Traffic Safety Improvement Program

Applications for
Traffic Control Devices
FY 2016

Received August 15, 2014

Traffic Control Devices
FY 2016

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
1	Iowa DOT, Office of Traffic & Safety	Replacement of Overhead Red-Yellow Flashing Beacons	$100,000	$100,000
3	Ringgold County	Stop Ahead Sign Replacement – NE Ringgold	$15,400	$8,778
7	City of West Des Moines	Pedestrian Signal Countdown Displays	$27,060	$27,060
23	City of Solon	Highway 1 and Main Street Signalization	$238,590	$115,900
73	City of Sioux City	Traffic Signal Battery Backup Units – Multiple Locations	$70,000	$70,000
93	City of Newton	Citywide Traffic Signal Battery Backup Units Project	$63,000	$63,000
105	City of New Vienna And New Vienna Police Department	New Vienna, IA; Pedestrian Crosswalk and Warning System	$19,770	$19,770
115	City of Council Bluffs	Council Bluffs/Battery Back-Up Systems	$135,130.50	$121,402.50
127	City of Clarion	Traffic Signalization Improvements at Intersection of IA Hwy 3 and Main Street and IA Hwy 3 and 4th Street East	$354,915	$354,915
149	City of Burlington	Agency and Hobby Lobby / Dollar Store Intersection	$144,860	$144,860
163	Allamakee County	Intersection of Old Hwy 9/A52 and Old Stage RD/W60	$11,047.80	$11,047.80
	TOTAL	**11 PROJECTS**	**$ 1,179,773.30**	**$ 1,036,733.30**

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Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

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Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Stop Ahead Sign Replacement - NE 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: ringgoldcoengr@iowatelecom.net
(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: $ 15,400

Safety Funds Requested: $ 8,778

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: David R. Inloes 8-25-14
Signature Date Signed

DAVID R. INLOES
Typed Name

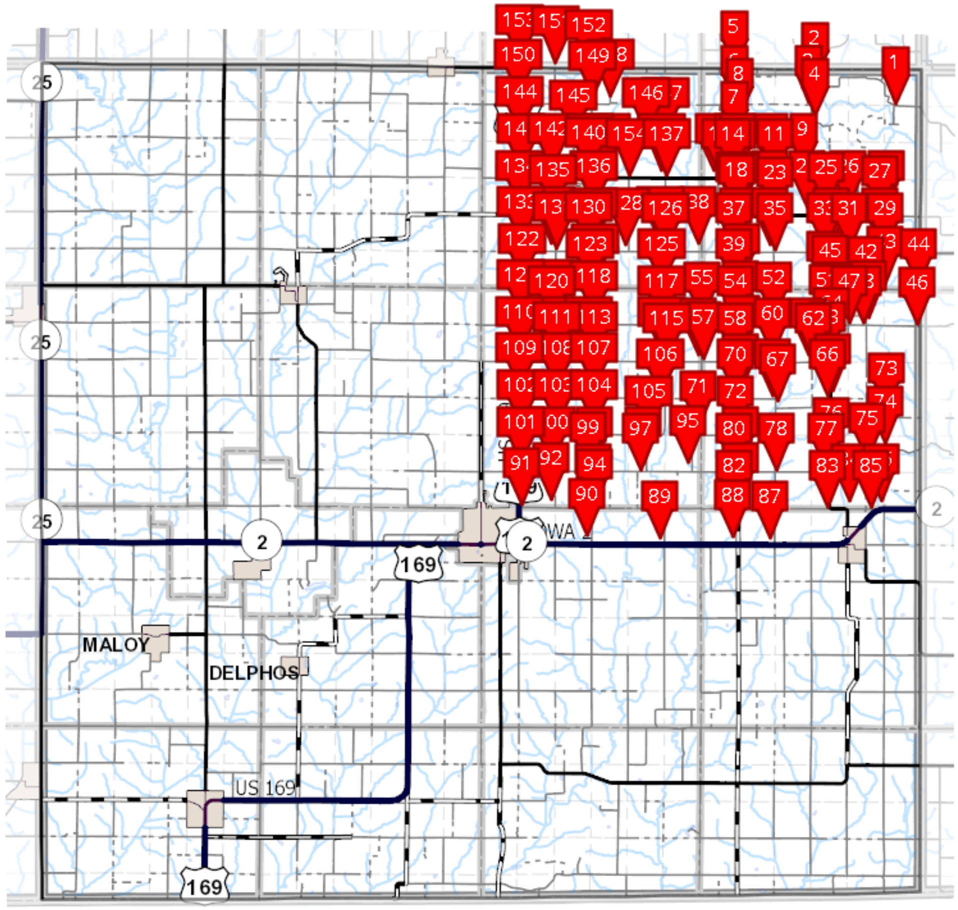
Attest: Amanda Waske 8-25-14
Signature Date Signed

Amanda Waske
Typed Name

Stop ahead signs - NE

Ringgold - ICEASB Easy Map

11:01 AM, Tue, Aug 19, 2014



Feature Key

Earth
Gravel
Seal Coat
County Pavement
State Pavement
Divided Hwy
Water
City
Township
Railroad
Bridge
E27 County Hwy
175 State Hwy
6 US Hwy

N

Miles

0 4 8 16

Generated by ICEASB Map Server (150 dpi)

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Pedestrian Signal Countdown Displays

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 (Area Code) — E-Mail: Jim.Dickinson@wdm.iowa.com

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 ______ (Area Code) — E-Mail ______

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- ☐ Site Specific
- ☒ Traffic Control Device
- ☐ Safety Study

Funding Amount

Total Project Cost $ 27,060

Safety Funds Requested $ 27,060

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.

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Representing the City of West Des Moines

Signed: Bret Hodne 8-12-14

Signature Date Signed

Bret Hodne, Director of Public Works

Typed Name

Attest: Jim Dickinson PE 8-12-14

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.

14-08-11-04

PASSED AND APPROVED this **11th** day of **August, 2014**.

Steven K. Gaer, Mayor

ATTEST:

Ryan T. Jacobson
City Clerk

COUNCIL ACTION	YEAS	NAYS	ABST.	ABSENT
TREVILLYAN	✓			
MICKELSON	✓			
TRIMBLE	✓			
MESSERSCHMIDT	✓			
SANDAGER				✓

MOTION BY Messerschmidt
SECOND BY: Trevillyan
ROLL CALL # 14-351

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NARRATIVE

Pedestrian Signal Countdown Displays

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 246 pedestrian signal countdown displays at 36 existing signalized intersections throughout the City. The City of West Des Moines is responsible for the operation and maintenance of the signalized intersections.

In 2002, the City of West Des Moines started to add pedestrian signal countdown displays to its pedestrian signal heads. Technology made it possible to have the LED's for the Hand-Walking Person symbols be overlayed so that they could both be displayed from a single section of the two-section pedestrian signal head. The pedestrian countdown display could then be installed in the lower section of the head.

Installation of the countdown display was allowed by the FHWA on an experimental basis and the city took advantage of this by installing the countdown displays at all signalized intersections that were school crossings. The school crossing guards loved the countdown display since it gave them positive feedback as to how much time was left for them to get the school children across the street. Our city council members also were positive about the countdown display and they requested that all new traffic signals in West Des Moines be equipped with the countdown display in the pedestrian signal heads. At this time, Jordan Creek Town Center was being constructed so all of the over 25 traffic signals constructed as a part of that project had the countdown display.

Currently, the City of West Des Moines maintains 111 signalized intersections, the majority of which have pedestrian signal heads. There are still 36 intersections that have pedestrian signal heads but no countdown display. This project would provide the pedestrian countdown display for the pedestrians at all of our signalized intersections.

The Manual on Uniform Traffic Control Devices (MUTCD) has included 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. This time is automatically read by the countdown display module from the length of time that the Upraised Hand symbol is flashing. 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 being 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 twelve years, pedestrians crossing the street at most of the signalized intersections in the City of West Des Moines have had the benefit of the information provided by the 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 246 pedestrian countdown displays at the remaining 36 signalized intersections in West Des Moines that currently have pedestrian signals without the countdown display.

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ITEMIZED BREAKDOWN OF COST

Pedestrian Signal Countdown Displays

West Des Moines, Iowa

Description		Cost
Pedestrian Signal Countdown Displays	246 units @ $110 each =	$27,060

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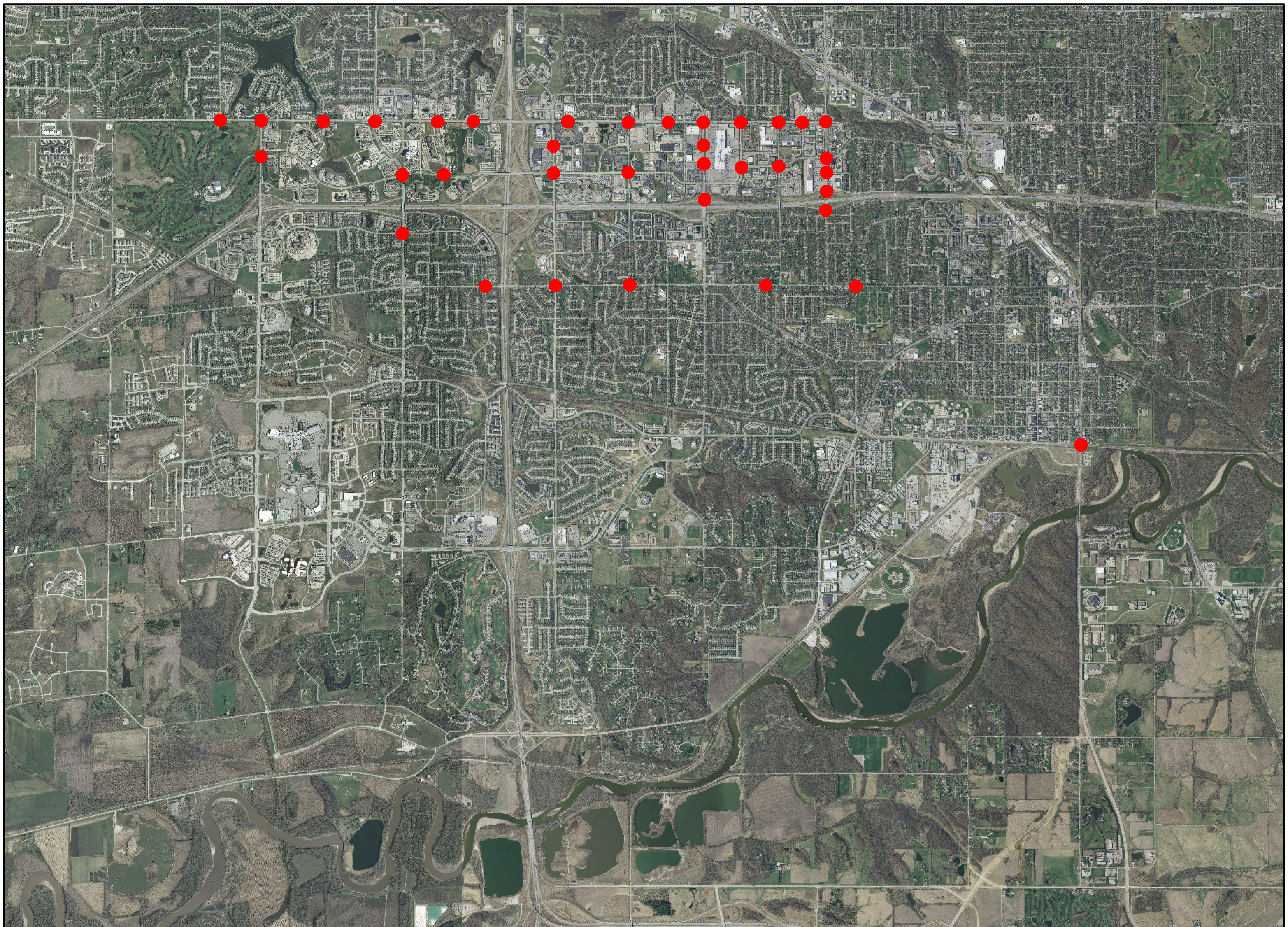
TIME SCHEDULE

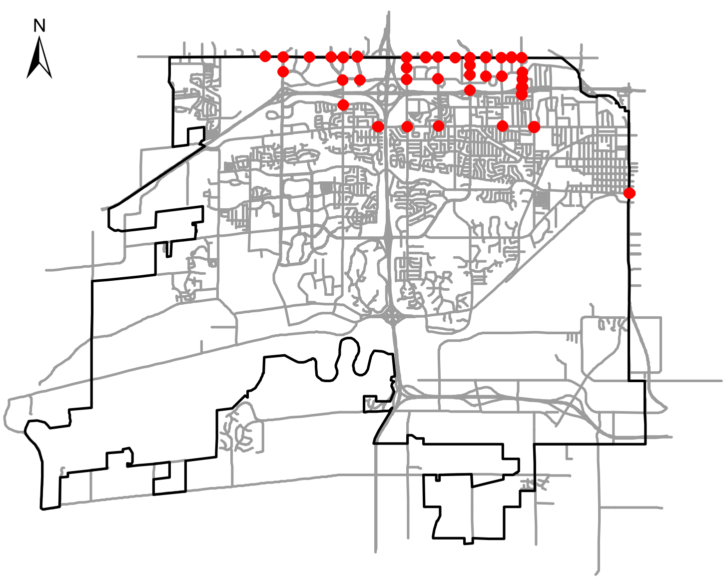
Pedestrian Signal Countdown Displays

West Des Moines, Iowa

TSIP Funding Application	August, 2014
TSIP Project Selection	December, 2014
TSIP Funding Available	July, 2015
Project Letting - Equipment	August, 2015
Start Project Installation	October, 2015
Project Completion	October, 2016



VICINTY MAP



LEGEND

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 Pedestrian Countdown Clock Signal

LOCATION:
Various Locations Within West Des Moines

DRAWN BY: REF	DATE: 8/11/2014	SHT. 1 OF 1

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PICTURES

Pedestrian Signal Countdown Displays

West Des Moines, Iowa

Pedestrian Signal Head With Pedestrian Countdown Display

Single Section Pedestrian Head With Hand/Walking Person Overlay
No Pedestrian 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

TRAFFIC VOLUMES

Pedestrian Signal Countdown Displays

West Des Moines, Iowa

2012 TRAFFIC COUNT SUMMARY
CITY OF WEST DES MOINES, IOWA
September 2012

STREET	LOCATION	2012 COUNT
Army Post Road	South 1st Street to S.W. Connector	1613
Ashworth Road	7th Street to 8th Street	6,845
Ashworth Road	18th Street to 19th Street	9,697
Ashworth Road	20th Street to 21st Street	15,125
Ashworth Road	Vine Street to Valley West Dr.	11,201
Ashworth Road	Valley West Dr. to 37th Street	9,808
Ashworth Road	41st Street to 42nd Street	9,442
Ashworth Road	I-35 Bridge to Prairie View Drive	11,609
Ashworth Road	55th Street to 57th Street	11,607
Ashworth Road	58th Street to 60th Street	12,585
Ashworth Road	63rd Street to 68th Street	5,367
Ashworth Road	72nd Street to 74th Street	5,479
Buffalo Road	73rd Street to 19th Street	7,697
Buffalo Road	19th Street to 19th Place	6,735
E.P. True Parkway	Grand Avenue to 19th Street	17,389
E.P. True Parkway	35th Street to 39th Street	11,482
E.P. True Parkway	39th Street to 50th Street	11,704
E.P. True Parkway	52nd Street to I-35 Bridge	14,489
E.P. True Parkway	Prairie View Drive to 56th Street	9,174
E.P. True Parkway	60th Street to 68th Street	8,765
E.P. True Parkway	68th Street to Jordan Creek Pkwy	5,827
E.P. True Parkway	Jordan Creek Pkwy to 81st Street	3,719
Fuller Road	South 19th Street to Grand Avenue	4,273
Fuller Road	Grand Avenue to Heatherwood Drive	5,159
Fuller Road	South 35th Street to G.M. Mills Civic Parkway	5,196
Grand Avenue	1st Street to 4th Street	15,388
Grand Avenue	7th Street to 8th Street	13,067
Grand Avenue	11th Street to 12th Street	12,141
Grand Avenue	16th Street to Vine Street	10,849
Grand Avenue	Elm Street to Railroad Avenue	13,903
Grand Avenue	South 19th Street to Fuller Road	6,164
Grand Avenue	Fuller Road to South 35th Street	6,458
Grand Avenue	South 35th Street to South 42nd Street	6,044

Grand Avenue	South 50th Street to I 35 East Ramps	6,847
Grand Avenue	I-35 West Ramps to Booneville Road	9,277
Grand Avenue	Raccoon River Drive to South 60th Street	3,770
Grand Avenue	South 60th Street to South Jordan Creek Pkwy	3,407
Jordan Creek Pkwy	University Ave to Westown Pkwy	29,238
Jordan Creek Pkwy	I-80 South Ramp to Vista Drive	37,546
Jordan Creek Pkwy	Vista Drive to Ashworth Road	30,470
Jordan Creek Pkwy	Ashworth Road to Pommel Place	30,037
Jordan Creek Pkwy	Cody Drive to E.P.True Pkwy	28,116
Jordan Creek Pkwy	E.P. True Parkway to Bridgewood Blvd	19,982
S. Jordan Creek Pkwy	Bridgewood Blvd to Mills Civic Pkwy	13,007
S. Jordan Creek Pkwy	Mills Civic Pkwy to West Wells Fargo Entrance	4,453
S. Jordan Creek Pkwy	Stagecoach Drive to Booneville Road	3,867
Lake Drive	Westown Parkway to Jordan Creek Pkwy	1,781
Mills Civic Pkwy	E.P.True Parkway to South 35th Street	11,706
Mills Civic Pkwy	South 35th Street to Fuller Road	8,735
Mills Civic Pkwy	South 50th Street to I 35 bridge	24,269
Mills Civic Pkwy	I-35 Bridge to Glen Oaks Drive	38,743
Mills Civic Pkwy	South Prairie View Dr to South 60th Street	29,789
Mills Civic Pkwy	South 60th Street to Stagecoach Drive	29,675
Mills Civic Pkwy	Stagecoach Drive to South 68th Street	23,066
Mills Civic Pkwy	South 68th Street to South Jordan Creek Pkwy	9,748
Mills Civic Pkwy	South Jordan Creek Pkwy to South 88th Street	3471
Office Park Road	8th Street to 11th Street	7,569
Prairie View Drive	Ashworth Road to Colt Drive	2,984
Prairie View Drive	Boulder Drive to E.P. True Parkway	3,109
Raccoon River Drive	Grand Ave to West Corporate Limits	4,572
Railroad Avenue	3rd Street to 4th Street	16,530
Railroad Avenue	9th Street to 10th Street	17,370
Railroad Avenue	Fuller Road to Holiday Circle	12,018
Stagecoach Drive	Mills Civic Pkwy to South 68th Street	2,482
Stagecoach Drive	South 68th Street to South Jordan Creek Pkwy	2,293
University Avenue	22nd Street to 25th Street	16,646
University Avenue	25th Street to 28th Street	16,540
University Avenue	31st Street to Valley West Drive	17,366
University Avenue	36th Street to 42nd Street	24,095
University Avenue	42nd Street to 50th Street	20,951
University Avenue	50th Street to East Ramp I-80/35	31,598
University Avenue	I-80/35 West Ramp to West Lakes Parkway	30,376
University Avenue	West Lakes Parkway to 59th Place	26,108
University Avenue	60th Street to 68th Street	18,721
University Avenue	Jordan Creek Pkwy to 142nd Street(Clive)	23,835
University Avenue	142nd Street(Clive) to 92nd Street	24,850

University Avenue	92nd Street to 98th Street	16,689
Valley West Drive	University Ave to Westown Pkwy	18,507
Valley West Drive	Westown Place to Westown Parkway	23,091
Valley West Drive	Westown Pkwy to North Ramp I-235 Bridge	30,381
Valley West Drive	South Ramp I-235 Bridge to Woodland Avenue	21,140
Valley West Drive	Woodland Ave to Ashworth Road	17,073
Valley West Drive	Meadow Lane to Giles Street	12,855
Valley West Drive	Maple Street to E.P. True Parkway	12,612
Vine Street	4th Street to 5th Street	3,224
Vine Street	6th Street to 7th Street	3,458
Vine Street	16th Street to Grand Avenue	3,513
Vine Street	Grand Avenue to 18th Street	4,781
Vine Street	29th Street to 30th Street	2,859
Vista Drive	58th Street to 60th Street	3,252
Vista Drive	60th Street to 62nd Street	5,018
Vista Drive	66th Street to Office Plaza Drive	4,738
Vista Drive	Office Plaza Drive to Jordan Creek Pkwy	7,244
Westown Parkway	19th Place to 22nd Street	7,193
Westown Parkway	25th Street to 28th Street	11,411
Westown Parkway	29th Street to 30th Street	8,651
Westown Parkway	31st Street to 35th Street	10,017
Westown Parkway	36th Street to 42nd Street	12,406
Westown Parkway	45th Street to 50th Street	10,673
Westown Parkway	50th Street to West Lakes Parkway	14,036
Westown Parkway	Lake Drive to 68th Street	7,310
Woodland Avenue	33rd Street to Valley West Dr.	2,112
Woodland Avenue	Valley West Drive to 39th Street	4,674
Woodland Avenue	Vividell Lane to 42nd Street	3,193
Woodland Avenue	42nd Street to 45th Street	1,859
Woodland Avenue	45th Street to 49th Street	2,598
5th Street	Elm Street to Maple Street	1,684
8th Street	Office Park Road to Center Street	19,311
8th Street	Clegg Road to Ashworth Road	14,056
8th Street	Prospect Drive to Hillside Street	5,626
8th Street	Walnut Street to Elm Street	4,006
19th Street	Pearl Drive to Vine Street	7,854
19th Street	Locust Street to Elm Street	7,112
22nd Street	University Avenue to Westown Parkway	24,189
22nd Street	Kingman Avenue to North Ramp I-235	28,141
22nd Street	21st Street to Ashworth Road	9,761
25th Street	University Avenue to Westown Parkway	1,977
South 35th Street	Mills Civic Pkwy to Park Haven Dr	2,255
South 35th Street	Thornwood Road to Grand Ave	959
42nd Street	Corporate Drive to Westown Parkway	6,114
42nd Street	Woodland Avenue to Francrest Circle	4,423
50th Street	University Avenue to Corporate Drive	17,127
50th Street	Westown Parkway to I-235	20,781
50th Street	Woodland Avenue to Ashworth Road	18,841

50th Street	Ashworth Road to Colt Drive	17,697
South 50th Street	E.P. True Parkway to Westwood Drive	12,013
South 50th Street	Westwood Drive to Mills Civic Parkway	11,705
South 50th Street	Park Drive to Grand Avenue	4,281
60th Street	University Avenue to Westown Parkway	13,233
60th Street	Westown Parkway to Vista Drive	15,775
60th Street	Vista Drive to Ashworth Road	14,512
60th Street	Ashworth Road to E.P. True Parkway	13,252
South 60th Street	Mills CP to Booneville Road - Gravel	794
68th Street	E.P.True Pkwy to Wistful Vista Drive	6,424
South 68th Street	Coachlight Drive to Mills Civic Pkwy	8,618
South 68th Street	Mills Civic Pkwy to South 64th Street	2,503

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Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

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PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:
Application Type

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Safety Funds Requested Þ ммрΣфлл

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Rev. 3/08

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 Solon

Signed: Cami Rasmussen 8/15/14

Signature Date Signed

Cami Rasmussen

Typed Name

Attest: Susie Siddell 8/15/14

Signature Date Signed

Susie Siddell

Typed Name

Highway 1 & Main Street - Signal Evaluation

A formal traffic signal analysis was conducted for the Highway 1 / Main Street intersection and can be viewed in Appendix A. The signal analysis indicates that the 8-hour vehicle volume warrants are not met, indicating that there is not enough side street traffic continuously throughout the day to justify stopping traffic on Highway 1. That said, the intersection does meet the four-hour vehicle volume warrants and the AM and PM peak hour vehicle volume warrants. This indicates that there is enough side street traffic during peak travel periods to justify stopping Highway 1 traffic with a traffic signal.

An evaluation of sight distance was performed at the intersection in tandem with the signal analysis. Visibility is impacted by the buildings on the north corners, and by vegetation on the southwest corner. Although installing a traffic signal would help alleviate some of the issues caused by the limited sight distance (as Main Street traffic would not have to look for cross traffic during the “green” signal cycle), eastbound drivers turning right-on-red from the side-streets would still have visibility issues that would require they pull forward past the stop bar to determine if there is a safe gap in traffic. The collision history does not indicate that the visibility limitations are causing a significant safety concern at the intersection; however a traffic signal would improve conditions for drivers on Main Street. The signal cycle would be relatively short at this intersection, which would keep delay to a minimum for Highway 1 traffic which carries the majority of traffic at the intersection.

Staff Recommendations:

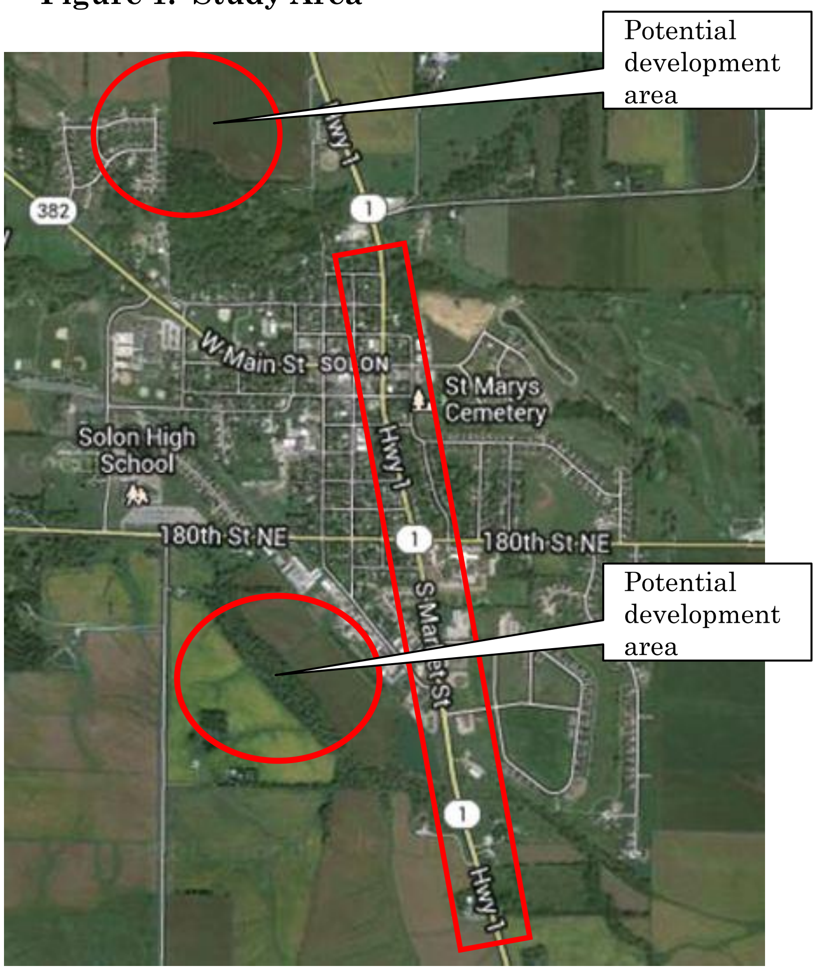
Highway 1 / Main Street intersection carries more side-street traffic than other intersections in town and has inherent visibility issues. The Highway 1 / Main Street intersection is also the “gateway” to Solon‟s downtown commercial district. As such, we would recommend signalization of the Highway 1 / Main Street intersection prior to installing signals at other Highway 1 intersection, unless there is a significant shift in traffic patterns.

Existing Conditions

Study Area

This study generally includes the entire incorporated area of the City of Solon, but also includes several key locations for which specific study elements are addressed. Key locations include the Highway 1 corridor, Highway 1 & Main Street intersection, the anticipated subdivision(s) generally located north of Solon (west of Highway 1), and a future development area to the south of 180th Street (Figure 1)..

Figure 1: Study Area



Comprehensive Plan

With respect to transportation, the City of Solon Comprehensive Plan identifies several major goals that the City should aim to achieve. Several of those goals, including "Increasing safety of the transportation system in Solon" and "Increasing pedestrian safety" are consistent with the recommendations provided by this study.

Highway 1 - Traffic Speeds

Data on vehicle speeds were collected at several locations along Hwy 1 between Main Street and 5th Street in Solon. The purpose of this analysis is to determine if existing vehicle speeds are appropriate for the primarily residential corridor. Measured speeds in this study are represented as 85th percentile speeds.

85th percentile speeds are used by traffic engineers as a measure of the "safe and reasonable" speed on a roadway. This is the average speed at which 85% of motorists are traveling at, or below. Typically speed limits are set near the 85th percentile speed so that there is voluntary compliance by the majority of motorists. If speed limits are set below the 85th percentile speed, consistent police enforcement may be necessary as a high percentage of motorists will likely violate the posted speed limit.

Existing Conditions

Highway 1 is a major north/south arterial connection between Iowa City (to the south) and the City of Mt. Vernon (to the north). The corridor has no existing stop or signal control for north/southbound motorists except for a pedestrian activated signal between 1st Street and 3rd Street. The existing posted speed limit within the study corridor (5th Street to Main Street) is 30mph.

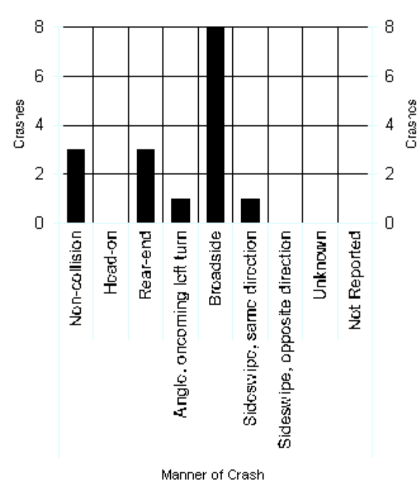
Traffic Speeds

In May 2013, 85th percentile speeds were recorded at 34mph northbound and 37mph southbound between 1st Street & 3rd Street. In March 2012, 85th percentile speeds were recorded at 35 mph northbound and 38mph southbound north of 5th Street on Highway 1.

Collisions

Between 2010-2012 there were 16 documented collisions on Highway 1 between 5th Street and Main Street. This figure includes all collisions over $1000 in property damage and/or collisions resulting in personal injury. Table 1 shows the number and types of incidents that occurred during this timeframe. A majority of collisions in the corridor were 'broadside' collisions, with (2) occurring at the Main Street / Hwy 1 intersection and (6) occurring at the 5th Street / Hwy 1 intersection. These figures are not surprising given

Table 1 – collision history



the relatively high volumes of traffic entering the Highway 1 corridor from these streets and relatively high vehicle speeds on the Hwy 1 corridor. The MPO conducted a signal warrant analysis in 2012 that shows a traffic signal is warranted at the 5^{th} Street intersection. Installation of traffic signal at this location would likely reduce the occurrence of broadside collisions at this location.

Analysis

The measured 85^{th} percentile speeds on Highway 1 and the documented collision history within the study area suggest the existing 30 mph posted speed limit is appropriate between 5^{th} Street and Main Street. The typical motorist is traveling approximately 4-7 mph over the posted speed between 1^{st} and 3^{rd} Street and approximately 5-8 mph over the speed limit near 5^{th} Street. This is not uncommon for corridors with good sight distance characteristic of Highway 1. Higher southbound 85^{th} percentile speeds near 5^{th} Street are also expected as motorists anticipate the transition to 45mph near 6^{th} Street.

Broadside type collisions are the most common type of collision within the corridor. This does not come as a surprise given the 85^{th} percentile speeds and the relatively large number of driveways and intersections located within the corridor. Increasing the posted speed limit would likely increase the number and/or severity of broadside (and other) type collisions. With the existing 85^{th} percentile speeds above 30mph, a reduction in the 30mph posted speed is also not a good alternative unless accompanied by stringent enforcement.

For this reason, staff feels that the current 30mph speed limit between Main Street and 5^{th} Street is appropriate and does not recommend changing the posted speed limit within this area. However, given that vehicle speeds are (on average) 4-8mph over the posted speed limit, spot speed enforcement should be conducted to bring 85^{th} percentile speeds closer to the posted speed limit.

Staff Recommendations:

- Use of spot police enforcement and use of radar trailers on Highway 1 (between 6^{th} Street and main Street) to bring 85^{th} percentile speeds closer to the 30mph posted speed limit.

Highway 1 & Main Street - Signal Evaluation

A formal traffic signal analysis was conducted for the Highway 1 / Main Street intersection and can be viewed in Appendix A. The signal analysis indicates that the 8-hour vehicle volume warrants are not met, indicating that there is not enough side street traffic continuously throughout the day to justify stopping traffic on Highway 1. That said, the intersection does meet the four-hour vehicle volume warrants and the AM and PM peak hour vehicle volume warrants. This indicates that there is enough side street traffic during peak travel periods to justify stopping Highway 1 traffic with a traffic signal.

An evaluation of sight distance was performed at the intersection in tandem with the signal analysis. Visibility is impacted by the buildings on the north corners, and by vegetation on the southwest corner. Although installing a traffic signal would help alleviate some of the issues caused by the limited sight distance (as Main Street traffic would not have to look for cross traffic during the "green" signal cycle), eastbound drivers turning right-on-red from the side-streets would still have visibility issues that would require they pull forward past the stop bar to determine if there is a safe gap in traffic. The collision history does not indicate that the visibility limitations are causing a significant safety concern at the intersection; however a traffic signal would improve conditions for drivers on Main Street. The signal cycle would be relatively short at this intersection, which would keep delay to a minimum for Highway 1 traffic which carries the majority of traffic at the intersection.

In December of 2012, a signal warrant analysis was also performed for the Highway 1 / 5th Street intersection. That intersection also does not meet the 8-hour traffic volume warrants, but does meet the four-hour and the peak-hour warrants. There is also not a collision history that indicates a significant safety issue that would be improved if traffic signals were installed.

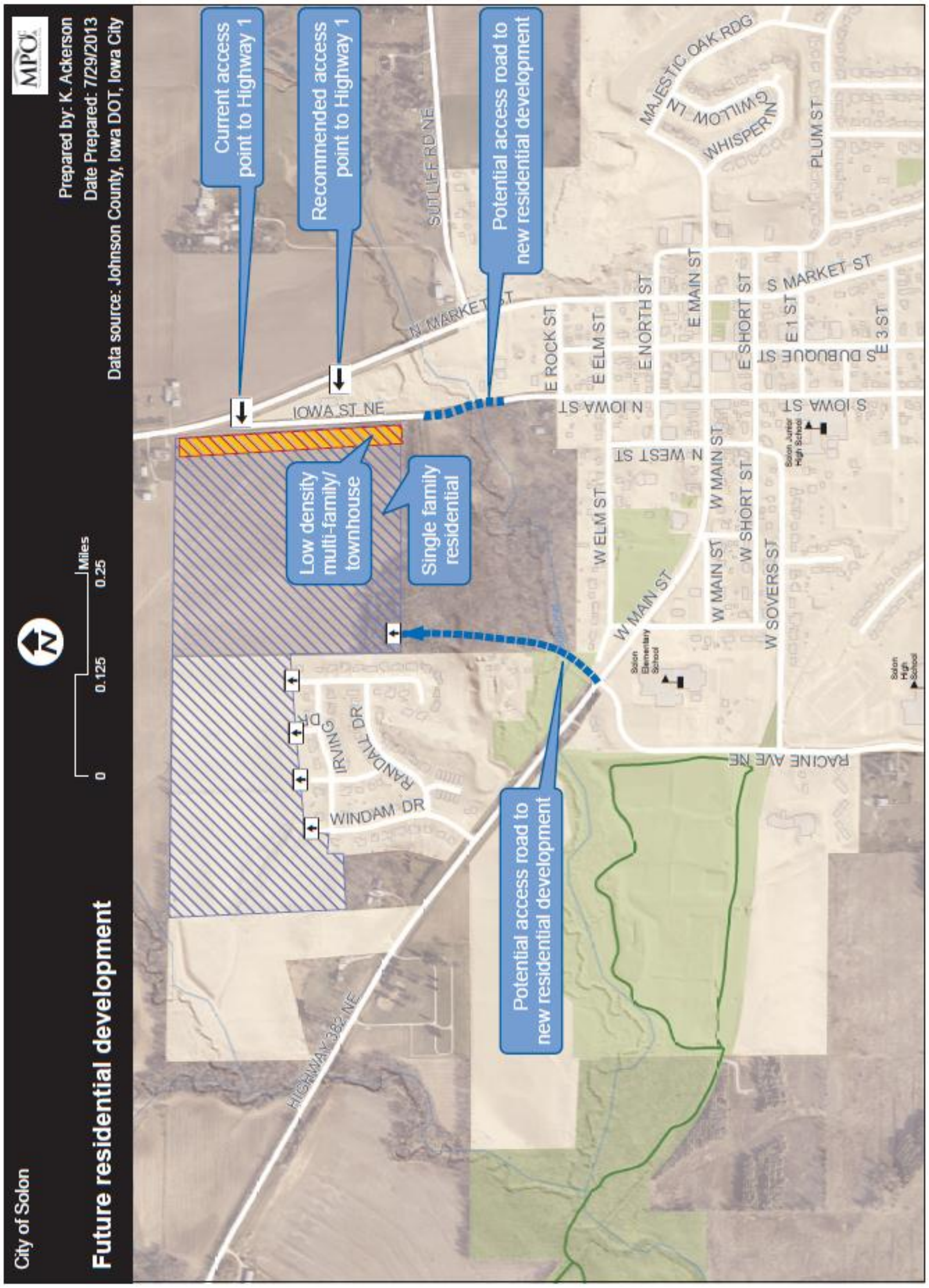
Staff Recommendations:

- Both intersections have relatively similar characteristics; however the Highway 1 / Main Street intersection carries more side-street traffic and has inherent visibility issues. The Highway 1 / Main Street intersection is also the "gateway" to Solon's downtown commercial district. As such, we would recommend signalization of the Highway 1 / Main Street intersection prior to installing signals at the Highway 1 / 5th Street intersection, unless there is a significant shift in traffic patterns.

