Traffic Safety Improvement Program

Traffic Control Devices Category
FY 2022

Applications Received by August 25, 2020

Traffic Control Devices

FY 2022

Applications listed in alphabetical order by applicant.

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
4	Bremer County	C33 at V14, V43, V56, and V62	$20,748	$19,555
22	City of Atkins	33rd Ave at 5th St	$47,063	$15,567
42	City of Charles City	Three intersections on US 18	$3,021,463	$316,200
67	City of Grimes	IA 44 at IA 141 SB ramp terminal	$379,536	$126,619
88	City of Marshalltown	Various signalized intersections	$363,985	$363,985
118	City of Oskaloosa	US 63 at C Ave and US 63 at 15th Ave	$589,100	$500,000
144	City of Urbandale	Twelve signalized intersections	$80,400	$80,400
163	Dubuque County	County-wide	$54,500	$54,500

187	Iowa DOT - Traffic and Safety	Statewide	$200,000	$200,000
189	Lee County	County-wide	$65,000	$65,000
206	Madison County	County-wide	$63,000	$63,000
229	Marion County	Five intersections	$16,464	$16,464
		TOTALS	**$4,880,511**	**$1,801,735**

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION **DATE:** September 30, 2019

Location / Title of Project: County Road C33 Intersections – Co Rd V14, Co Rd V43, Co Rd V56, & Co Rd V62

Applicant: Bremer County

Contact Person: Landon Moore Title: County Engineer

Complete Mailing Address: 1995 Euclid Avenue
Waverly, IA 50677

Phone: (319)352-4302 (Area Code) E-Mail: lmoore@co.bremer.ia.us

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:

Funding Amount

Total Safety Cost	$	$19,554.40
Total Project Cost	$	$20,747.60
Safety Funds Requested	$	$19,554.40

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain

☒ No

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Bremer County Board of Supervisors

Signed: Tim Neil 9/30/19
Signature Date Signed

Tim Neil, Chairman
Printed Name

Attest: Shelley Wolf 9/30/19
Signature Date Signed

Shelley Wolf, Auditor
Printed Name

TSIP APPLICATION NARRATIVE

Existing Condition

The proposed projects are located along County Road C33 which runs east and west through Bremer County. C33 is a rural highway 24' wide with granular shoulders and a posted speed limit of 55 mph, except through the town of Bremer where it slows to 35 mph.

The first intersection project is at the intersection of C33 and County Road V14. V14 is a 24' wide rural highway running north and south from the town of Waverly with a posted speed of 55 mph at the intersection. Annual Average Daily Traffic at the intersection was 1180 to the west, 1600 to the east, 2140 to the south, and 900 to the north in 2017. The intersection is currently a 4-way stop.

The second intersection project is at the intersection of C33 and County Road V43. V43 is a 24' wide rural highway running north and south from the town of Tripoli with a posted speed of 55 mph at the intersection. Annual Average Daily Traffic at the intersection was 980 to the west, 740 to the east, 720 to the south, and 1270 to the north in 2017. Stops signs are located on C33 to the east and west of the intersection.

The third intersection project is at the intersection of C33 and County Road V56. V56 is a 24' wide rural highway with a posted speed of 55 mph at the intersection. Annual Average Daily Traffic at the intersection was 740 to the west, 420 to the east, 1270 to the south, and 1090 to the north in 2017. Stops signs are located on C33 to the east and west of the intersection.

The fourth and final intersection project is at the intersection of C33 and County Road V62. The intersection is located on the county line between Bremer and Fayette Counties, but is maintained by Bremer County. V62 is a 24' wide rural highway with a posted speed of 55 mph at the intersection. Annual Average Daily Traffic at the intersection was 420 to the west, 460 to the east, 680 to the south, and 590 to the north in 2017. Stops signs are located on C33 to the east and west of the intersection.

Proposed Improvements

The proposed project would replace the existing Stop signs with solar powered embedded Light Emitting Diodes (LED) bordered Stop signs, installed per section 2A of the Manual on Uniform Traffic Control Devices (MUTCD).

Justification

Per the Iowa Crash Analysis Tool (ICAT), the C33 corridor through Bremer County has had 125 crashes since 2009, including 1 fatality and 6 suspected serious injuries. Of those 125 crashes, 19 were reported as "Ran stop sign" or "Failure to Yield ROW: From Stop Sign."

PROJECT SCHEDULE

TSIP Application Due	August 2020
TSIP Award Notification	January 2021
TSIP Funding Available	July 1, 2021
Purchase Materials	July 2021
Install LED Stop Signs	August 2021

OPINION OF PROBABLE COST

BREMER COUNTY
C33 LED STOP SIGNS
COST ESTIMATE

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	Quantities	TOTAL
1.1	LED STOP SIGN 36" x 36"	EA	$ 1,955.44	10	$ 19,554.40
1.2	POST - 4" x 4" WOOD	EA	$ 25.00	10	$ 250.00
1.3	INSTALLATION	HR	$ 23.58	40	$ 943.20
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
SUBTOTAL					**$ 20,747.60**
TOTAL OPINION OF PROBABLE COST					**$20,748**

Date Printed: 9/30/2019
\\qnap-bc\Eng Data\Grant Applications\TSIP2021\
est-LEDStopSignsC33

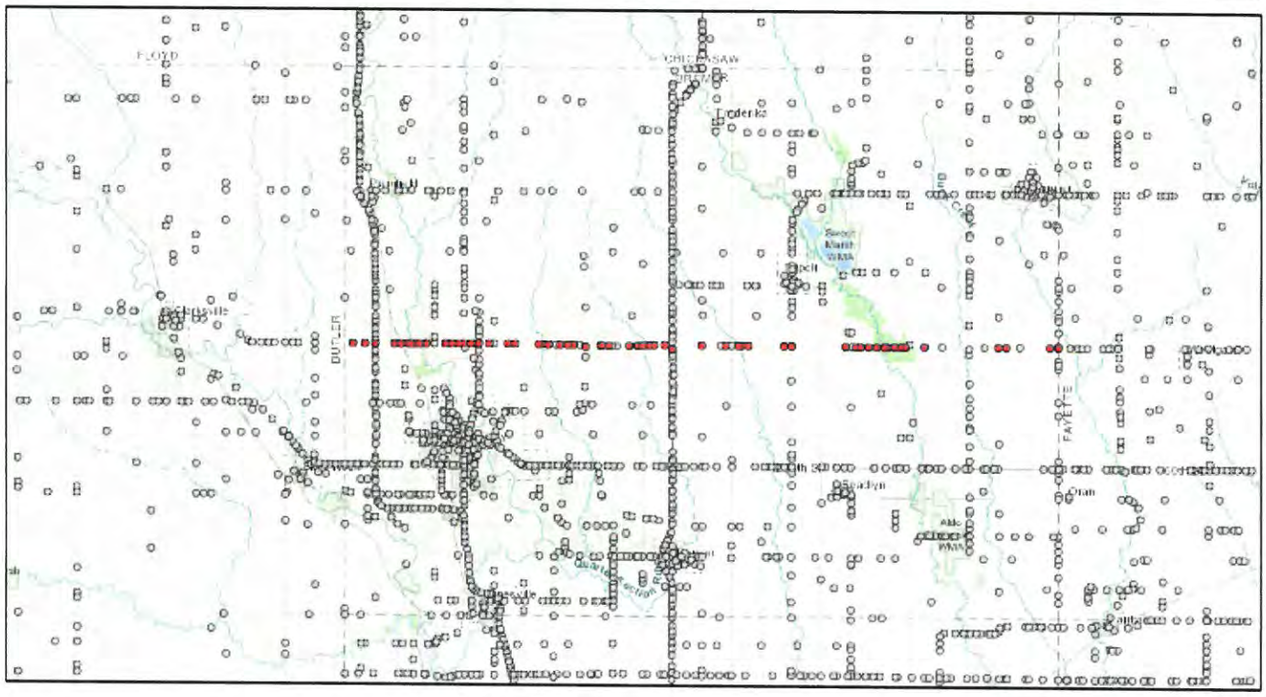
Iowa Crash Analysis Tool
Quick Report
2009-2019

Crash Severity	125
Fatal Crash	1
Suspected Serious Injury Crash	5
Suspected Minor Injury Crash	9
Possible/Unknown Injury Crash	9
Property Damage Only	101

Injury Status Summary	46
Fatalities	1
Suspected serious/incapacitating	6
Suspected minor/non-incapacitating	21
Possible (complaint of pain/injury)	18
Unknown	0
Not reported	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	817,370.00
Average (per crash dollars):	6,538.96
Total Vehicles:	158.00
Average (per crash):	1.26
Total Occupants:	10,278.00
Average (per crash):	82.22

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.01
Injuries/Crash:	0.36
Major Injuries/Crash:	0.05
Minor Injuries/Crash:	0.17
Possible/Unknown Injuries/Crash:	0.14



Major Cause			124
Animal	66	Ran traffic signal	0
Ran stop sign	5	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	12	FTYROW: From yield sign	0
FTYROW: Making left turn	0	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	1	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	8
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	4
Exceeded authorized speed	1	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	3
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	0	Made improper turn	1
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	1
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	3
Ran off road - straight	0	Ran off road - left	5
Lost control	4	Swerving/Evasive Action	4
Over correcting/over steering	0	Failed to keep in proper lane	0
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	1
Towing improperly	0	Cargo/equipment loss or shift	1
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	1	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	1		

Time of Day/Day of Week

Day of Week	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reported	Total
Sunday	1	1	0	0	1	1	1	0	1	1	4	1	0	12
Monday	2	0	0	4	3	1	0	0	0	7	1	0	0	18
Tuesday	1	0	4	3	1	0	1	2	3	1	5	0	0	21
Wednesday	0	0	3	4	1	2	2	1	4	1	2	0	0	20
Thursday	0	0	1	6	3	0	3	0	2	2	2	1	0	20
Friday	0	1	0	4	2	2	0	0	4	3	1	2	0	19
Saturday	1	0	0	1	2	2	1	0	1	1	3	3	0	15
Total	5	2	8	22	13	8	8	3	15	16	18	7	0	125

Manner of Crash Collision	125
Non-collision (single vehicle)	53
Head-on (front to front)	2
Rear-end (front to rear)	8
Angle, oncoming left turn	2
Broadside (front to side)	15
Sideswipe, same direction	1
Sideswipe, opposite direction	3
Rear to rear	0
Rear to side	0
Not reported	39
Other	0
Unknown	2

Surface Conditions	125
Dry	43
Wet	4
Ice/frost	13
Snow	4
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	59
Other	1
Unknown	0

Fixed Object Struck			158
Bridge overhead structure	2	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	12	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	3	Guardrail - end	0
Concrete traffic barrier (median or right sid...	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	0	Traffic sign support	1
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	1	None (no fixed object struck)	139

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	Total
< 14	0	0	0	0	0
= 14	0	0	0	0	0
= 15	1	0	0	0	1
= 16	0	4	0	0	4
= 17	2	3	0	0	5
= 18	3	0	0	0	3
= 19	1	2	0	0	3
= 20	0	5	0	0	5
>= 21 and <= 24	6	5	0	0	11
>= 25 and <= 29	10	8	0	0	18
>= 30 and <= 34	3	1	0	0	4
>= 35 and <= 39	5	14	1	0	20
>= 40 and <= 44	5	7	0	0	12
>= 45 and <= 49	6	5	0	0	11
>= 50 and <= 54	10	12	1	0	23
>= 55 and <= 59	4	6	0	0	10
>= 60 and <= 64	6	4	0	0	10
>= 65 and <= 69	2	6	0	0	8
>= 70 and <= 74	0	3	0	0	3
>= 75 and <= 79	2	3	0	0	5
>= 80 and <= 84	2	0	0	0	2
>= 85 and <= 89	0	0	0	0	0
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	68	88	2	0	158

Drug/Alcohol Related	125
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	2
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	123

Alcohol Test Given	158
None	149
Blood	0
Urine	0
Breath	4
Vitreous	0
Refused	0
Not reported	5

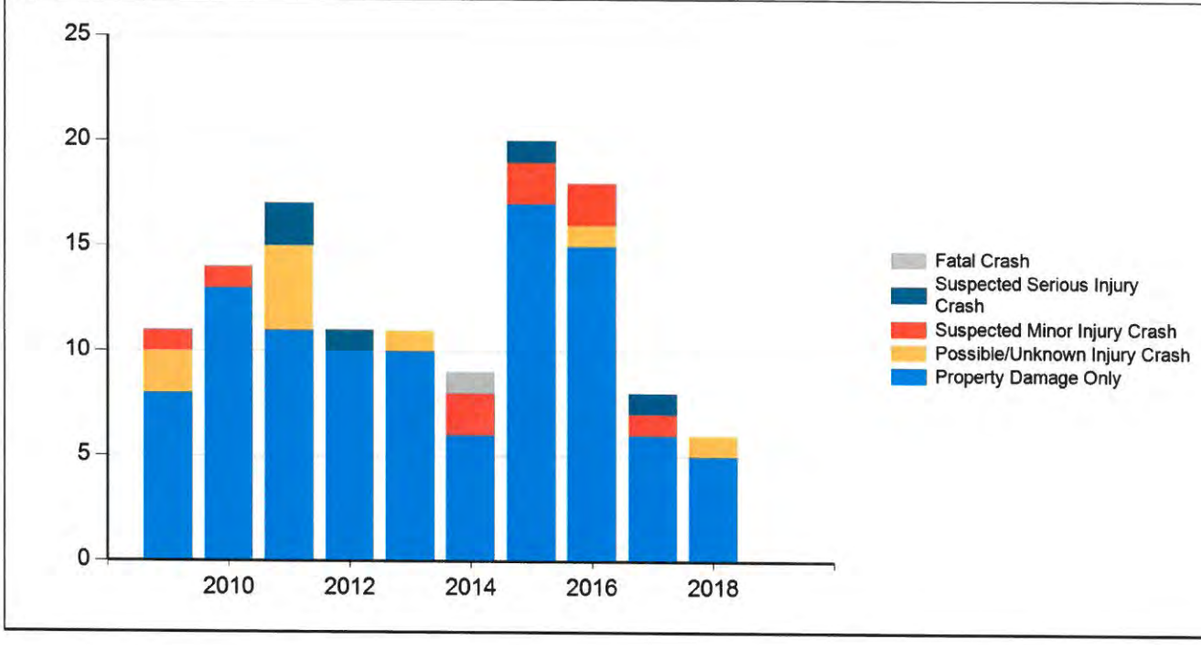
Drug Test Given	158
None	141
Blood	1
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	16

Drug Test Result	158
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	158
Other	0

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2009	0	0	1	2	8	11
2010	0	0	1	0	13	14
2011	0	2	0	4	11	17
2012	0	1	0	0	10	11
2013	0	0	0	1	10	11
2014	1	0	2	0	6	9
2015	0	1	2	0	17	20
2016	0	0	2	1	15	18
2017	0	1	1	0	6	8
2018	0	0	0	1	5	6
2019	0	0	0	0	0	0
Total	1	5	9	9	101	125

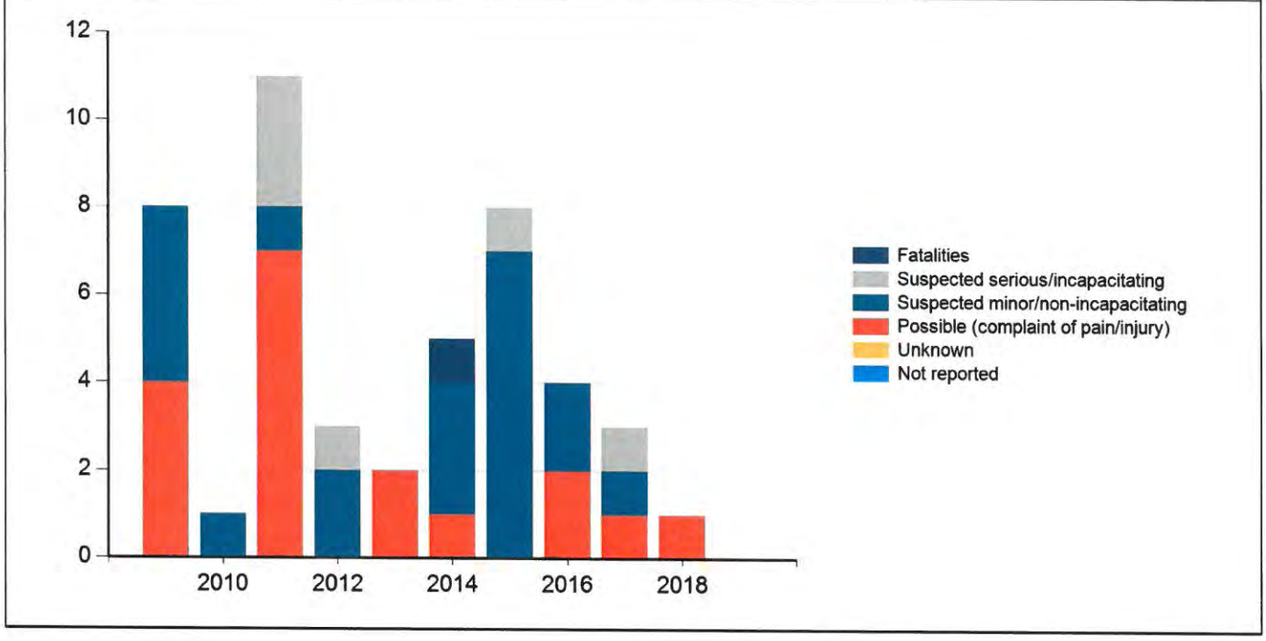
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Not reported	Total
2009	0	0	4	4	0	0	8
2010	0	0	1	0	0	0	1
2011	0	3	1	7	0	0	11
2012	0	1	2	0	0	0	3
2013	0	0	0	2	0	0	2
2014	1	0	3	1	0	0	5
2015	0	1	7	0	0	0	8
2016	0	0	2	2	0	0	4
2017	0	1	1	1	0	0	3
2018	0	0	0	1	0	0	1
2019	0	0	0	0	0	0	0
Total	1	6	21	18	0	0	46

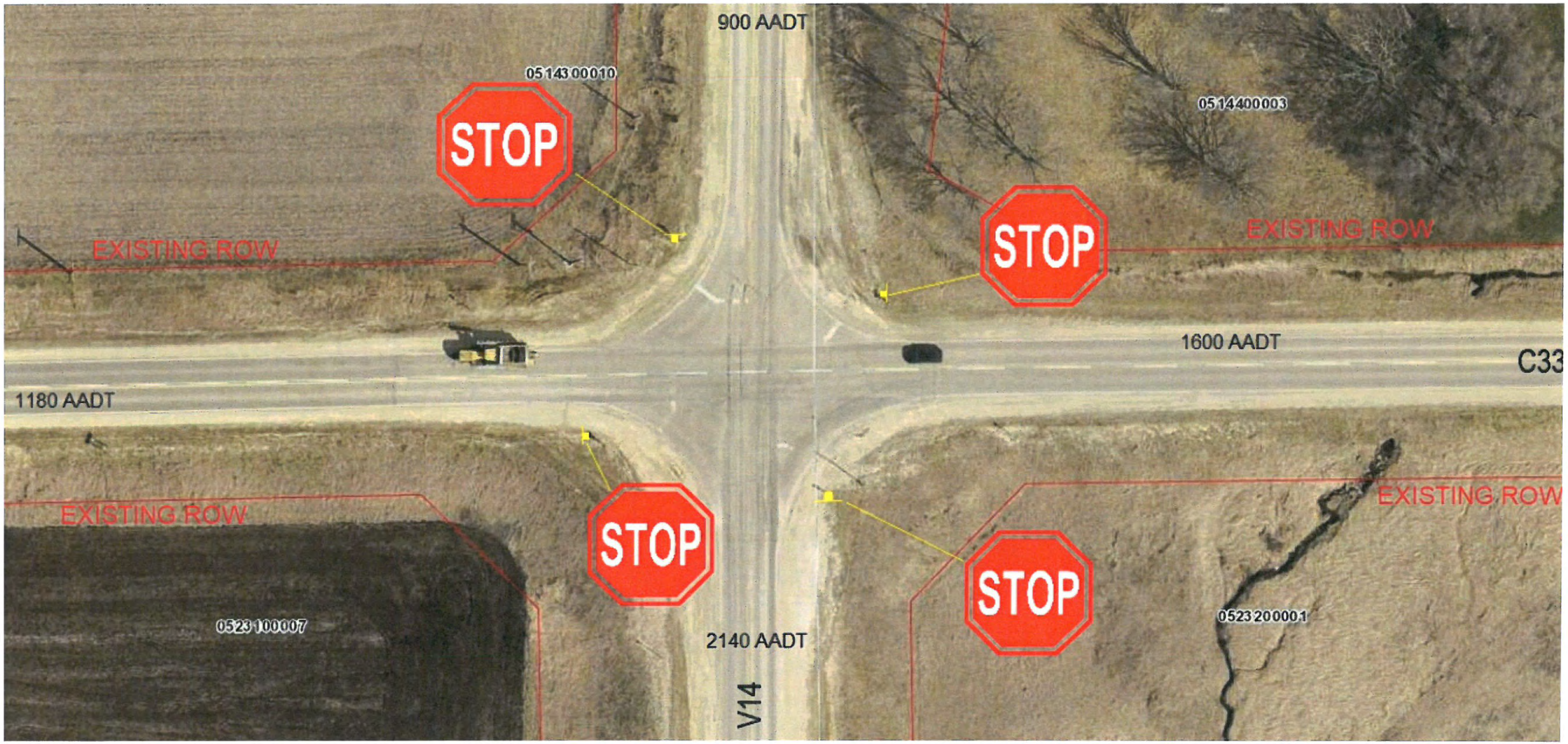
Injury Status/Year

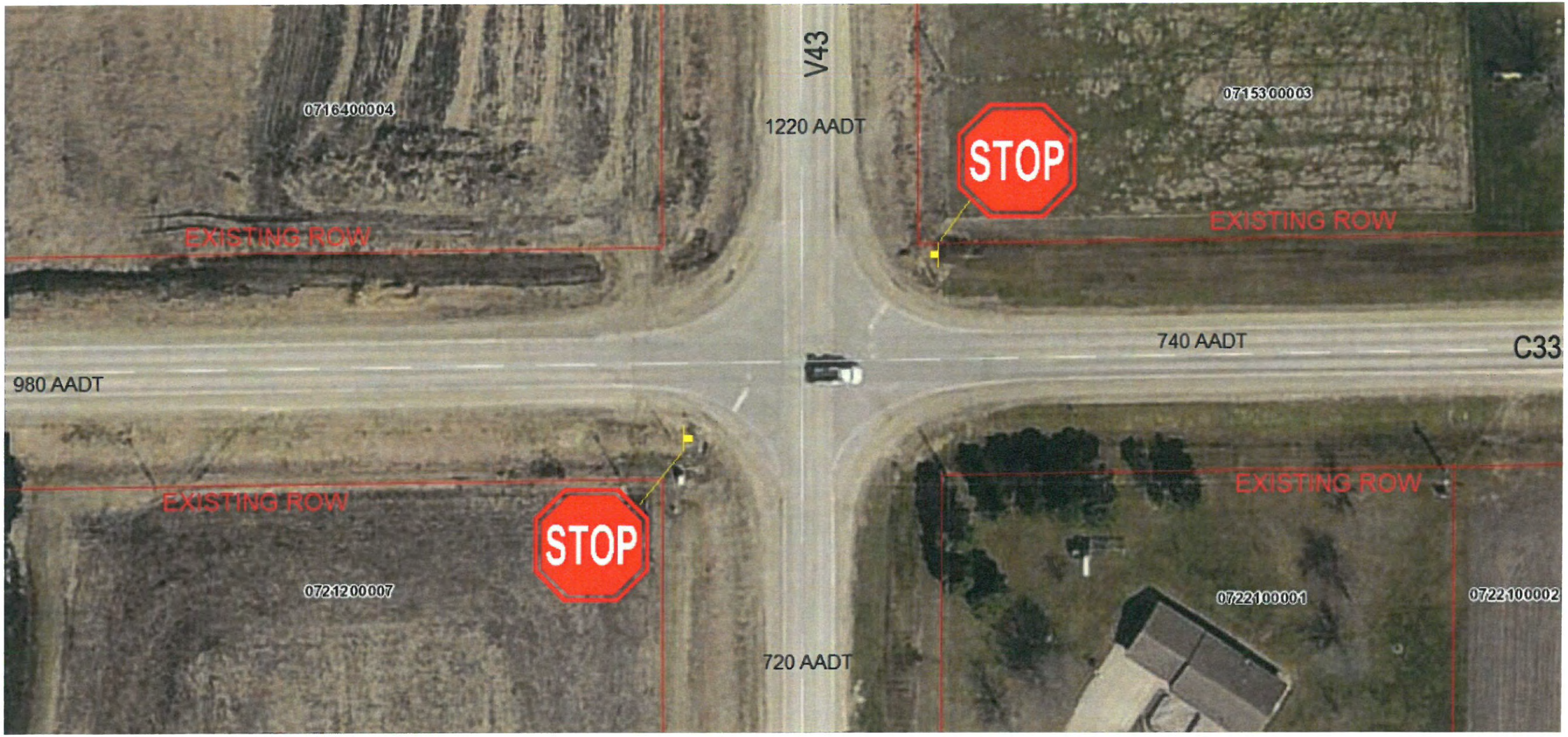


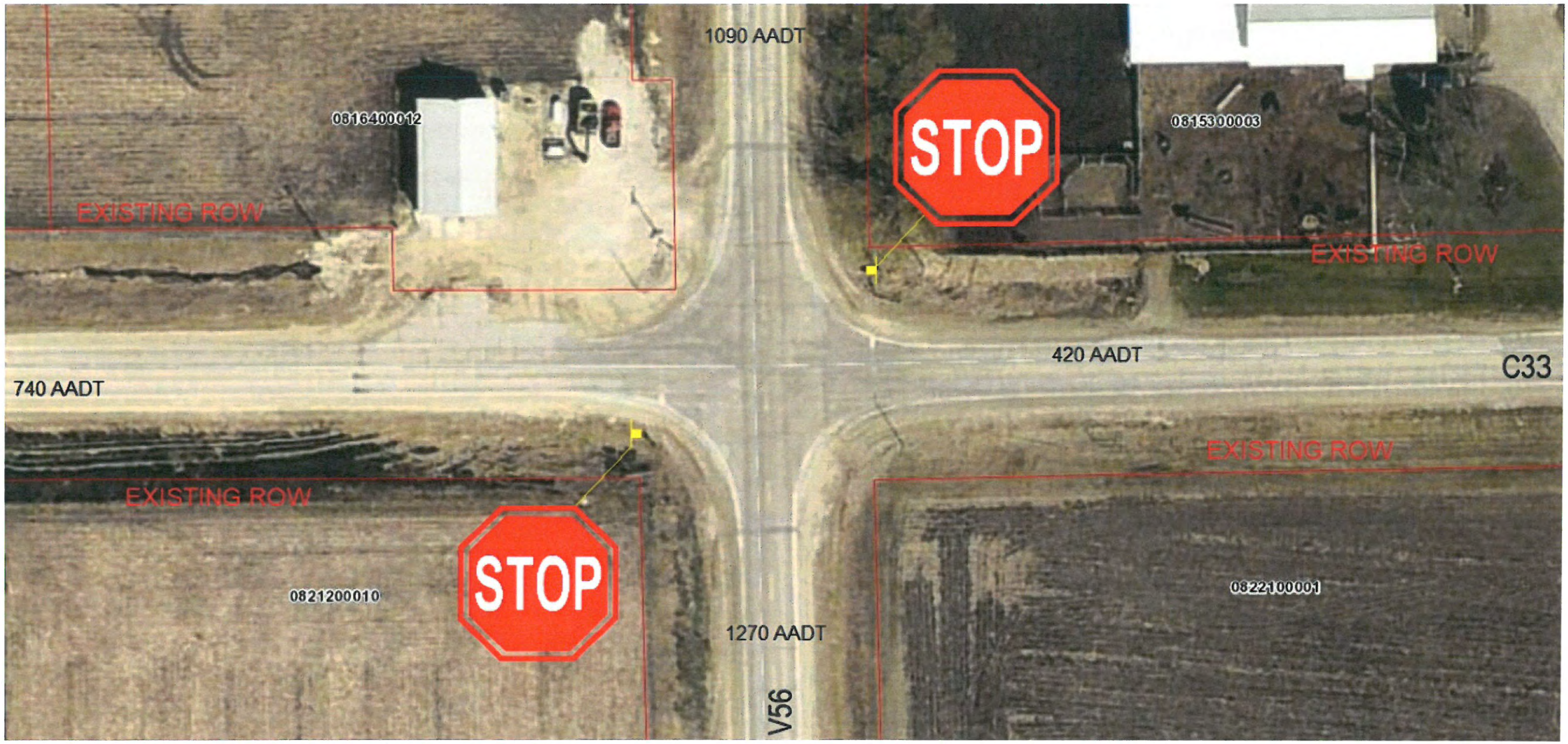
Meeting the following criteria

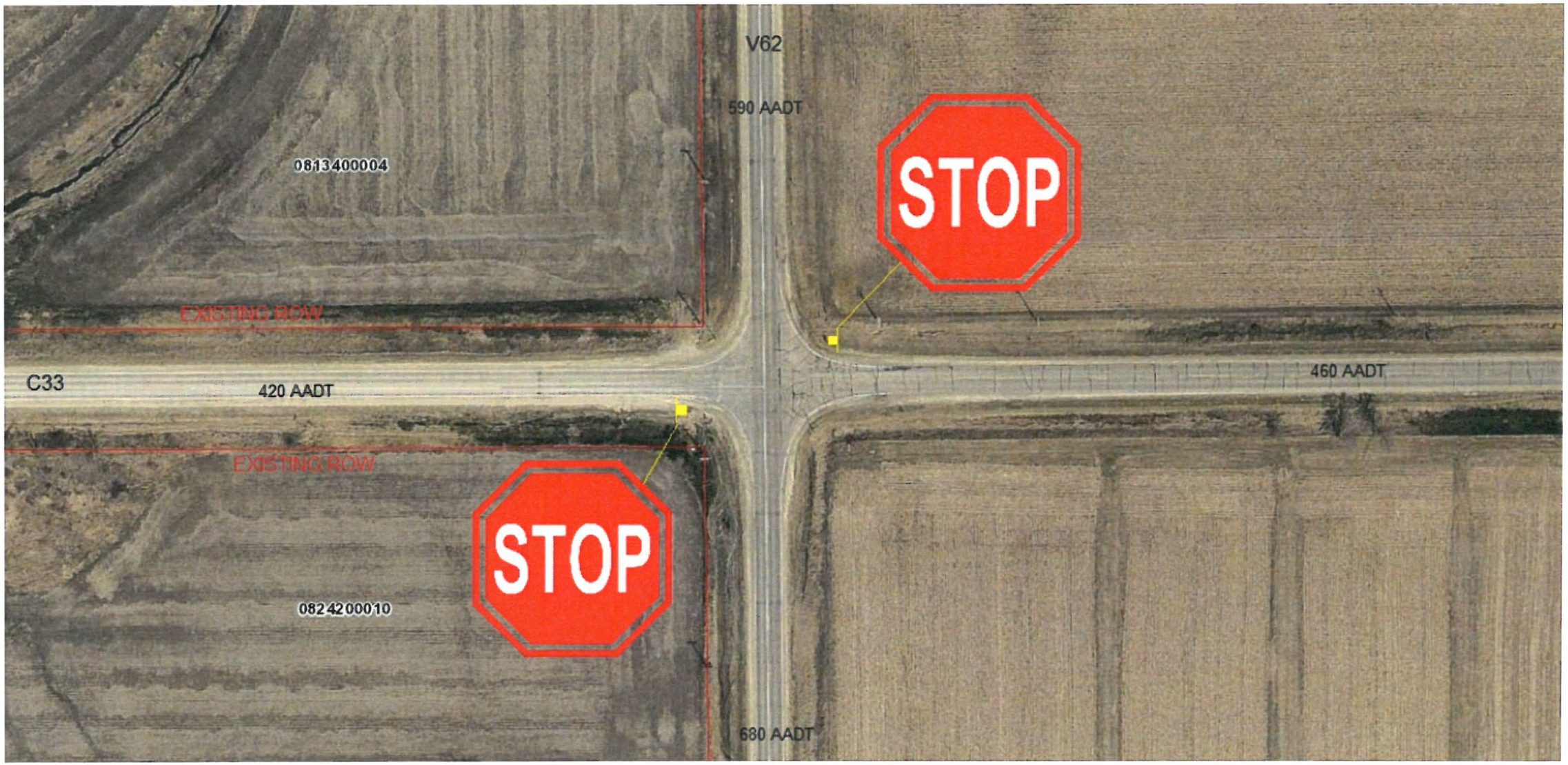
Jurisdiction: Counties (Bremer)
Location: All; C 33
Year: 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019
Map Selection: No
Filter: None

Analyst Information


900 AADT
0514300010
STOP
EXISTING ROW
0514400003
STOP
EXISTING ROW
1600 AADT
C33
1180 AADT
EXISTING ROW
STOP
STOP
EXISTING ROW
0523100007
0523200001
2140 AADT
V14


V43
1220 AADT
0716400004
EXISTING ROW
0715300003
STOP
EXISTING ROW
740 AADT
C33
980 AADT
EXISTING ROW
STOP
0721200007
EXISTING ROW
0722100001
0722100002
720 AADT


1090 AADT
0816400012
STOP
0815300003
EXISTING ROW
EXISTING ROW
420 AADT
C33
740 AADT
EXISTING ROW
EXISTING ROW
STOP
0821200010
0822100001
1270 AADT
V56


V62
590 AADT
STOP
0813400004
EXISTING ROW
C33
420 AADT
460 AADT
EXISTING ROW
STOP
0824200010
680 AADT

A

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION **DATE:** August 14, 2020

Location / Title of Project 33rd Avenue & 5th Street Crosswalk Improvement

Applicant Atkins, Iowa

Contact Person Bruce Visser Title Mayor

Complete Mailing Address 480 3rd Ave, PO Box 171

Atkins, IA 52206

Phone 319-446-7870 E-Mail
(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:

Funding Amount

Total Safety Cost	$ 15,567
Total Project Cost	$ 47,063
Safety Funds Requested	$ **15,567**

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain

☒ No

A

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Atkins

Signed: Bruce Visser — August 17, 2020
Signature — Date Signed

Bruce Visser, Mayor
Printed Name

Attest: Amber Bell — August 17th, 2020
Signature — Date Signed

Amber Bell, City Clerk
Printed Name

RESOLUTION NO. 787

A RESOLUTION AUTHORIZING THE CITY OF ATKINS, IOWA, TO SUBMIT AN IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION FOR PARTIAL FUNDING OF THE 33rd AVENUE & 5TH STREET INTERSECTION PEDESTRIAN SAFETY IMPROVEMENT PROJECT

WHEREAS, the City of Atkins, Iowa, recognizes the need for traffic safety improvements at the 33rd Avenue & 5th Street intersection; and

WHEREAS, the proposed improvements to the intersection of 33rd Avenue & 5th Street includes the addition of a Rectangular Rapid Flashing Beacon, high visibility crosswalk markings and appropriate pedestrian warning signs to improve the safety of pedestrian use of the intersection;

NOW THEREFORE BE IT RESOLVED by the City Council of the City of Atkins, Iowa that:

1. The City of Atkins City Council supports and approves the attached application for Iowa DOT Traffic Safety Improvement Program funding.

2. The City of Atkins City Council hereby commits to the City matching monies as required by the Traffic Safety Improvement Program.

3. The City of Atkins City Council hereby commits to accepting and maintaining these improvements.

4. The Mayor is hereby authorized to execute the application on behalf of the City.

Roll Call Vote:

Spading yea - YEA/NAY/Absent
Robison yea - YEA/NAY/Absent
Svejda yea - YEA/NAY/Absent
Rinderknecht yea - YEA/NAY/Absent
Shepard yea - YEA/NAY/Absent

Adopted and approved this 17th day of August, 2020.

CITY OF ATKINS, IOWA

By: Bruce Visser
Bruce Visser, Mayor

Attest:
I, Amber Bell, City Clerk of the City of Atkins, Iowa hereby certify that at a meeting of the City Council of said City, held on the above date, among other proceedings the above was adopted.

Amber Bell, City Clerk

B - Narrative

Existing Conditions

33rd Avenue is a two-lane, main access road to the City of Atkins from U.S. Highway 30. Entering the city from the south, 33rd Avenue changes from a 55 mph posted speed limit to 45 mph and then 35 mph south of the study intersection. From the north, 33rd Avenue has a 35 MPH speed limit through a 350 foot corner and maintains this speed limit past the study intersection. There is currently no street parking allowed along 33rd Avenue near the study intersection nor are there existing sidewalks for pedestrian use.

5th Street/Pleasant Hill Drive is a residential street running perpendicular to 33rd Avenue. 33rd Avenue cuts through two residential areas, with exclusively single family residential zoning to the west and a mixture of single family and multiple family zoning to the east. The intersection is stop controlled on the minor leg, but does not have any crosswalk markings. Pleasant Hill Drive has an existing sidewalk leading east from the study intersection for roughly 150 feet to the intersection of Pleasant Hill & Ridgeview Drive. 5th Street does not have a sidewalk.

Traffic Data

Turning movement counts were collected by Snyder & Associates from July 21 to July 23, 2020. The collected counts were adjusted using Iowa DOT seasonal adjustment factors to generate average daily traffic counts. The July seasonal adjustment for secondary roads is 0.963. Due to the on-going Covid-19 pandemic, the turning movement counts were further adjusted using Iowa DOT traffic COVID count factors to determine appropriate traffic volumes at the study intersection.

Collected turning movement counts and adjusted turning movement counts are attached. The existing traffic volumes, based on collected data and adjustment factors, for the intersecting roadways are shown in in Table 1.

Table 1. Traffic Volumes

Roadway	Approach	2020 AADT (not adjusted for Covid-19)	2020 AADT (adjusted for Covid-19)
Pleasant Hill Dr	East	1,172	1,301
5th St	West	341	379
33rd Ave	South	2,577	2,860
33rd Ave	North	2,320	2,575

In addition to motorist turning movements, this intersection has a number of pedestrians steadily using the intersection throughout the day. The collected turning movement counts also captured pedestrians crossing 33rd Avenue, with 94 pedestrians observed crossing throughout the day on the 22nd, and 9 pedestrians crossing between 1:00 pm and 2:00 pm alone.

Crash History

Relevant crash data was accessed via the Iowa Crash Analysis Tool, an online application made available by the Iowa DOT. Upon review, there have not been any recorded collisions between 2015 – June 2020 at this intersection.

Pedestrian Accommodations

The Federal Highway Administration (FHWA) advises a number of countermeasures to increase the visibility and safety pedestrians at intersections. These countermeasures are intersection specific and rely on the AADT and 85th percentile speed of motorists to determine applicable roadway treatments[1].

When applied to the conditions for the study intersection, the following is recommended by the FHWA for consideration:

1. High-visibility crosswalk markings;
2. Parking restrictions on crosswalk approach;
3. Curb extensions;
4. Adequate nighttime lighting levels;
5. Crossing warning signs (W11 -2);
6. Pedestrian Refuge island;
7. Rectangular Rapid-Flashing Beacon (RRFB); or
8. Pedestrian Hybrid Beacon (PHB).

Figure 2: RRFB Example

For this intersection parking restrictions, curb extension, and pedestrian refugee islands are not appropriate. Parking is already prohibited on the intersection legs and with only two lanes of travel to traverse (one lane in either direction) pedestrian travel distance is low enough that the reduced travel distance reductions that curb extensions and pedestrian refuge islands provide are unnecessary. The study intersection also already has a streetlight on the southwest corner that provides adequate nighttime illumination.

To warrant the installation of a PHB, thresholds of vehicle travel speed, vehicle volume, crosswalk length, and pedestrian volume should be met[2]. The study intersection does not surpass these thresholds and the use of a RRFB should be considered instead. RRFBs are particularly appropriate for crosswalks on multilane roads with speed limits below 40 mph. Motorist yield rates vary but have been as high as 98 percent at marked crosswalks[3] following the installation of an RRFB.

Proposed Improvement

The City of Atkins is applying for Traffic Safety Improvement Program funds to install a Rectangular Rapid-Flashing Beacon, improved high-visibility crosswalk markings, and pedestrian crossing warning signs at and in advance of the intersection of 33rd Avenue and 5th St/Pleasant Hill Road.

In doing so, Atkins will minimize current and future concerns of pedestrian crossing conflicts, increase the conspicuity and visibility of pedestrian users, improve driver yielding patterns, and counter excessive motorist speed at the study intersection. The intersection seems well suited to the installation of an RRFB.

---

[1] Federal Highway Administration, *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.* 2018.

[2] U.S. Department of Transportation Federal Highway Administration. *Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition.*

[3] Federal Highway Administration, *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.* 2018.

OPINION OF PROBABLE PROJECT COSTS

SNYDER & ASSOCIATES

33rd Ave and 5th St/Pleasant Hill Rd
Atkins, Iowa
120.0701.08
Prepared: August 11, 2020

ITEM #	DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	EXTENDED PRICE	Estimated Materials (2/3)	Estimated Labor (1/3)
1	RRFB Assembly	(1)	2	EA	$ 9,925.00	$19,850.00	$13,233.33	$ 6,616.67
2	Painted Pavement Markings, Durable		1.25	STA	$ 800.00	$ 1,000.00	$ 666.67	$ 333.33
3	Advanced Warning Signs / Posts		5	EA	$ 500.00	$ 2,500.00	$ 1,666.67	$ 833.33
4	Sidewalk, PCC, 4 inch	(2)	117	SY	$ 80.00	$ 9,360.00		
5	Detectable Warning	(2)	36	SF	$ 65.00	$ 2,340.00		
6	Pipe Culvert Extension	(2)	20	LF	$ 30.00	$ 600.00		
7	Excavation, Class 10	(2)	50	CY	$ 40.00	$ 2,000.00		
	Subtotal					$37,650.00		
					25% contingency	$ 9,412.50		
					TOTAL	$47,062.50	$15,566.67	$7,783.33

Notes

(1) RRFB Assembly includes post, signs, solar power unit, footing, and RRFB unit.
(2) These items are not eligible for TSIP funding.

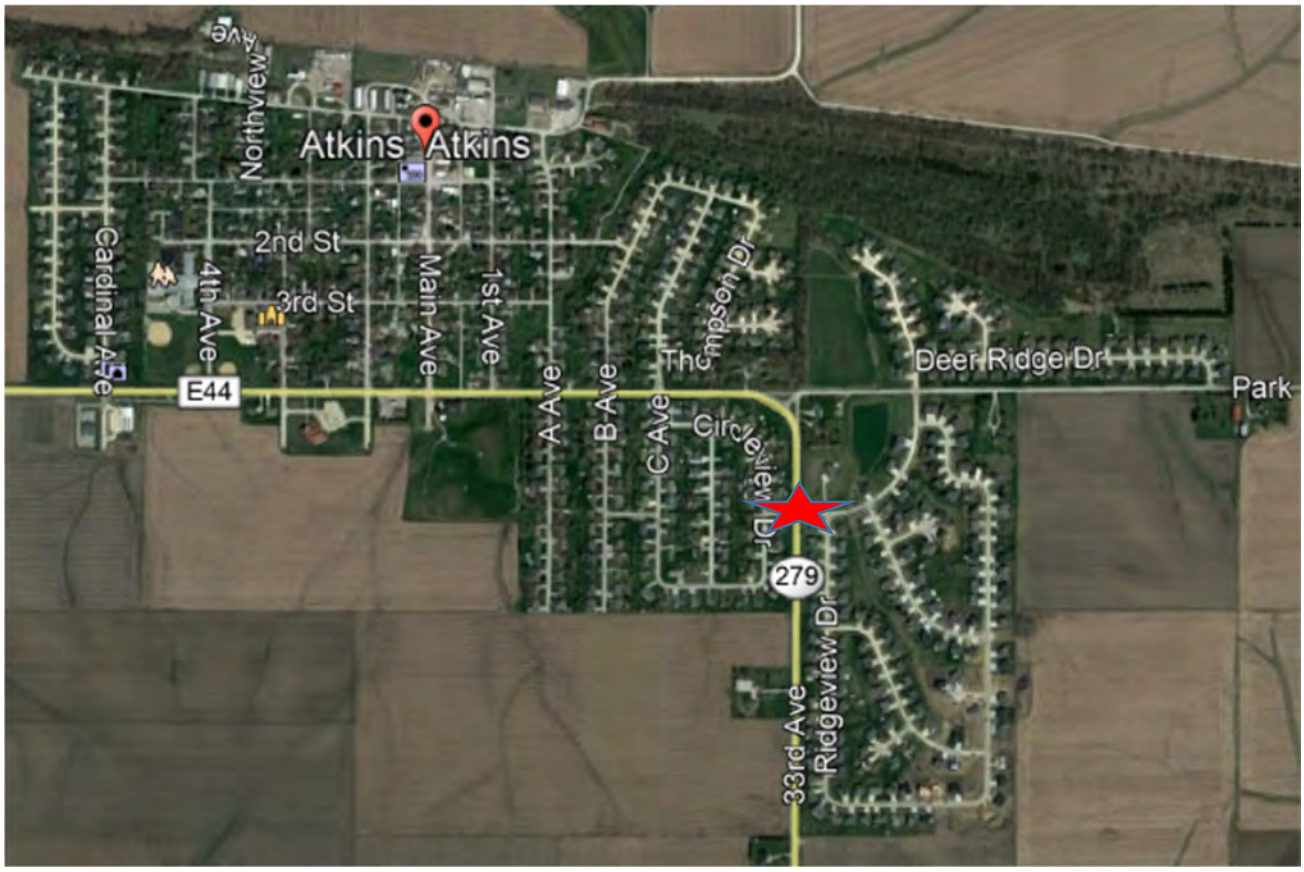
Project Timeline

The following includes the anticipated project schedule

Task	**Completion Date**
Traffic Safety Improvement Program Funding Application Submission	August 15, 2020
Design/Plan Development	Winter 2020
Contractor Selection	Spring 2021
Construction	Summer 2021

E

Project Location Map



Intersection Photos

Iowa 279/33rd Avenue & 5th Street/Pleasant Hill Drive

Aerial View

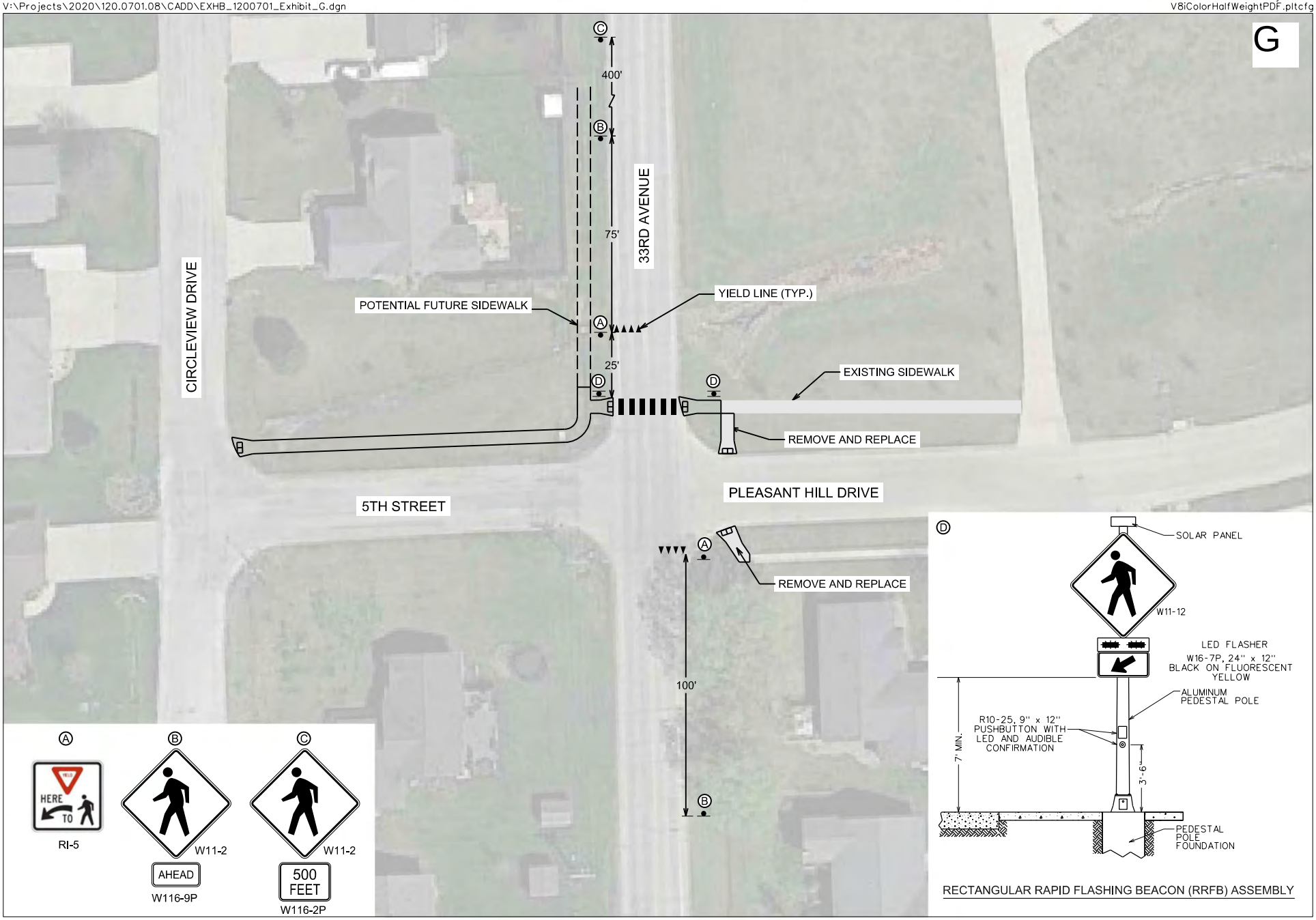
Facing North

Facing South

Facing East

Facing West

G



SNYDER & ASSOCIATES

0 25 50
FEET

N

Exhibit G - Plan View

Concept | Atkins, Iowa | 08/11/2020

Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 1

Groups Printed- Cars - Trucks

	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
12:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:15 AM	0	1	0	0	1	1	0	1	0	2	1	1	0	0	2	0	0	0	0	0	5
12:30 AM	0	0	0	0	0	2	0	0	0	2	2	1	0	0	3	0	0	0	0	0	5
12:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
Total	0	2	0	0	2	3	0	1	0	4	4	4	0	0	8	0	0	0	0	0	14
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
*** BREAK ***																					
01:30 AM	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1	4
*** BREAK ***																					
Total	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	0	1	0	0	1	6
*** BREAK ***																					
02:15 AM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	2
02:30 AM	0	0	1	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	3
*** BREAK ***																					
Total	0	0	1	0	1	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	5
03:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
03:15 AM	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	1	0	0	0	1	4
*** BREAK ***																					
03:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total	0	1	0	0	1	0	0	2	0	2	2	0	0	0	2	2	0	0	0	2	7
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
04:15 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
04:30 AM	0	3	0	0	3	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	6
04:45 AM	0	4	0	0	4	0	0	1	0	1	0	1	0	0	1	2	0	0	0	2	8
Total	0	7	0	0	7	0	0	2	0	2	1	6	0	0	7	2	0	0	0	2	18
05:00 AM	0	4	1	0	5	2	0	4	0	6	1	0	0	0	1	2	0	0	0	2	14
05:15 AM	0	2	1	0	3	1	0	4	0	5	0	2	0	0	2	2	1	0	0	3	13
05:30 AM	0	6	0	0	6	0	0	4	0	4	0	3	0	2	5	1	0	0	0	1	16
05:45 AM	0	14	3	0	17	7	0	6	0	13	1	0	0	2	3	1	1	0	0	2	35
Total	0	26	5	0	31	10	0	18	0	28	2	5	0	4	11	6	2	0	0	8	78
06:00 AM	0	9	0	0	9	1	0	4	0	5	0	2	1	2	5	2	0	0	0	2	21
06:15 AM	0	25	1	1	27	0	0	6	0	6	1	0	0	3	4	3	1	0	0	4	41
06:30 AM	0	17	1	0	18	4	0	4	0	8	1	3	0	3	7	1	0	0	0	1	34
06:45 AM	0	31	0	0	31	4	0	5	0	9	5	2	1	1	9	3	0	0	0	3	52
Total	0	82	2	1	85	9	0	19	0	28	7	7	2	9	25	9	1	0	0	10	148
07:00 AM	0	21	4	0	25	2	1	3	0	6	1	6	2	3	12	2	0	0	0	2	45
07:15 AM	0	26	3	1	30	6	1	4	0	11	2	3	2	1	8	1	0	0	0	1	50
07:30 AM	0	33	2	0	35	5	0	11	0	16	1	10	0	1	12	4	1	0	0	5	68
07:45 AM	0	19	1	0	20	3	0	8	0	11	4	5	0	0	9	3	1	0	0	4	44
Total	0	99	10	1	110	16	2	26	0	44	8	24	4	5	41	10	2	0	0	12	207

Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

H

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 2

Groups Printed- Cars - Trucks

	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
08:00 AM	1	18	3	2	24	2	0	6	0	8	4	9	0	1	14	1	1	0	0	2	48
08:15 AM	1	21	0	0	22	5	1	4	0	10	2	7	1	0	10	1	1	0	0	2	44
08:30 AM	0	22	2	0	24	3	1	5	0	9	4	14	0	0	18	2	1	0	0	3	54
08:45 AM	0	23	4	0	27	3	1	5	0	9	4	4	1	1	10	2	2	0	0	4	50
Total	2	84	9	2	97	13	3	20	0	36	14	34	2	2	52	6	5	0	0	11	196
09:00 AM	1	16	3	1	21	1	0	4	0	5	0	5	0	2	7	1	1	0	0	2	35
09:15 AM	0	15	2	0	17	3	0	3	0	6	3	7	2	1	13	2	0	0	0	2	38
09:30 AM	0	13	1	1	15	5	0	4	0	9	1	11	1	0	13	1	1	0	0	2	39
09:45 AM	1	16	2	0	19	6	1	2	0	9	3	8	0	3	14	1	0	0	0	1	43
Total	2	60	8	2	72	15	1	13	0	29	7	31	3	6	47	5	2	0	0	7	155
10:00 AM	2	13	3	0	18	7	0	2	0	9	6	6	1	1	14	1	0	0	0	1	42
10:15 AM	0	5	1	0	6	0	1	4	0	5	6	17	1	0	24	0	1	1	0	2	37
10:30 AM	0	13	3	0	16	4	0	3	0	7	2	13	2	0	17	0	0	0	0	0	40
10:45 AM	0	11	3	0	14	5	1	5	0	11	3	7	2	1	13	4	2	0	0	6	44
Total	2	42	10	0	54	16	2	14	0	32	17	43	6	2	68	5	3	1	0	9	163
11:00 AM	0	16	0	0	16	2	3	2	0	7	4	6	0	0	10	2	1	0	0	3	36
11:15 AM	0	17	8	0	25	5	0	6	0	11	3	17	1	0	21	1	3	0	0	4	61
11:30 AM	1	14	1	2	18	3	0	3	0	6	4	13	2	0	19	1	0	1	0	2	45
11:45 AM	1	15	5	0	21	1	1	4	0	6	0	9	1	2	12	1	2	0	0	3	42
Total	2	62	14	2	80	11	4	15	0	30	11	45	4	2	62	5	6	1	0	12	184
12:00 PM	1	12	4	0	17	3	2	0	0	5	2	13	0	0	15	0	2	0	0	2	39
12:15 PM	1	18	2	0	21	2	1	0	0	3	1	15	1	0	17	0	0	0	0	0	41
12:30 PM	0	16	6	0	22	0	1	1	0	2	4	11	2	1	18	2	0	0	0	2	44
12:45 PM	0	10	4	0	14	7	0	2	0	9	4	13	1	2	20	1	0	0	0	1	44
Total	2	56	16	0	74	12	4	3	0	19	11	52	4	3	70	3	2	0	0	5	168
01:00 PM	0	16	4	0	20	5	1	4	0	10	2	17	0	0	19	0	0	0	0	0	49
01:15 PM	1	14	5	1	21	1	1	5	1	8	7	14	3	0	24	1	1	1	0	3	56
01:30 PM	0	17	3	1	21	0	2	4	0	6	6	11	0	0	17	1	1	0	0	2	46
01:45 PM	0	10	2	0	12	5	0	5	0	10	3	8	3	0	14	3	2	0	0	5	41
Total	1	57	14	2	74	11	4	18	1	34	18	50	6	0	74	5	4	1	0	10	192
02:00 PM	0	8	1	0	9	2	1	3	0	6	4	12	0	1	17	1	0	0	0	1	33
02:15 PM	0	11	2	1	14	1	0	7	0	8	5	14	0	0	19	3	0	0	0	3	44
02:30 PM	0	14	2	0	16	3	1	2	0	6	9	13	0	0	22	3	1	0	0	4	48
02:45 PM	1	13	3	0	17	2	0	7	0	9	10	19	2	0	31	0	0	0	0	0	57
Total	1	46	8	1	56	8	2	19	0	29	28	58	2	1	89	7	1	0	0	8	182
03:00 PM	0	13	4	0	17	4	1	6	0	11	8	11	3	1	23	0	0	0	0	0	51
03:15 PM	0	12	0	0	12	1	1	2	0	4	7	25	1	0	33	1	0	1	0	2	51
03:30 PM	0	11	3	0	14	1	1	5	0	7	7	27	3	0	37	0	2	0	0	2	60
03:45 PM	0	12	5	0	17	4	0	4	0	8	7	33	2	1	43	0	0	0	0	0	68
Total	0	48	12	0	60	10	3	17	0	30	29	96	9	2	136	1	2	1	0	4	230
04:00 PM	0	14	5	0	19	3	1	4	0	8	6	40	2	0	48	2	3	0	0	5	80
04:15 PM	0	14	6	0	20	6	4	3	0	13	11	16	1	0	28	2	1	0	0	3	64
04:30 PM	0	15	6	0	21	6	0	6	0	12	12	33	3	0	48	3	0	0	0	3	84

Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

H

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 3

Groups Printed- Cars - Trucks

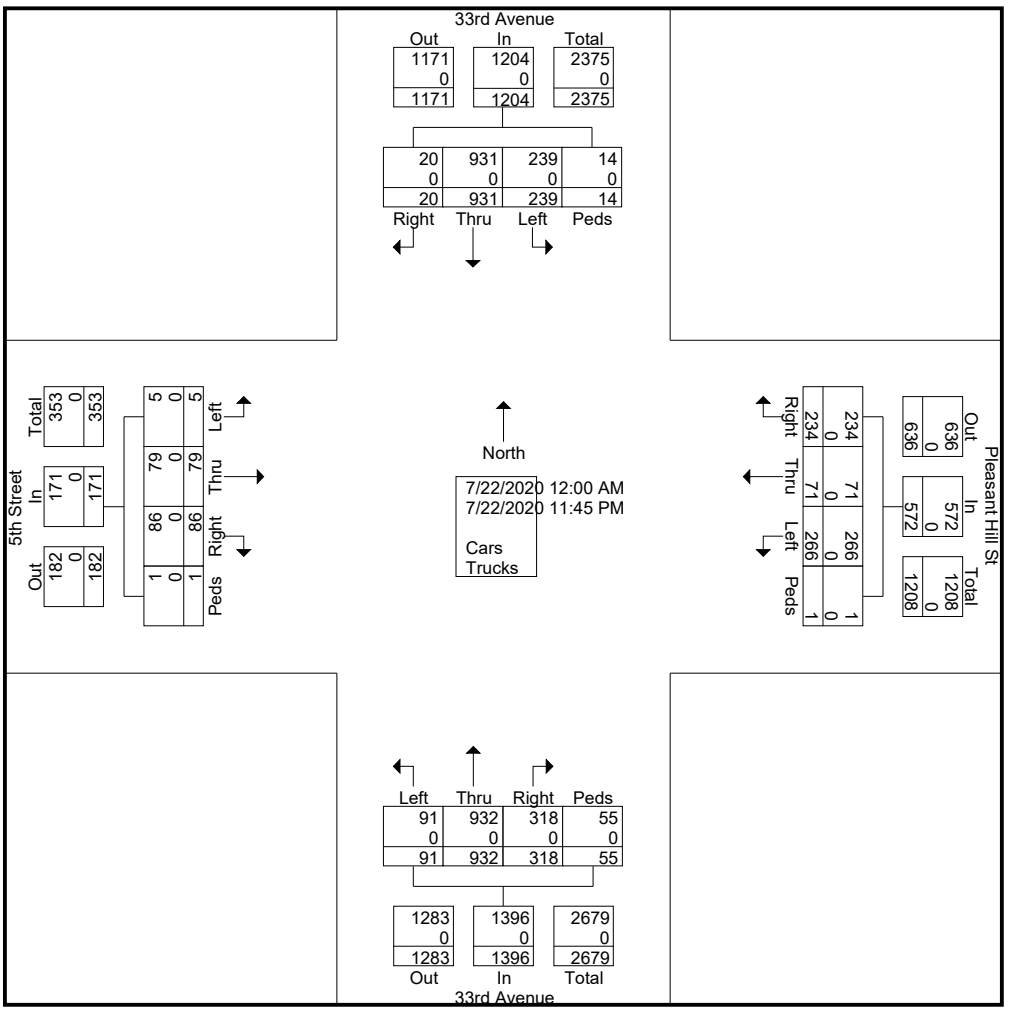
	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:45 PM	2	16	4	0	22	10	1	2	0	13	14	29	1	0	44	1	5	0	0	6	85
Total	2	59	21	0	82	25	6	15	0	46	43	118	7	0	168	8	9	0	0	17	313
05:00 PM	1	17	6	0	24	7	5	8	0	20	9	32	6	2	49	1	1	0	0	2	95
05:15 PM	0	24	9	0	33	8	2	3	0	13	8	29	0	0	37	0	0	0	0	0	83
05:30 PM	0	7	7	0	14	9	3	9	0	21	10	27	4	4	45	0	2	0	0	2	82
05:45 PM	0	16	3	0	19	4	2	8	0	14	10	26	1	2	39	1	2	1	0	4	76
Total	1	64	25	0	90	28	12	28	0	68	37	114	11	8	170	2	5	1	0	8	336
06:00 PM	1	10	5	0	16	7	3	3	0	13	12	28	2	0	42	2	0	0	0	2	73
06:15 PM	0	7	4	0	11	3	5	1	0	9	3	26	3	0	32	2	2	0	0	4	56
06:30 PM	0	9	5	0	14	5	1	2	0	8	6	24	2	0	32	1	6	0	0	7	61
06:45 PM	0	6	9	0	15	9	2	7	0	18	5	19	2	0	26	1	1	0	0	2	61
Total	1	32	23	0	56	24	11	13	0	48	26	97	9	0	132	6	9	0	0	15	251
07:00 PM	0	11	4	0	15	5	2	4	0	11	4	12	0	0	16	0	0	0	0	0	42
07:15 PM	1	7	3	0	11	3	1	3	0	7	4	13	1	2	20	0	3	0	1	4	42
07:30 PM	1	10	5	1	17	0	1	1	0	2	3	11	2	0	16	0	4	0	0	4	39
07:45 PM	1	8	2	0	11	1	3	0	0	4	6	10	0	0	16	0	3	0	0	3	34
Total	3	36	14	1	54	9	7	8	0	24	17	46	3	2	68	0	10	0	1	11	157
08:00 PM	0	4	3	1	8	1	3	3	0	7	1	12	2	5	20	2	2	0	0	4	39
08:15 PM	0	4	0	0	4	0	1	0	0	1	6	12	1	2	21	0	2	0	0	2	28
08:30 PM	0	4	2	0	6	1	0	2	0	3	2	6	3	0	11	0	2	0	0	2	22
08:45 PM	0	10	1	1	12	0	1	1	0	2	2	9	1	0	12	0	1	0	0	1	27
Total	0	22	6	2	30	2	5	6	0	13	11	39	7	7	64	2	7	0	0	9	116
09:00 PM	0	1	1	0	2	1	0	0	0	1	5	8	1	1	15	0	3	0	0	3	21
09:15 PM	0	3	0	0	3	2	1	0	0	3	0	5	2	0	7	0	1	0	0	1	14
09:30 PM	0	7	3	0	10	2	0	0	0	2	5	9	1	0	15	1	0	0	0	1	28
09:45 PM	0	4	1	0	5	1	0	1	0	2	3	9	1	0	13	0	0	0	0	0	20
Total	0	15	5	0	20	6	1	1	0	8	13	31	5	1	50	1	4	0	0	5	83
10:00 PM	0	4	2	0	6	0	1	1	0	2	2	6	1	0	9	0	0	0	0	0	17
10:15 PM	0	7	12	0	19	2	0	0	0	2	2	5	0	1	8	0	2	0	0	2	31
10:30 PM	0	8	7	0	15	0	2	0	0	2	4	3	2	0	9	0	1	0	0	1	27
10:45 PM	0	3	3	0	6	1	1	2	0	4	1	0	0	0	1	0	1	0	0	1	12
Total	0	22	24	0	46	3	4	3	0	10	9	14	3	1	27	0	4	0	0	4	87
11:00 PM	0	2	1	0	3	0	0	0	0	0	1	4	0	0	5	1	0	0	0	1	9
11:15 PM	1	3	9	0	13	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	16
11:30 PM	0	2	2	0	4	1	0	3	0	4	1	9	2	0	12	0	0	0	0	0	20
11:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	1	8	12	0	21	1	0	3	0	4	3	14	4	0	21	1	0	0	0	1	47
Grand Total	20	931	239	14	1204	234	71	266	1	572	318	932	91	55	1396	86	79	5	1	171	3343
Apprch %	1.7	77.3	19.9	1.2		40.9	12.4	46.5	0.2		22.8	66.8	6.5	3.9		50.3	46.2	2.9	0.6		
Total %	0.6	27.8	7.1	0.4	36	7	2.1	8	0	17.1	9.5	27.9	2.7	1.6	41.8	2.6	2.4	0.1	0	5.1	
Cars	20	931	239	14	1204	234	71	266	1	572	318	932	91	55	1396	86	79	5	1	171	3343
% Cars	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

H

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 4

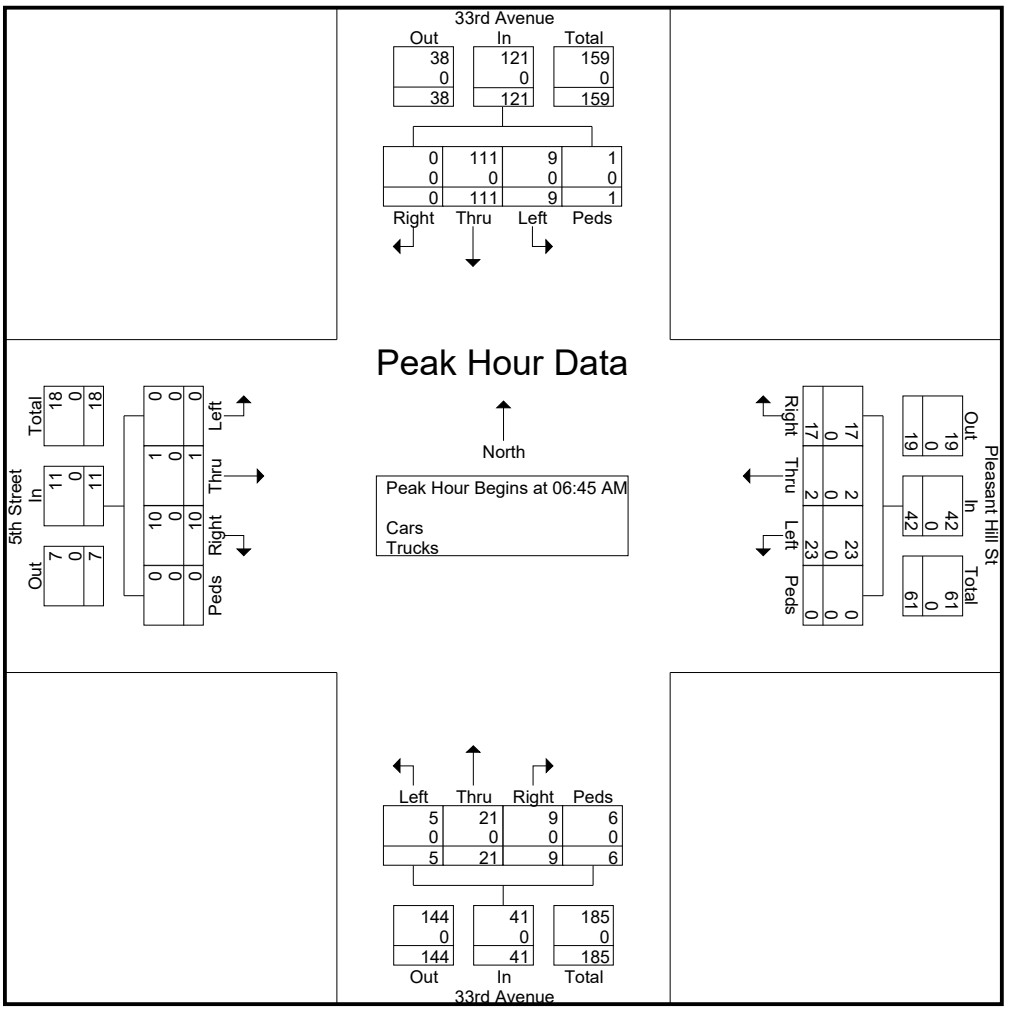


Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 5

	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 09:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	0	31	0	0	31	4	0	5	0	9	**5**	2	1	1	9	3	0	0	0	3	52
07:00 AM	0	21	**4**	0	25	2	**1**	3	0	6	1	6	**2**	**3**	**12**	2	0	0	0	2	45
07:15 AM	0	26	3	**1**	30	**6**	1	4	0	11	2	3	2	1	8	1	0	0	0	1	50
07:30 AM	0	**33**	2	0	**35**	5	0	**11**	0	**16**	1	**10**	0	1	12	**4**	**1**	0	0	**5**	**68**
Total Volume	0	111	9	1	121	17	2	23	0	42	9	21	5	6	41	10	1	0	0	11	215
% App. Total	0	91.7	7.4	0.8		40.5	4.8	54.8	0		22	51.2	12.2	14.6		90.9	9.1	0	0		
PHF	.000	.841	.563	.250	.864	.708	.500	.523	.000	.656	.450	.525	.625	.500	.854	.625	.250	.000	.000	.550	.790
Cars	0	111	9	1	121	17	2	23	0	42	9	21	5	6	41	10	1	0	0	11	215
% Cars	0	100	100	100	100	100	100	100	0	100	100	100	100	100	100	100	100	0	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



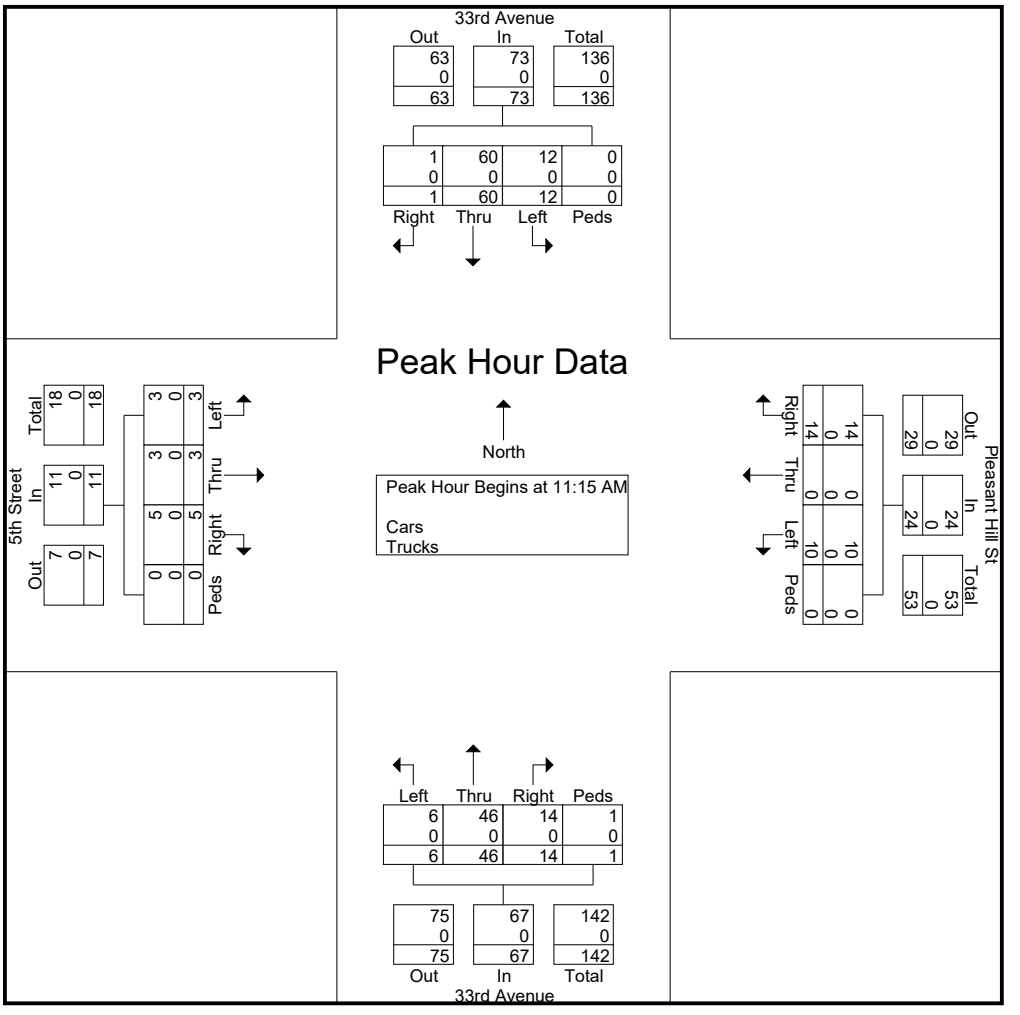
Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

H

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 6

	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	0	**17**	**8**	0	**25**	**5**	0	**6**	0	**11**	3	**17**	1	0	**21**	**1**	**3**	0	0	**4**	**61**
11:30 AM	**1**	14	1	**2**	18	3	0	3	0	6	**4**	13	**2**	0	19	1	0	**1**	0	2	45
11:45 AM	1	15	5	0	21	1	1	4	0	6	0	9	1	**2**	12	1	2	0	0	3	42
12:00 PM	1	12	4	0	17	3	**2**	0	0	5	2	13	0	0	15	0	2	0	0	2	39
Total Volume	3	58	18	2	81	12	3	13	0	28	9	52	4	2	67	3	7	1	0	11	187
% App. Total	3.7	71.6	22.2	2.5		42.9	10.7	46.4	0		13.4	77.6	6	3		27.3	63.6	9.1	0		
PHF	.750	.853	.563	.250	.810	.600	.375	.542	.000	.636	.563	.765	.500	.250	.798	.750	.583	.250	.000	.688	.766
Cars	1	60	12	0	73	14	0	10	0	24	14	46	6	1	67	5	3	3	0	11	175
% Cars	33.3	103.4	66.7	0	90.1	116.7	0	76.9	0	85.7	155.6	88.5	150.0	50.0	100	166.7	42.9	300.0	0	100	93.6
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



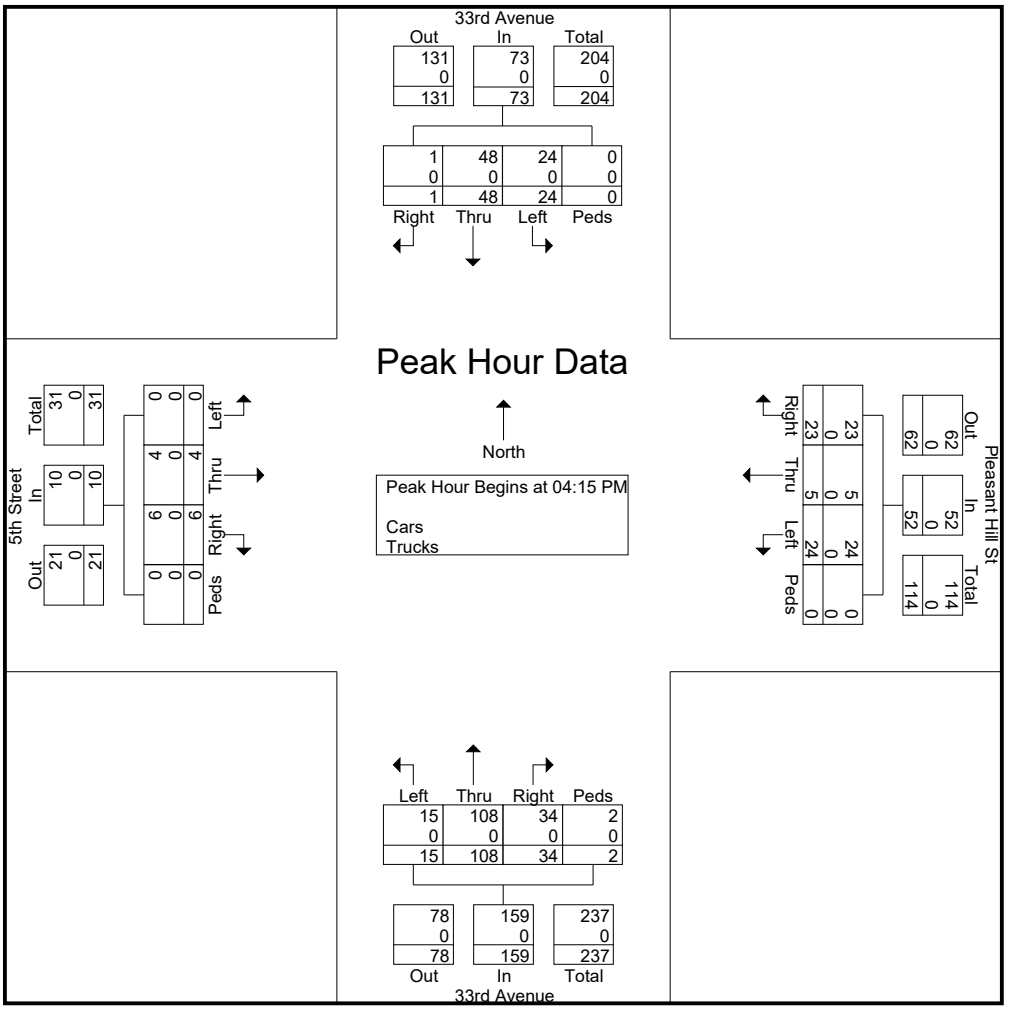
Snyder & Associates, Inc.
5005 Bowling St SW
Cedar Rapids, IA 52404

H

5th St & 33rd Avenue
Atkins, Iowa
07/21/2020 - 07/23/2020
120.0701.08

File Name : AtkinsTMC
Site Code : 00000000
Start Date : 7/21/2020
Page No : 7

	33rd Avenue From North					Pleasant Hill St From East					33rd Avenue From South					5th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	14	**6**	0	20	6	4	3	0	13	11	16	1	0	28	2	1	0	0	3	64
04:30 PM	0	15	6	0	21	6	0	6	0	12	12	**33**	3	0	48	**3**	0	0	0	3	84
04:45 PM	**2**	16	4	0	22	**10**	1	2	0	13	**14**	29	1	0	44	1	**5**	0	0	**6**	85
05:00 PM	1	**17**	6	0	**24**	7	**5**	**8**	0	**20**	9	32	**6**	**2**	**49**	1	1	0	0	2	**95**
Total Volume	3	62	22	0	87	29	10	19	0	58	46	110	11	2	169	7	7	0	0	14	328
% App. Total	3.4	71.3	25.3	0		50	17.2	32.8	0		27.2	65.1	6.5	1.2		50	50	0	0		
PHF	.375	.912	.917	.000	.906	.725	.500	.594	.000	.725	.821	.833	.458	.250	.862	.583	.350	.000	.000	.583	.863
Cars	1	48	24	0	73	23	5	24	0	52	34	108	15	2	159	6	4	0	0	10	294
% Cars	33.3	77.4	109.1	0	83.9	79.3	50.0	126.3	0	89.7	73.9	98.2	136.4	100	94.1	85.7	57.1	0	0	71.4	89.6
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Rev. 8/03

A

Application for TRAFFIC CONTROL DEVICE TSIP FUNDS

GENERAL INFORMATION **DATE:** August 11, 2020

Location / Title of Project U.S. 18 Corridor Improvements Project

Applicant City of Charles City

Contact Person John Fallis Title City Engineer

Complete Mailing Address 105 Milwaukee Mall

Charles City, IA 50616

Phone (641) 257-6300 E-Mail john@cityofcharlescity.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:

Funding Amount

Total Safety Cost	$ 316,200
Total Project Cost	$ 3,021,463
Safety Funds Requested	$ 316,200

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project? ☐Yes –
Explain _____ ☒No

Rev. 8/03

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

A

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Charles City

Signed: _____ 8/19/2020
Signature Date Signed

Dean Andrews, Mayor
Printed Name

Attest: _____ 8/19/2020
Signature Date Signed

Trudy O'Donnell, City Clerk
Printed Name

A

RESOLUTION NO. 141-20

RESOLUTION APPROVING A GRANT APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDS FOR A BRANTINGHAM STREET & CLARK STREET AND 4TH AVENUE & NORTH GRAND AVENUE TRAFFIC SIGNAL REPLACEMENT AND 4TH AVENUE & F STREET PEDESTRIAN HYBRID BEACON INSTALLATION PROJECT

WHEREAS, the City Council of the City of Charles City, Iowa, recognizes the need for traffic safety improvements at the 4th Avenue (US 18) & F Street intersection because of its importance as a school route to the Lincoln Elementary School; and

WHEREAS, the current signals at the intersection of Brantingham Street (US 18) & Clark Street and 4th Avenue (US 18) & North Grand Avenue are at the end of their useable lives;

WHEREAS, the proposed improvements to the intersections of Brantingham Street (US 18) & Clark Street, 4th Avenue (US 18) & North Grand Avenue, and 4th Avenue (US 18) & F Street include the replacement of existing traffic signals and the installation of a Pedestrian Hybrid Beacon to improve pedestrian and vehicle safety;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Charles City, Iowa, meeting in regular session on the 17th Day of August, 2020, supports the City of Charles City's pursuit of Traffic Safety Improvement Program (TSIP) Funds from the Iowa Department of Transportation, commits to accepting and maintaining these improvements, and authorized City staff to submit such application.

Joerger moved the adoption of the foregoing Resolution;
Pittman seconded the motion to adopt, and on roll call the voting was as follows:

AYES: Starr, Joerger, Freeseman, Pittman, Knighten
NAYES: none

Passed and approved this 17th day of August, 2020

Dean Andrews, Mayor

Attest:
Trudy O'Donnell, City Clerk

B - Narrative

B

Existing Conditions
U.S. 18 is an east/west principal arterial that runs through the City of Charles City with variable street widths and accommodations within the project limits. West of N Grand Ave U.S. 18 is a 45 ft. wide, four lane roadway and urban cross section (curb & gutter) with no parking. East of N Grand Ave, U.S. 18 is a two lane roadway that is 32 ft. wide with an urban cross section and on-street parking on the south side of the street. East of F Street, U.S. 18 transitions to a rural two-lane roadway with no parking. Pedestrians are currently accommodated with sidewalks along the south side of U.S. 18, west of N Grand Ave and on both sides of U.S. 18 east of N Grand Ave. The posted speed limit on U.S. 18 is 30 mph. There are three signalized intersections along the project corridor that include U.S. 18 & Clark Street, U.S. 18 & Grand Avenue, and U.S. 18 & F Street.

The roadway pavement is deteriorated and traffic signal poles and controller cabinets at the signalized intersections are at the end of their serviceable lives and are in need of re-location to better accommodate sidewalk and truck turning paths at various locations. The intersection of U.S. 18 & F Street is adjacent to Lincoln Elementary School and includes unconventional signalized school crossings.

Traffic Data
The Average Annual Daily Traffic (AADT) count for U.S. 18 in Charles City is variable along U.S. 18, with heavier traffic closer to the downtown area and lower traffic volumes as one moves to the east. For the proposed project intersections, the AADT is as follows:

- 7,400 (U.S. 18) and 4,800 – 3,180 (Clark St);
- 7,400 (U.S. 18) and 3,990 - 980 (Grand Ave); and,
- 4,660 (U.S. 18) and 350 (F St).

Turning movement traffic data is available for the U.S. 18 & N Grand and U.S. 18 & Clark intersections but is not available for U.S. 18 and F St. Refer to Exhibit H for Iowa DOT AADT and Turning Count sheets.

Crash History
Crash data has been drawn from the Iowa DOT Crash Analysis Tool and provides information on crashes in the project area's intersections of interest from 2015 – 2019. U.S. 18 & Clark had 23 crashes, U.S. 18 & N Grand Ave had 17 crashes, and U.S. 18 & F St had 3 crashes, with the majority of crashes resulting in property damage only.

In general, the reported crashes from all three locations result from failures to yield while making a left turn, improper turns, following too closely, and running traffic signals. Many of the left turn crashes are likely attributable the combination of the 4-lane undivided roadway section for U.S. 18 and the lack of protected left turn phasing.

Traffic Signal Warrants
Traffic signal warrant analysis was conducted for the intersections of US-18 and Clark St, and U.S. 18 and North Grand Avenue according to Manual of Uniform Traffic Control Devices (MUTCD), 2009 Edition.

The U.S. 18 & Clark Street intersection meets the 4-Hour Volumes and Peak Hour Volumes traffic signal warrants.

The intersection of U.S. 18 & North Grand Avenue did not meet any of the signals warrants, but came very close to doing so for Warrant 2- 4-Hour Volumes, meeting three one-hour periods with an additional hour falling just below the threshold.

Looking beyond just traffic volumes, while pedestrian counts were not available, the current crosswalks likely serve pedestrians throughout the day to access the various land uses near both intersections. As U.S. 18 will remain a 4-lane undivided roadway at these intersections, it is recommended to maintain existing signalization to allow for signalized pedestrian crossings.

Proposed Improvement

The U.S. 18 corridor rehabilitation project includes pavement rehabilitation, sidewalk curb ramp replacements at intersections, the upgrade of U.S. 18 segment east of F St from a rural roadway to an urban 2-lane road (with drainage improvements), intersection geometry improvements at the intersection of U.S. 18 and N Grand Avenue to improve the turning radii for large truck traffic, and replacement of the traffic signal equipment.

The safety improvements associated with the project include the replacement and improvement of the traffic signals at U.S. 18 & Clark Street, U.S. 18 & Grand Avenue, and U.S. 18 & F Street.

Along with replacing the existing equipment, the current signal phasing at U.S. 18 & Clark St and US18 and North Grand Avenue will be improved. Leading eastbound protected left turn phasing will be provided for traffic on U.S. 18 to address crash patterns, which could likely reduce angle crashes that are primarily caused due to FTYROW: when making a left turn.

A Pedestrian Hybrid Beacon (PHB) is proposed to replace the existing signal control at F Street. A PHB signal is used to assist pedestrians crossing a street or a highway and also provides a protected pedestrian crossing phase when activated. When activated at the intersection, turning movements across the crosswalk from the side streets will be prohibited during.

EXHIBIT C - ITEMIZED BREAKDOWN OF COST

The following cost opinion was prepared for the US 18 Corridor Rehabilitation Project. For purposes of this application, we have identified safety-related work items for this project as materials for traffic signal improvements. These improvements are listed as line items in the following cost opinion spreadsheet.

The anticipated funding sources for the project include:

Source	**Funding Amount**
TSIP Funding (requested)	$316,200
Iowa DOT Corridor Project (Total)	$1,908,193
City of Charles City	$797,070
TOTAL Project Cost	$3,021,463

Exhibit C - Cost Opinion

C

U.S. 18 Charles City Overlay
NHSN-018-6(103)--2R-34
Engineer's Opinion of Probable Construction Costs - Updated D5 Submittal
May 28, 2020

				DOT Cost		City of Charles City Cost		Overall
Item Code	**Item Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**	**Quantity**	**Total Cost**	**Total Cost**
2212-5070310	PATCHES, FULL-DEPTH REPAIR	SY	$135.00	4,146.40	$559,764.00	240.00	$32,400.00	$592,164.00
2212-5070330	PATCHES BY COUNT (REPAIR)	EACH	$155.00	373.00	$57,815.00	12.00	$1,860.00	$59,675.00
2214-5145150	PAVEMENT SCARIFICATION	SY	$1.55	23,401.70	$36,272.64	1,603.00	$2,484.65	$38,757.29
2301-1033100	PCC PAVEMENT, CLASS C, CLASS 3, 10 INCH	SY	$65.00	203.50	$13,227.50	265.20	$17,238.00	$30,465.50
2303-1042500	HMA HT INTERMEDIATE COURSE, 1/2 IN. MIX	TON	$38.00	2,324.60	$88,334.80	139.00	$5,282.00	$93,616.80
2303-1043500	HMA HT SURFACE COURSE, 1/2 IN. MIX, NO FRICTION	TON	$50.00	2,324.60	$116,230.00	139.00	$6,950.00	$123,180.00
2303-1258284	ASPHALT BINDER, PG 58-28H	TON	$580.00	287.30	$166,634.00	8.30	$4,814.00	$171,448.00
2303-6911000	HMA PAVEMENT SAMPLES	LS	$3,000.00	1.00	$3,000.00		$0.00	$3,000.00
2435-0140148	MANHOLE, SW-401, 48"	EACH	$4,300.00	3.50	$15,050.00	3.50	$15,050.00	$30,100.00
2435-0250100	INTAKE, SW-501	EACH	$3,500.00		$0.00	8.00	$28,000.00	$28,000.00
2435-0250700	INTAKE, SW-507	EACH	$4,000.00	6.00	$24,000.00	11.00	$44,000.00	$68,000.00
2435-0250704	INTAKE, SW-507, TOP ONLY	EACH	$3,000.00	0.50	$1,500.00	4.50	$13,500.00	$15,000.00
2435-0250904	INTAKE, SW-509, TOP ONLY	EACH	$3,800.00		$0.00	1.00	$3,800.00	$3,800.00
2435-0254500	INTAKE, SW-545	EACH	$6,000.00		$0.00	2.00	$12,000.00	$12,000.00
2435-0600010	MANHOLE ADJUSTMENT, MINOR	EACH	$1,500.00		$0.00	2.00	$3,000.00	$3,000.00
2435-0700020	CONNECTION TO EXISTING INTAKE	EACH	$1,500.00		$0.00	2.00	$3,000.00	$3,000.00
2503-0114215	STORM SEWER GRAVITY MAIN, TRENCHED, 2000D RCP, 15 INCH	LF	$72.00	242.00	$17,424.00	243.00	$17,496.00	$34,920.00
2503-0114224	STORM SEWER GRAVITY MAIN, TRENCHED, 2000D RCP, 24 INCH	LF	$92.00	638.00	$58,696.00	639.00	$58,788.00	$117,484.00
2510-6745850	REMOVAL OF PAVEMENT	SY	$10.00	247.40	$2,474.00	190.80	$1,908.00	$4,382.00
2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES	EACH	$750.00		$0.00	33.00	$24,750.00	$24,750.00
2511-6745900	REMOVAL OF SIDEWALK	SY	$12.00	845.60	$10,147.20		$0.00	$10,147.20
2511-7526004	SIDEWALK, PCC, 4 INCH	SY	$50.00	576.70	$28,835.00	176.30	$8,815.00	$37,650.00
2511-7526006	SIDEWALK, PCC, 6 INCH	SY	$70.00	267.50	$18,725.00	8.70	$609.00	$19,334.00
2511-7528101	DETECTABLE WARNINGS	SF	$45.00	594.00	$26,730.00	20.00	$900.00	$27,630.00
2512-1725156	CURB AND GUTTER, PCC, 1.5 FEET	LF	$42.00	1,990.00	$83,580.00	1,990.00	$83,580.00	$167,160.00
2515-2475008	DRIVEWAY, PCC, 8"	SY	$65.00	461.60	$30,004.00		$0.00	$30,004.00
2515-6745600	REMOVAL OF PAVED DRIVEWAY	SY	$10.00	461.60	$4,616.00		$0.00	$4,616.00
2525-0000100	TRAFFIC SIGNALIZATION	LS	$550,000.00	0.09	$50,000.00	0.91	$500,000.00	$550,000.00
2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	$13.00	86.70	$1,127.10		$0.00	$1,127.10
2527-9263137	PAINTED SYMBOL AND LEGEND, WATERBORNE OR SOLVENT-BASED	EACH	$150.00	2.00	$300.00		$0.00	$300.00
2528-8445110	TRAFFIC CONTROL	LS	$50,000.00	1.00	$50,000.00		$0.00	$50,000.00
2528-8445113	FLAGGERS	EACH	$480.00	20.00	$9,600.00		$0.00	$9,600.00
2528-8445115	PILOT CARS	EACH	$715.00	5.00	$3,575.00		$0.00	$3,575.00
2533-4980005	MOBILIZATION (5%)	LS	$150,000.00	0.75	$112,500.00	0.25	$37,500.00	$150,000.00
	SUBTOTAL				$1,590,161.24		$927,724.65	$2,517,885.89
	CONTINGENCY (20%)				$318,032.00		$185,545.00	$503,577.00
					$1,908,193.24		$1,113,269.65	$3,021,462.89

C

Estimate of Traffic Signal Quantities										TOTAL	ESTIMATED	ESTIMATED
Item	Description	Unit	Clark	Grand	F St	UNIT COST	Clark	Grand	F St	EXTENSION	MATERIALS (2/3)	LABOR (1/3)
CONTROLLER	8-PHASE ATC CONTROLLER, CABINET, AND ACCESSORIES	LS	1	1	1	$30,000.00	$30,000.00	$30,000.00	$20,000.00	$80,000.00	$53,333.33	$26,666.67
AND CABINET	UNINTERRUPTABLE POWER SUPPLY (BATTERY BACK-UP)	LS	1	1	1	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$24,000.00	$16,000.00	$8,000.00
	0	0	0	0	0		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
DETECTION	VIDEO DETECTION SYSTEM	LS	1	1	0	$30,000.00	$30,000.00	$30,000.00	$0.00	$60,000.00	$40,000.00	$20,000.00
	APS PEDESTRIAN PUSHBUTTON WITH SIGN	EACH	8	8	2	$2,750.00	$22,000.00	$22,000.00	$5,500.00	$49,500.00	$33,000.00	$16,500.00
	EMERGENCY VEHICLE PREEMPTION SYSTEM	LS	0	0	0	$8,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TRAFFIC SIGNAL HEADS	12" R,Y,G,<Y,<G (ALL LED) W/ BACKPLATE, MAST-ARM MOUNTED	EACH	1	1	0	$1,300.00	$1,300.00	$1,300.00	$0.00	$2,600.00	$1,733.33	$866.67
	12" R,Y,G (ALL LED) W/ BACKPLATE, MAST-ARM MOUNTED	EACH	7	5	0	$950.00	$6,650.00	$4,750.00	$0.00	$11,400.00	$7,600.00	$3,800.00
	12" R,Y,G, (ALL LED), SIDE-OF-POLE MOUNTED	EACH	4	4	0	$850.00	$3,400.00	$3,400.00	$0.00	$6,800.00	$4,533.33	$2,266.67
	12" R,R,Y (ALL LED) W/ BACKPLATE, MAST-ARM MOUNTED	EACH	0	0	2	$1,100.00	$0.00	$0.00	$2,200.00	$2,200.00	$1,466.67	$733.33
	12" R,R,Y, (ALL LED), SIDE-OF-POLE MOUNTED	EACH	0	0	2	$1,100.00	$0.00	$0.00	$2,200.00	$2,200.00	$1,466.67	$733.33
	BLANK-OUT TRAFFIC SIGN (LED, FILLED IN), R3-1, 24" x 24", COLOR, SIDE-OF-POLE MOUNTED	EACH	0	0	2	$2,500.00	$0.00	$0.00	$5,000.00	$5,000.00	$3,333.33	$1,666.67
	BLANK-OUT TRAFFIC SIGN (LED, FILLED IN), R3-2, 24" x 24", COLOR, SIDE-OF-POLE MOUNTED	EACH	0	0	2	$2,500.00	$0.00	$0.00	$5,000.00	$5,000.00	$3,333.33	$1,666.67
	16" CD HAND/WALKING PERSON, 1-SECTION, SOP	EACH	8	8	2	$1,000.00	$8,000.00	$8,000.00	$2,000.00	$18,000.00	$12,000.00	$6,000.00
POWER SUPPLY	POWER SUPPLY	EACH	1	1	1	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$6,000.00	$4,000.00	$2,000.00
	0	0	0	0	0		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
HANDHOLES	TYPE III - 24" x 36" PRE-CAST POLYMER-CONCRETE HANDHOLE	EACH	4	4	3	$1,500.00	$6,000.00	$6,000.00	$4,500.00	$16,500.00	$11,000.00	$5,500.00
WIRE AND CABLE	SIGNAL CABLE - 16c #14 AWG	LIN FT	520	790	110	$3.50	$1,820.00	$2,765.00	$385.00	$4,970.00	$3,313.33	$1,656.67
	SIGNAL CABLE - 7c #14 AWG	LIN FT	70	80	0	$2.25	$157.50	$180.00	$0.00	$337.50	$225.00	$112.50
	SIGNAL CABLE - 5c #14 AWG	LIN FT	660	590	460	$2.00	$1,320.00	$1,180.00	$920.00	$3,420.00	$2,280.00	$1,140.00
	SIGNAL CABLE - 2c #14 AWG	LIN FT	1150	1220	140	$1.50	$1,725.00	$1,830.00	$210.00	$3,765.00	$2,510.00	$1,255.00
	EMERGENCY VEHICLE PREEMPTION CABLE	LIN FT	0	0	0	$1.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	VIDEO DETECTION CABLE(S)	LIN FT	70	70	0	$3.00	$210.00	$210.00	$0.00	$420.00	$280.00	$140.00
	LUMINAIRE CABLE - 1c #8 AWG	LIN FT	690	670	0	$1.75	$1,207.50	$1,172.50	$0.00	$2,380.00	$1,586.67	$793.33
	LUMINAIRE CABLE - 1c #10 AWG	LIN FT	420	420	110	$1.50	$630.00	$630.00	$165.00	$1,425.00	$950.00	$475.00
	POWER CABLE - 1c #6 AWG	LIN FT	240	240	240	$1.90	$456.00	$456.00	$456.00	$1,368.00	$912.00	$456.00
	GROUND WIRE - 1c #6 BARE	LIN FT	340	380	180	$1.60	$544.00	$608.00	$288.00	$1,440.00	$960.00	$480.00
	TRACER WIRE - 1c #10	LIN FT	340	380	180	$0.75	$255.00	$285.00	$135.00	$675.00	$450.00	$225.00
	PULL TAPE	LIN FT	340	380	180	$0.50	$170.00	$190.00	$90.00	$450.00	$300.00	$150.00
CONDUIT	2" PVC, TRENCHED/BORED	LIN FT	0	30	20	$15.00	$0.00	$450.00	$300.00	$750.00	$500.00	$250.00
	3" PVC, TRENCHED/BORED	LIN FT	290	300	140	$25.00	$7,250.00	$7,500.00	$3,500.00	$18,250.00	$12,166.67	$6,083.33
CONCRETE FOOTING	POLE FOOTING, 3' DIA x 12' DEPTH	EACH	2	2	1	$3,750.00	$7,500.00	$7,500.00	$3,750.00	$18,750.00	$12,500.00	$6,250.00
	POLE FOOTING, 3' DIA x 14' DEPTH	EACH	2	1	0	$4,500.00	$9,000.00	$4,500.00	$0.00	$13,500.00	$9,000.00	$4,500.00
	POLE FOOTING, 3' DIA x 16' DEPTH	EACH	0	1	0	$5,500.00	$0.00	$5,500.00	$0.00	$5,500.00	$3,666.67	$1,833.33
	POLE FOOTING, 2' DIA x 3' DEPTH	EACH	0	2	2	$1,000.00	$0.00	$2,000.00	$2,000.00	$4,000.00	$2,666.67	$1,333.33

