of 7 day sample	53 mph
Length of speed transition zone	302 feet
Speed reduction within transition zone	30 mph (55-25 mph)
Accidents in transition zone (2004-2014)	1 accident
Largest variance in recorded speeds (max-min)	45 mph
Crash density in transition zone	1.75 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.7.a

Daily Data From Spot Speed Study

Date: 3/24-31/2015

Location: G66 EB to Macedonia
 Site #: 7

Data Recording Date: 3/17/2015
 Data Download Date: 3/24/2015

Time: 10:00 AM
 Time: 8:00AM

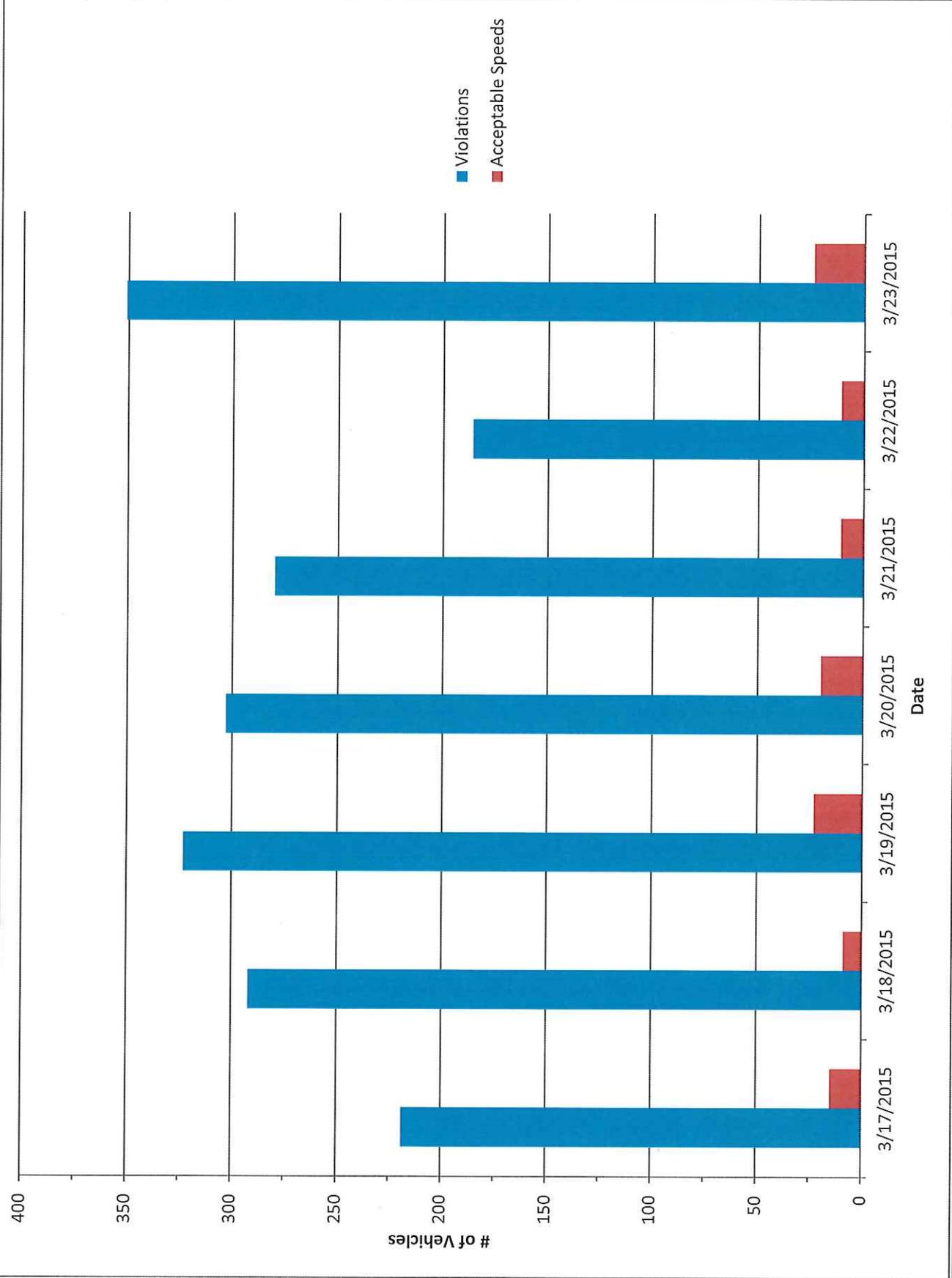
Description: Data recorded from 25 mph speed post at end of transition zone

Posted Speed: 25 mph
 Tolerable Speed: 30 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
3/17/2015	234	219	15	47	94%	34	51	14	37	34	43
3/18/2015	301	292	9	61	97%	35	53	22	31	35	43
3/19/2015	346	323	23	75	93%	34	49	12	37	35	43
3/20/2015	323	303	20	40	94%	35	56	14	42	36	45
3/21/2015	291	280	11	39	96%	35	50	7	43	36	43
3/22/2015	197	186	11	30	94%	34	56	17	39	35	42
3/23/2015	375	351	24	91	94%	33	52	12	40	34	40
Total	2067	1954	113	383							
Average	295	279	16	55	95%	34	52	14	38	35	43

*Note: Data collected on 3/24/15 combined with data on 3/17/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G66 EB to Macedonia Site Pictures

(H.7.a)