North Solon Development Area

City Administration requested that MPO staff provide an analysis for an anticipated 75 acre subdivision(s) generally located north of W. Elm Street and west of Highway 1 (Figure 2).

Figure 2: Anticipated Development Area & Potential Access Points



Trip Generation Estimate North Solon Development Area

To estimate the traffic generation for the North Solon Development Area assumptions were made on the type of residential land use and density based on the Solon Comprehensive Plan and the densities of other recent residential development in Solon (Table 2).

Table 2: Vehicle Trips per Day – North Solon Development Area

Land Use	Acres	Units/Acre	Units	Vehicle trips / unit	Vehicle trips / day
Low density multi-family / townhouse	7.5	6	45	6	270
Single Family	75	2.5	188	10	1,880
Total	82.5				2,150

Based on these estimates, full build-out of the North Solon Development Area will generate 2,150 vehicle trips per day (vpd). Table 3 below describes our assumptions on how this traffic will be distributed into and out of this area. Please note that with this size of a development area, we recommend that N. Iowa Street be reconnected across Mill Creek – this will help relieve the potential traffic burden on Windham Drive, a residential street. Other than Windham Drive and N. Iowa St, there is no other logical opportunity for street connectivity to the south without property acquisition.

Table 3: Traffic Distribution Estimates* – North Solon Development Area

	Vehicle trips / day	Highway 1 access	N Iowa St	Windham Drive
In-bound	1,075	537 (50%)	215 (20%)	322 (30%)
Out-bound	1,075	538 (50%)	215 (20%)	323 (30%)
Total	2,150	1,075 (50%)	430 (20%)	645 (30%)

*Please note these are estimates for the purpose of illustrating vehicle trip distribution. Actual vehicle trip distribution can be verified once development has occurred in the North Solon Development Area, and confirming the number of access points into the North Solon Development area.

Highway 1 Access

Traffic speed and volume data was collected on Highway 1 near the North Solon City Limits in May 2013.

Table 4: Average Daily Traffic (ADT), Highway 1, near North Solon City Limits

	ADT	AM Peak Hour	PM Peak Hour	85th percentile speed*
Northbound	3,591	184	486	59.7 MPH
Southbound	3,613	427	318	62.2 MPH
Total	7,204	611	804	

*85th percentile speed is the traffic engineering measurement used to describe the speed of a safe and reasonable motorist given the conditions. 85 percent of traffic is traveling at or below the 85th percentile speed

Based on the 85th percentile traffic speed and sight distance along the highway corridor, locations for a potential access to Highway 1 were evaluated. Sight distance is important to evaluate on any higher speed and/or higher-volume corridor due to the need to maintain adequate visibility for traffic turning into and out of a highway access point.

For sight distance at 65 MPH (the minimum recommended standard based on actual traffic speeds), at least 645 feet of visibility is required. Stopping sight distance is the distance necessary for a motorist to see an obstruction in the road such as a vehicle, react, and come to a stop. It is conservative in that most motorists will not need to come to a full stop when they see a vehicle turning onto Highway 1, they would just need to see the vehicle and be ready to react.

Based on sight distance measurements conducted in June 2013, the existing N Iowa Street / Highway 1 intersection would meet stopping sight distance requirements. However, sight distance improves to the south of the N Iowa St / Highway 1 intersection, and other locations to the south (north of Mill Creek) would be appropriate.

Table 5: Stopping Sight Distance required at 65 MPH = 645 feet

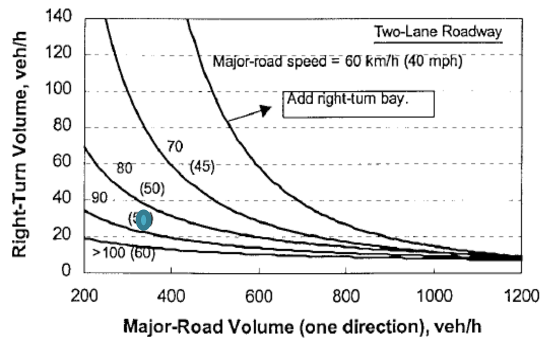
Location	Measured Sight Distance
North Iowa St / Highway 1	660 feet
Davis Vet Driveway	1,340 feet
Just north of Mill Creek	1,690 feet

As the North Solon Development Area is annexed and begins to develop to City densities, it will be appropriate to request that the Iowa DOT or MPOJC conduct a speed study on Highway 1 to potentially reduce the speed limit on Highway 1. Any reduction in actual traffic speed will reduce necessary sight distance.

Left Turn Lane Analysis – Highway 1 access

Staff analyzed the need for a northbound left turn lane and a southbound right turn lane for the proposed new access to Highway 1. The evaluation for a left turn lane is based on the advancing (northbound) volume of peak-hour traffic, the opposing (southbound) volume of peak hour traffic, and the percentage of traffic making left turns.

Based on our assumptions regarding the traffic volume which would be accessing this area via Highway 1, we can estimate traffic volumes and percentages making right and left turns into the area from Highway 1. The PM Peak hour was used for this analysis, as the majority of traffic turning into the property will likely be during the PM Peak.



(a)

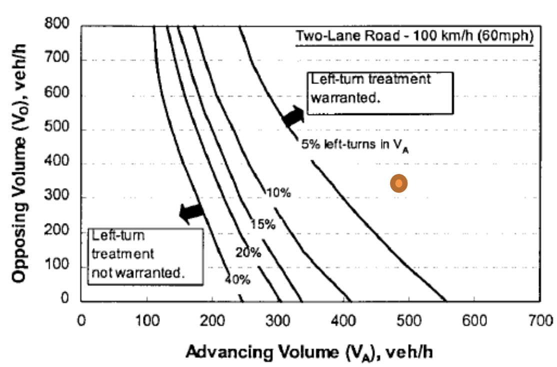
Table 6: ADT Volume Turning into Highway 1 Access = 537 vpd

	Northbound (left turns)	Southbound (Right turns)
Daily Volume	268 (50%)	269 (50%)
PM Peak Volume	27 (10%)	27 (10%)
Total PM Peak Volume	486	345
% NB Left turns	[27 / 486] = 5%	[27 / 345] = 8%

Using National Cooperative Highway Research Program (NCHRP) guidance, a northbound left turn lane is clearly warranted. This is primarily due to the volume of peak hour traffic on Highway 1 and the introduction of left-turning vehicles. The left-turn lane allows vehicles to shift out of the travel lane when slowing down to make a left turn thereby minimizing the chance of a rear-end collision and preserving highway capacity. While the volume of left-turning vehicles is predicted to be relatively low, the higher volume of northbound Highway 1 traffic and traffic speeds make a left-turn lane warranted.

Right Turn Lane Analysis – Highway 1 Access

A southbound right turn lane / deceleration lane is also warranted primarily due to the volume of peak hour southbound vehicles and the speed of traffic. A southbound right turn lane allows right-turning vehicles to transition out of the travel lane thereby minimizing rear-end collisions and same-direction side-swipe collisions. If actual traffic



(c)

speeds are reduced on Highway 1, rear-end and side-swipe collisions become less of a concern and a southbound right turn lane may not be warranted.

Access

To handle the estimated 2,150 vehicle trips per day estimated to be generated by the subject property, staff recommends a minimum of two access points to/from the property. A minimum of two access points ensures emergency access in the event of an emergency, and will also minimize the amount of traffic funneling through any one residential street – thereby minimizing safety concerns and frustration with increased neighborhood traffic.

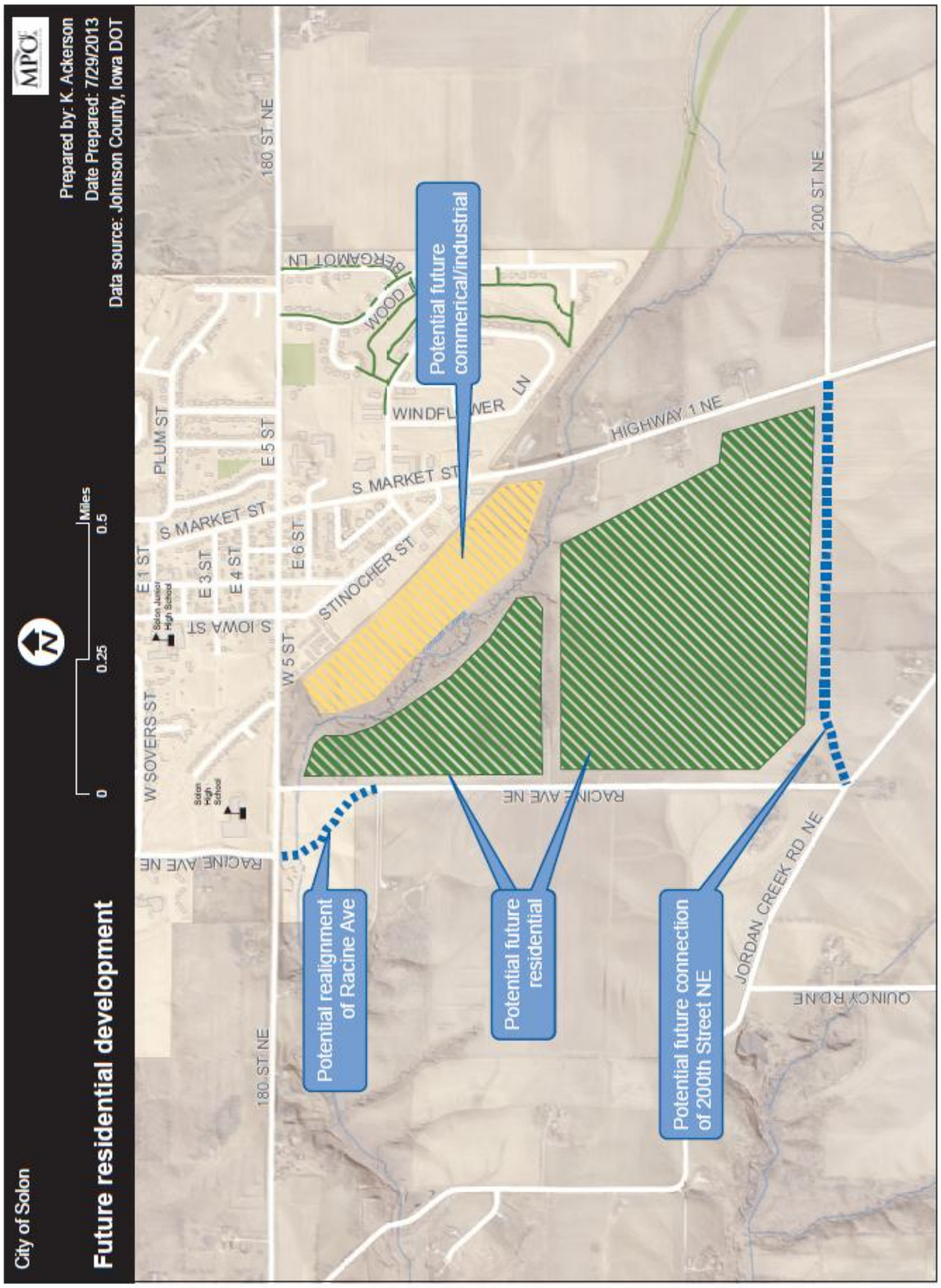
Staff Recommendations:

- Provide connections to the potential North Solon Development Area via Windam Drive, Montclair Street, Irving Drive, and Crestview Drive. Given that there are existing 'stub' streets already constructed, these locations would allow for logical connections to the subject property from the south.
- Provide access(s) to N. Iowa Street to the east of the subject property. Also reestablish the connection of N. Iowa Street across Mill Creek. Reestablishing this connection will allow motorists an alternative to access the downtown core without having to enter the Highway 1 corridor.
- Provide access to Highway 1 via N. Iowa Street. While the existing access of N. Iowa Street at Highway 1 meets sight distance criteria, moving the access to the south could provide a safer connection to the Highway 1 corridor.
- Study the need for a northbound left-turn lane and a southbound right-turn lane on Highway 1 when development proposals are submitted. Using the assumptions made for this study, construction of both the right and left-turn lanes are warranted.

South Solon Development Area

City Administration requested that staff provide a brief analysis of what type(s) of future development and access would be appropriate generally south of 180th Street and west of Highway 1. Figure 2 below shows a general concept of what may be appropriate for this area based on current land use and development patterns [please note that this is conceptual and does not take into account property ownership, environmentally sensitive areas, topography, or infrastructure needs].

Figure 2: Concept Development Area & Potential Access



Due to existing land-use patterns and topography it is logical for the commercial / industrial area located south of Stinocher Street to expand southward towards the wooded creek. The wooded creek provides an approximate 200-300 ft. buffer area that would naturally separate the recommended commercial / industrials uses from potential residential uses south of the wooded creek area (Figure 2).

If this area is to redevelop, there may also be an opportunity to realign Racine Avenue so that it aligns north and south of 180th Street. This would provide a more logical connection of Racine Avenue and provide safety benefits should the corridor ever be reconstructed to urban standards. Similarly, should future development occur, there would also be an opportunity to provide a connection from Racine Avenue to the Highway 1 corridor with a future 200th Street connection shown conceptually in Figure 2.

Staff Recommendations:

- Should development and annexation occur south of 180th Street, investigate realignment of Racine Avenue so that it aligns north and south of 180th Street. This would provide a more logical connection of Racine Avenue and provide safety benefits. Similarly, investigate providing a connection from Racine Avenue to the Highway 1 corridor with a future 200th Street connection.

Bicycle & Pedestrian Network

The City of Solon has a growing sidewalk and trail network that provides routes through town and extending into unincorporated Johnson County. The sidewalk network totals 9.8 miles and the trail system is 2.5 miles – a total of 12.3 miles. The following summarizes an inventory of the bicycle and pedestrian network for the City of Solon.

Existing bicycle and pedestrian network

The map in Appendix B illustrates the extent of sidewalks along the street network. Three areas stand out as opportunities. One is the residential neighborhood in the vicinity of Windflower Lane; the City of Solon currently requires residential development to provide sidewalks for new construction, so gaps in this area will naturally fill-in over time.

The second area includes West Elm Street and a few neighboring streets – constructing a sidewalk in this area would enable multiple connections: to the trail alongside West Main Street (Highway 382), to Racine Avenue NE, and to the Solon Rec and Nature Center.

The third area that the City could consider addressing is the South Market Street commercial corridor, which was recently reconstructed but does not include bike lanes or sidewalks. Being a commercial area, it would benefit these businesses if customers were enabled to choose various modes of transportation.

Complete Streets Policy

Communities across the state are making their roads safer and more accessible for everyone who uses them by adopting ‘complete streets policies.’ The policy can be adopted by resolution or ordinance to formalize the community’s intent to plan, design, operate, and maintain streets so safe facilities are provided for all users, including pedestrians, bicyclists, motorists, and freight vehicles. In eastern Iowa the cities of Iowa City, Cascade, and Dubuque have adopted complete streets policies. If the City of Solon would like to explore the idea further, MPO staff is available for assistance.

Trail System

The Johnson County Conservation Board is currently working with property owners to extend the Cedar Valley Nature Trail into Solon along the Lake McBride Trail. If/when this connection is completed, the trail will become a destination for recreational trail users from across the region and Solon will become the southernmost trailhead.

While the Conservation Board pursues trail development north of Solon, the City may consider extending a trail loop from Solon Rec and Nature Area – the City of Decorah recently completed a similar loop trail which has been a boon for residents and visitors (Appendix C). If constructed, a loop trail around Solon would be approximately four miles long. The alignment shown is a general concept based on topography, current land uses, and scenic corridors. MPOJC staff, and staff from the East Central Iowa Council of Governments can help assist with the trail planning process, if the City elects to discuss the idea further.

Pedestrian crosswalk across South Market Street (Highway 1)

The City recently installed a pedestrian actuated mid-block traffic signal (also referred to as a HAWK signal) south of East 1st Street to allow pedestrians to stop traffic on Highway 1 so that they can cross the highway safely. The corridor carries averages over 6,000 vehicles per day, which can make it difficult for pedestrians to find a safe gap in traffic to cross, especially during rush hour. The City could consider additional installations of these crosswalk improvements further north and south of this site – perhaps in the vicinity of the commercial area around East 6th St. and/or near Main Street. If a traffic signal is installed at the Market St/Main St intersection, the City should consider pedestrian activated crosswalk signals with countdown timers.

Staff Recommendations:

- Fill gaps in the existing sidewalk network where possible (see Appendix B for locations).
- Investigate the adoption of a 'complete streets' policy. MPO staff is available to assist with this discussion.
- Request MPO staff assistance with exploration of planning / construction of a 4-mile loop-trail around Solon.
- Explore the use of additional signalized pedestrian crossings on Highway 1. This may be provided at signalized intersections or mid-block locations.

Appendix A

Date: August 16, 2013

To: Kent Ralston, Assistant Transportation Planner

From: Sidney Noyce, Transportation Planning Intern

Re: All-Way Stop and Traffic Signal Analysis for the Solon Highway 1 and Main Street Intersection

This memorandum documents both an all-way stop and traffic signal warrant study for the intersection of Highway 1 and Main Street in Solon.

Existing Conditions

Figure 1 shows an aerial view of Highway 1 (north-south) and Main Street (east-west). The intersection is currently stop controlled on Main Street. Both streets are two-way corridors with Highway 1 having a posted speed limit of 30 mph and Main Street a speed limit of 25 mph.

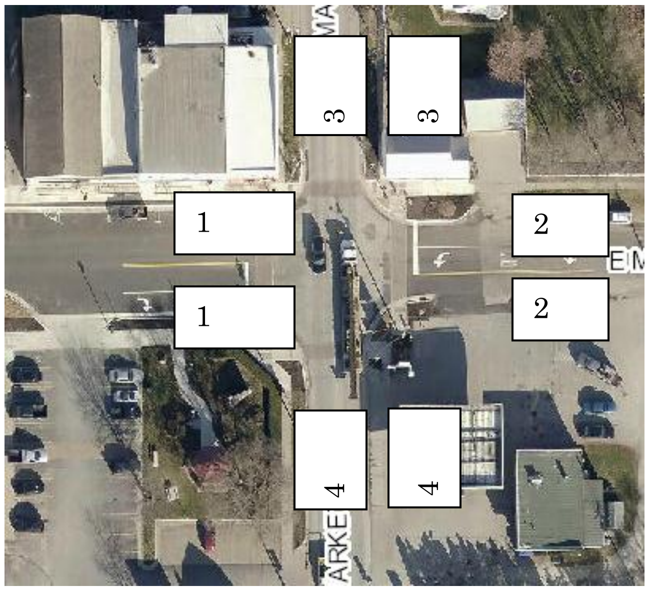
The intersection is located in a built-out area near the heart of Solon. Commercial uses are located near the intersection on both Highway 1 and Main Street. Residential uses are located in the northeast quadrant of the intersection. Visibility is somewhat limited for Main Street drivers due to the location of buildings and vegetation.

Figure 1: Highway 1 and Main Street

Traffic Counts

The average daily traffic counts and 85th percentile speeds were collected at the intersection May 7th – 10th, 2013 (**Figure 2**). Highway 1 carries the majority of the traffic at the intersection. The 85th percentile speeds on Highway 1 were recorded between 28 and 36 mph. The 85th percentile speeds on Main Street were recorded between 23 and 24 mph.

Figure 2: Average Daily Traffic Counts



Sight Distance

After coming to a complete stop on Main Street, drivers have some difficulty seeing traffic approaching the intersection on Highway 1. On the westbound approach, a driver's view of southbound traffic is somewhat blocked by a building (see **Figure 3**) resulting in a sight-distance of 336 feet from the stop sign. On the eastbound approach, both northbound and southbound visibility is limited by buildings and vegetation. Views of northbound traffic (**Figure 4**) are limited by a hedge, resulting in a sight-distance measurement of 290 feet. Views of southbound traffic (**Figure 5**) are obstructed by a building, resulting in a sight-distance measurement of 120 feet.

Figure 3: Westbound movement, looking north

Figure 4: Eastbound movement, looking south

Figure 5: Eastbound movement, looking north

With an 85th-percentile speed on Highway 1 between 30-35 mph, the design standard for sight distance is 250 feet. The westbound approach to the intersection does meet the standard and drivers must pull up past the stop sign to determine if there is a safe gap in traffic to enter the intersection. The south view from the eastbound approach passes the standard, but a reduction in the hedge height would improve visibility in that direction. The north view from the eastbound approach provides a driver with only half of the recommended standard for sight distance. Drivers must pull farther out into the intersection from the eastbound approach in order to determine if there is a safe gap in traffic to enter the intersection.

ALL-WAY STOP ANALYSIS

There are specific traffic conditions that should exist for an all-way stop to be justified. The criteria (warrants) are based on traffic volumes, collision history, pedestrian volumes, and traffic speeds. Installing stop signs in locations where they are not warranted results in a greater chance of rear-end collisions, motorists rolling through the stop signs, and higher traffic speeds downstream of the stop signs. It is important for all-way stop requests to be carefully considered for these reasons.

MUTCD All-Way Stop Warrant Analysis

In order to warrant an all-way stop controlled intersection certain criteria must be met to facilitate efficient traffic flow. In analyzing the intersection, *1 of 4* of the following criteria from the Manual on Uniform Traffic Control Devices (MUTCD) must be satisfied in order to warrant an all-way stop controlled intersection.

A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

- *A traffic signal is warranted at this location, but, due to a lack of correctable collisions, the multi-way stop interim measure would not be justified; therefore* ***Warrant A is not met****.*

B. 5 or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right and left-turn collisions as well as right-angle collisions.

- *Only four collisions occurred at the intersection from 2010-2012, of which three would be correctable by adding an all-way stop (****Table 1****); therefore,* ***Warrant B is not met****.*

Table 1 – Collision Analysis

Highway 1 & Main Street Collision History: 2010-2012		
Type of Crash	**Number of Collisions**	**Warranted? (> 5 per year)**
Rear-End	0	**No**
Broadside*	2	**No**
Non-Collision	1	**No**
Angle, oncoming left turn*	1	**No**

Sideswipe, same direction	0	No
Total Collisions	**4**	**No**

*Collision types considered correctable using multi-way stop control

C. Minimum volumes:

1. **The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and**
    - *Traffic from Highway 1, the major street, does average 300 entering vehicles per hour for 8 hours of an average day. Traffic exceeds 300 vehicles for a total of 14 hours; therefore* ***Warrant C1 is met (Appendix A)****.*
2. **The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but**
    - *Traffic from the minor street, Main Street, including pedestrians and bicycle traffic entering the intersection did not exceed 200 units for any hour; therefore* ***Warrant C2 is not met (Appendix A)****.*
3. **If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.**
    - *Highway 1 is posted at 30 mph and collection of 24-hour traffic and speed data confirmed that 85th percentile speeds near the intersection did not exceed 40 mph; therefore* ***Warrant C3 is not met****.*

D. Where no single criterion is satisfied, but where Criteria B, C1, and C2 are all satisfied to 80 percent of the minimum values. Criterion C3 is excluded from this condition.

- *This criterion is not applicable since Criterion C1 was met; therefore* ***Warrant D is not met****.*

Four additional optional criteria are available to use based on engineering judgment.

I. The need to control left-turn conflicts;

- *The lack of left-turn collisions (1 from 2010-2012) at the intersection does not warrant an all-way stop, therefore* ***optional Warrant I is not met****.*

II. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

- *There are not high pedestrian volumes at this intersection and no need to control vehicle/pedestrian conflicts; therefore* ***optional Warrant II is not met****.*

III. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting traffic is also required to stop; and

- *Sight distance issues do exist at the intersection. Assuming an 85th-percentile speed on Highway 1 of around 35 mph, a driver, after coming to a complete stop on Main Street, may not be able to safely maneuver through the intersection; therefore **optional Warrant III is met**.*

IV. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

- *The intersection is not residential in nature; therefore **optional Warrant IV is not met**.*

Warrant Summary

All-way stop control at the Highway 1 / Main Street intersection in Solon is not warranted as no warrant was met. Only Warrant C1 was met, but not Warrant C as a whole. Optional Warrant III was met due to sight distance and visibility issues at the intersection, but the lack of correctable collisions demonstrates that drivers are able to maneuver through the intersection. Alternatively, “Cross Traffic Does Not Stop” signs can be placed on the Main Street approaches to the intersection.

Warrant	Description	Warrant Met?
A	Interim Measure for Traffic Signal	No
B	Collision History	No
C1	Major Street Vehicle Volume	Yes
C2	Minor Street Ped, Bike, and Vehicle Volume	No
C3	85th Percentile Speeds	No
D	80% of Criterion B, C1, and C2	No
Optional #1	Control Left Turn Conflicts	No
Optional #2	Control Vehicle/Pedestrian Conflicts	No
Optional #3	Sight Distance & Visibility	Yes
Optional #4	Improve Residential Area Op Characteristics	No

TRAFFIC SIGNAL ANALYSIS

A traffic signal warrant analysis is performed to determine the need for a traffic signal. At a minimum, at least 1 of the 9 warrants must be met, but the satisfaction of a warrant does not in itself require the installation of a traffic signal.

The 9 traffic signal warrants are as follows:

1) Eight-Hour Vehicular Volume
2) Four-Hour Vehicular Volume
3) Peak Hour
4) Pedestrian Volume *(not evaluated)*
5) School Crossing *(not evaluated)*
6) Coordinated Signal System *(not evaluated)*
7) Crash Experience
8) Roadway Network
9) Intersection Near a Grade Crossing *(not evaluated)*

Please see the Manual on Uniform Traffic Control Devices (MUTCD) for further detail of each warrant. Traffic signal warrants 1-3 and 7 of the MUTCD were evaluated with respect to the observed traffic volumes. Twenty-four hour traffic counts were performed May 7th – 10th, 2013. Because Solon is an isolated community with a population of less than 10,000, the 70% factor for traffic volumes was used in the analysis.

Warrant 1 Analysis – Eight-Hour Vehicular Volume

Condition A – Minimum Vehicular Volume

Condition A examines whether the intersection meets the minimum vehicular volume per hour to warrant a traffic signal. *Eight* 1-hour periods must meet appropriate traffic volumes. With a one-lane approach at each leg of the intersection, during each hour the major street (Highway 1) must have a total of 350 vehicles entering the intersection and the higher volume minor leg (Main Street) must have 105 vehicles entering the intersection to meet Condition A. Only four 1-hour periods met these required volumes; therefore **Condition A is not met (Appendix B).**

Condition B – Interruption of Continuous Traffic

Condition B examines whether the traffic on the major street is so heavy that traffic on a minor street suffers excessive delay or conflict in entering or crossing the major street. With a one-land approach at each leg of the intersection, during each hour the major street (Highway 1) must have a total of 525 entering vehicles and the higher volume minor leg (Main Street) must have 53 vehicles entering the intersection to meet Condition B. Only six 1-hour periods met these required volumes; therefore **Condition B is not met (Appendix B)**.

Warrant 2 Analysis – Four-Hour Vehicular Volume

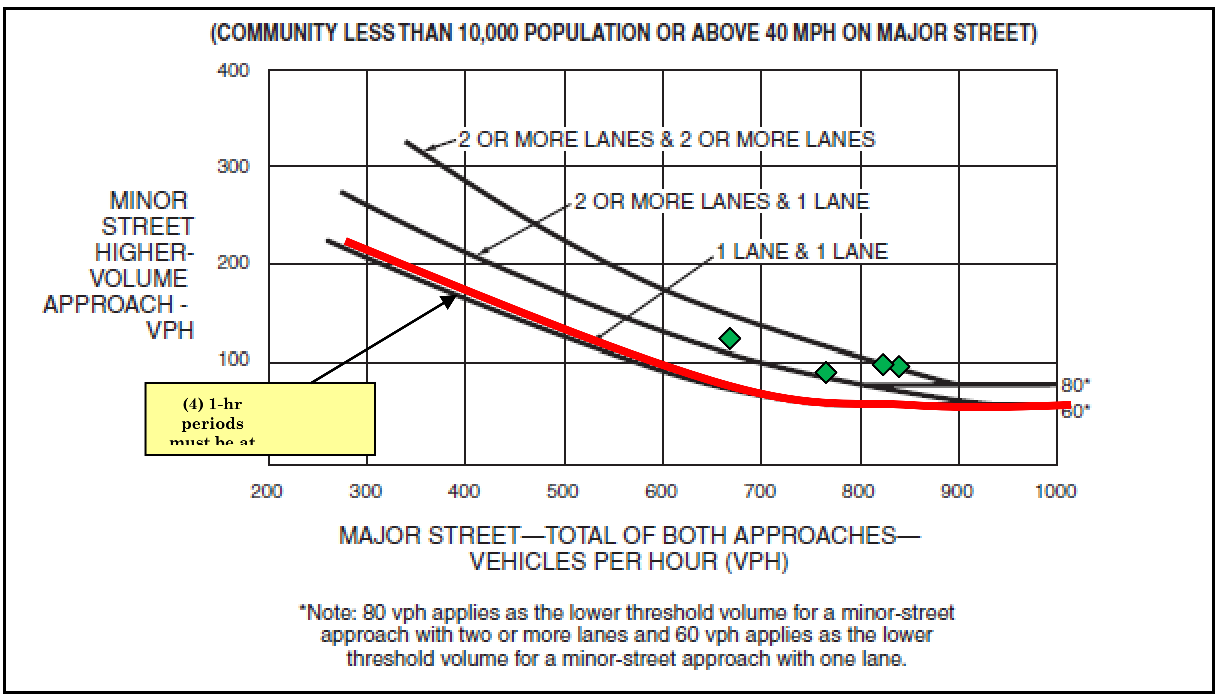
The four-hour vehicle volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is a principal reason to consider installing a traffic control signal. To meet Warrant 2, traffic volumes on both streets must meet the required volume threshold for four 1-hour periods. **Figure 6** graphically depicts the required vehicular volume threshold for the major and minor streets (red line) in comparison to the observed volumes. Both **Figure 6** and **Table 2** show that four 1-hour periods met the required vehicular volumes threshold; therefore **Warrant 2 is met.**

Table 2: Four-Hour Vehicular Volume*

Warrant 2: Four-Hour Vehicular Volume Highway 1 & Main Street, Solon			
Hour Threshold Met	**Highway 1 Major Street**	**Main Street Minor Street**	**Meets Volume Threshold**
0800	746	88	**Yes**
1600	655	123	**Yes**
1700	813	95	**Yes**
1800	830	90	**Yes**

*This table contains the four highest hourly traffic volumes

Figure 6: Four-Hour Vehicular Volume



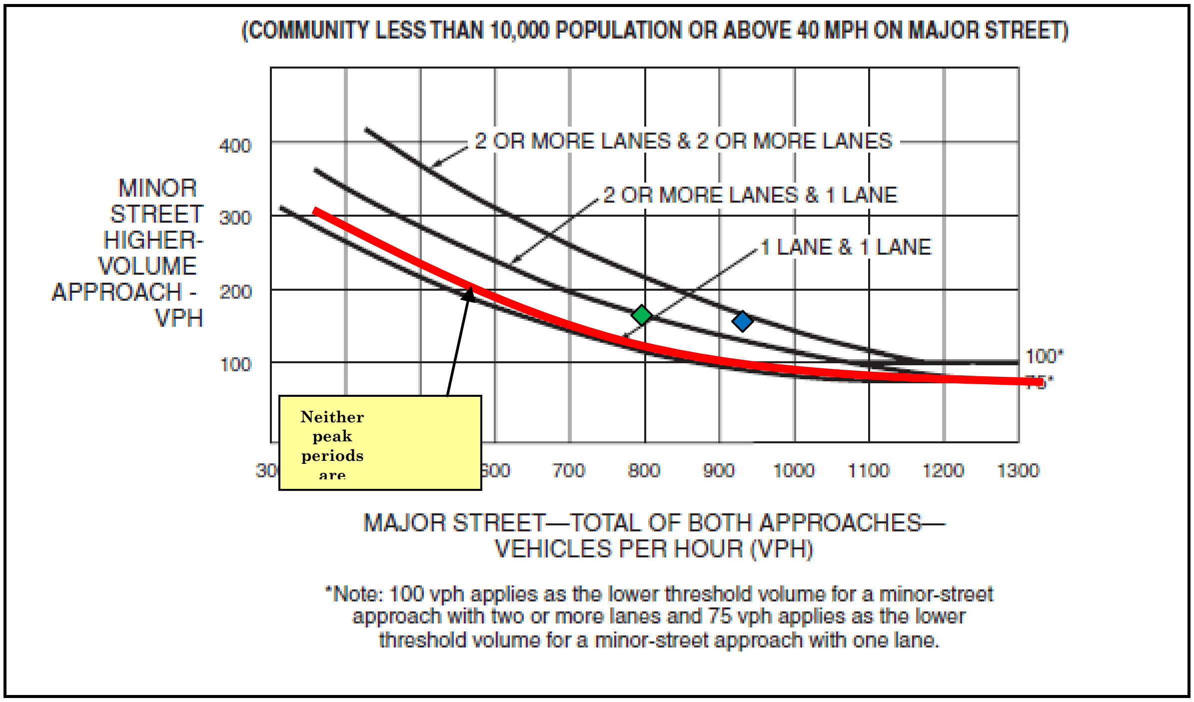
Warrant 3 Analysis – Peak Hour

The peak hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of one hour on an average day, the minor street traffic suffers undue delay when entering or crossing the major street. AM and PM peak hour traffic volumes were collected at the intersection on May 13th, 2013. Peak hour traffic volumes on both streets must meet required thresholds under Warrant 3. **Figure 7** depicts the required vehicular volume threshold for the major and minor streets (red line) in comparison to the observed volumes. **Figure 7** and **Table 3** show that both the AM and PM peak hours meet the required thresholds; therefore **Warrant 3 is met.**

Table 3: Peak Hour Warrant

Warrant 3: Peak Hour Traffic Volumes Highway 1 & Main Street, Solon							
Highway 1 Entering Traffic		Main Street Highest Vol. Approach		Warranted?		Legend	
AM	PM	AM	PM	AM	PM	AM	PM
765	899	167	152	Yes	Yes	◆	◆

Figure 7: Peak Hour Warrant Threshold & Observed Volumes



Warrant 7 Analysis – Collision Experience

Because the installation of traffic signals often results in a trade of one type of collision for another, Warrant 7 states that there must be 5 crashes of a type correctable by a signal in twelve months. From 2010 – 2012, there was a total of four accidents (one non-collision) at the Highway 1 and Main Street intersection. **Table 4** shows the number and type of collisions between 2010 and 2012; therefore **Warrant 7 is not met.**

Table 4: Collision Experience

Warrant 7: Crash Experience Highway 1 and Main Street: 2010 - 2012		
Type of Crash	**Number of Collisions**	**Warranted? (> 5 per year)**
Rear-End	0	**No**
Broadside*	2	**No**
Non-collision	1	**No**
Angle, oncoming left turn*	1	**No**
Sideswipe, same direction	0	**No**
Total Number of Collisions	**4**	**No**

*Types of collisions considered correctable by signalization

Warrant Summary

A traffic signal at the Highway 1 and Main Street intersection is warranted as 2 of 9 warrants were satisfied. Warrants 2 and 3 were met. Condition B under Warrant 1 was satisfied to within 75% of the threshold.