C

Estimate of Traffic Signal Quantities										TOTAL	ESTIMATED	ESTIMATED
Item	Description	Unit	Clark	Grand	F St	UNIT COST	Clark	Grand	F St	EXTENSION	MATERIALS (2/3)	LABOR (1/3)
TRAFFIC SIGNAL POLES	STEEL COMBINATION SIGNAL/LIGHTING - 28' MAST ARM	EACH	0	1	0	$7,500.00	$0.00	$7,500.00	$0.00	$7,500.00	$5,000.00	$2,500.00
	STEEL COMBINATION SIGNAL/LIGHTING - 32' MAST ARM	EACH	2	0	1	$8,000.00	$16,000.00	$0.00	$8,000.00	$24,000.00	$16,000.00	$8,000.00
	STEEL COMBINATION SIGNAL/LIGHTING - 34' MAST ARM	EACH	0	1	0	$8,500.00	$0.00	$8,500.00	$0.00	$8,500.00	$5,666.67	$2,833.33
	STEEL COMBINATION SIGNAL/LIGHTING - 37' MAST ARM	EACH	1	0	0	$9,000.00	$9,000.00	$0.00	$0.00	$9,000.00	$6,000.00	$3,000.00
	STEEL COMBINATION SIGNAL/LIGHTING - 40' MAST ARM	EACH	1	0	0	$9,500.00	$9,500.00	$0.00	$0.00	$9,500.00	$6,333.33	$3,166.67
	STEEL COMBINATION SIGNAL/LIGHTING - 45' MAST ARM	EACH	0	1	0	$10,000.00	$0.00	$10,000.00	$0.00	$10,000.00	$6,666.67	$3,333.33
	STEEL COMBINATION SIGNAL/LIGHTING - 53' MAST ARM	EACH	0	1	0	$11,000.00	$0.00	$11,000.00	$0.00	$11,000.00	$7,333.33	$3,666.67
	ALUMINUM PEDESTAL POLE, 15' HEIGHT	EACH	0	2	2	$1,500.00	$0.00	$3,000.00	$3,000.00	$6,000.00	$4,000.00	$2,000.00
LUMINAIRE	LUMINAIRE FIXTURE	EACH	5	4	1	$1,000.00	$5,000.00	$4,000.00	$1,000.00	$10,000.00	$6,666.67	$3,333.33
	CONNECTOR - Y-1, FUSED	EACH	4	4	0	$50.00	$200.00	$200.00	$0.00	$400.00	$266.67	$133.33
	CONNECTOR - L-1, FUSED	EACH	6	6	2	$50.00	$300.00	$300.00	$100.00	$700.00	$466.67	$233.33
MISC.	STREETNAME SIGN - 42" x 24", MAST-ARM MOUNTED	EACH	0	0	2	$350.00	$0.00	$0.00	$700.00	$700.00	$466.67	$233.33
	STREETNAME SIGN - 60" x 24", MAST-ARM MOUNTED	EACH	0	2	2	$400.00	$0.00	$800.00	$800.00	$1,600.00	$1,066.67	$533.33
	STREETNAME SIGN - 66" x 24", MAST-ARM MOUNTED	EACH	2	0	0	$400.00	$800.00	$0.00	$0.00	$800.00	$533.33	$266.67
	STREETNAME SIGN - 96" x 24", MAST-ARM MOUNTED	EACH	0	2	0	$450.00	$0.00	$900.00	$0.00	$900.00	$600.00	$300.00
	STREETNAME SIGN - 108" x 24", MAST-ARM MOUNTED	EACH	2	0	0	$450.00	$900.00	$0.00	$0.00	$900.00	$600.00	$300.00
	TRAFFIC SIGN - 24" x 30", MAST-ARM MOUNTED	EACH	0	0	2	$350.00	$0.00	$0.00	$700.00	$700.00	$466.67	$233.33
	TRAFFIC SIGN - 30" x 30", POST MOUNTED, WITH 14' POST	EACH	0	0	2	$750.00	$0.00	$0.00	$1,500.00	$1,500.00	$1,000.00	$500.00
	EXISTING SIGNAL REMOVAL	EACH	1	1	1	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$75,000.00	$0.00	$75,000.00
							$216,295.00	$223,606.50	$109,399.00	$549,300.50	**$316,200.35**	$233,100.15

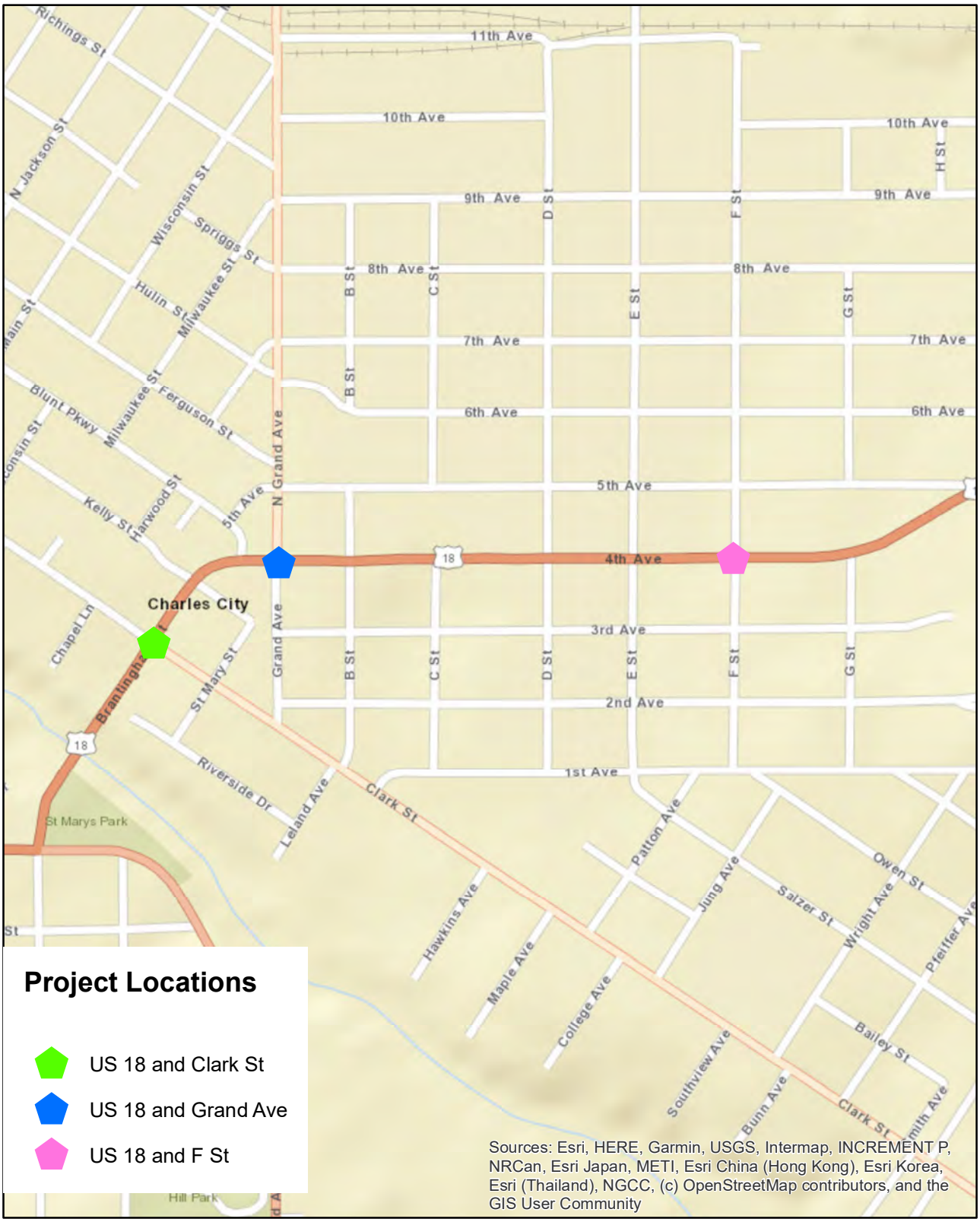
Exhibit D – Project Timeline

The following includes the anticipated project schedule

Task	**Completion Date**
Traffic Safety Improvement Program Funding Application Submission	August 15, 2020
Check Plan Submission (DM5)	August 18, 2020
Final Plan Submittal	September 22, 2020
Project Letting	December 15, 2020
Construction	Spring 2021

Exhibit E - Project Locations

E



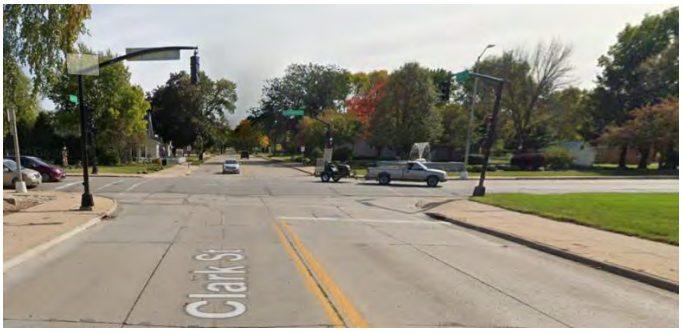
Project Intersections
Charles City, IA

Date: 5/26/2020

Intersection Photos

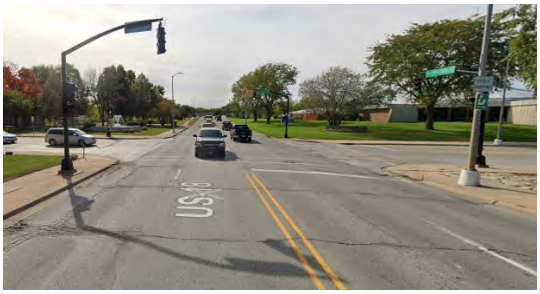
US 18 and Clark St

Aerial View of US 18 and Clark Street



Facing North

Facing South



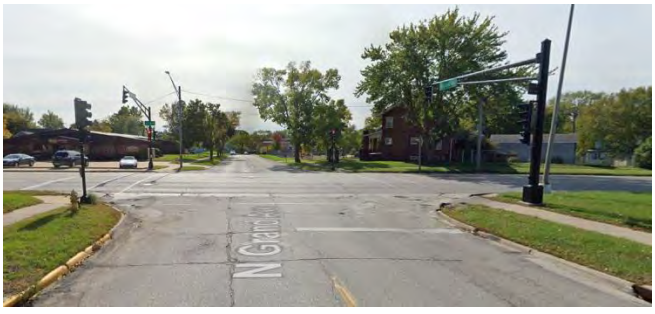
Facing East

Facing West

US 18 and North Grand Avenue

Aerial View of US 18 and North Grand Avenue

Facing North



Facing South

Facing East

Facing East

Facing West

Facing West

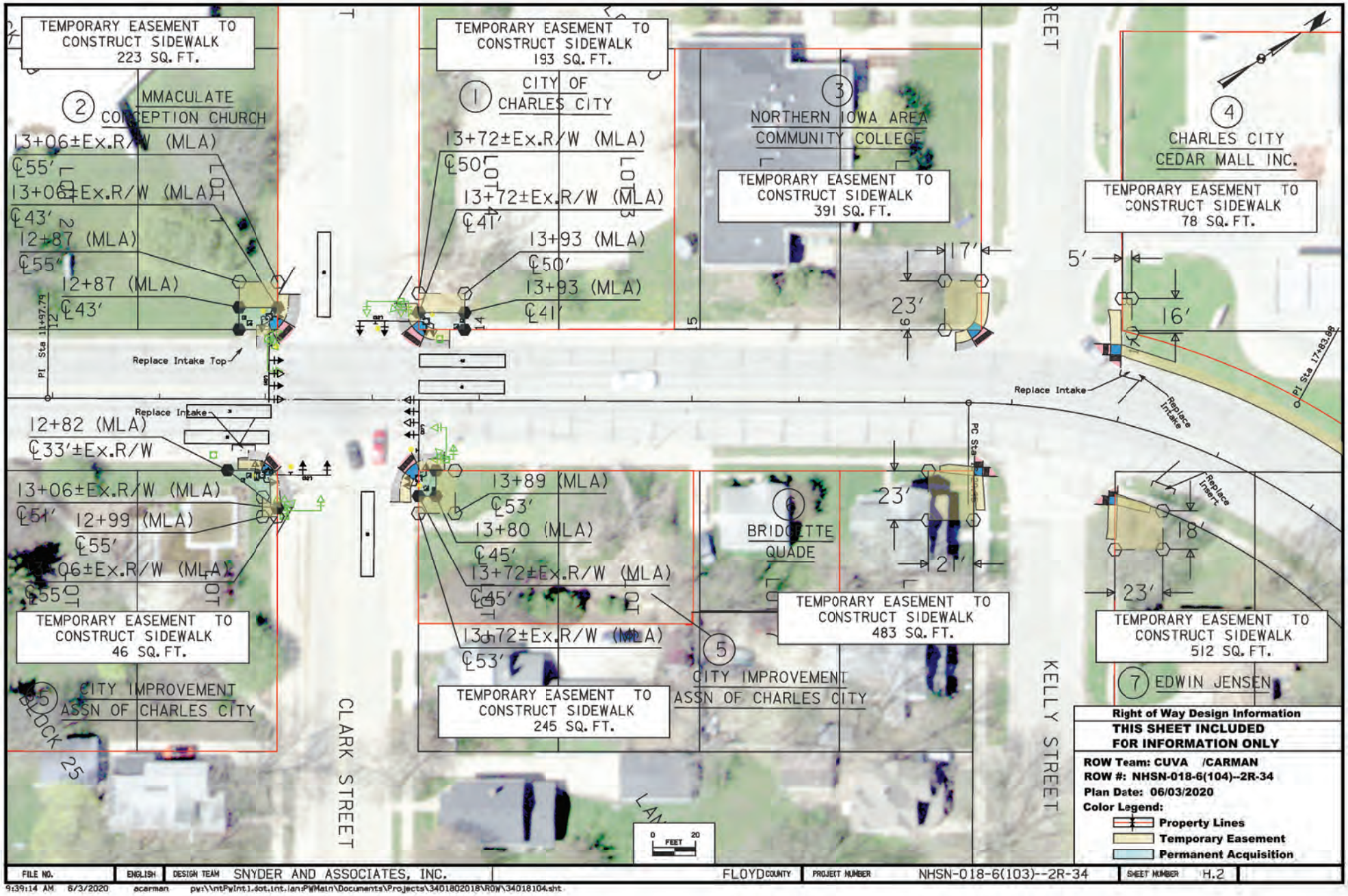
US 18 and F Street

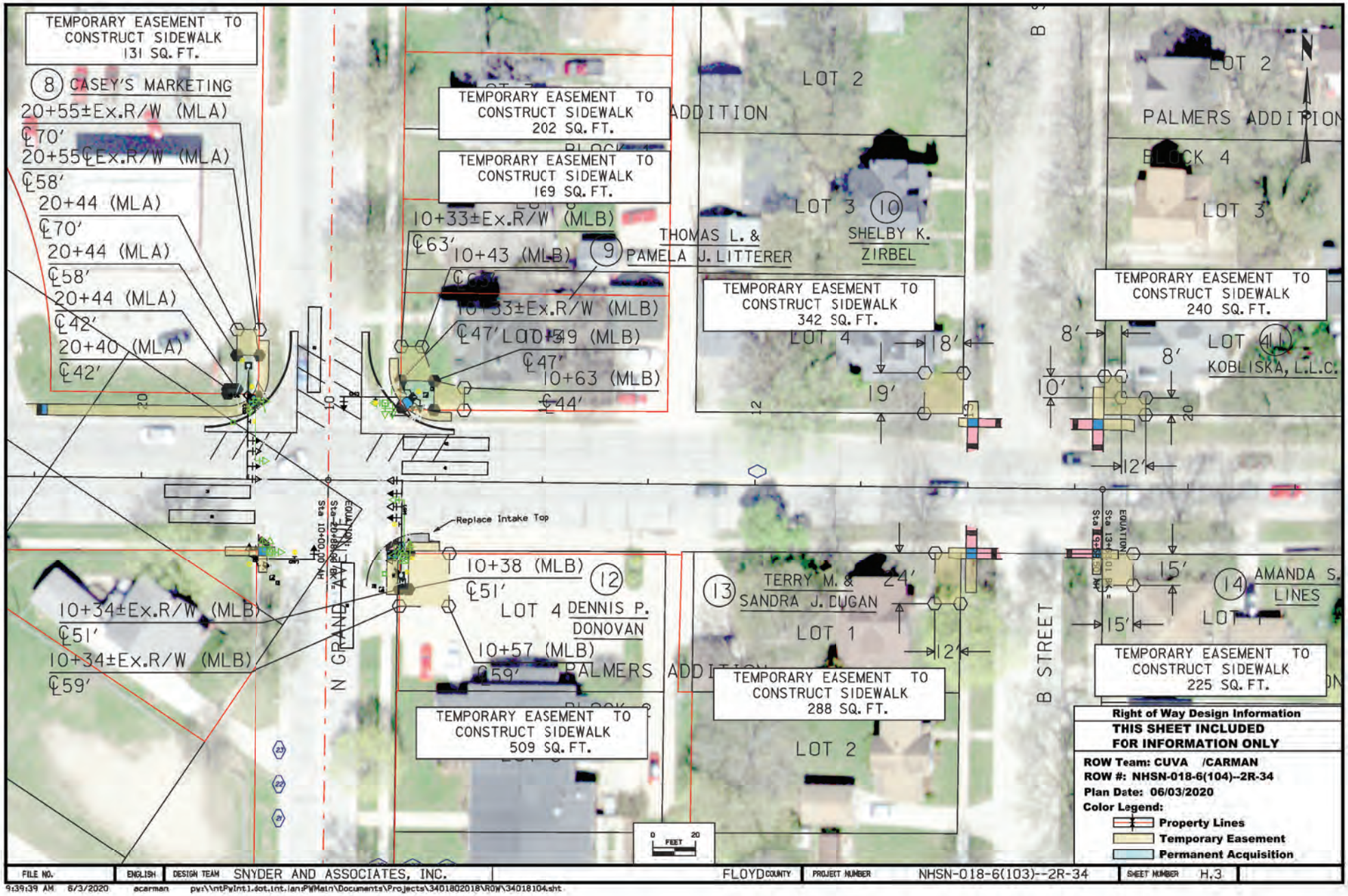
Aerial View of US 18 and F Street

Facing South

Exhibit G - Plan View

G




TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 131 SQ. FT.
8 CASEY'S MARKETING
20+55±Ex.R/W (MLA)
℄70'
20+55℄Ex.R/W (MLA)
℄58'
20+44 (MLA)
℄70'
20+44 (MLA)
℄58'
20+44 (MLA)
℄42'
20+40 (MLA)
℄42'
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 202 SQ. FT.
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 169 SQ. FT.
10+33±Ex.R/W (MLB)
℄63'
10+43 (MLB)
9 THOMAS L. & PAMELA J. LITTERER
10+33±Ex.R/W (MLB)
℄47'
10+49 (MLB)
℄47'
10+63 (MLB)
℄44'
LOT 2
ADDITION
LOT 3
10 SHELBY K. ZIRBEL
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 342 SQ. FT.
LOT 4
18'
19'
LOT 2
PALMERS ADDITION
BLOCK 4
LOT 3
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 240 SQ. FT.
8'
8'
10'
LOT 4
KOBLISKA, L.L.C.
12'
N GRAND AVENUE
Replace Intake Top
10+38 (MLB)
℄51'
12 LOT 4 DENNIS P. DONOVAN
10+57 (MLB)
℄59'
PALMERS ADDITION
10+34±Ex.R/W (MLB)
℄51'
10+34±Ex.R/W (MLB)
℄59'
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 509 SQ. FT.
13 TERRY M. & SANDRA J. DUGAN
LOT 1
24'
12'
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 288 SQ. FT.
LOT 2
B STREET
15'
15'
14 AMANDA S. LINES
LOT 1
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 225 SQ. FT.
Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY
ROW Team: CUVA /CARMAN
ROW #: NHSN-018-6(104)--2R-34
Plan Date: 06/03/2020
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition
0 FEET 20
FILE NO.
ENGLISH
DESIGN TEAM SNYDER AND ASSOCIATES, INC.
FLOYD COUNTY
PROJECT NUMBER NHSN-018-6(103)--2R-34
SHEET NUMBER H.3
9:39:39 AM 6/3/2020 acarman pw:\\ntPwInt1.dot.int.ia:PWMain\Documents\Projects\3401802018\ROW\34018104.sht

G

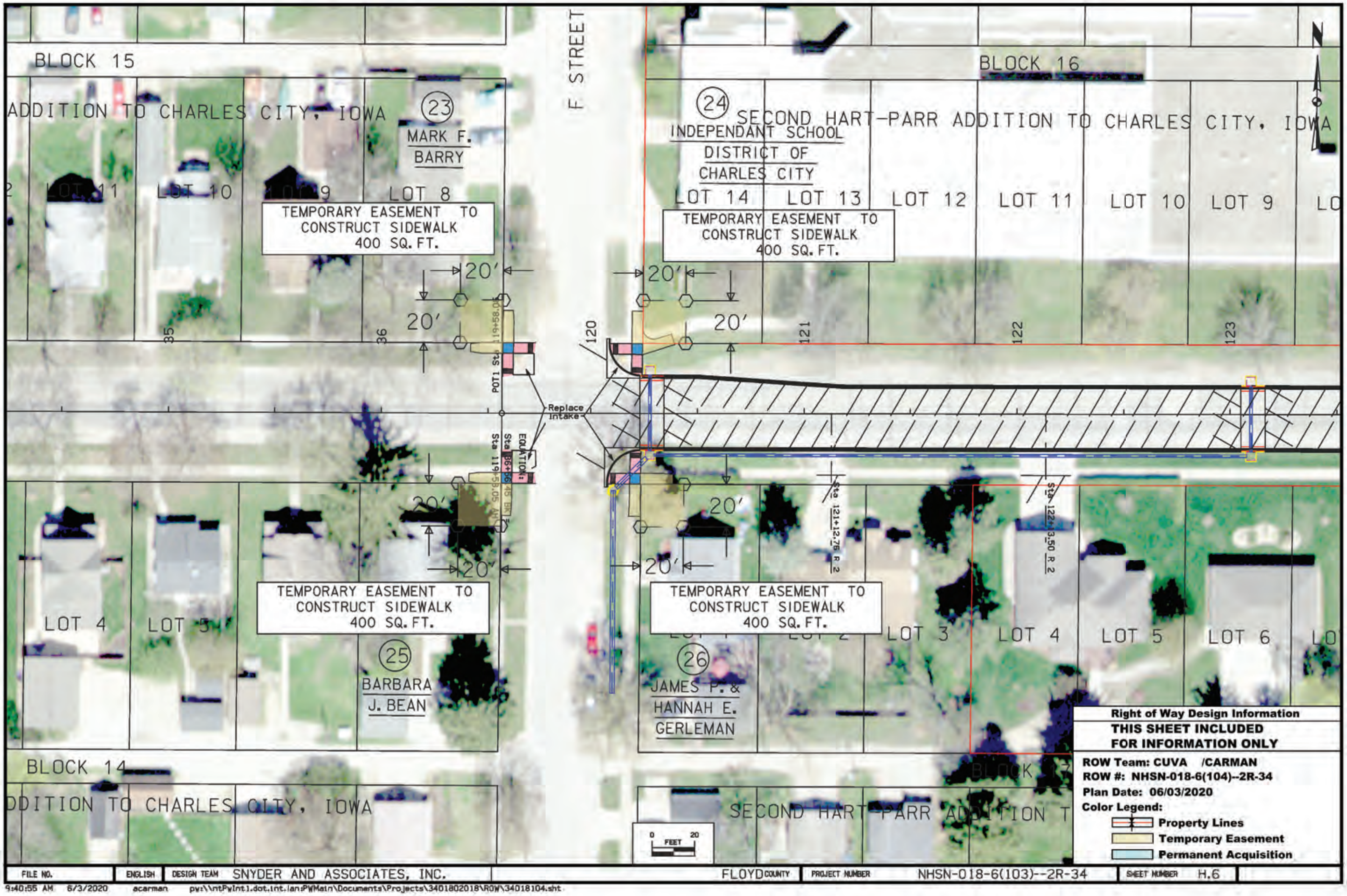
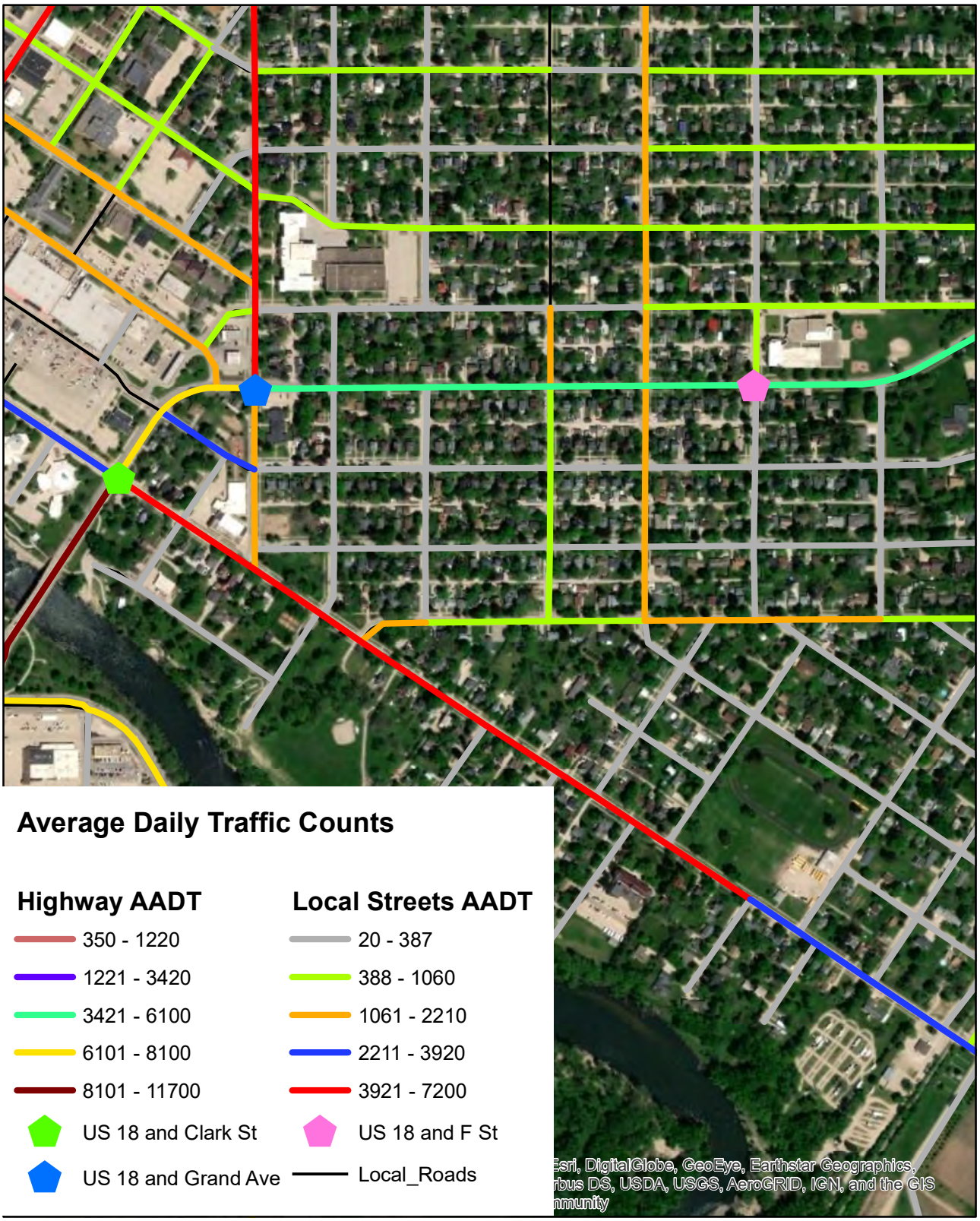

BLOCK 15
ADDITION TO CHARLES CITY, IOWA
F STREET
BLOCK 16
SECOND HART-PARR ADDITION TO CHARLES CITY, IOWA
23
MARK F. BARRY
24
INDEPENDANT SCHOOL DISTRICT OF CHARLES CITY
LOT 11
LOT 10
LOT 9
LOT 8
LOT 14
LOT 13
LOT 12
LOT 11
LOT 10
LOT 9
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 400 SQ. FT.
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 400 SQ. FT.
20'
35
36
120
121
122
123
Replace Intake
EQUATION:
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 400 SQ. FT.
TEMPORARY EASEMENT TO CONSTRUCT SIDEWALK 400 SQ. FT.
LOT 4
LOT 5
LOT 3
LOT 4
LOT 5
LOT 6
25
BARBARA J. BEAN
26
JAMES P. & HANNAH E. GERLEMAN
BLOCK 14
DDITION TO CHARLES CITY, IOWA
SECOND HART-PARR ADDITION T
Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY
ROW Team: CUVA /CARMAN
ROW #: NHSN-018-6(104)--2R-34
Plan Date: 06/03/2020
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition
FEET
0
20
FILE NO.
ENGLISH
DESIGN TEAM SNYDER AND ASSOCIATES, INC.
FLOYD COUNTY
PROJECT NUMBER NHSN-018-6(103)--2R-34
SHEET NUMBER H.6
9:40:55 AM 6/3/2020 acarman

Exhibit H - Charles City Traffic Counts

H



Project Intersections
Charles City, IA

Date: 5/26/2020

AADT Sources:
Highway AADT - Traffic Log Book AADT IDOT Open Data, 2020
Local Streets - Secondary Municipal Traffic. IDOT Open Data. 2019

Exhibit H - Iowa Department of Transportation

H

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

34237993099

Count Date:

Wednesday, June 14, 2017

County:

Floyd

Location Description:

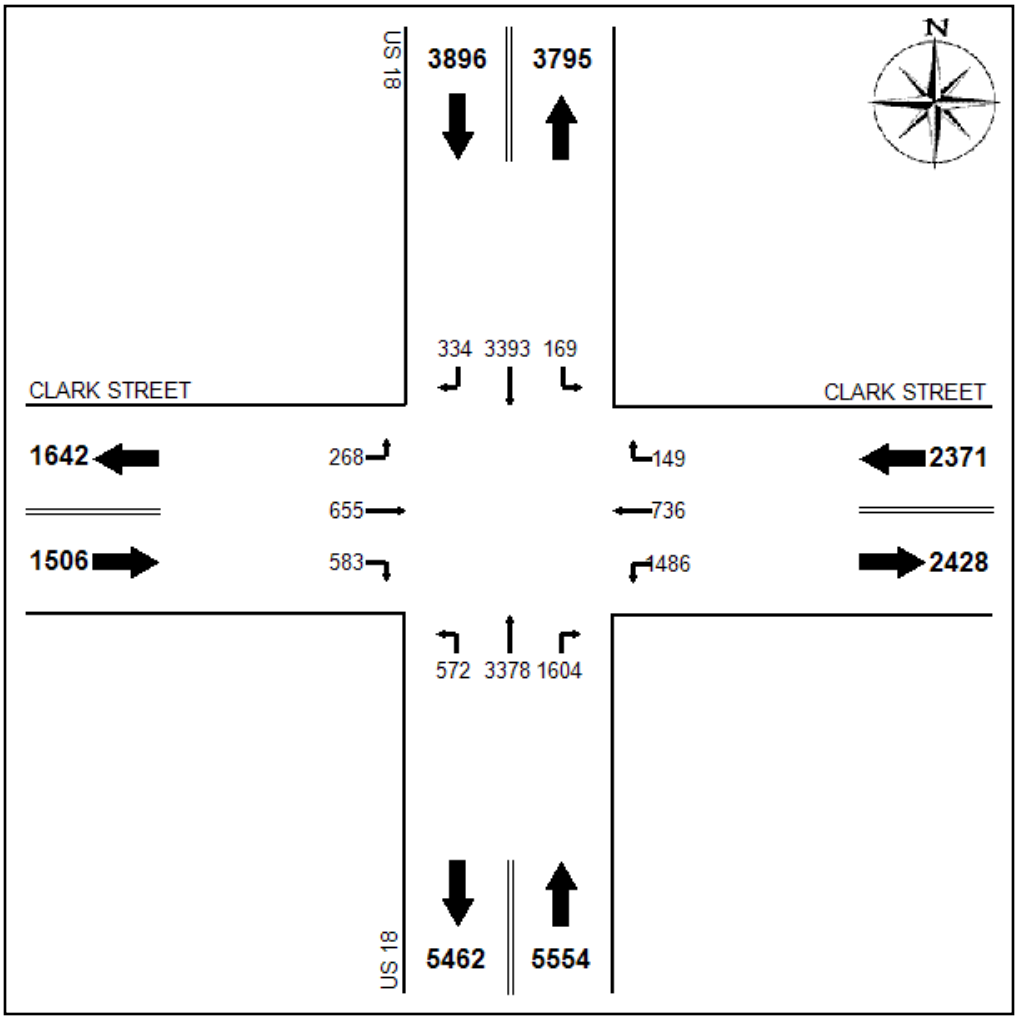
US 18, BRANTINGHAM ST & CLARK ST

Volume Factor: 1.838

Pass Class Factor: 1.856

SU Class Factor: 1.543

Combo Class Factor: 1.503



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	4	243	16	118	45	5	21	171	69	9	22	13
08:00	5	213	27	145	68	8	42	175	92	12	36	28
11:00	13	263	30	95	56	12	51	243	106	23	60	63
12:00	17	261	31	129	54	11	70	250	118	23	46	62
15:00	16	313	35	118	67	17	51	311	155	22	45	59
16:00	14	282	21	88	55	13	41	353	180	31	76	43
17:00	22	277	20	112	53	15	34	340	149	25	69	47

Exhibit H - Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

34248001099

Count Date:

Wednesday, June 14, 2017

County:

Floyd

Location Description:

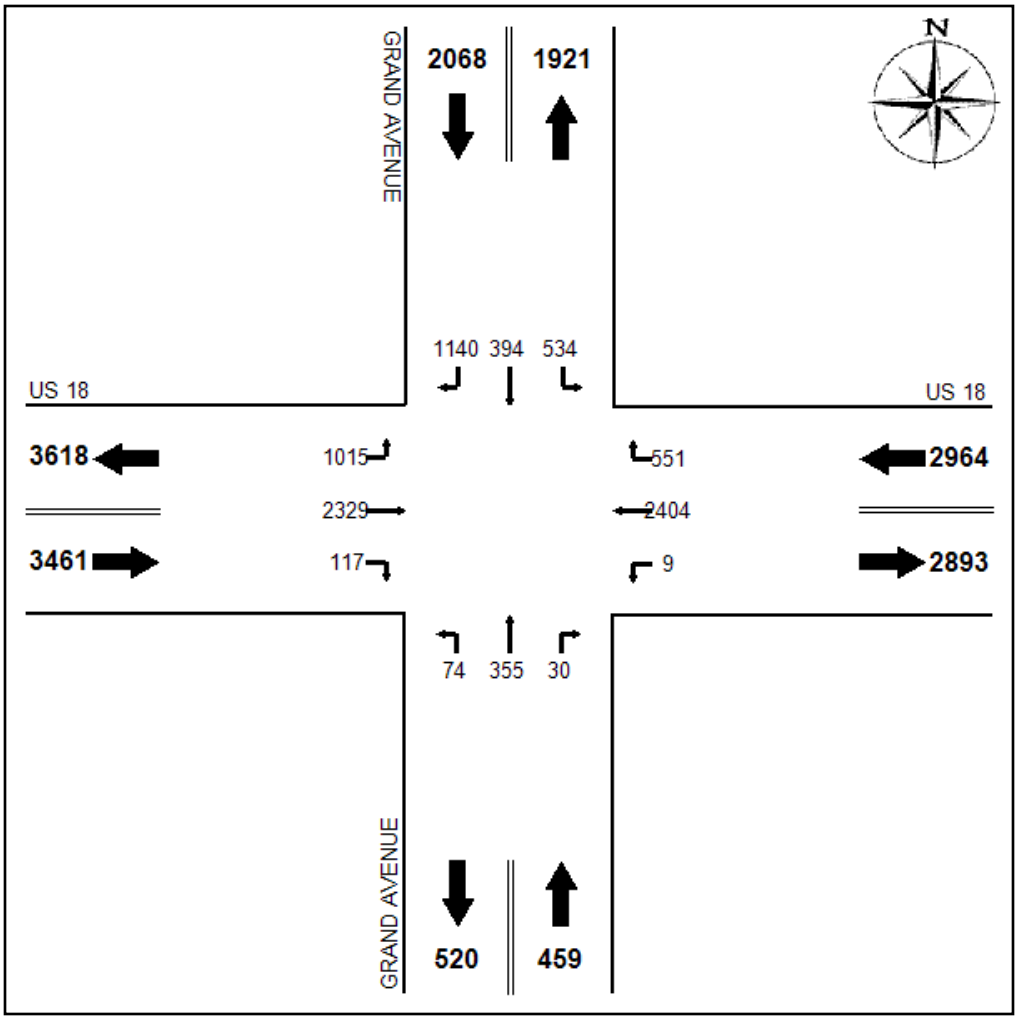
US 18 & GRAND AVE

Volume Factor: 1.838

Pass Class Factor: 1.856

SU Class Factor: 1.543

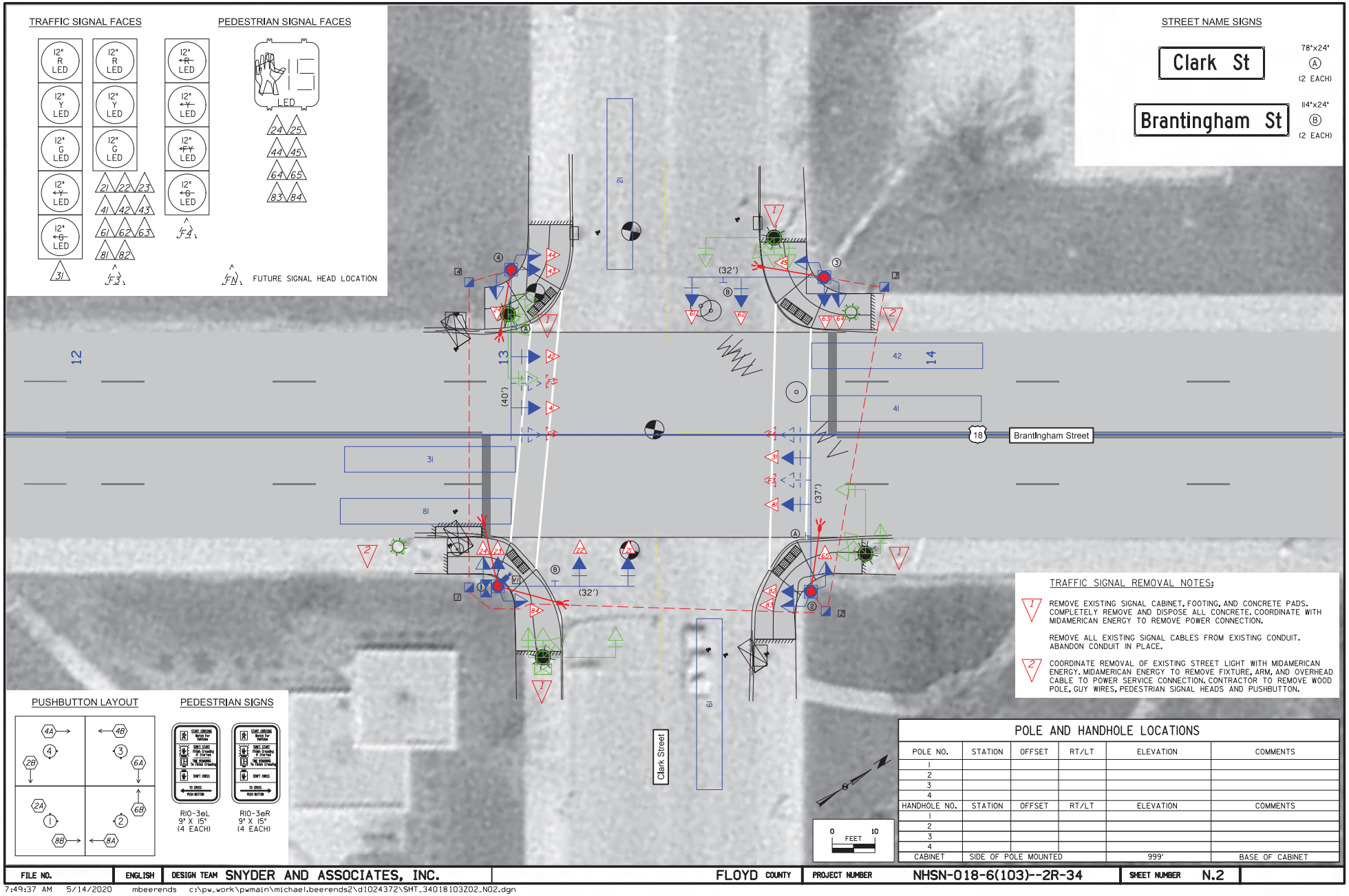
Combo Class Factor: 1.503



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	31	25	68	0	199	61	5	39	1	52	95	5
08:00	34	27	71	1	175	36	4	21	1	47	110	4
11:00	31	23	86	1	177	42	3	22	2	65	180	8
12:00	45	26	92	0	177	44	9	19	2	87	178	8
15:00	58	42	100	1	223	43	7	27	5	94	199	13
16:00	56	27	105	0	174	29	5	34	1	104	274	12
17:00	34	43	97	2	185	44	7	30	4	104	232	13

Exhibit I - Equipment Diagram



POLE AND HANDHOLE LOCATIONS

POLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					
2					
3					
4					
HANDHOLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					
2					
3					
4					
CABINET	SIDE OF POLE MOUNTED			999'	BASE OF CABINET

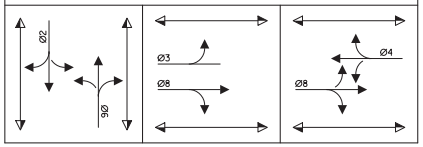
FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	FLOYD COUNTY	PROJECT NUMBER NHSN-018-6(103)--2R-34	SHEET NUMBER N.2

7:49:37 AM 5/14/2020 mbeerends c:\pw_work\pwmain\michael.beerends2\d1024372\SHT_34018103Z02_N02.dgn

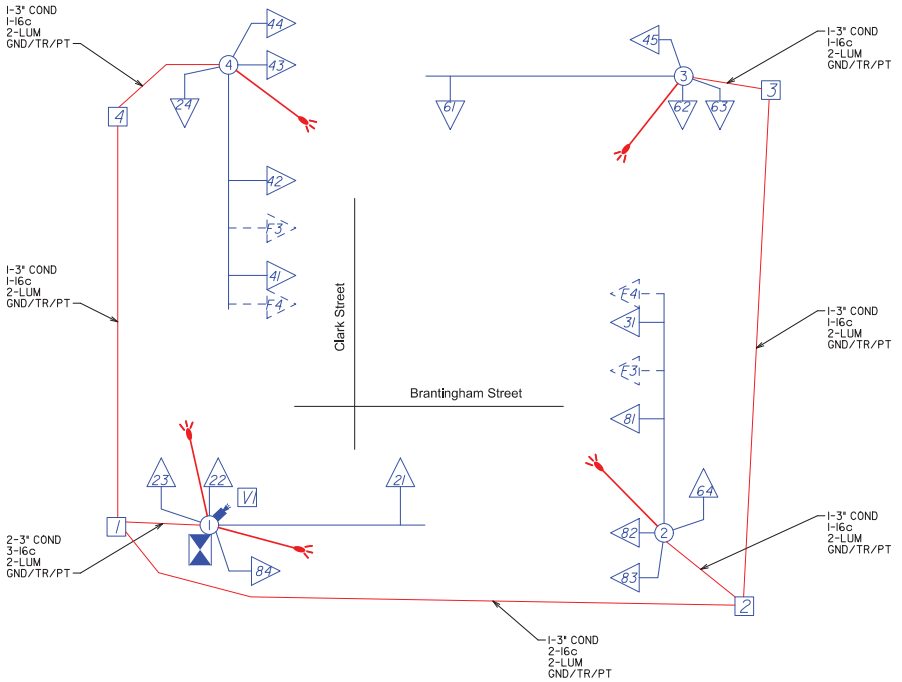
DETECTOR SUMMARY

CAMERA NUMBER	DETECTION ZONE	ZONE LIMITS (DISTANCE FROM STOP LINE)	PHASE CALLED	PHASE EXTENDED	COMMENTS
VI	21	0-40'	2	2	
VI	31	0-40'	3	3/8	
VI	41	0-40'	4	4	
VI	42	0-40'	4	4	
VI	61	0-40'	6	6	
VI	81	0-40'	8	8	
2A, 2B					PED PUSHBUTTON
4A, 4B					PED PUSHBUTTON
6A, 6B					PED PUSHBUTTON
8A, 8B					PED PUSHBUTTON

TRAFFIC PHASING AND COLOR SEQUENCE



NOT TO SCALE



NOTES:

ZONE LIMITS ARE FOR DETECTION LIMITS ONLY. ACTUAL DETECTION ARAEAS FOR EACH ZONE WILL BE DETERMINED IN THE FIELD.

TRAFFIC SIGNAL POLE DATA

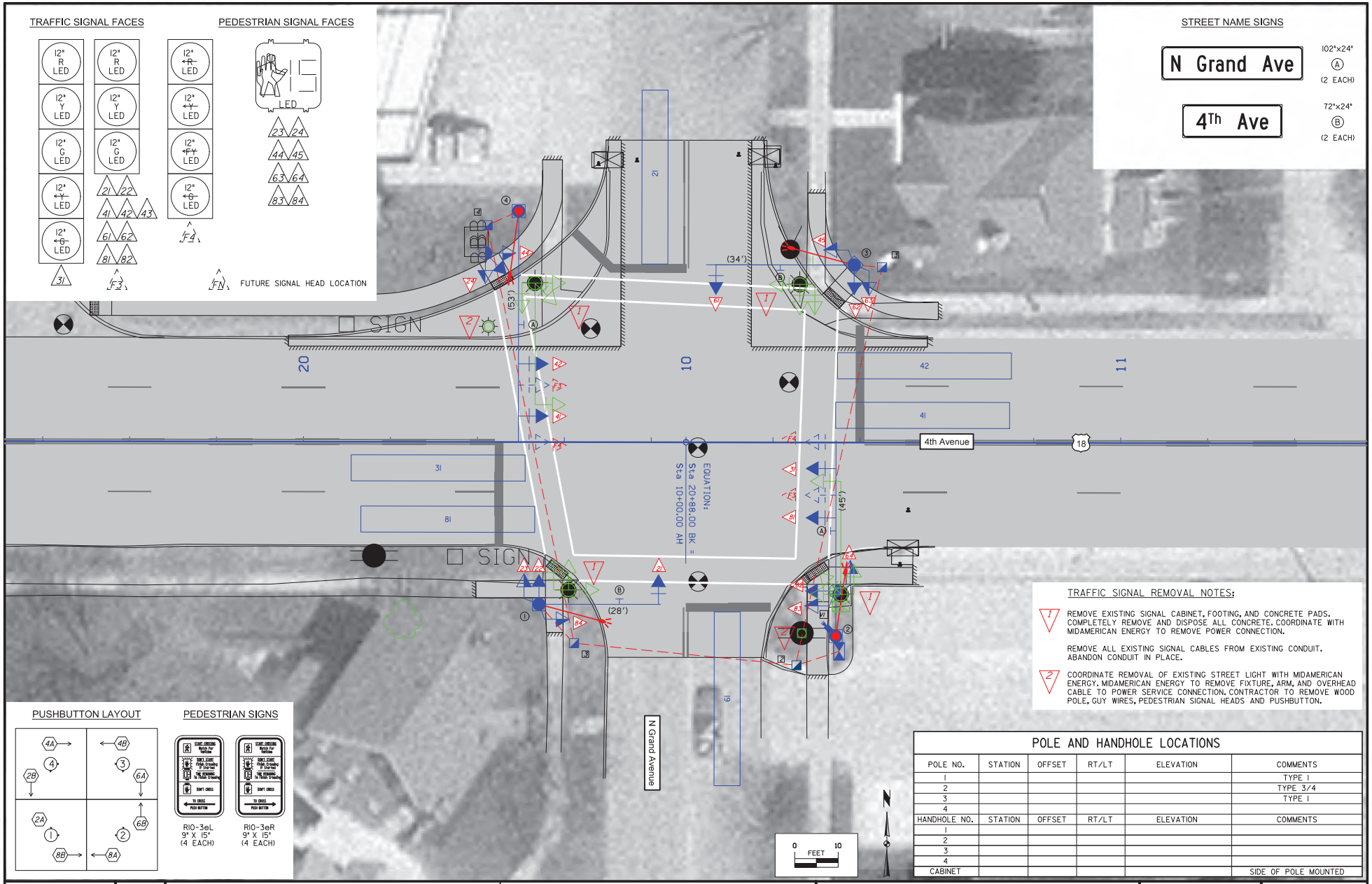
POLE NO.	POLE TYPE	MAST ARM LENGTH / PEDESTAL HEIGHT (ft.)	TRAFFIC SIGNAL HEADS		FUTURE TRAFFIC SIGNAL HEADS		TRAFFIC SIGNS		FUTURE TRAFFIC SIGNS		LUMINAIRE ARM			FOOTING DIMENSIONS		MISCELLANEOUS	TOTAL QUANTITY
			QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	SPREAD (ft.)	MOUNTING HEIGHT (ft.)	ORIENTATION (degrees)	DIA. (ft.)	DEPTH (ft.)		
1	COMBINATION SIGNAL/LIGHTING	32	2	19,30			1	13			8	25	0,90	3	12		1
2	COMBINATION SIGNAL/LIGHTING	37	2	20,31	2	26,37	1	13			8	25	0	3	14		1
3	COMBINATION SIGNAL/LIGHTING	32	2	19,31			1	24			8	25	0	3	12		1
4	COMBINATION SIGNAL/LIGHTING	40	2	20,32	2	27,39	1	14			8	25	0	3	14		1

NOTES:

1. LOCATION REPRESENTS APPROXIMATE LINEAR DISTANCE FROM POLE MEASURED OUTWARD TO END OF ARM.
2. ORIENTATION OF LUMINAIRE ARM REPRESENTS A COUNTERCLOCKWISE ANGLE MEASURED FROM THE CENTERLINE OF THE MAST ARM.
3. POLES SHALL BE DESIGNED AS PER FUTURE TRAFFIC SIGNAL HEADS AND FUTURE TRAFFIC SIGNS FOUND ON TRAFFIC SIGNAL POLE DATA TABLE.
4. UNLESS OTHERWISE DIRECTED, TRAFFIC SIGNAL HEADS ON MAST ARMS ARE TO BE ALIGNED OVER THE CENTER OF INTERSECTION APPROACH LANES. APPROXIMATE LOCATIONS ARE AS SHOWN IN THE TRAFFIC SIGNAL POLE DATA TABLE. CONTRACTOR SHALL FIELD VERIFY SIGNAL HEAD LOCATIONS.