Figure 27 G66 West of Macedonia looking west bound, 40 mph zone



Figure 28 G66 West of Macedonia looking east bound, 25 mph zone

G.7.b

Daily Data From Spot Speed Study

Date: 3/24-31/2015

Location: G66 WB to Macedonia

Data Recording Date: 3/24/2015

Time: 9:00 AM

Site #: 7

Data Download Date: 3/31/2015

Time: 8:15 AM

Description: Data recorded from 25 mph speed post at end of transition zone

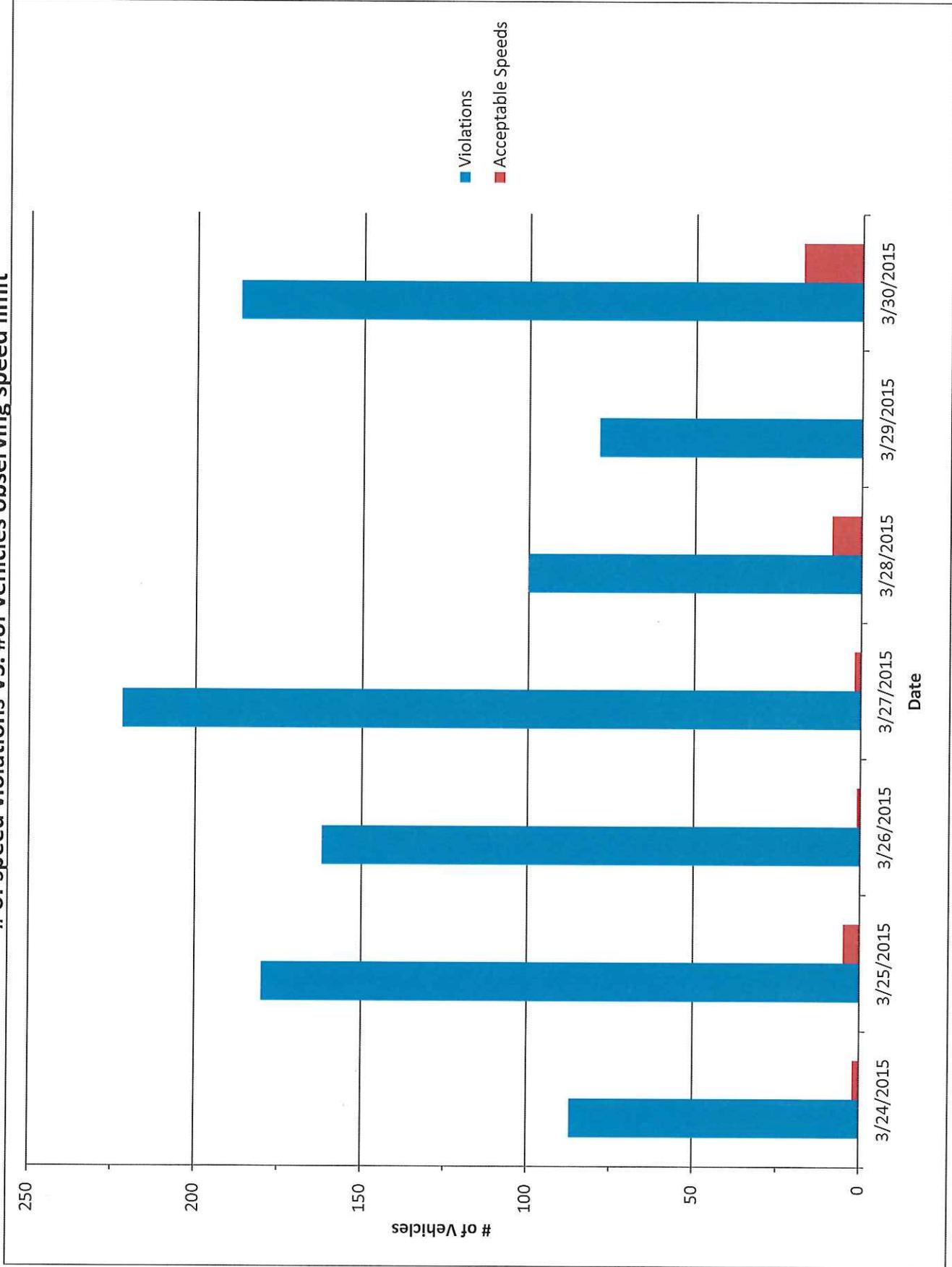
Posted Speed: 25 mph

Tolerable Speed: 30 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
3/24/2015	93	87	2	0	94%	44	73	38	35	45	53
3/25/2015	185	180	5	0	97%	44	65	14	51	45	49
3/26/2015	163	162	1	2	99%	44	62	18	44	45	53
3/27/2015	224	222	2	4	99%	45	58	19	39	46	52
3/28/2015	109	100	9	0	92%	43	62	14	48	46	55
3/29/2015	79	79	0	1	100%	44	58	27	31	46	54
3/30/2015	205	187	18	7	91%	43	77	13	64	45	53
Total	1058	1017	37	14							
Average	151	145	5	2	96%	44	65	20	45	45	53

*Note: Data collected on 3/31/15 combined with data on 3/24/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



G66 WB to Macedonia Site Pictures

(H.7.b)



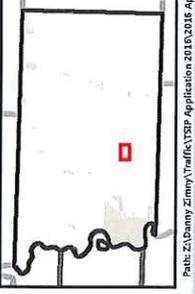
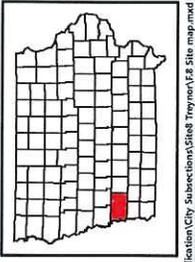
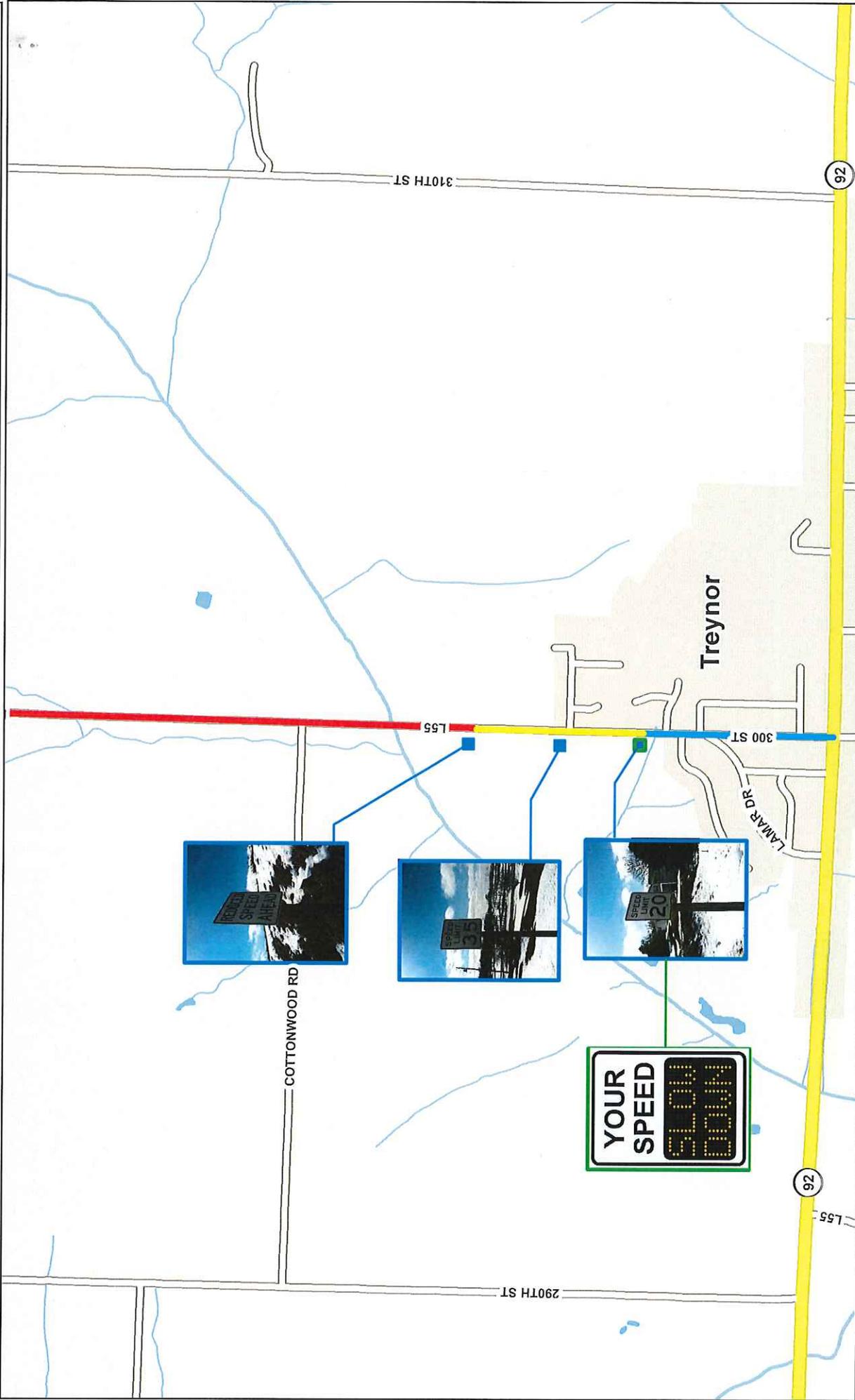
Figure 29 G66 East of Macedonia looking west bound, 25 mph zone



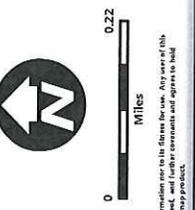
Figure 30 G66 East of Macedonia looking east bound, 25 mph transition to 55mph

Treynor Site Map

F.8



- Local High Speed Rural Road, 55mph
- Transition Zone, 35 mph
- City Speed Limit, 20 mph
- Existing Sign
- Existing Sign with Proposed Driver Feedback



GIS Department
 Council Bluffs, IA 51501
 712.328.4885
gis@pottcounty.com
www.gis.pottcounty.com
 Map Published: 7/20/2015
 Author: GIS Department
 Source: Pottawattamie GIS

This map is for informational purposes only and does not constitute a warranty of accuracy or liability. The information on this map is for informational purposes only. Any use of this map product occurs at the user's own risk. Pottawattamie County, Iowa, or its employees, officers, agents, or contractors, in no way, are liable for any use of this map product.

G.8

Treynor Traffic Summary

Population (2013): 936
 Farm to Market (FM) routes within city limits: L55
 Daily entering volume from FM routes: 743 Vehicle per day average
 Crashes on FM route within city limits since 2004: 3 *Excluding Transition Zone*

L55 South Bound Into Treynor

Federal functional classification	Major Collector
Posted speed limit in city	20 mph
Vehicles per day (7 day average)	743
Average number of speed violations per day	739
85th speed percentile of 7 day sample	48 mph
Length of defined transition zone	1845 feet
Posted speed reduction within transition zone	35 mph (55-20 mph)
Largest variance in recorded speeds (max-min)	46 mph
Accidents in transition zone (2004-2014)	7 accidents
Crash density in transition zone	2.00 crashes/mile/year
10-year average crash density for major collectors on Iowa secondary roads	0.37 crashes/mile/year