Warrant	Description	Warrant Met?
1	Eight-Hour Vehicular Volume	**No**
2	Four-Hour Vehicular Volume	**Yes**
3	Peak Hour	**Yes**
4	Pedestrian Volume	N/A
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	**No**
8	Roadway Network	N/A
9	Intersection Near a Grade Crossing	N/A

Delay and Level of Service (LOS)

EXISTING CONDITIONS

Existing intersection delay and Level of Service (LOS) was evaluated using the Synchro 8.0 traffic modeling software. Traffic congestion is expressed in terms of LOS as defined by the Highway Capacity Manual (HCM). LOS is a letter code ranging from "A" for free-flow conditions to "F" for extreme congestion.

Table 5: Percent of Total Traffic during Peak Travel Periods

Movement	AM Peak	PM Peak
Northbound (Hwy 1)	**29%**	**58%**
- Left	12%	17%
- Through	17%	40%
- Right	0%	1%
Southbound (Hwy 1)	**49%**	**24%**
- Left	0%	1%
- Through	44%	20%
- Right	5%	3%
Eastbound (Main St)	**17%**	**14%**
- Left	1%	1%
- Through	1%	1%
- Right	15%	11%
Westbound (Main St)	**5%**	**4%**
- Right	1%	1%
- Through	2%	2%
- Left	1%	1%

The intersection, as a whole, currently does not experience significant congestion as the majority of traffic is on Highway 1, which is not stop controlled. During the AM, the average daily delay per vehicle is 5.9 seconds (LOS A) and during the PM it is 5.2 seconds (LOS A). During the AM, the westbound left-turning movement experiences the most delay at 47.9 seconds (LOS E). During the PM, the westbound through / right turn movement experiences the most delay at 35.1 average seconds per vehicle (LOS E) **(Table 6).**

Table 6: Existing Delay and LOS

Highway 1 / Main Street – Existing Conditions				
Movement	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
Northbound (Hwy 1)	9.4	**A**	9.0	**A**
Southbound (Hwy 1)	8.1	**A**	7.6	**A**
Eastbound (Main St)	17.6	**C**	15.7	**C**
- Through/Left	22.8	**C**	19.3	**C**
- Right	13.8	**B**	13.0	**B**
Westbound (Main St)	34.0	**D**	25.8	**D**
- Through/Right	30.6	**D**	35.1	**E**
- Left	47.9	**E**	23.1	**C**
Average Delay / Vehicle	**5.9**	**A**	**5.2**	**A**

* Not enough traffic to generate delay and LOS

PROPOSED – SIGNALIZED WITH PERMISSIVE LEFT TURNS (FLASHING YELLOW ARROW)

Under signalized conditions with a permissive left turns (including a flashing yellow arrow) for all movements, the intersection would function well at LOS B during both peak hours. The northbound and southbound movements would both function at LOS B, while the eastbound movement would function at LOS B during the AM peak hour and LOS A during the PM peak hour. Westbound traffic would perform at LOS A during both peak hours **(Table 7).**

Table 7: Signalized Delay and LOS

Highway 1 / Main Street – Signalized with Permissive Left Turns (Flashing Yellow Arrow)				
Movement	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
Northbound (Hwy 1)	13.2	**B**	12.9	**B**
Southbound (Hwy 1)	13.2	**B**	14.9	**B**
Eastbound (Main St)	11.6	**B**	8.7	**A**
- Through/Left	11.9	**B**	9.0	**A**
- Right	9.6	**A**	7.4	**A**
Westbound (Main St)	9.9	**A**	7.6	**A**
- Through/Right	9.8	**A**	7.6	**A**
- Left	9.9	**A**	7.7	**A**
Average Delay / Vehicle	**12.7**	**B**	**12.9**	**B**

* Not enough traffic to generate delay and LOS

DELAY AND LOS COMPARISON: EXISTING AND SIGNALIZED

Northbound and southbound approaches of Highway 1, which currently function at a LOS A, decrease slightly to LOS B under signalized conditions. The eastbound approach of Main Street improves from LOS C to LOS B (AM) and LOS C to LOS A (PM) while the westbound approach improves from LOS D to LOS A. Average delay per vehicle at the intersection increases from 5.9 seconds (LOS A) to 12.7 seconds (LOS B) during the AM peak and from 5.2 seconds (LOS A) to 12.9 (LOS B) during the PM peak **(Table 8).**

Table 8: Delay and LOS Comparison

Highway 1 / Main Street – Average Delay per Vehicle and LOS								
Movement	Existing				Signalized – Permissive Left Turns			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Northbound (Hwy 1)	9.4	A	9.0	A	13.2	B	12.9	B
Southbound (Hwy 1)	8.1	A	7.6	A	13.2	B	14.9	B
Eastbound (Main St)	17.6	C	15.7	C	11.6	B	8.7	A
- Through/Left	22.8	C	19.3	C	11.9	B	9.0	A
- Right	13.8	B	13.0	B	9.6	A	7.4	A
Westbound (Main St)	34.0	D	25.8	D	9.9	A	7.6	A
- Through/Right	30.6	D	35.1	E	9.8	A	7.6	A
- Left	47.9	E	23.1	C	9.9	A	7.7	A
Average Delay	**5.9**	A	**5.2**	A	**12.7**	B	**12.9**	B

* Not enough traffic to generate delay and LOS

CONCLUSION

Based on analysis of the MUTCD all-way stop and traffic signal warrants, a traffic signal is warranted at the Highway 1 / Main Street intersection in Solon. Under traffic signal warrants, Warrants 2 and 3 are met while Warrants 1 and 7 are *not* met (Warrants 4, 5, 8, and 9 were not evaluated). The MUTCD states that a traffic signal is warranted if 1 of 9 warrants is satisfied; therefore, since 2 of 9 are satisfied, a traffic signal is warranted.

All-way stop control is currently not warranted at the intersection, even as an interim measure prior to signalization. No single warrant was met in the analysis and the lack of correctable collisions does not necessitate use of an all-way stop.

Signalization with permissive left turns increases the average delay of the intersection, but significantly improves the LOS of all movements on Main Street. Under this scenario, left-turning traffic must filter through gaps in opposing traffic to complete left-turning movements. The capacity analysis shows that the intersection (as a whole) would decrease from LOS A to B under signalized conditions. Highway 1 would operate at LOS B during both peak periods and Main Street's eastbound approach would operate at LOS B during the AM peak. All other movements on Main Street would *significantly* improve to LOS A.

Since the intersection is part of the State Highway 1 system, Solon should work with the Iowa Department of Transportation should they choose to move forward with signalization of the Highway 1 / Main Street intersection. MPOJC staff will be available to take part in those conversations if Solon chooses to move forward with those discussions.

Appendix A

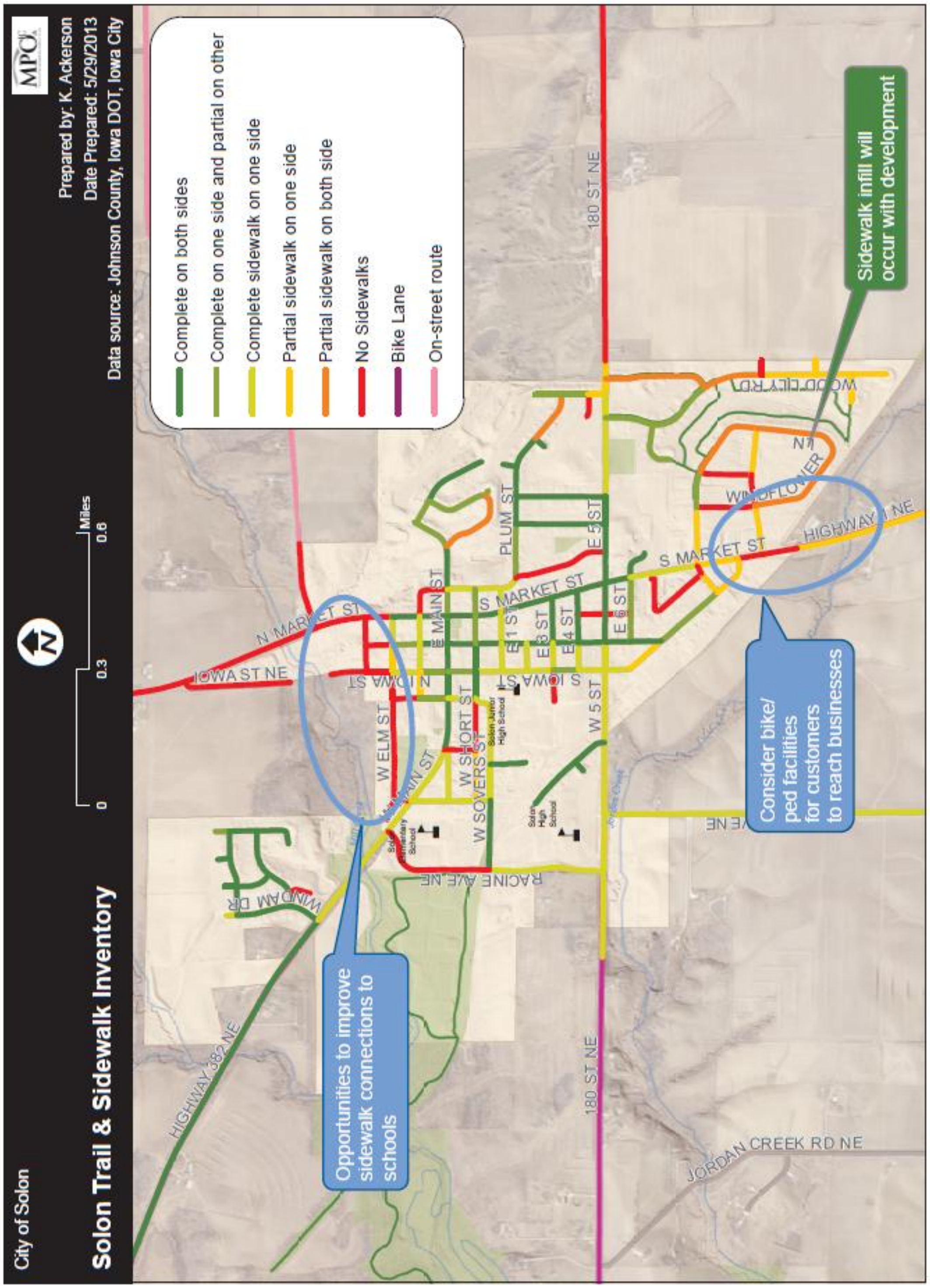
All-Way Stop Warrant C

Warrant C – Minimum Volumes Criterion C1 – Major Street Volume Criterion C2 – Minor Street Volume									
Highway 1 and Main Street									
Solon, IA	Data Gathered: May 7th – 10th, 2013							MPOJC	
Time	Entering Traffic				Total Entering Traffic	Major Street Total	Minor Street Total	Warranted?	
	Highway 1		Main Street						
	Northbound	Southbound	Eastbound	Westbound				C1	C2
0100	23	9	4	0	36	32	4	No	No
0200	15	5	5	0	24	20	5	No	No
0300	4	10	19	0	33	14	19	No	No
0400	9	13	62	0	83	21	62	No	No
0500	16	28	132	0	176	44	132	No	No
0600	32	105	169	3	308	137	172	No	No
0700	142	302	82	13	538	443	95	Yes	No
0800	276	470	88	24	859	746	112	Yes	No
0900	227	352	81	15	675	578	96	Yes	No
1000	193	247	96	9	545	440	105	Yes	No
1100	203	183	83	12	481	386	95	Yes	No
1200	233	177	84	10	505	411	94	Yes	No
1300	236	180	131	10	558	416	142	Yes	No
1400	245	186	149	7	588	432	156	Yes	No
1500	351	184	150	8	693	536	158	Yes	No
1600	441	214	123	17	795	655	140	Yes	No
1700	578	235	95	18	926	813	113	Yes	No
1800	589	241	90	19	940	830	109	Yes	No
1900	337	167	65	17	586	504	82	Yes	No
2000	234	106	25	8	373	340	33	Yes	No
2100	174	105	14	7	300	279	21	No	No
2200	120	82	5	2	208	201	7	No	No
2300	73	44	2	1	121	118	3	No	No
2400	42	20	1	1	63	62	1	No	No

Appendix B
Traffic Signal Analysis Warrant 1

Warrant 1 – Eight-Hour Vehicular Volume Condition A – Minimum Vehicular Volume Condition B – Interruption of Continuous Traffic									
Highway 1 & Main Street									
Solon, IA		Data Gathered: May 7th – 10th, 2013						MPOJC	
Time	Entering Traffic				Total Entering Traffic	Major Street Total	Highest Minor Approach	Warranted?	
	Highway 1		Main Street						
	Northbound	Southbound	Eastbound	Westbound				1A	1B
0100	23	9	4	0	36	32	4	No	No
0200	15	5	5	0	24	20	5	No	No
0300	4	10	19	0	33	14	19	No	No
0400	9	13	62	0	83	21	62	No	No
0500	16	28	132	0	176	44	132	No	No
0600	32	105	169	3	308	137	169	No	No
0700	142	302	82	13	538	443	82	No	No
0800	276	470	88	24	859	746	88	No	Yes
0900	227	352	81	15	675	578	81	No	Yes
1000	193	247	96	9	545	440	96	No	No
1100	203	183	83	12	481	386	8	No	No
1200	233	177	84	10	505	411	84	No	No
1300	236	180	131	10	558	416	131	Yes	No
1400	245	186	149	7	588	432	149	Yes	No
1500	351	184	150	8	693	536	150	Yes	Yes
1600	441	214	123	17	795	655	123	Yes	Yes
1700	578	235	95	18	926	813	95	No	Yes
1800	589	241	90	19	940	830	90	No	Yes
1900	337	167	65	17	586	504	65	No	No
2000	234	106	25	8	373	340	25	No	No
2100	174	105	14	7	300	279	14	No	No
2200	120	82	5	2	208	201	5	No	No
2300	73	44	2	1	121	118	2	No	No
2400	42	20	1	1	63	62	1	No	No

Appendix B
Trail & Sidewalk Inventory



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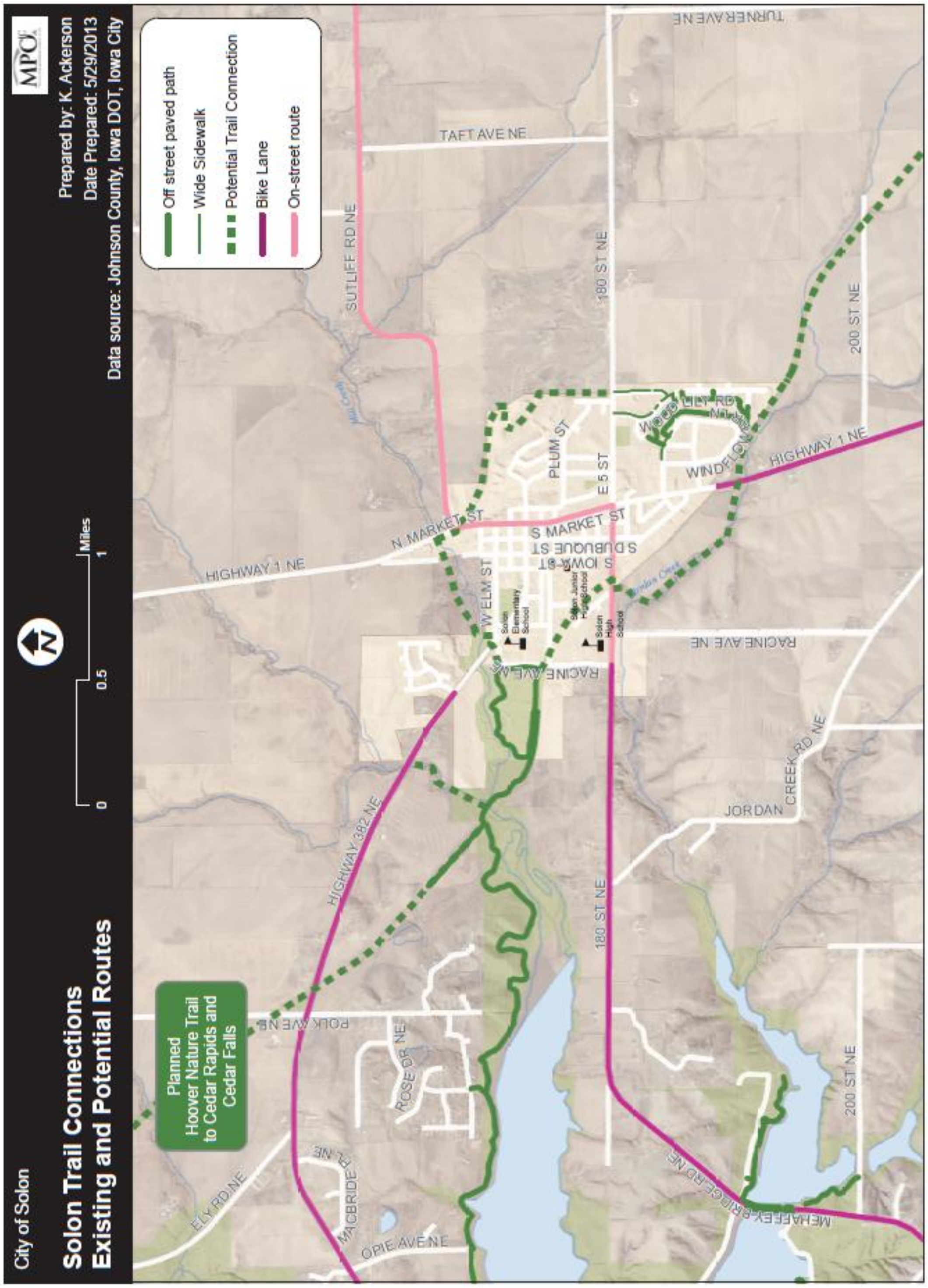
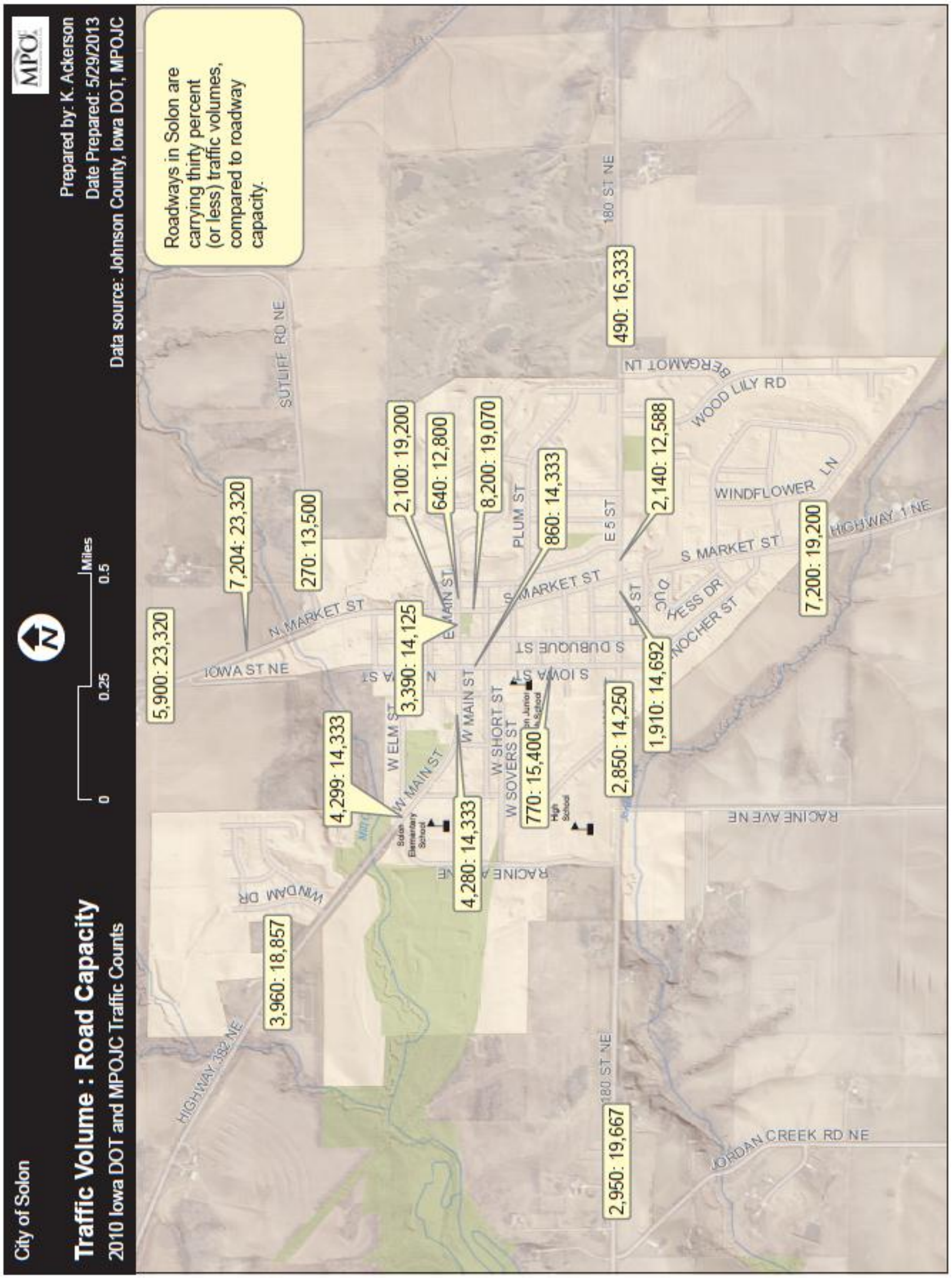
Appendix C
Trail Connections



Appendix D
Traffic Volume & Road Capacity



City of Solon	Traffic Control Device Application	14-Aug-14

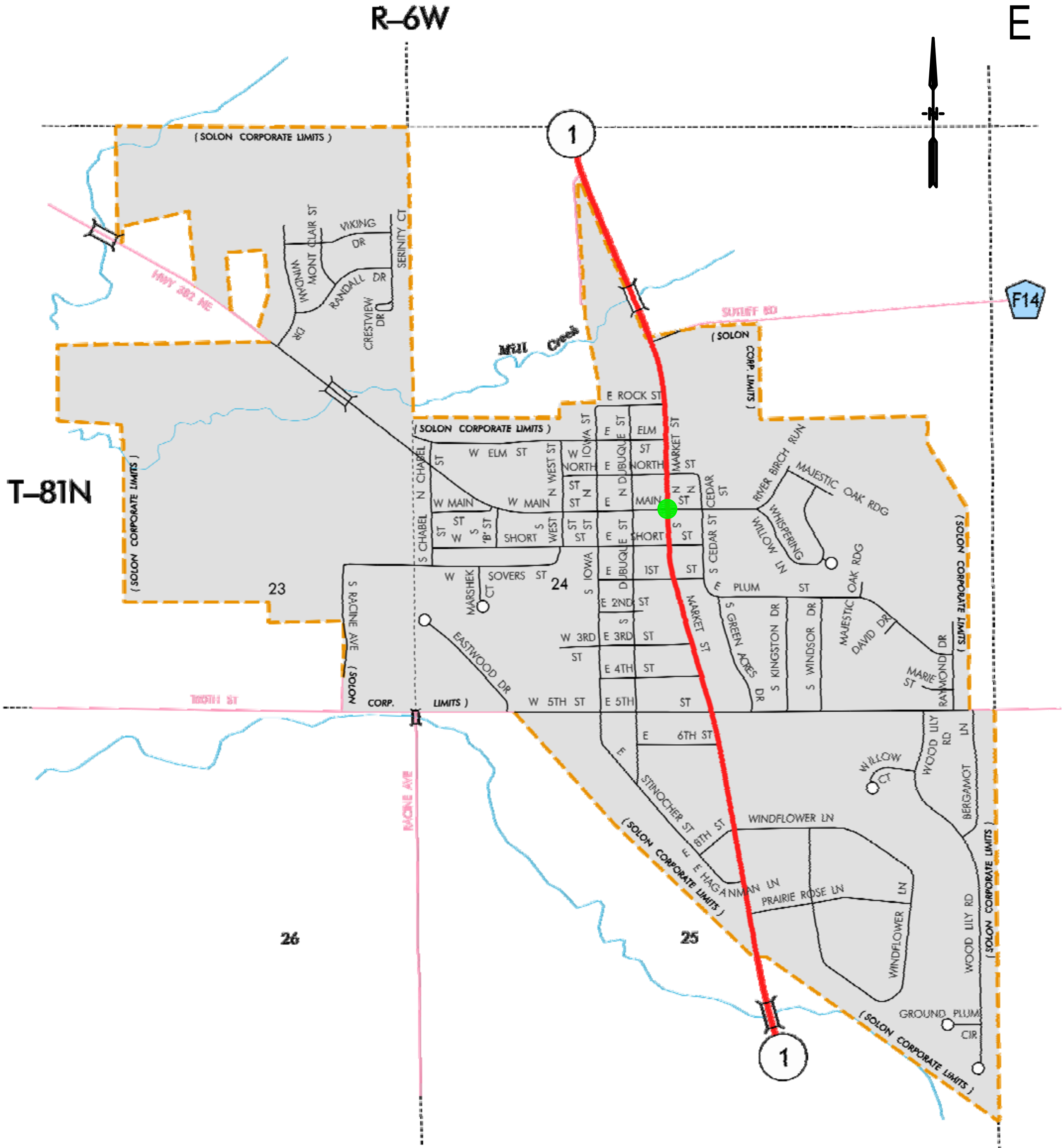
C. Itemized Breakdown of Cost

Mast Arm Ples with Lumiaries Brackets	$ 25,000.00
Traffic Signal Controller, Cabinet, Aux. Equipment	$ 15,000.00
Battery Backup	$ 5,400.00
Concrete Footings	$ 6,500.00
Traffic Signal Wiring	$ 5,000.00
Conduit (bored)	$ 6,500.00
Handholds	$ 3,500.00
Traffic Signal Heads	$ 7,500.00
Traffic Signal LED Indications	$ 2,500.00
Vehicle & Bicycle Detection	$ 25,000.00
ADA Pedestrial Push Button System	$ 7,000.00
Power Meter/Disconnect Box	$ 1,500.00
Pavement Markings	$ 2,000.00
Traffic Signs	$ 3,500.00
Materials Total	**$ 115,900.00**
Labor/Installation	$ 75,000.00
Contingency (10%)	$ 19,090.00
Engineering, Construction Inspection, Staking (15%)	$ 28,600.00
Total Project Cost	**$ 238,590.00**

City of Solon **Traffic Control Device Application** **14-Aug-14**

Project Schedule

Date	Activity
August, 2014	Submit TSIP Grant Application
December, 2014	Grant Approval
December, 2014	Prepare Plans and Specifications
January, 2015	IDOT Plan Review
March, 2015	Final Plan Revision
May, 2015	Request Bids for Project
June, 2015	Award Project
July, 2015	Begin Construction
September, 2015	Project Completion



PROJECT LOCATION: INTERSECTION OF MAIN ST & HIGHWAY 1

VEENSTRA & KIMM, INC.

LOCAION MAP
CITY OF SOLON
FIGURE E-1


201 S Market St
Exit Street View
HARDWARE
SPORTING GOODS
HOUSEWARE
gifts
25
© 2014 Google
© 2014 Google
Google earth
Report a problem
41°48'25.87" N 91°29'36.58" W elev 809 ft eye alt 814 ft


1731 N Market St
Exit Street View
© 2014 Google
© 2014 Google
Google earth
Report a problem
41°48'23.77" N 91°29'34.18" W elev 840 ft eye alt 815 ft


165 S Market St
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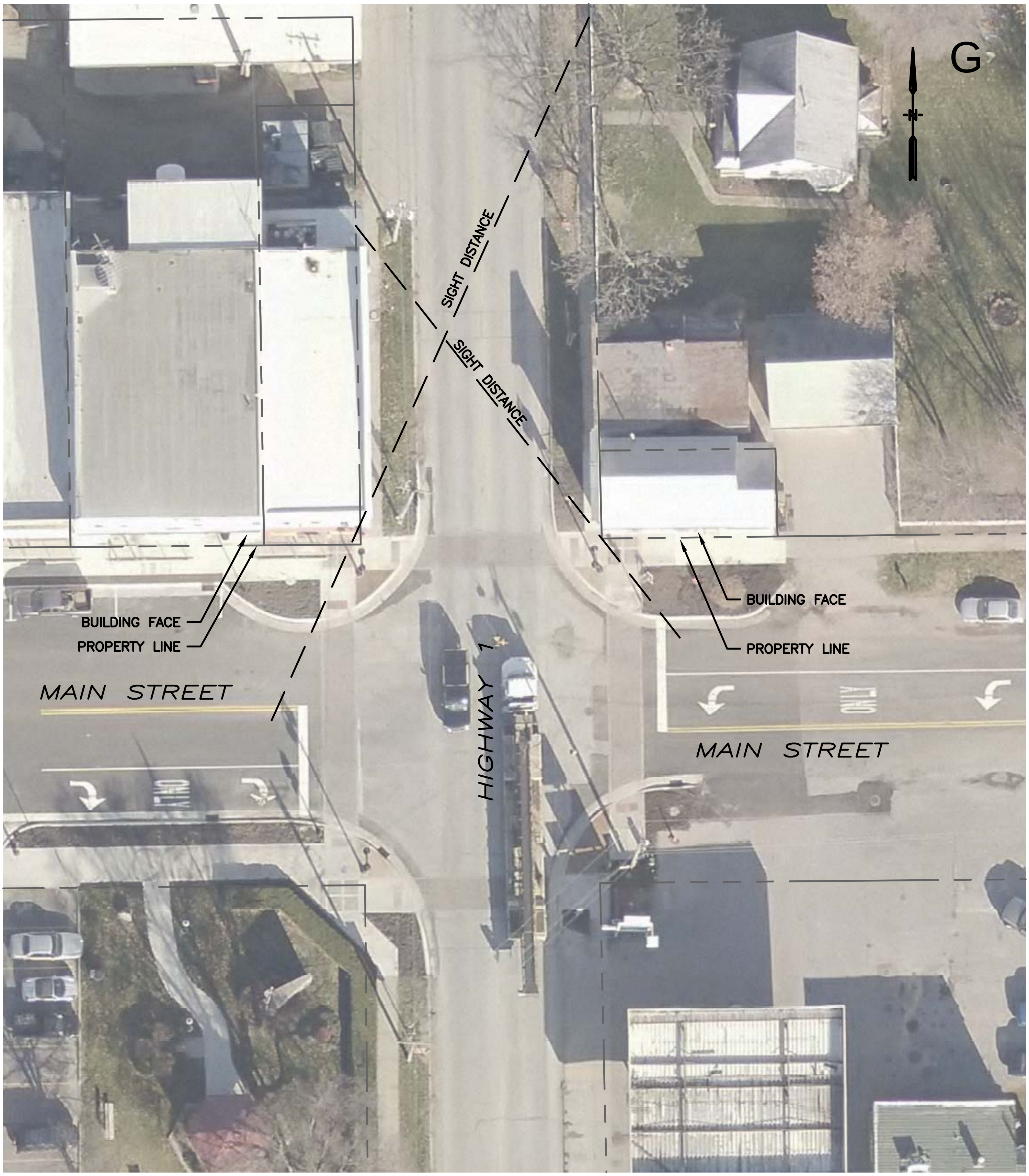

VEENSTRA & KIMM, INC.