WIRING LEGEND

▷	SIGNAL NUMBER
②	POLE NUMBER
[2]	HANDHOLE NUMBER
42	EXISTING DETECTOR NUMBER
82	PROPOSED DETECTOR NUMBER
COND	CONDUIT
PWR	POWER CABLE
LUM	LUMINAIRE (lc #8)
PB	PEDESTRIAN PUSHBUTTON (2c)
EVP	EMERGENCY VEHICLE PREEMPTION
VID	VIDEO CABLE(S)
FO	FIBER OPTIC CABLE
GND	GROUND WIRE (lc #6)
TR	TRACER WIRE (lc #10)
PT	PULL TAPE



POLE AND HANDHOLE LOCATIONS

POLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					TYPE 1
2					TYPE 3/4
3					TYPE 1
4					
HANDHOLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					
2					
3					
4					
CABINET					SIDE OF POLE MOUNTED

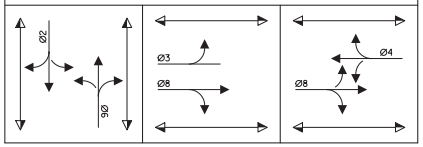
FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	FLOYD COUNTY	PROJECT NUMBER NHSN-018-6(103)--2R-34	SHEET NUMBER N.4

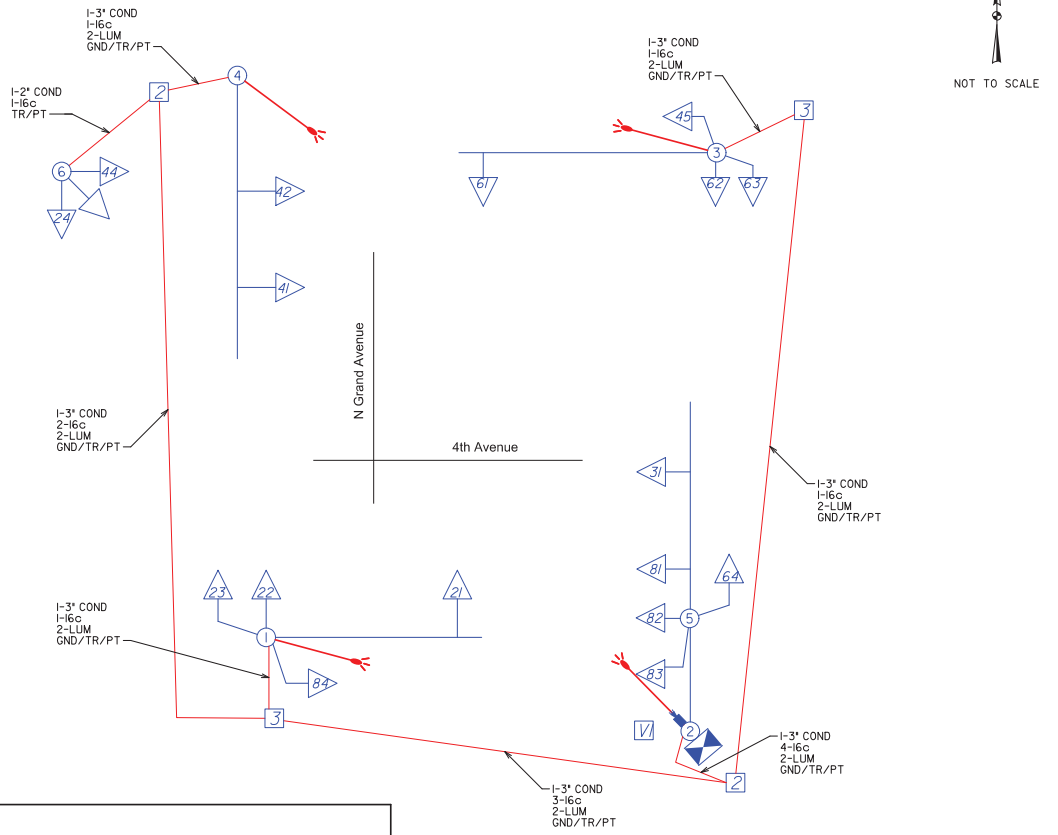
7:58:09 AM 5/14/2020 mbeerends c:\pw_work\pwmain\michael.beerends2\d1024372\SHT_34018103Z02_N04.dgn

DETECTOR SUMMARY

CAMERA NUMBER	DETECTION ZONE	ZONE LIMITS (DISTANCE FROM STOP LINE)	PHASE CALLED	PHASE EXTENDED	COMMENTS
VI	2I	0-40'	2	2	
VI	3I	0-40'	3	3/8	
VI	4I	0-40'	4	4	
VI	42	0-40'	4	4	
VI	6I	0-40'	6	6	
VI	8I	0-40'	8	8	
2A, 2B					PED PUSHBUTTON
4A, 4B					PED PUSHBUTTON
6A, 6B					PED PUSHBUTTON
8A, 8B					PED PUSHBUTTON

TRAFFIC PHASING AND COLOR SEQUENCE





NOTES:

ZONE LIMITS ARE FOR DETECTION LIMITS ONLY. ACTUAL DETECTION ARAEAS FOR EACH ZONE WILL BE DETERMINED IN THE FIELD.

TRAFFIC SIGNAL POLE DATA

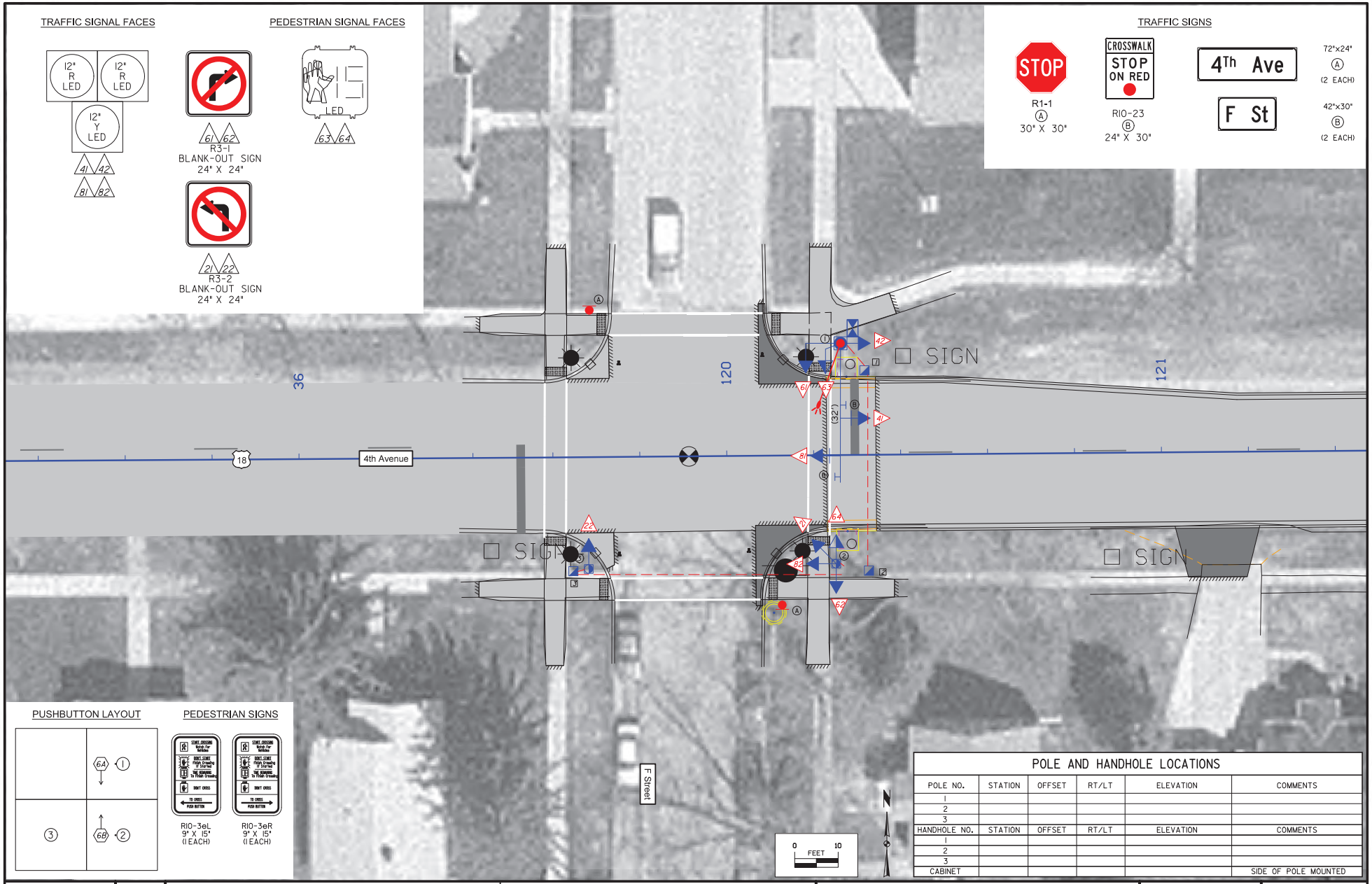
POLE NO.	POLE TYPE	MAST ARM LENGTH/ PEDESTAL HEIGHT (ft.)	TRAFFIC SIGNAL HEADS		FUTURE TRAFFIC SIGNAL HEADS		TRAFFIC SIGNS		FUTURE TRAFFIC SIGNS		LUMINAIRE ARM			FOOTING DIMENSIONS		MISCELLANEOUS	TOTAL QUANTITY
			QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	SPREAD (ft.)	MOUNTING HEIGHT (ft.)	ORIENTATION (degrees)	DIA. (ft.)	DEPTH (ft.)		
1	COMBINATION SIGNAL/LIGHTING	28	1	27			1	18			8	25	0	3	12		1
2	COMBINATION SIGNAL/LIGHTING	45	3	39,27,10	2	45,32	1	24			8	25	0	3	14		1
3	COMBINATION SIGNAL/LIGHTING	34	1	32			1	17			8	25	0	3	12		1
4	COMBINATION SIGNAL/LIGHTING	53	2	47,35	2	53, 40	1	26			8	25	0	3	16		1

NOTES:

1. LOCATION REPRESENTS APPROXIMATE LINEAR DISTANCE FROM POLE MEASURED OUTWARD TO END OF ARM.
2. ORIENTATION OF LUMINAIRE ARM REPRESENTS A COUNTERCLOCKWISE ANGLE MEASURED FROM THE CENTERLINE OF THE MAST ARM.
3. POLES SHALL BE DESIGNED AS PER FUTURE TRAFFIC SIGNAL HEADS AND FUTURE TRAFFIC SIGNS FOUND ON TRAFFIC SIGNAL POLE DATA TABLE.
4. UNLESS OTHERWISE DIRECTED, TRAFFIC SIGNAL HEADS ON MAST ARMS ARE TO BE ALIGNED OVER THE CENTER OF INTERSECTION APPROACH LANES. APPROXIMATE LOCATIONS ARE AS SHOWN IN THE TRAFFIC SIGNAL POLE DATA TABLE. CONTRACTOR SHALL FIELD VERIFY SIGNAL HEAD LOCATIONS.

WIRING LEGEND

▷	SIGNAL NUMBER
(2)	POLE NUMBER
[2]	HANDHOLE NUMBER
42	EXISTING DETECTOR NUMBER
42	PROPOSED DETECTOR NUMBER
COND	CONDUIT
PWR	POWER CABLE
LUM	LUMINAIRE (lc #8)
PB	PEDESTRIAN PUSHBUTTON (2c)
EVP	EMERGENCY VEHICLE PREEMPTION
VID	VIDEO CABLE(S)
FO	FIBER OPTIC CABLE
GND	GROUND WIRE (lc #6)
TR	TRACER WIRE (lc #10)
PT	PULL TAPE

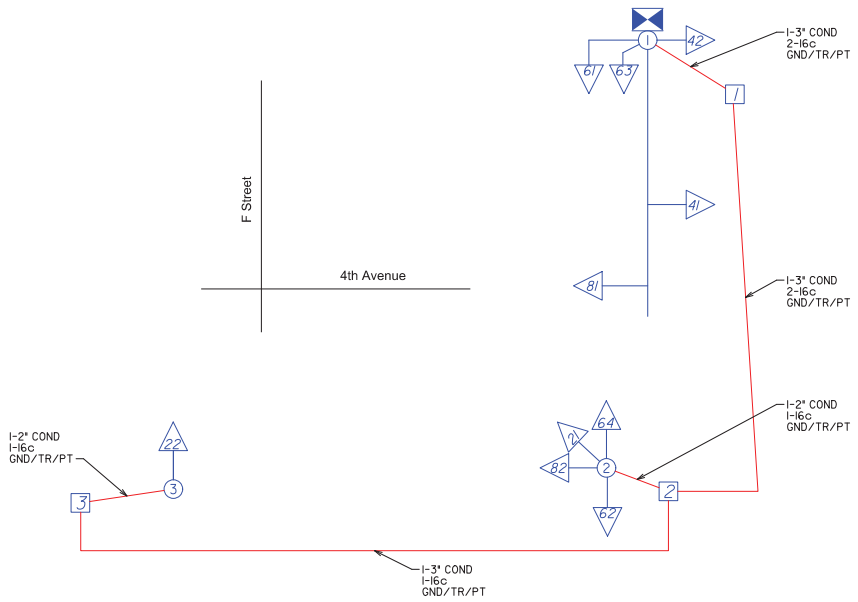


POLE AND HANDHOLE LOCATIONS

POLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					
2					
3					
HANDHOLE NO.	STATION	OFFSET	RT/LT	ELEVATION	COMMENTS
1					
2					
3					
CABINET					SIDE OF POLE MOUNTED

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	FLOYD COUNTY	PROJECT NUMBER NHSN-018-6(103)--2R-34	SHEET NUMBER N.6

7:52:47 AM 5/14/2020 mbeerends c:\pw_work\pwmain\michael.beerends2\d1024372\SHT_34018103Z02_N06.dgn



TRAFFIC SIGNAL POLE DATA

POLE NO.	POLE TYPE	MAST ARM LENGTH/ PEDESTAL HEIGHT (ft.)	TRAFFIC SIGNAL HEADS		FUTURE TRAFFIC SIGNAL HEADS		TRAFFIC SIGNS		FUTURE TRAFFIC SIGNS		LUMINAIRE ARM			FOOTING DIMENSIONS		MISCELLANEOUS	TOTAL QUANTITY
			QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	QTY.	LOCATION ON ARM (ft.)	SPREAD (ft.)	MOUNTING HEIGHT (ft.)	ORIENTATION (degrees)	DIA. (ft.)	DEPTH (ft.)		
1	COMBINATION SIGNAL/LIGHTING	32'	2	26,17			2	31,14						3	12		1
2	COMBINATION DUAL SIGNAL/LIGHTING	12'												2	3		1
3	PEDESTAL	12'												2	3		1

NOTES:

1. LOCATION REPRESENTS APPROXIMATE LINEAR DISTANCE FROM POLE MEASURED OUTWARD TO END OF ARM.
2. ORIENTATION OF LUMINAIRE ARM REPRESENTS A COUNTERCLOCKWISE ANGLE MEASURED FROM THE CENTERLINE OF THE MAST ARM.
3. POLES SHALL BE DESIGNED AS PER FUTURE TRAFFIC SIGNAL HEADS AND FUTURE TRAFFIC SIGNS FOUND ON TRAFFIC SIGNAL POLE DATA TABLE.
4. UNLESS OTHERWISE DIRECTED, TRAFFIC SIGNAL HEADS ON MAST ARMS ARE TO BE ALIGNED OVER THE CENTER OF INTERSECTION APPROACH LANES. APPROXIMATE LOCATIONS ARE AS SHOWN IN THE TRAFFIC SIGNAL POLE DATA TABLE. CONTRACTOR SHALL FIELD VERIFY SIGNAL HEAD LOCATIONS.

WIRING LEGEND

▷	SIGNAL NUMBER
②	POLE NUMBER
[2]	HANDHOLE NUMBER
42	EXISTING DETECTOR NUMBER
82	PROPOSED DETECTOR NUMBER
COND	CONDUIT
PWR	POWER CABLE
LUM	LUMINAIRE (lc #8)
PB	PEDESTRIAN PUSHBUTTON (2c)
EVP	EMERGENCY VEHICLE PREEMPTION
VID	VIDEO CABLE(S)
FO	FIBER OPTIC CABLE
GND	GROUND WIRE (lc #6)
TR	TRACER WIRE (lc #10)
PT	PULL TAPE

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION **DATE:** August 4, 2020

Location / Title of Project Grimes / IA 44 & IA 141 SB RAMPS TRAFFIC SIGNAL IMPROVEMENT PROJECT

Applicant City of Grimes

Contact Person Matt Ahrens Title City Engineer

Complete Mailing Address Grimes City Hall, 101 NE Harvey Street,
Grimes, Iowa 50111

Phone 515-986-4050 (Area Code) E-Mail mahrens@grimesiowa.gov

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:

Funding Amount

Total Safety Cost	$ 126,619
Total Project Cost	$ 379,536
Safety Funds Requested	$ 126,619

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain _____

☒ No

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Grimes

Signed: Matt Ahrens 8-13-20
Signature Date Signed

Matt Ahrens
Printed Name

Attest: Evann Martin 8-13-20
Signature Date Signed

Evann Martin
Printed Name

A

RESOLUTION NO. 08-0820

A RESOLUTION AUTHORIZING THE CITY OF GRIMES, IOWA, TO SUBMIT AN IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION FOR PARTIAL FUNDING OF THE SB IOWA HWY 141 RAMPS & E 1st STREET (IOWA HWY 44) TRAFFIC SIGNALIZATION PROJECT

WHEREAS, the City of Grimes, Iowa, recognizes the need for traffic capacity and safety improvements at the Southbound Iowa Highway 141 Ramps & East 1st Street (Iowa Highway 44) intersection; and

WHEREAS, the proposed improvements to the intersection of Southbound Iowa Highway 141 Ramps & East 1st Street (Iowa Highway 44) includes the addition of traffic signalization and the addition of a southbound right turn lane to improve traffic operations;

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

1. The Grimes City Council supports and approves the attached application for Iowa DOT Traffic Safety Improvement Program funding.

2. The Grimes City Council hereby commits to the City matching monies as required by the Traffic Safety Improvement Program.

3. The Grimes City Council hereby commits to accepting and maintaining these improvements.

4. The Mayor is hereby authorized to execute the application on behalf of the City.

PASSED AND APPROVED this 11 day of August, 2020.

CITY OF GRIMES, IOWA

By: _____
Scott Mikkelsen, Mayor

Attest:

_____
Rochelle Williams, City Clerk

NARRATIVE

Existing Conditions

The project includes intersection improvements for the interchange ramp intersection of IA 44 (E 1st Street) with the IA 141 SB Ramps (NE Grimes Boulevard).

IA 44 (E 1st Street) is a four-lane divided arterial with a raised median and posted speed limit of 35 mph. The westbound approach (east leg) has a 150 ft left turn lane for traffic turning from IA 44 to the southbound entrance ramp to IA 141. A pedestrian/bicycle trail was constructed along the north side of IA 44 from the S Gateway Dr intersection to the IA 141 NB Ramps in 2019, connecting existing facilities.

IA 141 (NE Grimes Boulevard) is a four lane, divided expressway that has a grade separated interchange with IA 44 in Grimes. The interchange is a diamond configuration, with an existing traffic signal at the northbound ramps, and stop control at the southbound ramps being improved as described below.

Refer to the *2020 IA 44 & IA 141 SB RAMPS TRAFFIC SIGNAL WARRANT ANALYSIS* for additional detail on existing conditions of the study area.

Traffic Data

The 2016 Average Daily Traffic collected by Iowa DOT for IA 44 is 16,000 west of the study intersection and was 19,800 for IA 141 north of the study intersection. Per 2019 traffic counts collected by Snyder & Associates, southbound ramp traffic is relatively split for east and west turn movements, with more southbound-to-westbound right turns in the AM peak hour. IA 44 has a distinct commuting pattern with predominant eastbound traffic in the AM split between through and right turning traffic, while the PM peak hour is predominantly westbound through.

In addition, development plans under consideration by the City indicate continued growth in the immediately surrounding area, which will likely result in an increase in traffic on IA 44 and southbound IA 141.

Crash History

Crash history was reviewed for the ramp intersection for 2015-2019. Over this five-year period, seven crashes were reported at the IA 44 & IA 141 SB Ramps intersection. Of these seven crashes, six were severity ‘property damage only’, one was severity ‘minor injury’. Three crashes were broadside, two sideswipe – same direction, one single-vehicle non-collision, and one ‘other’. Five of the crashes involved crashes between southbound and westbound vehicles with major causes of failure to yield right of way by southbound drivers turning left or right, and by ran off road.

The peak hour capacity analysis conducted as part of the 2020 study of IA 44 & IA 141 SB Ramps traffic signal warrant analysis shows long delays under current conditions, which will continue with traffic growth. This may lead to drivers selecting inadequate gaps in traffic resulting in crashes. A traffic signal is expected to reduce these broadside crashes resulting from traffic from the ramp approach turning onto IA44.

Traffic Signal Warrant Analysis

Traffic signal warrant criteria for the intersection of IA 44 & IA 141 SB Ramps were evaluated in the 2020 study by Snyder & Associates mentioned earlier. The primary signal warrants relevant to this location were Warrant 1 (eight-hour vehicular volume), Warrant 2 (four-hour vehicular volume), Warrant 3 (peak hour vehicular volume), and Warrant 7 (crash experience). Warrant 1, Warrant 2, and Warrant 3 criteria were satisfied with current traffic and existing conditions. A second analysis with additional southbound right turn lane was conducted with warrants 1, 2 and 3 being warranted. A third analysis scenario was performed based on reductions in right turning traffic, specifically at the southbound IA 141 approach, to account for potential 'right turn on red' movements, the Warrant 1B (eight hour) criteria was satisfied for existing traffic.

Proposed Improvements

To address the existing congestion and safety concerns, future traffic growth at the intersection, and to improve the trail crossing on the north side of the intersection, the proposed improvements are planned to include:

1. Construction of a 370 ft. southbound right turn lane on the IA 141 SB ramp.
2. Installation of a traffic signal at the intersection of IA 44 (E 1st Street) with the IA 141 SB Ramps (NE Grimes Boulevard).
    a) Flexibility for protective or permissive phasing for westbound left turning traffic.
    b) Coordination between the IA 141 SB Ramps intersection and traffic signals to the east and west utilizing the existing fiber optic interconnection along the corridor.
    c) Pedestrian traffic signals and pushbutton detection to accommodate the existing trail along the north side of IA 44.

EXHIBIT C - ITEMIZED BREAKDOWN OF COST

The following cost opinion was developed for the IA 44 & IA 141 SB RAMPS TRAFFIC SIGNAL IMPROVEMENT PROJECT. For purposes of this application, we have identified safety-related work items for this project as materials for traffic signal improvements.

These improvements are listed as line items in the following cost opinion spreadsheets.

The anticipated funding sources for the project include:

Source	Funding Amount
TSIP Funding (requested)	$ 126,619
City of Grimes (RUT / GO)	$ 252,917
TOTAL Project Cost	$ 379,536

OPINION OF PROBABLE COST - CHECK PLAN

IA HWY 141 SB RAMPS & IA 44 TRAFFIC SIGNAL PROJECT

GRIMES, IA
120.0457.01

ITEM #	ITEM CODE	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENDED PRICE	COMMENTS
		EARTHWORK					
2.01	2010-108-D-3	Topsoil, Strip, Salvage and Respreaad, 6 Inch Depth	355	CY	$ 15.00	$ 5,325.00	
2.02	2010-108-E-0	Excavation, Class 10	637	CY	$ 12.00	$ 7,644.00	
2.03	2010-108-F-0	Below Grade Excavation (Core Out)	20	CY	$ 50.00	$ 1,000.00	
2.04	8010-108-G-0	Subgrade Preparation, 12"	610	SY	$ 8.00	$ 4,880.00	
2.05	2010-108-I-0	Subbase, Special Backfill, 6" Depth	498	SY	$ 18.00	$ 8,964.00	
2.06	2010-108-L-0	Compaction Testing	1	LS	$ 2,000.00	$ 2,000.00	
		SEWERS AND DRAINS					
4.01	4010-108-A-1	Pipe Culvert, Trenched, RCP, 48" Dia, 2000D	10	LF	$ 175.00	$ 1,750.00	
4.02	4010-108-B,C,D	Pipe Apron, Remove and Reinstall with Footing and Guard, 48" Dia	1	EA	$ 5,000.00	$ 5,000.00	
		STREETS AND RELATED WORK					
7.01	7010-108-A-0	PCC Pavement, 9"	441	SY	$ 70.00	$ 30,870.00	9' wide with thickened edge,
7.02	7010-108-I-0	PCC Pavement Samples and Testing	1	LS	$ 2,000.00	$ 2,000.00	DOT Spec with Plant Monitoring
7.03	7030-108-A-0	Removal of Sidewalk, PCC	74	SY	$ 12.00	$ 888.00	
7.04	7030-108-C-0	Shared Use Path, 6"	73	SY	$ 60.00	$ 4,380.00	
7.05	7030-108-D-0	Special Subgrade Preparation for Shared Use Path	73	SY	$ 12.00	$ 876.00	
7.06	7030-108-G-0	Detectable Warnings	51	SF	$ 55.00	$ 2,805.00	
7.07	7040-108-H-0	Pavement Removal	55	SY	$ 125.00	$ 6,875.00	Narrow strip of HMA along slab edge
		TRAFFIC CONTROL					
8.01	8010-108-A-0	Traffic Signal	1	LS	$ 200,000.00	$ 200,000.00	
8.02	8020-108-D-0	Pavement Markings, Durable	17.2	STA	$ 130.00	$ 2,236.00	
8.03	8020-108-F-0	Wet, Retroflective Removable Tape Markings	5.0	STA	$ 150.00	$ 750.00	
8.04	8020-108-K-0	Pavement Markings, Removed	10.6	STA	$ 250.00	$ 2,650.00	
8.05	8020-108-M-0	Grooves Cut for Pavement Markings	17.2	STA	$ 150.00	$ 2,580.00	
8.06	8030-108-A-0	Temporary Traffic Control	1	LS	$ 5,000.00	$ 5,000.00	
8.07	SPECIAL	Portable Dynamic Message Signs	10	CDAY	$ 250.00	$ 2,500.00	
8.08	SPECIAL	Temporary Barrier Rail	188	LF	$ 30.00	$ 5,640.00	
		SITE WORK AND LANDSCAPING					
9.01	9010-108-B-0	Seeding, Fertilizing, and BFM Mulch for Hydraulic Seeding, Permanent, Type 3	0.5	AC	$ 5,000.00	$ 2,500.00	
9.02	9040-108-E-0	Temporary RECP, Type 2.C	547	SY	$ 15.00	$ 8,205.00	
9.03	9040-108-N-1	Silt Fence and Silt Fence Ditch Check, Installation	729	LF	$ 3.00	$ 2,187.00	
9.04	9040-108-N-3	Silt Fence and Silt Fence Ditch Check, Removal of Device	729	LF	$ 1.00	$ 729.00	
		MISCELLANEOUS					
11.01	0000-00000000	Mobilization	1	LS	$ 16,000.00	$ 16,000.00	
					Subtotal:	$ 336,234	
					Contingency (5%):	$ 16,800	
					CONSTRUCTION TOTAL:	$ 353,034	
					Other Project Costs		
					Construction Services including Survey:	$ 26,500.00	Estimated
					TOTAL PROJECT COST:	**$ 379,536**	

Notes

(1) Construction Spring 2021

(2) Assumes local letting, no Davis-Bacon or Buy America contract provisions.

(3) Assumes construction survey is included as a Professional Service.

OPINION OF PROBABLE PROJECT COSTS

SNYDER & ASSOCIATES

TRAFFIC SIGNAL COST ESTIMATE
IOWA DOT TSIP APPLICATION- IA 44 & IA 141 SB RAMPS
CITY OF GRIMES, IA
PROJECT NO.: 120.0457.01

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL EXTENSION	ESTIMATED MATERIALS (2/3)	ESTIMATED LABOR (1/3)
1	8-PHASE ATC CONTROLLER, CABINET, LOW VOLAGE, 12" RISER, AND ACCESSORIES	LS	1	$35,000.00	35,000.00	23,333.33	11,666.67
2	UNINTERRUPTABLE POWER SUPPLY (BATTERY BACK-UP)	LS	1	$10,000.00	10,000.00	6,666.67	3,333.33
3	ETHERNET SWITCH	EACH	1	$1,250.00	1,250.00	833.33	416.67
4	VIDEO DETECTION SYSTEM	LS	1	$30,000.00	30,000.00	20,000.00	10,000.00
5	PEDESTRIAN PUSHBUTTON WITH SIGN	EACH	2	$500.00	1,000.00	666.67	333.33
6	12" <R,<Y,<FY,<G (ALL LED) W/ BACKPLATE, MAST-ARM MOUNTED	EACH	1	$1,250.00	1,250.00	833.33	416.67
7	12" R,Y,G (ALL LED) W/ BACKPLATE, MAST-ARM MOUNTED	EACH	6	$1,000.00	6,000.00	4,000.00	2,000.00
8	12" R,Y,G, (ALL LED), SIDE-OF-POLE MOUNTED	EACH	4	$1,000.00	4,000.00	2,666.67	1,333.33
9	16" CD HAND/WALKING PERSON, 1-SECTION, SOP	EACH	2	$1,100.00	2,200.00	1,466.67	733.33
10	POWER SUPPLY	EACH	1	$1,250.00	1,250.00	833.33	416.67
11	TYPE I - PRE-CAST CONCRETE HANDHOLE, 24" DIAMETER	EACH	2	$900.00	1,800.00	1,200.00	600.00
12	TYPE IV - 30" x 48" PRE-CAST POLYMER-CONCRETE HANDHOLE	EACH	1	$1,500.00	1,500.00	1,000.00	500.00
13	SIGNAL CABLE - 16c #14 AWG	LIN FT	470	$3.25	1,527.50	1,018.33	509.17
14	SIGNAL CABLE - 5c #14 AWG	LIN FT	850	$1.75	1,487.50	991.67	495.83
15	SIGNAL CABLE - 2c #14 AWG	LIN FT	460	$1.25	575.00	383.33	191.67
16	VIDEO DETECTION CABLE(S)	LIN FT	230	$2.50	575.00	383.33	191.67
17	FIBER OPTIC CABLE - SINGLE MODE - 12-CT	LIN FT	270	$2.50	675.00	450.00	225.00
18	LUMINAIRE CABLE - 1c #8 AWG	LIN FT	810	$1.60	1,296.00	864.00	432.00
19	LUMINAIRE CABLE - 1c #10 AWG	LIN FT	540	$1.25	675.00	450.00	225.00
20	POWER CABLE - 1c #6 AWG	LIN FT	240	$2.00	480.00	320.00	160.00
21	GROUND WIRE - 1c #6 BARE	LIN FT	560	$1.40	784.00	522.67	261.33
22	TRACER WIRE - 1c #10	LIN FT	610	$0.80	488.00	325.33	162.67
23	PULL TAPE	LIN FT	610	$0.50	305.00	203.33	101.67
24	2" PVC, TRENCHED/BORED	LIN FT	120	$25.00	3,000.00	2,000.00	1,000.00
25	3" PVC, TRENCHED/BORED	LIN FT	800	$35.00	28,000.00	18,666.67	9,333.33
26	CONTROLLER FOOTING	EACH	1	$1,750.00	1,750.00	1,166.67	583.33
27	POLE FOOTING, 3' DIA x 12' DEPTH	EACH	1	$3,000.00	3,000.00	2,000.00	1,000.00
28	POLE FOOTING, 3' DIA x 14' DEPTH	EACH	1	$3,500.00	3,500.00	2,333.33	1,166.67
29	POLE FOOTING, 3' DIA x 16' DEPTH	EACH	1	$4,000.00	4,000.00	2,666.67	1,333.33
30	POLE FOOTING, 2' DIA x 3' DEPTH	EACH	2	$900.00	1,800.00	1,200.00	600.00
31	STEEL COMBINATION SIGNAL/LIGHTING - 34' MAST ARM	EACH	1	$9,000.00	9,000.00	6,000.00	3,000.00
32	STEEL COMBINATION SIGNAL/LIGHTING - 44' MAST ARM	EACH	1	$10,000.00	10,000.00	6,666.67	3,333.33
33	STEEL COMBINATION SIGNAL/LIGHTING - 48' MAST ARM	EACH	1	$11,000.00	11,000.00	7,333.33	3,666.67
34	PEDESTAL POLE - 5' HEIGHT	EACH	1	$1,250.00	1,250.00	833.33	416.67
35	PEDESTAL POLE - 12' HEIGHT	EACH	1	$2,000.00	2,000.00	1,333.33	666.67
36	LUMINAIRE FIXTURE	EACH	3	$1,000.00	3,000.00	2,000.00	1,000.00
37	CONNECTOR - Y-1, FUSED	EACH	4	$65.00	260.00	173.33	86.67
38	CONNECTOR - L-1, FUSED	EACH	6	$65.00	390.00	260.00	130.00
39	STREETNAME SIGN - 36" x 18", MAST-ARM MOUNTED	EACH	1	$400.00	400.00	266.67	133.33
40	STREETNAME SIGN - 84" x 18", MAST-ARM MOUNTED	EACH	2	$550.00	1,100.00	733.33	366.67
41	TRAFFIC SIGN - R3-5L, 30" x 36", MAST-ARM MOUNTED	EACH	1	$400.00	400.00	266.67	133.33
42	TRAFFIC SIGN - R3-5R, 30" x 36", MAST-ARM MOUNTED	EACH	1	$400.00	400.00	266.67	133.33
43	EXISTING TRAFFIC SIGNAGE MODIFICATION	LS	1	$5,000.00	5,000.00	0.00	5,000.00
44	FIBER OPTIC TERMINATIONS, SINGLE MODE - ST CONNECTORS	EACH	24	$65.00	1,560.00	1,040.00	520.00
				TOTAL SIGNALIZATION ESTIMATE	194,928.00	126,618.67	68,309.33

TIME SCHEDULE

The following includes the anticipated project schedule:

TASK	COMPLETION DATE
Traffic Safety Improvement Program Funding Application	August 15, 2020
Design	Summer/Fall 2020
Letting	March 2021
Construction	Spring/Summer 2021

FILE PATH: V:\Projects\2019\119.1081.01\Design\Fig1_StudyArea.mxd
SOURCES: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

E

SNYDER & ASSOCIATES

N

0 500 1,000
Feet

Figure 1 - Study Area

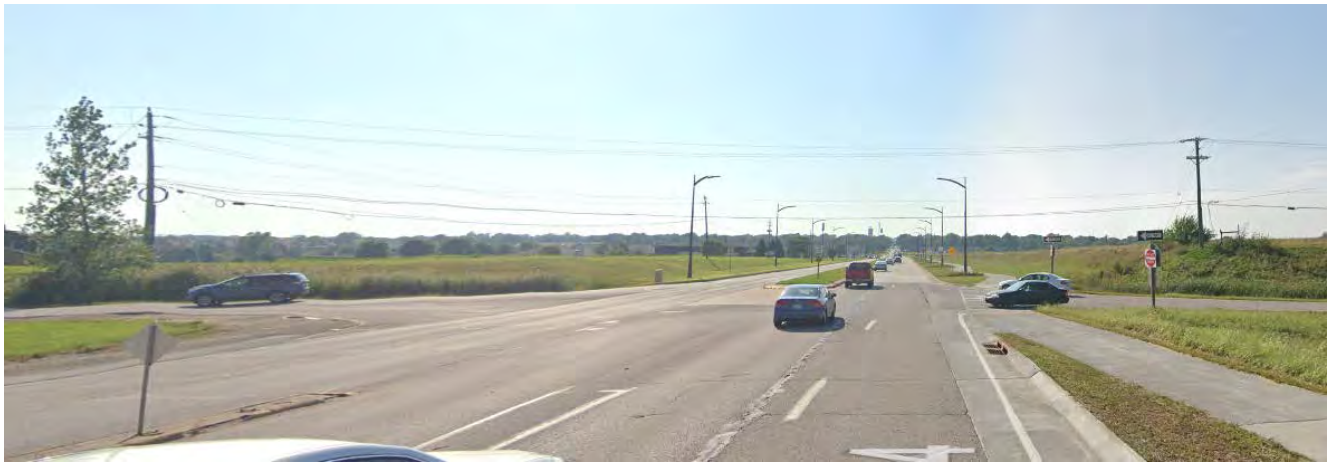
IA 44 & IA 141 SB Ramps Traffic Signal Warrant Analysis | Grimes, IA

Color Pictures: IA 44 & IA 141

Looking East

Source: Google, "Streetview", digital images, Google Maps (http://maps.google.com), Sep 2019

Looking West



Source: Google, "Streetview", digital images, Google Maps (http://maps.google.com), Sep 2019

Looking North

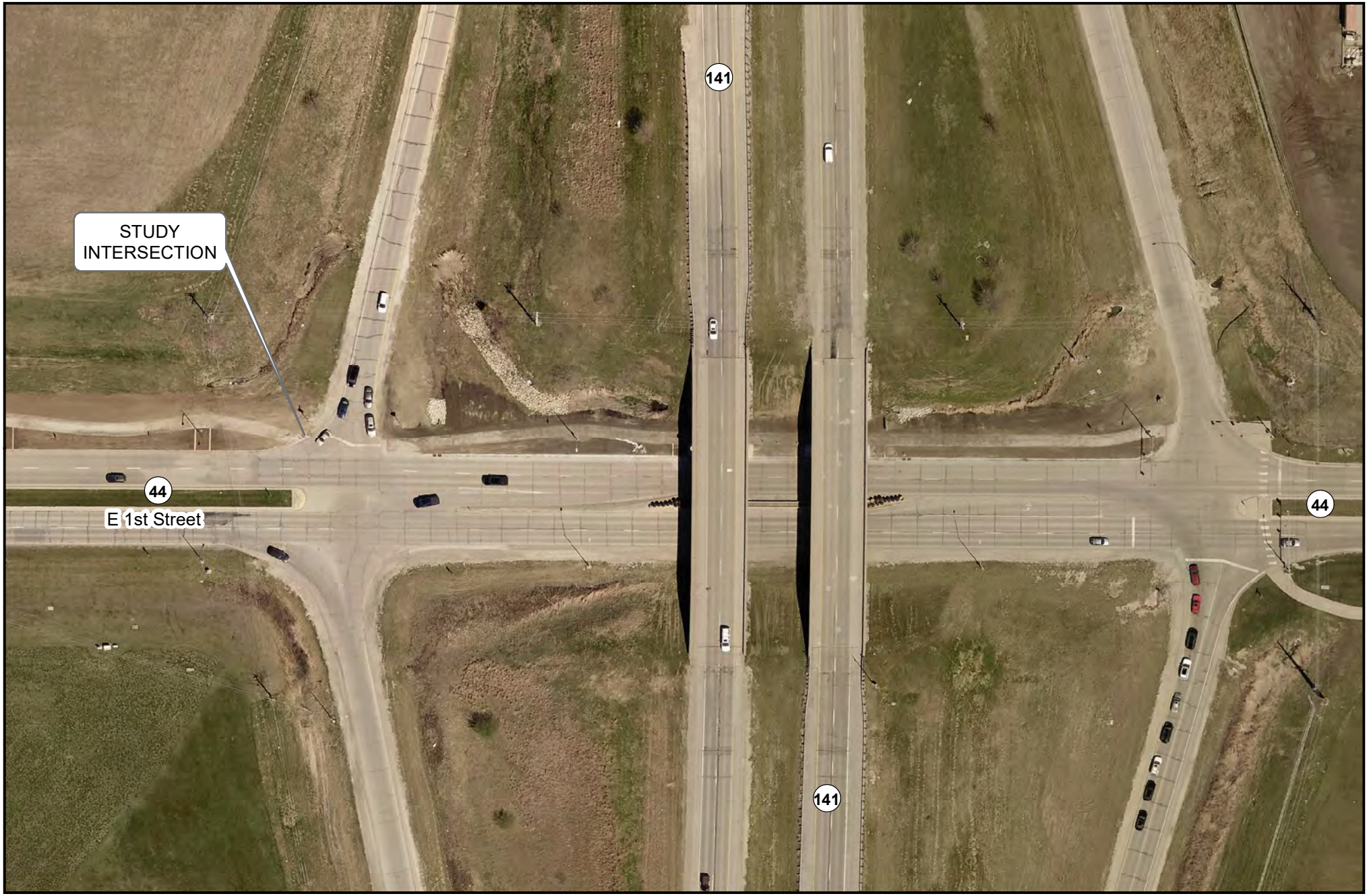
Source: Google, "Streetview", digital images, Google Maps (http://maps.google.com), Aug 2018

Looking South

Source: Google, "Streetview", digital images, Google Maps (http://maps.google.com), Sep 2019

FILE PATH: V:\Projects\2019\119.1081.01\Design\Fig2_StudyIntersection.mxd
SOURCES:

G



SNYDER & ASSOCIATES

N

0 50 100
Feet

Figure 2 - Study Intersection

IA 44 & IA 141 SB Ramps Traffic Signal Warrant Analysis | Grimes, IA

Turning Movement Count Summary

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	IA 141 SB					IA 44 WB					IA 141 NB					IA 44 EB					
Start Time	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00 AM	9	0	12	0	21	13	27	0	0	40	0	0	0	0	0	0	42	69	0	111	172
06:15 AM	14	0	9	0	23	14	30	0	0	44	0	0	0	0	0	0	56	82	0	138	205
06:30 AM	17	0	11	0	28	13	50	0	0	63	0	0	0	0	0	0	54	110	0	164	255
06:45 AM	16	0	15	2	33	10	74	0	0	84	0	0	0	0	0	0	86	104	0	190	307
Total	56	0	47	2	105	50	181	0	0	231	0	0	0	0	0	0	238	365	0	603	939
07:00 AM	17	0	23	0	40	24	63	0	0	87	0	0	0	0	0	0	81	98	0	179	306
07:15 AM	23	0	28	0	51	19	88	0	0	107	0	0	0	0	0	0	108	103	0	211	369
07:30 AM	14	0	41	0	55	25	112	0	0	137	0	0	0	0	0	0	98	82	0	180	372
07:45 AM	21	0	44	0	65	13	104	0	0	117	0	0	0	0	0	0	97	96	0	193	375
Total	75	0	136	0	211	81	367	0	0	448	0	0	0	0	0	0	384	379	0	763	1422
08:00 AM	17	0	27	0	44	19	66	0	0	85	0	0	0	0	0	0	74	99	0	173	302
08:15 AM	14	0	26	0	40	23	62	0	0	85	0	0	0	0	0	0	70	84	0	154	279
08:30 AM	17	0	24	0	41	16	57	0	0	73	0	0	0	0	0	0	74	60	0	134	248
08:45 AM	23	0	27	1	51	14	70	0	0	84	0	0	0	0	0	0	51	52	0	103	238
Total	71	0	104	1	176	72	255	0	0	327	0	0	0	0	0	0	269	295	0	564	1067
09:00 AM	17	0	21	0	38	23	64	0	0	87	0	0	0	0	0	0	43	61	0	104	229
09:15 AM	21	0	17	0	38	20	53	0	0	73	0	0	0	0	0	0	59	56	0	115	226
09:30 AM	15	0	13	0	28	17	71	0	0	88	0	0	0	0	0	0	55	51	0	106	222
09:45 AM	17	0	14	0	31	21	53	0	0	74	0	0	0	0	0	0	68	44	0	112	217
Total	70	0	65	0	135	81	241	0	0	322	0	0	0	0	0	0	225	212	0	437	894
10:00 AM	21	1	14	0	36	17	83	0	0	100	0	0	0	0	0	0	50	49	0	99	235
10:15 AM	16	0	11	0	27	17	61	0	0	78	0	0	0	0	0	0	56	61	0	117	222
10:30 AM	17	0	14	0	31	17	58	0	0	75	0	0	0	0	0	0	47	59	0	106	212
10:45 AM	15	2	18	0	35	22	85	0	0	107	0	0	0	0	0	0	68	53	0	121	263
Total	69	3	57	0	129	73	287	0	0	360	0	0	0	0	0	0	221	222	0	443	932
11:00 AM	15	0	21	0	36	20	79	0	0	99	0	0	0	0	0	0	67	45	0	112	247
11:15 AM	21	1	19	0	41	17	87	0	0	104	0	0	0	0	0	0	70	59	0	129	274
11:30 AM	20	0	18	0	38	17	99	0	0	116	0	0	0	0	0	0	74	40	0	114	268
11:45 AM	18	0	27	0	45	18	78	0	0	96	0	0	0	0	0	0	76	59	0	135	276
Total	74	1	85	0	160	72	343	0	0	415	0	0	0	0	0	0	287	203	0	490	1065
12:00 PM	21	1	17	0	39	28	91	0	0	119	0	0	0	0	0	0	78	43	0	121	279
12:15 PM	17	0	13	1	31	18	92	0	0	110	0	0	0	0	0	0	77	42	0	119	260
12:30 PM	19	1	19	1	40	33	80	0	0	113	0	0	0	0	0	0	82	54	0	136	289
12:45 PM	16	0	17	0	33	22	88	0	0	110	0	0	0	0	0	0	69	44	0	113	256
Total	73	2	66	2	143	101	351	0	0	452	0	0	0	0	0	0	306	183	0	489	1084
01:00 PM	26	0	27	0	53	20	98	0	0	118	0	0	0	0	0	0	72	56	0	128	299
01:15 PM	20	0	19	0	39	26	89	0	0	115	0	0	0	0	0	0	66	65	0	131	285
01:30 PM	17	0	9	1	27	12	100	0	0	112	0	0	0	0	0	0	80	52	0	132	271
01:45 PM	27	0	16	0	43	18	102	0	0	120	0	0	0	0	0	0	66	53	0	119	282
Total	90	0	71	1	162	76	389	0	0	465	0	0	0	0	0	0	284	226	0	510	1137
02:00 PM	19	0	16	0	35	19	84	0	0	103	0	0	0	1	1	0	57	41	0	98	237
02:15 PM	15	0	18	0	33	24	99	0	0	123	0	0	0	0	0	0	73	51	0	124	280
02:30 PM	13	0	28	0	41	22	107	0	0	129	0	0	0	0	0	0	55	51	0	106	276
02:45 PM	22	1	22	0	45	10	111	0	0	121	0	0	0	0	0	0	73	49	0	122	288
Total	69	1	84	0	154	75	401	0	0	476	0	0	0	1	1	0	258	192	0	450	1081
03:00 PM	13	0	18	0	31	22	133	0	0	155	0	0	0	0	0	0	75	64	0	139	325
03:15 PM	18	1	16	0	35	11	126	0	0	137	0	0	0	0	0	0	87	47	0	134	306
03:30 PM	18	0	18	0	36	23	142	0	0	165	0	0	0	0	0	0	89	75	0	164	365
03:45 PM	19	2	28	1	50	23	175	0	0	198	0	0	0	0	0	0	100	71	0	171	419
Total	68	3	80	1	152	79	576	0	0	655	0	0	0	0	0	0	351	257	0	608	1415