G.8.a

Daily Data From Spot Speed Study

Date: 3/10-17/2015

Location: L55 SB into Treynor

Data Recording Date: 3/10/2015

Time: 10:00 AM

Site #: 8

Data Download Date: 3/17/2015

Time: 8:00 AM

Description: Data collected at 20 mph post at end of transition zone

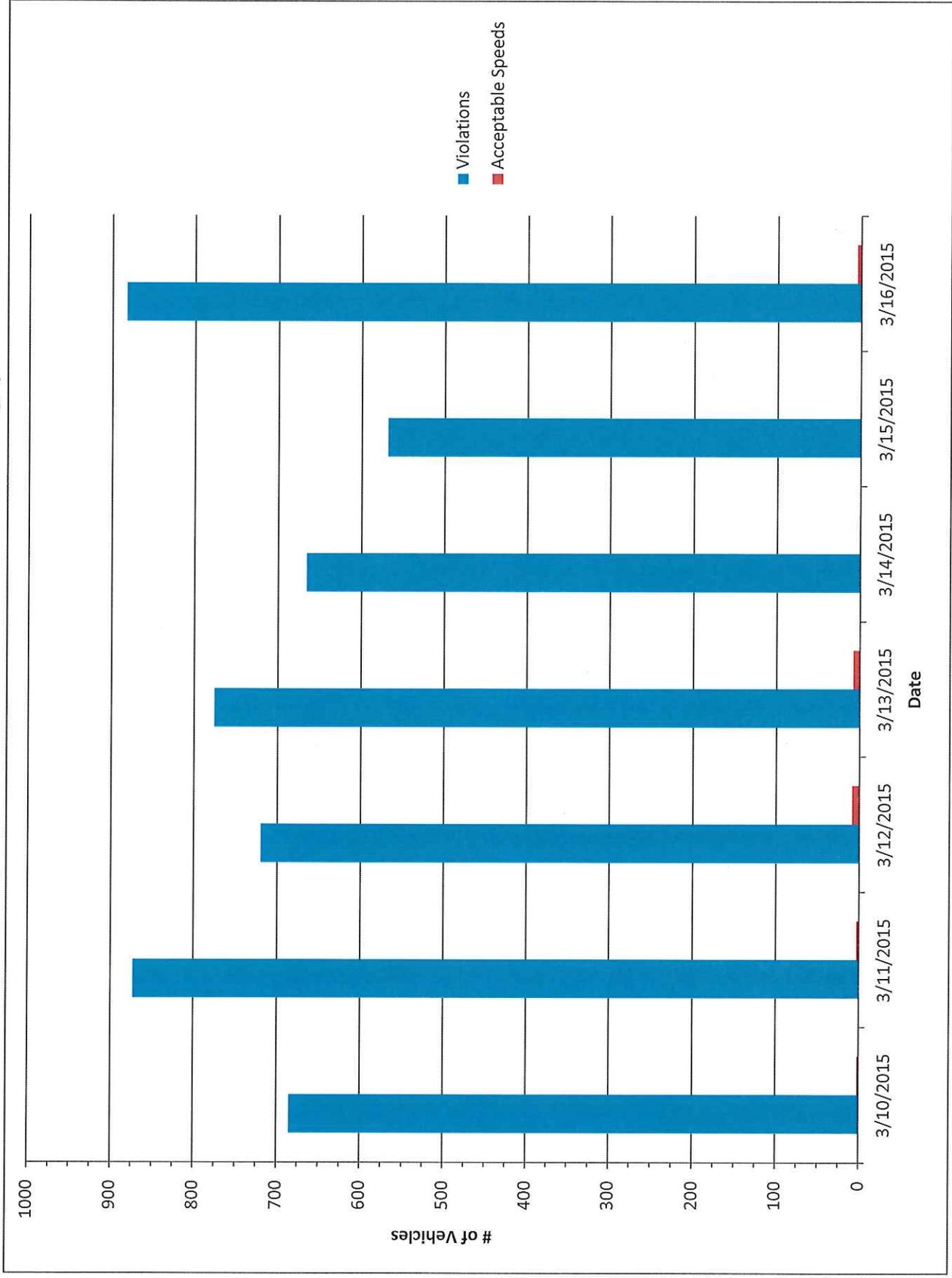
Posted Speed: 20 mph

Tolerable Speed: 25 mph

Day	Vehicle Count	# of Speed Violations	# of Vehicles Respecting Limit	# of Violations within Tolerable Speed	% of Speed Limit Violations	Average Vehicle Speed (mph)	Highest Speed Recorded (mph)	Lowest Speed Recorded (mph)	Largest Variance in Speed (mph)	50th Percentile (mph)	85th Percentile (mph)
3/10/2015	687	685	2	3	99.9	40	61	16	45	41	48
3/11/2015	876	873	3	15	99.9	39	59	18	41	41	48
3/12/2015	729	720	9	19	99	38	61	15	46	39	47
3/13/2015	784	776	8	14	99	39	63	9	54	40	48
3/14/2015	667	666	1	8	99.9	40	58	18	40	41	49
3/15/2015	569	569	0	3	99.9	39	55	22	33	41	48
3/16/2015	888	883	5	15	99	38	60	15	45	39	47
Total	5200	5172	28	77							
Average	743	739	4	11	99.9	39	60	16	44	40	48

*Note: Data collected on 3/17/15 combined with data on 3/10/15 to make one full day of data

of speed violations VS. # of vehicles observing speed limit



L55 SB to Treynor Site Pictures

(H.8.a)



Figure 31 L55 North of Treynor looking North, 55 mph zone



Figure 32 L55 North of Treynor looking South, 20 mph city speed limit

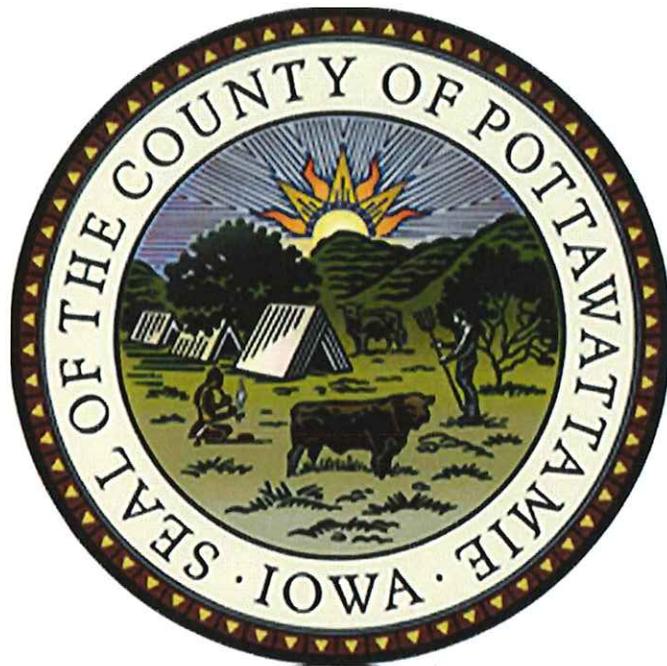
Works Cited

(I)

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APPENDIX A

G37 Recessed Pavement Marker Plan Sheets



ESTIMATED PROJECT QUANTITIES

100-1C
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2306-1000000	BITUMINOUS FOG SEAL (PAVEMENT)	GAL	5.05
2	2527-9263005	GROOVING FOR PAVEMENT MARKERS	SY	42.13
3	2527-9263005	RAISED PAVEMENT MARKER	EA	130
4	2533-4980005	MOBILIZATION	LS	1
5	2528-8445110	TRAFFIC CONTROL	LS	1
6	2528-8445112	FLAGGERS	DAY	1
7	2528-8445114	PILOT CAR	DAY	1

PROJECT DESCRIPTION

100-1D
10-18-05

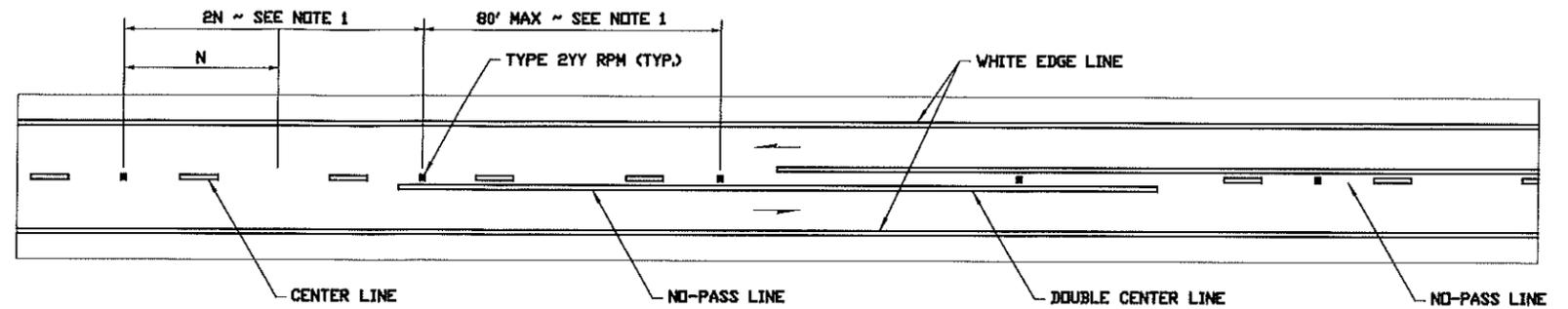
This project includes installation of recessed pavement markers along the centerline of old mormon bridge road (G37) starting at the junction of hwy 680 and G37 and ending at the intersection of G37 and L20 in the city of crescent; stations 1370+40.66 - 1472+73.59 respectively.