EXISTING CONDTIONS
CITY OF SOLON
FIGURE G-1

H-1

2013 MPO TURNING MOVEMENT COUNTS

	Highway 1		Main Street	
Time	Northbnd	Southbnd	Eastbnd	Westbnd
1	23	9	4	0
2	15	5	5	0
3	4	10	19	0
4	9	13	62	0
5	16	28	132	0
6	32	105	169	3
7	142	302	82	13
8	276	470	88	24
9	227	352	81	15
10	193	247	96	9
11	203	183	83	12
12	233	177	84	10
13	236	180	131	10
14	245	186	149	7
15	351	184	150	8
16	441	214	123	17
17	578	235	95	18
18	589	241	90	19
19	337	167	65	17
20	234	106	25	8
21	174	105	14	7
22	120	82	5	2
23	73	44	2	1
24	42	20	1	1
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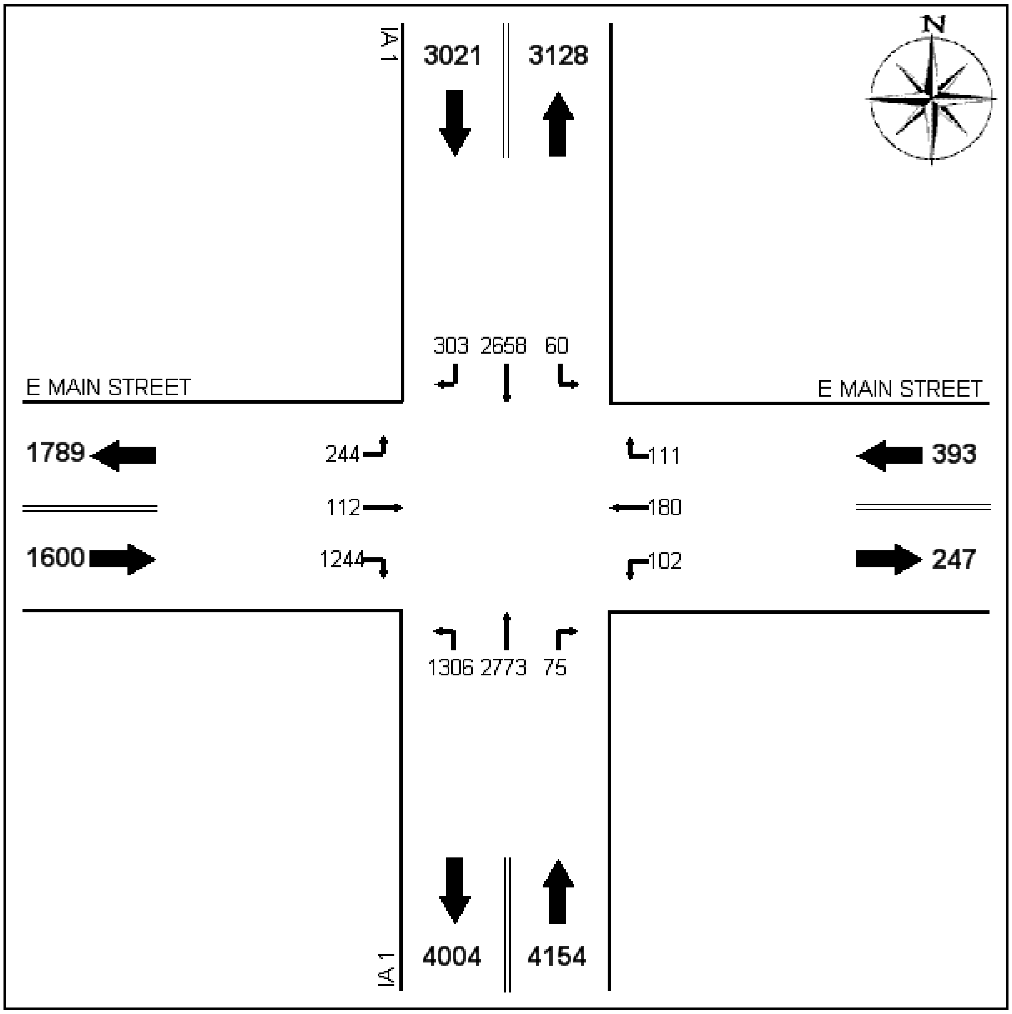

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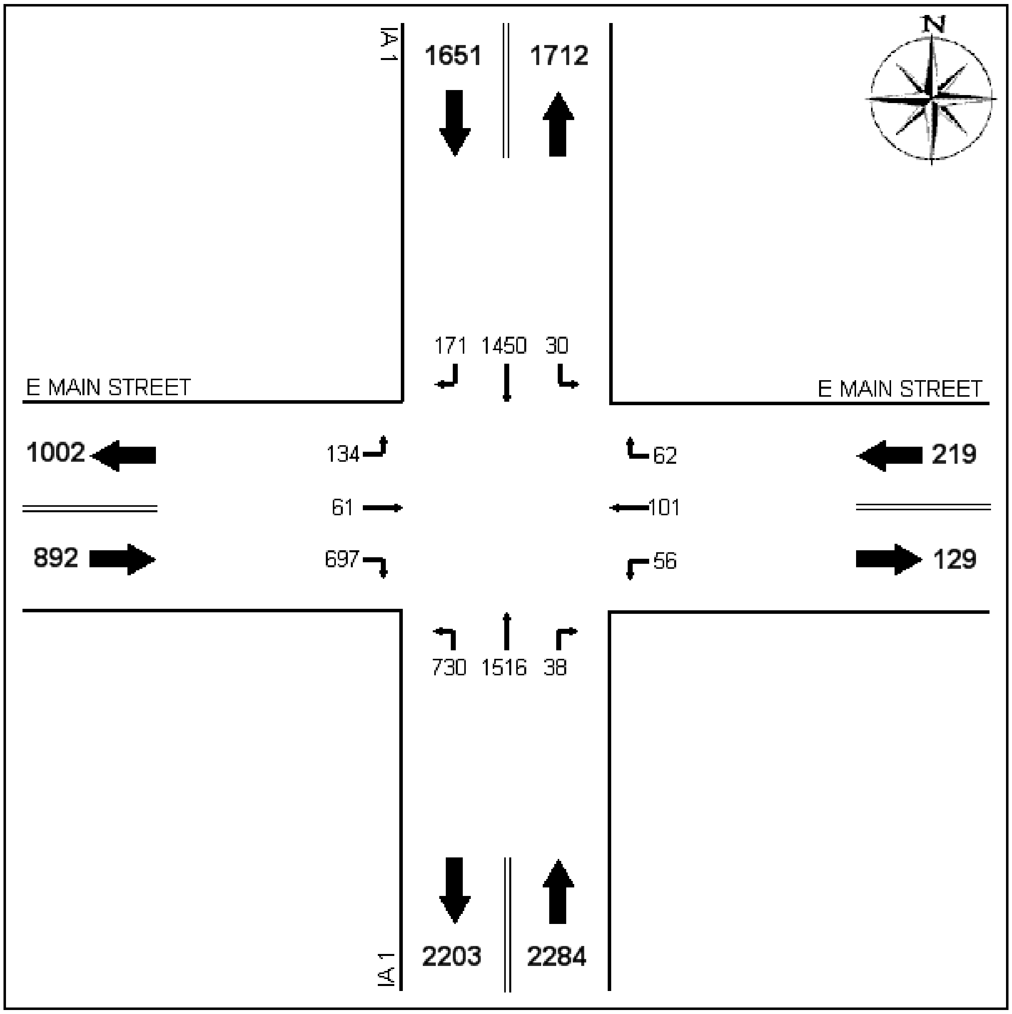

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Iowa Department of Transportation

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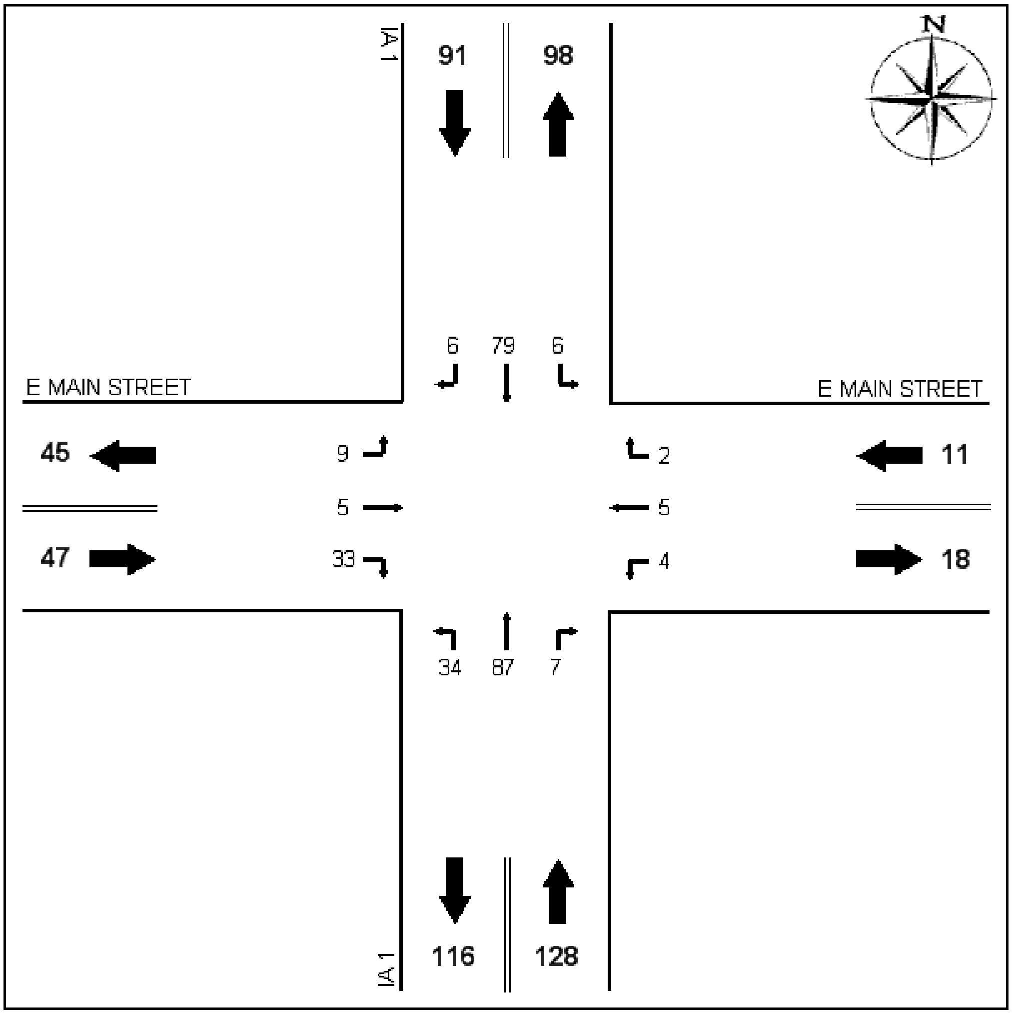

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Iowa Department of Transportation

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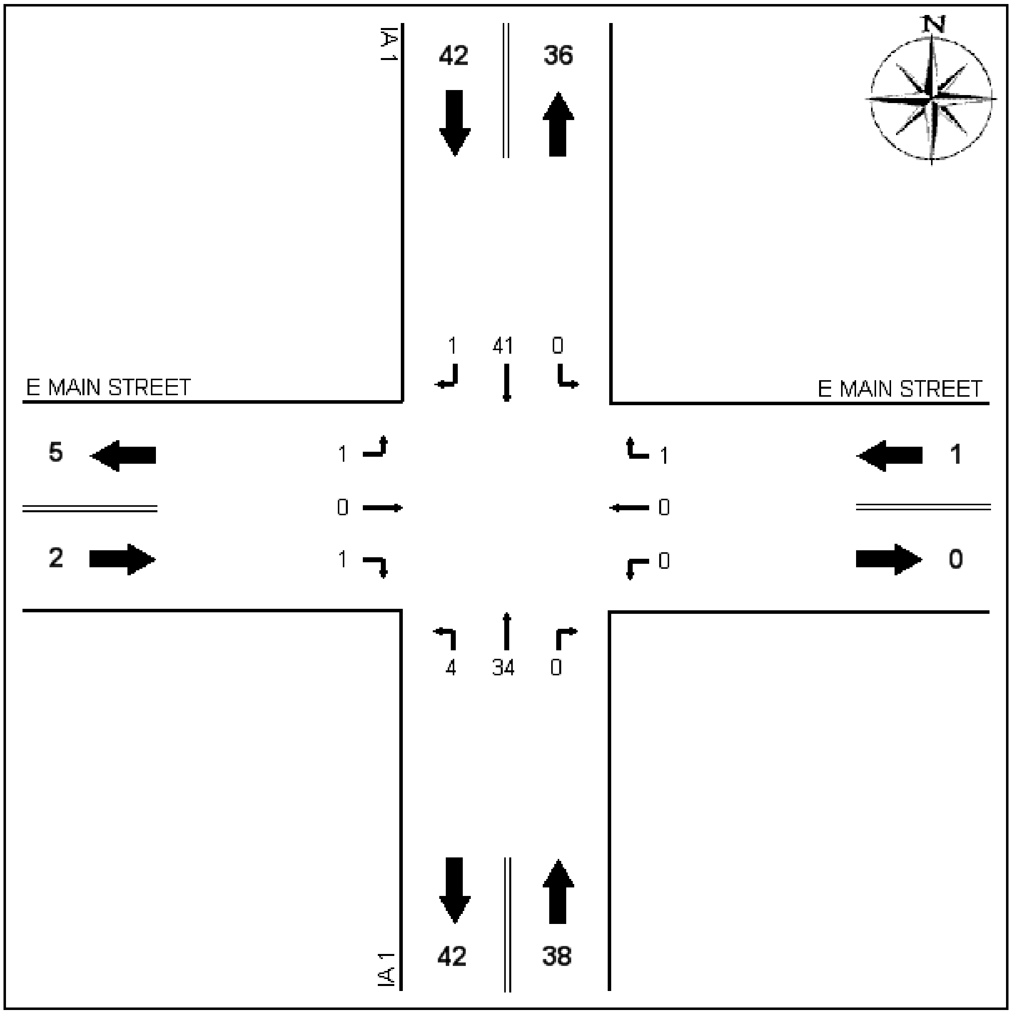

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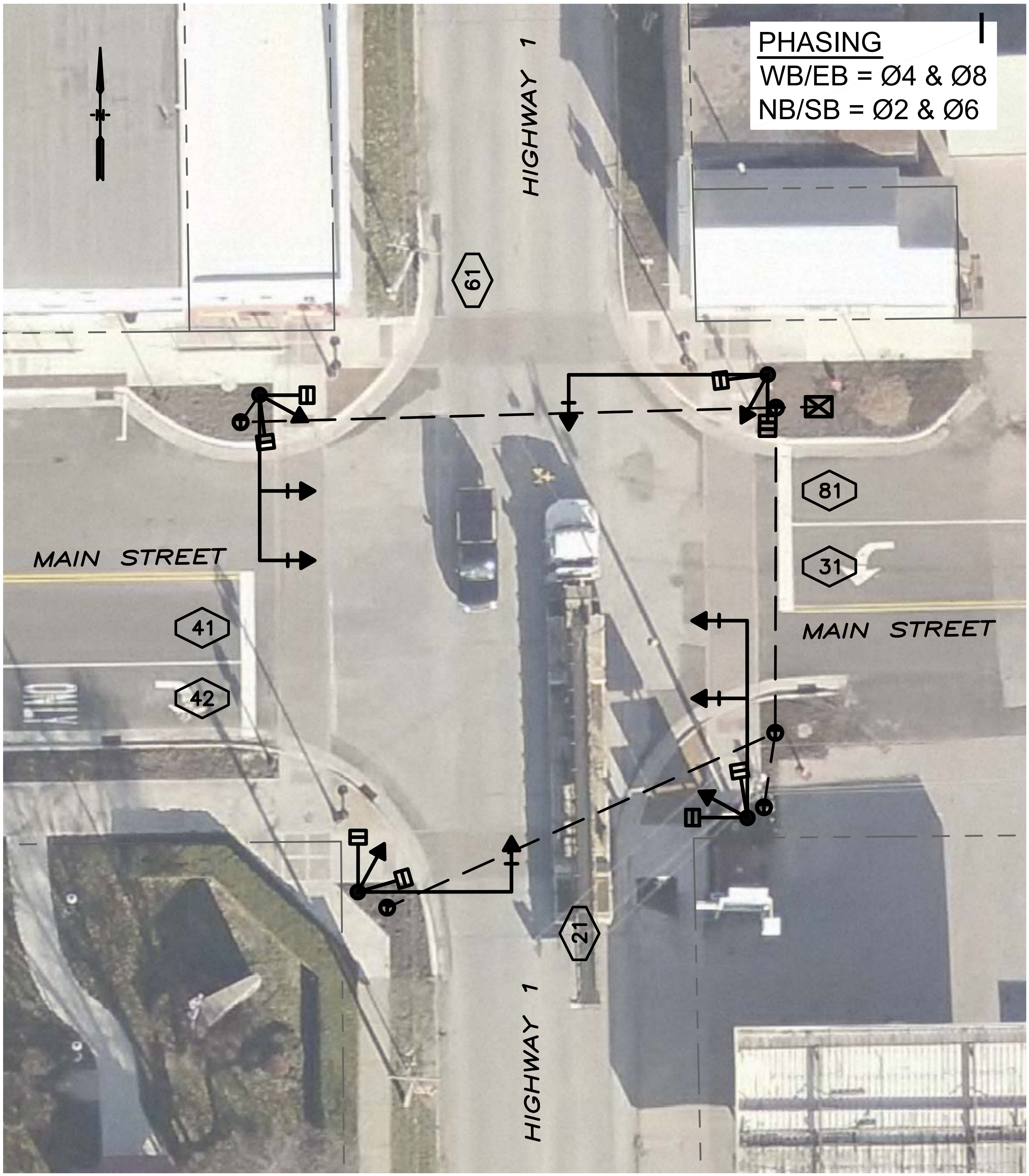


VEENSTRA & KIMM, INC.

TRAFFIC SIGNAL
CITY OF SOLON
FIGURE I-1

Iowa Department of Transportation

Major Cause Summary

Main/Highway 1

Report Version 1.1 Jan 2005

Analysis Years: 2010 [1], 2011 [1], 2012 [1], 2013 [3]

Crash Summary:

Fatal	–
Major Injury	–
Minor Injury	–
Possible/Unknown	–
PDO	6
Total Crashes	6

Injury Summary:

Fatal	–
Major Injury	–
Minor Injury	–
Possible	–
Unknown	–
Total Injuries	0

Surface Condition Summary:

Dry	6
Wet	–
Ice	–
Snow	–
Slush	–
Sand/Dirt/Oil/Gravel	–
Water	–
Other	–
Unknown	–
Not Reported	–
Total Crashes	6

TOT Property Damage: $22,000

AVG Property Damage: $3,667

Major Cause Summary:

	Animal	Improper Backing
	Ran Traffic Signal	Illegally Parked/Unattended
2	Ran Stop Sign	Swerving/Evasive Action
	Crossed Centerline	Over-Correcting/Over-Steering
	FTYROW: At Uncontrolled Intersection	Downhill Runaway
	FTYROW: Making Right Turn on Red Signal	Equipment Failure
3	FTYROW: From Stop Sign	Separation of Units
	FTYROW: From Yield Sign	Ran Off Road - Right
1	FTYROW: Making Left Turn	Ran Off Road - Straight
	FTYROW: From Driveway	Ran Off Road - Left
	FTYROW: From Parked Position	Lost Control
	FTYROW: To Pedestrian	Inattentive/Distracted By: Passenger
	FTYROW: Other (explain in narrative)	Inattentive/Distracted By: Use of Phone or Other
	Traveling Wrong Way or on Wrong Side of Rd	Inattentive/Distracted By: Fallen Object
	Driving Too Fast for Conditions	Inattentive/Distracted By: Fatigued/Asleep
	Exceeded Authorized Speed	Other: Vision Obstructed
	Made Improper Turn	Oversized Load/ Oversized Vehicle
	Improper Lane Change	Cargo/Equipment Loss or Shift
	Followed Too Close	Other: Other Improper Action
	Disregarded Railroad Signal	Unknown
	Disregarded Warning Sign	Other: No Improper Action
	Operating Vehicle in Reckless/Aggressive Manner	None Indicated

Selection Filter:

((MAJORCAUSE = 3 or MAJORCAUSE = 7 or MAJORCAUSE = 9 or MAJORCAUSE = 13 or MAJORCAUSE = 43)) AND ((CRCOMANNER = 4 or CRCOMANNER = 5 or CRCOMANNER = 9 or CRCOMANNER = 77)) AND ((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst: Ackerson

Notes:

A. Application, Certification, & Resolution

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Traffic Signal Battery Backup Units - Multiple Locations

Applicant: City of Sioux City

Contact Person: Brittany Anderson   Title: Civil Engineer

Complete Mailing Address: 405 6th Street, P.O. Box 447
Sioux City, IA 51102

Phone: 712-279-6401   E-Mail: branderson@sioux-city.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 $ 70,000.00

Safety Funds Requested $ 70,000.00

Rev. 3/08

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 Sioux City

Signed: Mike Collett for RKP 7-28-14
Signature Date Signed

Mike Collett
Typed Name

Attest: Lisa McCardle 7-28-14
Signature Date Signed

Lisa McCardle
Typed Name

RESOLUTION NO. 2014 - 0516
with attachments

RESOLUTION AUTHORIZING AND APPROVING THE SUBMISSION OF A GRANT APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM TO ASSIST WITH THE PURCHASE OF TRAFFIC SIGNAL BATTERY BACKUP UNITS.

WHEREAS, the Iowa Department of Transportation Traffic Safety Improvement Program operates under the rules of the Iowa Administrative Code 761 - Chapter 164; and

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

WHEREAS, the City of Sioux City has determined that by providing battery backup units for the traffic signals identified in the grant application there will be continued operation of signals during power outages thereby reducing traffic congestion and improving the safety of the intersection; and

WHEREAS, the City of Sioux City's grant application to the Iowa Department of Transportation Traffic Safety Improvement Program, a copy of which is attached hereto and by this reference made a part hereof, will provide funding for the battery backup units; and

WHEREAS, said grant application should be approved as to form and content.

NOW, THERFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SIOUX CITY, IOWA that the City Manager and City Clerk are hereby authorized to execute the application on behalf of the City and the Engineering Division is hereby authorized and directed to submit the grant application to the Iowa Department of Transportation Traffic Safety Improvement Program to request funding for the purchase of traffic signal battery backup units.

PASSED AND APPROVED: July 28, 2014

R E Scott
Robert E. Scott, Mayor

ATTEST: Lisa L. McCardle
Lisa L. McCardle, City Clerk

B. Narrative

The City of Sioux City is submitting this application for Traffic Safety Improvement Program funds under the Traffic Control Device category. This funding request will allow the City to purchase battery backup units and to retrofit the existing signalized intersections as further described in the application. The battery backup units will be installed in a separate cabinet that will be either mounted on or adjacent to the existing traffic signal cabinet. The City of Sioux City is responsible for the operation and maintenance of the signals identified below. These intersections have been identified for battery backup units since they are critical intersections surrounding Sioux City's Downtown and entertainment districts, which have historically had more power outages.

Gordon Drive Intersections

- **Virginia Street**
- **Interstate 29 Northbound Exit Ramp**
- **Nebraska Street**
- **Pierce Street**
- **Pearl Street**

The Gordon Drive intersections identified above are included in the Iowa DOT Gordon Drive Reconstruction Project; however, battery backup units were unintentionally not included. The City is responsible for the operation and maintenance of these signals even though they are within the DOT's right-of-way. Gordon Drive serves as a principal arterial into Downtown Sioux City and the entertainment district. The traffic flow through these intersections ranges from 14,400 to almost 22,000 as provided in the 2011 Iowa DOT Annual Average Daily Traffic Report.

Wesley Parkway Intersections

- **3rd Street**
- **5th Street**
- **6th Street**
- **West 7th Street**

Wesley Parkway serves as a minor arterial for Downtown Sioux City with traffic counts ranging from 12,500 to 17,500. The 3rd Street connection to Wesley Parkway was completed in 2013 which provided for a more efficient corridor into downtown. Within the past few years a connection of Wesley Parkway north of West 7th Street to Hamilton Boulevard was also completed making for an easy route into and out of downtown to the west.

Pierce Street Intersections

- **3rd Street**
- **4th Street**
- **5th Street**
- **6th Street**

Pierce Street is a one-way, three lane minor arterial for southbound traffic out of the downtown area and onto Gordon Drive and Interstate 29. Average daily traffic counts along this corridor are 6,100 based on the 2011 Iowa DOT Annual Average Daily Traffic Report. Access to major attractions such as the Orpheum Theatre, Sioux City Art Center, and the Tyson Event Center are off of Pierce Street between 3rd and 6th Street.

Nebraska Street Intersections

- **3rd Street**
- **4th Street**
- **5th Street**
- **6th Street**

Nebraska Street is a one-way, three lane minor arterial for northbound traffic into the downtown area from Gordon Drive and Interstate 29. Several businesses and attractions have access off of Nebraska Street between 3rd and 6th Street including the Sioux City Museum and the Martin Luther King Transportation Center. Traffic counts along this corridor are 7,600 based on the 2011 Iowa DOT Annual Average Daily Traffic Report.

3rd Street & Pearl Street Intersection

The intersection of 3rd Street and Pearl Street serves as a minor arterial for entrance into the entertainment venues accessed from Wesley Parkway including the Tyson Event Center, the Hard Rock Casino, and the Sioux City Art Center. Traffic counts in 2011 were 8,900; however, since that time the connection of 3rd Street and Wesley Parkway was completed and the Hard Rock Casino opened so it is anticipated that these counts have drastically increased.

4th Street & Floyd Boulevard Intersection

Floyd Boulevard is a four lane, major arterial from Interstate 29 into Sioux City's Downtown and the industrial area north of downtown. The intersection at 4th Street provides access to the Historic 4th Street attraction with shops, restaurants, spas, and bars. This intersection had an average daily count of 9,200 vehicles per the 2011 report.

11th Street & Floyd Boulevard Intersection

Floyd Boulevard at 11th Street serves as the entrance into the Hoeven Valley industrial business park with businesses such as Cargill, Knife River Midwest, and L.G. Everist this intersections sees heavy truck traffic. The 2011 Iowa DOT Annual Average Daily Traffic Report has a vehicle count of 12,000 at this intersection.

C. Itemized Breakdown of Costs

Item	Quantity	Unit Cost	Total
Battery Backup Unit	20	$3,500.00	$70,000.00

Unit prices are based on previously received contractor's bid and adjusted for 2015 construction schedule. Installation will be completed by the City's Field Services.

D. Time Schedule

TSIP Funding Application Due……………..August 15, 2014

TSIP Notification of Award…………………December 15, 2014

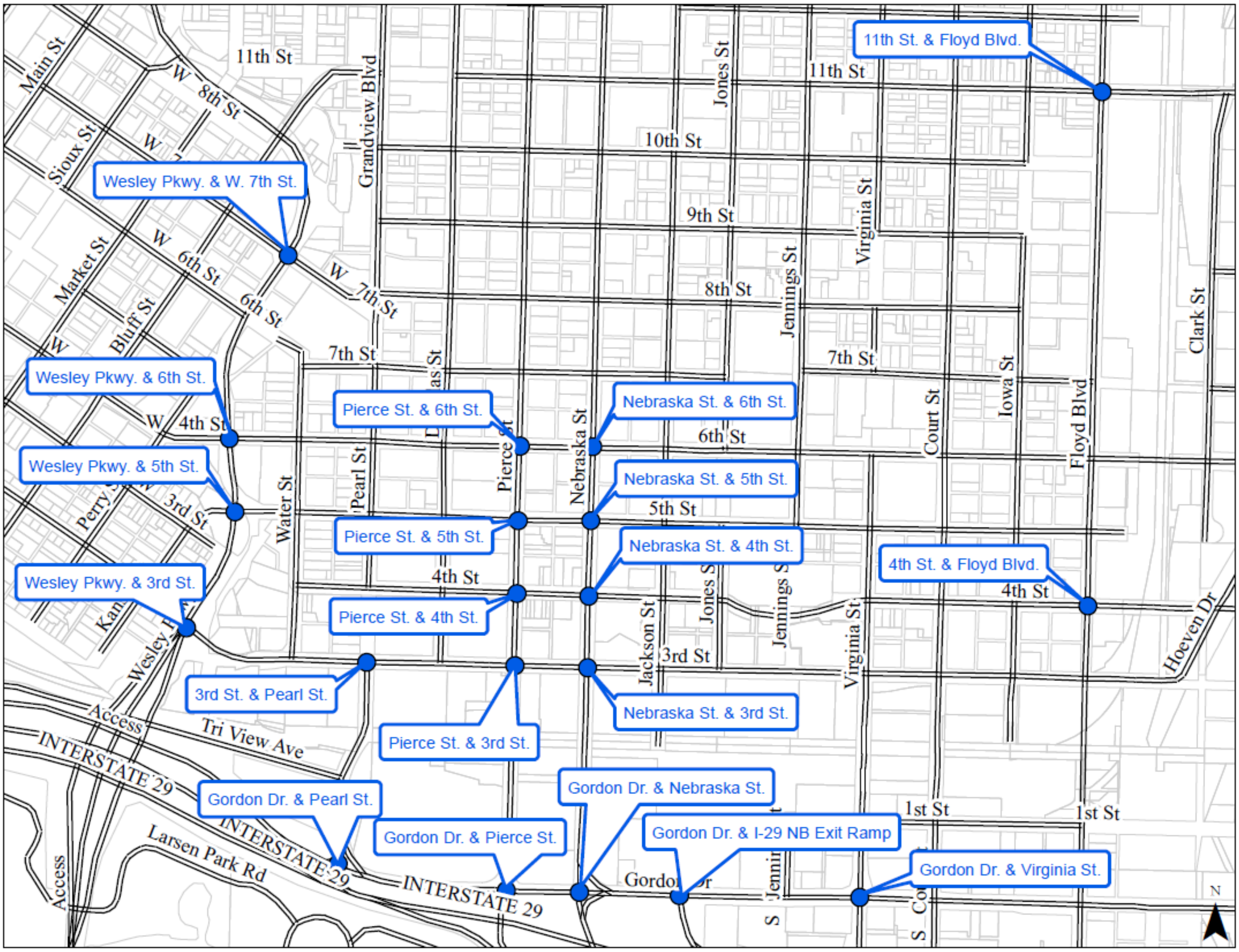
TSIP Funding Available……………….……July 1, 2015

Project Letting………………………………..July 15, 2015

Project Construction…………………………July - November 2015

Project Completion…………………….………November 2015

E. Location Map



F. Color Pictures

Gordon Drive & Virginia Street

Gordon Drive & Interstate 29 Northbound Exit Ramp

Gordon Drive & Nebraska Street

Gordon Drive & Pierce Street

Gordon Drive & Pearl Street

Wesley Parkway & 3rd Street

Wesley Parkway & 5th Street

Wesley Parkway & 6th Street

Wesley Parkway & West 7th Street

Pierce Street & 3rd Street

Pierce Street & 4th Street

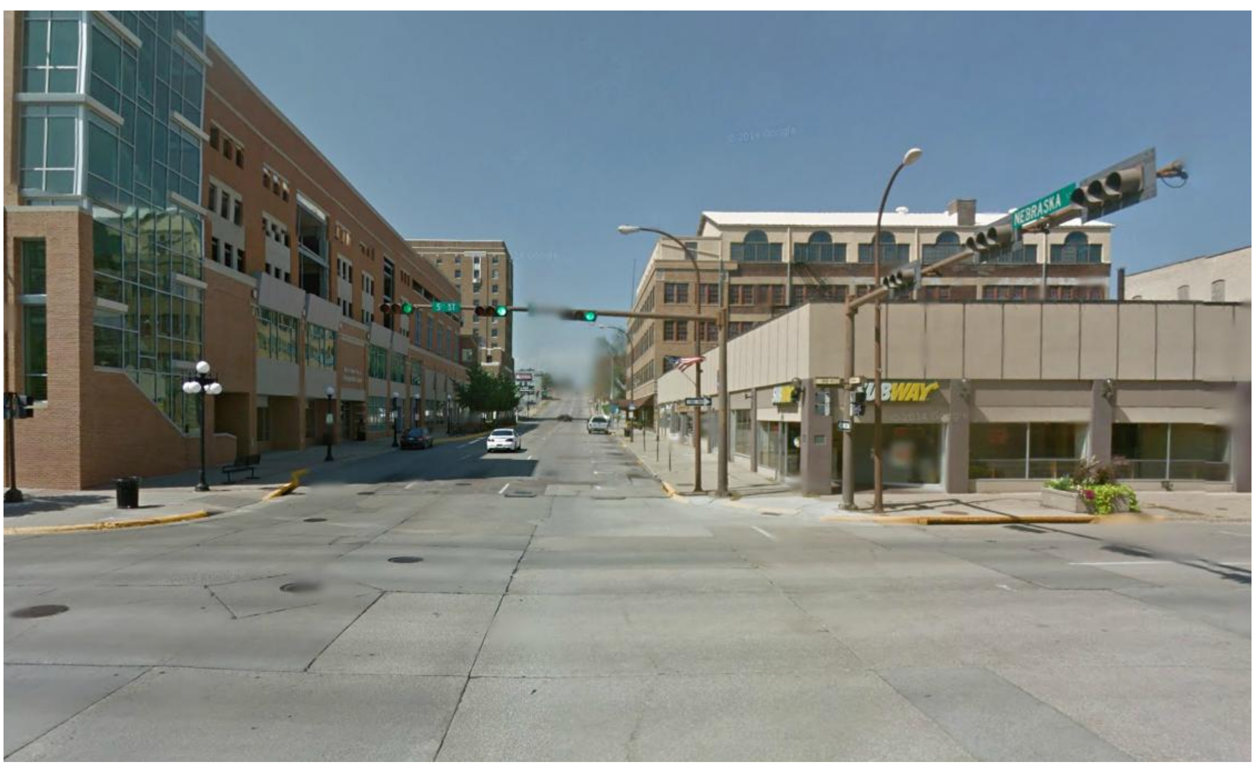
Pierce Street & 5th Street

Pierce Street & 6th Street

Nebraska Street & 3rd Street

Nebraska Street & 4th Street

Nebraska Street & 5th Street



Nebraska Street & 6th Street

3rd Street & Pearl Street Intersection

4th Street & Floyd Boulevard Intersection

11th Street & Floyd Boulevard Intersection

G. Plan Layout

Not Applicable

H. Traffic Volumes

Traffic volumes are shown below as vehicles per day based on the Iowa DOT 2011 Annual Average Daily Traffic Report. Numbers noted with asterisks were taken from Iowa DOT 2007 Annual Average Daily Traffic Report.

Gordon Drive Intersections
- Virginia Street……………………………….21,200
- Interstate 29 Northbound Exit Ramp...….21,650
- Nebraska Street…………………..…...……14,400
- Pierce Street………………………………..14,650
- Pearl Street…………………………………14,700

Wesley Parkway Intersections
- 3rd Street…………………………………...17,500*
- 5th Street…………………………………...17,500*
- 6th Street……………………...…………13,900*
- West 7th Street…………………………….12,500

Pierce Street Intersections
- 3rd Street……………………………………6,100
- 4th Street……………………………………6,100
- 5th Street……………………………………6,100
- 6th Street……………………………………6,100

Nebraska Street Intersections
- 3rd Street……………………………………7,600
- 4th Street……………………………………7,600
- 5th Street……………………………………7,600
- 6th Street……………………………………7,600

3rd Street & Pearl Street Intersection…………….8,900

4th Street & Floyd Boulevard Intersection…...…..9,200

11th Street & Floyd Boulevard Intersection…….12,000

I. Signal Layout

Not Applicable

J. Benefit / Cost Worksheet

Not Applicable

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Citywide Traffic Signal Battery Backup Units Project

Applicant: City of Newton

Contact Person: Keith Laube   Title: Public Works Director

Complete Mailing Address: 1700 N 4th Ave W
Newton, Iowa 50208

Phone: 641-792-6622 Ext. 30   E-Mail: keithl@newtongov.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): N/A

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: $ 63,000

Safety Funds Requested: $ 63,000

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 Newton

Signed: M L Hansen 6/3/14
Signature Date Signed

Michael L. Hansen, Mayor
Typed Name

Attest: Katrina Davis 6/3/14
Signature Date Signed

Katrina Davis, City Clerk
Typed Name

Citywide Traffic Signal Battery Backup Units Project
Newton, Iowa

B. Narrative

The City of Newton 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 battery backup units and the associated equipment to retrofit existing signalized intersections. The City of Newton has installed battery backup units at 2 intersections during the past few years, as the budget has allowed. There are 15 remaining signalized intersections that do not have battery backup units. The City desires to have battery backup units installed at 9 of these intersections.

The battery backup is installed in a separate cabinet that is either mounted on or adjacent to the existing traffic signal cabinet. The City of Newton is responsible for the operation and maintenance of the signals.

The objective of installing traffic signal battery units is to increase public safety and reduce traffic congestion by allowing traffic signals to function during power outages. Based on Newton's experience, the average traffic signalized intersection experiences 6 to 8 local power outages per year. Having a battery backup unit to maintain power at every signalized intersection will provide motorist and pedestrians additional safety benefits.

During a power outage affected signals cease to operate, creating a blacked out signal condition. This condition requires drivers to treat the intersection as an all way stop. However, in many instances drivers on the major street treat this as a green and proceed through the intersection.

The present practice during a power outage is for Public Works staff to install temporary stop signs at affected intersections. This is a time consuming process as staff must first travel to from their job site to the Public Works facility, load the signs, travel to the affected intersection(s), and install signage. Depending upon the severity of the power outage the city may or may not have enough signs to cover all impacted intersections. During this time, Public Works staff and police personnel are unable to focus on their primary duties. The response time is increased when outages occur outside of business hours as staff has to be notified and travel from their residences to the Public Works facility to load the signs. Installing battery backups will increase work efficiencies.

The majority of traffic signals that currently do not have a battery backup unit in Newton are located along the 1st Avenue (U.S. Highway 6) corridor. 1st Avenue is a principal arterial that extends west to east through the center of Newton. The other intersection that does not have battery backup units for traffic signals is Highway 14 / N 4th Ave W.

Based on the 2010 DOT Traffic counts, the average daily traffic counts on 1st Avenue range from 6,500 to 10,400. The traffic counts are from the 2010 DOT average daily traffic counts and the speed limit at the intersections is 25 mph, unless otherwise noted. The following is the specific information for each intersection:

1) 1st Ave W and W 8th St: 1st Ave W is a two lane highway with a center left turn lane for eastbound traffic and a speed limit of 30 mph. W 8th St is a two lane minor arterial that serves as major route to the Newton DMACC campus. The traffic volume on 1st Ave W and W 8th St is 7,500 vehicles per day and 2,820 vehicles per day, respectively.

2) 1st Ave W and W 4th St: 1st Ave W is a two lane highway in the Downtown Business District with a center left turn lane and a traffic volume of 6,500 vehicles per day. W 4th St is a two lane collector with a center left turn lane. W 4th St serves as a route to commercial, residential zones and the traffic volume is 3,360 vehicles per day based on the 2006 DOT average daily traffic counts.

3) 1st Ave E and E 4th St: 1st Ave E is a two lane highway with center turn lanes and a traffic volume of 10,100 vehicles per day in the Downtown Business District. E 4th St is a two lane collector that serves as a major route to the Newton High School and Skiff Hospital. Traffic volume on E 4th St is 4,230 vehicles per day.

4) 1st Ave E and E 8th St: 1st Ave E is a two lane highway with center turn lanes, a traffic volume of 8,800 vehicles per day and a speed limit of 30 mph. E 8th St is a two lane collector with a traffic volume of 1,390 vehicles per day.

5) 1st Ave E and E 12th St: 1st Ave E is a two lane highway with center turn lanes, a traffic volume of 10,400 vehicles per day and a speed limit of 30 mph. E 12th St is a two lane minor arterial with single right turn lanes and a traffic volume of 3,290 vehicles per day. E 12th St serves the Newton Municipal Airport and is County Highway S74 south of the city limits.

6) 1st Ave E and E 14th St: 1st Ave E transitions from two lane highway with center turns lanes and a traffic volume of 10,400 vehicles per day to a four lane roadway with a traffic volume of 7,600 vehicles per day. The speed limit through the intersection is 30 mph for eastbound traffic and 35 mph for westbound traffic. E 14th St is a collector with a traffic volume of 5,400 vehicles per day based on

the 2002 DOT average daily traffic counts. Southbound traffic on E 14th Street is the north entrance to the Hy-Vee shopping center

7) <u>1st Ave E and E 17th St:</u> 1st Ave E is a 4 lane highway with one of these lanes used for left turn movements, the traffic volume is 8,500 vehicles per day and a speed limit of 35 mph. E 17th St is a two lane collector with an additional lane for left turn movements and a traffic volume of 4,120 vehicles per day. E 17th Street serves as a route to the east entrance drives of the Hy-Vee shopping center, the Newton YMCA, and as a route between schools.

8) <u>1st Ave E and E 23rd St:</u> 1st Ave E is a 4 lane arterial highway with 9,200 vehicles per day and a speed limit of 40 mph. E 23rd St is a 2 lane collector with 1,620 vehicles per day and serves as a major route for vehicles and pedestrians between Berg Elementary/Berg Middle School and Aurora Heights Elementary School.

9) <u>Highway 14 and N 4th Ave W:</u> Highway 14 is two lane principal arterial highway with a traffic volume of 3,350 vehicles per day and a speed limit of 35 mph. Highway 14 provides access to Interstate 80 approximately 1.3 miles south of this intersection. N 4th Ave W is a 2 lane collector with a traffic volume of 1,140 vehicles per day. N 4th Ave W serves as a route for vehicles and pedestrians to Thomas Jefferson Elementary School.