Turning Movement Count Summary

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019

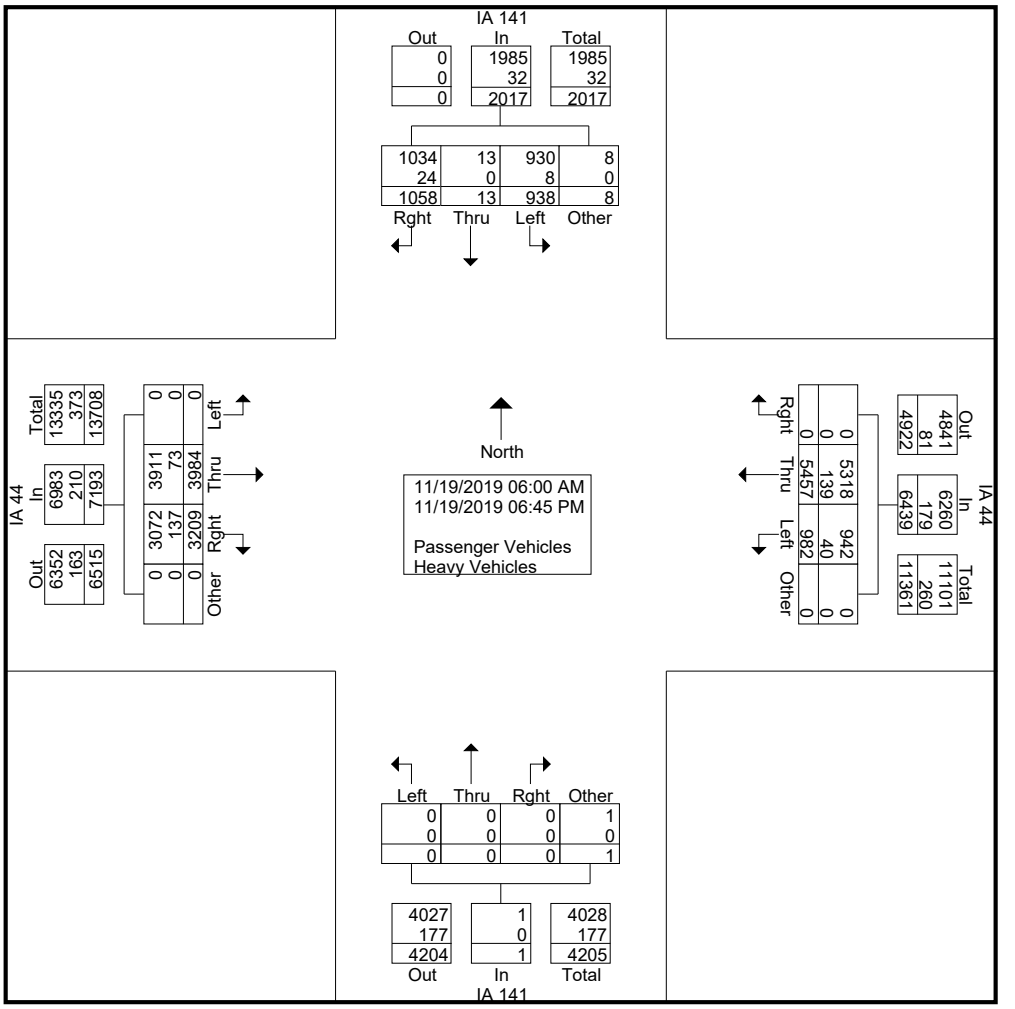
Groups Printed- Passenger Vehicles - Heavy Vehicles

	IA 141 SB					IA 44 WB					IA 141 NB					IA 44 EB					
Start Time	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	21	0	22	1	44	18	183	0	0	201	0	0	0	0	0	0	110	70	0	180	425
04:15 PM	20	0	32	0	52	20	190	0	0	210	0	0	0	0	0	0	100	58	0	158	420
04:30 PM	18	1	27	0	46	18	208	0	0	226	0	0	0	0	0	0	106	72	0	178	450
04:45 PM	22	0	26	0	48	20	188	0	0	208	0	0	0	0	0	0	136	48	0	184	440
Total	81	1	107	1	190	76	769	0	0	845	0	0	0	0	0	0	452	248	0	700	1735
05:00 PM	17	0	20	0	37	23	231	0	0	254	0	0	0	0	0	0	110	78	0	188	479
05:15 PM	21	1	23	0	45	21	205	0	0	226	0	0	0	0	0	0	101	69	0	170	441
05:30 PM	18	0	24	0	42	19	175	0	0	194	0	0	0	0	0	0	128	64	0	192	428
05:45 PM	20	1	25	0	46	20	157	0	0	177	0	0	0	0	0	0	101	68	0	169	392
Total	76	2	92	0	170	83	768	0	0	851	0	0	0	0	0	0	440	279	0	719	1740
06:00 PM	20	0	17	0	37	19	133	0	0	152	0	0	0	0	0	0	84	51	0	135	324
06:15 PM	18	0	18	0	36	14	137	0	0	151	0	0	0	0	0	0	67	40	0	107	294
06:30 PM	12	0	20	0	32	14	148	0	0	162	0	0	0	0	0	0	69	29	0	98	292
06:45 PM	16	0	9	0	25	16	111	0	0	127	0	0	0	0	0	0	49	28	0	77	229
Total	66	0	64	0	130	63	529	0	0	592	0	0	0	0	0	0	269	148	0	417	1139
Grand Total	938	13	1058	8	2017	982	5457	0	0	6439	0	0	0	1	1	0	3984	3209	0	7193	15650
Apprch %	46.5	0.6	52.5	0.4		15.3	84.7	0	0		0	0	0	100		0	55.4	44.6	0		
Total %	6	0.1	6.8	0.1	12.9	6.3	34.9	0	0	41.1	0	0	0	0	0	0	25.5	20.5	0	46	
Passenger Vehicles	930	13	1034	8	1985	942	5318	0	0	6260	0	0	0	1	1	0	3911	3072	0	6983	15229
% Passenger Vehicles	99.1	100	97.7	100	98.4	95.9	97.5	0	0	97.2	0	0	0	100	100	0	98.2	95.7	0	97.1	97.3
Heavy Vehicles	8	0	24	0	32	40	139	0	0	179	0	0	0	0	0	0	73	137	0	210	421
% Heavy Vehicles	0.9	0	2.3	0	1.6	4.1	2.5	0	0	2.8	0	0	0	0	0	0	1.8	4.3	0	2.9	2.7

Turning Movement Count Summary

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019
Page No : 3

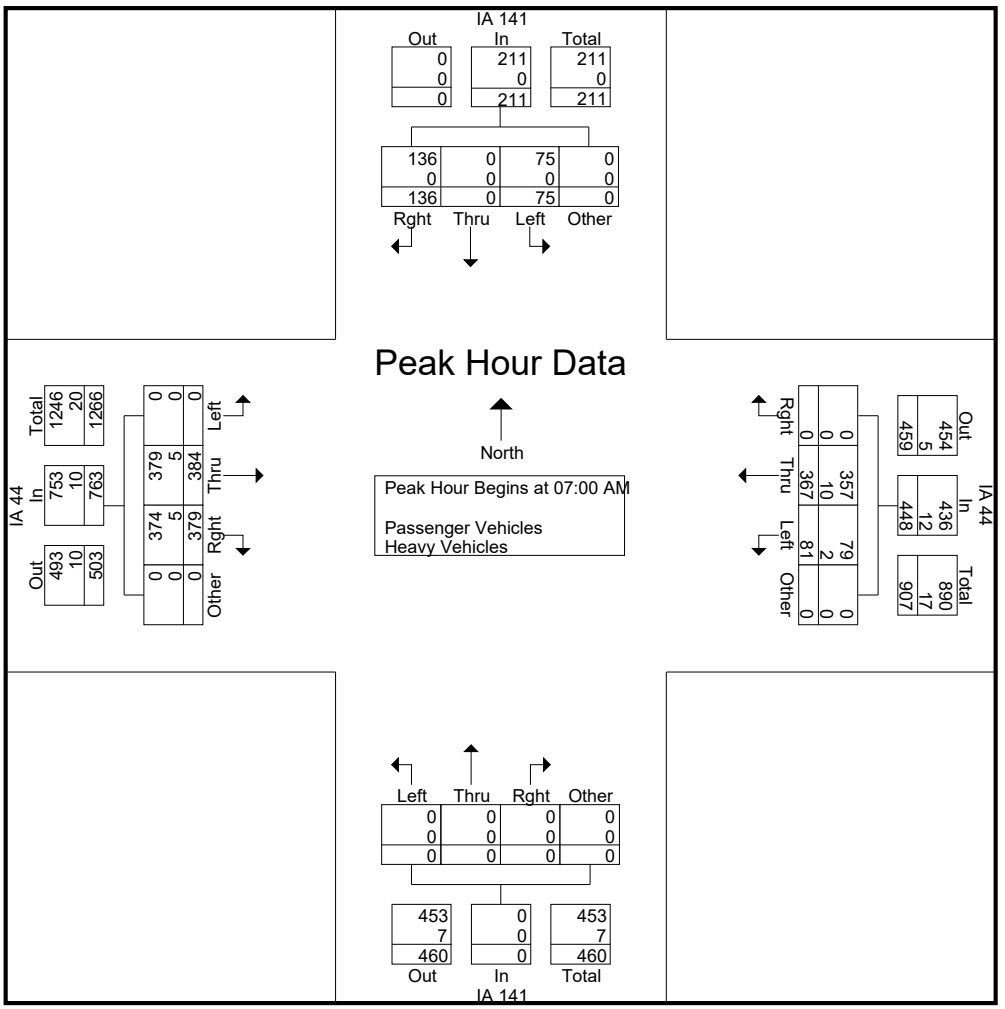


Turning Movement Count Summary

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019
Page No : 4

	IA 141 SB					IA 44 WB					IA 141 NB					IA 44 EB					
Start Time	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	17	0	23	0	40	24	63	0	0	87	0	0	0	0	0	0	81	98	0	179	306
07:15 AM	23	0	28	0	51	19	88	0	0	107	0	0	0	0	0	0	108	103	0	211	369
07:30 AM	14	0	41	0	55	25	112	0	0	137	0	0	0	0	0	0	98	82	0	180	372
07:45 AM	21	0	44	0	65	13	104	0	0	117	0	0	0	0	0	0	97	96	0	193	375
Total Volume	75	0	136	0	211	81	367	0	0	448	0	0	0	0	0	0	384	379	0	763	1422
% App. Total	35.5	0	64.5	0		18.1	81.9	0	0		0	0	0	0		0	50.3	49.7	0		
PHF	.815	.000	.773	.000	.812	.810	.819	.000	.000	.818	.000	.000	.000	.000	.000	.000	.889	.920	.000	.904	.948
Passenger Vehicles	75	0	136	0	211	79	357	0	0	436	0	0	0	0	0	0	379	374	0	753	1400
% Passenger Vehicles	100	0	100	0	100	97.5	97.3	0	0	97.3	0	0	0	0	0	0	98.7	98.7	0	98.7	98.5
Heavy Vehicles	0	0	0	0	0	2	10	0	0	12	0	0	0	0	0	0	5	5	0	10	22
% Heavy Vehicles	0	0	0	0	0	2.5	2.7	0	0	2.7	0	0	0	0	0	0	1.3	1.3	0	1.3	1.5



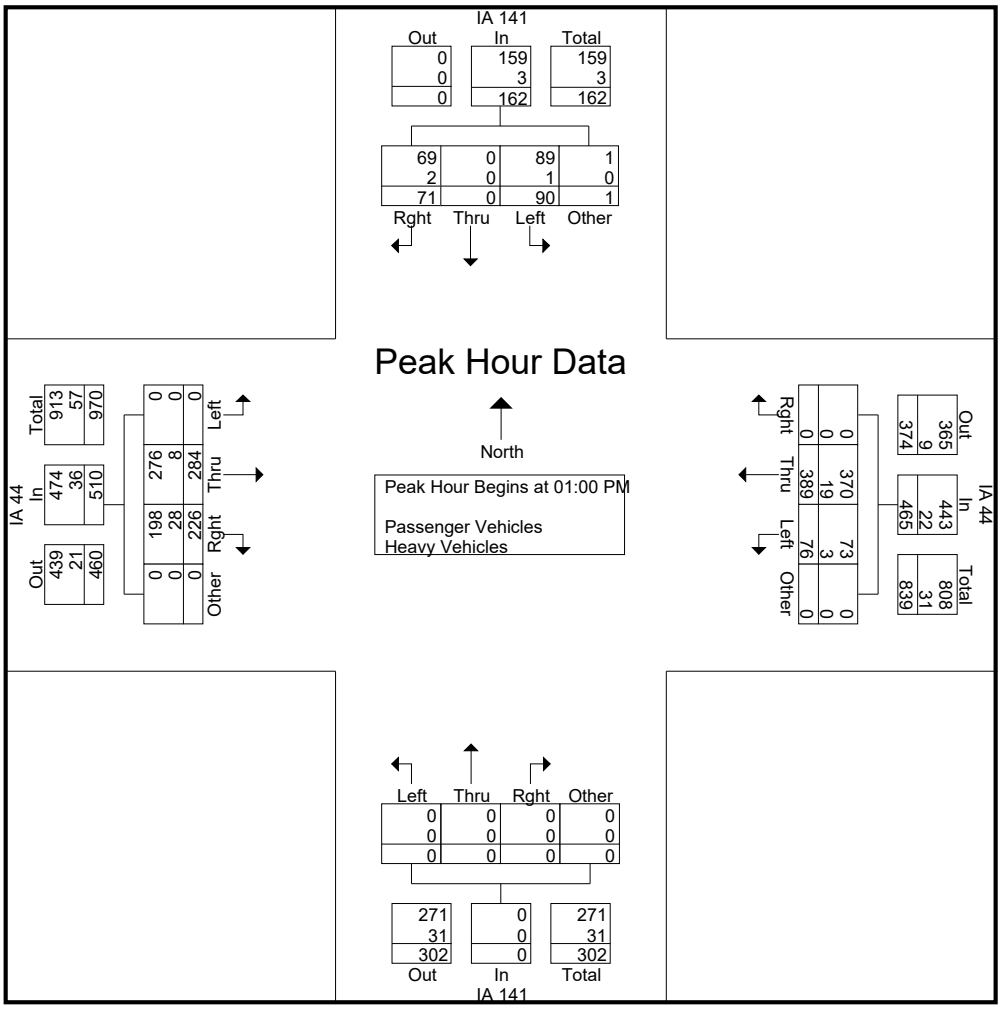
Turning Movement Count Summary

H

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019
Page No : 5

	IA 141 SB					IA 44 WB					IA 141 NB					IA 44 EB					
Start Time	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	26	0	27	0	53	20	98	0	0	118	0	0	0	0	0	0	72	56	0	128	299
01:15 PM	20	0	19	0	39	26	89	0	0	115	0	0	0	0	0	0	66	65	0	131	285
01:30 PM	17	0	9	1	27	12	100	0	0	112	0	0	0	0	0	0	80	52	0	132	271
01:45 PM	27	0	16	0	43	18	102	0	0	120	0	0	0	0	0	0	66	53	0	119	282
Total Volume	90	0	71	1	162	76	389	0	0	465	0	0	0	0	0	0	284	226	0	510	1137
% App. Total	55.6	0	43.8	0.6		16.3	83.7	0	0		0	0	0	0		0	55.7	44.3	0		
PHF	.833	.000	.657	.250	.764	.731	.953	.000	.000	.969	.000	.000	.000	.000	.000	.000	.888	.869	.000	.966	.951
Passenger Vehicles	89	0	69	1	159	73	370	0	0	443	0	0	0	0	0	0	276	198	0	474	1076
% Passenger Vehicles	98.9	0	97.2	100	98.1	96.1	95.1	0	0	95.3	0	0	0	0	0	0	97.2	87.6	0	92.9	94.6
Heavy Vehicles	1	0	2	0	3	3	19	0	0	22	0	0	0	0	0	0	8	28	0	36	61
% Heavy Vehicles	1.1	0	2.8	0	1.9	3.9	4.9	0	0	4.7	0	0	0	0	0	0	2.8	12.4	0	7.1	5.4

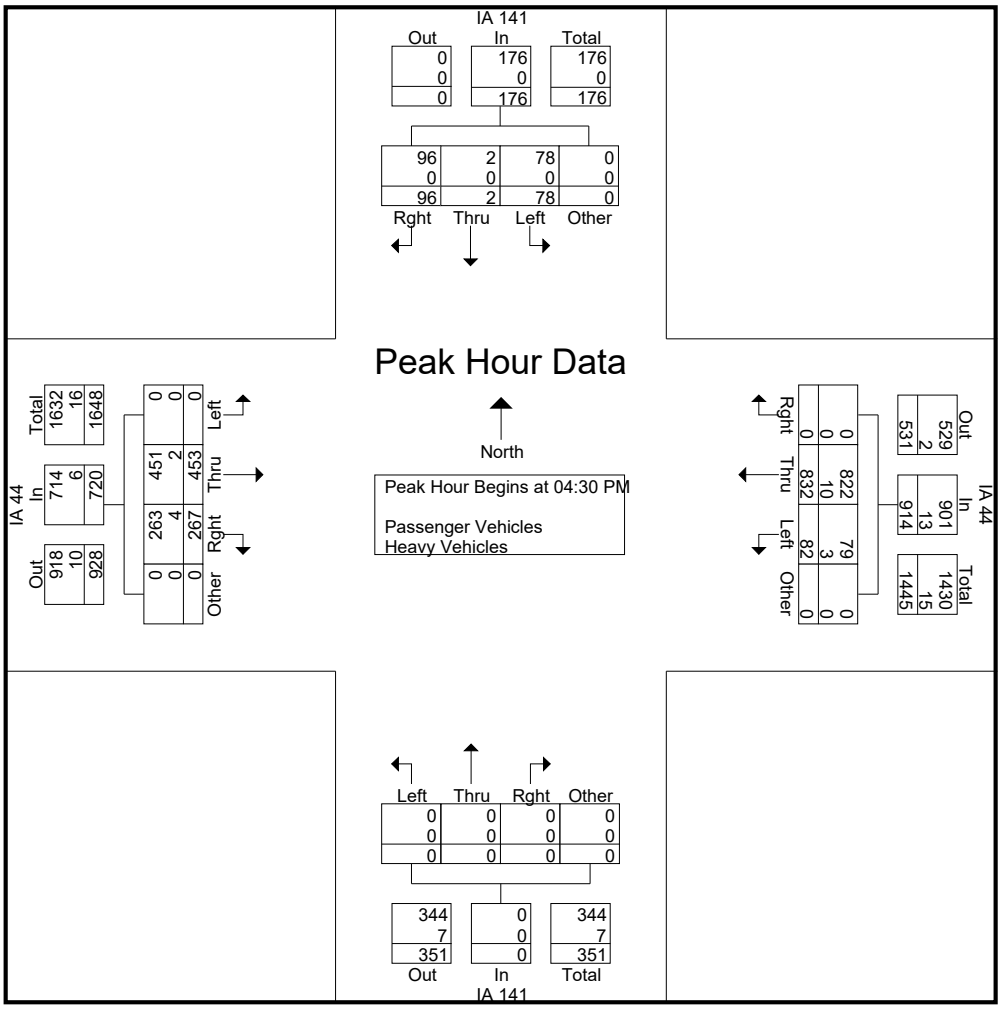


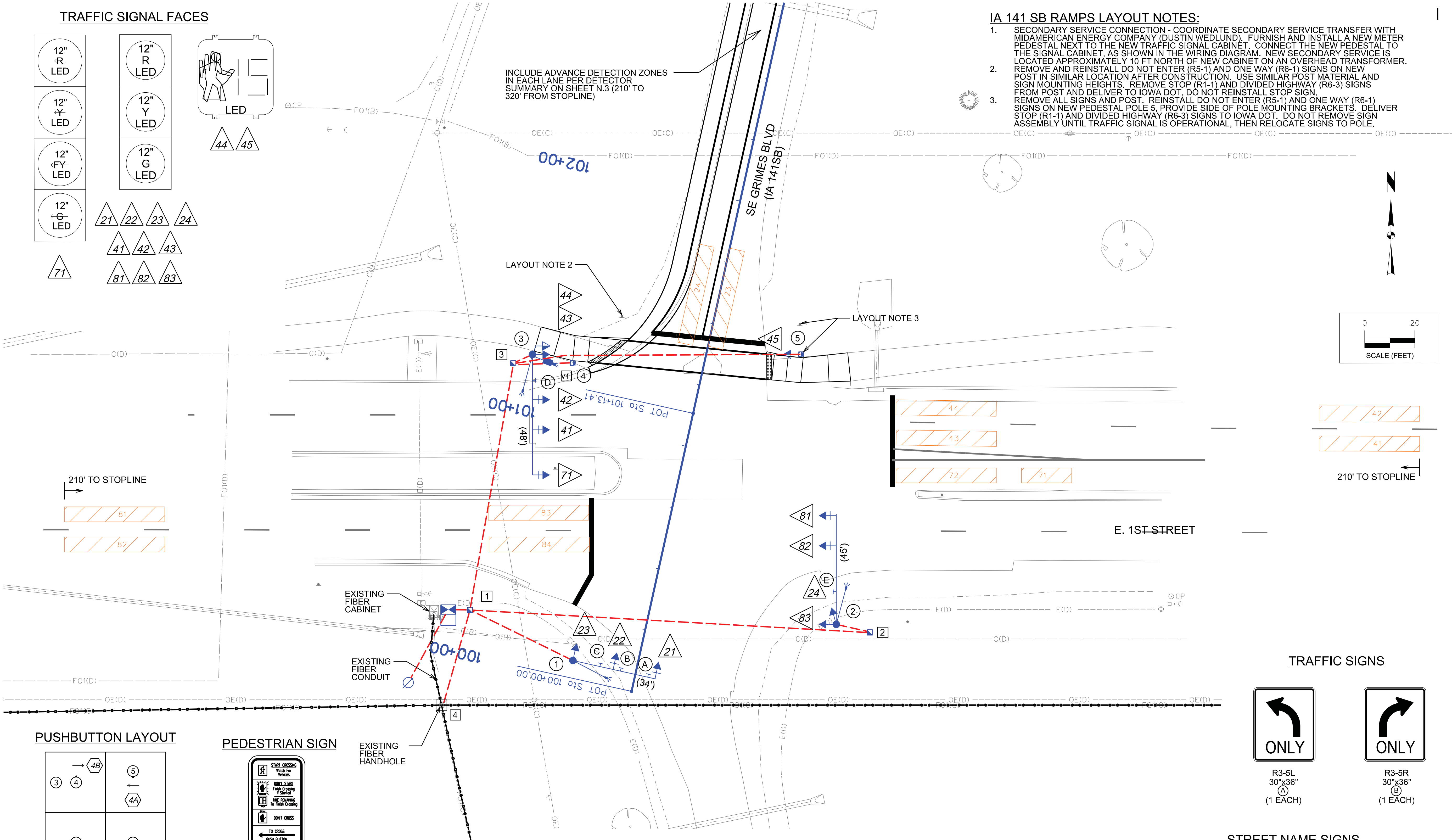
Turning Movement Count Summary

Turning Movement Counts
IA 44 & IA 141 SB Ramp
Grimes, IA
119.1081.01

File Name : CNT_TMC_13HR_IA 141 & IA 44_20191119
Site Code :
Start Date : 11/19/2019
Page No : 6

	IA 141 SB					IA 44 WB					IA 141 NB					IA 44 EB					
Start Time	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Left	Thru	Rght	Other	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	18	1	27	0	46	18	208	0	0	226	0	0	0	0	0	0	106	72	0	178	450
04:45 PM	22	0	26	0	48	20	188	0	0	208	0	0	0	0	0	0	136	48	0	184	440
05:00 PM	17	0	20	0	37	23	231	0	0	254	0	0	0	0	0	0	110	78	0	188	479
05:15 PM	21	1	23	0	45	21	205	0	0	226	0	0	0	0	0	0	101	69	0	170	441
Total Volume	78	2	96	0	176	82	832	0	0	914	0	0	0	0	0	0	453	267	0	720	1810
% App. Total	44.3	1.1	54.5	0		9	91	0	0		0	0	0	0		0	62.9	37.1	0		
PHF	.886	.500	.889	.000	.917	.891	.900	.000	.000	.900	.000	.000	.000	.000	.000	.000	.833	.856	.000	.957	.945
Passenger Vehicles	78	2	96	0	176	79	822	0	0	901	0	0	0	0	0	0	451	263	0	714	1791
% Passenger Vehicles	100	100	100	0	100	96.3	98.8	0	0	98.6	0	0	0	0	0	0	99.6	98.5	0	99.2	99.0
Heavy Vehicles	0	0	0	0	0	3	10	0	0	13	0	0	0	0	0	0	2	4	0	6	19
% Heavy Vehicles	0	0	0	0	0	3.7	1.2	0	0	1.4	0	0	0	0	0	0	0.4	1.5	0	0.8	1.0





IA 141 SB RAMPS LAYOUT NOTES:

1. SECONDARY SERVICE CONNECTION - COORDINATE SECONDARY SERVICE TRANSFER WITH MIDAMERICAN ENERGY COMPANY (DUSTIN WEDLUND). FURNISH AND INSTALL A NEW METER PEDESTAL NEXT TO THE NEW TRAFFIC SIGNAL CABINET. CONNECT THE NEW PEDESTAL TO THE SIGNAL CABINET, AS SHOWN IN THE WIRING DIAGRAM. NEW SECONDARY SERVICE IS LOCATED APPROXIMATELY 10 FT NORTH OF NEW CABINET ON AN OVERHEAD TRANSFORMER.
2. REMOVE AND REINSTALL DO NOT ENTER (R5-1) AND ONE WAY (R6-1) SIGNS ON NEW POST IN SIMILAR LOCATION AFTER CONSTRUCTION. USE SIMILAR POST MATERIAL AND SIGN MOUNTING HEIGHTS. REMOVE STOP (R1-1) AND DIVIDED HIGHWAY (R6-3) SIGNS FROM POST AND DELIVER TO IOWA DOT, DO NOT REINSTALL STOP SIGN.
3. REMOVE ALL SIGNS AND POST. REINSTALL DO NOT ENTER (R5-1) AND ONE WAY (R6-1) SIGNS ON NEW PEDESTAL POLE 5, PROVIDE SIDE OF POLE MOUNTING BRACKETS. DELIVER STOP (R1-1) AND DIVIDED HIGHWAY (R6-3) SIGNS TO IOWA DOT. DO NOT REMOVE SIGN ASSEMBLY UNTIL TRAFFIC SIGNAL IS OPERATIONAL, THEN RELOCATE SIGNS TO POLE.

POLE AND HANDHOLE LOCATIONS

POLE NO.	STATION	OFFSET	LT/RT	TOP OF FOOTING ELEVATION	FOOTING SIZE	COMMENTS
1	100+06.96	25.44'	LT	T/F ELEV.=GRADE+2"	3.0' DIA x 12.0' DEEP	COMBO SIGNAL/LIGHTING
2	100+45.67	75.45'	RT	T/F ELEV.=GRADE+2"	3.0' DIA x 14.0' DEEP	COMBO SIGNAL/LIGHTING
3	101+22.45	67.53'	LT	T/F= ELEV.=	3.0' DIA x 16.0' DEEP	COMBO SIGNAL/LIGHTING
4	101+22.35	51.34'	LT	T/F= ELEV.=	2.0' DIA x 3.0' DEEP	PEDESTAL POLE (5')
5	101+45.65	36.88	RT	T/F= ELEV.=	2.0' DIA x 3.0' DEEP	PEDESTAL POLE (10')
HANDHOLE NO.	STATION	OFFSET	LT/RT	ELEVATION	FOOTING SIZE	COMMENTS
1	100+17.72	69.83'	LT	PER DETAIL		TYPE IV HANDHOLE
2	100+43.47	87.62'	RT	PER DETAIL		TYPE I HANDHOLE
3	101+17.40	74.31	LT	PER DETAIL		TYPE I HANDHOLE
4	UAC	UAC	UAC	UAC	UAC	EXISTING
CABINET	100+16.03	78.29'	LT	PER DETAIL	PER DETAIL	

MARK | REVISION | DATE | BY

Engineer: JAR | Checked By: TDK | Technician: KCG | Date: 05/18/20 | Scale: 1"= 20' | Field Bk: | Pg: | Project No: 1200457 | Sheet N.2

IA 141 SB/IA 44 TRAFFIC SIGNAL & TURN LANE IMPROV

GRIMES, IOWA

TRAFFIC SIGNAL LAYOUT

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com
SNYDER & ASSOCIATES

Project No: 1200457

Sheet N.2

VIDEO DETECTOR SUMMARY

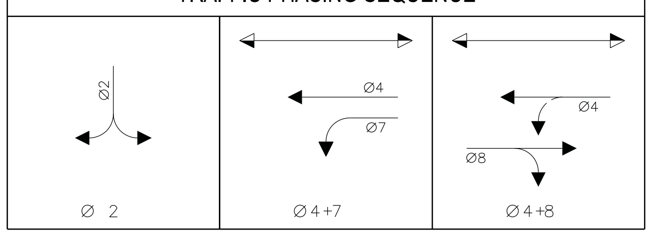
CAMERA NUMBER	DETECTION ZONE	ZONE LIMITS (DISTANCE FROM STOP LINE)	PHASE CALLED	PHASE EXTENDED	COMMENTS
V1	21	210'-320'	2	2	
	22	210'-320'	2	2	
	23	0'-40'	2	2	
	24	0'-40'	2	2	DELAY = 5 SEC
	41	170'-210'	4	4	
	42	170'-210'	4	4	
	43	0'-40'	4	4	
	44	0'-40'	4	4	
	71	50'-70'	7	7,4	
	72	0'-40'	4	7,4	
	81	170'-210'	8	8	
	82	170'-210'	8	8	
	83	0'-40'	8	8	
	84	0'-40'	8	8	
	4A,4B		4		PED PUSHBUTTONS

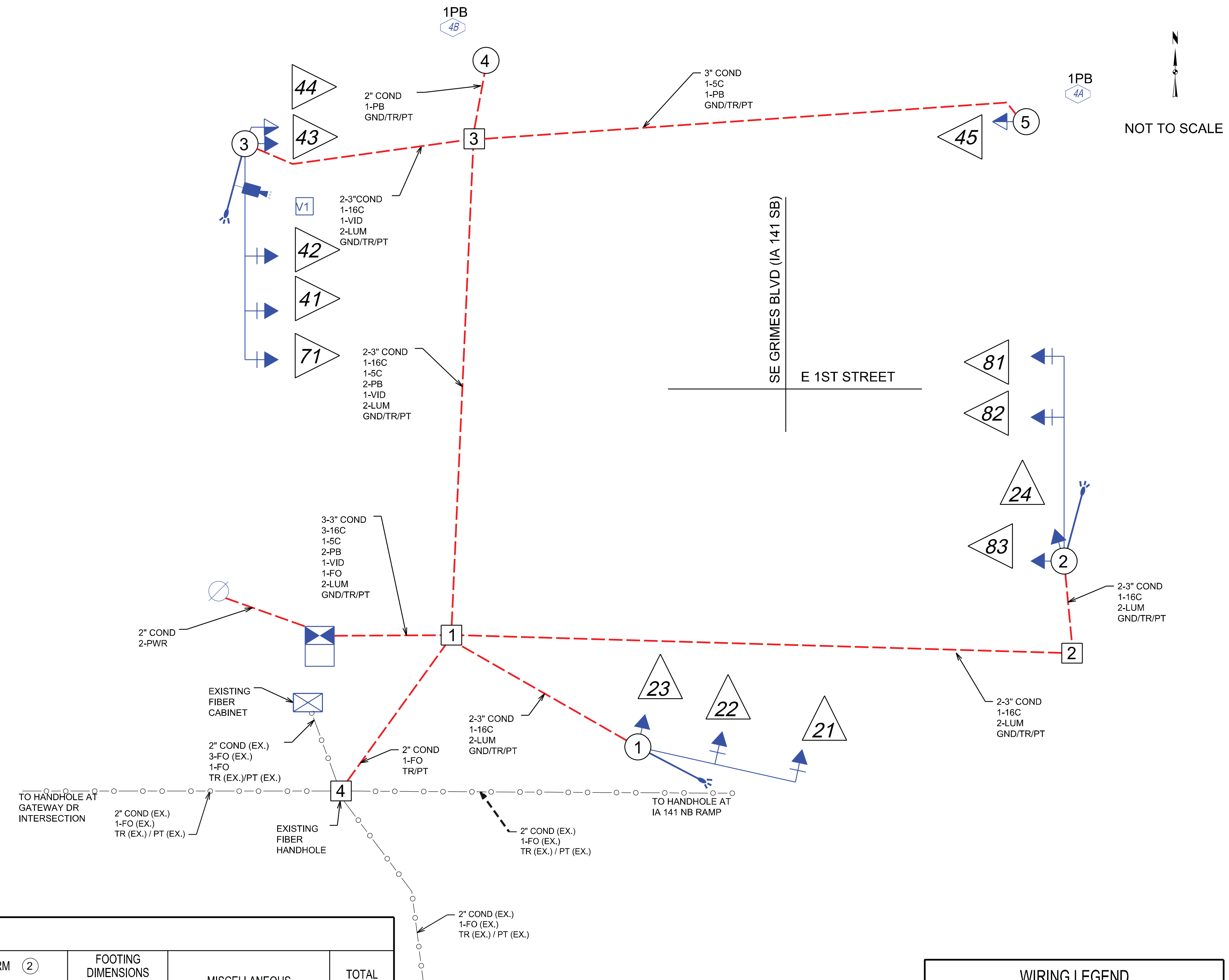
NOTE: ZONE LIMITS ARE FOR DETECTION LIMITS ONLY. ACTUAL DETECTION AREAS FOR EACH ZONE WILL BE DETERMINED IN THE FIELD.

INITIAL RECOMMENDED TIMING (SECONDS)

PHASE	1	2	3	4	5	6	7	8
MINIMUM GREEN		10		10			5	10
PASSAGE		3.0		3.0			3.0	3.0
MAXIMUM I		30		30			20	30
MAXIMUM II								
YELLOW CHANGE		4.9		4.1			3.3	4.1
RED CLEARANCE		2.0		1.2			2.8	1.2
WALK				7				
PEDESTRIAN CLEARANCE				13				
PED RECALL								

TRAFFIC PHASING SEQUENCE





TRAFFIC SIGNAL POLE DATA

POLE NO.	POLE TYPE	MAST ARM LENGTH/ PEDESTAL HEIGHT (ft.)	TRAFFIC SIGNAL HEADS (1) QTY.	TRAFFIC SIGNAL HEADS (1) LOCATION ON ARM (ft.)	TRAFFIC SIGNS (1) QTY.	TRAFFIC SIGNS (1) LOCATION ON ARM (ft.)	LUMINAIRE ARM (2) SPREAD (ft.)	LUMINAIRE ARM (2) MOUNTING HEIGHT (ft.)	LUMINAIRE ARM (2) ORIENTATION (degrees)	FOOTING DIMENSIONS DIA. (ft.)	FOOTING DIMENSIONS DEPTH (ft.)	MISCELLANEOUS	TOTAL QUANTITY
1	COMBINATION SIGNAL/LIGHTING	34	2	34,16	3	31,19,11	15	40	0	3	12		1
2	COMBINATION SIGNAL/LIGHTING	44	2	44,32	1	13	15	40	0	3	18		1
3	COMBINATION SIGNAL/LIGHTING	48	3	48,30,18	1	10	15	40	0	3	16		1
4	PEDESTAL	5								2	3		1
5	PEDESTAL	12								2	14		1

NOTES:

1. LOCATION REPRESENTS APPROXIMATE LINEAR DISTANCE FROM POLE MEASURED OUTWARD TO END OF ARM.
2. ORIENTATION OF LUMINAIRE ARM REPRESENTS A COUNTERCLOCKWISE ANGLE MEASURED FROM THE CENTERLINE OF THE MAST ARM.
3. UNLESS OTHERWISE DIRECTED, TRAFFIC SIGNAL HEADS ON MAST ARMS ARE TO BE ALIGNED OVER THE CENTER OF INTERSECTION APPROACH LANES. APPROXIMATE LOCATIONS ARE AS SHOWN IN THE TRAFFIC SIGNAL POLE DATA TABLE. CONTRACTOR SHALL FIELD VERIFY SIGNAL HEAD LOCATIONS.

WIRING LEGEND

- SIGNAL NUMBER
- POLE NUMBER
- HANDHOLE NUMBER
- PROPOSED DETECTOR NUMBER
- COND — CONDUIT
- PWR — POWER CABLE (1c #6)
- LUM — LUMINAIRE (1c #8)
- PB — PEDESTRIAN PUSHBUTTON (2c)
- VID — VIDEO CABLE(S)
- FO — FIBER OPTIC CABLE (12-COUNT SM)
- GND — GROUND WIRE (1c #6)
- TR — TRACER WIRE (1c #10)
- PT — PULL TAPE
- EX. — EXISTING

IA 141 SB/IA 44 TRAFFIC SIGNAL & TURN LANE IMPROV

GRIMES, IOWA

TRAFFIC SIGNAL WIRING

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

MARK	REVISION	DATE	BY

Engineer: JAR | Technician: KCG | Checked By: TDK | Date: 05/18/20 | Scale: 1"= NTS | Field Bk: | Pg:

Project No: 1200457

Sheet N.3

SNYDER & ASSOCIATES

Project No: 1200457

Sheet N.3

Rev. 5/18

Application for TRAFFIC CONTROL DEVICE

TSIP FUNDS

GENERAL INFORMATION **DATE:** August 10, 2020

Location / Title of Project Marshalltown Traffic Signal Improvements

Applicant City of Marshalltown

Contact Person Jay C. Koch Title Civil Engineer II

Complete Mailing Address 24 N. Center St.

Marshalltown, IA 50158

Phone (641) 754-5734 E-Mail jkoch@marshalltown-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:

Funding Amount

Total Safety Cost	$ 363,985.00
Total Project Cost	$ 363,985.00
Safety Funds Requested	$ 363,985.00

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐Yes – Explain _____

☒No

Rev. 5/18

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Marshalltown

Signed: Joel Greer 8/12/20

Signature Date Signed

Joel Greer, Mayor

Printed Name

Attest: Alicia Hunter 8/12/20

Signature Date Signed

Alicia Hunter, City Clerk

Printed Name

2020-233

RESOLUTION AUTHORIZING THE PUBLIC WORKS ENGINEERING DEPARTMENT TO SUBMIT A GRANT APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION (IDOT) TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FOR A GRANT RELATED TO TRAFFIC CONTROL DEVICE TSIP FUNDS

WHEREAS, the City of Marshalltown (hereinafter referred to as the "City"), State of Iowa, is a political subdivision organized and existing under the law and the Constitution of the State of Iowa (the "State"); and

WHEREAS, the City has identified Traffic Safety Control Devices as a potential project eligible for funding; and

WHEREAS, the City may provide installation services in the form of which can serve as matching funds for the project; and

WHEREAS, the City Council has found the request to apply for grant funding for approximately $363,985.00 from the Iowa Department of Transportation (IDOT) Traffic Safety Improvement Program {TSIP), to be in the best interest of the City.

NOW THEREFORE, BE·IT RESOLVED BY THE CITY OF MARSHALLTOWN, IOWA:

Section 1. This Council hereby authorizes City staff to prepare and submit a grant application to the Iowa Department of Transportation (IDOT) Traffic Safety Improvement Program (TSIP), for the purpose of completing the Traffic Safety Control Devices Project.

Section 2. This Council hereby authorizes staff to accept the award if granted and sign necessary agreement to execute an award.

Passed this 12th day of August, 2020, and signed this 13th day of August, 2020.

CITY OF MARSHALLTOWN

Joel Greer

Joel Greer, Mayor

ATTEST:

Alicia Hunter

Alicia Hunter, City Clerk

Narrative:

Traffic Signal Controllers:

The City of Marshalltown, Iowa is seeking assistance for the purchase of traffic signal controllers. The new traffic signal controllers will replace 20+ years old controllers throughout the City. Eighteen of twenty-one controllers requested are located on the Highway 14 corridor extending north and south through the City. The remaining three controllers are located in other parts of the City.

The proposed project will include new signal controllers for 21 of the 23 primary signal lights within the City. The City has already upgraded two of the controllers and needs to replace the remaining controllers prior to failure. Failure of the controller for the lights results in unsafe intersection conditions, delays for travelers, and unnecessary overtime for City employees.

The City has received a quote for 21 - M60 controllers. The controllers will be installed by the City in existing cabinets. The quoted price for the controllers is $3,285.00 each for a total cost of $68,985.00. Since the City will install the controllers, there would be no additional costs for labor.

Traffic Signal Battery Backup Units:

The City of Marshalltown, Iowa is seeking assistance for the purchase of fifteen battery backup units for existing signals. Currently when there is a power outage, planned or unplanned, the affected traffic signals cease to operate. This blacked out signal condition would require all drivers to treat these signals as all way stops. However, in reality, many drivers treat a blacked out signal as a green, especially drivers on the major street.

Typically when traffic signals are blacked out, the Public Works Department will deploy temporary stop signs. This requires the signal technicians to go to the Public Works Facility, load the stop signs, and then place the stop signs at the intersection or intersections. There have been instances that the power outage has been so extensive that there were not enough temporary stop signs available to place at all of the impacted intersections. All of these steps take time and divert the City employees and police personnel away from their primary responsibilities. When these outages occur during non-working hours, response times are longer. City street personnel must be called out from home and travel to the Public Works Facility to load up the stop signs. This results in significant overtime pay.

The objective of installing traffic signal battery backup units is to increase public safety and reduce traffic congestion by allowing traffic signals to function even during a power failure. A typical traffic signal intersection experiences eight to ten local power outages annually of varying lengths of time. By immediately going to battery backup power during a power outage and keeping the signals in operation will provide increased safety to the public and eliminate the need to dispatch police or signal technicians to

control traffic or set up temporary stop signs. Providing continuous signal operation, even during a power outage, will improve the safety of the intersection as well as reduce traffic crashes and congestion that would occur if the signals are out during a power outage.

The City received a quote of $13,000.00 each for the battery backup units. The fifteen requested would be $195,000.00. The City will install the units, so there would be no additional costs for labor.

Traffic Signal Interconnect:

With recent additions of fiber optic cabling installed along the Highway 14 corridor from Iowa Avenue to Olive Street, the City of Marshalltown is requesting funding for assistance in interconnecting eight traffic signals. This will allow the City to properly time/coordinate traffic signals through this corridor.

The overall objective of signal control is to provide for the safe and efficient traffic flow at intersections, along routes and in street networks. A well-timed signal system can reduce fuel consumption, eliminate unnecessary stops and delays, improve safety and enhance the environment. By interconnecting the eight signals on the Highway 14 corridor, the City will be able to time the signals to provide efficient traffic flows, monitor signal maintenance issues and remotely adjust signal timing to provide efficient traffic flows.

The City of Marshalltown received a quote to provide fiber optic interconnect at eight locations. The average estimated cost were $12,500 per signal for a total cost of $100,000.00.

Itemized Cost Breakdown:

Traffic Signal Controllers:	21 each.	$3,285.00	$68,985.00
Traffic Signal Battery Backup Units:	15 each	$13,000.00	$195,000.00
Traffic Signal Interconnect:	8 each	$12,500.00	$100,000.00
Additional Labor for Installation:			$0.00
Total Project Costs:			**$363,985.00**

Time Schedule:

Upon project selection for funding and availability of funds, the City will order all materials and schedule fiber optic interconnects. Materials will be delivered within 90 days of ordering and installation by City personnel will begin almost immediately.

The City forces anticipate approximately 3 months for completion of the installations. However, this will be subject to delays from natural disasters and other non-foreseen emergencies. The City fully intends to have the work completed before the end of 2021.