ESTIMATE REFERENCE INFORMATION

- ① APPLY FOG SEAL TO THE GROVED SECTIONS AT A RATE OF 0.12 GALLONS PER SQUARE YARD.
- ② CUT GROVE IN ACCORDANCE WITH SECTION A ALONG CENTERLINE AT LOCATIONS SPECIFIED BY THE ENGINEER. REMOVE AND CLEAN THE GROVED AREA AFTER SCARFICATION. ALL DEBRIS IS PROPERTY OF THE CONTRACTOR. CONTRACTOR SHALL ENSURE THAT GRINDING OF THE PAVEMENT DOES NOT RESULT IN ANY DAMAGE TO THE REMAINING SLAB.
- ③ APPLY ADHESIVE COMPOUND TO THE GROVED SECTION AS DIRECTED BY THE ENGINEER ONCE THE GROVED SECTION HAS DRIED. COMPOUND IS TO BE HEATED TO THE MANUFACTURERS RECOMMENDED TEMPERATURE BEFORE THE RAISED PAVEMENT MARKER (RPM) IS APPLIED. RPM IS TO BE DOUBLE YELLOW REFLECTIVE. RPM MAY BE WARMED PRIOR TO SETTING. ITEM INCLUDES ALL FRUNISHING AN INSTALLING COSTS OF RPMs AND ADHESIVE COMPOUNDS.
- ⑤ TRAFFIC CONTROL LAYOUT IS TO BE IN ACCORDANCE WITH IQWA DOT STANDARD ROAD PLAN TC-214
- ⑥ INCLUDES ALL COST OF FLAGGERS USED DURING THE DAILY CONSTRUCTION OPERATION
- ⑦ INCLUDES ALL COST OF PILOT CARS USED DURING THE DAILY CONSTRUCTION OPERATION

TYPE 2 RPM RAISED FACE COLORS

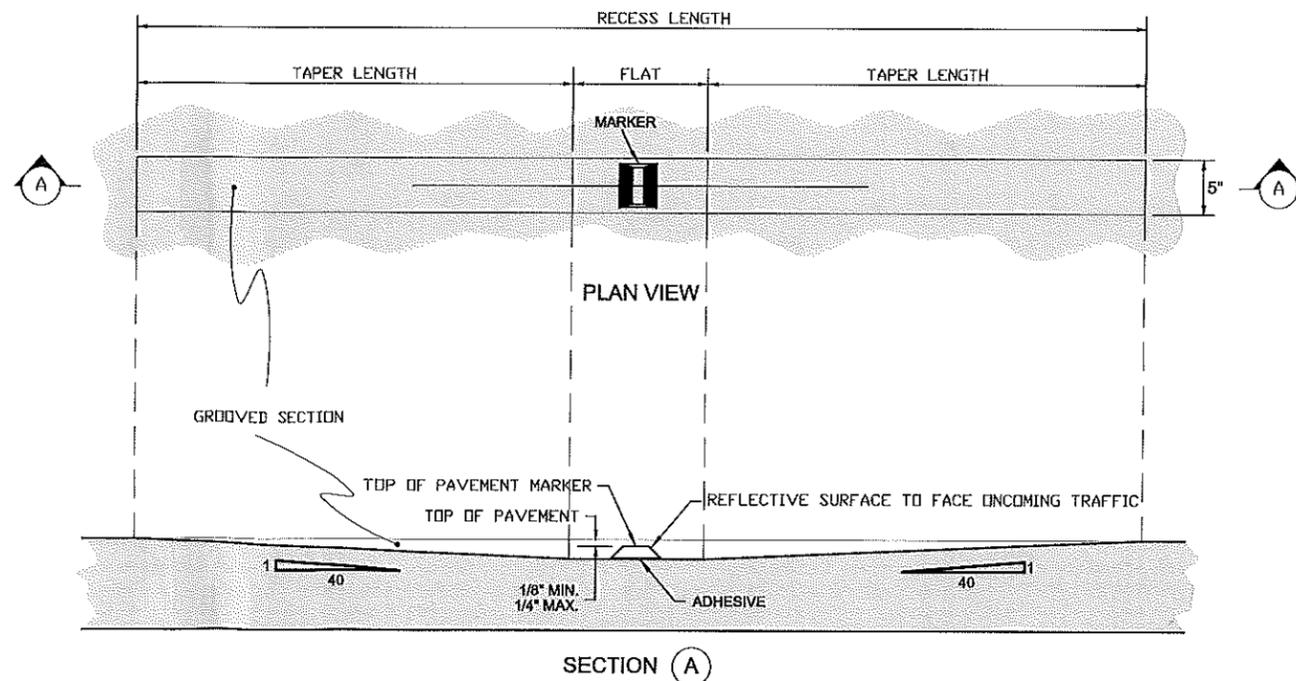
TYPE 2YY	YELLOW AND YELLOW
----------	-------------------



TWO LANE TWO-WAY TRAFFIC

RECESSED PAVEMENT MARKERS

ROAD ID.	LOCATION	REFLECTOR DATA					
		START STA.	END STA.	REFLECTOR TYPE	INTERVAL 2N	TAPERS FT	FLAT FT
G37	CENTERLINE	1370+40.66	1472+73.59	2YY	80.00	3.00	1.00