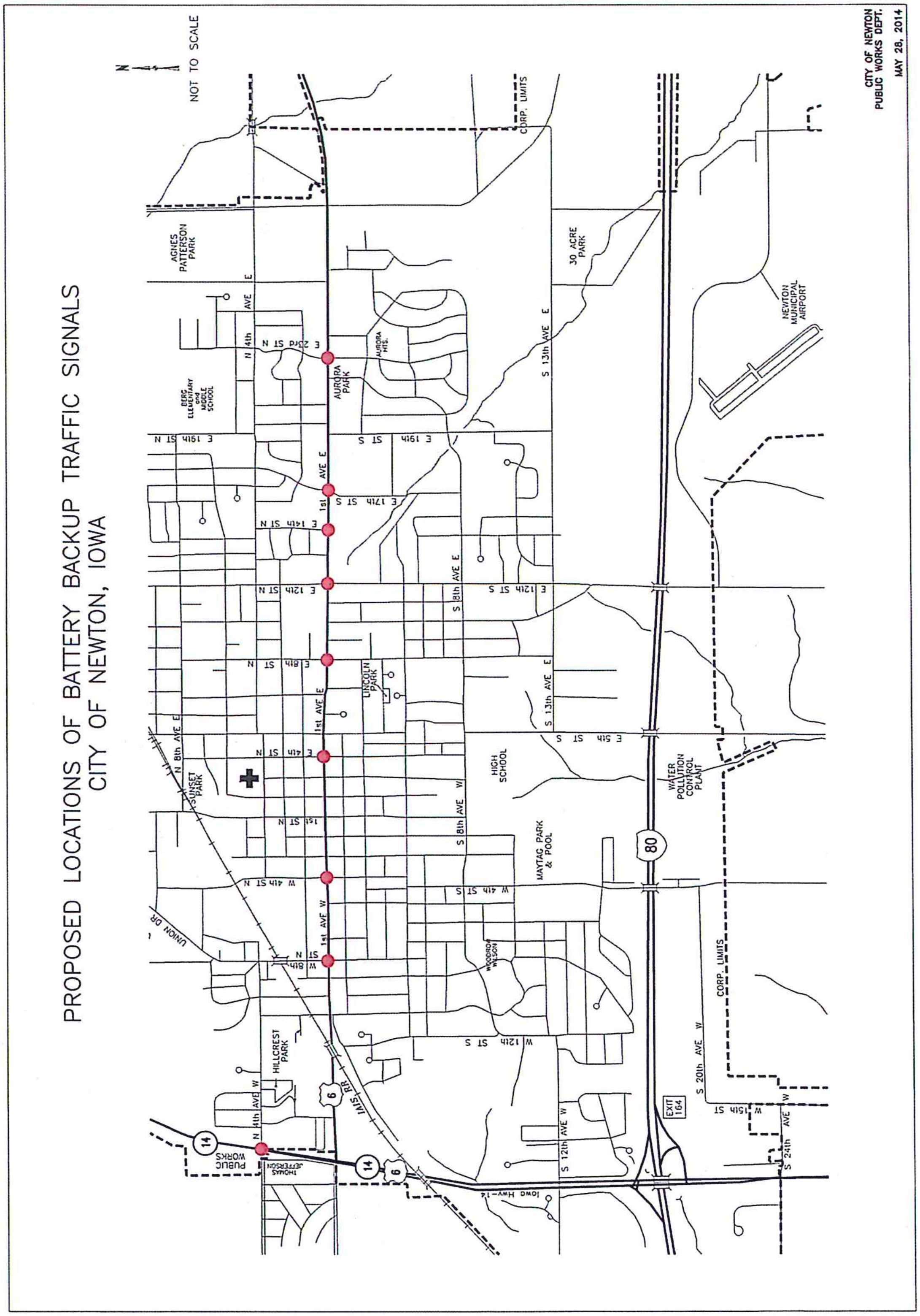
C. Itemized Breakdown of Cost

$7,000 per intersection, which includes cost of materials and installation

D. Time Schedule

Project Approval:	December 2014
Agreement Signed:	March 2015
Project bid (Equipment):	May 2015
Installation completed:	December 2015
Project Closeout:	March 2016

E. Location Map

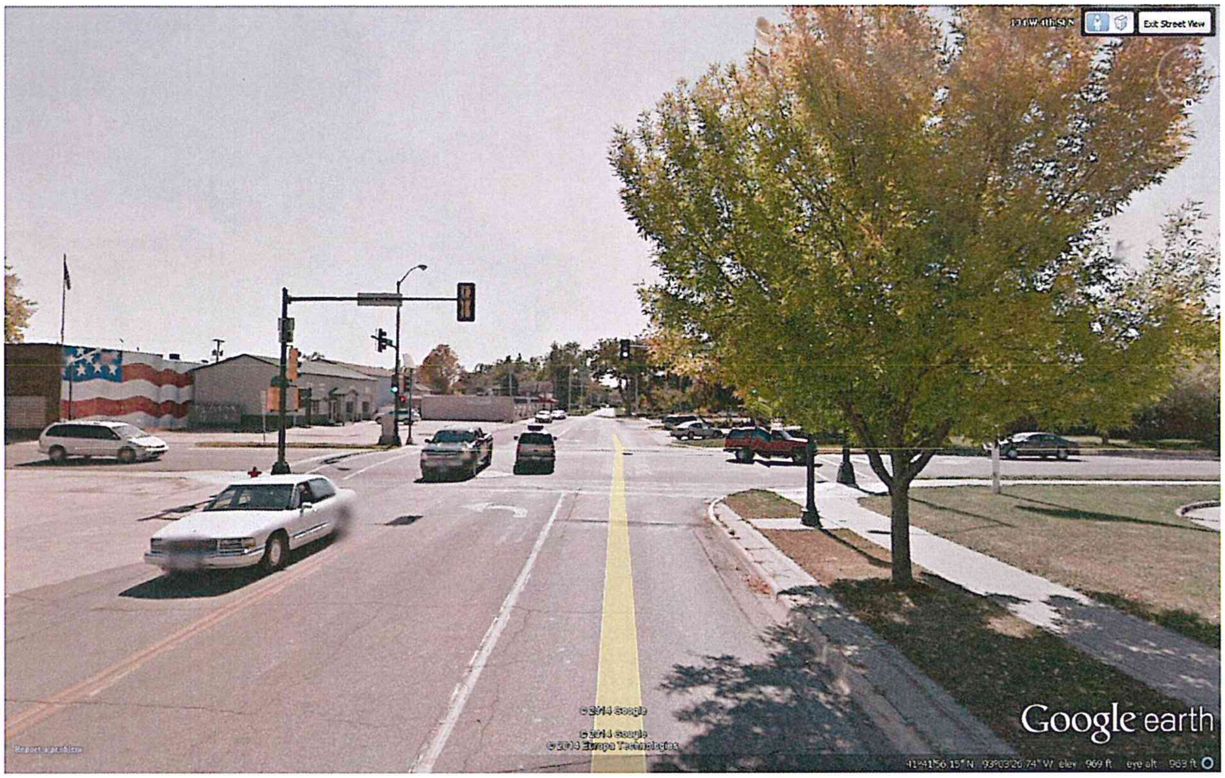


F. Color Pictures

Photograph of an existing city battery backup unit

Credits: The following street photos shown are from Google Earth

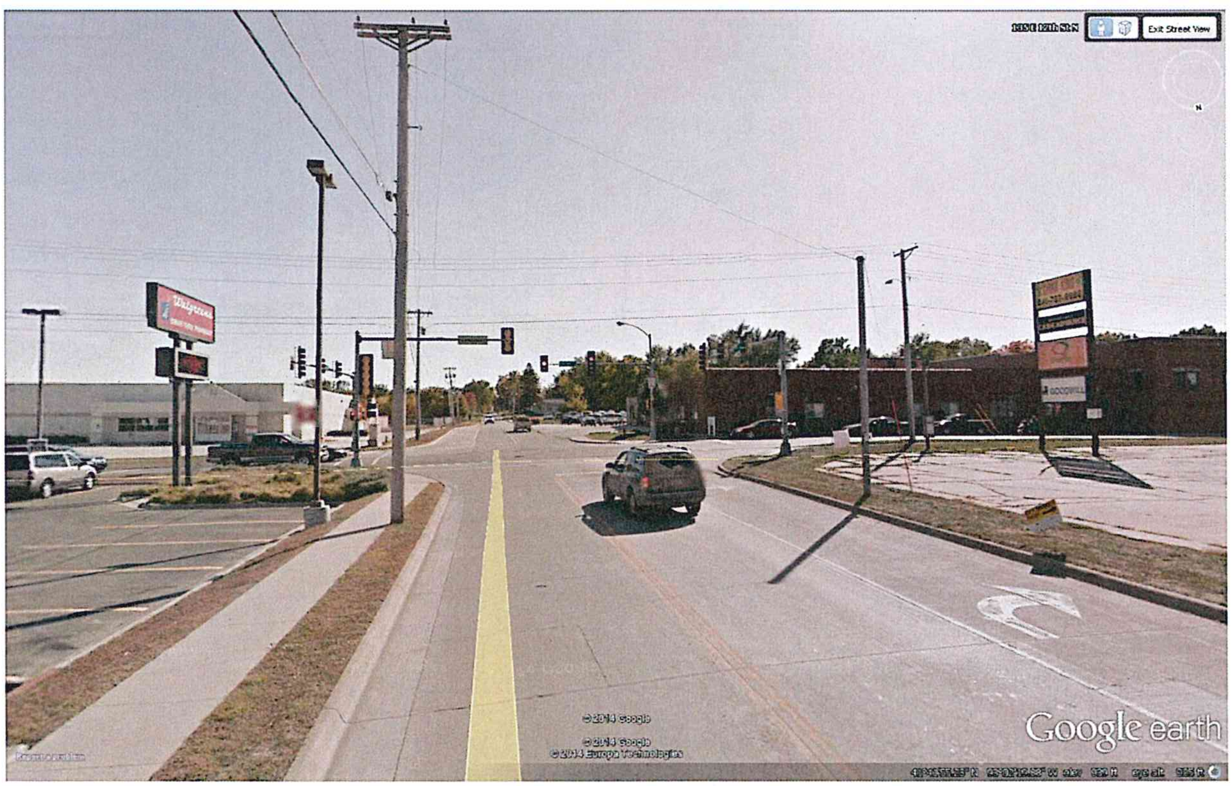
Looking north at the intersection of 1st Avenue W and W 8th Street



Looking south at the intersection of 1st Avenue W and W 4th Street

Looking east at the intersection of 1st Avenue and E 4th Street

Looking east at the intersection of 1st Avenue and E 8th Street



Looking south at the intersection of 1st Avenue and E 12th Street

Looking south at the intersection of 1st Avenue and E 14th Street (the Hy-Vee shopping center is in the background on the left)

Looking west at the intersection of 1st Avenue and E 17th Street

Looking west at the intersection of 1st Avenue and E 23rd Street

Looking north at the intersection of Highway 14 and N 4th Avenue W

G. Plan View

NOT APPLICABLE

H. Aerial Photography

NOT APPLICABLE

I. Officer Reports

NONE

J. Table of Traffic Volumes

Traffic volumes are taken from the busiest leg of the intersection. Traffic counts are from 2010 DOT survey, unless otherwise noted.

Intersection	Vehicles per Day
1st Ave W and W 8th St	7,500
1st Ave W and W 4th St	6,500
1st Ave E and E 4th St	10,100
1st Ave E and E 8th St	8,800
1st Ave E and E 12th St	10,400
1st Ave E and E 14th St	10,400
1st Ave E and E 17th St	8,500
1st Ave E and E 23rd St	9,200
Highway 14 and N 4th Ave W	3,350

K. Signal Layout

NOT APPLICABLE

L. Benefit / Cost Worksheet

NOT APPLICABLE

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: New Vienna IA; Pedestrian Crosswalk & Warning System

Applicant: City of New Vienna Iowa and New Vienna Police Department

Contact Person: Mark Blatz Title: Chief of Police

Complete Mailing Address: 7271 Columbus Street P.O. Box 19
New Vienna, Iowa 52065-0019

Phone: (563) 921-2295 E-Mail: nvpolice@iowatelecom.net
(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): N/A

Contact Person: Mark Blatz Title: Chief of Police

Complete Mailing Address: 7271 Columbus Street P.O. Box 19
New Vienna, Iowa 52065-0019

Phone: (563) 581-0145 cell E-Mail: nvpolice@iowatelecom.net
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- ☐ Site Specific
- ☒ Traffic Control Device
- ☐ Safety Study

Funding Amount

Total Project Cost $ 19,770.00

Safety Funds Requested $ 19,770.00

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 New Vienna Iowa and New Vienna Police Department

Signed: Mark Blatz 8/15/14

Signature Date Signed

Mark Blatz

Typed Name

Attest: Patrick Hermsen (ATTS) 8/15/14

Signature Date Signed

Patrick Hermsen Mayor

Typed Name

City of New Vienna, Iowa

7271 Columbus Street • PO Box 19, New Vienna, Iowa 52065-0019 (563) 921-2295

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

August 15, 2014

RE: Traffic Safety Improvement Program (TSIP)

Dear Terry Ostendorf,

The city of New Vienna is making a formal request for Traffic Safety Improvement Program (TSIP) study to be conducted along the Hwy 136/Columbus Street corridor, within the city limits of New Vienna, Iowa.

At the present the city of New Vienna receives an average of 3930 daily Vehicle traffic (as per 2012 IDOT Survey) along the Hwy 136/Columbus Street corridor. Since 2009 (average daily vehicle traffic of 3580 per 2009 IDOT Survey) this is an increase of about .9%. Once the Hwy 136 corridor (from the city of Luxemburg to the city of Dyersville, Iowa) is re-designated to U.S. 52, it is projected the city of New Vienna (along the Hwy l-36lColumbus Street corridor) will have an additional .9% increase in average daily vehicle traffic-c, to about 4280 vehicle per day.

The Hwy l36/Columbus Street corridor, within the city limits represent a number of issues of concern. #1. We have an average of 408 trucks, including semis per day traveling the Hwy 136/Columbus Street corridor. The majority of the truck Traffic is the result of the Ethanol Plant, located west of the city of Dyersville, Iowa and south of city of New Vienna. #2 The city of New Vienna has eleven businesses located along the Hwy 136/Co1umbus Street corridor. Each of these businesses contributes an average of eighteen trucks, including semis per day to the Hwy 136/Columbus Street corridor.

Due to the increase in average daily vehicle traffic, including semi traffic on the Hwy 136/Columbus Street corridor, pedestrian traffic and safety becomes a concern. Located within the heart of the city of New Vienna is our City Park (located between the intersections of Main Street and Water Street) along the Hwy 136/Columbus Street corridor. Not only is the City Park a popular gathering place (especially in the summer time) for area residence; it is also the Western Dubuque Community Schools bus stop for pickup and drop offs. As a result of the City Park being a school bus stop we have an increase pedestrian and vehicle traffic within the area. The increase in vehicle traffic adds to the already daily vehicle traffic resulting in pedestrian safety concerns.

The goal of the city of New Vienna is to increase pedestrian safety along the Hwy 136/Columbus Street corridor, within the city limits. To accomplish this the city of New Vienna is seeking to establish a pedestrian activated flashing (solar amber) beacon (with signage) at the intersection of Main Street and Hwy 136/Co1umbus Street corridor, from the City Park across Hwy 136/Columbus Street corridor (east) to a local business the Downtown Lounge. The pedestrian

City of New Vienna, Iowa

7271 Columbus Street • PO Box 19, New Vienna, Iowa 52065-0019 (563) 921-2295

activated flashing (solar amber) beacon (with signage and with marked crosswalk) would be activated by pedestrian traffic to alert vehicle traffic on Hwy 136/Columbus Street corridor as to pedestrian traffic in the area.

The city of New Vienna would place a radar speed control sigh 12" on the north edge of the Hwy 136/Columbus Street corridor with signage to alert southbound vehicle traffic as to pedestrian traffic on the corridor. The city will also place a radar speed control sigh 12" with signage on the south edge of the. Hwy 136/Columbus Street to alert northbound vehicle traffic as to pedestrian traffic on the corridor.

The city of New Vienna would completed the project within 12-month from receiving approval/funding for project

It is the hope TSIP study for this project will provide the assistance needed to establish a safe environment for pedestrian and vehicle traffic.

We appreciate your consideration for this request. Should you have any question about this project, please contact me, Mark F. Blatz, Chief of Police with the New Vienna Police Department, at (563) 923,-2295 or by e-mail at nvpoliee@iowatelecom.net.

Thank you.

Sincerely;

Mark Blatz

Mark F. Blatz
Chief of Police
New Vienna Police Department

BROWN
Traffic Products, Inc.

MERGING INNOVATION, TECHNOLOGY & SERVICE

Quote

Quote Number: Q033809

736 Federal Street Suite 2312 | Davenport, IA 52803 | 1(563) 323-0009

To: New Vienna Police Dept.
7271 Columbus Street
P.O. Box 19
New Vienna, IA 52065
United States

Date: 09/04/2013
Prepared By: Cathy Jorgensen

Contact: Mark Blatz
Phone: 563.581.0145
Fax: 563.921.3030
Email: nvpolice@iowatelecom.net

RFQ #:
Description: Carmanah Solar Beacons

Part #	Description	Quantity	Price	Extended
CAR-R820-DUAL-YEL	Pedestrian Beacon -Dual Standard Solar Engine w/radio, pushbutton - Yellow Housing	2	$3,090.00	$6,180.00
CAR-45RDH-AMB LED/YEL HOUSING	Pelco Top Pole Mount w/ Wedge, Dual Horizontal Yellow Beacon - Amber LED	2	$1,230.00	$2,460.00
PEL-PB-5102-15-NC	15' Spun Alum Pole, Sch 80	4	$595.00	$2,380.00
PEL-PB-5335-NC	Square aluminum base, plastic door	4	$0.00	$0.00
PEL-PB-5325-NC	Pole and base collar assy.	4	$0.00	$0.00
AHK075C210015HGE	3/4-10x21 anchor bolt w/ hardened washer stnd, galv	16	$0.00	$0.00
RU2-FAST 250	250 RADAR SPEED CONTROL SIGN 12" DISP., POLE MT	2	$4,375.00	$8,750.00
RU2-FAST 250 SOLAR POWER 80 WATT	Solar Power 80 watt for Fast-250	2	$0.00	$0.00
RU2 Fast Pole Side Mtg	RU2 Fast Pole Side Mounting Brackets (2) w/ U-Bolts	2	$0.00	$0.00
			Total:	**$19,770.00**

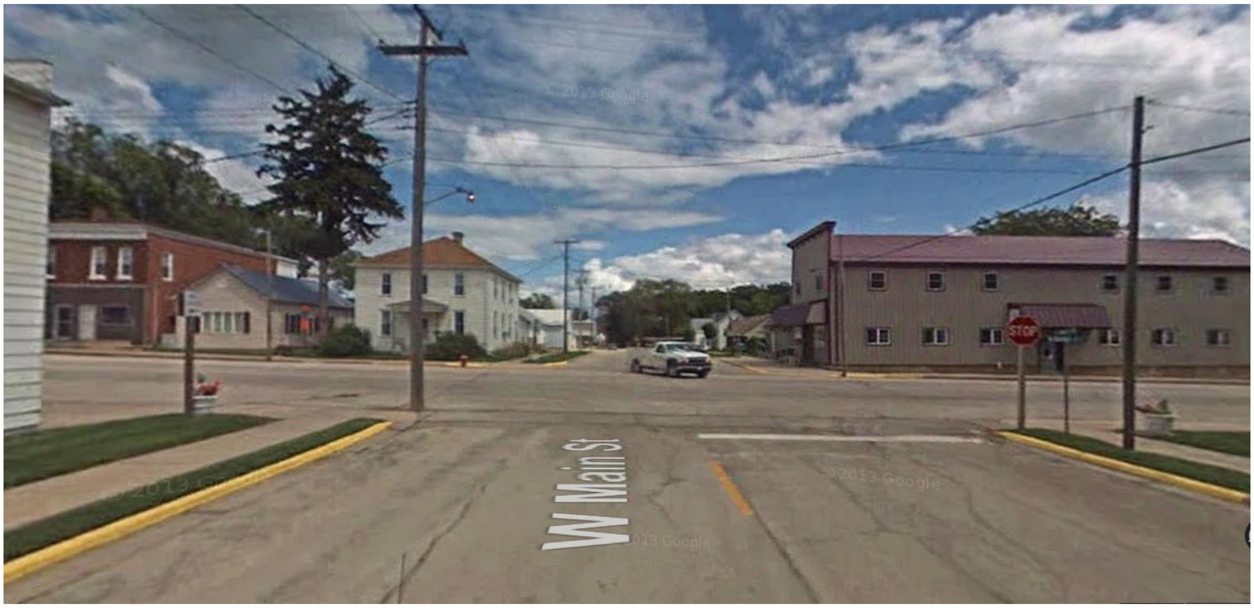
Notes:
QUOTATION DOES INCLUDE FREIGHT. LEADTIME IS APPROXIMATELY 4-6 WEEKS.

NOTE: The equipment on the Radar Sign does not include any signage in addition to the digital sign provided with the kit. Other options available for the Radar Sign are Red LED "SLOW" message, Data Acquisition package, and time clock.

2012

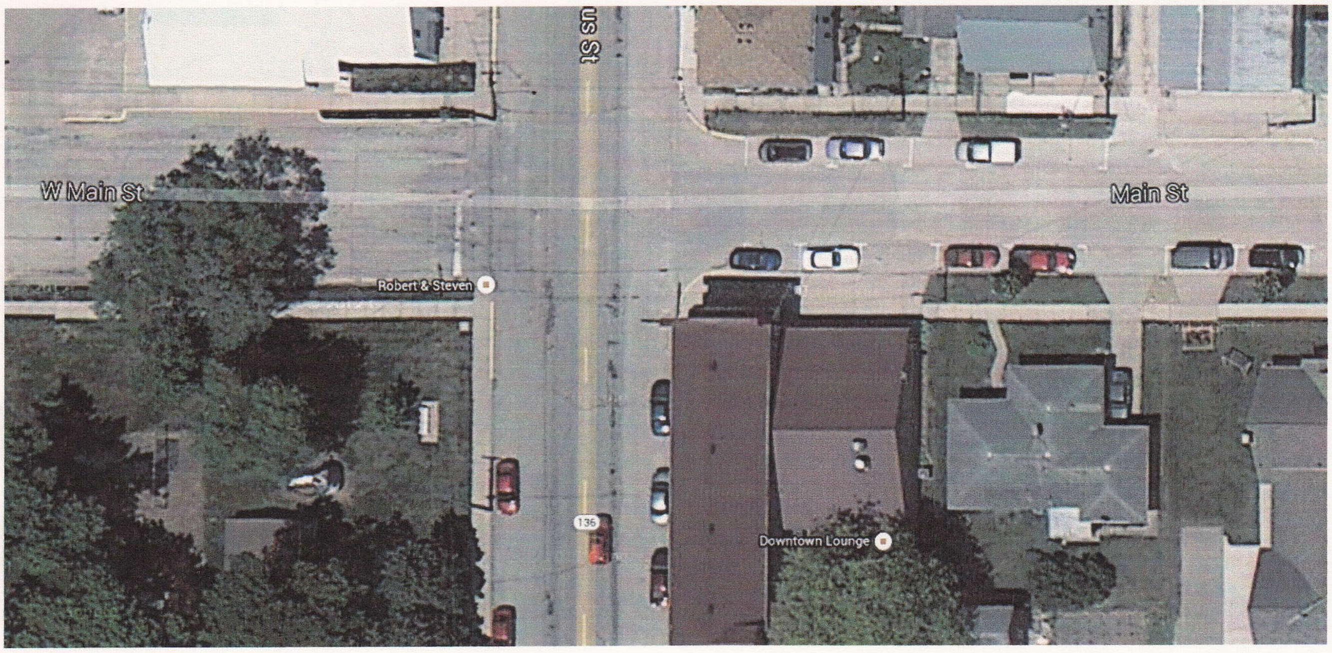
Route	Primary Route Section Description	Rural/Municipal	Section Length (miles)	Annual Average Daily Traffic	Vehicle Classification Distribution of Annual Average Daily Traffic											Average Daily Vehicle Miles	
								Single Unit Trucks				Combination Trucks					
					Motorcycles	Cars, Vans and Pickups	Total Trucks and Buses	Buses	2 Axle	3 Axle	4 or more Axles	4 or less Axles	5 Axle	6 or more Axles	Multiple Trailer	All Vehicles	Trucks and Buses
136	31 DUBUQUE COUNTY																
136	INTERSECTION 1ST AVENUE	M	0.175	1810	10	1596	203	18	74	21	2	10	71	2	2	317	36
136	NORTH LIMITS OF CASCADE	M	0.345	3720	22	3495	203	18	74	21	2	10	71	2	2	1283	70
136	US 151 INTERCHANGE	R	0.264	2620	15	2395	210	19	78	22	2	11	73	2	2	692	55
136	SOUTH LIMITS OF WORTHINGTON	R	8.587	2030	10	1621	399	26	106	30	3	28	191	6	7	17432	3426
136	INTERSECTION 1ST AVENUE	M	0.292	1790	9	1396	385	25	103	29	3	27	184	6	7	523	112
136	NORTH LIMITS OF WORTHINGTON	M	0.295	2180	11	1784	385	25	103	29	3	27	184	6	7	643	114
136	SOUTH LIMITS OF DYERSVILLE	R	4.597	2250	12	1840	399	26	106	30	3	28	191	6	7	10343	1834
136	JUNCTION OLD CASTLE ROAD	M	0.053	3020	17	2618	385	25	103	29	3	27	184	6	7	160	20
136	US 20 INTERCHANGE	M	0.259	3910	22	3503	385	25	103	29	3	27	184	6	7	1013	100
136	JUNCTION 9TH STREET EAST	M	0.812	9000	52	8132	817	75	310	89	10	40	273	9	12	7308	663
136	INTERSECTION 2ND AVENUE SOUTH	M	0.164	7100	40	6244	817	75	310	89	10	40	273	9	12	1164	134
136	JUNCTION 3RD AVE	M	0.168	7400	41	6542	817	75	310	89	10	40	273	9	12	1243	137
136	NORTH LIMITS OF DYERSVILLE	M	0.640	5300	28	4455	817	75	310	89	10	40	273	9	12	3392	523
136	SOUTH LIMITS OF NEW VIENNA	R	3.382	3930	22	3500	408	46	188	54	6	14	94	3	4	13291	1380
136	INTERSECTION MAIN STREET	M	0.432	3560	20	3146	394	44	181	52	6	13	91	3	4	1538	170
136	NORTH LIMITS OF NEW VIENNA	M	0.418	3080	17	2669	394	44	181	52	6	13	91	3	4	1287	165
136	SOUTH LIMITS OF LUXEMBURG	R	3.604	2800	15	2377	408	46	188	54	6	14	94	3	4	10091	1470
136	JUNCTION US 52 & IA 3	M	0.502	2710	15	2301	394	44	181	52	6	13	91	3	4	1360	198
136	END OF IA 136																
	ROUTE SUMMARY - RURAL		20.434	2537												51849	8165
	ROUTE SUMMARY - MUNICIPAL		4.555	4661												21231	2442


New Vienna Rd
New Vienna Rd
New Vienna Rd
NEW VIENNA
Coffee Creek
136
136
136
136



W Main St and Columbus ST/ IA 136

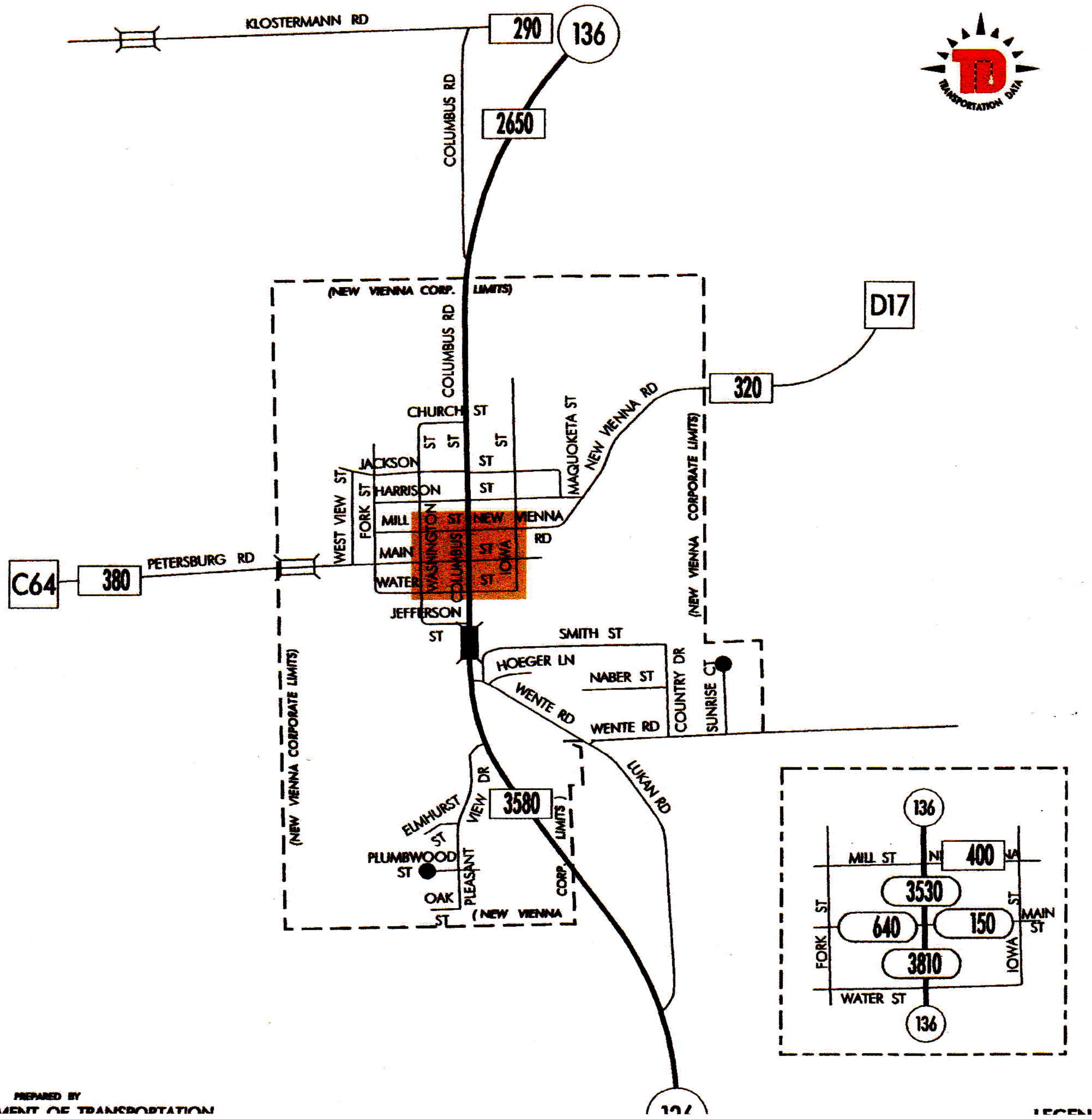
Columbus ST/ IA 136 and W Main St



Imagery ©2014 City of Dubuque, Map data ©2014 Google 20 ft

Iowa Department of Transportation

TRAFFIC FLOW MAP OF
NEW VIENNA
DUBUQUE COUNTY
2009 ANNUAL AVERAGE DAILY TRAFFIC



PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION

LEGEND

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

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

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: $ 135,130.50

Safety Funds Requested: $ 121,402.50

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 Council Bluffs

Signed: Gregory W. Reeder 8/11/14
Signature Date Signed

Gregory W. Reeder
Typed Name

Attest: Matthew S. Cox 8/11/14
Signature Date Signed

Matthew S. Cox
Typed Name

B

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 24 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 59 signalized intersections equipped with battery back-up. This project would add battery back-up to the 24 remaining traffic signals capable of utilizing it.