No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown

DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

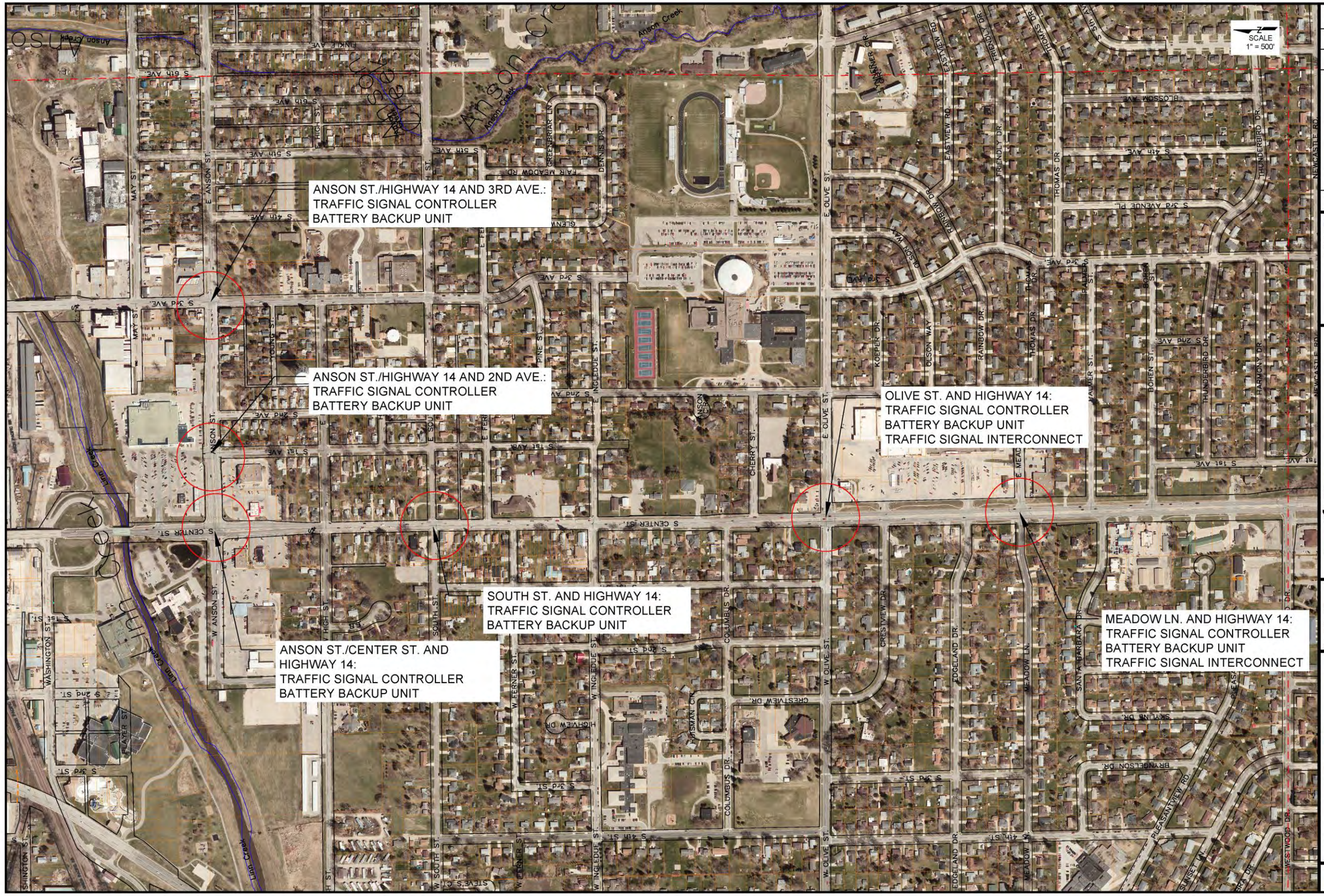
Drawn By:	JCK
Chk' By:	JCK
Proj. No:	PRELIM
Dwg. No:	LOCATION MAP
VP. No:	EXHIBIT
Date:	7/23/20

HIGHWAY 14 CORRIDOR
TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

1 OF 10

E



I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

No.	Revisions	By	App.	Date

The City of Marshalltown

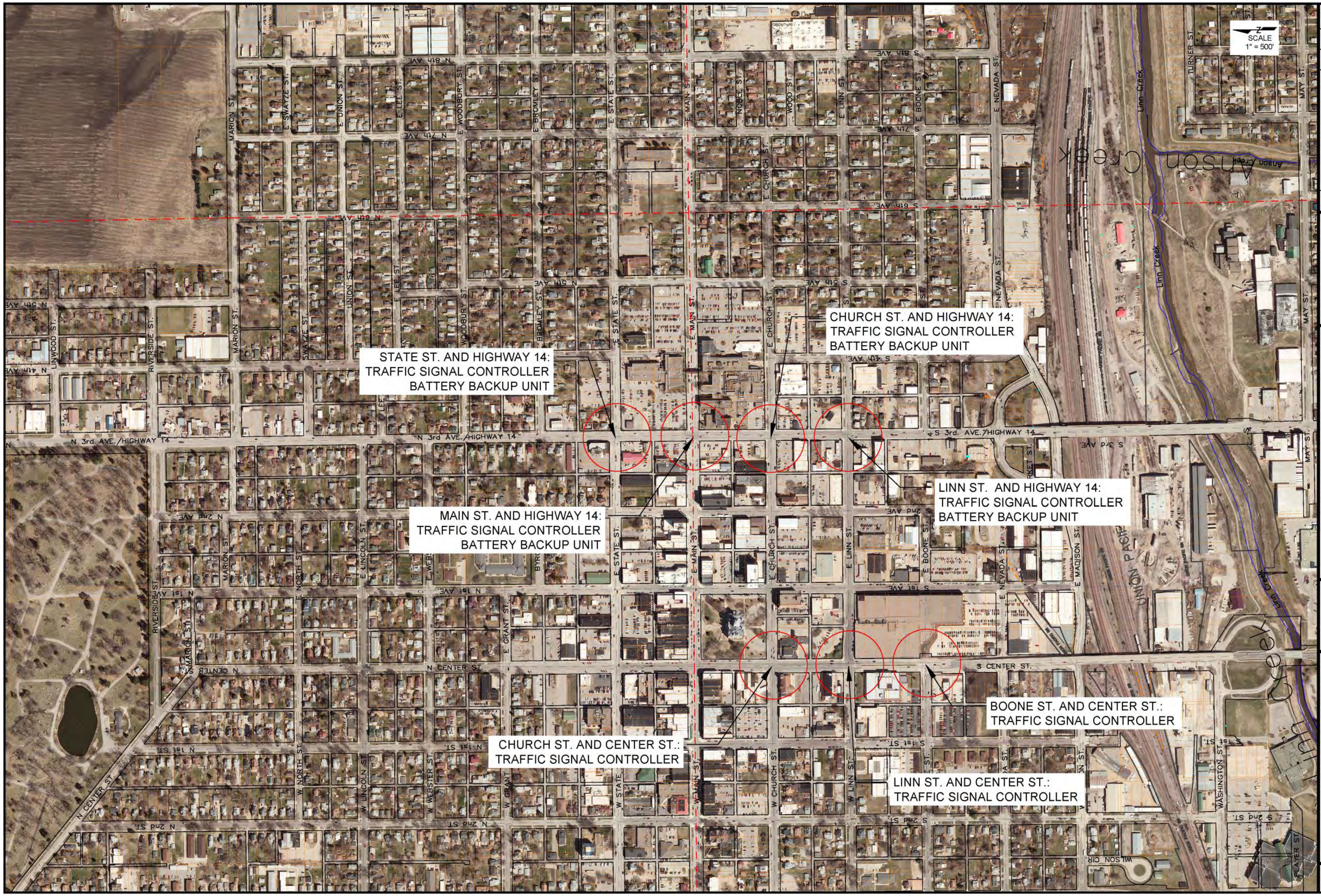
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH: (641) 754-5734

Drawn By:	JCK
Chk' By:	JCK
Proj. No	PRELIM
Dwg No.	LOCATION MAP
VP. No.	LAYOUT01
Date:	7/23/20

HIGHWAY 14 CORRIDOR
TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

E



I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown

DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST. MARSHALLTOWN, IA 50158
PH. (641) 754-5734

Drawn By: JCK
Chk' By: JCK
Proj. No: PRELIM
Date: 7/23/20

HIGHWAY 14 CORRIDOR/CENTER ST. TRAFFIC SIGNALS
TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

3 OF 10

E

No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown

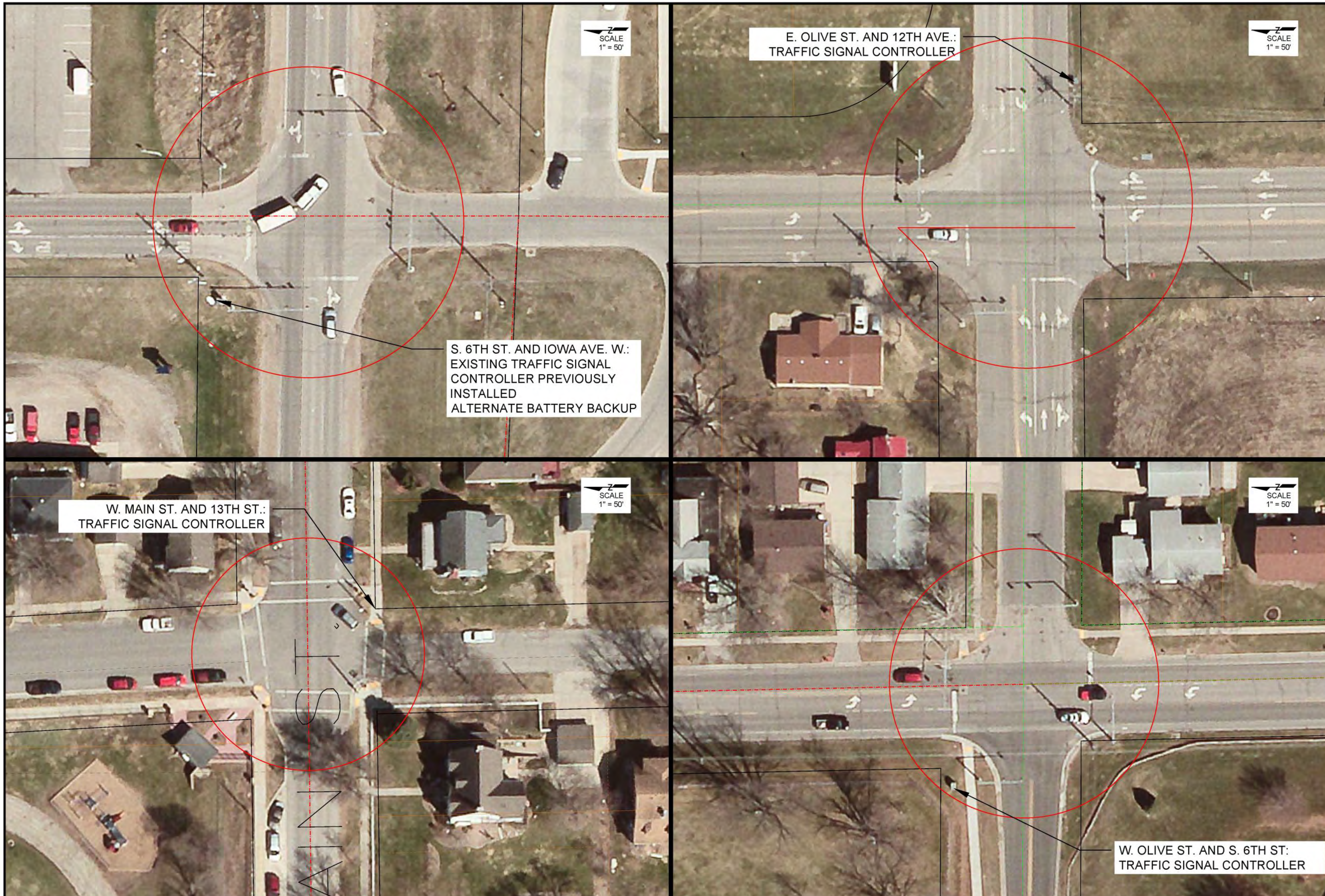
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

Drawn By:	JCK
Chk By:	JCK
Proj. No:	PRELIM
Dwg No:	LOCATION MAP
VP No:	LAYOUT1
Date:	7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

E



No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

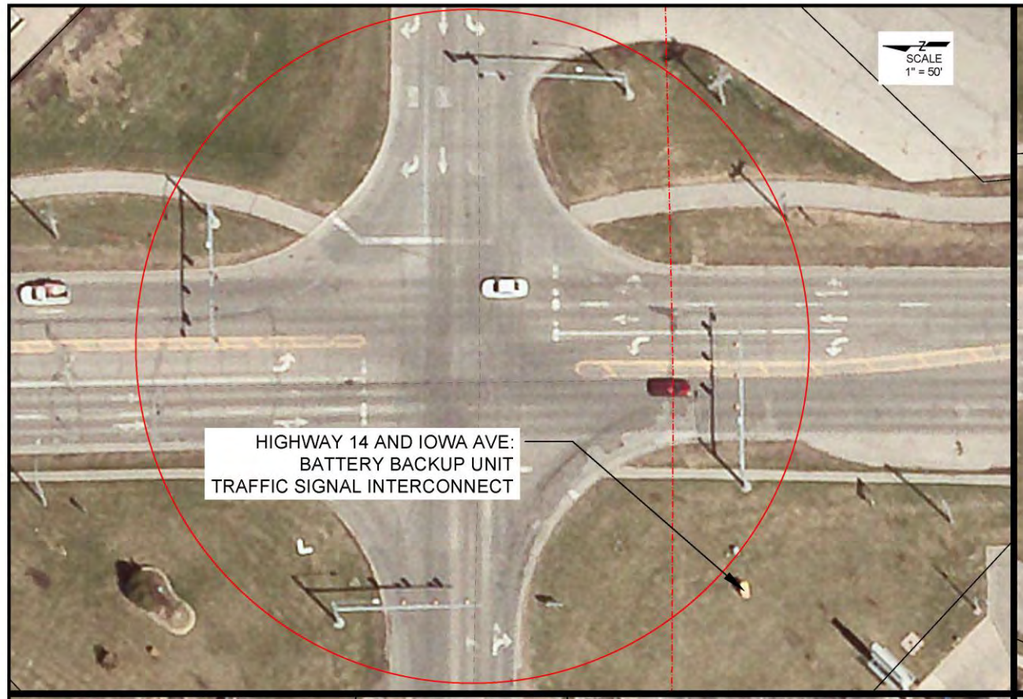
Registration No. P25428

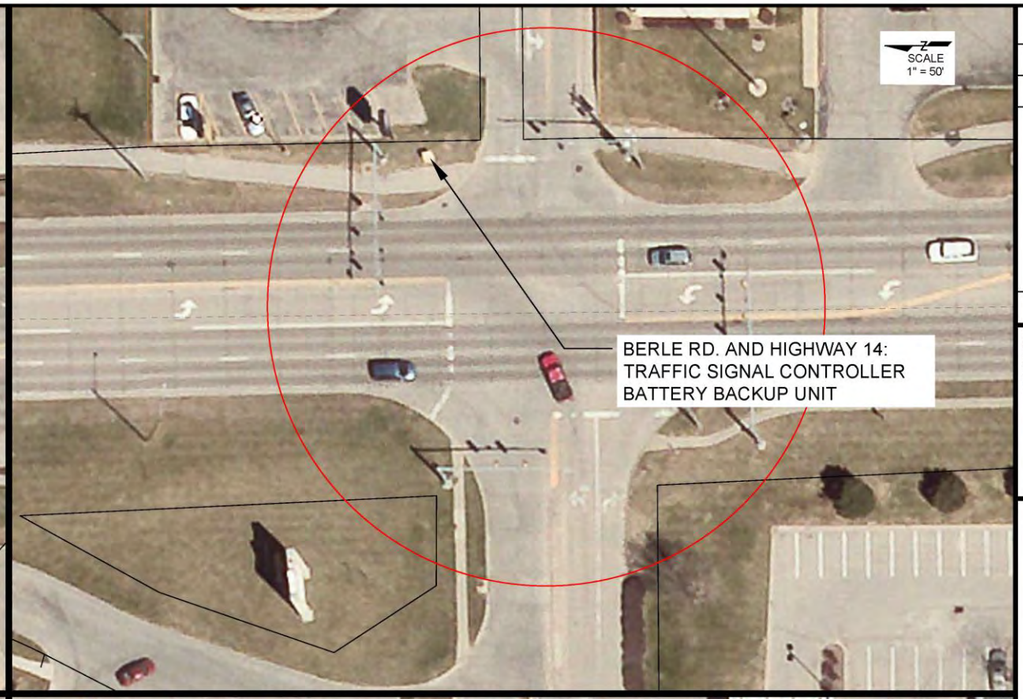
the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

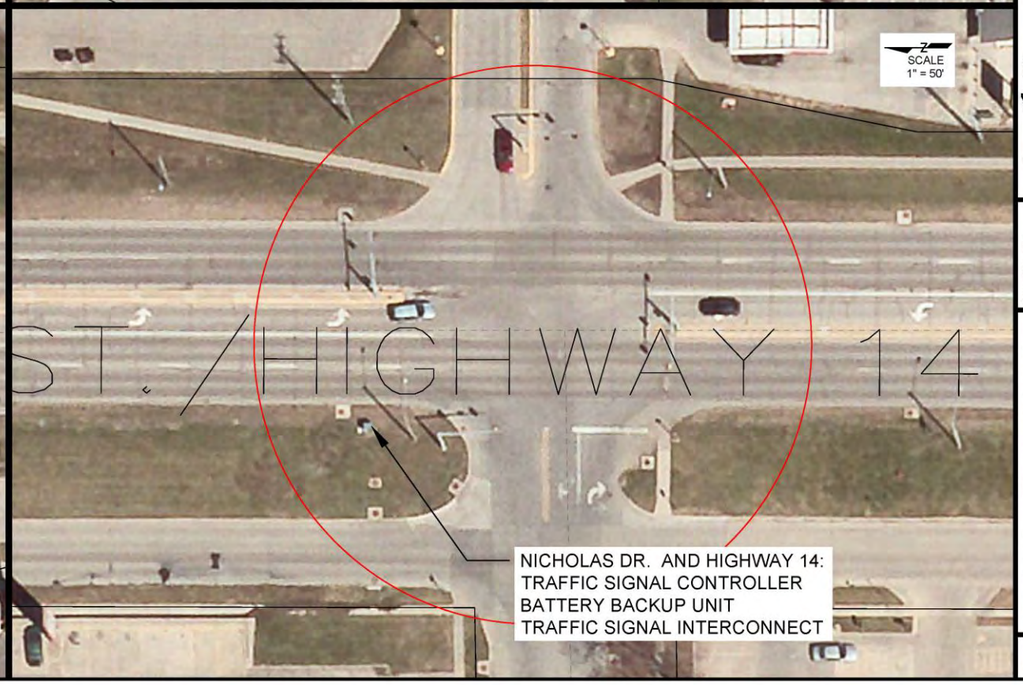
Drawn By: JCK
Chk' By: JCK
Proj. No: PRELIM
Dwg. No: LOCATION MAP
VP. No: LAYOUT1 (5)
Date: 7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA







No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

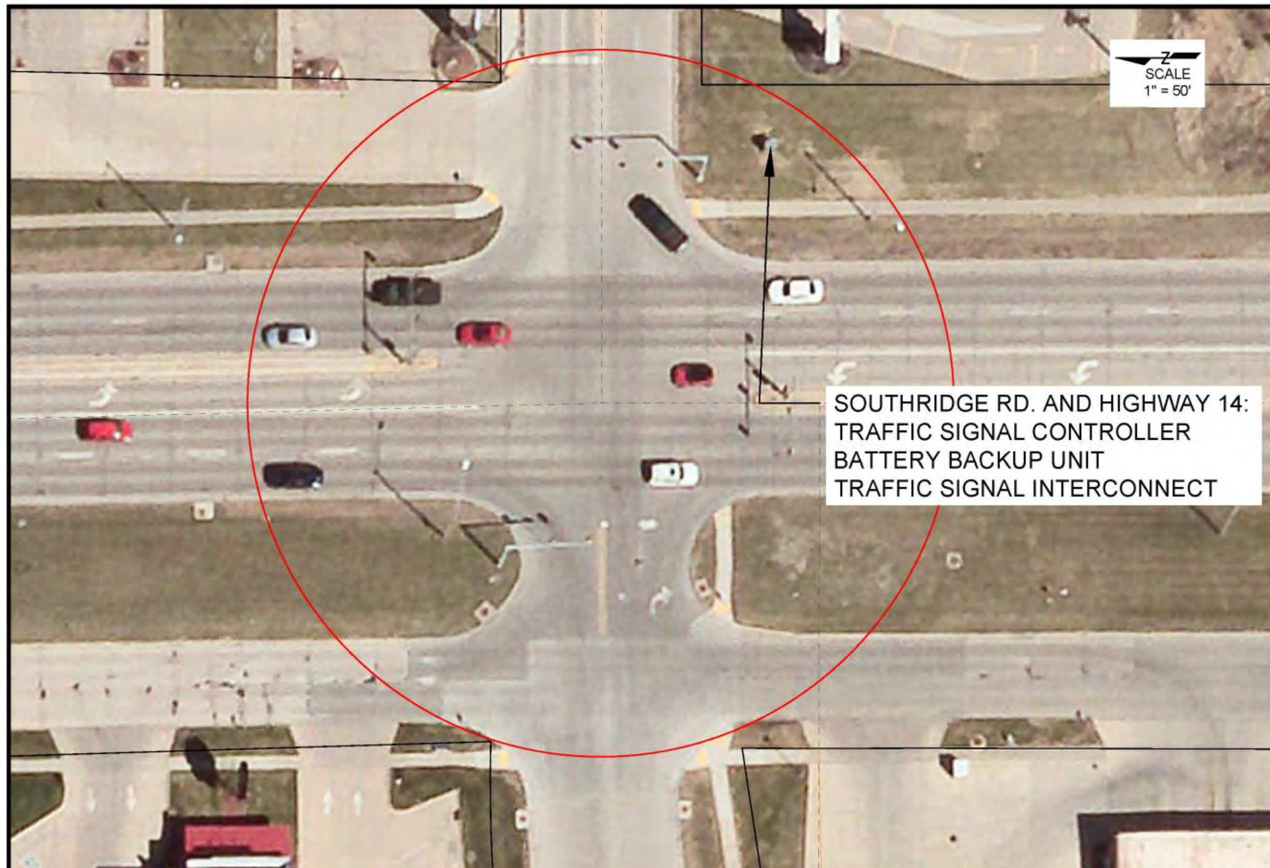
Registration No. P25428

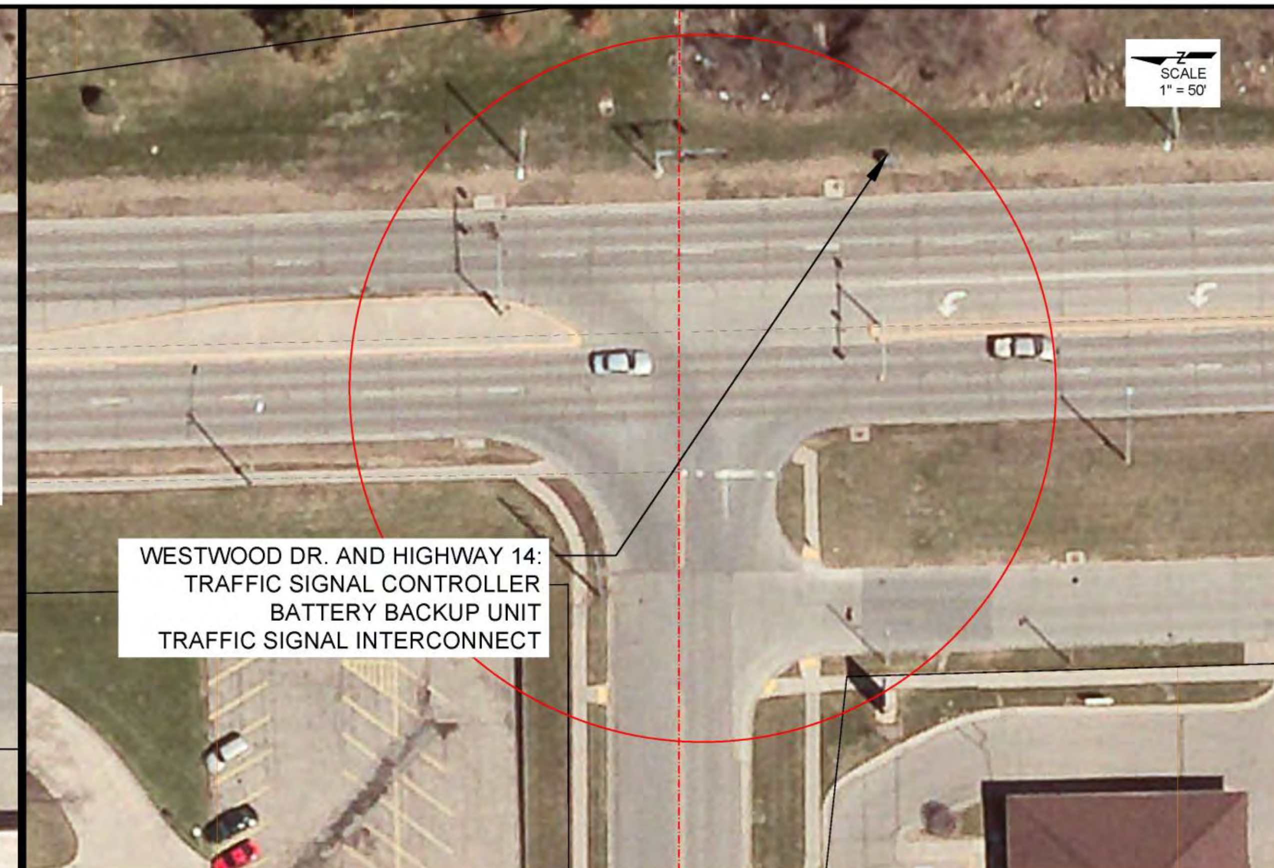
the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

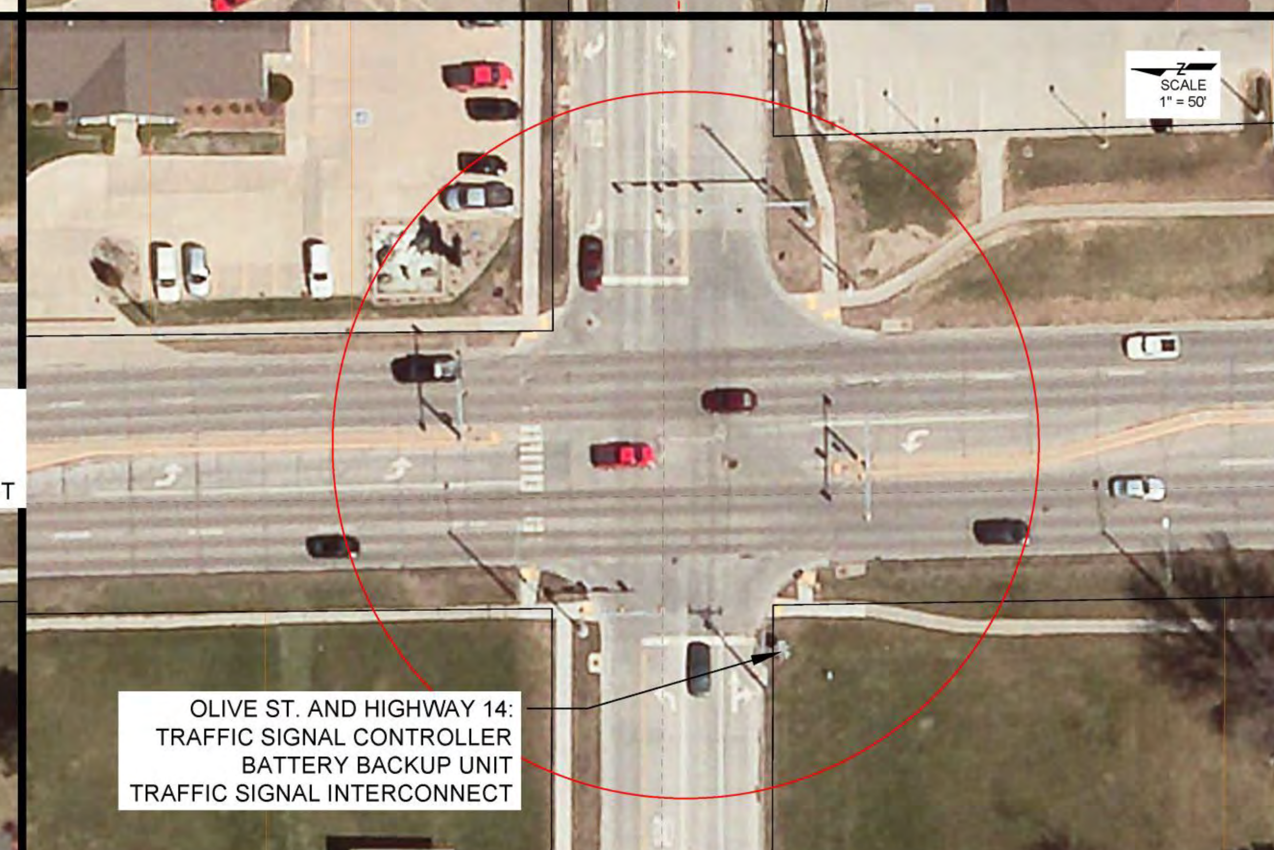
Drawn By:	JCK
Chk By:	JCK
Proj. No:	PRELIM
Dwg No:	LOCATION MAP
VP No:	LAYOUT1
Date:	7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA







No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

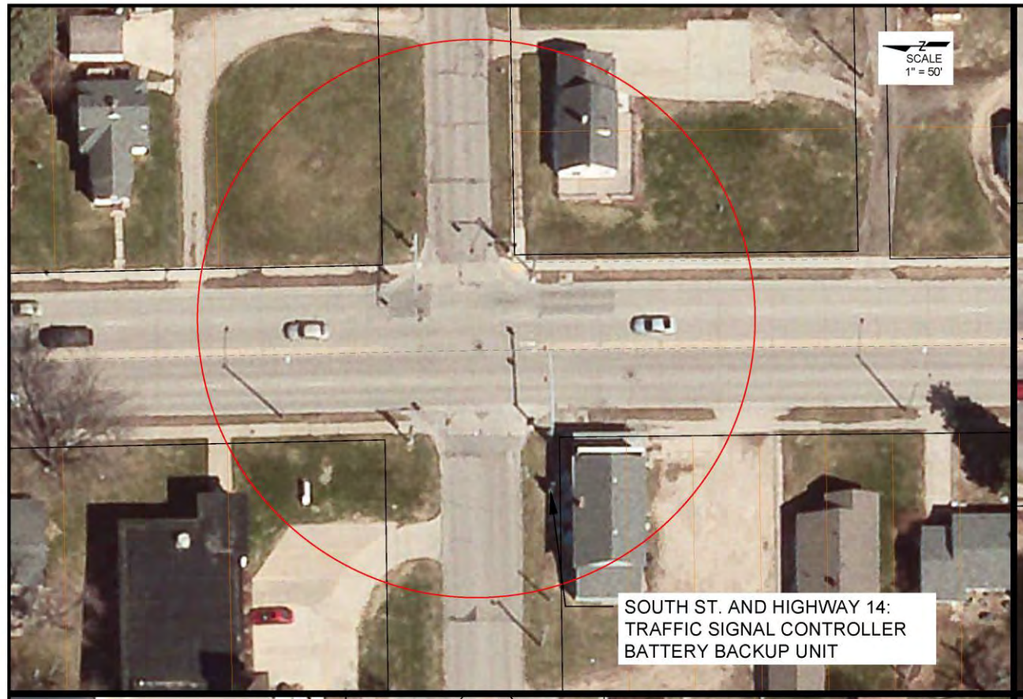
Registration No. P25428

the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

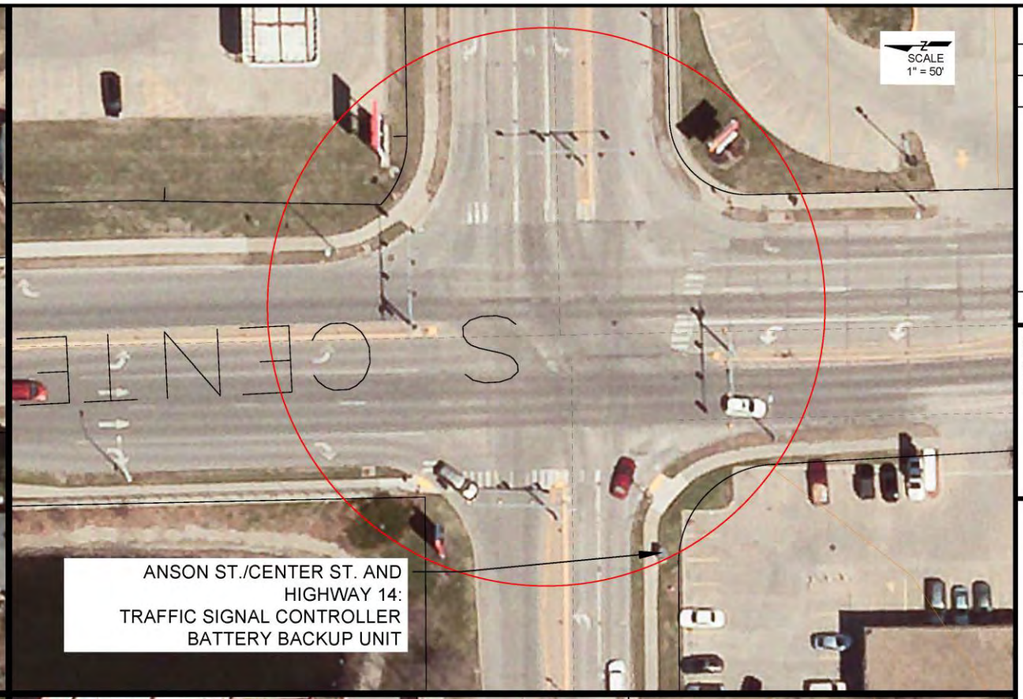
Drawn By: JCK
Chk' By: JCK
Proj. No: PRELIM
Dwg. No: LOCATION MAP
VP. No: LAYOUT1 (7)
Date: 7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

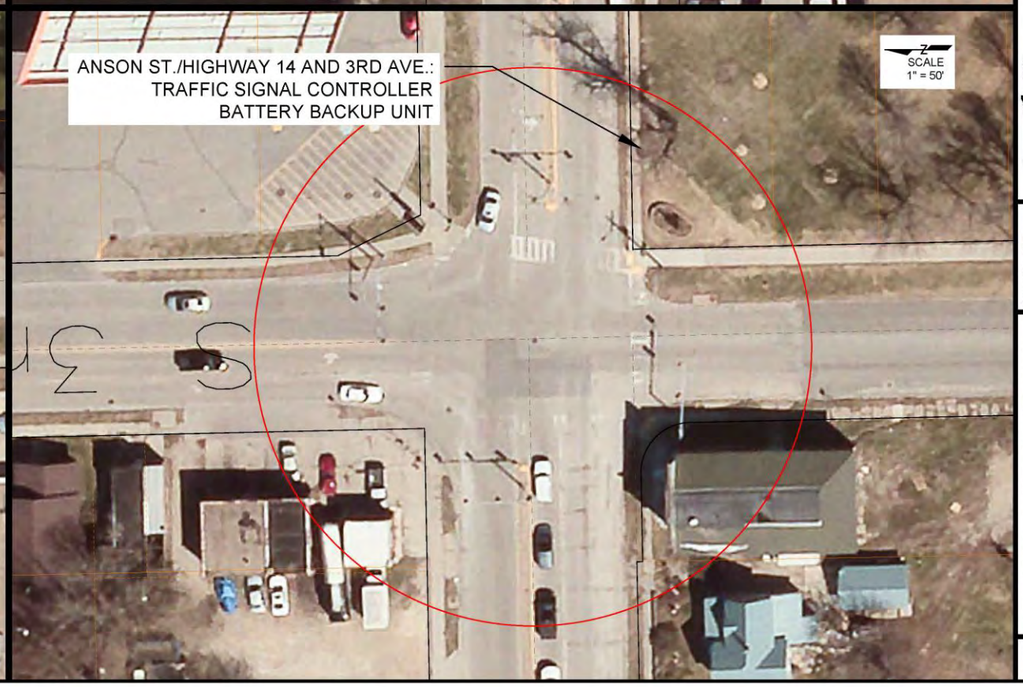


SOUTH ST. AND HIGHWAY 14:
TRAFFIC SIGNAL CONTROLLER
BATTERY BACKUP UNIT



ANSON ST./CENTER ST. AND
HIGHWAY 14:
TRAFFIC SIGNAL CONTROLLER
BATTERY BACKUP UNIT

HIGHWAY 14/ANSON ST AND 2ND AVE:
TRAFFIC SIGNAL CONTROLLER
BATTERY BACKUP UNIT



ANSON ST./HIGHWAY 14 AND 3RD AVE.:
TRAFFIC SIGNAL CONTROLLER
BATTERY BACKUP UNIT

No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

Drawn By: JCK
Chk By: JCK
Proj. No: PRELIM
Dwg No: LOCATION MAP
VP No: LAYOUT1
Date: 7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown

DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

Drawn By:	JCK
Chk' By:	JCK
Proj. No.	PRELIM
Dwg. No.	LOCATIONMAP
Ver. No.	VERSION
Date	7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

No.	Revisions	By	App.	Date

I Hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the law of the State of Iowa.

Registration No. P25428

the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
24 N. CENTER ST., MARSHALLTOWN, IA. 50158
PH. (641) 754-5734

Drawn By:	JCK
Chk' By:	JCK
Proj. No	PRELIM
Dwg. No	LOCATION MAP
VP. No	LAYOUT1
Date:	7/23/20

CITY STREET TRAFFIC SIGNALS

TRAFFIC SIGNAL IMPR.
MARSHALLTOWN, IOWA

10 OF 10

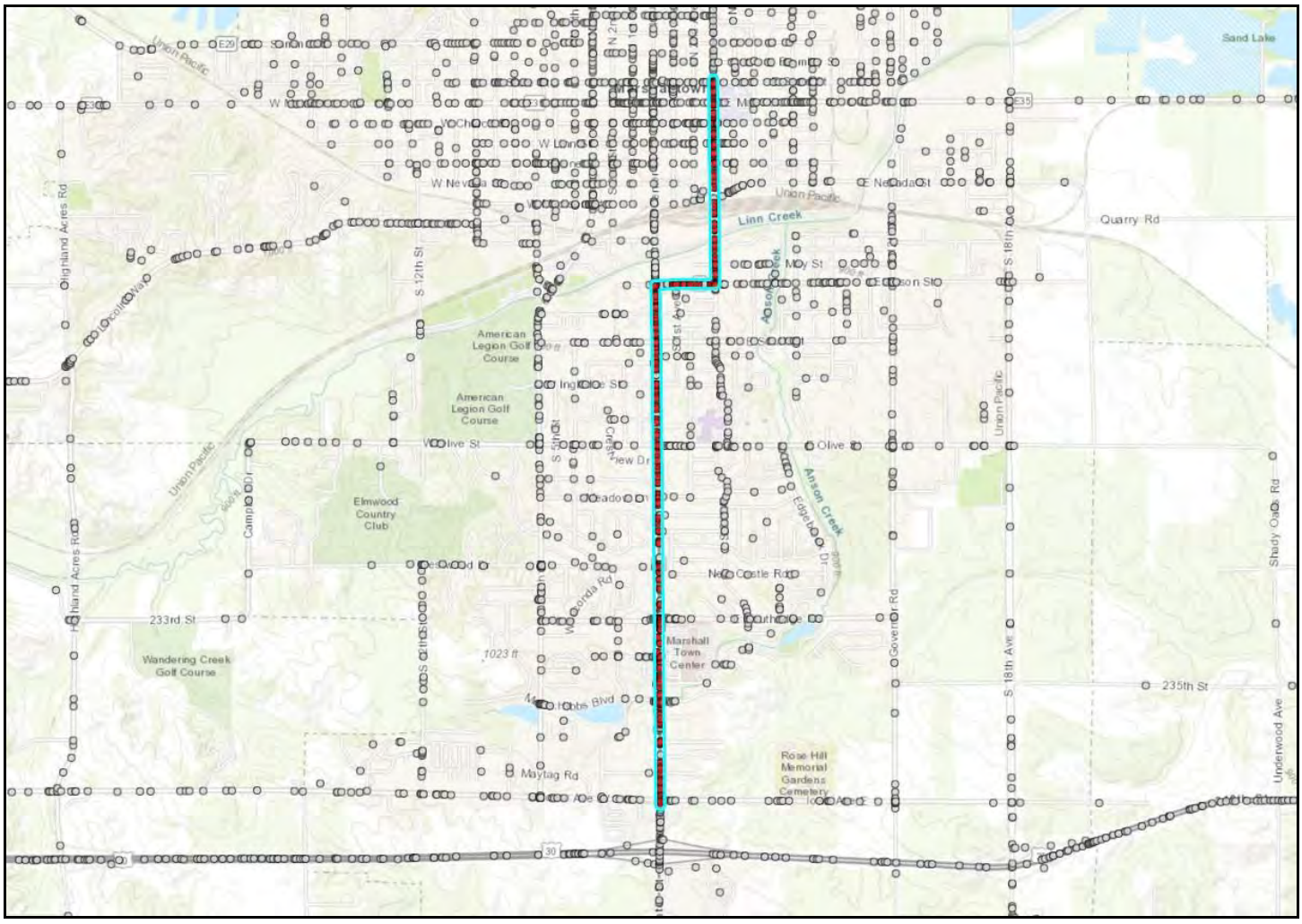
Highway 14 Corridor - Iowa Ave to State St

Crash Severity	480
Fatal Crash	0
Suspected Serious Injury Crash	8
Suspected Minor Injury Crash	49
Possible/Unknown Injury Crash	74
Property Damage Only	349

Injury Status Summary	169
Fatalities	0
Suspected serious/incapacitating	9
Suspected minor/non-incapacitating	62
Possible (complaint of pain/injury)	89
Unknown	9

Property/Vehicles/Occupants	
Property Damage Total (dollars):	2,926,640.00
Average (per crash dollars):	6,097.17
Total Vehicles:	961.00
Average (per crash):	2.00
Total Occupants:	1,427.00
Average (per crash):	2.97

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.33
Major Injuries/Crash:	0.02
Minor Injuries/Crash:	0.13
Possible/Unknown Injuries/Crash:	0.19



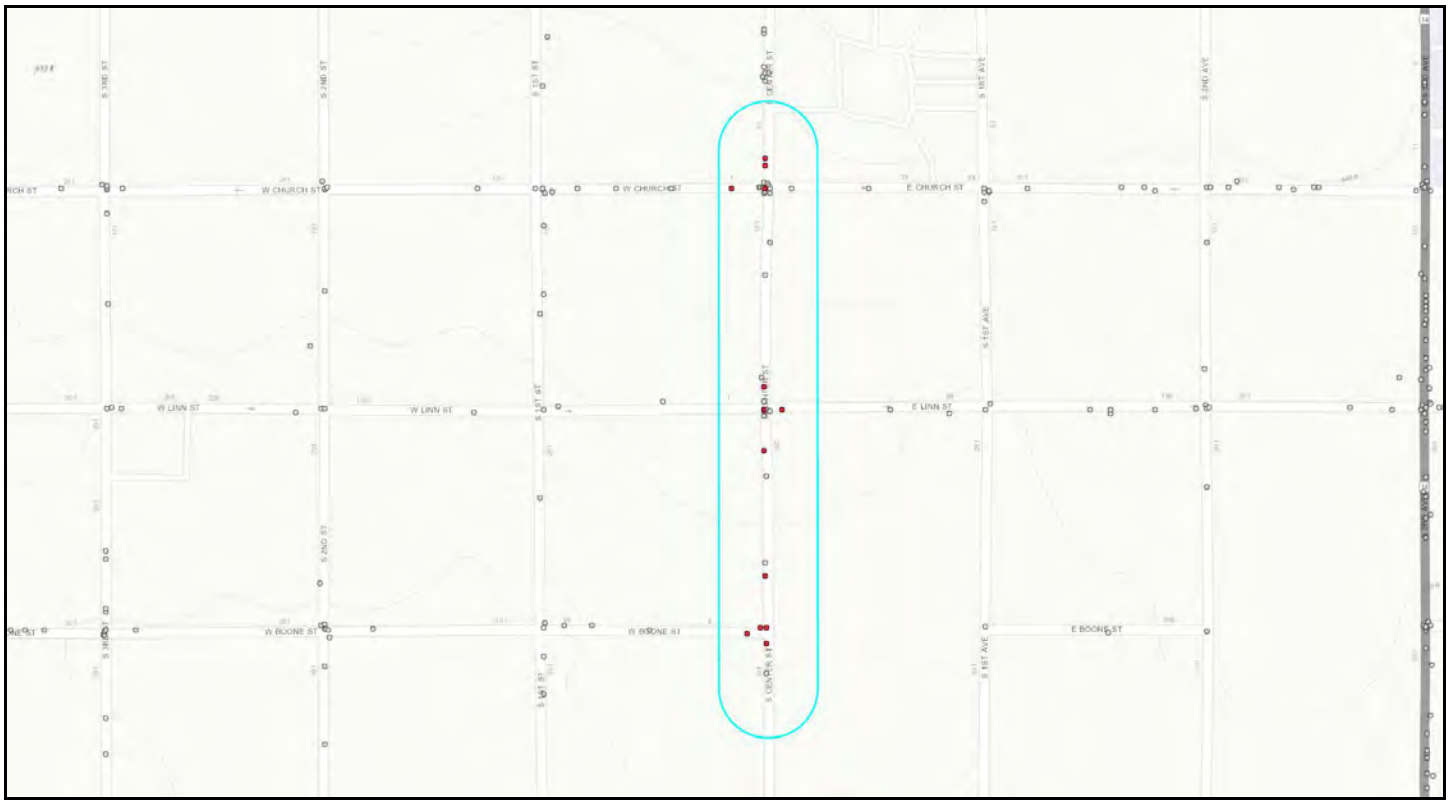
South Center Street - Boone St to Church St

Crash Severity	22
Fatal Crash	1
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	2
Possible/Unknown Injury Crash	3
Property Damage Only	16

Injury Status Summary	7
Fatalities	1
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	2
Possible (complaint of pain/injury)	3
Unknown	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	123,950.00
Average (per crash dollars):	5,634.09
Total Vehicles:	41.00
Average (per crash):	1.86
Total Occupants:	49.00
Average (per crash):	2.23

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.05
Injuries/Crash:	0.23
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.09
Possible/Unknown Injuries/Crash:	0.14



W Main St and 13th St Intersection

Crash Severity	4
Fatal Crash	1
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	1
Property Damage Only	2

Injury Status Summary	2
Fatalities	1
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	1
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	13,500.00
Average (per crash dollars):	3,375.00
Total Vehicles:	7.00
Average (per crash):	1.75
Total Occupants:	45.00
Average (per crash):	11.25

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.25
Injuries/Crash:	0.25
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.25

W Olive St and S 6th St Intersection

Crash Severity	4
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	0
Property Damage Only	4

Injury Status Summary	0
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	0
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	25,600.00
Average (per crash dollars):	6,400.00
Total Vehicles:	8.00
Average (per crash):	2.00
Total Occupants:	14.00
Average (per crash):	3.50

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.00
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.00

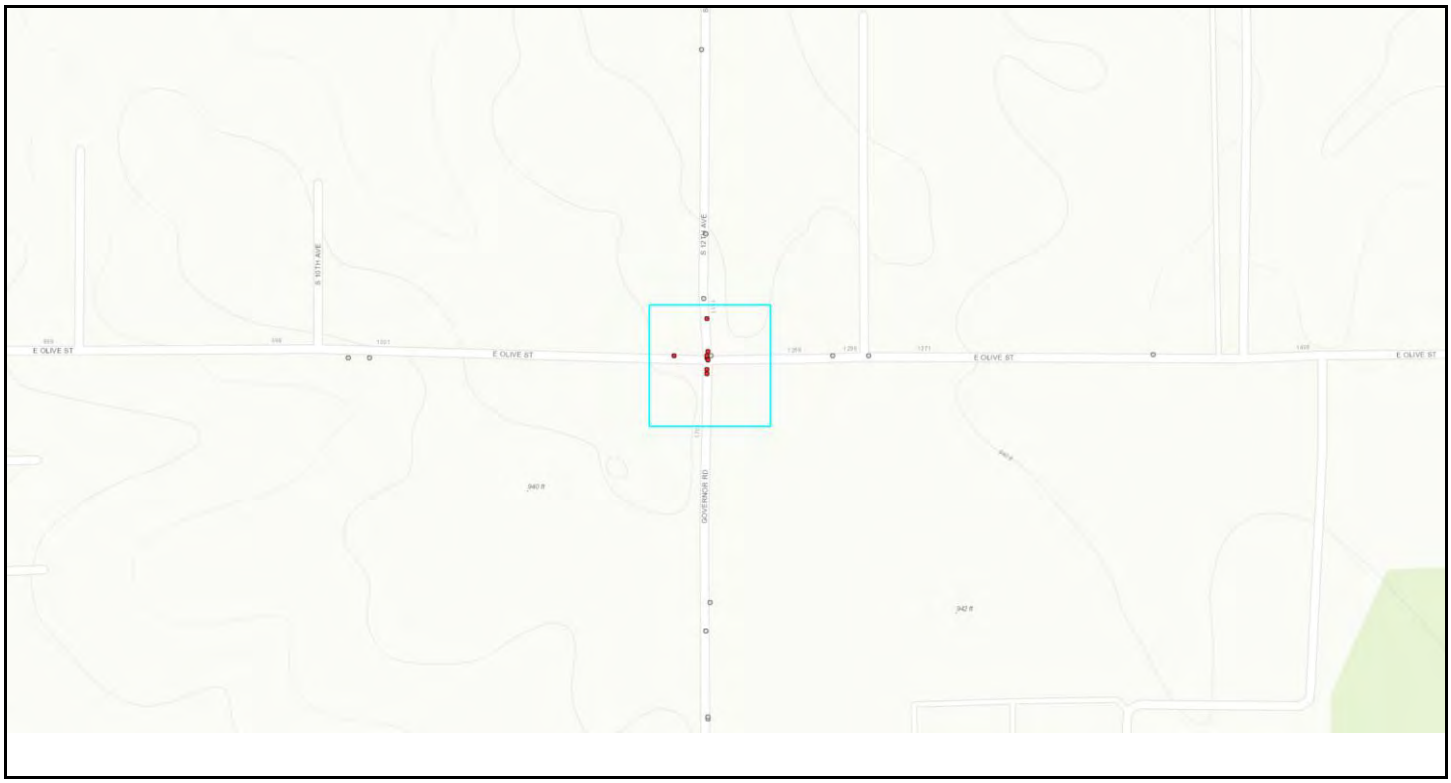
E Olive St and S 12th Ave Intersection

Crash Severity	13
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	4
Property Damage Only	6

Injury Status Summary	9
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	3
Possible (complaint of pain/injury)	6
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	109,000.00
Average (per crash dollars):	8,384.62
Total Vehicles:	25.00
Average (per crash):	1.92
Total Occupants:	36.00
Average (per crash):	2.77

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.69
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.23
Possible/Unknown Injuries/Crash:	0.46



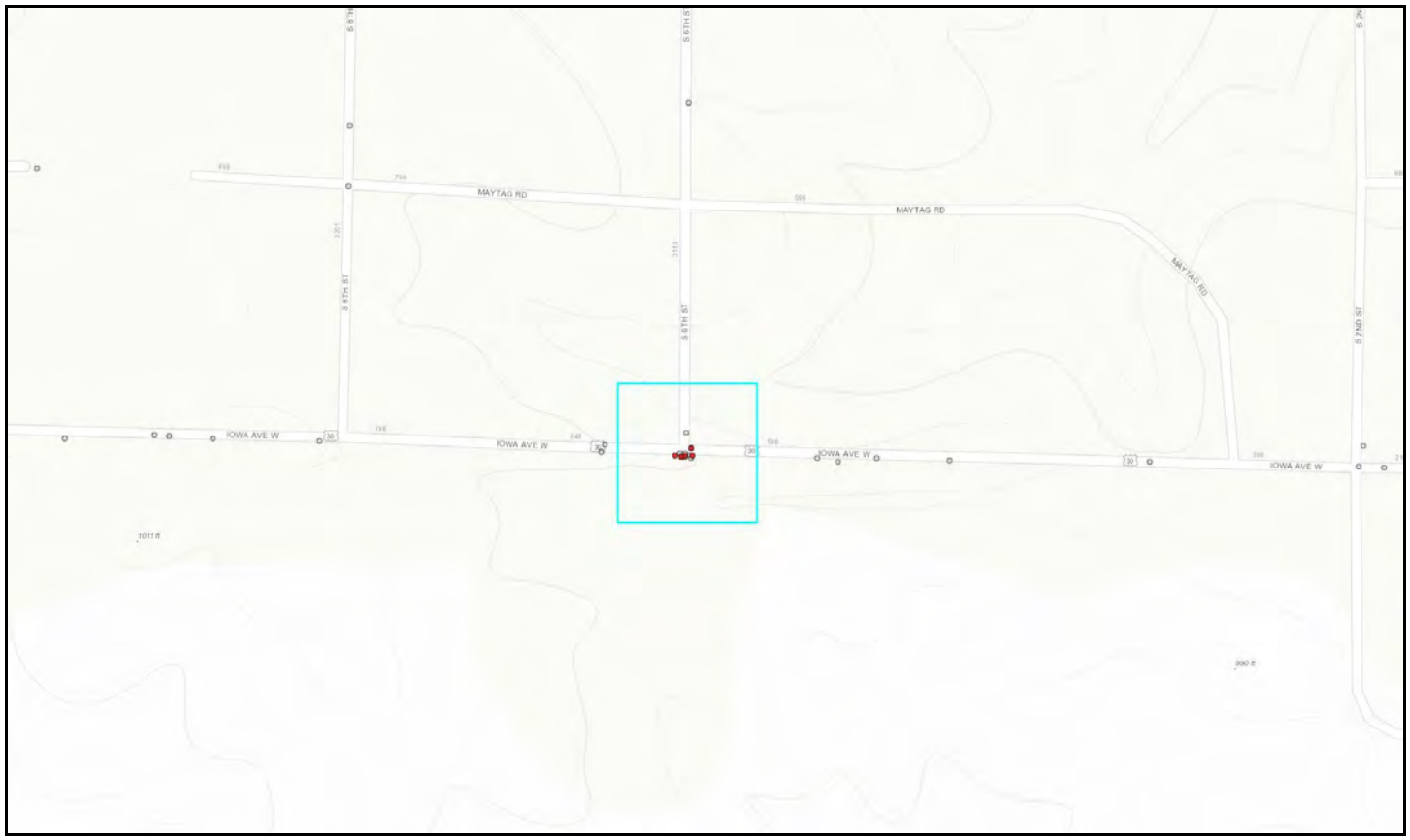
S 6th St and W Iowa Ave Intersection

Crash Severity	13
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	2
Property Damage Only	8

Injury Status Summary	6
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	3
Possible (complaint of pain/injury)	3
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	115,150.00
Average (per crash dollars):	8,857.69
Total Vehicles:	26.00
Average (per crash):	2.00
Total Occupants:	47.00
Average (per crash):	3.62