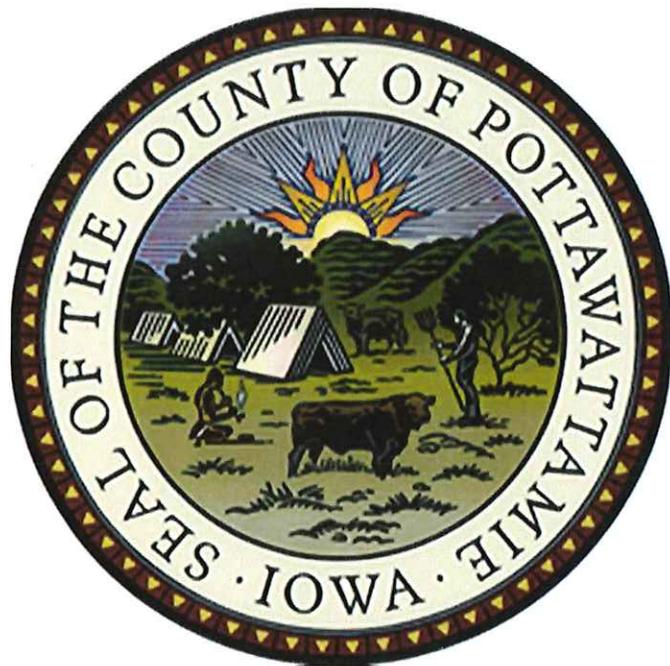


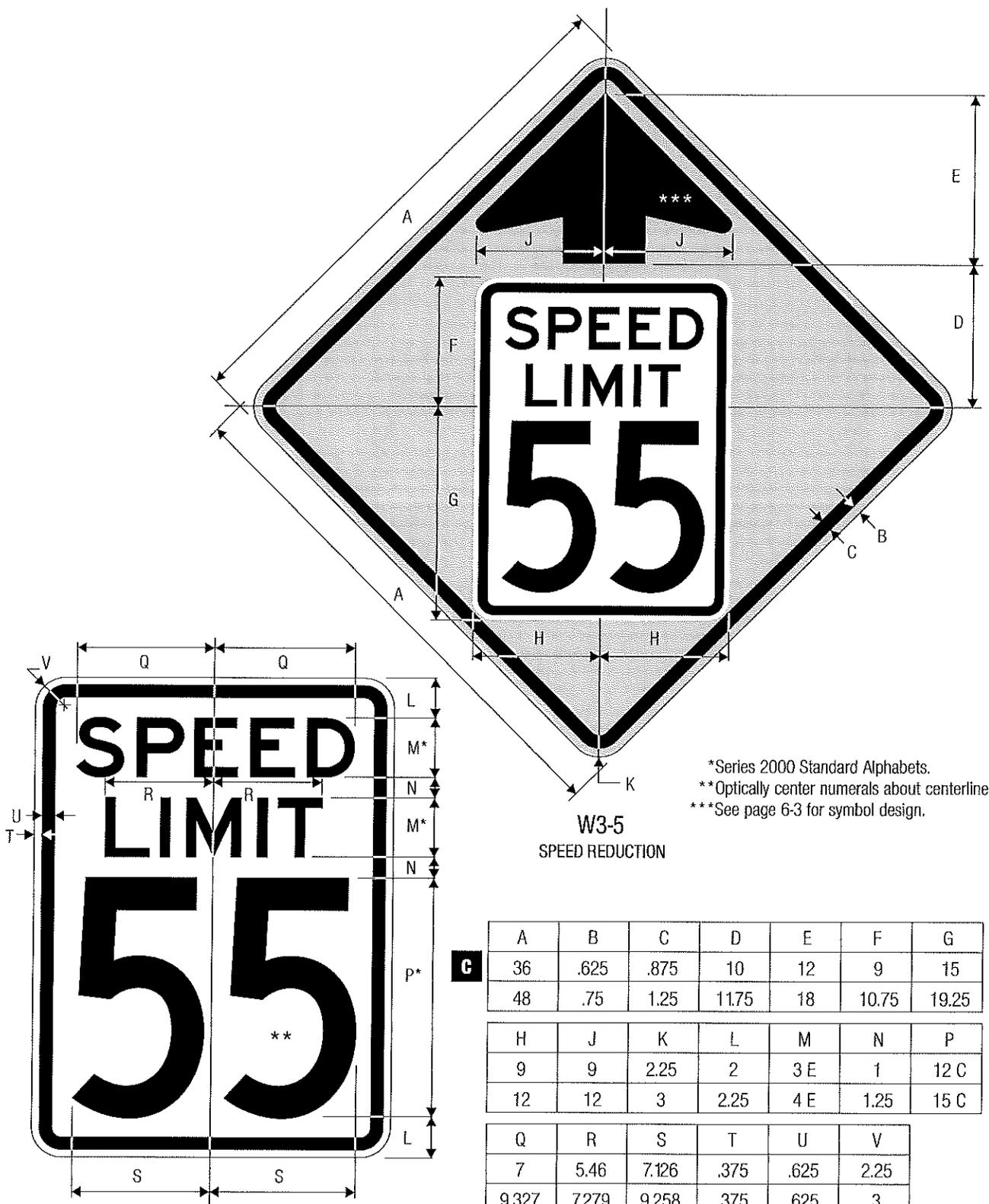
NOTES

- ① PLACE RPM'S AT A RATE OF 2N AT A MAXIMUM OF 80' INTERVALS ON TANGENTS AND CURVES WITH A RADIUS OF 1900' OR GREATER.
PLACE RPM'S AT A RATE OF 2N AT A MAXIMUM OF 40' INTERVALS ON CURVES WITH A RADIUS OF 1900' OR LESS.
PLACE RPM'S AT A RATE OF 2N AT A MAXIMUM OF 20' INTERVALS ON CURVES WITH A RADIUS OF 380' OR LESS.

APPENDIX B

Material Data Sheets





*Series 2000 Standard Alphabets.
 **Optically center numerals about centerline.
 ***See page 6-3 for symbol design.

W3-5
 SPEED REDUCTION

A	B	C	D	E	F	G
36	.625	.875	10	12	9	15
48	.75	1.25	11.75	18	10.75	19.25

H	J	K	L	M	N	P
9	9	2.25	2	3 E	1	12 C
12	12	3	2.25	4 E	1.25	15 C

Q	R	S	T	U	V
7	5.46	7.126	.375	.625	2.25
9.327	7.279	9.258	.375	.625	3

WARNING SIGN COLORS:

- BORDER & ARROW — BLACK
- SYMBOL — SEE R2-1
- BACKGROUND — YELLOW (RETROREFLECTIVE)

TTC COLORS:

- BORDER & ARROW — BLACK
- SYMBOL — SEE R2-1
- BACKGROUND — ORANGE (RETROREFLECTIVE)

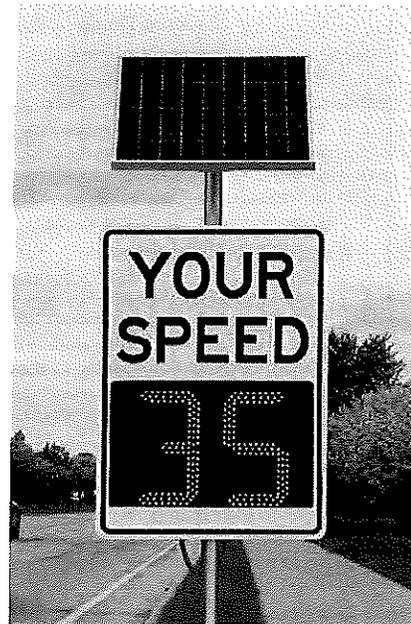
BlinkerRadar™ 15" Character Display Radar Driver Feedback Sign

An affordably priced and fully-featured radar driver feedback (DFB) sign to support traffic calming in one small and modular footprint. Built to last, easy to install and programmable through the provided BlinkerRadar™ Configuration and Collection Software, the 15" BlinkerRadar™ sign promotes increased safety and reliability for every street in America.

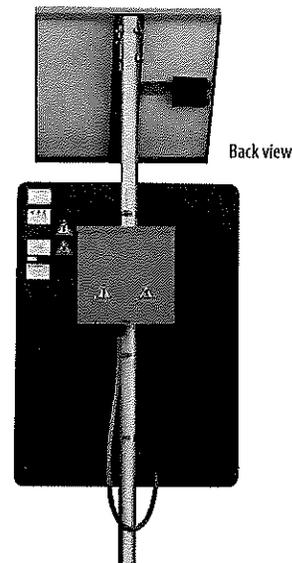
- 2 year warranty
- Manufactured in an ISO9001 certified facility
- Crystal bright visibility by design with amber LEDs
- 15" speed display numbers
- NEMA-3 weatherproof sealed electronics
- 30"W x 41"H x 3"D

Ideal for city and residential streets, urban corridors, private roads and industrial parks, the 15" BlinkerRadar™ driver feedback sign is the practical solution for today's restrained traffic calming funds. The sign delivers all the features and functionality required to encourage drivers to adhere to posted speed limits and comes in a small and modular profile for ease of shipment, installation and maintenance.

Solar model includes: Driver Feedback sign, mounting bracket, insulated battery box w/charge controller, 60W solar panel with mounting bracket, (2) AGM lead acid 12V 35AH batteries, and conduit/wiring (to connect box, sign & panel), BlinkerRadar™ Configuration and Collection Software



Pole sold separately



LED Display	7-segment (numerals only)
LED Color	Amber or red*
Display height	15"
Housing dimensions	30"W x 41"H x 3"D, weighs 36 lbs.
Housing construction	3/16" aluminum chassis powder-coated DOT green, 0.100" sign face, sealed electronics (removable from the mounting frame as a complete unit)
Enclosure Rating	Weatherproof NEMA 3R
Sign Face Sheeting	3M DG ³ Diamond Grade™ reflective sheeting
Available Sign Face Colors	White or fluorescent yellow green
Display Cover	3/16" thick non-glare, non-permeable polycarbonate. Graffiti and sunlight resistant.
Programmable integrated strobe	Yes
External Device Control (beacons, cameras, etc)	External output port
Radar	K-band (24.15GHz) direct sensing, license free (FCC part 15 compliant)
Radar Range	450' average
Communication and programming	Bluetooth [®] (Class 1, 300' range) and RS-232 port
Sign legibility	Viewable range: 1,000'; Legible range: 750'
Speed Display Range	5 mph - 50 mph (displays up to 99 mph)
Data collection	BlinkerRadar™ Configuration and Collection software (license free)
Data Capacity	90 days w/circular buffer
Stealth Mode	Yes
Warranty	2 years
Service	Modular design
Power	60W solar panel and battery charger or 110 V, AC
Power Consumption	12VDC, usage: stealth 2W, standby 500mW, day average 15W, night average 6W.

*Power consumption averages based on varying ambient light conditions and 50% traffic load

TAPCO 1-800-236-0112 www.tapconet.com

STIMSONITE MODEL C80

SPECIFICATION

SPECIFICATION FOR ABRASION RESISTANT, HIGH BRIGHTNESS PRISMATIC RETROREFLECTIVE PAVEMENT MARKER

SMC80 – June 2007

GENERAL DESCRIPTION

Markers shall consist of a durable all-thermoplastic housing. The housing shall have one or two, abrasion resistant coated prismatic retroreflecting lenses to reflect incident light from a single or opposite directions.