Battery Back-Up systems for traffic signals require all signal indications to be LED. The 24 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	24	$4,545.00	$ 109,080.00	Grant Funds	
LED Yellow ball indication	186	$55.00	$ 10,230.00	Grant Funds	
LED Yellow arrow indication	27	$77.50	$ 2,092.50	Grant Funds	
Total Cost of Materials			**$ 121,402.50**		
Labor					
Man/hours - 8.0 per system	192	$50.00	**$ 9,600.00**	City General Funds	
Equipment					
AR150 Bucket Truck - hours	96	$43.00	**$ 4,128.00**	City General Funds	
Total Project Cost			**$ 135,130.50**		
TSIP Funds Requested			**$ 121,402.50**		

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

C

Locations for BBS Systems	LED Yellows Needed	LED Yellow Arrows Needed
16th St & Ave B	12	2
16th St & Ave G	13	3
16th St & Big Lake Rd		
6th St & 5th Ave	6	
6th St & Willow Ave	6	
7th St & 32nd Ave	12	
7th St & 5th Ave	6	
7th St & Willow Ave	6	
9th Ave & Main St	12	
Bennett Ave & Bonham Ave	12	1
Bennett Ave & Franklin Ave	10	3
Broadway & 4th St	11	2
Hwy 6 & College Rd	12	3
Hwy 6 & Railroad Hwy		
Hwy 6 & Sherwood Dr		
Hwy 92 & Valley View Dr		
Langdon Blvd & E. S. Omaha Bridge Rd.	10	2
Langdon Blvd & L.C. High School Entrance	10	3
Langdon Blvd & L.C. Mid School Entrance	10	2
Langdon Blvd/3rd St & 16th Ave	10	2
Madison Ave & Valley View Dr	11	2
Mall Dr & Bennett Ave	8	1
Mall Dr & Valley View Dr		
N. 25th St & Ave N/Nash Blvd	9	1
24 traffic signals	186	27

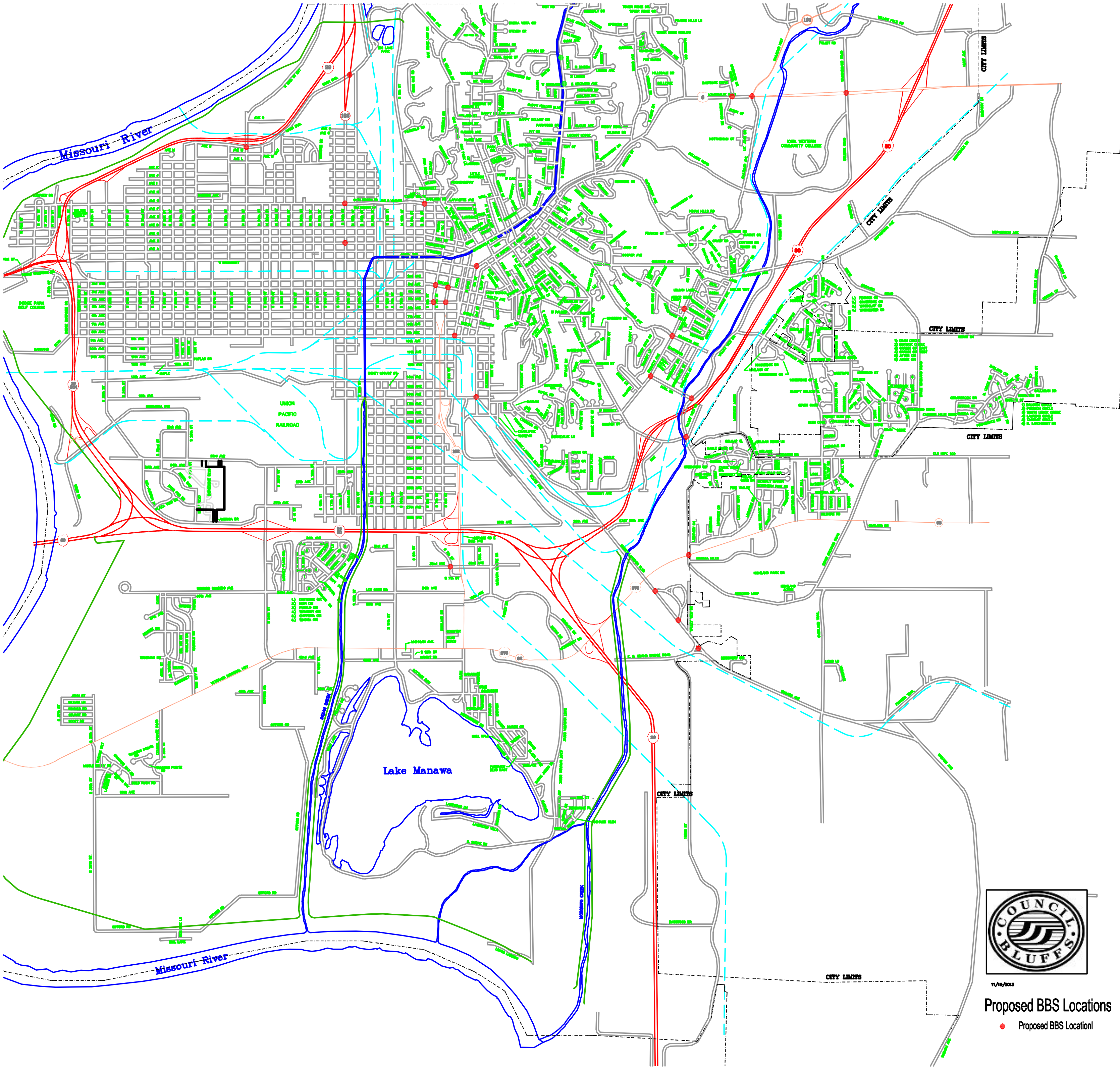
D

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

Time Schedule

1 January 2015	**Notification of Approval**
1 July 2015	**Funds become available**
1 July 2015	**Request for Quotes**
1 August 2015	**Materials received and work begins**
1 June 2016	**Project completion**

E



Proposed BBS Locations

TSIP Application, Council Bluffs Battery Back-Up Systems

F

Internal View Battery Back-up System

External Cabinet Battery Back-up System

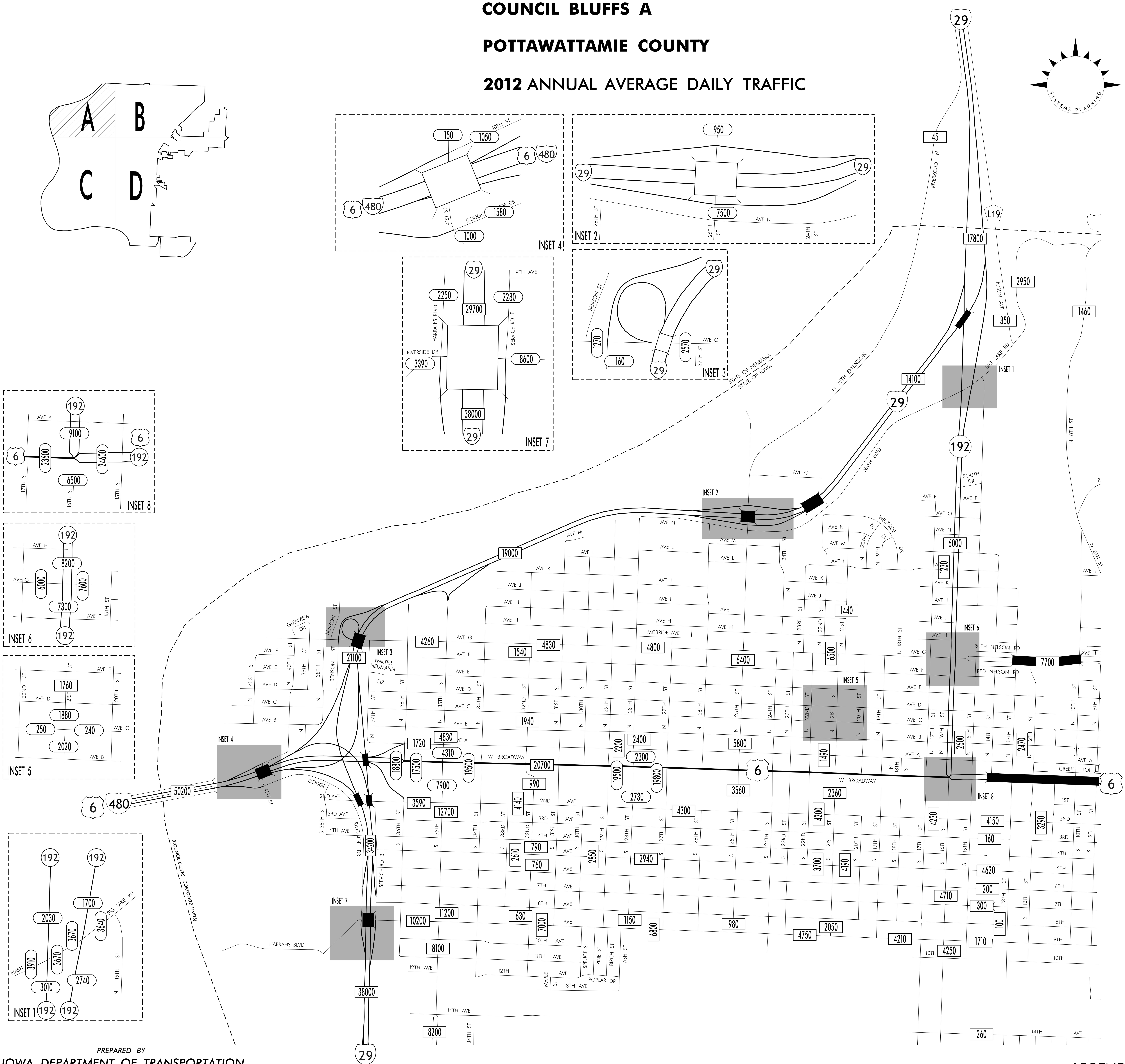
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

COUNCIL BLUFFS A

POTTAWATTAMIE COUNTY

2012 ANNUAL AVERAGE DAILY TRAFFIC



PREPARED BY

IOWA DEPARTMENT OF TRANSPORTATION

DIVISION OF PLANNING AND PROGRAMMING

OFFICE OF SYSTEM PLANNING

PHONE (515) 239-1289

LEGEND

RECORDER ONLY

MANUAL COUNT 123

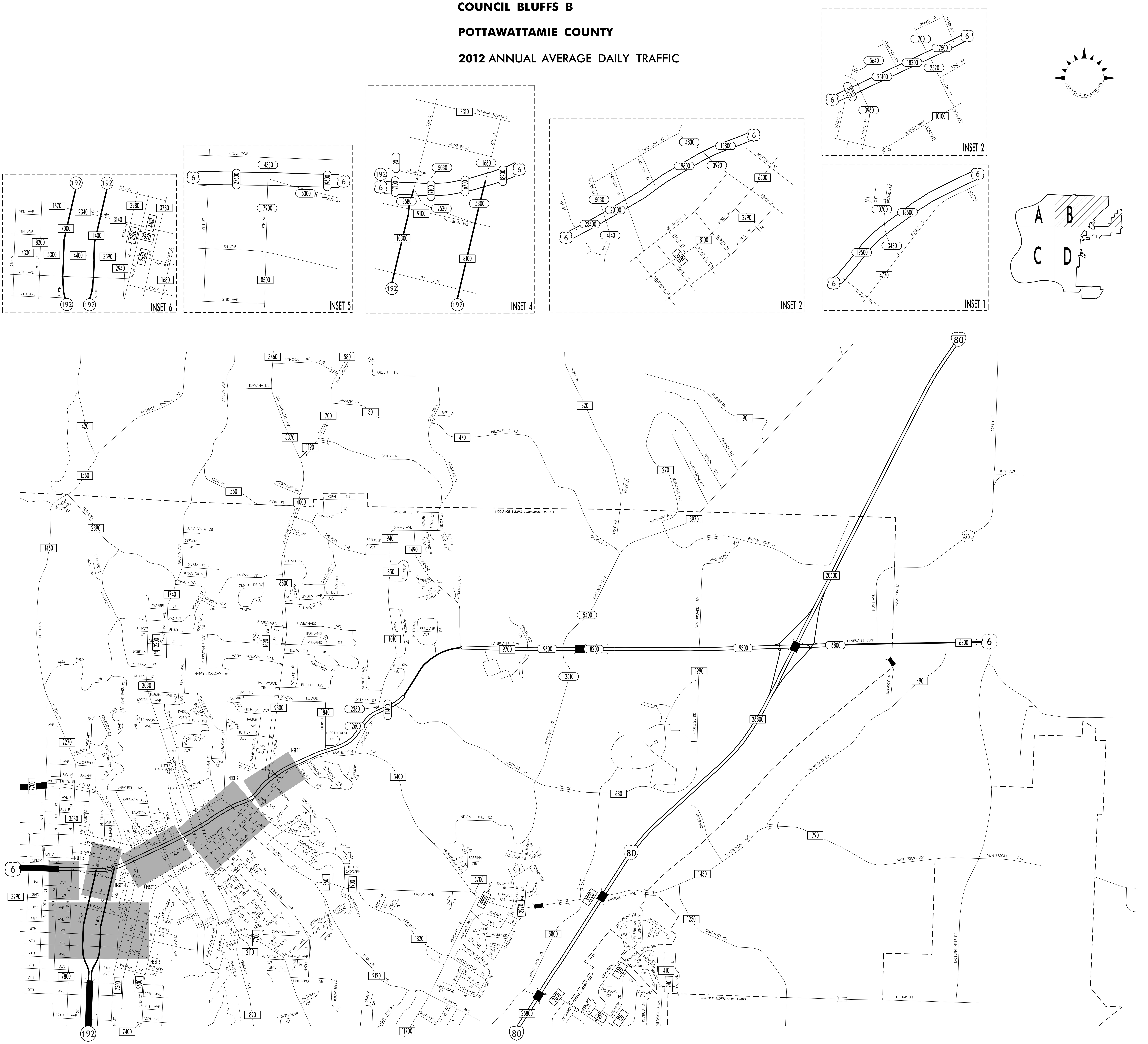
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

COUNCIL BLUFFS B

POTTAWATTAMIE COUNTY

2012 ANNUAL AVERAGE DAILY TRAFFIC



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IOWA DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING AND PROGRAMMING
OFFICE OF SYSTEM PLANNING
PHONE (515) 239-1289

LEGEND

RECORDER ONLY
MANUAL COUNT

124

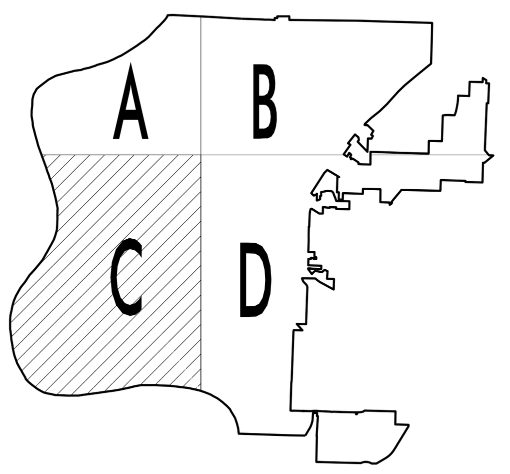
Iowa Department of Transportation

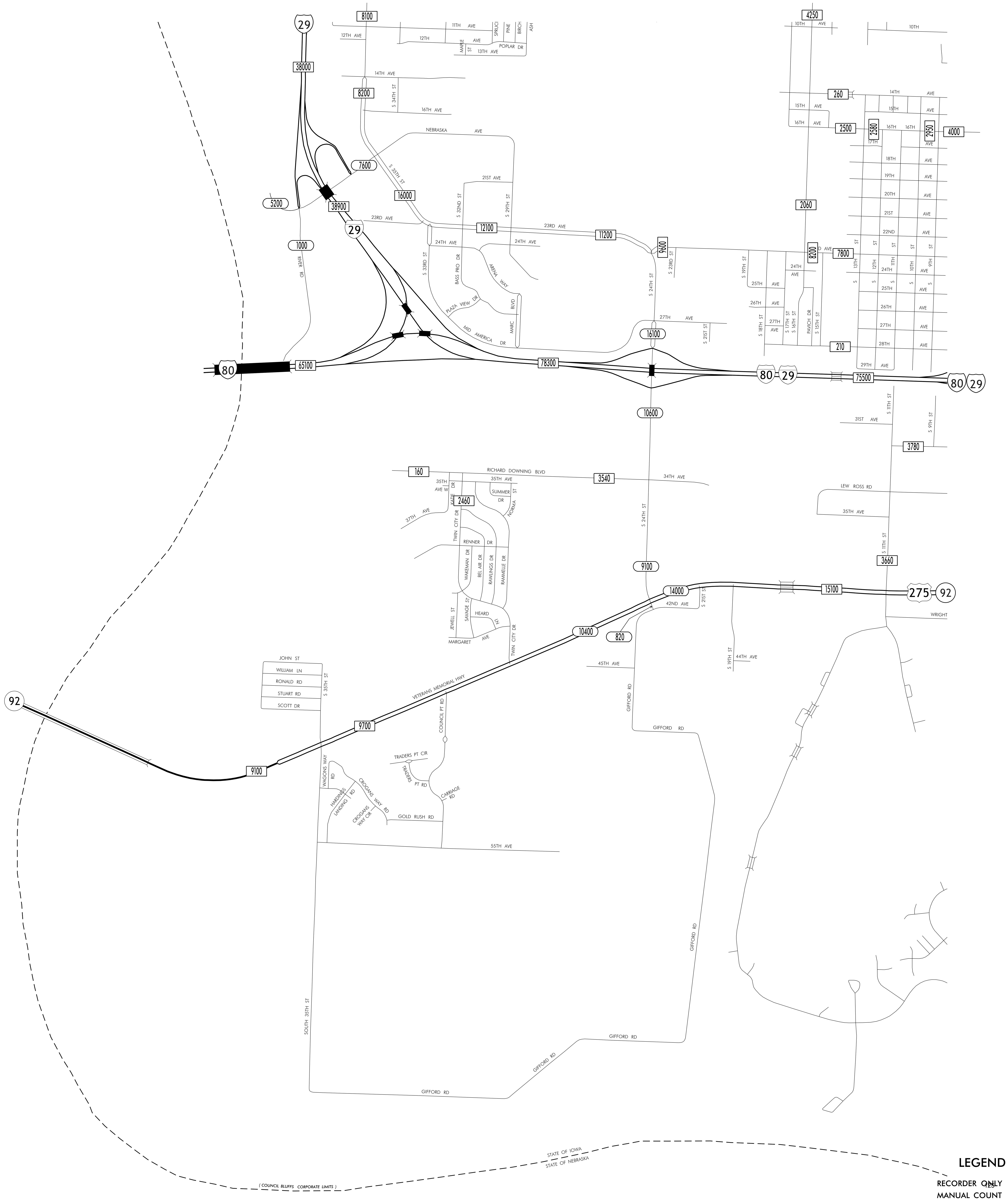
TRAFFIC FLOW MAP OF

COUNCIL BLUFFS C

POTTAWATTAMIE COUNTY

2012 ANNUAL AVERAGE DAILY TRAFFIC





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IOWA DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING AND PROGRAMMING
OFFICE OF SYSTEM PLANNING
PHONE (515) 239-1289

LEGEND
RECORDER ONLY
MANUAL COUNT

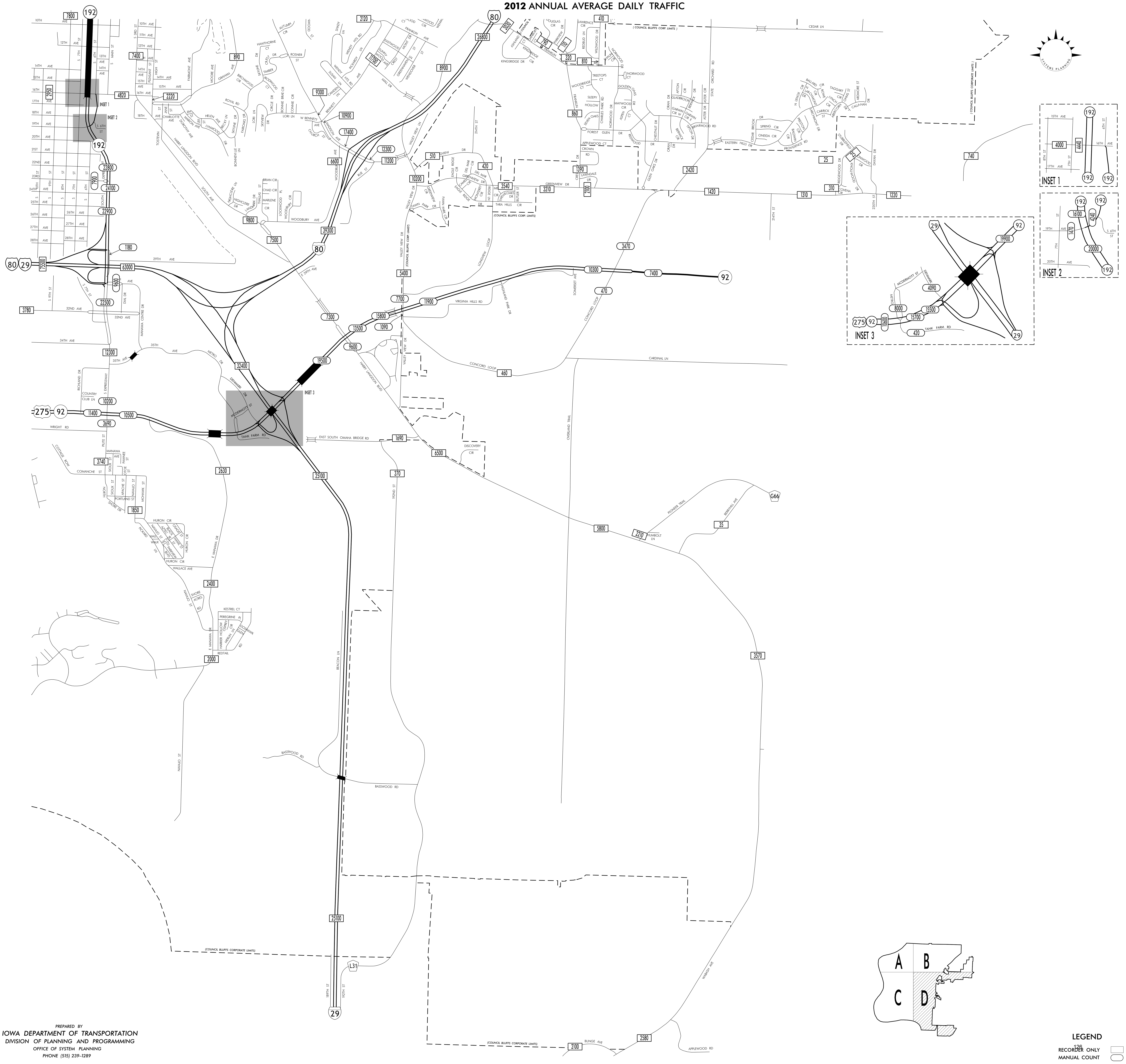
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

COUNCIL BLUFFS D

POTTAWATTAMIE COUNTY

2012 ANNUAL AVERAGE DAILY TRAFFIC



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IOWA DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING AND PROGRAMMING
OFFICE OF SYSTEM PLANNING
PHONE (515) 239-1289

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Traffic Signalization Improvements at Intersection of IA Hwy 3 and Main Street and IA Hwy. 3 and 4th Street East

Applicant: City of Clarion

Contact Person: Rochelle Pohlman   Title: City Administrator/Clerk

Complete Mailing Address: P.O. Box 266, 121 1st Street S.W.
Clarion, IA 50525-0266

Phone: 515-532-2847 (Area Code)   E-Mail: repohlman@mchsi.com

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): N/A

Contact Person: ______   Title: ______

Complete Mailing Address: ______

______

Phone: ______ (Area Code)   E-Mail: ______

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

- ☐ Site Specific
- ☒ Traffic Control Device
- ☐ Safety Study

Funding Amount

Total Project Cost $ 354,915.00

Safety Funds Requested $ 354,915.00

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 Clarion

Signed: _______________ 8-4-14

Signature Date Signed

Mike Nail, Mayor

Typed Name

Attest: _______________ 8-4-14

Signature Date Signed

Rochelle Pohlman, City Administrator/Clerk

Typed Name

PROJECT NARRATIVE

MAIN STREET AND IA HIGHWAY 3 (CENTRAL AVENUE)

4TH STREET EAST AND IA HIGHWAY 3 (CENTRAL AVENUE)

TRAFFIC SAFETY IMPROVEMENT PROGRAM

CLARION, IOWA

The traffic signals along Iowa Highway 3 are becoming obsolete. The City of Clarion wishes to improve the traffic signals at two locations in the downtown area – at the intersection of the Highway 3 and Main Street and at the intersection of Highway 3 and 4th Street East. The installations of the current signals were made between 25 and 40 years ago.

- The devices are 40 years old at Highway 3 and Main Street.
- The devices are 20 years old at Highway 3 and 4th Street.

There is a need to replace the detection devices, beyond the simple reason of age, because the current aging system is not functioning and is now running on "recall" or a fixed time cycle which is inefficient for through traffic on Highway 3. The speed limit along Highway 3 at the signal locations is 30 miles per hour with clear sight lines and no restrictions on view. The installation of video detection system in place of the current fixed time cycle system would greatly increase the efficiency of the intersections, provide for advance detection on Highway 3 and provide for a more reliable overall system. Currently, a two phase system is proposed for both intersections with the capabilities to change to a three phase system at Main Street in the future.

At the intersection of Highway 3 and Main Street, the current traffic signal poles will be replaced with combination signal/ lighting poles at each corner. This would result in the removal of a light pole from each corner, help to minimize the number of fixed objects in the ROW, and overall reduce the congestion for the pedestrian traffic. Also at the intersection of Highway 3 and 4th Street East improvements to the current signalization infrastructure is requested. Currently no traffic volume studies are available for this intersection; however a study was conducted for the intersection of Highway 3 and 6th Street East and is assumed to be similar to Highway 3 and 4th Street East. There are currently no mast arms on the signal poles for traffic approaching the intersection from 4th Street East, and only one mast arm mounted signal head for two lanes of traffic approaching the intersection from Highway 3. Similarly there is only one overhead light to illuminate the entire intersection. The lone overhead light is currently attached to a utility pole, and it is desired to have it moved to a traffic signal pole. The existing mast arms located over Highway 3 at both intersections are not long enough to provide a signal head centered over the inside lane of traffic. These are all current conditions that will be addressed and to help improve the visibility with the intersections and overall improve the safety.

The existing signal lights are old incandescent lights with some of the signal heads being only 8" in diameter. The proposed new LED traffic lights have many advantages. They lower power consumption by typically using only 10% of the power of the current incandescent lights and operate for many years without the need to change a bulb. These signals are cost effective and can provide energy savings and maintenance savings when compared to a conventional incandescent light. The environment benefits and cost savings measures are important but as important is that the new lights offer high reliability for a better, safer traffic control system. The LED lights generate little heat, are shock and vibration resistant and easy to install. New advanced optical lens design meet the luminous intensity standards while light output is redirected to motorists on the streets. Compared to traditional incandescent signals, upsized 12 inch heads with LED signals are high in brightness, show pure and consistent colors throughout the entire module area. They provide better visibility at all times – at night and in direct sun light which is critical as the population continues to age. The population of Clarion area residents with ages 65 years and older is important and growing larger. At 20.7% of the Wright County population, this is a considerably larger segment than the state average of 14.8% for people 65 and older. Upgrading traffic and pedestrian lights to a 12 inch size and greater brightness with a back plate will increase the target value and make them easier to see. This improves safety conditions.

Pedestrian signal heads will be replaced or added to the sites. Those that are in place now are not functioning and are non-existent in some locations. Installation will be a significant safety improvement.

Controllers and cabinets will be replaced at both intersections to accommodate the proposed detection and phasing improvements. A GPS based universal time clock will provide coordination between intersections along Iowa Highway 3 and new conduits and wiring will provide for a fully updated signal installation.

TRAFFIC SIGNALIZATION IMPROVEMENTS

C

CITY OF CLARION, IOWA

PRELIMINARY ENGINEER'S OPINION OF PROBABLE PROJECT COST

August 1, 2014

MAIN STREET & IA HWY 3, 4TH STREET EAST & IA HWY 3

			MAIN STREET & IA HWY 3			4TH STREET EAST & IA HWY 3		
ITEM NO.	**DESCRIPTION**	**UNITS**	**UNIT PRICE**	**QUANTITY**	**TOTAL**	**UNIT PRICE**	**QUANTITY**	**TOTAL**
1	MOBILIZATION	LS	$ 7,100.00	1	$ 7,100.00	$ 7,050.00	1	$ 7,050.00
2	TRAFFIC CONTROL	LS	$ 1,700.00	1	$ 1,700.00	$ 1,700.00	1	$ 1,700.00
3	REMOVE SIDEWALK AND DRIVEWAY	SY	$ 80.00	5	$ 400.00	$ 80.00	5	$ 400.00
4	SIDEWALK, P.C. CONCRETE, 4 IN.	SY	$ 75.00	25	$ 1,875.00	$ 75.00	0	$ -
5	TRAFFIC SIGNALIZATION, MATERIALS ONLY (ITEMS LISTED BELOW)	LS	$ 55,000.00	1	$ 55,000.00	$ 55,000.00	1	$ 55,000.00
	NEW CONTROLLER	EA		1			1	
	NEW CABINET	EA		1			1	
	GPS BASED UNIVERSAL TIME CLOCK	EA		1			1	
	CONFLICT MONITOR	EA		1			1	
	TRAFFIC SIGNAL HEADS MAST ARM MOUNT RIGID 3-12"	EA		6			6	
	TRAFFIC SIGNAL HEADS POLE MOUNT STEEL BRACKET 3-12"	EA		4			4	
	TRAFFIC SIGNAL HEADS PEDESTRIAN COMBINATION HAND/MAN 1-16"	EA		8			8	
	ACTUATION BOTTONS	EA		8			8	
	SIGNAL HEAD VISORS	EA		30			30	
	VIDEO DETECTION SYSTEM	EA		1			1	
	BACKPLATES FOR MAST ARM MOUNTED HEADS	EA		6			6	
	HAND HOLES	EA		4			4	
	PVC CONDUIT 3"	LS		1			1	
	SIGNAL CABLE AND CONDUCTORS	LS		1			1	
6	TRAFFIC SIGNALIZATION, INSTALLATION ONLY	LS	$ 30,000.00	1	$ 30,000.00	$ 30,000.00	1	$ 30,000.00
7	TRAFFIC SIGNAL POLES, FURNISH AND INSTALL (ITEMS LISTED BELOW)	LS	$ 40,000.00	1	$ 40,000.00	$ 36,000.00	1	$ 36,000.00
	TRAFFIC SIGNAL POLES W/ MAST ARMS	EA		0			2	
	TRAFFIC SIGNAL POLES W/ MAST ARMS AND LUMINAIRES	EA		4			2	
	LUMINAIRES - 400 WATT HPS	EA		4			2	
	REMOVE EXISTING BASES	EA		4			4	
	INSTALL TRAFFIC SIGNAL BASES (TYPE A)	EA		4			4	
	REMOVE & SALVAGE EXISTING TRAFFIC SIGNAL POLES	EA		4			4	
	REMOVEAL OF LIGHT POLES	EA		4			0	
8	TYPE A SIGN, SHEET ALUMINUM	SF	$ 50.00	21	$ 1,050.00	$ 50.00	21	$ 1,050.00
9	SEEDING AND FERTILIZING	LS	$ 550.00	0	$ -	$ 550.00	1	$ 550.00
	TOTAL				$ 137,125.00			$ 131,750.00
				10% Contingency	**$ 13,712.50**			**$ 13,175.00**
				20% Non Construction Costs	**$30,167.50**			**$28,985.00**
					$ 181,005.00			**$ 173,910.00**

TOTAL PROJECT COST **$ 354,915.00**

PROPOSED PROJECT DEVELOPMENT TIMELINE
TRAFFIC SIGNALIZATION IMPROVEMENTS AT THE INTERSECTION OF IA HWY. 3 AND MAIN STREET, 4TH STREET
CLARION, IOWA

	2014					2015											
TASK	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Application Submittal	■																
Submittal Review		■	■	■	■	■											
Application Approval/ Project Agreement Development							■	■									
Design									■								
Bid Letting										■							
Construction											■	■	■				

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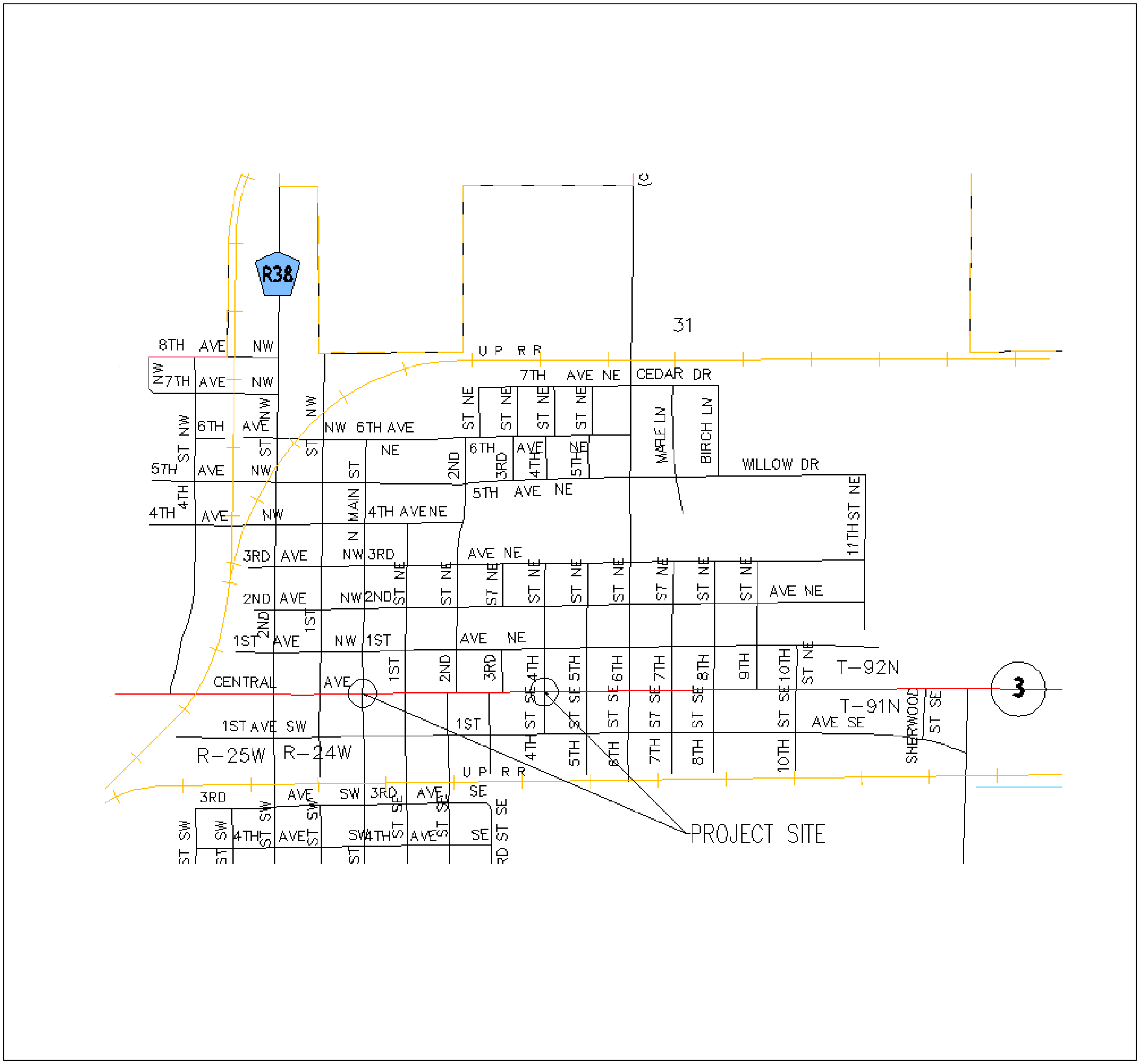
TRAFFIC SAFETY IMPROVEMENT PROGRAM
MAIN STREET AND IA HWY 3,
4TH STREET EAST AND IA HWY 3
CLARION, IA



LOCATION MAP

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INTERSECTION OF MAIN STREET AND IA HWY 3 (CENTRAL AVENUE), CLARION, IA

Figure 1 Looking North on Main Street, Google Maps. (2013)

Figure 2 Looking East on U.S. Hwy 3, Google Maps. (2013)

Figure 3 Looking South on Main Street, Google Maps. (2013)

Figure 4 Looking West on U.S. Hwy 3, Google Maps. (2013)

INTERSECTION OF 4TH STREET EAST AND IA HWY 3 (CENTRAL AVENUE), CLARION, IA

Figure 5 Looking North on 4th Street East, Google Maps. (2013)

Figure 6 Looking East on U.S. Hwy 3, Google Maps. (2013)

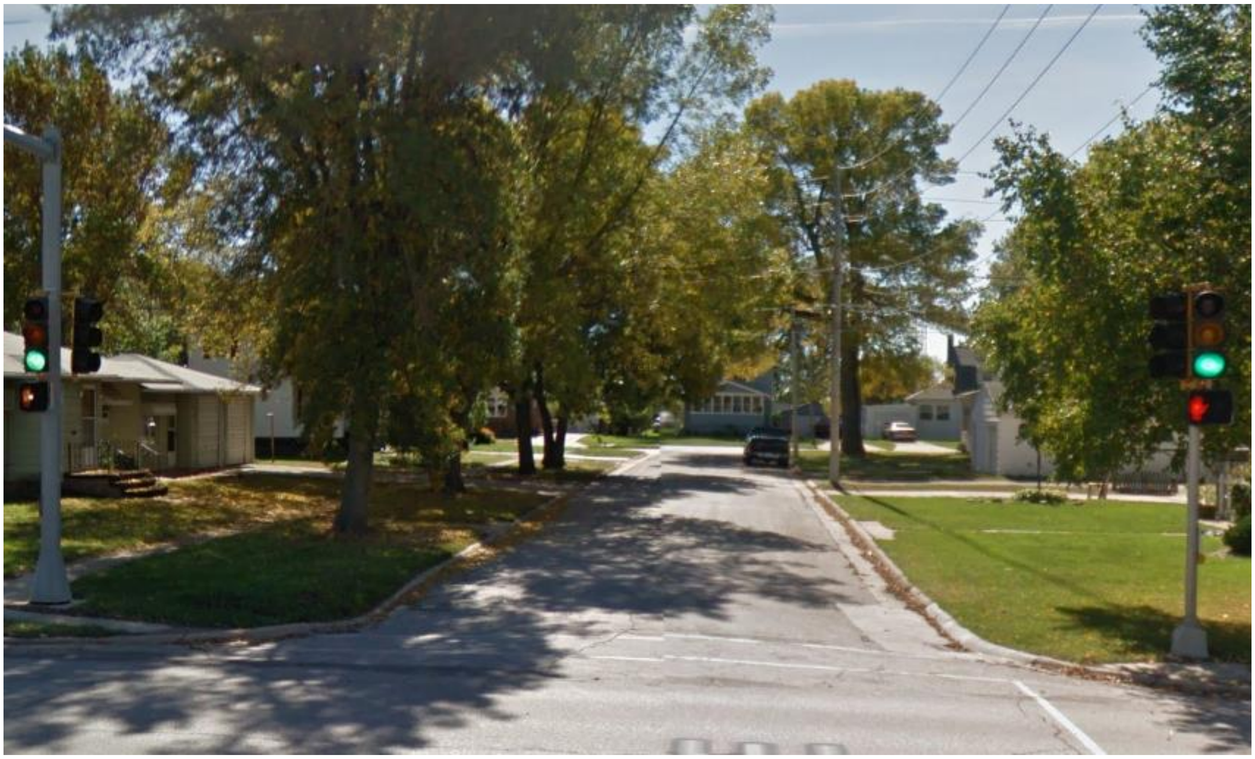
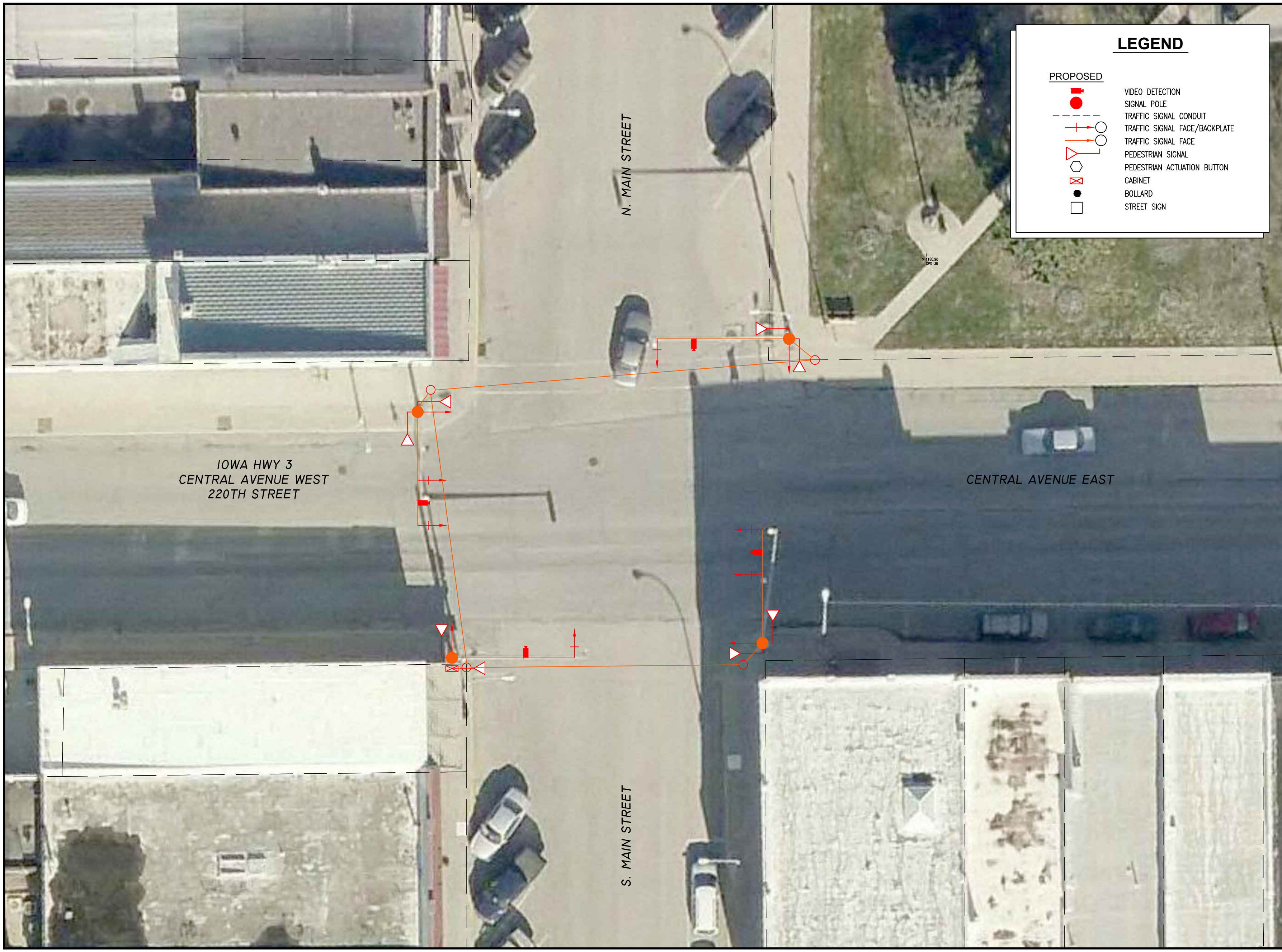


Figure 7 Looking South on 4th Street East, Google Maps. (2013)

Figure 8 Looking West on U.S. Hwy 3, Google Maps. (2013)



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PROJECT

TRAFFIC SIGNALIZATION IMPROVEMENTS

CLARION IOWA

Revision Schedule

Mark	Date	Description

PROJECT NO.	16973
FILE NAME	TRAFFIC SIGNAL DETAIL SHEET
DRAWN BY	JKF/ NRF/JSS
DESIGNED BY	NRF
REVIEWED BY	KLR
ISSUE DATE	8/15/2014
CLIENT PROJECT NO.	