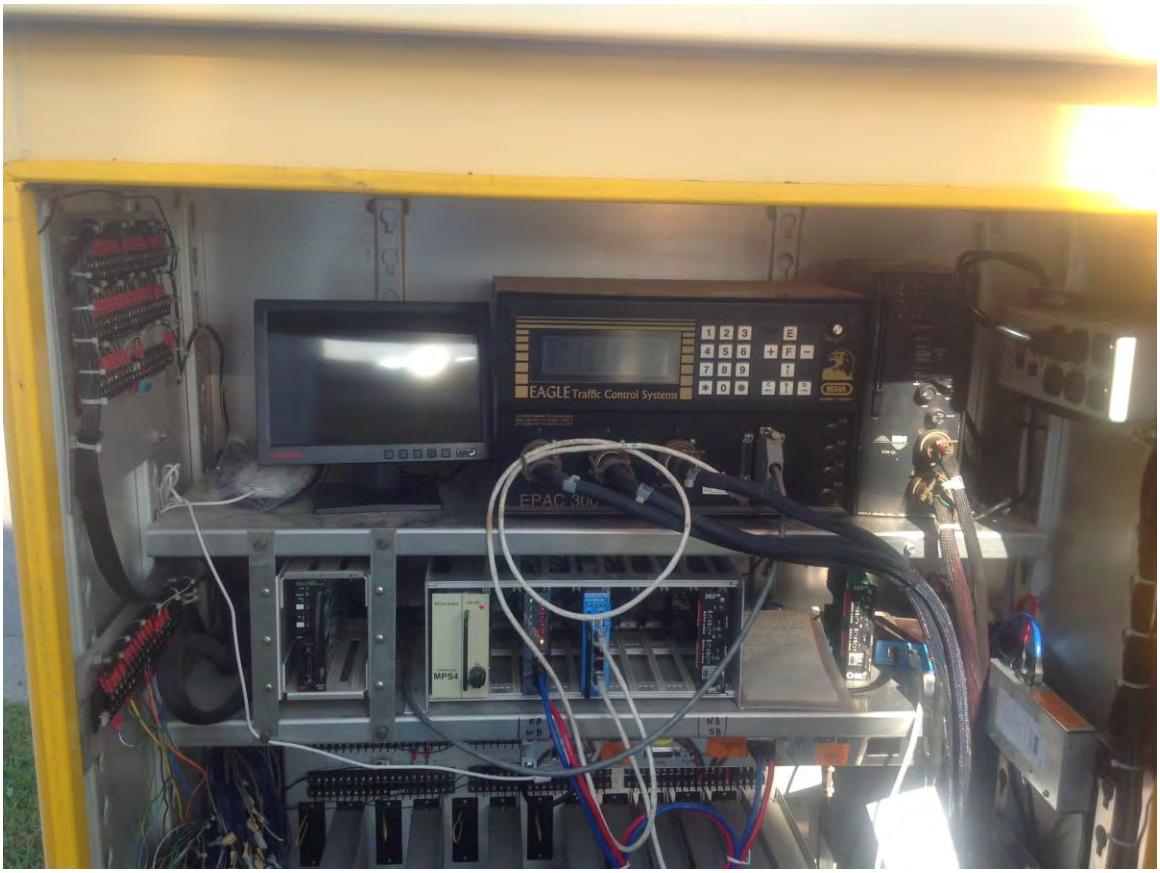
Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.46
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.23
Possible/Unknown Injuries/Crash:	0.23



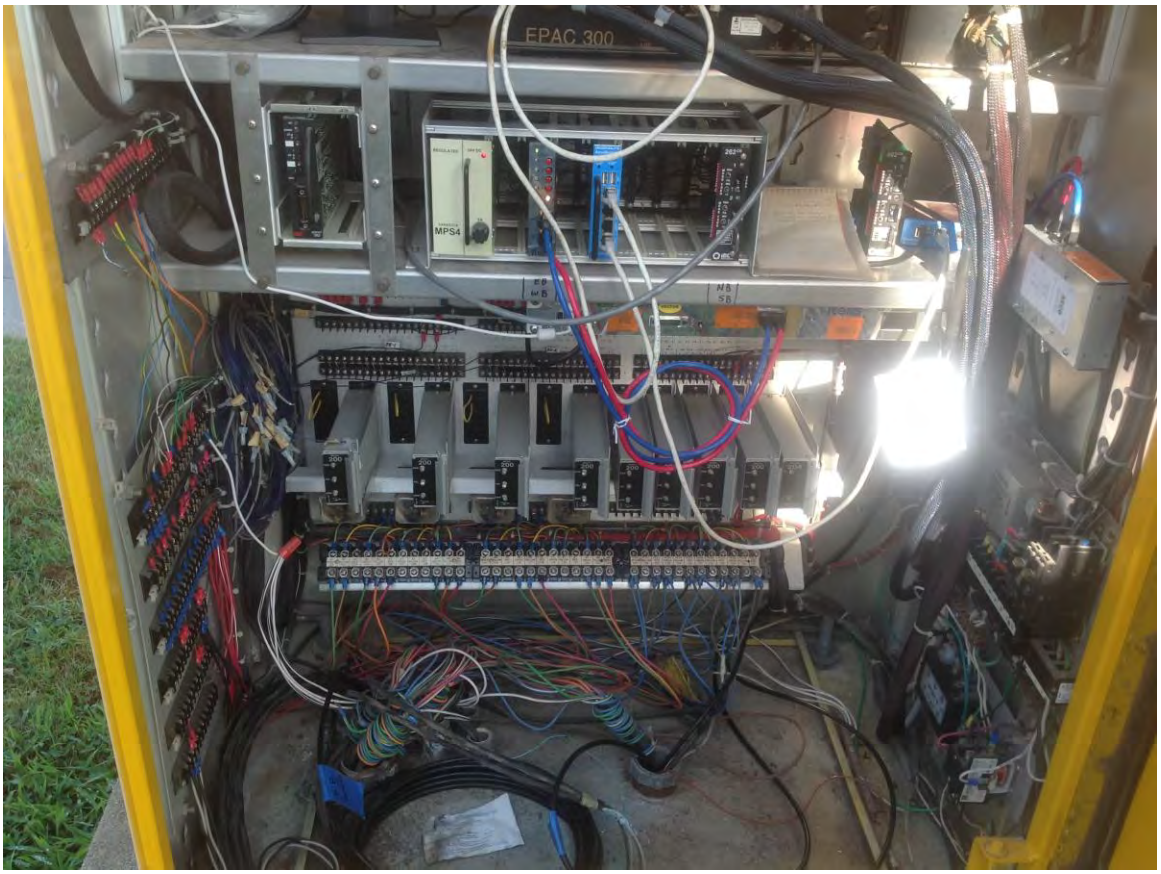
Traffic Control Cabinet at S. 1st Ave and E. Anson

Traffic Control Cabinet at S Center St and W Church St

Traffic Controls at S 1st Ave and E Anson St

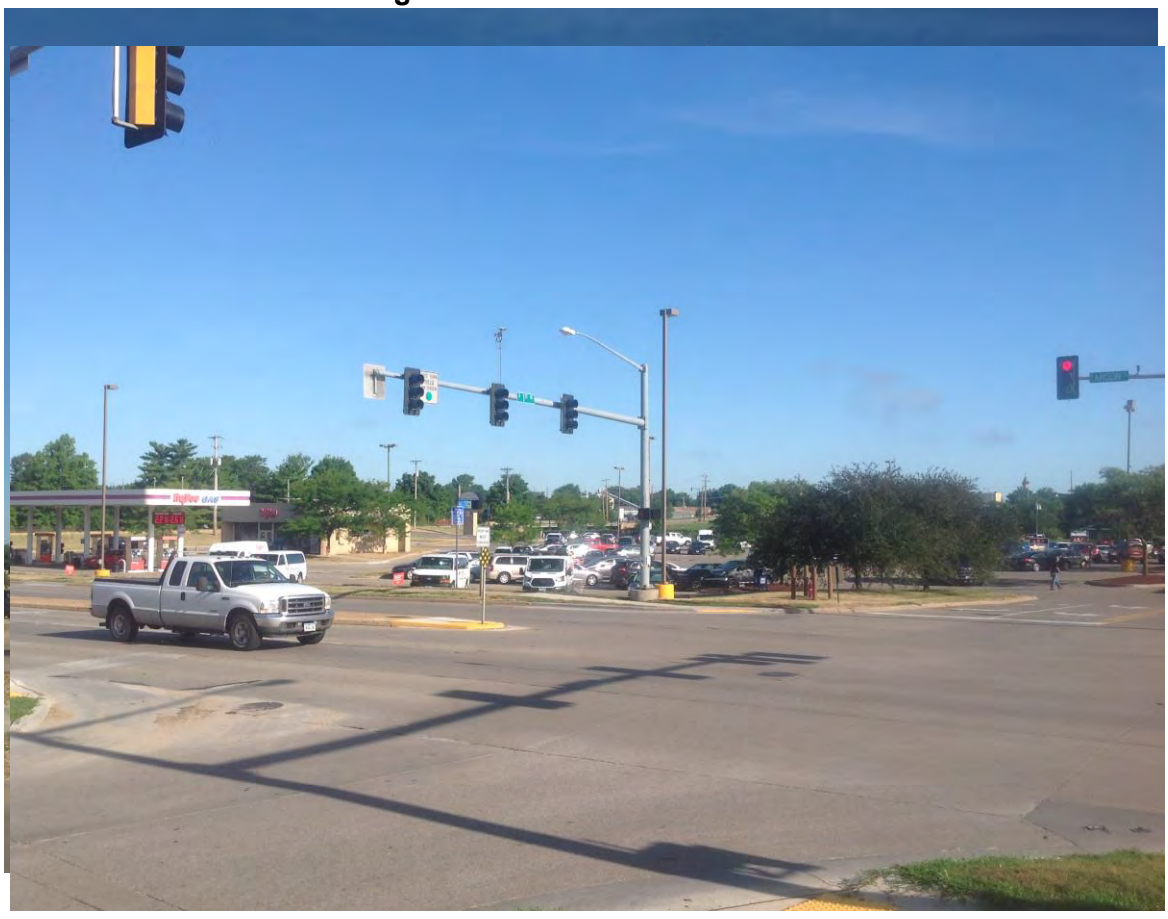


Traffic Controls at S. 1st Ave and E Anson St



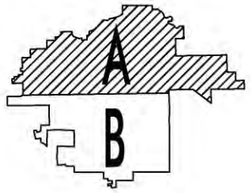
Traffic Light Pole at S. Center St and Church St

Traffic Light Pole S. 1st Ave and E. Anson St



Traffic Lights at S 1st Ave and E. Anson St

IOWADOT

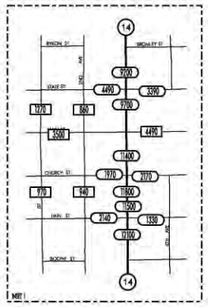


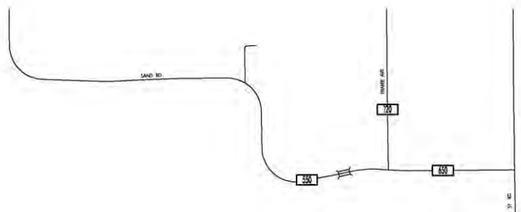
TRAFFIC FLOW MAP OF

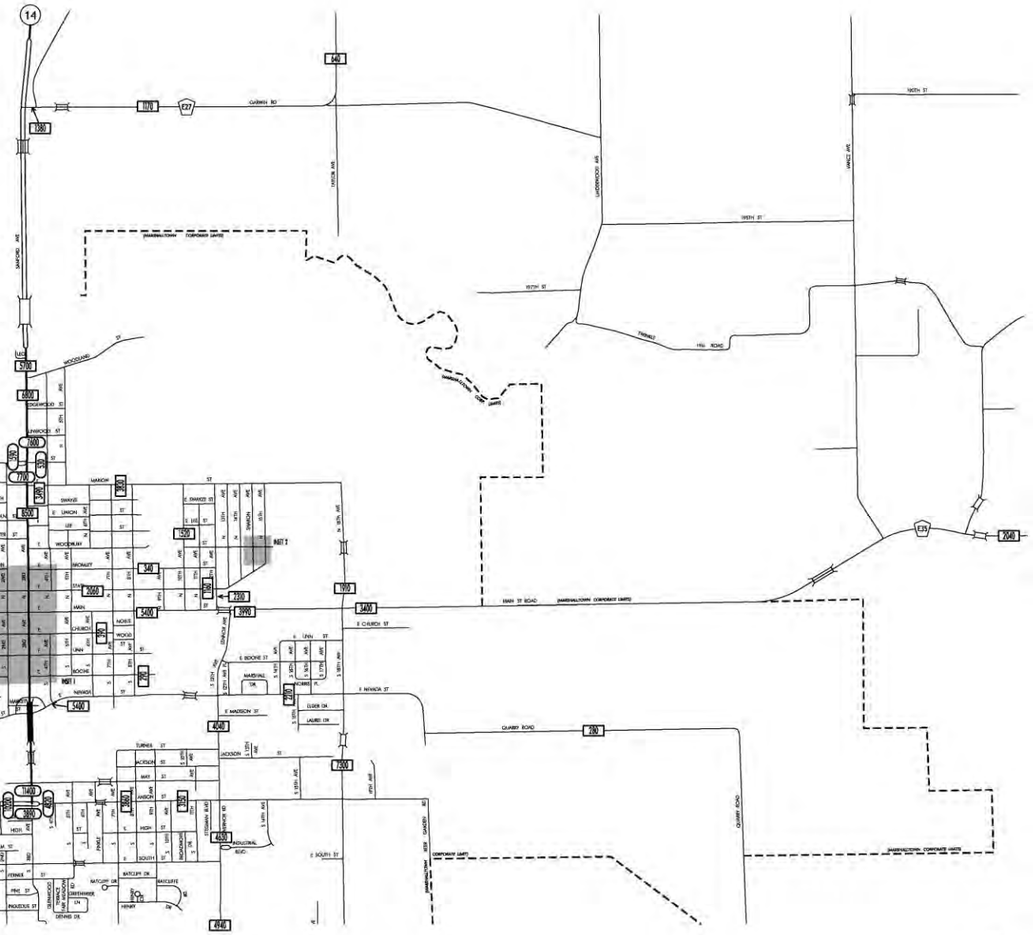
MARSHALLTOWN A

MARSHALL COUNTY

2017 ANNUAL AVERAGE DAILY TRAFFIC







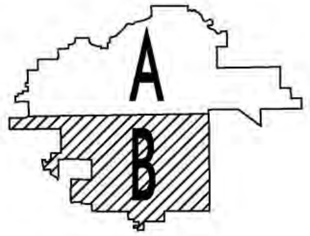
PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING AND PROGRAMMING
OFFICE OF SYSTEM PLANNING
PHONE (515) 239-1289

LEGEND

RECORDER ONLY
MANUAL COUNT

H

IOWADOT

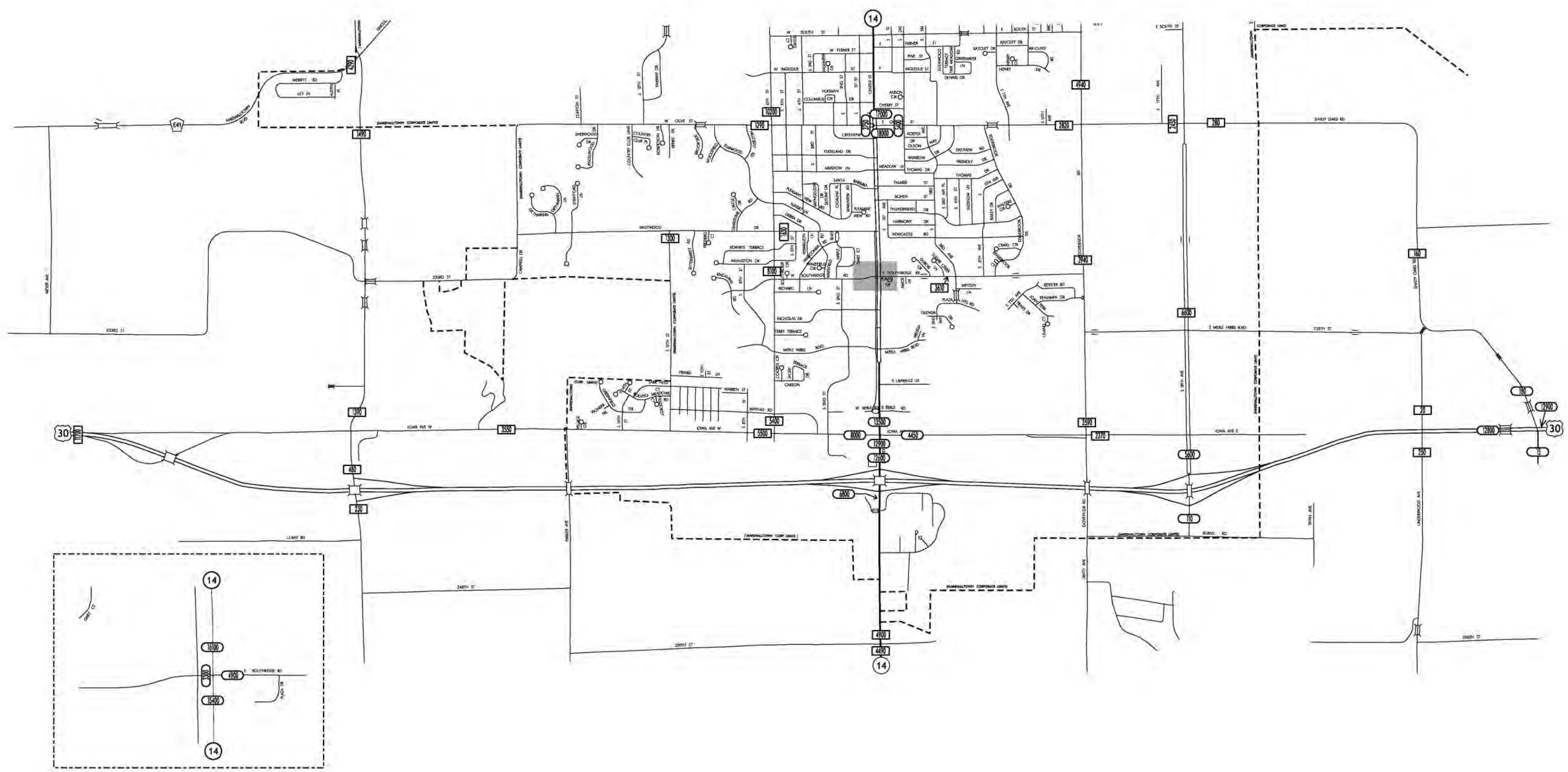


TRAFFIC FLOW MAP OF

MARSHALLTOWN B

MARSHALL COUNTY

2017 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

Application for TRAFFIC CONTROL DEVICE TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/31/2020

Location / Title of Project Traffic Signals, US 63 and C Ave & US 63 and 15th Ave

Applicant City of Oskaloosa

Contact Person Michael Schrock Title City Manager

Complete Mailing Address 220 South Market Street

Oskaloosa, IA 52577

Phone (641) 673-9431 E-Mail Michael.Schrock@oskaloosaiowa.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:

Funding Amount

Total Safety Cost	$	589,100
Total Project Cost	$	589,100
Safety Funds Requested	$	500,000

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☒ Yes – Explain 2018 Traffic Safety Study

☐ No

Rev. 5/18

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Oskaloosa, Iowa

Signed: Michael Schrock — August 4, 2020
Signature — Date Signed

Michael Schrock
Printed Name

Attest: Amy Miller — August 4, 2020
Signature — Date Signed

Amy Miller
Printed Name

RESOLUTION NO. 20-04-73

A RESOLUTION TO APPROVE AN AGREEMENT WITH MCCLURE ENGINEERING COMPANY TO PREPARE TRAFFIC SAFETY IMPROVEMENT PROGRAM GRANT APPLICATIONS

WHEREAS, on August 6, 2018, the City Council approved a comprehensive traffic study performed by Snyder and Associates, Inc. (will be known as 'study'), by Resolution No. 18-08-137, to improve traffic efficiency and safety, minimizing traffic delays and congestion, and allowing for future planning; and

WHEREAS, as a part of the study, improvements were recommended to convert to three-lane cross-section with continuous left-turn lane on A Avenue, between Highway 432 and the east corporate limits, and on Market Street, between 2nd Avenue and 16th Avenue; and

WHEREAS, as a part of the same study, improvements were also recommended to install new traffic signals at the intersection of Market Street and C Avenue and at the intersection of Market Street and 15th Avenue; and

WHEREAS, the Iowa Department of Transportation provides financial assistance under its Traffic Safety Improvement Program (TSIP) and the City Council of the City of Oskaloosa, Iowa, has heretofore deemed it appropriate to apply for the funding assistance to perform the above-mentioned improvements; and

WHEREAS, the City of Oskaloosa requires professional services associated with preparing the TSIP grant application; and

WHEREAS, McClure Engineering Company has prepared and presented an agreement for these professional services for an amount not to exceed [redacted] and

WHEREAS, the Council finds that the proposed agreement with McClure Engineering Company should be approved and the Mayor authorized to execute the same.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Oskaloosa, Iowa that the agreement between the City of Oskaloosa and McClure Engineering Company, for an amount not to exceed [redacted] is hereby approved and the Mayor is authorized to execute all related contract documents.

Passed by the Council the 20th day of April 2020, and approved this 20th day of April 2020.

David Krutzfeldt, Mayor

ATTEST:

Amy Miller, City Clerk

PROJECT NARRATIVE
US 63 / MARKET STREET AND C AVENUE &
US 63 / MARKET STREET AND 15TH AVENUE

Project Concept

In July 2018, the City of Oskaloosa completed a study through the Traffic Engineering Assistance Program (TEAP). This study reviewed existing conditions, reviewed crash history, conducted traffic volume counts, traffic signal warrant evaluations and traffic operations modeling. Iowa DOT review of the study resulted in concurrence with the conclusions.

The traffic signal warrant evaluation resulted in the recommendation of installing fully actuated traffic signals at two locations. These locations are:

- US 63/Market Street and C Avenue
- US 63/Market Street and 15th Avenue

Existing Conditions

The project includes improvements to the two intersections on US 63/Market Street at C Avenue and at 15th Avenue. Both locations are currently controlled by side street stop signs on the east-west minor approach lanes.

US 63/ Market Street, a north-south primary highway carrying traffic through Oskaloosa, is a 3-lane urban cross section from Glendale Road on the northern side of the city to 2nd Avenue, south of IA 92/A Avenue. Geometry at the C Avenue intersection includes a two-way-left-turn-lane (TWLTL) for the north-south directions. This area could be striped as dedicated left turn lanes once the intersection of C Avenue becomes signalized. The east-west directions are single-lane approaches.

US 63/Market Street is a 2-lane rural cross-section from the southern corporate limits to 16th Avenue with a posted speed limit of 45 mph. Market Street from 16th Avenue to 8th Avenue is a 4-lane urban cross-section with a posted speed limit of 35 mph. From 8th Street to 3rd Avenue, it is a 2-lane roadway with 35 mph speed limit. The intersection of 15th Avenue is in the 4-lane section. This corridor is under consideration for conversion to a 3-lane facility with TWLTLs. Regardless of whether US 63/Market Street remains four lanes or is reconfigured to three lanes, this intersection is recommended for signalization based on the recently completed 2018 traffic study.

Traffic Count Data

Per Iowa DOT traffic count data, the AADT on US 63/Market Street at C Avenue is approximately 8,300 vehicles per day (vpd). The AADT on US 63/Market Street is approximately 6,800 vpd. The mainline posted speed limit through both of these intersections is 35 mph.

Crash History

Failure to yield the right of way (FTYROW) from Stop Sign is the most frequently cited traffic incident at both of these intersections, sometimes resulting in injury. The most recent crash data was obtained for years 2015 through 2019. There were a total 19 crashes at the US 63/Market Street and C Avenue intersection. The predominate manner of collision was broadside (front to side) with more than half the crashes occurring in this manner. One-fourth of these crashes were injury crashes. The crash rate is 1.0 crashes per million entering vehicles (MEV) for this intersection. There were a total of 11 crashes at the US 63/Market Street and 15th Avenue intersection. Two were injury crashes. The crash rate is 0.7 crashes per MEV for this intersection.

Justification

The 2018 traffic study shows that both intersections satisfy all three volume-based signal warrants. The three volume-based signal warrants are: Warrant 1, Eight-Hour Vehicular Volume; Warrant 2, Four-Hour Vehicular Volume; and Warrant 3, Peak Hour. The traffic signal warrant analysis table, Table 1 is reproduced, in part, from the 2018 study report.

Table 1: Traffic Signal Warrant Analysis

Warrant	Market Street Intersecting with				
	15th Ave	2nd Ave	1st Ave	High Ave	C Ave
Warrant 1 - 8 Hour Volumes					
1A - Minimum Volume	Yes (8)	No (1)	No (0)	No (0)	Yes (8)
1B - Interruption of Continuous Traffic	No (3)	No (6)	No (7)	No (6)	No (7)
Warrant 2 - 4 Hour Volume	Yes (4)	No (2)	No (1)	No (1)	Yes (6)
Warrant 3 - Peak Hour					
3A - Peak Hour Delay	Not Evaluated				
3B - Peak Hour Volume	No	No	No	No	Yes

Warrant 1 (Eight Hour Vehicular Volume)

Condition A: 8 hours (of 8) for 15th Ave
Condition A: 8 hours (of 8) for C Ave
Warrant Met for 15th Ave
Warrant Met for C Ave

Warrant 2 (Four-Hour Vehicular Volume)

4 hours (of 4) for 15th Ave
6 hours (of 4) for C Ave
Warrant Met for 15th Ave
Warrant Met for C Ave

Warrant 3 (Peak Hour)

Warrant NOT Met for 15th Ave
Warrant Met for C Ave

Opinion of Probable Cost
US 63/Market Street and C Avenue
Traffic Signal Installation

Preliminary Engineer's Estimate

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	NEMA Controller, Cabinet and Accessories	EA	1	$ 25,000.00	$ 25,000.00
2	Four Camera Video Detection System	EA	1	$ 25,000.00	$ 25,000.00
3	GPS Receivers for Time-Base Control	EA	1	$ 800.00	$ 800.00
4	Mast Arm Signal Pole w/Single Luminaire Arm, 40 ft	EA	2	$ 15,000.00	$ 30,000.00
5	Mast Arm Signal Pole w/Single Luminaire Arm, 45 ft	EA	2	$ 17,000.00	$ 34,000.00
6	Pedestrian Pedestal Pole	EA	6	$ 3,000.00	$ 18,000.00
7	Pedestrian Push Buttons with Sign R10-3E	EA	6	$ 400.00	$ 2,400.00
8	3-Sec. Signal Heads, 12" RYG w/Backplate	EA	10	$ 900.00	$ 9,000.00
9	1-Sec. Hand/Man w/Countdown Timer Pedestrian Heads	EA	6	$ 1,200.00	$ 7,200.00
10	2" Rigid PVC Conduit, Trenched	LF	150	$ 10.00	$ 1,500.00
11	3" Rigid Conduit, Trenched	LF	50	$ 15.00	$ 750.00
12	3" Rigid Conduit, Pushed	LF	300	$ 35.00	$ 10,500.00
13	4" Rigid Conduit, Trenched	LF	50	$ 20.00	$ 1,000.00
14	Power Service	EA	1	$ 3,000.00	$ 3,000.00
15	Power Supply Cable for Street Lighting	LF	1000	$ 1.25	$ 1,250.00
16	Belden Coaxial Cable for Detection Cameras	LF	800	$ 2.50	$ 2,000.00
17	Power Cable for Detection Cameras	LF	800	$ 1.75	$ 1,400.00
18	Signal Cables	LS	1	$ 10,000.00	$ 10,000.00
19	Wye Connectors	EA	12	$ 60.00	$ 720.00
20	Luminaire - LED Series	EA	4	$ 1,700.00	$ 6,800.00
21	Concrete Pad for Controller	EA	1	$ 2,000.00	$ 2,000.00
22	Concrete Base, 3.0' Dia. Footings	EA	4	$ 4,000.00	$ 16,000.00
23	Concrete Pedestal Base, Type FIII, 2.0' Dia x 3.0' deep	EA	6	$ 1,000.00	$ 6,000.00
24	Handhole, Type I 24" Poured or Precast, Ring & Cover	EA	4	$ 1,200.00	$ 4,800.00
25	Handhole, Type II, 30"x48"x36"D Tub w/Lid	EA	1	$ 1,800.00	$ 1,800.00
26	Street Name Signs, Mast Arm Mounted	EA	4	$ 800.00	$ 3,200.00
27	Left-Turn Only Overhead Sign (30"x36") R3-5L	EA	2	$ 500.00	$ 1,000.00
28	Uninterruptible Power Supply	EA	1	$ 5,000.00	$ 5,000.00
29	Traffic Control	LS	1	$ 3,500.00	$ 3,500.00
30	Mobilization	LS	1	$ 10,000.00	$ 10,000.00
			Sub Total Signals		**$ 243,620.00**
			Engineering - Legal - Administration (15%)		$ 36,543.00
			Signals Total		**$ 281,000.00**

Opinion of Probable Cost
US 63/Market Street and 15th Avenue
Traffic Signal Installation

Preliminary Engineer's Estimate

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	NEMA Controller, Cabinet and Accessories	EA	1	$ 25,000.00	$ 25,000.00
2	Four Camera Video Detection System	EA	1	$ 25,000.00	$ 25,000.00
3	GPS Receivers for Time-Base Control	EA	1	$ 800.00	$ 800.00
4	Mast Arm Signal Pole w/Single Luminaire Arm, 40 ft	EA	2	$ 15,000.00	$ 30,000.00
5	Mast Arm Signal Pole w/Single Luminaire Arm, 45 ft	EA	2	$ 17,000.00	$ 34,000.00
6	Pedestrian Pedestal Pole	EA	2	$ 3,000.00	$ 6,000.00
7	Pedestrian Push Buttons with Sign R10-3E	EA	2	$ 400.00	$ 800.00
8	3-Sec. Signal Heads, 12" RYG w/Backplate	EA	10	$ 900.00	$ 9,000.00
9	1-Sec. Hand/Man w/Countdown Timer Pedestrian Heads	EA	2	$ 1,200.00	$ 2,400.00
10	2" Rigid PVC Conduit, Trenched	LF	100	$ 10.00	$ 1,000.00
11	3" Rigid Conduit, Trenched	LF	50	$ 15.00	$ 750.00
12	3" Rigid Conduit, Pushed	LF	300	$ 35.00	$ 10,500.00
13	4" Rigid Conduit, Trenched	LF	50	$ 20.00	$ 1,000.00
14	Power Service	EA	1	$ 3,000.00	$ 3,000.00
15	Power Supply Cable for Street Lighting	LF	1000	$ 1.25	$ 1,250.00
16	Belden Coaxial Cable for Detection Cameras	LF	800	$ 2.50	$ 2,000.00
17	Power Cable for Detection Cameras	LF	800	$ 1.75	$ 1,400.00
18	Signal Cables	LS	1	$ 10,000.00	$ 10,000.00
19	Wye Connectors	EA	12	$ 60.00	$ 720.00
20	Luminaire - LED Series	EA	4	$ 1,700.00	$ 6,800.00
21	Concrete Pad for Controller	EA	1	$ 2,000.00	$ 2,000.00
22	Concrete Base, 3.0' Dia. Footings	EA	4	$ 4,000.00	$ 16,000.00
23	Concrete Pedestal Base, Type FIII, 2.0' Dia x 3.0' deep	EA	2	$ 1,000.00	$ 2,000.00
24	Handhole, Type I 24" Poured or Precast, Ring & Cover	EA	4	$ 1,200.00	$ 4,800.00
25	Handhole, Type II, 30"x48"x36"D Tub w/Lid	EA	1	$ 1,800.00	$ 1,800.00
26	Street Name Signs, Mast Arm Mounted	EA	4	$ 800.00	$ 3,200.00
27	Left-Turn Only Overhead Sign (30"x36") R3-5L	EA	2	$ 500.00	$ 1,000.00
28	Uninterruptible Power Supply	EA	1	$ 5,000.00	$ 5,000.00
29	Traffic Control	LS	1	$ 3,500.00	$ 3,500.00
30	Mobilization	LS	1	$ 10,000.00	$ 10,000.00
			Sub Total Signals		**$ 220,720.00**
			Engineering - Legal - Administration (15%)		$ 33,108.00
			Signals Total		**$ 254,000.00**

Opinion of Probable Cost
US 63/Market Street and C Avenue
Roadway Improvements

Preliminary Engineer's Estimate

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Curb and Gutter, 2.5', 7 IN.	LF	10	$ 72.00	$ 720.00
2	PCC Pavement Samples and Testing	LS	1	$ 600.00	$ 600.00
3	Removal of Sidewalk, Shared Use Path, or Driveway	SY	5	$ 18.00	$ 90.00
4	Curb and Gutter Removal	LF	10	$ 18.00	$ 180.00
5	Construction Survey	LS	1	$ 1,200.00	$ 1,200.00
6	Mobilization	LS	1	$ 1,200.00	$ 1,200.00
7	Concrete Washout	LS	1	$ 300.00	$ 300.00
			Sub Total Roadway		**$ 4,290.00**
			Engineering - Legal - Administration (15%)		$ 643.50
			Roadway Total		**$ 5,000.00**

Opinion of Probable Cost
US 63/Market Street and 15th Avenue
Roadway Improvements

Preliminary Engineer's Estimate

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Pavement, PCC, 6 IN.	SY	635	$ 42.00	$ 26,670.00
2	PCC Pavement Samples and Testing	LS	1	$ 1,200.00	$ 1,200.00
3	PCC Sidewalk, 4 IN.	SY	30	$ 54.00	$ 1,620.00
4	PCC Sidewalk, 6 IN.	SY	10	$ 66.00	$ 660.00
5	Detectable Warnings	SF	20	$ 60.00	$ 1,200.00
6	Pavement Removal	SY	180	$ 18.00	$ 3,240.00
7	Construction Survey	LS	1	$ 6,000.00	$ 6,000.00
8	Mobilization	LS	1	$ 2,400.00	$ 2,400.00
9	Concrete Washout	LS	1	$ 600.00	$ 600.00
			Sub Total Roadway		**$ 43,590.00**
			Engineering - Legal - Administration (15%)		$ 6,538.50
			Roadway Total		**$ 51,000.00**

Opinion of Probable Cost
US 63/Market Street Signals
Project Totals

Preliminary Engineer's Estimate

	Description	Extended Price
	Traffic Signal Installation at US 63 and C Avenue	$ 243,620.00
	Traffic Signal Installation at US 63 and 15th Avenue	$ 220,720.00
	Roadway Subtotal at US 63 and C Avenue	$ 4,290.00
	Roadway Subtotal at US 63 and 15th Avenue	$ 43,590.00
	Engineering (15%)	$ 76,833.00
		$ 589,053.00

PROPOSED PROJECT SCHEDULE

Task	Start Date	End Date
TSIP Award Notification	Jan 15, 2021	NA
Task 1 Preliminary Plans	Jan 15, 2021	Mar 16, 2021
Task 2 Check Plans	Mar 16, 2021	Apr 6, 2021
Task 3 Final Plans	Apr 6, 2021	May 18, 2021
Task 4 Contracts Turn In	June 1, 2021	NA
Task 5 Project Bid & Letting	Aug 17, 2021	NA
Task 6 Project Construction	Aug 17, 2021	Nov 15, 2021
* Traffic Safety Improvement Program Funds Available **July 1, 2021**		

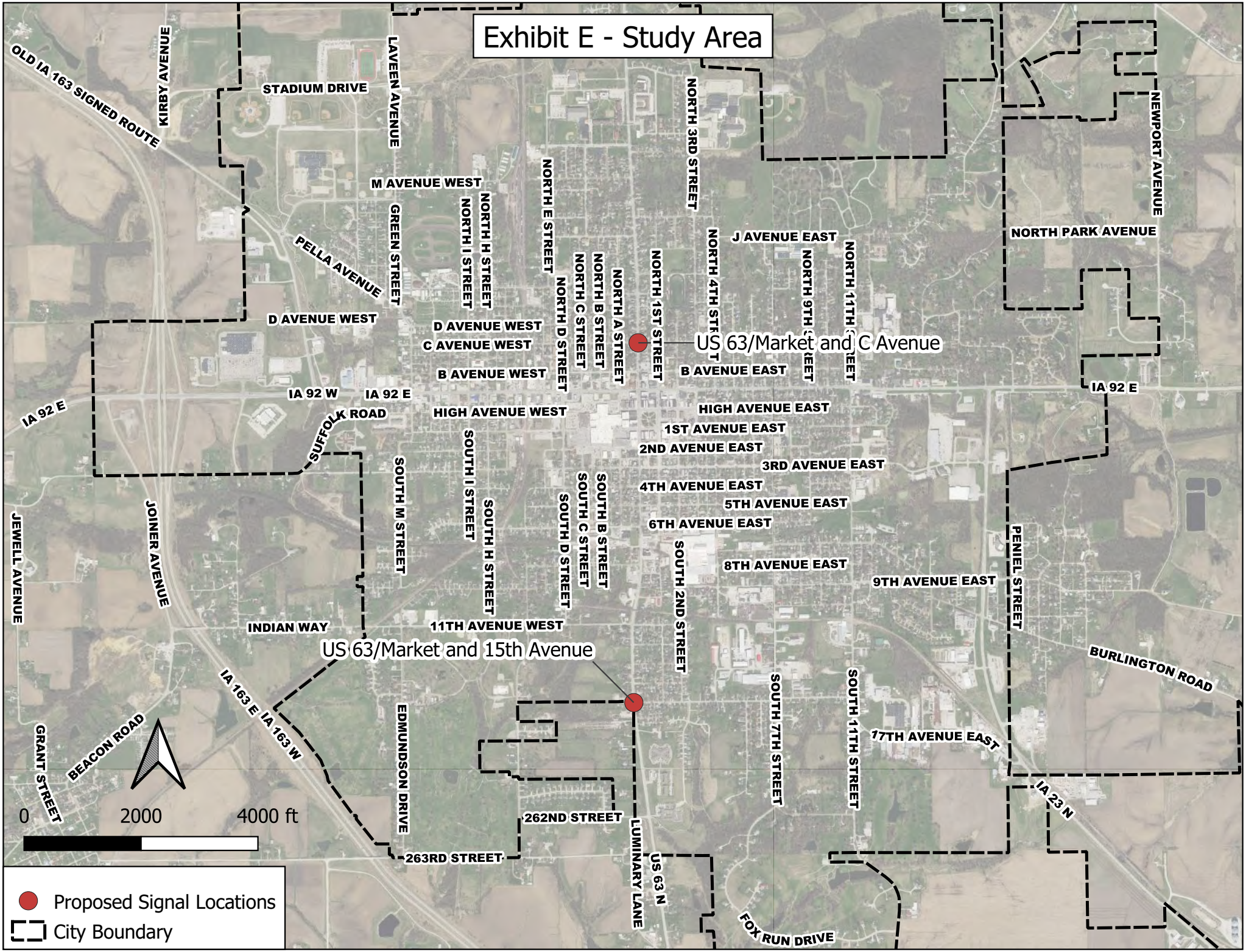


Exhibit E - Study Area
OLD IA 163 SIGNED ROUTE
KIRBY AVENUE
STADIUM DRIVE
LAVEEN AVENUE
M AVENUE WEST
GREEN STREET
NORTH I STREET
NORTH H STREET
NORTH E STREET
NORTH 3RD STREET
NEWPORT AVENUE
NORTH PARK AVENUE
PELLA AVENUE
J AVENUE EAST
NORTH 9TH STREET
NORTH 11TH STREET
NORTH 4TH STREET
NORTH 1ST STREET
NORTH A STREET
NORTH B STREET
NORTH C STREET
NORTH D STREET
D AVENUE WEST
C AVENUE WEST
B AVENUE WEST
B AVENUE EAST
US 63/Market and C Avenue
IA 92 W
IA 92 E
IA 92 E
IA 92 E
SUFFOLK ROAD
HIGH AVENUE WEST
HIGH AVENUE EAST
1ST AVENUE EAST
2ND AVENUE EAST
3RD AVENUE EAST
4TH AVENUE EAST
5TH AVENUE EAST
6TH AVENUE EAST
8TH AVENUE EAST
9TH AVENUE EAST
SOUTH M STREET
SOUTH I STREET
SOUTH H STREET
SOUTH D STREET
SOUTH C STREET
SOUTH B STREET
SOUTH 2ND STREET
JOINER AVENUE
JEWELL AVENUE
PENIEL STREET
INDIAN WAY
11TH AVENUE WEST
US 63/Market and 15th Avenue
BURLINGTON ROAD
IA 163 E
IA 163 W
BEACON ROAD
GRANT STREET
EDMUNDSON DRIVE
SOUTH 7TH STREET
SOUTH 11TH STREET
77TH AVENUE EAST
IA 23 N
262ND STREET
263RD STREET
LUMINARY LANE
US 63 N
FOX RUN DRIVE
0
2000
4000 ft
Proposed Signal Locations
City Boundary

COLOR PHOTOS

Looking north on US 63/Market Street at C Avenue

Looking south on US 63/Market Street at C Avenue

COLOR PHOTOS

Looking west on C Avenue at US 63/Market Street

Looking east on C Avenue at US 63/Market Street

COLOR PHOTOS

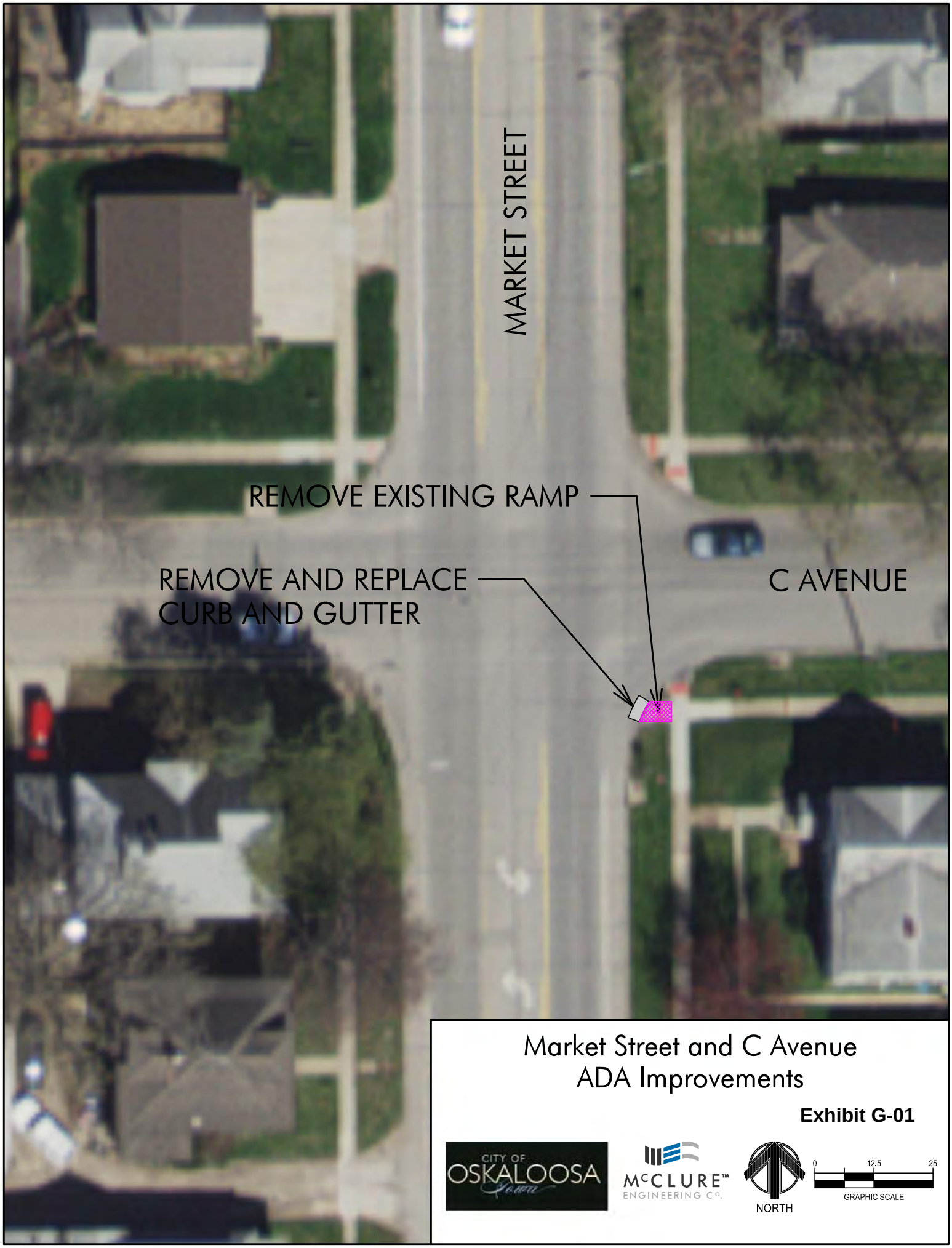
Looking north on US 63/Market Street at 15th Avenue

Looking south on US 63/Market Street at 15th Avenue

COLOR PHOTOS

Looking west on 15th Avenue at US 63/Market Street

Looking west at east side of 15th Avenue and US 63/Market Street



Market Street and C Avenue
ADA Improvements

Exhibit G-01

CITY OF OSKALOOSA

McCLURE™ ENGINEERING CO.

NORTH

0 12.5 25

GRAPHIC SCALE

15th Avenue and Market Street
Church Driveway Alternative #1

Exhibit G-02

CITY OF OSKALOOSA

McCLURE™ ENGINEERING CO.

NORTH

0 25 50

GRAPHIC SCALE

15th Avenue and Market Street
Church Driveway Alternative #2

Exhibit G-03

McCLURE™ ENGINEERING CO.