DETAILED SPECIFICATIONS

1. DESIGN AND FABRICATION

A. Dimensions and Construction Details

- 1) Housing 11.6 cm × 8.1 cm × 1.8 cm (nominal)
 4.55 in × 3.20 in × 0.66 in (nominal)

2) Lens shall comprise a series of integral cells containing unmetallized prismatic cubes capable of providing total internal reflection of the light entering the lens face.

Slope of Lens	35° to base
Normal Area of Each Lens Face	16.8 sq. cm. (2.60 sq. in.)

3) The lenses will be permanently welded to the housing creating a hermetic seal for each cell.

B. Material

The marker shall be comprised of materials with adequate chemical, water and UV resistance for the intended use.

C. Surface

A coating shall be applied to the lens faces to provide a hard, durable abrasion resistant surface. The remainder of the base's outer surface shall be smooth except for purposes of identification.

The base of the marker shall be substantially free from gloss and substances that may reduce its bond to adhesive.

2. OPTICAL REQUIREMENTS

A. DEFINITIONS

Retroreflector Axis shall mean the line from the center of the lens that is in a plane parallel to the base of the marker and also in a plane perpendicular to the leading edge of the marker.

Illumination Axis shall mean the line from the center of the lens to the source of illumination.

Observation Axis shall mean the line from the center of the lens to the point of observation.

Entrance Angle shall mean the angle formed between the Retroreflector Axis and the Illumination Axis.

Observation Angle shall mean the angle formed between the Illumination Axis and the Observation Axis.

STIMSONITE MODEL C80

SPECIFICATION

Coefficient of Luminous Intensity (R_l) shall mean the ratio of the luminous intensity of the marker lens in the direction of observation to the illuminance at the marker lens on a plane perpendicular to the direction of the incident light. R_l is expressed in millicandelas per incident lux (mcd/lx). The corresponding English measure is Specific Intensity (SI) expressed in candles per foot candle (cd/ftc). One cd/ftc is equivalent to 92.9 mcd/lx.

B. OPTICAL PERFORMANCE

1) Coefficient of Luminous Intensity

For each lot select 30 markers at random for Coefficient of Luminous Intensity check. Photometer in accordance with procedure 2C. Coefficient of Luminous Intensity of each marker lens shall be not less than shown in Table 1. Failure of more than 10% of the lenses shall be cause for rejection of the lot. In this event, and at the discretion of the purchaser, a resample may be taken consisting of 40 markers at random. Failure of more than 10% of their lenses shall then be cause for rejection of the lot.

TABLE 1 COEFFICIENT OF LUMINOUS INTENSITY REQUIREMENTS

Observation Angle (degrees)	Entrance Angle (degrees)	Coefficient of Luminous Intensity mcd/lx					Specific Intensity cd/ftc				
		White	Yellow	Red	Green	Blue	White	Yellow	Red	Green	Blue
0.2	0	279	167	70	93	26	3.0	1.8	0.75	1.0	0.28
0.2	20	112	67	28	37	10	1.2	0.72	0.30	0.4	0.11

2) Abrasion Resistance

Select at random five retroreflective lenses that previously passed the Coefficient of Luminous Intensity requirements as stated in Table 1. Place each retroreflective face beneath the sand drop apparatus and allow 2.5 ± 0.05 kilograms of natural silica sand from the St. Peters or Jordan sandstone deposits fall 3.00 ± 0.03 meters. The sand shall fall uniformly onto the abrasion resistive retroreflective surface of the lens at a rate of 0.4 to 1.0 kilograms per minute. Measure the Coefficient of Luminous Intensity of each abraded lens. The Coefficient of Luminous Intensity shall be not less than shown in Table 2. The failure of more than one retroreflective face shall be cause for rejection of the lot. (Note: On two color units the red lens may not be covered with the abrasion resistant coating and if so should not be abraded.)

TABLE 2 COEFFICIENT OF LUMINOUS INTENSITY REQUIREMENTS AFTER ABRASION RESISTANCE TESTING

Observation Angle (degrees)	Entrance Angle (degrees)	Coefficient of Luminous Intensity mcd/lx					Specific Intensity cd/ftc				
		White	Yellow	Red	Green	Blue	White	Yellow	Red	Green	Blue
0.2	0	140	84	35	47	13	1.5	0.90	0.38	0.50	0.14
0.2	20	56	34	14	19	5	0.60	0.36	0.15	0.20	0.06

3) Optical Testing Procedure

When Coefficient of Luminous Intensity is measured at 15 m (50 ft) test distance, receptor diameter and source diameter shall each be 2.6 cm (1.0 in.). Other test distances may be used, provided they are no shorter than 7.5 m (25 ft), and provided that the receptor and source apertures each subtend 0.1° at the marker.

The testing arrangement shall have the entrance angle in a plane parallel to the base of the marker and the observation angle in a plane perpendicular to that plane. The test shall include both possible 20° entrance angles, left and right. This geometry is consistent with that in ASTM D 4280, Specification for Extended Life Type, Nonplowable, Raised Retroreflective Pavement Markers, which includes illustrations.

RAISED PAVEMENT MARKERS

INSTALLATION INSTRUCTIONS

This procedure outlines the recommended steps for the installation of the Stimsonite Model C80, 80, 980, 911, C88, 88, 953, & 948 Raised Pavement Markers with bituminous adhesive.

Prepare bituminous adhesive

Bituminous adhesive is a hot melt material packaged as a solid block. Remove the outer carton from the adhesive block, and break the material into chunks, typically with an axe. Deposit material into thermostatically controlled melter-applicator equipment. Heat the desired quantity of adhesive to a temperature recommended by the manufacturer. Stir the material frequently to ensure even heating.

NOTE: Do not overheat the bituminous adhesive.

NOTE: Start-up typically requires 20-30 minutes. Ambient temperature should be at least 35°F during application or as recommended by the adhesive manufacturer.

Determine where to locate the marker

Mark the locations of the raised pavement markers. When using raised pavement markers to supplement a solid pavement stripe, offset the markers a minimum of 2" from the edge of the stripe. When using raised pavement markers to supplement a dashed stripe, locate the marker in the gap in line with the stripe. This permits repainting without affecting the raised pavement markers' reflectivity.

NOTE: Do not locate markers over joints or cracks in the pavement surface; do not place over existing paint, epoxy or thermoplastic. Marker location must be flat.

Prepare the pavement surface

The pavement surface must be clean and dry, at least 24 hours since any significant rainfall. Use a wire brush, if necessary, to loosen and remove dirt. Brush or blow clean.

NOTE: If unsure of moisture in the pavement, prepare the installation area with a propane torch to remove any additional moisture.

Apply adhesive to pavement

Position melter-applicator over desired marker location and dispense a puddle of adhesive approximately 6" in diameter.

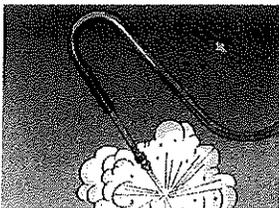
NOTE: When installing on open-graded friction course, a second dose of adhesive is recommended.

Place the raised pavement marker

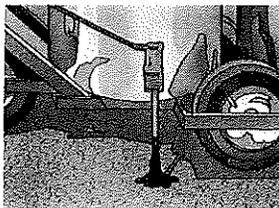
Place the marker onto the adhesive puddle, aligned with existing lines. Press the marker lightly onto the adhesive. The reflective faces must be perpendicular to traffic. Do not allow adhesive to flow onto the reflective face or build up in front of it.

IMPORTANT: Marker must be placed onto the adhesive as quickly as possible, preferably within five seconds of adhesive placement.

NOTE: Adhesive will set up in approximately 2 minutes and typically requires no protection from traffic.



Prepare surface — must be clean and dry.



Apply adhesive to selected location.

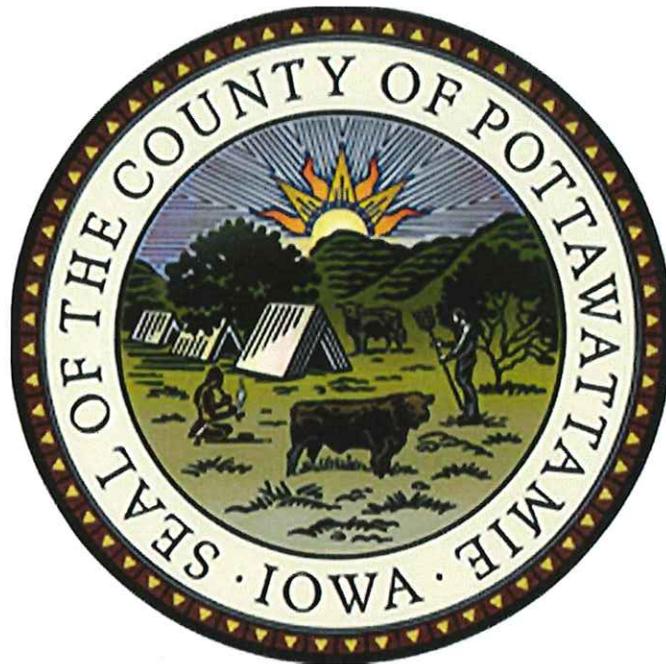


Place marker onto adhesive and press lightly.