TITLE

TRAFFIC SIGNAL DETAIL SHEET

SHEET

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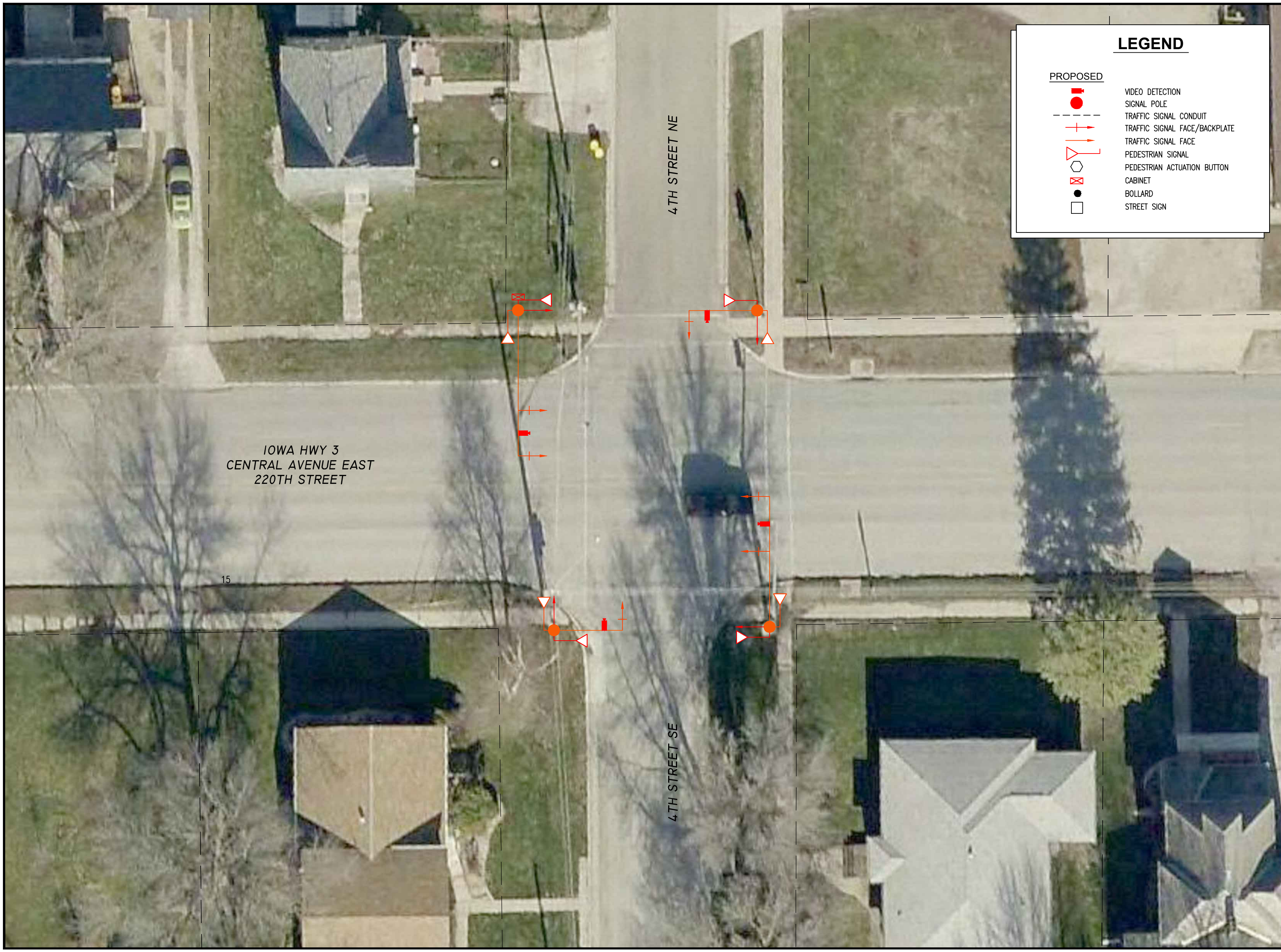

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TRAFFIC SIGNALIZATION IMPROVEMENTS

CLARION IOWA

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TITLE

TRAFFIC SIGNAL DETAIL SHEET

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Iowa Department of Transportation

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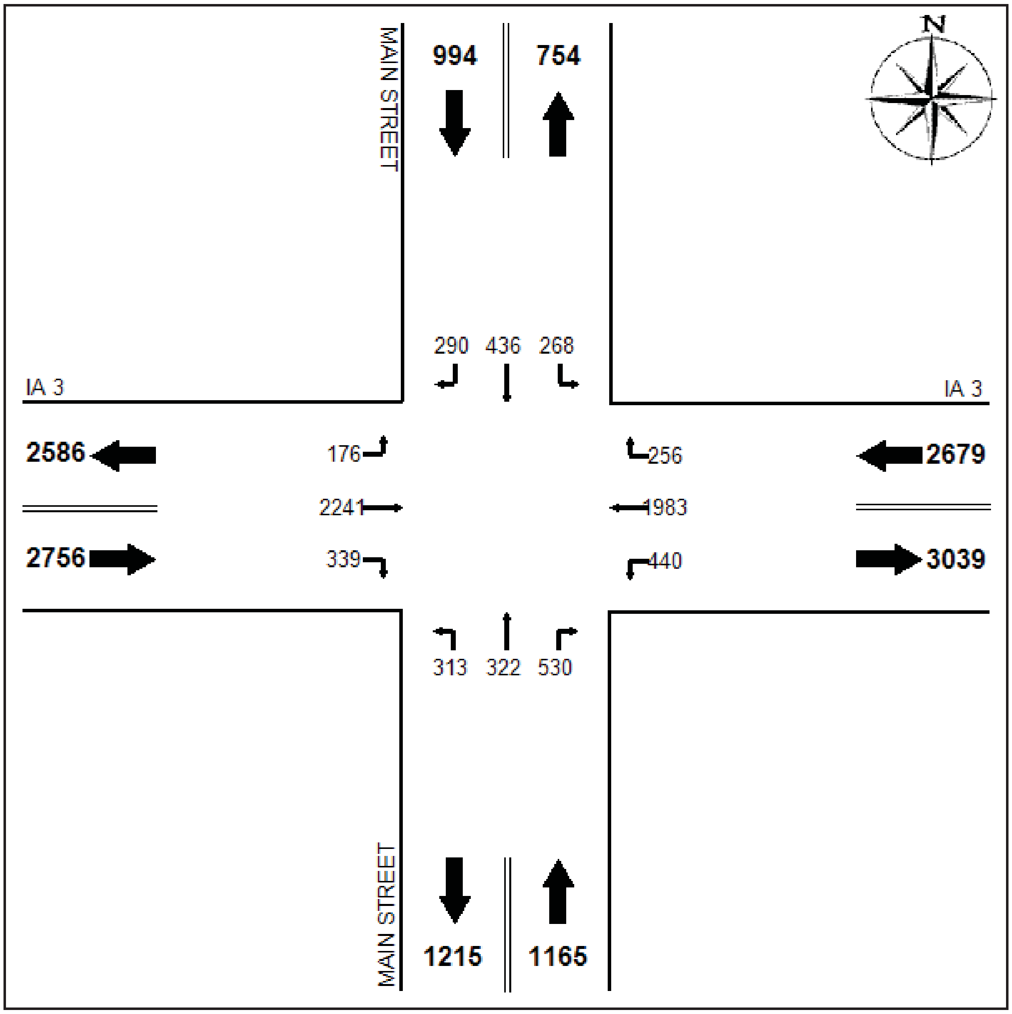

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Iowa Department of Transportation

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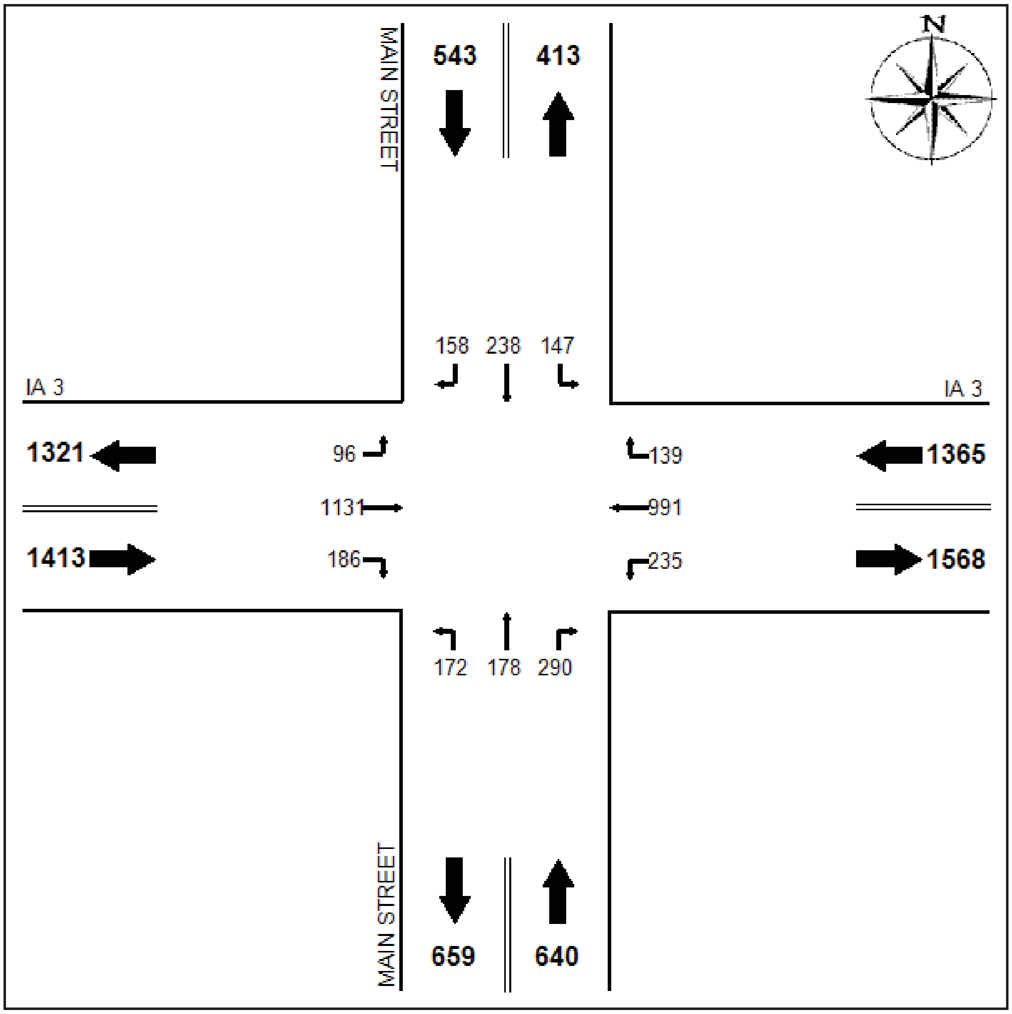

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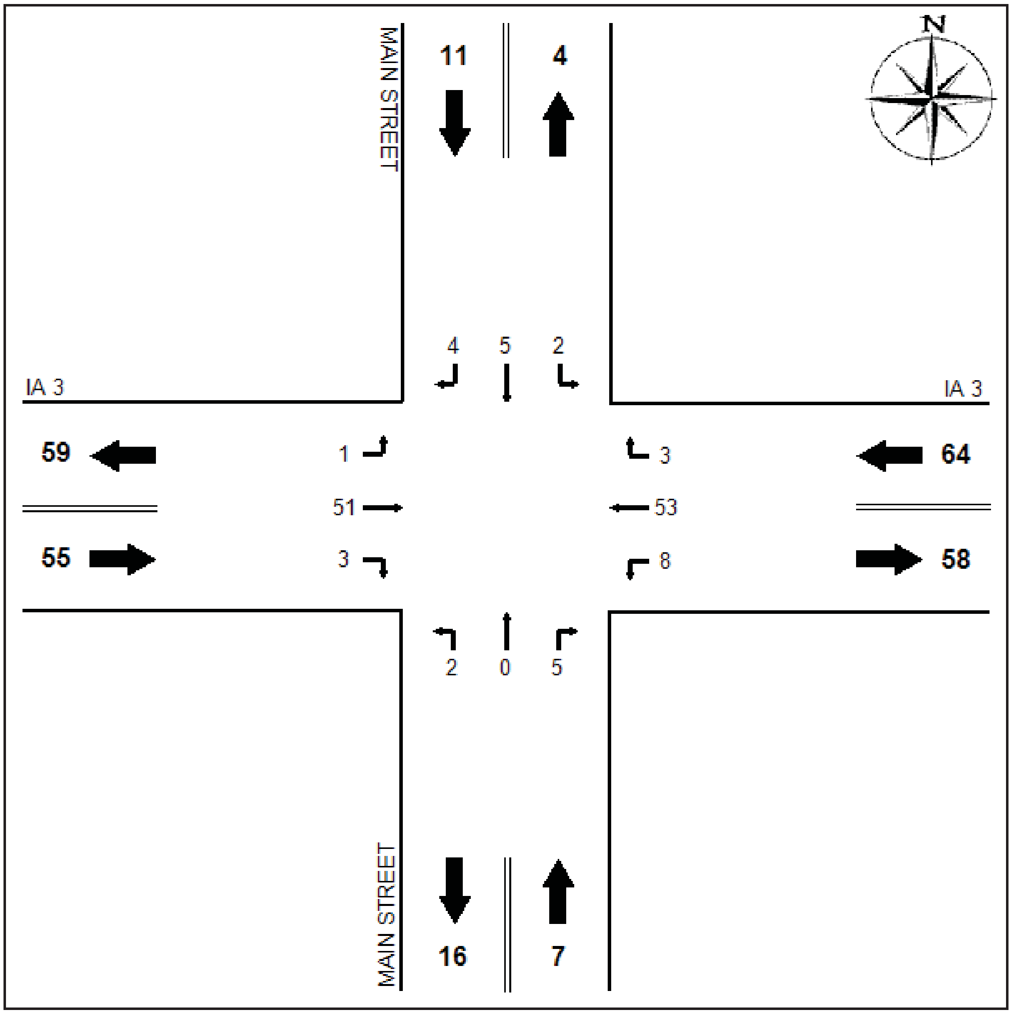

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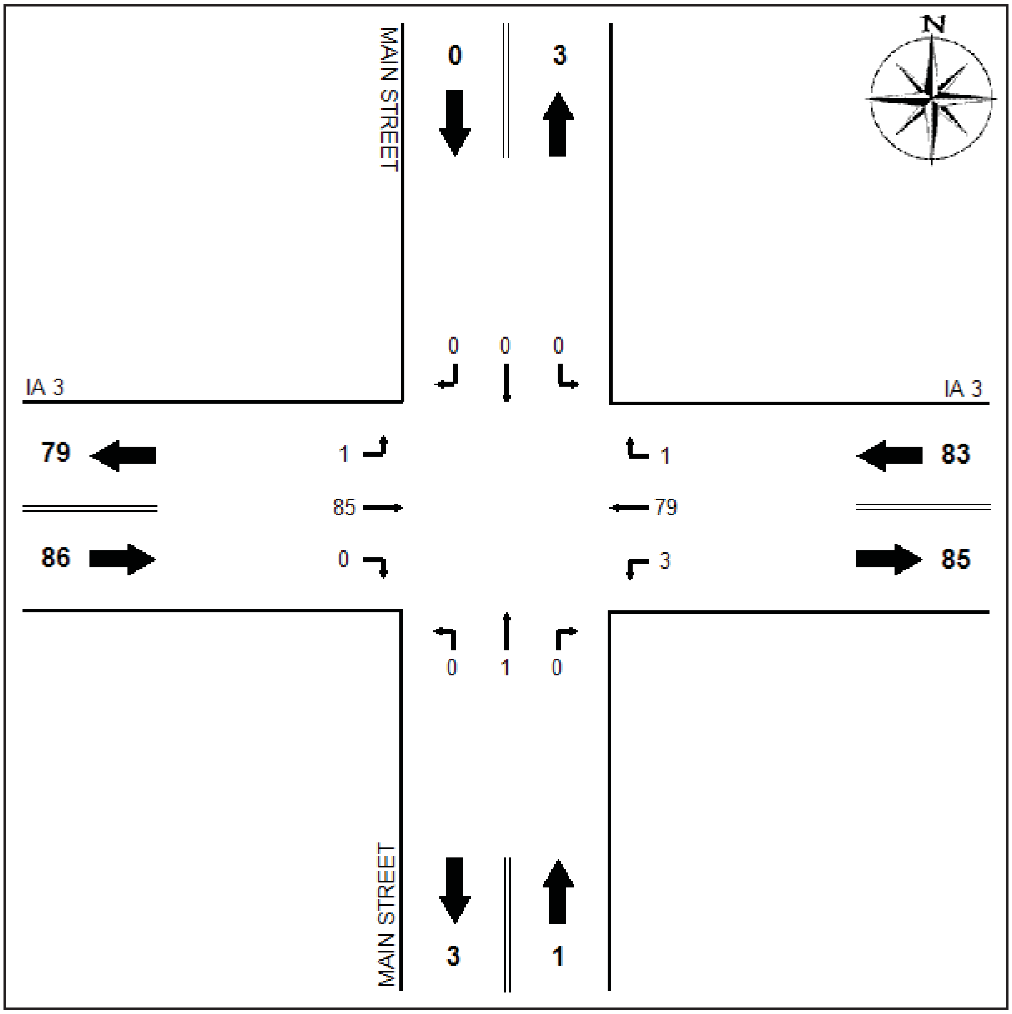

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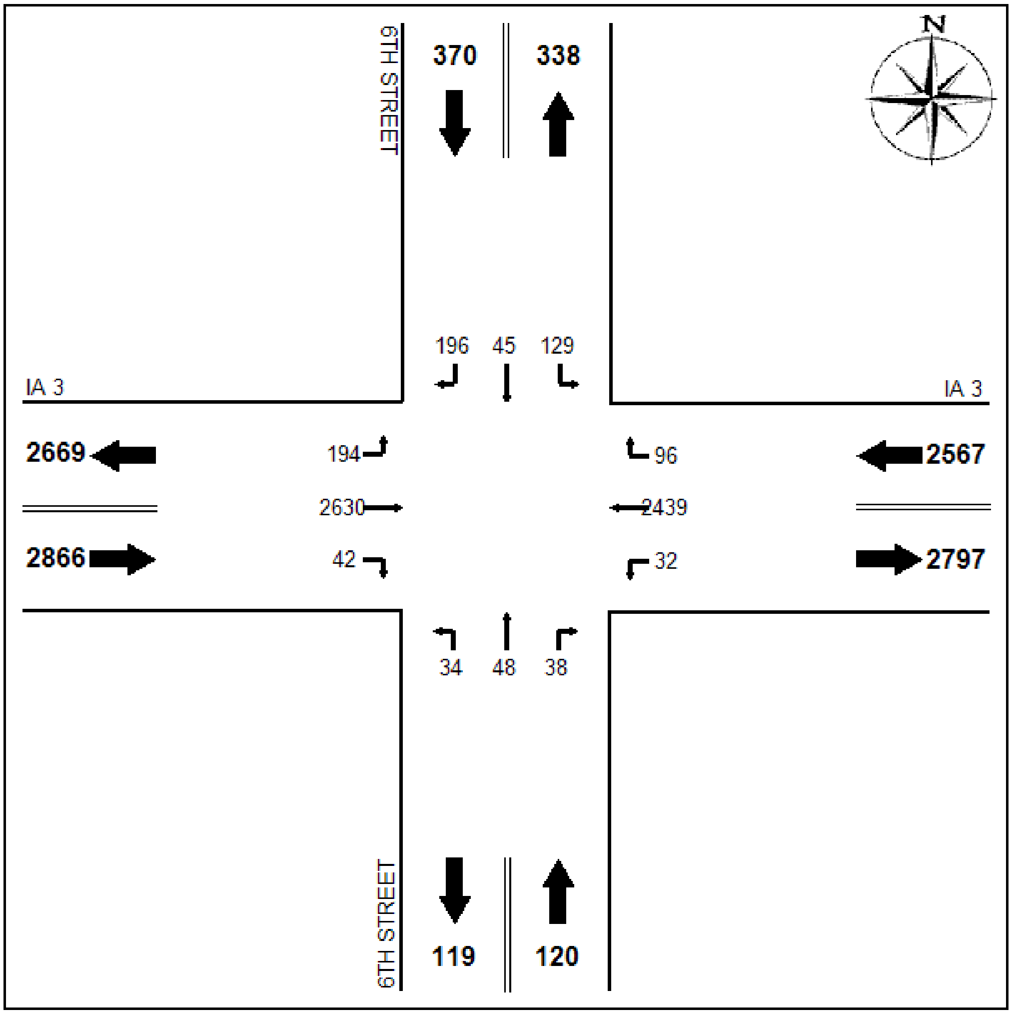

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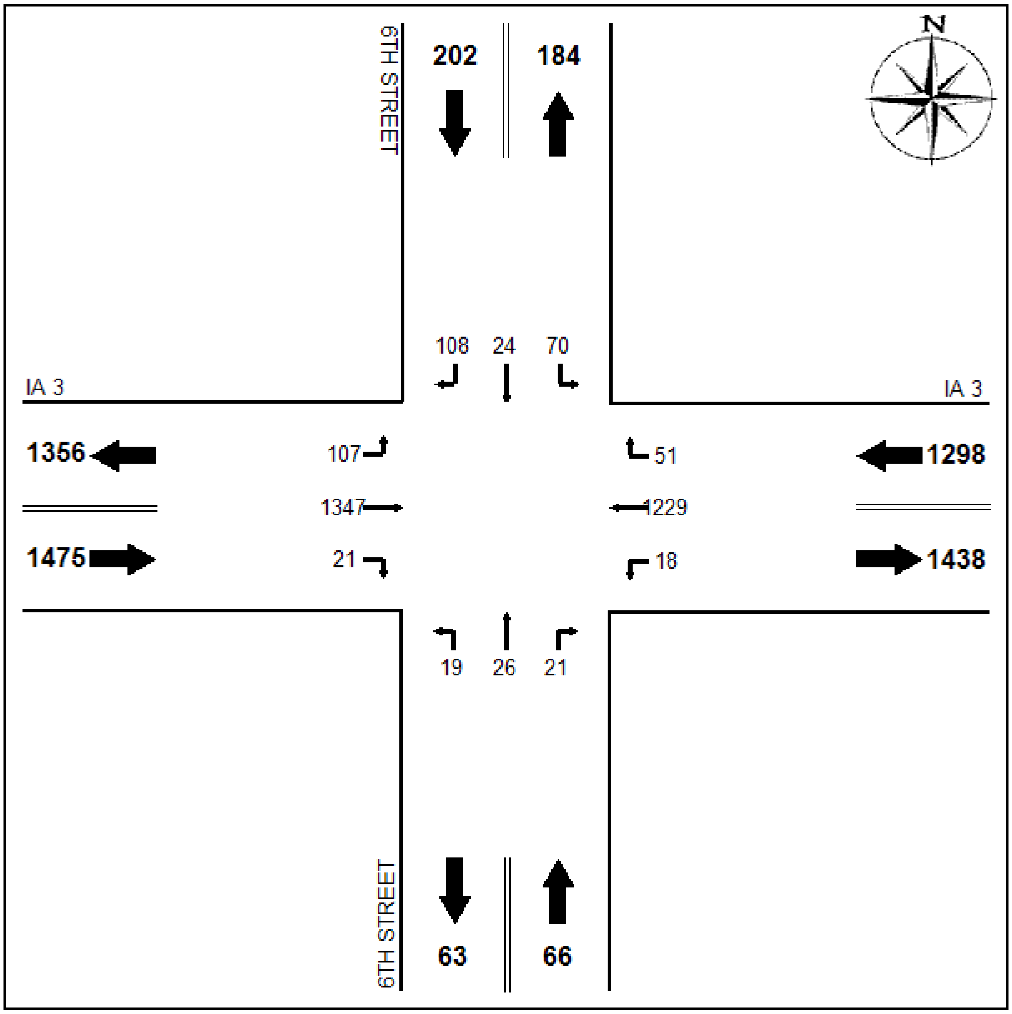

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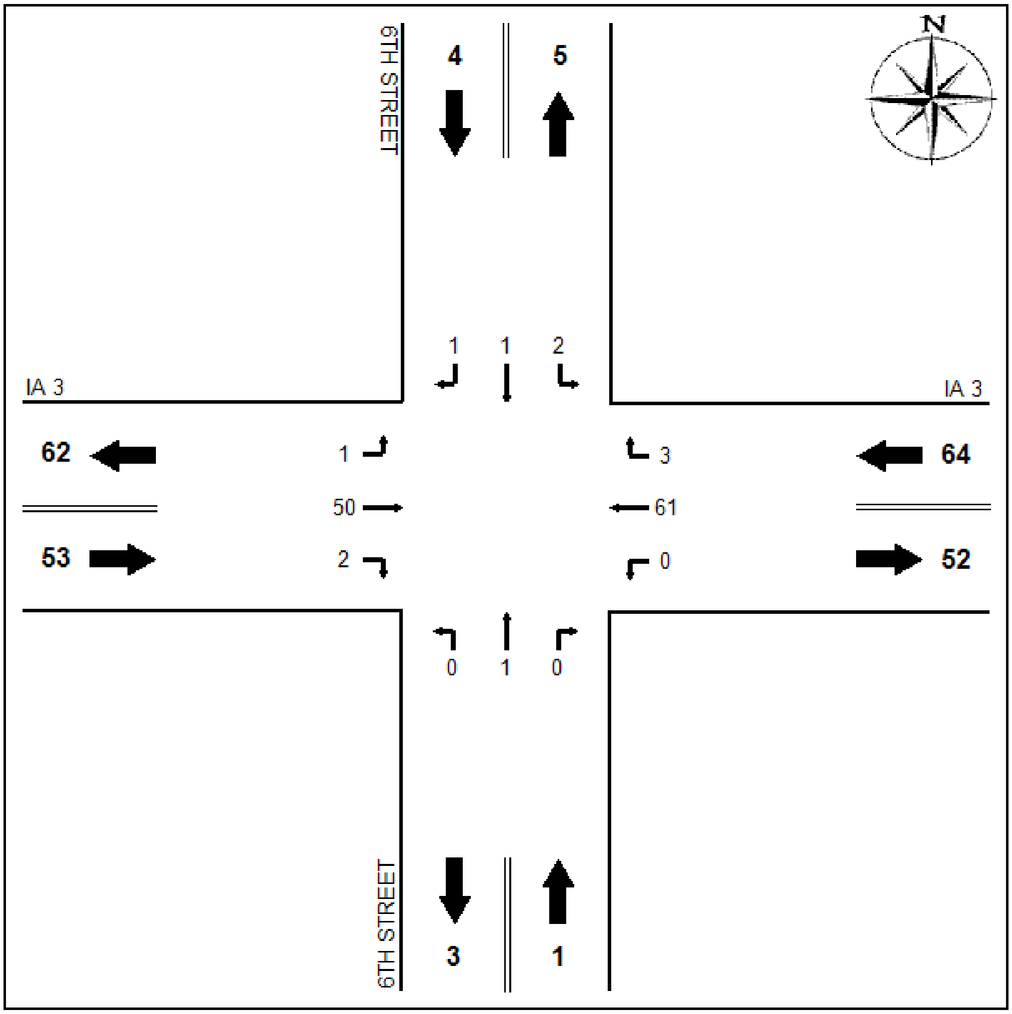

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Iowa Department of Transportation

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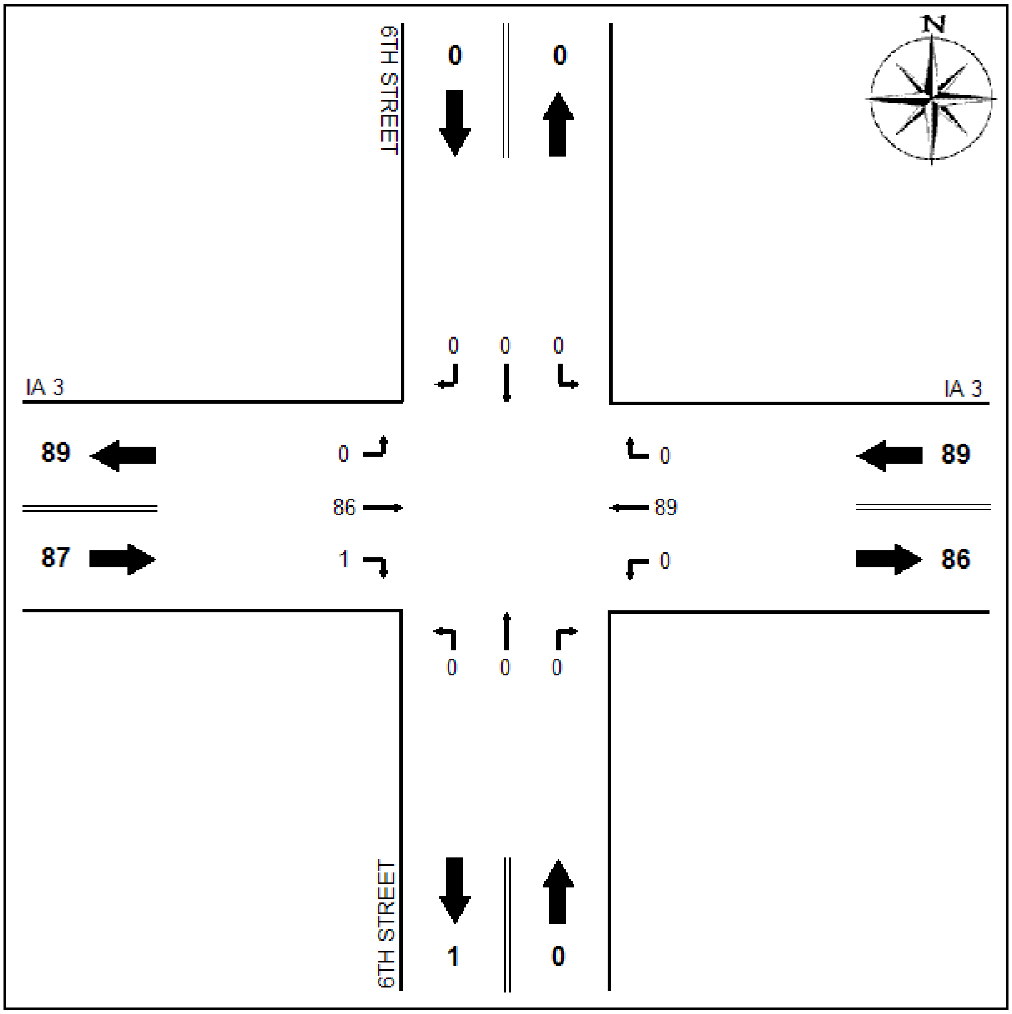

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Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Agency & Hobby Lobby/ Dollar General Intersection

Applicant: City of Burlington

Contact Person: Steve Hoambrecker   Title: Public Works Director

Complete Mailing Address: 3510 Division
Burlington, IA 52601

Phone: 319-753-8171   E-Mail: hoambreckers@burlingtoniowa.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 $ 144,860

Safety Funds Requested $ 144,860

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 Burlington

Signed: ______________________________

Signature Date Signed

Shane McCampbell, Mayor
Typed Name

Attest: ______________________________

Signature Date Signed

Kathleen Salisbury, City Clerk
Typed Name

Existing Conditions:

Agency Street is a major arterial that runs east-west through Burlington and connects downtown Burlington with a commercial corridor located in the west portion of Burlington, extending into West Burlington. Agency Street is a four lane undivided road with lanes of approximately 11 foot in width and a speed limit of 30 miles per hour. Many commercial businesses are located along Agency Street west of Roosevelt Avenue/US Highway 61. One of the primary intersections to access commercial development in this area is that of Agency Street and Frontage Road. This intersection serves as the primary access to a number of commercial retailers including Dollar General, Big Lots, Hobby Lobby, and Advance Auto Parts, among others. The speed limit of Agency Street at this intersection is 30 mph and the intersection is controlled by wire mounted traffic signals. The traffic signals do have turn lights and there are also turn lanes for motorist to use on approach to the intersection.

On July 30th, 2014 the Southeast Iowa Regional Planning Commission performed traffic counts along Agency Street to provide data for this application. The Agency Street and Frontage Road intersection was included in that SEIRPC traffic study. Along Agency Street the AADT of eastbound traffic was 7,684 with westbound traffic at 4,156. On Frontage Road southbound AADT was 680 and northbound as 1,672.

At this intersection there have been 27 crashes between the years of 2005 and 2014 according to CMAT data provided by the Iowa DOT. Of those accidents 1 had minor injuries, 6 had possible/unknown injuries and 20 had property damage only. There has been $76,650 worth of property damage as a result of accidents at this intersection between the years of 2005 and 2014. Out of the 27 accidents that have occurred at this intersection 11 of the accidents have been the result of improperly reacting to the traffic signal or other improper actions at the intersection. The intersection is largely dominated by the manner of rear-end or angle collisions.

New commercial development is being proposed to the east of this intersection on Agency Street and the existing Walgreens. The proposed commercial development will be called the Burlington Crossing Development and will incorporate several different types of land uses including apartments, a hotel, shopping center, convenience store, and restaurants. On the north side of Agency Street there is likely to be more retail commercial development going in the old Kmart and surrounding area. These new commercial developments will most likely increase the amount of through traffic and turning traffic at the intersection of Agency Street and Frontage Road.