APPENDIX C

Annual Traffic Count Sheet from Driver Feedback Sign





Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: 8-4-2015

Location / Title of Project Stop Ahead Sign Replacement - NW Ringgold

Applicant Ringgold

Contact Person Zachary A. Gunsolley Title County Engineer

Complete Mailing Address 707 S. Henderson Dr
Mt. Ayr, IA 50854

Phone 641.464.3232 E-Mail zgunsolley@ringgoldcounty.us
 (Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
 (Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

Site Specific	<input type="checkbox"/>
Traffic Control Device	<input checked="" type="checkbox"/>
Safety Study	<input type="checkbox"/>

Funding Amount

Total Project Cost \$ 17500

Safety Funds Requested \$ 9975

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the Ringgold County Board of Supervisors

Signed: Paul Dystra 8-10-15
Signature Date Signed

Paul Dystra
Typed Name

Attest: Amanda Waske 8-10-15
Signature Date Signed

Amanda Waske
Typed Name

RESOLUTION RC15-150

WHEREAS, the Ringgold County Board of Supervisors hereby approves the 2017 TSIP Grant to fund new stop ahead signs.

THEREFORE, a motion was made by Kraig Pennington and seconded by Royce Dredge stating such.

The vote on the resolution: AYES: All. NAYS: None.

ATTEST: Amanda Waske, Auditor. Passed and approved August 10, 2015

Paul Pennington
Board of Supervisors Chairman

ATTEST: Amanda Waske
Ringgold County Auditor

RESOLUTION RC15-151

WHEREAS, the Ringgold County Board of Supervisors hereby approves to reduce the speed limit to 45mph on J55 through the city limits of Redding.

THEREFORE, a motion was made by Kraig Pennington and seconded by Royce Dredge stating such.

The vote on the resolution: AYES: All. NAYS: None.

ATTEST: Amanda Waske, Auditor. Passed and approved August 10, 2015

Paul Pennington
Board of Supervisors Chairman

ATTEST: Amanda Waske
Ringgold County Auditor

RESOLUTION RC15-152

WHEREAS, the Ringgold County Board of Supervisors hereby approves to appoint Karen Taylor to fill a vacancy on the Ringgold County Supportive Services Board.

THEREFORE, a motion was made by Royce Dredge and seconded by Kraig Pennington stating such.

The vote on the resolution: AYES: All. NAYS: None.

ATTEST: Amanda Waske, Auditor. Passed and approved August 10, 2015

Paul Pennington
Board of Supervisors Chairman

ATTEST: Amanda Waske
Ringgold County Auditor



Office of County Engineer

Zachary A. Gunsolley, P.E.
707 S. Henderson Drive
Mt. Ayr, IA 50854

Phone: 641-464-3232
Fax: 641-464-0620
E-mail: zgunsolley@ringgoldcounty.us

TSIP Supporting Documents - Traffic Control Device Application

- A. Resolution attached.
- B. Ringgold County continues to update its regulatory and warning signs to comply with MUTCD standards. Ringgold County W3-1 "Stop Ahead" and W3-2 "Yield Ahead" warning signs are currently not compliant due in large part to the change to the symbol graphic. In addition, many signs also have engineering grade sheeting instead of high intensity prismatic sheeting. Ringgold County is submitting a TSIP application to assist the county with purchasing signs and posts for replacement of these signs.
- C. Itemized breakdown of project costs is as follows:
- | | |
|--|--|
| a. Sign - Iowa Prison Industries | \$40 per sign x 175 sites = \$7,000 |
| b. Post - IDOT | \$17 per sign x 175 sites = \$2,975 |
| c. Labor, Equipment, Hardware - County | \$43 per sign x 175 sites = <u>\$7,525</u> |
| Total Project Cost | \$17,500 |
- D. Completion Date: Within one year from July 1, 2016.
- E. Map attached.
- F. See E above.
- G. N/A
- H. N/A
- I. N/A
- J. N/A

Stop Ahead Signs - NW
Ringgold - ICEASB Easy Map

3:09 PM, Tue, Aug 4, 2015



Feature Key

- Gravel
- Seal Coat
- County Pavement
- State Pavement
- Divided Hwy
- Water
- City
- Township
- Rail Road
- Bridge
- E27 County Hwy
- 175 State Hwy
- 6 US Hwy





Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

DATE: 8/10/15

Location / Title of Project Green Valley State Park Speed Control Project

Applicant Green Valley State Park

Contact Person Alan Carr Title Park Ranger

Complete Mailing Address 1480 130th St.
Creston, IA 50801

Phone 641-782-5131 E-Mail alan.carr@dnr.iowa.gov
 (Area Code)

If more than one highway authority is involved in this project, please indicate and fill in the information below (use additional sheets if necessary).

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ E-Mail _____
 (Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- Site Specific
- Traffic Control Device
- Safety Study

Funding Amount

Total Project Cost \$ 2,600

Safety Funds Requested \$ 2,600

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local government(s). I understand the attached resolution(s) binds the participating local government(s) to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved city streets or secondary roads.

I understand that, although this information is sufficient to secure a commitment of funds, a firm contract between the applicant and the Department of Transportation is required prior to the authorization of funds.

Representing the _____

Signed: _____
Signature Date Signed

Typed Name

Attest: _____
Signature Date Signed

Typed Name

B. Narrative

The goal of this project is to provide a Radar Speed Sign at Green Valley State Park to help slow the traffic to the posted speed limit of 15 mph. The speed limit in the park is 25 mph, but when park visitors turn onto the campground road the speed limit is reduced to 15 mph. This area receives heavy traffic throughout the summer and especially on the weekends. The road passes a playground before entering the campground. Thus there is also a lot of pedestrian traffic on this portion of the road. We would propose to place Radar Speed Sign between the playground and campground in order to slow the traffic. We have borrowed a portable radar speed trailer from the Union County Sheriff Department in the past. When placed at this location we have noticed a significant reduction of speed. We would expect the permanent placement of a Radar Speed Sign would help control speed on a consistent and ongoing basis.

C. Itemized Breakdown of Cost

The estimated cost of this project is \$2,600. This would include the following:

One SP100 Safe Place speed sign

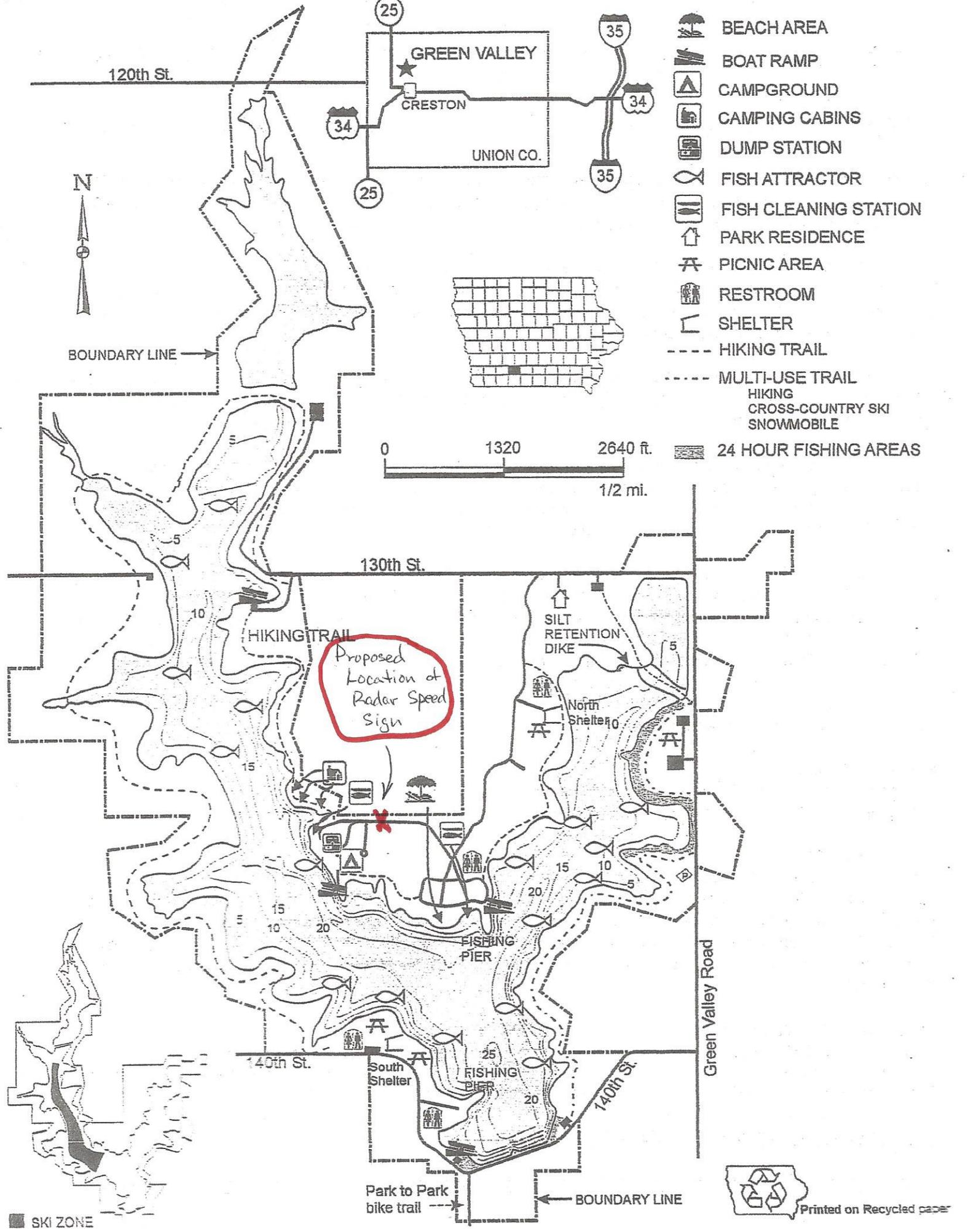
The above funds would be received through the Iowa Department of Transportation. Any additional costs would be covered by Green Valley State Park through existing budgeted funds or from donations to the park.