Proposed Concepts

The proposed improvements for the Agency Street and Hobby Lobby intersection include new pole mounted traffic signals. The current signals at this intersection are wire span mounted traffic signals. The current signals do have turn lights and the intersection does incorporate left turn lanes. Despite having turn lights and left turn lanes the intersection is still prone to many accidents. As stated above this intersection is largely dominated by rear-end or angle type of crashes. These types of accidents are often associated with and indicative of poor visibility. It is our belief that the current wire span mounted signals, although better than pedestal mounted signals, are still not providing an appropriate level of visibility. Upgrading to pole mounted signals will significantly improve the visibility for motorists. These signals are also outdated and need to be replaced by new pole mounted signals that incorporate the appropriate timing and looping sequence for the intersection.

These and other improvements along the corridor will improve the operational traffic and safety of the Agency Street corridor. All of the proposed improvements for the intersection will identify and incorporate any requirements set forth in the Manual on Uniform Traffic Control Devices and will address any problems within the clear zone.

Safety Justification

Based on the CMAT safety data the Agency Street and Frontage Road intersection suffers largely from rear-end and angle collisions. The above proposed improvements will help mitigate this problem. Incorporating new pole mounted turn signals that are more visible to the driver will allow for traffic to move efficiently and safely through the intersection. These improvement will likely lead to more comfort for the driver and safer driving behavior by motorist in the functional area of the intersection.

By constructing new pole mounted traffic signals that incorporates the appropriate timing and looping sequence the hope is that driver visibility and comfort ability is increased. These proposed countermeasures will be able to mitigate and reduce the number of traffic accidents at the intersection of Agency and Frontage Road. Along with the potential safety benefits the new pole mounted traffic signals will also enhance the aesthetic appeal of the intersection and hopefully reduce the maintenance at the intersection.

Engineers Conceptual Cost Estimate 8/11/2014

Project: 2015/16 Agency & Frontage Road Signals - TSIP By: RJT

Line No	Item	Price
1	Traffic Controller	$ 4,700.00
2	Conflict Monitor	$ 1,260.00
3	Camera Controls	$ 25,000.00
4	Traffic Signal Poles	$ 110,000.00
5	Conduit for Wiring	$ 750.00
6	Camera Wire	$ 1,250.00
7	Signal Wire	$ 1,000.00
8	Load Switches	$ 900.00
	Total	$ 144,860.00

<u>Time Schedule for Project Development</u>

Grant Award .... December 2014

Approve contact with Iowa DOT.............................. January 2015

Submit Plans .... February 2015

Bid Letting, Award, and contract for
Traffic signals... March/April 2015

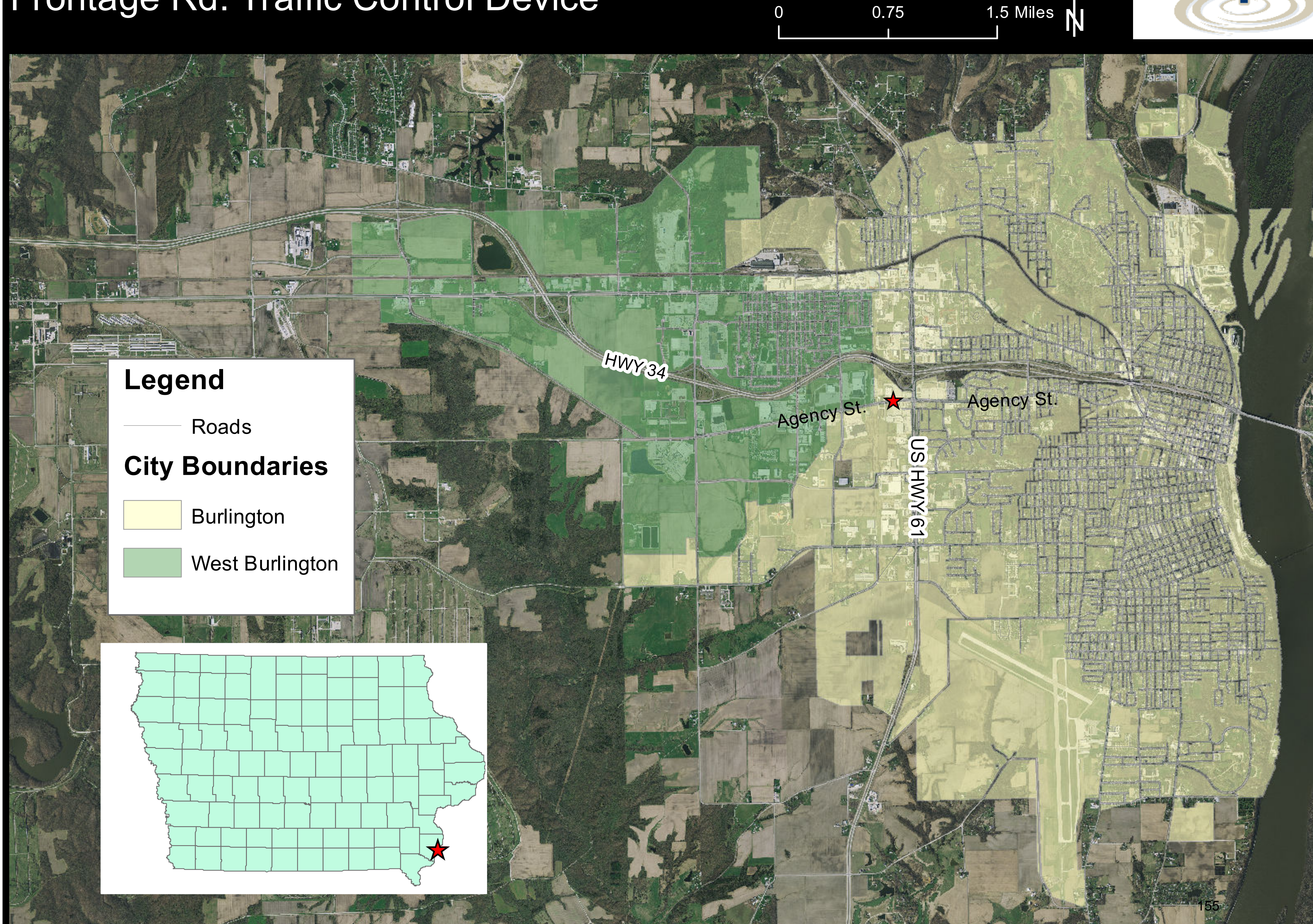
Begin Construction .... May/June 2015

Complete Construction .... July 2015

Project Closeout... August/September 2015

TSIP Site Location Map: Agency St. & Frontage Rd. Traffic Control Device

Southeast Iowa Regional Planning Commission
seirpc



Aerial of Agency St. and Frontage Rd. Intersection

Figure 1 - Intersection of Agency & Hobby Lobby looking SW

Figure 2 - Intersection of Agency & Hobby Lobby Looking SE

Figure 3 - Intersection of Agency and Hobby Lobby Looking NE

Figure 4 - Intersection of Agency and Hobby Lobby Looking NW

Intersection Map and Traffic Counting Totals July 30th to July 31st, 2014

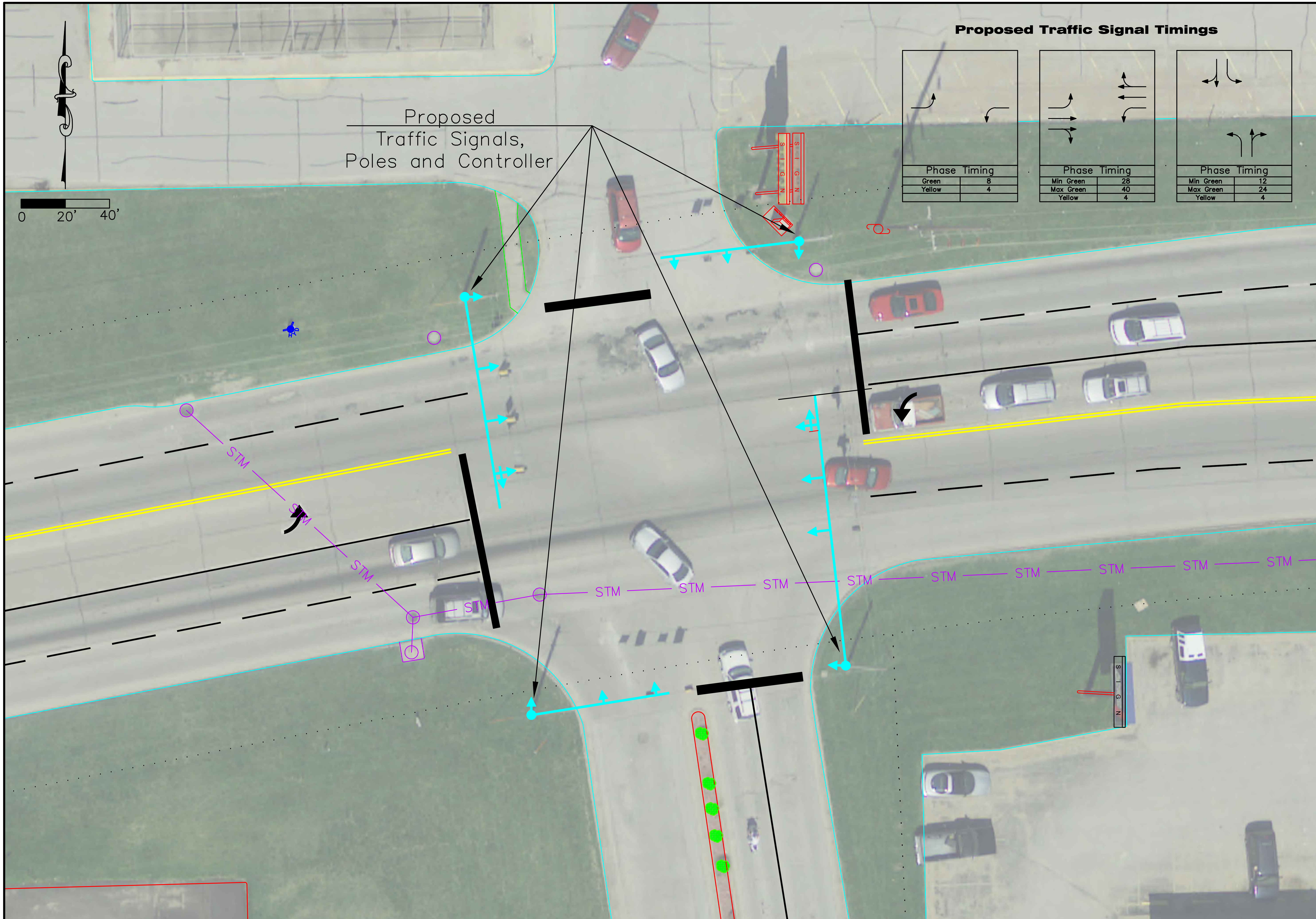
Hourly Breakdown of Traffic County – July 30th to July 31st, 2014

Northbound	
10am	72
11am	118
12pm	174
1pm	130
2pm	120
3pm	127
4pm	128
5pm	140
6pm	112
7pm	84
8pm	63
9pm	31
10pm	20
11pm	24
12am	8
1am	7
2am	2
3am	2
4am	10
5am	10
6am	16
7am	25
8am	28
9am	56
10am	86
11am	79
Totals	1672

Westbound	
10am	464
11am	566
12pm	604
1pm	544
2pm	500
3pm	592
4pm	546
5pm	569
6pm	462
7pm	306
8pm	206
9pm	124
10pm	82
11pm	50
12am	35
1am	22
2am	14
3am	24
4am	57
5am	86
6am	170
7am	232
8am	288
9am	402
10am	525
11am	338
Total	7808

Eastbound	
10am	425
11am	503
12pm	448
1pm	450
2pm	469
3pm	447
4pm	484
5pm	465
6pm	411
7pm	349
8pm	268
9pm	165
10pm	123
11pm	71
12am	38
1am	20
2am	17
3am	16
4am	20
5am	58
6am	76
7am	152
8am	211
9am	324
10am	413
11am	154
Total	6577

Southbound	
11am	72
12pm	91
1pm	56
2pm	43
3pm	41
4pm	33
5pm	46
6pm	39
7pm	51
8pm	20
9pm	12
10pm	1
11pm	4
12am	0
1am	0
2am	0
3am	1
4am	0
5am	1
6am	8
7am	12
8am	21
9am	41
10am	53
11am	34
Total	680



Proposed Traffic Signal Timings

Phase Timing	
Green	8
Yellow	4

Phase Timing	
Min Green	28
Max Green	40
Yellow	4

Phase Timing	
Min Green	12
Max Green	24
Yellow	4

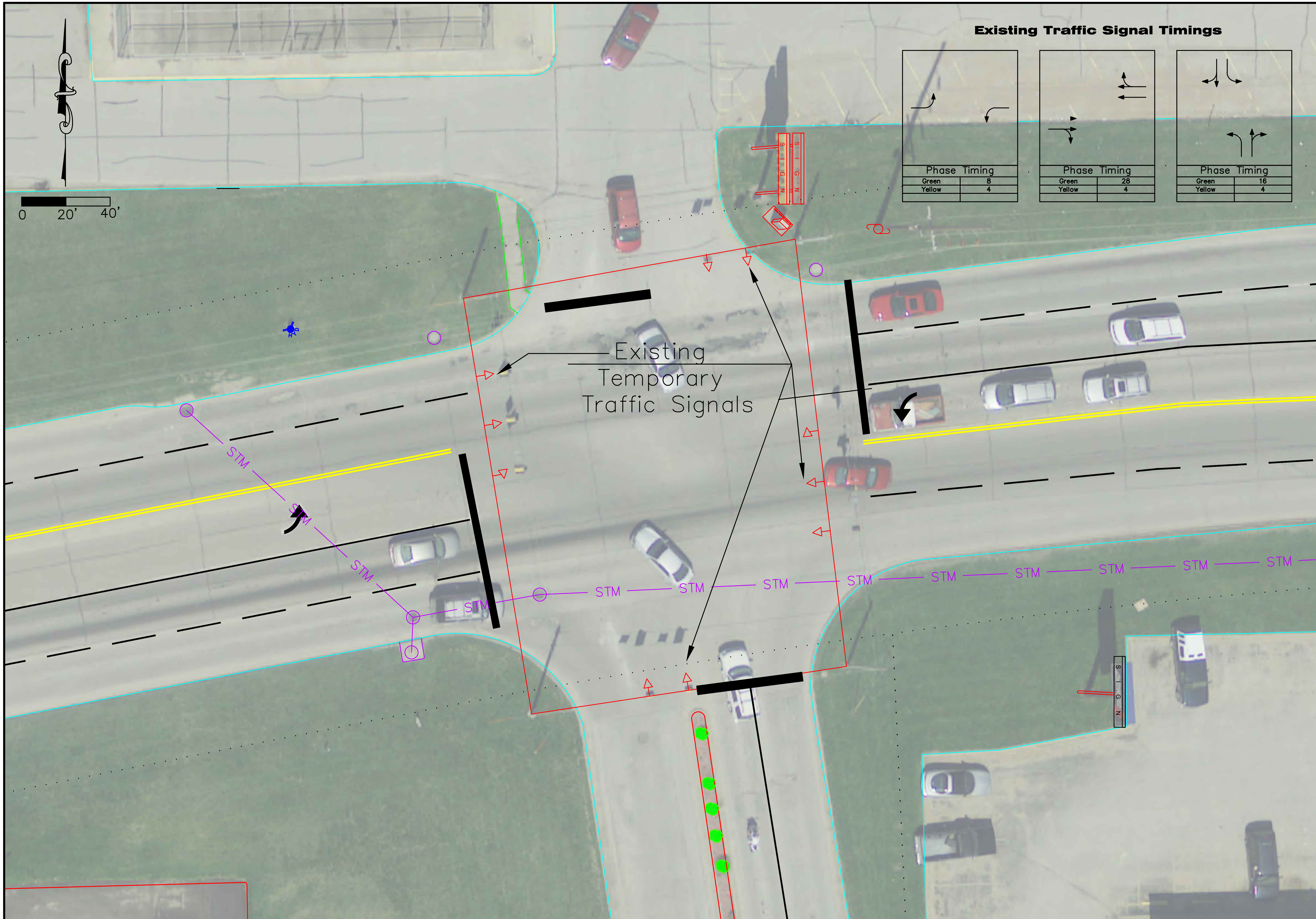
City of Burlington IOWA

REVISION: DATE: DESCRIPTION: ARCH. LOCATION

DESIGNED:
DRAWN: RT

TSIP Traffic Control Devices Agency & Hobby Lobby Proposed Improvements

SHEET: TBD
OF: TBD



Existing Traffic Signal Timings

Phase Timing	
Green	8
Yellow	4

Phase Timing	
Green	28
Yellow	4

Phase Timing	
Green	16
Yellow	4

City of Burlington IOWA

REVISION: | DATE: | DESCRIPTION: | ARCH. LOCATION

DESIGNED:
DRAWN: RT

TSIP Traffic Control Devices
Agency & Hobby Lobby
Existing Conditions

SHEET: TBD
162
OF: TBD

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Intersection of Old Hwy 9/A52 and Old Stage Rd/W60

Applicant: Allamakee County

Contact Person: Brian Ridenour Title: Engineer

Complete Mailing Address: PO Box 493
Waukon, Iowa 52172

Phone: (563) 568 4574 E-Mail: bridenour@co.allamakee.ia.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
- ☒ Traffic Control Device
- ☐ Safety Study

Funding Amount

Total Project Cost: $ 11,047.80

Safety Funds Requested: $ 11,047.80

Rev. 3/08

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 Allamakee County Engineer's Office

Signed: ____________________ 8-15-14

Signature Date Signed

Brian Ridenour

Typed Name

Attest: ____________________ 8-15-14

Signature Date Signed

Jeremy Bjerke

Typed Name

NARRATIVE:

The Intersection of Old Highway 9/A52 and Old Stage Rd/W60 has a few concerns for traffic safety. The intersection has a limited sight distance which likely has led to an increased amount of accidents.

Both highways are a farm-to-market classification and they connect the city of Waukon to Decorah. The roadways are 22 foot wide concrete paved roadways with a clear zone of 7 feet. The intersection is a 2-way stop controlled with North/South stopping traffic on Old Stage Rd. The speed limit along the roadway of both intersecting roads is 55 mph.

Sight obstructions at the intersection include the southwest quadrant of the intersection where trees from a dwelling have grown on private property and limit sight distance. Landowners were contacted by the county, but will not allow the county to cut trees. The northeast and northwest quadrants also have limited sight distance due to narrow ditches with high backslopes. While traveling eastbound along Old Highway 9 there is a minor sag followed by a minor crest curve as you enter the intersection. The intersection is at the bottom of a minor sag curve along the Old Stage Rd. With the changes in elevation along with the sight obstructions, the intersection has become an area of concern for the residents of Allamakee County.

This past winter a TEAP Intersection safety study was completed for this intersection. One of the suggestions was to place beacons on the stop signs and on the cross road ahead signs. By installing red flashing beacons above the stop signs on Old Stage Rd, the approaching stop should be much more easily seen and should reduce the possibility of drivers running the stop sign. With the addition of Yellow flashing beacons above the cross road ahead signs on Old Highway 9, driver's awareness of the approaching intersection should be greatly improved. With this in mind it was decided to place solar LED flashing beacons on the two stop signs and the two cross road ahead signs. The LED beacons were chosen to reduce the overall lifetime maintenance and operation cost. Along with the cross road sign it was decided to place a 45 mph speed advisory sign below the cross road sign. This should reduce the speed of oncoming traffic, improving their ability to respond to a situation if it may arise. The stop sign will also have a cross traffic does not stop sign placed below it. These signs will all be High Intensity Prismatic (HIP) grade.

The Intersection safety study also suggested improving sight distance and to correct the spacing on existing signs throughout the intersection. Both of these suggestions are being worked on to be corrected in the near future. As seen in the Plan View the Right Of Way has been acquired to improve the sight distances along the north side of the intersection. The signs are currently being inspected and making a plan to move them to their suggested spacing.

Placement of signs is crucial to their effectiveness that is why the Manual on Uniform Traffic Control Devices (MUTCD) and the Iowa Traffic Safety Manual (ITSM) were created. Chapter 2 of MUTCD and chapter 2 of the ITSM explain the requirements of sign placement. It is vital to follow these guidelines in order to ensure the full potential of signing is achieved. The listed guidelines for advance placement of warning signs as listed in the ITSM place the cross road sign and speed advisory at 500 feet from the intersection. MUTCD suggests placing the cross road sign and speed advisory sign at a distance of 275 feet from the intersection. The greater distance of 500 feet was chosen to give the driver more time to prepare for the intersection. For lateral placement measured from edge of pavement, the ITSM sets a minimum of 18 feet and a desirable distance of 24 feet. MUTCD sets a minimum lateral offset of 12 feet. It was chosen to use the minimum of 18 feet to satisfy both standards. As for the stop sign for Northbound Old Stage Rd traffic ITSM suggests 12 to 25 feet from the approaching roadway and 12 to 50 feet from edge of intersecting pavement. MUTCD suggests 6 to 12 feet minimum from the approaching roadway and 50 feet maximum from the intersecting pavement. The placement of the northbound traffic stop sign will depend upon whether or not the ROW to the south is acquired before installation. As for the stop sign for southbound traffic the stop sign will be placed in the Island. MUTCD suggests placing it 2 feet from the edge of the island closest to the stopping traffic and 2 feet from the edge of the island closest to cross traffic.

With the addition of the flashing beacons and future projects that are in the works, we at Allamakee County Engineers Office hope to improve the safety of the Allamakee County residents as they travel in our county.

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Figure 1 - Itemized Cost of Materials

Supplier	Description	Quantity	Unit Price	Total Price
Tapco	12" amber LED Solar Flashing Beacon	2	$ 1,795.00	$ 3,590.00
	12" red LED Solar Flashing Beacon	2	$ 1,795.00	$ 3,590.00
	15' heavy duty pole package-soil mount	3	$ 999.00	$ 2,997.00
	10' heavy duty pole package-concrete mount	1	$ 576.00	$ 576.00
IPI	36" Stop sign HIP	2	$ 46.70	$ 93.40
	30" Cross Road Symbol HIP	2	$ 39.10	$ 78.20
	36" x 18" Cross Traffic Does Not Stop HIP	2	$ 25.80	$ 51.60
	45 MPH Adisory Speed	2	$ 35.80	$ 71.60
		Signage Material Cost		$ 11,047.80

The cost of materials was taken from two different sources:

Tapco

5100 W Brown Deer Rd

Brown Deer, Wi USA 53223

1-800-236-0112

IPI

510 E 12th Street

Des Moines, Ia 50319

515-725-5705

TIME SCHEDULE

Project Application:	August 2014
Project Approval:	January 2015
Agreement Signed:	March 2015
Project Bid:	May 2015
Installation Completed:	September 2015
Project Closeout:	December 2015

Figure 2 - Map of intersection

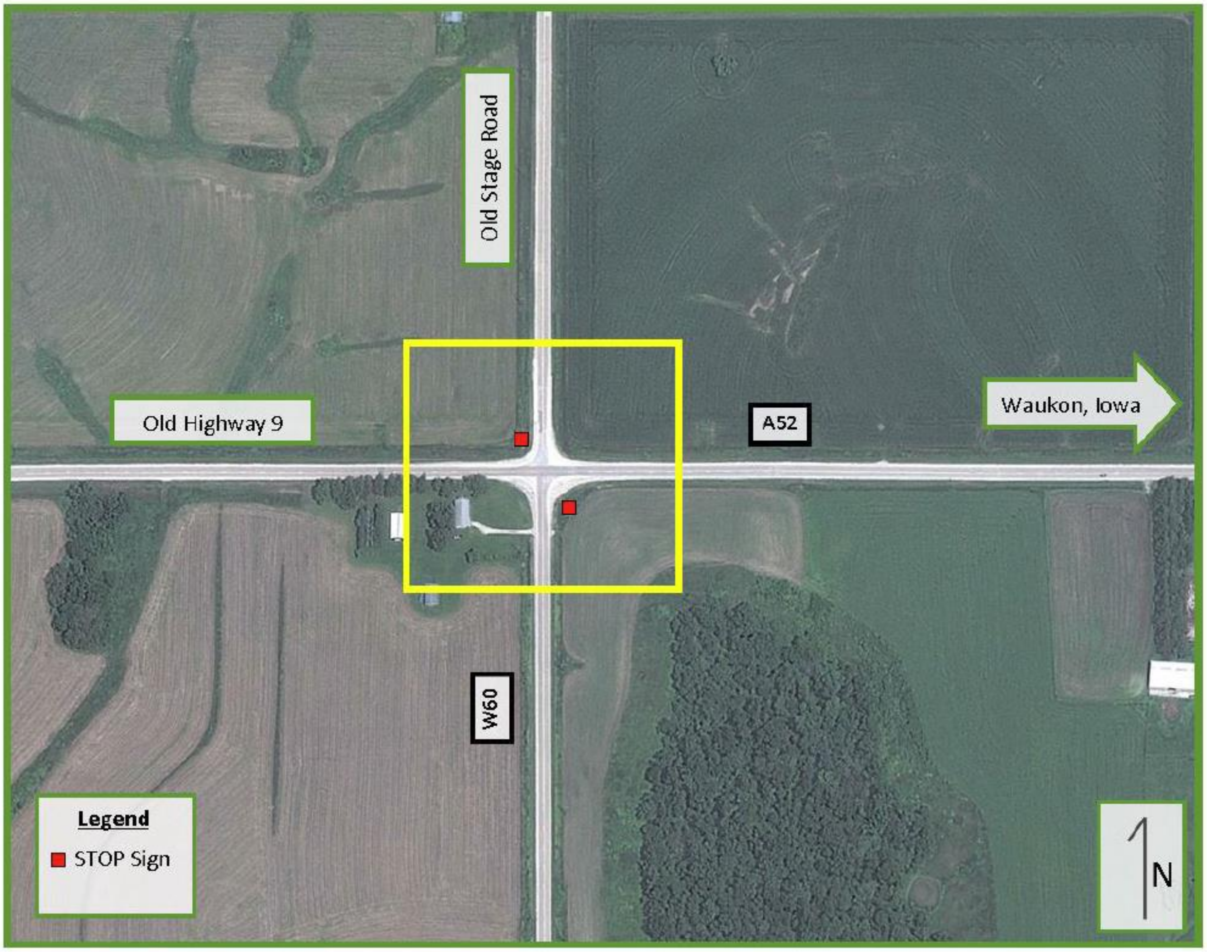

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Figure 3 - Views of Traffic

Figure 4 - Existing Cross Road Ahead Signs

Figure 5 - Sign Layout at Intersection

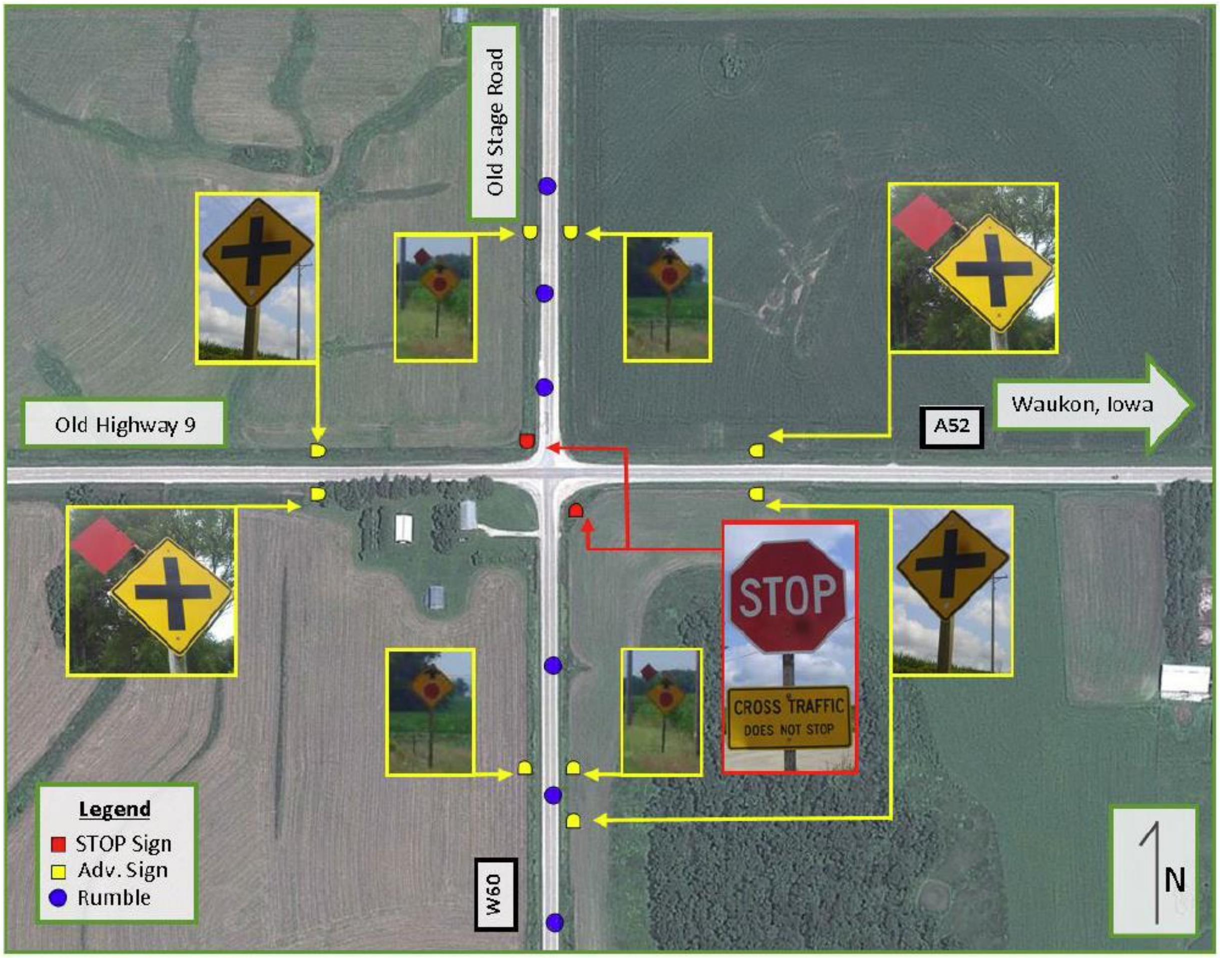


Figure 6 - Plan View East Side of Intersection

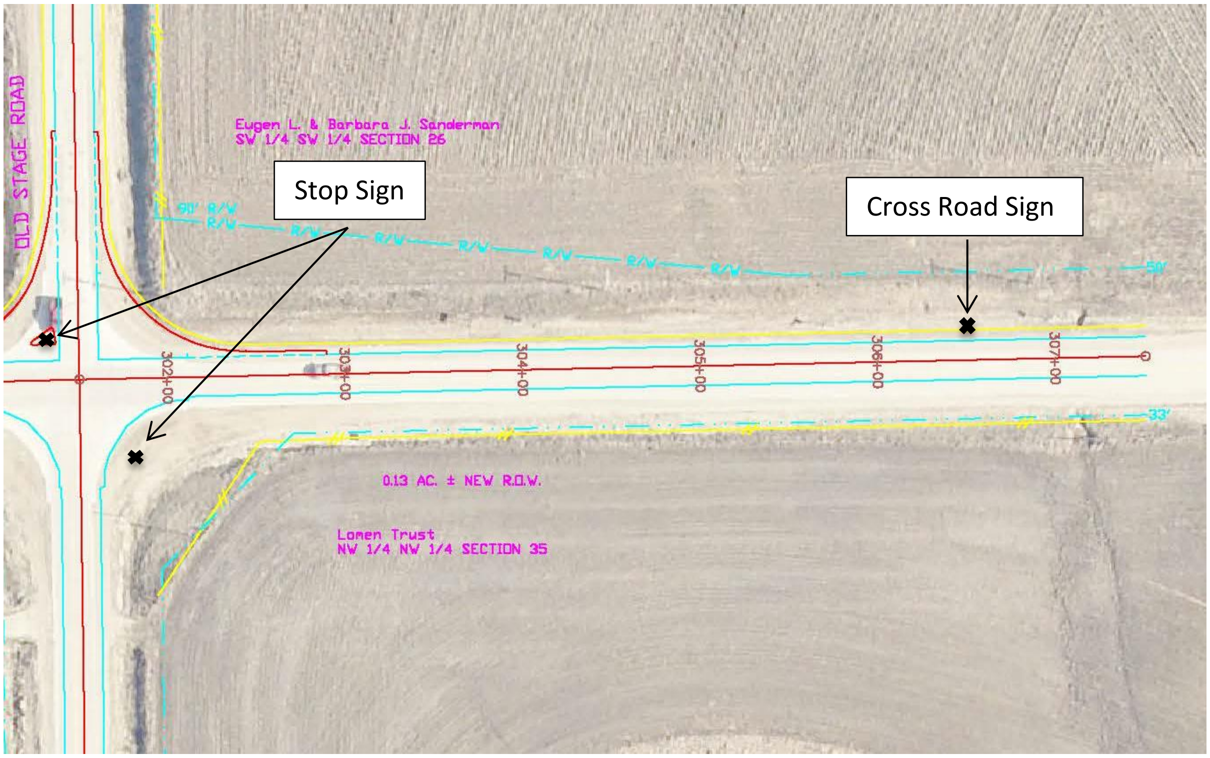
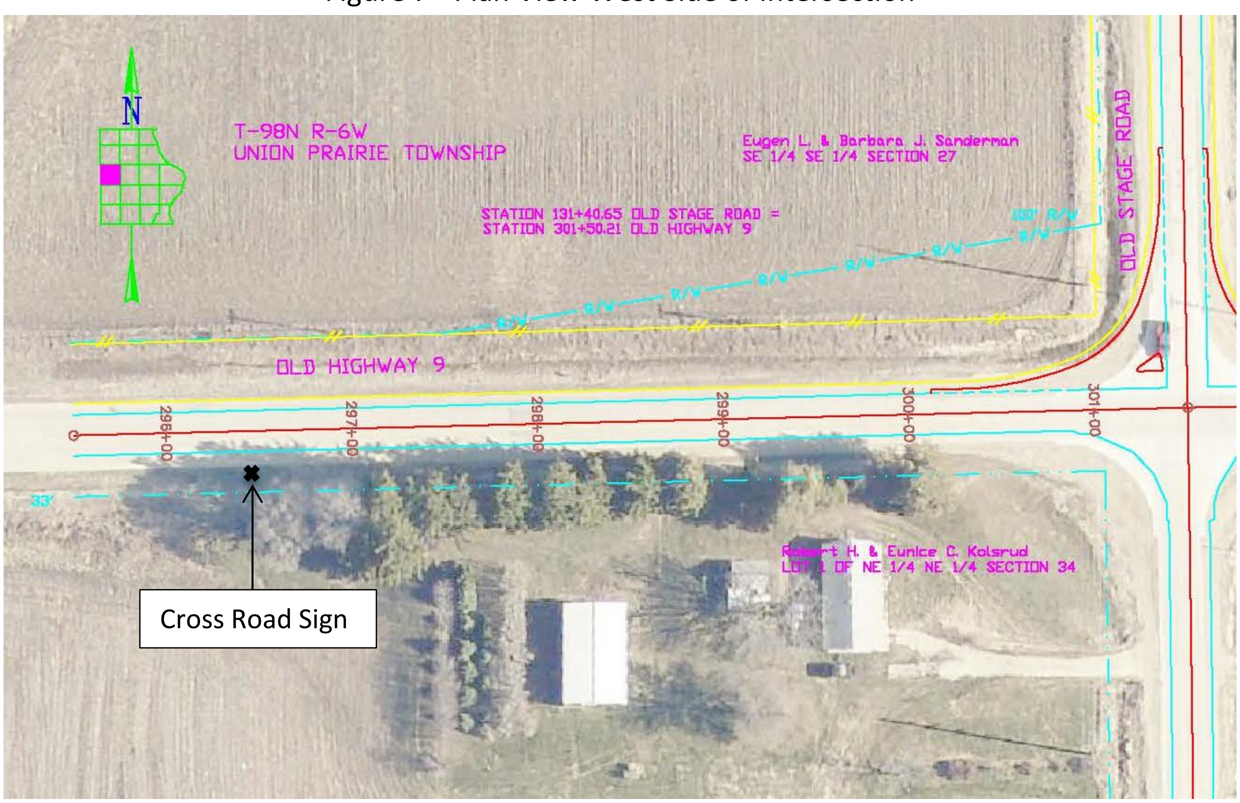


Figure 7 - Plan View West Side of Intersection



The 2013 Annual Average Daily Traffic count is described as approaching the intersection. Southbound 720 vehicles, Westbound 1610 vehicles, Northbound 680 Vehicles and Eastbound 1190 vehicles. Data was not collected for the turning vehicles due to the current construction at the north edge of the intersection closing northbound traffic from the intersection.