D. Time Schedule

The proposed time table for implementation of this project if funding is approved by July 1, 2016 would be as follows:. Order and purchase of equipment by August 1, 2016, with a completion date and the equipment being in place and operational by September 1, 2016.

GREEN VALLEY STATE PARK

E. Map



GREEN VALLEY STATE PARK

Trail Map - Lake Trail



Iowa Department of Transportation

Monthly Volume Calendar

Site Names: 603
 County: Union
 Funct. Class: Rural Major Collector
 Num. Days: 31
 Location: ENTRANCE TO GREEN VALLEY STATE PARK

Roadway:	Pos Dir	Neg Dir
MADT:	533	262
MAWDT:	422	204
MAWET:	690	357

July 2015

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road	-	-	-	1 542	2 658	3 856	4 891
Neg Dir	-	-	-	282	355	450	450
Pos Dir	-	-	-	260	303	406	441
	5	6	7	8	9	10	11
	826	335	452	471	511	642	722
	398	173	243	237	256	349	353
	428	162	209	234	255	293	369
	12	13	14	15	16	17	18
	606	355	404	399	443	557	644
	279	176	203	198	231	317	326
	327	179	201	201	212	240	318
	19	20	21	22	23	24	25
	497	298	381	472	517	644	713
	198	154	194	251	281	349	372
	299	144	187	221	236	295	341
	26	27	28	29	30	31	-
	617	365	298	412	395	614	-
	286	181	153	210	207	336	-
	331	184	145	202	188	278	-
MADW	637	338	384	459	505	663	743
STDEV	137	30	64	57	99	114	105
DAYFAC	0.84	1.57	1.39	1.16	1.05	0.80	0.72

MAWDT: Average of the MADW's for Monday - Thursday.

MAWET: Average of the MADW's for Saturday and Sunday.

Values enclosed in () are excluded from summarized values based on Notes detailed below.

From To Note Description

Iowa Department of Transportation

Roadway, Monthly Hourly Volume for July 2015

Site Names: 603
 County: Union
 Funct Class: Rural Major Collector
 Location: ENTRANCE TO GREEN VALLEY STATE PARK
 Seasonal Factor Group: Recreational Rds
 Daily Factor Group: Recreational Rds
 Axle Factor Group: Recreational Rds
 Growth Factor Group: Recreational Rds

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Wed, 01	1	0	0	0	2	6	18	13	17	29	16	30	33	37	33	29	43	51	47	50	44	26	15	2	542
Thu, 02	0	0	1	0	0	9	12	24	30	26	28	25	47	33	25	46	58	80	50	66	48	25	20	5	658
Fri, 03	2	0	0	0	0	6	10	29	40	42	40	45	40	52	63	60	56	73	63	87	64	44	30	10	856
Sat, 04	3	0	1	0	0	7	8	25	35	52	28	66	54	55	70	92	57	72	50	64	44	53	47	8	891
Sun, 05	7	1	1	0	0	5	6	15	39	58	61	85	63	68	81	70	54	55	39	56	40	11	7	5	826
Mon, 06	0	0	0	1	3	2	17	16	21	23	32	21	16	35	27	18	18	25	19	24	5	7	4	1	335
Tue, 07	0	2	0	0	3	3	13	18	16	29	17	23	14	21	29	42	40	41	50	39	23	22	5	2	452
Wed, 08	5	0	0	1	2	7	19	32	12	31	24	18	39	22	26	42	45	30	29	26	32	26	1	2	471
Thu, 09	0	0	0	1	0	5	11	23	29	25	16	34	35	31	32	24	34	37	45	52	35	33	7	2	511
Fri, 10	0	0	0	0	1	7	10	25	18	33	35	44	39	30	43	32	51	51	61	52	55	30	18	7	642
Sat, 11	1	2	0	1	1	5	6	6	23	41	69	58	52	48	56	53	63	44	40	55	52	29	12	5	722
Sun, 12	2	1	0	0	3	1	5	15	27	46	48	55	58	45	58	50	33	33	27	35	39	13	10	2	606
Mon, 13	0	0	0	0	2	2	9	16	16	24	21	9	17	13	19	17	32	21	29	36	43	15	11	3	355
Tue, 14	2	1	0	0	0	3	7	16	24	28	20	19	17	22	13	22	42	29	30	46	29	16	13	5	404
Wed, 15	1	0	2	3	1	2	12	17	18	22	15	17	24	30	20	39	29	41	38	33	20	10	4	1	399
Thu, 16	0	0	0	0	0	2	5	14	21	31	20	18	20	29	22	29	24	42	41	45	41	30	6	3	443
Fri, 17	1	1	1	1	0	4	10	18	18	32	27	24	21	43	47	34	47	38	50	47	51	24	14	5	557
Sat, 18	0	5	0	0	0	2	11	17	16	41	29	46	38	41	48	53	44	54	39	61	50	30	10	9	644
Sun, 19	3	0	0	0	0	6	6	11	28	48	50	37	40	38	46	33	37	28	24	30	23	6	3	0	497
Mon, 20	0	0	0	1	2	1	6	8	20	18	18	10	13	15	22	20	26	19	28	34	28	7	1	1	298
Tue, 21	2	0	0	1	0	2	9	8	16	13	14	14	19	23	26	31	34	39	32	47	24	20	5	2	381
Wed, 22	1	1	1	2	1	0	3	18	18	36	35	33	24	34	26	36	32	30	36	32	35	10	7	0	472
Thu, 23	1	0	0	2	2	2	14	25	28	23	35	30	35	41	29	39	41	46	46	36	21	12	4	5	517
Fri, 24	1	1	1	0	1	0	7	26	20	32	37	22	40	43	55	42	45	54	49	68	47	30	12	9	644
Sat, 25	4	0	0	2	1	1	14	13	21	39	30	52	44	56	64	63	42	58	46	44	34	19	4	4	713
Sun, 26	5	0	0	0	0	4	3	8	30	48	44	67	64	62	33	51	46	38	36	31	28	10	7	2	617
Mon, 27	1	0	0	0	2	1	9	21	24	22	26	27	20	20	40	19	26	22	29	26	23	6	1	0	365
Tue, 28	0	0	0	0	0	2	5	11	19	31	19	20	24	15	30	18	19	22	19	26	7	4	6	1	298
Wed, 29	0	0	0	0	0	2	3	11	13	28	33	14	25	17	32	43	28	37	35	39	36	15	1	0	412
Thu, 30	0	2	1	0	0	1	5	5	10	21	25	12	23	19	21	31	39	42	36	33	29	25	11	4	395
Fri, 31	0	0	0	2	0	3	7	13	31	29	40	34	32	27	37	35	48	69	50	53	49	32	17	6	614

Campground Rd Looking East



Campground Rd Looking West



Playground