NORTH

0 25 50

GRAPHIC SCALE

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

62223794099

Count Date:

Thursday, June 14, 2018

County:

Mahaska

Location Description:

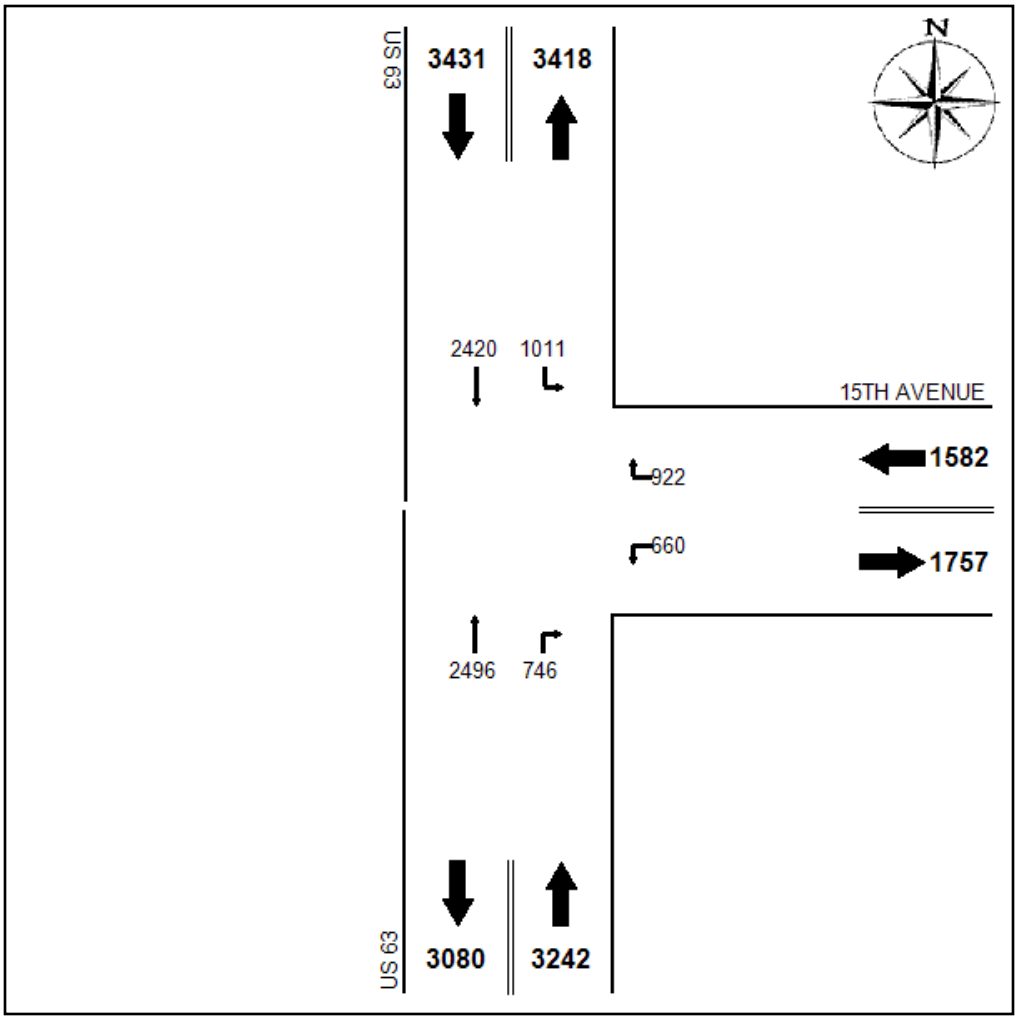
US 63 & 15TH AVE E

Volume Factor: 1.773

Pass Class Factor: 1.837

SU Class Factor: 1.477

Combo Class Factor: 1.428



Raw Data-All Vehicles:

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	53	175	57	57	158	74
08:00	45	117	43	52	158	55
11:00	61	137	33	60	165	50
12:00	84	181	45	81	200	51
15:00	94	239	70	70	196	55
16:00	101	248	58	96	249	85
17:00	120	250	67	91	266	53

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

62225694099

Count Date:

Wednesday, August 08, 2018

County:

Mahaska

Location Description:

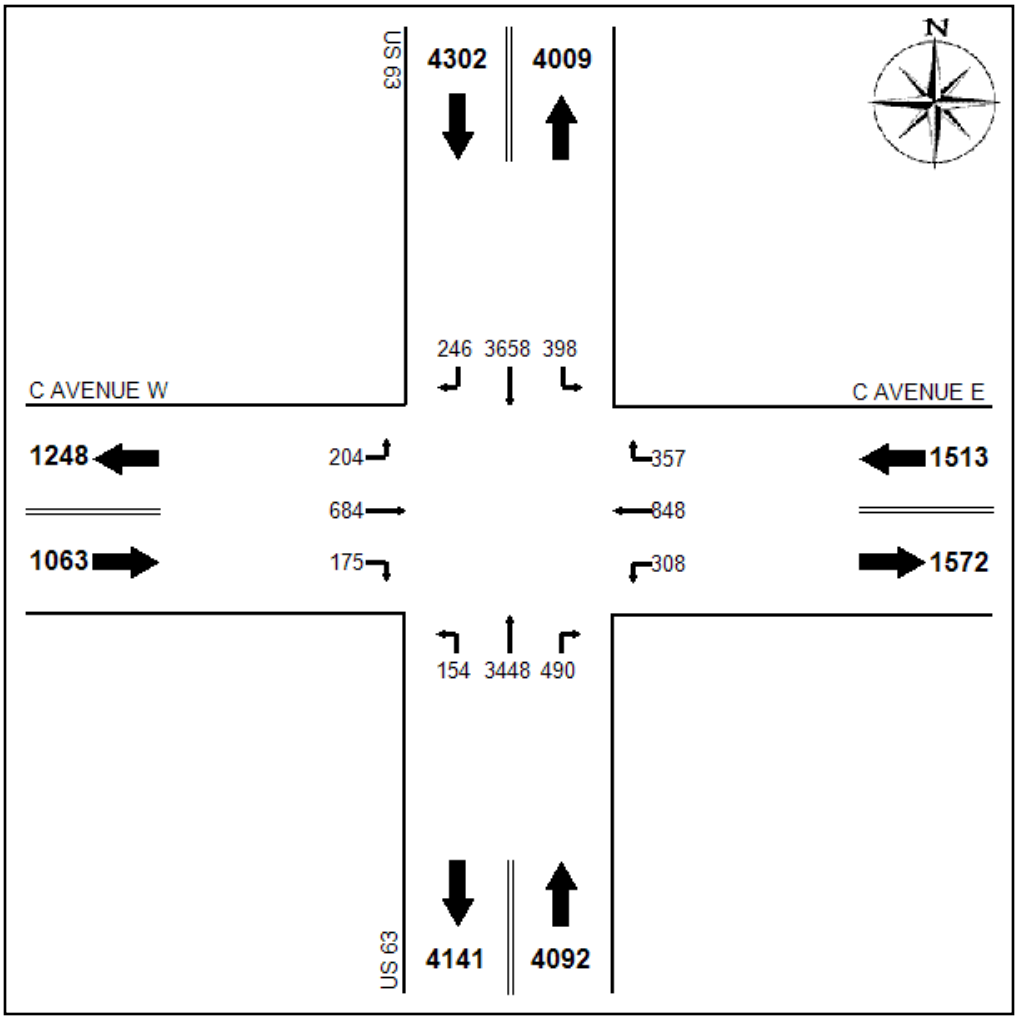
US 63 & C AVE

Volume Factor: 0.890

Pass Class Factor: 0.918

SU Class Factor: 0.771

Combo Class Factor: 0.723



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
00:00	2	25	2	0	2	5	3	25	6	1	1	1
01:00	1	9	0	4	4	4	0	17	3	1	4	1
02:00	2	9	2	0	1	1	0	23	3	0	2	0
03:00	3	8	0	1	3	0	0	15	1	0	2	0
04:00	1	36	2	6	10	1	2	21	3	2	3	1
05:00	6	90	2	15	14	5	3	70	7	2	4	3
06:00	18	186	12	11	43	7	3	140	16	6	22	8
07:00	32	262	18	14	51	19	4	189	13	3	32	12
08:00	27	250	11	19	57	28	13	187	18	6	39	14
09:00	26	247	18	15	53	14	9	204	28	14	52	10
10:00	27	223	17	20	68	27	8	220	28	17	50	14
11:00	26	253	9	32	56	20	7	215	42	11	41	9
12:00	32	301	29	26	62	36	15	271	43	16	45	10
13:00	25	250	14	16	54	18	8	268	26	21	45	10
14:00	28	293	18	20	67	36	9	270	31	14	43	16
15:00	33	290	22	24	57	35	15	257	43	24	81	12
16:00	35	290	27	23	82	32	16	335	40	21	72	19
17:00	27	257	15	19	77	32	24	315	45	17	65	16
18:00	24	236	13	23	54	15	7	200	36	13	39	12

Snyder & Associates, Inc.

Ankeny, Iowa

Exhibit H-03

Oskaloosa Traffic Signal Study
15th Ave & Market St
Oskaloosa, IA

File Name : TMC10_Market_15_170328
Site Code : 10
Start Date : 3/28/2017
Page No : 1

Groups Printed- Cars - Hvy Veh

	Market St Southbound					15th Ave Westbound					Market St Northbound					15th Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	6	37	0	0	43	13	0	11	0	24	0	27	2	0	29	0	0	0	0	0	96
06:15 AM	7	23	0	0	30	12	0	11	0	23	0	17	9	0	26	0	0	0	0	0	79
06:30 AM	17	47	0	0	64	8	0	14	0	22	0	36	15	0	51	0	0	0	0	0	137
06:45 AM	16	42	0	0	58	19	0	21	0	40	0	37	12	0	49	0	0	0	0	0	147
Total	46	149	0	0	195	52	0	57	0	109	0	117	38	0	155	0	0	0	0	0	459
07:00 AM	13	54	0	0	67	18	0	19	0	37	0	29	24	0	53	0	0	0	0	0	157
07:15 AM	12	51	0	0	63	26	0	23	0	49	0	37	20	0	57	0	0	0	0	0	169
07:30 AM	13	65	0	0	78	24	0	19	0	43	0	74	26	0	100	0	0	0	0	0	221
07:45 AM	21	36	0	0	57	10	0	22	0	32	0	76	26	0	102	0	0	0	0	0	191
Total	59	206	0	0	265	78	0	83	0	161	0	216	96	0	312	0	0	0	0	0	738
08:00 AM	29	40	0	0	69	18	0	16	0	34	0	66	19	0	85	0	0	0	0	0	188
08:15 AM	15	44	0	0	59	10	0	16	0	26	0	43	16	0	59	0	0	0	0	0	144
08:30 AM	7	45	0	0	52	10	0	13	0	23	0	35	17	0	52	0	0	0	0	0	127
08:45 AM	9	44	0	0	53	11	0	19	0	30	0	39	12	0	51	0	0	0	0	0	134
Total	60	173	0	0	233	49	0	64	0	113	0	183	64	0	247	0	0	0	0	0	593
09:00 AM	11	28	0	0	39	7	0	11	0	18	0	44	9	0	53	0	0	0	0	0	110
09:15 AM	8	41	0	0	49	5	0	15	0	20	0	49	14	0	63	0	0	0	0	0	132
09:30 AM	10	33	0	0	43	6	0	8	0	14	0	34	4	0	38	0	0	0	0	0	95
09:45 AM	11	45	0	0	56	13	0	8	0	21	0	48	11	0	59	0	0	0	0	0	136
Total	40	147	0	0	187	31	0	42	0	73	0	175	38	0	213	0	0	0	0	0	473
10:00 AM	9	39	0	0	48	12	0	17	0	29	0	43	9	0	52	0	0	0	0	0	129
10:15 AM	10	35	0	0	45	13	0	12	0	25	0	42	13	0	55	0	0	0	0	0	125
10:30 AM	13	31	0	0	44	8	0	11	0	19	0	38	15	0	53	0	0	0	0	0	116
10:45 AM	11	52	0	0	63	10	0	11	0	21	0	47	12	0	59	0	0	0	0	0	143
Total	43	157	0	0	200	43	0	51	0	94	0	170	49	0	219	0	0	0	0	0	513
11:00 AM	18	46	0	0	64	6	0	19	0	25	0	40	7	0	47	0	0	0	0	0	136
11:15 AM	16	44	0	0	60	11	0	16	0	27	0	32	14	0	46	0	0	0	0	0	133
11:30 AM	19	35	0	0	54	6	0	13	0	19	0	37	14	0	51	0	0	0	0	0	124
11:45 AM	17	41	0	0	58	14	0	16	0	30	0	60	14	0	74	0	0	0	0	0	162
Total	70	166	0	0	236	37	0	64	0	101	0	169	49	0	218	0	0	0	0	0	555
12:00 PM	21	41	0	0	62	9	0	20	0	29	0	43	9	0	52	0	0	0	0	0	143
12:15 PM	20	44	0	0	64	10	0	22	0	32	0	39	11	0	50	0	0	0	0	0	146
12:30 PM	19	35	0	0	54	7	0	18	0	25	0	40	14	0	54	0	0	0	0	0	133
12:45 PM	24	39	0	0	63	7	0	12	0	19	0	52	17	0	69	0	0	0	0	0	151
Total	84	159	0	0	243	33	0	72	0	105	0	174	51	0	225	0	0	0	0	0	573
01:00 PM	20	41	0	0	61	8	0	21	0	29	0	52	19	0	71	0	0	0	0	0	161
01:15 PM	15	42	0	0	57	11	0	21	0	32	0	35	13	0	48	0	0	0	0	0	137
01:30 PM	16	45	0	0	61	7	0	15	0	22	0	44	11	0	55	0	0	0	0	0	138
01:45 PM	21	41	0	0	62	13	0	17	0	30	0	49	16	0	65	0	0	0	0	0	157
Total	72	169	0	0	241	39	0	74	0	113	0	180	59	0	239	0	0	0	0	0	593
02:00 PM	21	38	0	0	59	7	0	15	0	22	0	48	10	0	58	0	0	0	0	0	139
02:15 PM	20	52	0	0	72	13	0	23	0	36	0	39	9	0	48	0	0	0	0	0	156
02:30 PM	10	46	0	0	56	12	0	28	0	40	0	53	8	0	61	0	0	0	0	0	157
02:45 PM	17	51	0	0	68	10	0	15	0	25	0	42	9	0	51	0	0	0	0	0	144
Total	68	187	0	0	255	42	0	81	0	123	0	182	36	0	218	0	0	0	0	0	596
03:00 PM	20	66	0	0	86	11	0	14	0	25	0	54	12	0	66	0	0	0	0	0	177
03:15 PM	28	50	0	0	78	15	0	15	0	30	0	45	17	0	62	0	0	0	0	0	170
03:30 PM	28	88	0	0	116	14	0	23	0	37	0	70	13	0	83	0	0	0	0	0	236
03:45 PM	36	60	0	0	96	24	0	22	0	46	0	68	20	0	88	0	0	0	0	0	230
Total	112	264	0	0	376	64	0	74	0	138	0	237	62	0	299	0	0	0	0	0	813

Snyder & Associates, Inc.

Ankeny, Iowa

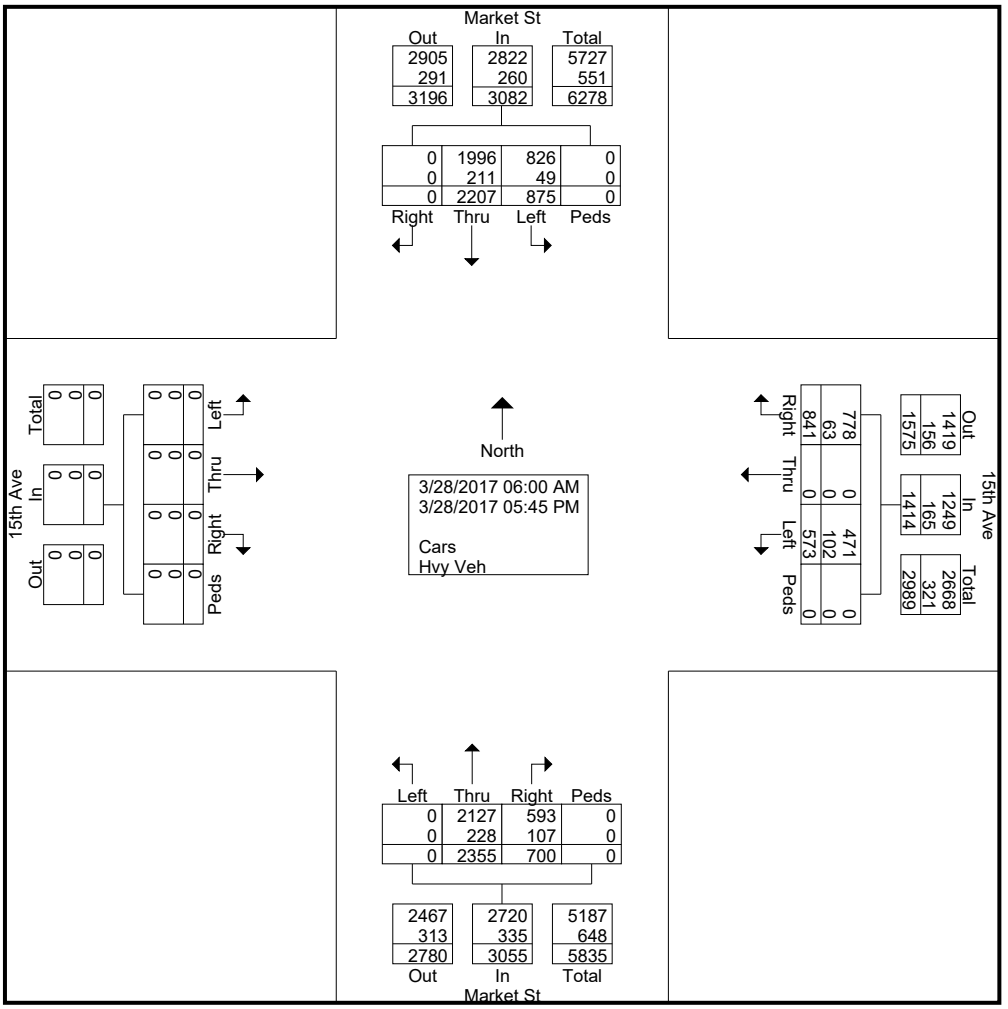
Exhibit H-04

Oskaloosa Traffic Signal Study
15th Ave & Market St
Oskaloosa, IA

File Name : TMC10_Market_15_170328
Site Code : 10
Start Date : 3/28/2017
Page No : 2

Groups Printed- Cars - Hvy Veh

	Market St Southbound					15th Ave Westbound					Market St Northbound					15th Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	26	51	0	0	77	20	0	27	0	47	0	70	22	0	92	0	0	0	0	0	216
04:15 PM	36	55	0	0	91	14	0	14	0	28	0	73	11	0	84	0	0	0	0	0	203
04:30 PM	25	58	0	0	83	11	0	21	0	32	0	73	28	0	101	0	0	0	0	0	216
04:45 PM	18	45	0	0	63	23	0	22	0	45	0	78	27	0	105	0	0	0	0	0	213
Total	105	209	0	0	314	68	0	84	0	152	0	294	88	0	382	0	0	0	0	0	848
05:00 PM	39	78	0	0	117	9	0	25	0	34	0	62	17	0	79	0	0	0	0	0	230
05:15 PM	28	55	0	0	83	9	0	28	0	37	0	89	14	0	103	0	0	0	0	0	223
05:30 PM	29	38	0	0	67	10	0	17	0	27	0	60	21	0	81	0	0	0	0	0	175
05:45 PM	20	50	0	0	70	9	0	25	0	34	0	47	18	0	65	0	0	0	0	0	169
Total	116	221	0	0	337	37	0	95	0	132	0	258	70	0	328	0	0	0	0	0	797
Grand Total	875	2207	0	0	3082	573	0	841	0	1414	0	2355	700	0	3055	0	0	0	0	0	7551
Apprch %	28.4	71.6	0	0		40.5	0	59.5	0		0	77.1	22.9	0		0	0	0	0		
Total %	11.6	29.2	0	0	40.8	7.6	0	11.1	0	18.7	0	31.2	9.3	0	40.5	0	0	0	0	0	
Cars	826	1996	0	0	2822	471	0	778	0	1249	0	2127	593	0	2720	0	0	0	0	0	6791
% Cars	94.4	90.4	0	0	91.6	82.2	0	92.5	0	88.3	0	90.3	84.7	0	89	0	0	0	0	0	89.9
Hvy Veh	49	211	0	0	260	102	0	63	0	165	0	228	107	0	335	0	0	0	0	0	760
% Hvy Veh	5.6	9.6	0	0	8.4	17.8	0	7.5	0	11.7	0	9.7	15.3	0	11	0	0	0	0	0	10.1



Snyder & Associates, Inc.

Exhibit H-05

Oskaloosa Traffic Signal Study
C Ave East & Market St
Oskaloosa, IA

File Name : TMC14_Market_C_170328
Site Code : 14
Start Date : 3/28/2017
Page No : 1

Groups Printed- Cars - Hvy Veh

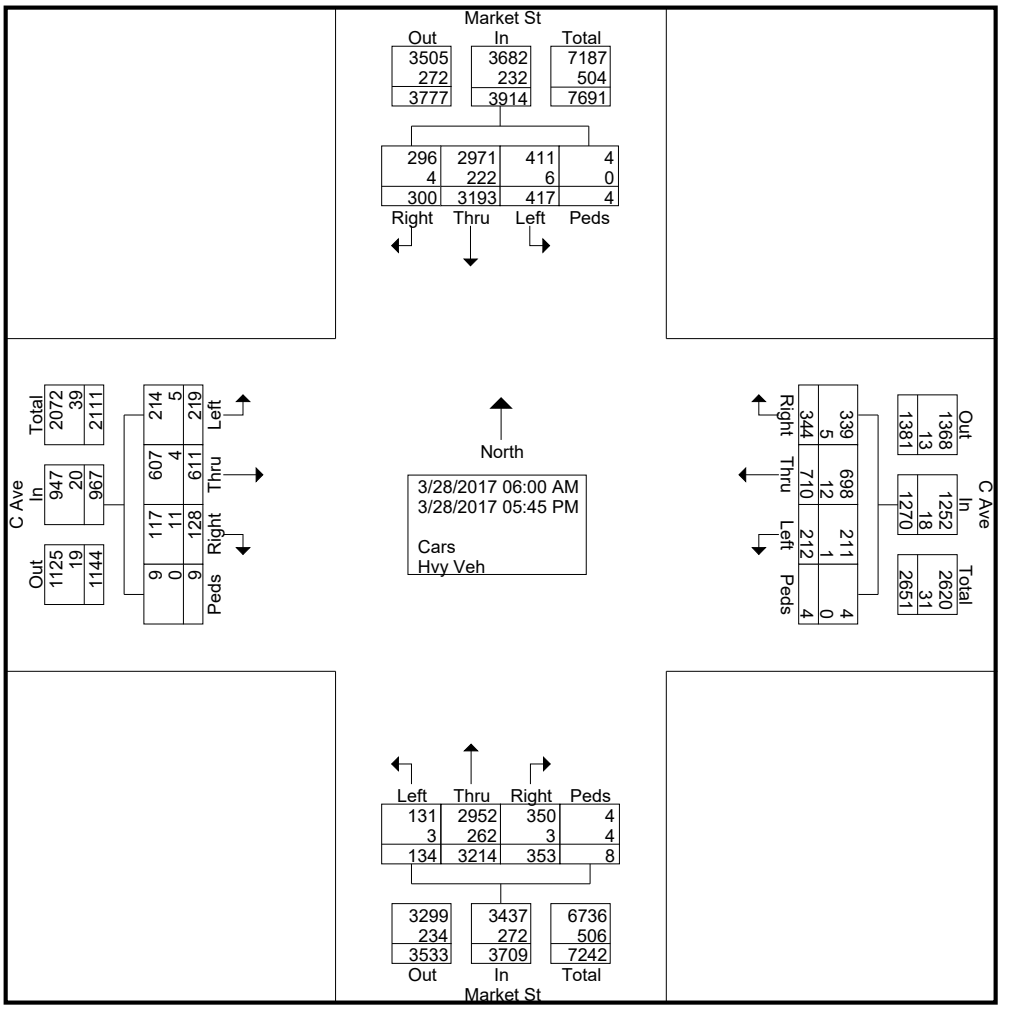
	Market St Southbound					C Ave Westbound					Market St Northbound					C Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	4	30	1	0	35	9	14	4	0	27	2	30	0	0	32	1	0	0	0	1	95
06:15 AM	1	32	0	0	33	2	6	6	0	14	0	30	4	0	34	2	4	0	0	6	87
06:30 AM	4	42	5	0	51	2	7	4	0	13	1	34	1	0	36	0	6	1	0	7	107
06:45 AM	13	49	2	0	64	2	8	4	0	14	0	62	6	0	68	0	3	5	0	8	154
Total	22	153	8	0	183	15	35	18	0	68	3	156	11	0	170	3	13	6	0	22	443
07:00 AM	4	51	4	0	59	4	13	4	0	21	1	39	2	0	42	3	9	4	0	16	138
07:15 AM	4	76	8	0	88	2	15	6	0	23	3	53	5	1	62	3	11	1	0	15	188
07:30 AM	11	66	15	0	92	1	23	10	0	34	2	74	10	0	86	6	7	0	0	13	225
07:45 AM	18	92	10	0	120	2	23	15	0	40	2	130	8	0	140	4	17	5	0	26	326
Total	37	285	37	0	359	9	74	35	0	118	8	296	25	1	330	16	44	10	0	70	877
08:00 AM	14	71	16	0	101	3	19	10	0	32	5	136	10	0	151	12	20	7	0	39	323
08:15 AM	11	72	8	0	91	2	14	5	0	21	1	40	6	0	47	3	12	4	0	19	178
08:30 AM	5	65	5	0	75	2	11	4	0	17	1	47	6	0	54	3	12	2	1	18	164
08:45 AM	13	58	5	0	76	6	12	2	0	20	0	44	4	0	48	3	13	3	0	19	163
Total	43	266	34	0	343	13	56	21	0	90	7	267	26	0	300	21	57	16	1	95	828
09:00 AM	6	48	7	0	61	3	8	5	0	16	2	44	4	0	50	6	8	5	1	20	147
09:15 AM	4	55	1	0	60	4	6	8	0	18	2	57	4	0	63	4	6	3	1	14	155
09:30 AM	7	57	3	0	67	6	14	8	0	28	1	70	5	0	76	3	9	1	0	13	184
09:45 AM	13	59	5	0	77	5	10	3	0	18	2	54	7	0	63	1	5	1	0	7	165
Total	30	219	16	0	265	18	38	24	0	80	7	225	20	0	252	14	28	10	2	54	651
10:00 AM	9	58	4	0	71	3	4	6	1	14	3	54	5	0	62	2	7	0	0	9	156
10:15 AM	4	64	1	1	70	3	7	2	0	12	6	53	3	1	63	1	6	1	0	8	153
10:30 AM	4	55	3	0	62	3	10	4	0	17	3	60	10	0	73	1	11	2	0	14	166
10:45 AM	11	58	6	0	75	12	17	5	0	34	3	47	5	0	55	1	11	1	0	13	177
Total	28	235	14	1	278	21	38	17	1	77	15	214	23	1	253	5	35	4	0	44	652
11:00 AM	14	66	3	0	83	0	16	3	0	19	0	72	3	0	75	9	15	2	0	26	203
11:15 AM	5	55	4	0	64	3	15	9	0	27	5	55	2	0	62	7	5	4	1	17	170
11:30 AM	3	69	16	0	88	3	17	5	0	25	3	55	12	0	70	5	10	2	0	17	200
11:45 AM	8	60	2	0	70	6	18	13	0	37	1	82	8	0	91	7	9	2	0	18	216
Total	30	250	25	0	305	12	66	30	0	108	9	264	25	0	298	28	39	10	1	78	789
12:00 PM	10	79	9	0	98	7	21	11	0	39	4	86	10	0	100	8	18	2	0	28	265
12:15 PM	6	61	5	0	72	4	17	4	0	25	5	62	7	0	74	5	17	3	0	25	196
12:30 PM	10	52	3	0	65	4	16	4	1	25	3	66	6	0	75	8	21	1	0	30	195
12:45 PM	11	68	4	0	83	4	11	1	0	16	1	71	5	0	77	2	12	3	0	17	193
Total	37	260	21	0	318	19	65	20	1	105	13	285	28	0	326	23	68	9	0	100	849
01:00 PM	6	68	7	0	81	5	18	6	1	30	1	56	5	0	62	4	10	4	0	18	191
01:15 PM	5	71	7	0	83	8	14	5	0	27	1	64	6	0	71	4	14	2	0	20	201
01:30 PM	7	66	5	0	78	3	16	5	0	24	0	68	9	4	81	2	13	4	0	19	202
01:45 PM	7	64	6	1	78	5	16	7	0	28	2	63	6	0	71	7	10	3	0	20	197
Total	25	269	25	1	320	21	64	23	1	109	4	251	26	4	285	17	47	13	0	77	791
02:00 PM	6	63	5	0	74	8	14	9	0	31	5	74	10	0	89	5	12	1	1	19	213
02:15 PM	4	49	3	1	57	3	16	7	0	26	3	62	5	0	70	5	14	2	0	21	174
02:30 PM	8	80	11	0	99	5	18	11	1	35	3	65	7	0	75	2	13	2	0	17	226
02:45 PM	8	74	7	0	89	1	19	5	0	25	4	76	11	0	91	2	9	4	3	18	223
Total	26	266	26	1	319	17	67	32	1	117	15	277	33	0	325	14	48	9	4	75	836
03:00 PM	14	111	10	0	135	6	14	7	0	27	5	78	9	0	92	3	12	5	0	20	274
03:15 PM	13	75	5	1	94	4	12	10	0	26	3	69	11	0	83	9	33	4	0	46	249
03:30 PM	26	128	23	0	177	4	15	13	0	32	2	68	7	0	77	8	14	4	0	26	312
03:45 PM	18	93	8	0	119	6	16	10	0	32	3	80	11	0	94	5	22	3	0	30	275
Total	71	407	46	1	525	20	57	40	0	117	13	295	38	0	346	25	81	16	0	122	1110
04:00 PM	9	83	8	0	100	7	18	5	0	30	3	84	10	1	98	6	19	2	0	27	255
04:15 PM	9	84	6	0	99	5	19	10	0	34	3	71	11	0	85	5	24	2	0	31	249
04:30 PM	6	81	7	0	94	10	20	8	0	38	4	87	9	0	100	6	18	4	0	28	260

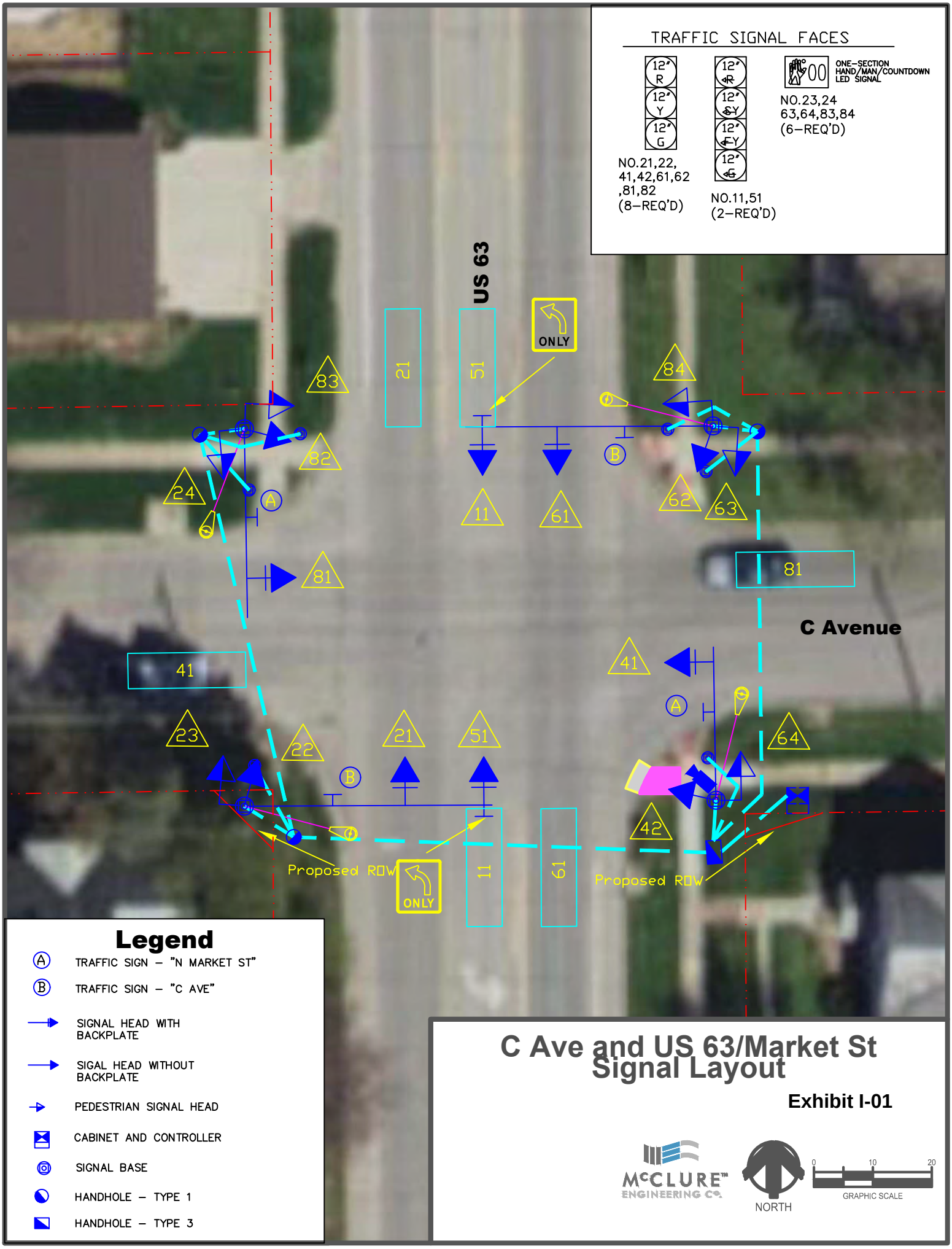
Oskaloosa Traffic Signal Study
C Ave East & Market St
Oskaloosa, IA

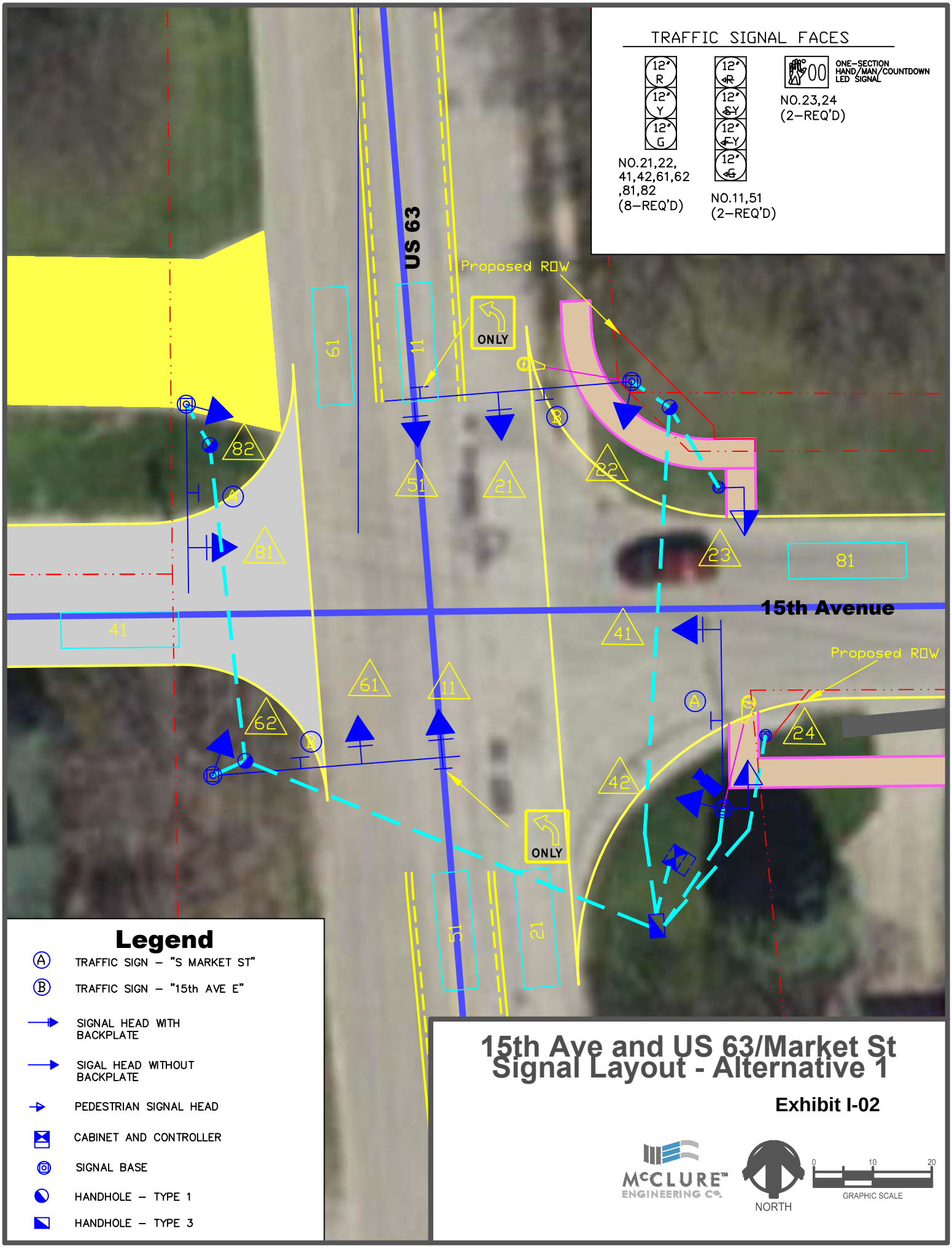
File Name : TMC14_Market_C_170328
Site Code : 14
Start Date : 3/28/2017
Page No : 2

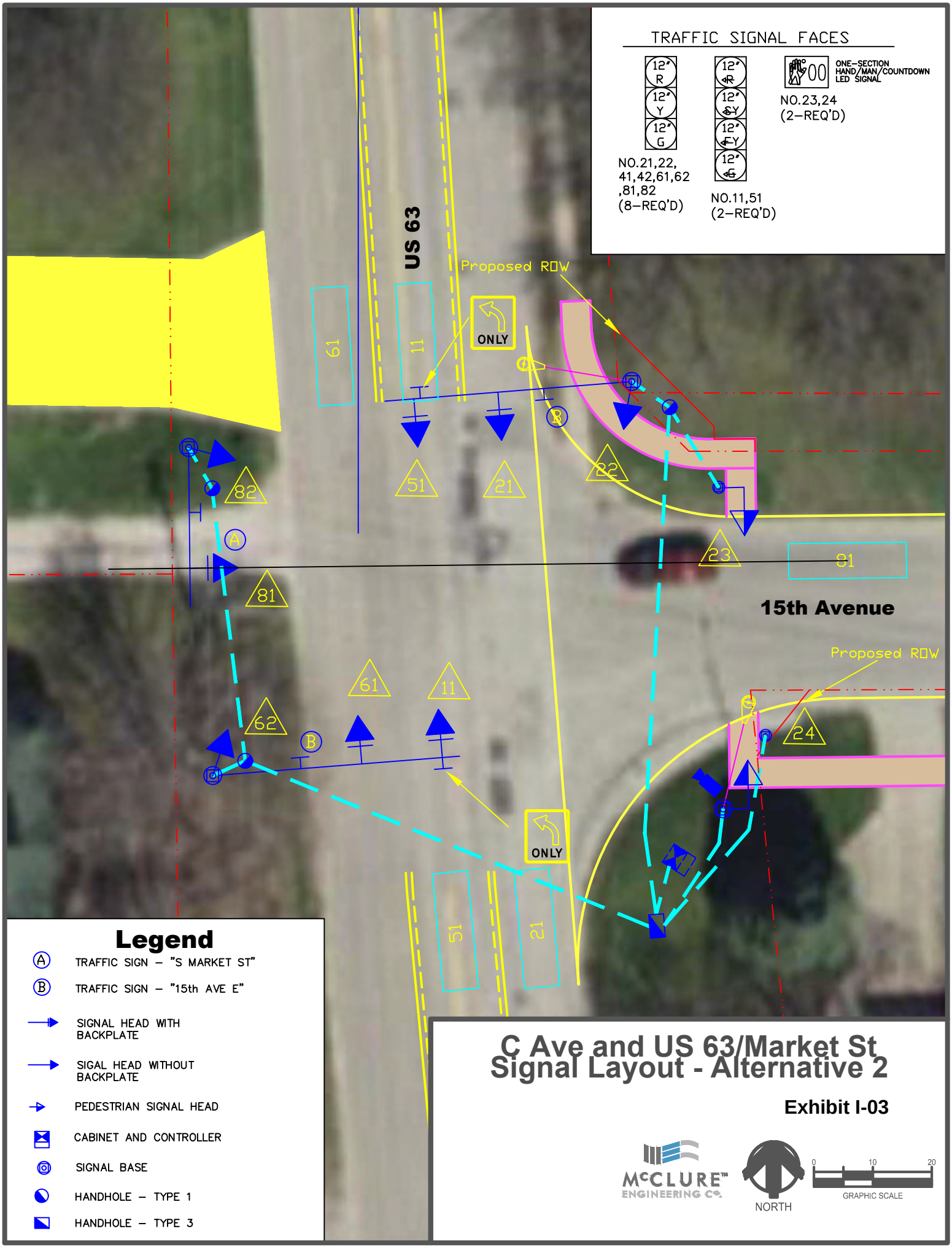
Groups Printed- Cars - Hvy Veh

	Market St Southbound					C Ave Westbound					Market St Northbound					C Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:45 PM	10	81	6	0	97	3	23	11	0	37	7	108	22	0	137	5	18	5	0	28	299
Total	34	329	27	0	390	25	80	34	0	139	17	350	52	1	420	22	79	13	0	114	1063
05:00 PM	7	81	7	0	95	10	24	17	0	51	7	112	13	0	132	9	19	4	0	32	310
05:15 PM	10	78	8	0	96	9	26	16	0	51	10	94	20	1	125	11	22	5	1	39	311
05:30 PM	9	63	6	0	78	2	13	14	0	29	5	90	8	0	103	4	25	0	0	29	239
05:45 PM	8	32	0	0	40	1	7	3	0	11	1	38	5	0	44	7	6	3	0	16	111
Total	34	254	21	0	309	22	70	50	0	142	23	334	46	1	404	31	72	12	1	116	971
Grand Total	417	3193	300	4	3914	212	710	344	4	1270	134	3214	353	8	3709	219	611	128	9	967	9860
Apprch %	10.7	81.6	7.7	0.1		16.7	55.9	27.1	0.3		3.6	86.7	9.5	0.2		22.6	63.2	13.2	0.9		
Total %	4.2	32.4	3	0	39.7	2.2	7.2	3.5	0	12.9	1.4	32.6	3.6	0.1	37.6	2.2	6.2	1.3	0.1	9.8	
Cars	411	2971	296	4	3682	211	698	339	4	1252	131	2952	350	4	3437	214	607	117	9	947	9318
% Cars	98.6	93	98.7	100	94.1	99.5	98.3	98.5	100	98.6	97.8	91.8	99.2	50	92.7	97.7	99.3	91.4	100	97.9	94.5
Hvy Veh	6	222	4	0	232	1	12	5	0	18	3	262	3	4	272	5	4	11	0	20	542
% Hvy Veh	1.4	7	1.3	0	5.9	0.5	1.7	1.5	0	1.4	2.2	8.2	0.8	50	7.3	2.3	0.7	8.6	0	2.1	5.5




TRAFFIC SIGNAL FACES
12" R
12" Y
12" G
NO.21,22,
41,42,61,62
,81,82
(8–REQ'D)
12" R
12" Y
12" Y
12" G
NO.11,51
(2–REQ'D)
ONE–SECTION
HAND/MAN/COUNTDOWN
LED SIGNAL
NO.23,24
63,64,83,84
(6–REQ'D)
US 63
C Avenue
ONLY
ONLY
Proposed ROW
Proposed ROW
21
51
11
61
83
82
24
81
84
62
63
41
23
22
64
42
Legend
TRAFFIC SIGN – "N MARKET ST"
TRAFFIC SIGN – "C AVE"
SIGNAL HEAD WITH BACKPLATE
SIGAL HEAD WITHOUT BACKPLATE
PEDESTRIAN SIGNAL HEAD
CABINET AND CONTROLLER
SIGNAL BASE
HANDHOLE – TYPE 1
HANDHOLE – TYPE 3
C Ave and US 63/Market St
Signal Layout
Exhibit I-01
McCLURE ENGINEERING CO.
NORTH
0
10
20
GRAPHIC SCALE


TRAFFIC SIGNAL FACES
12" R
12" Y
12" G
NO.21,22, 41,42,61,62 ,81,82 (8–REQ'D)
12" R
12" Y
12" Y
12" G
NO.11,51 (2–REQ'D)
ONE–SECTION HAND/MAN/COUNTDOWN LED SIGNAL
NO.23,24 (2–REQ'D)
US 63
Proposed ROW
ONLY
15th Avenue
Proposed ROW
ONLY
Legend
TRAFFIC SIGN – "S MARKET ST"
TRAFFIC SIGN – "15th AVE E"
SIGNAL HEAD WITH BACKPLATE
SIGAL HEAD WITHOUT BACKPLATE
PEDESTRIAN SIGNAL HEAD
CABINET AND CONTROLLER
SIGNAL BASE
HANDHOLE – TYPE 1
HANDHOLE – TYPE 3
15th Ave and US 63/Market St
Signal Layout - Alternative 1
Exhibit I-02
McCLURE ENGINEERING CO.
NORTH
0
10
20
GRAPHIC SCALE


TRAFFIC SIGNAL FACES
12" R
12" Y
12" G
NO.21,22, 41,42,61,62 ,81,82 (8–REQ'D)
12" R
12" Y
12" G
NO.11,51 (2–REQ'D)
ONE–SECTION HAND/MAN/COUNTDOWN LED SIGNAL
NO.23,24 (2–REQ'D)
US 63
Proposed ROW
ONLY
15th Avenue
Proposed ROW
ONLY
Legend
TRAFFIC SIGN – "S MARKET ST"
TRAFFIC SIGN – "15th AVE E"
SIGNAL HEAD WITH BACKPLATE
SIGAL HEAD WITHOUT BACKPLATE
PEDESTRIAN SIGNAL HEAD
CABINET AND CONTROLLER
SIGNAL BASE
HANDHOLE – TYPE 1
HANDHOLE – TYPE 3
C Ave and US 63/Market St
Signal Layout - Alternative 2
Exhibit I-03
McCLURE ENGINEERING CO.
NORTH
0
10
20
GRAPHIC SCALE

City of Urbandale

3600 86th Street • Urbandale, IA 50322 • 515.278.3900 • Urbandale.org

August 12, 2020

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

RE: APPLICATION FOR TRAFFIC SAFETY FUNDS -TRAFFIC CONTROL DEVICES
TRAFFIC SIGNAL BATTERY BACKUP UNITS – MULTIPLE LOCATIONS
CITY OF URBANDALE

Dear Traffic Safety Improvement Program:

The City of Urbandale is pleased to submit, for your consideration, an application for funding assistance through the Iowa Department of Transportation's Traffic Safety Improvement Program (TSIP) under the Traffic Control Device Category.

The proposed improvements consist of adding battery backup units at the follow intersections:

- 70th Place and Meredith Drive
- 72nd Street and Meredith Drive
- 72nd Street and Aurora Avenue
- 72nd Street and Douglas Avenue
- NW Urbandale Drive and Plum Drive
- NW Urbandale Drive and Aurora Avenue
- 100th Street and Plum Drive
- 104th Street and Meredith Drive
- 121st Street and Meredith Drive
- 123rd Street and Meredith Drive
- 125th Street and Meredith Drive
- 128th Street and Meredith Drive

The proposed improvements will allow for continued operation of traffic signals during a power outage. This will provide safer intersections for the traveling public by reducing traffic confusion, congestion and delays. The improvements will also provide a safer environment for Public Works staff by limiting their exposure to traffic during a power outage.

The City is confident the information presented herein supports the applicability of the safety improvement goals of the program and demonstrates the worthiness of the project for TSIP funding assistance. If you have any questions, please call me at (515) 278-3950.

Sincerely,

David J. McKay, P.E.
Director of Engineering and Public Works
City of Urbandale

Enclosure(s)

IOWA DEPARTMENT OF TRANSPORTATION
TRAFFIC SAFETY IMPROVEMENT PROGRAM

FY2022 TRAFFIC SAFETY FUND
APPLICATION

City of Urbandale
Department of Engineering and Public Works
August 12, 2020

David J. McKay, P.E. Director of Engineering and Public Works

TABLE OF CONTENTS

A. APPLICATION, CERTIFICATION, & RESOLUTION

IOWA DOT

Application for TRAFFIC CONTROL DEVICE TSIP FUNDS

GENERAL INFORMATION DATE: 08-12-2020

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

Applicant: City of Urbandale

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

Complete Mailing Address: 3600 86th Street
Urbandale, IA 50322-4057

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

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:

Funding Amount

Total Safety Cost	$ 80,400
Total Project Cost	$ 96,000
Safety Funds Requested	$ 80,400

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain

☒ No

A. APPLICATION, CERTIFICATION, & RESOLUTION (CONTINUED)

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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

Representing the City of Urbandale

Signed: David J. McKay — 8-13-2020
Signature — Date Signed

David J. McKay, P.E.
Printed Name

Attest: Kristin E Brostrom — 8/13/2020
Signature — Date Signed

Kristin E. Brostrom, P.E.
Printed Name

A. APPLICATION, CERTIFICATION, & RESOLUTION (CONTINUED)

RESOLUTION 165-2020

A RESOLUTION AUTHORIZING THE CITY OF URBANDALE, IOWA, TO MAKE AN APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM FOR THE FUNDING OF THE INSTALLATION OF BATTERY BACKUP UNITS AT TWELVE (12) TRAFFIC SIGNALS AND FURTHER APPROVING THE APPLICATION WHICH OBLIGATES THE CITY TO MAINTAIN THE FUNDED IMPROVEMENTS.

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

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

WHEREAS, the City of Urbandale has determined that by providing battery backups for these traffic signals there will be continued operation of signals during power outages thereby reducing traffic congestion and improving the safety of the intersection;

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

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

PASSED AND APPROVED this 11th day of August, 2020.

Robert D. Andeweg, Mayor

Attest:

Nicole Lunders, City Clerk

B. NARRATIVE

Traffic Signal Battery Backup Units – Multiple Locations
Urbandale, Iowa

The City of Urbandale is submitting this application for Traffic Safety Improvement Program Funds under the Traffic Control Device category. The funding request is to provide for the purchase of battery backup units and the associated equipment to retrofit the existing signalized intersections described below. The battery backup unit is installed in a separate cabinet that is either mounted on or adjacent to the existing traffic signal cabinet. The City of Urbandale is responsible for the operation and maintenance of the signals.

- Meredith Drive is a 4 lane roadway with traffic volumes that range from 3,000 to 16,000 vehicles per day.
- Douglas Avenue is a 4 lane divided roadway with traffic volumes that range from 12,000 to 37,000 vehicles per day and serves as a major route to office and commercial areas.
- NW Urbandale Drive is a 4 lane divided roadway with traffic volumes of approximately 17,000 vehicles per day.
- Aurora Avenue is a 4 lane roadway with traffic volumes that range from 4,000 to 9,000 vehicles per day. Aurora Avenue is a major collector that primarily serves residential and office park areas.

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

During a power outage the Public Works Department will mobilize and install temporary signs. This is a time consuming process as staff must first travel to the facility, load the signs, travel to the affected intersections, and install the signage. Depending on 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 the 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.

The use of LED traffic signal indicators has made it possible to install battery backup units that can provide power during electrical outages. The battery backup unit can provide full operation of a traffic signal for over five hours. The additional hours of operation provided by battery backups during a power outage will allow for the continued operation of the signal while the electrical supply is restored. During outages that exceed the battery life, the additional hours will allow for signage to be installed at a controlled intersection, thereby reducing the risk to staff. The intersections that are equipped with a battery backup will provide a safer environment for

the traveling public and city staff by reducing traffic confusion, congestion and delays, and limiting the exposure of city of staff to traffic.

The City of Urbandale currently has 54 signalized intersections, and either has equipped or is in the process of installing battery backups at 36 intersections. After this proposed project, the City of Urbandale will have battery backups at all signalized intersections that the City manages, with the exception of two intersections. By installing battery backups at the proposed twelve locations, the City will have all main routes fully functional during power outages. The City of Urbandale will be installing battery backups units and GPS Emergency Preemption at all future signalized locations.

The City of Urbandale has installed GPS Emergency Preemption at all signalized intersections in the past two years. Installing Battery Backups at these major intersections will allow the Emergency Preemption to remain working during power outages which will allow emergency vehicles to have safer travel thru the intersection and allow other drivers to have proper signal to stop.

The City of Urbandale has also installed switches at all signalized intersections to get the data from the GPS Preemption and Battery Backups back to the City of Urbandale Engineering for monitoring and will provide notification when the system is operating on the battery backup, which will allow staff to analyze the problem remotely and make more timely repairs or to install signage if the outage is likely to exceed the battery life of the backup system.

The installation of battery backups at these critical intersections will increase public safety by reducing driver confusion and traffic congestion during power outages. Additionally, this will reduce the exposure of City staff to traffic in an uncontrolled intersection, and allow staff to focus on their primary duties. The continuous signal operation provided by battery backup systems during a power outage will allow for improved safety and traffic flow as well as reduce the traffic congestion and limit the potential for accidents.

C. ITEMIZED BREAKDOWN OF COSTS

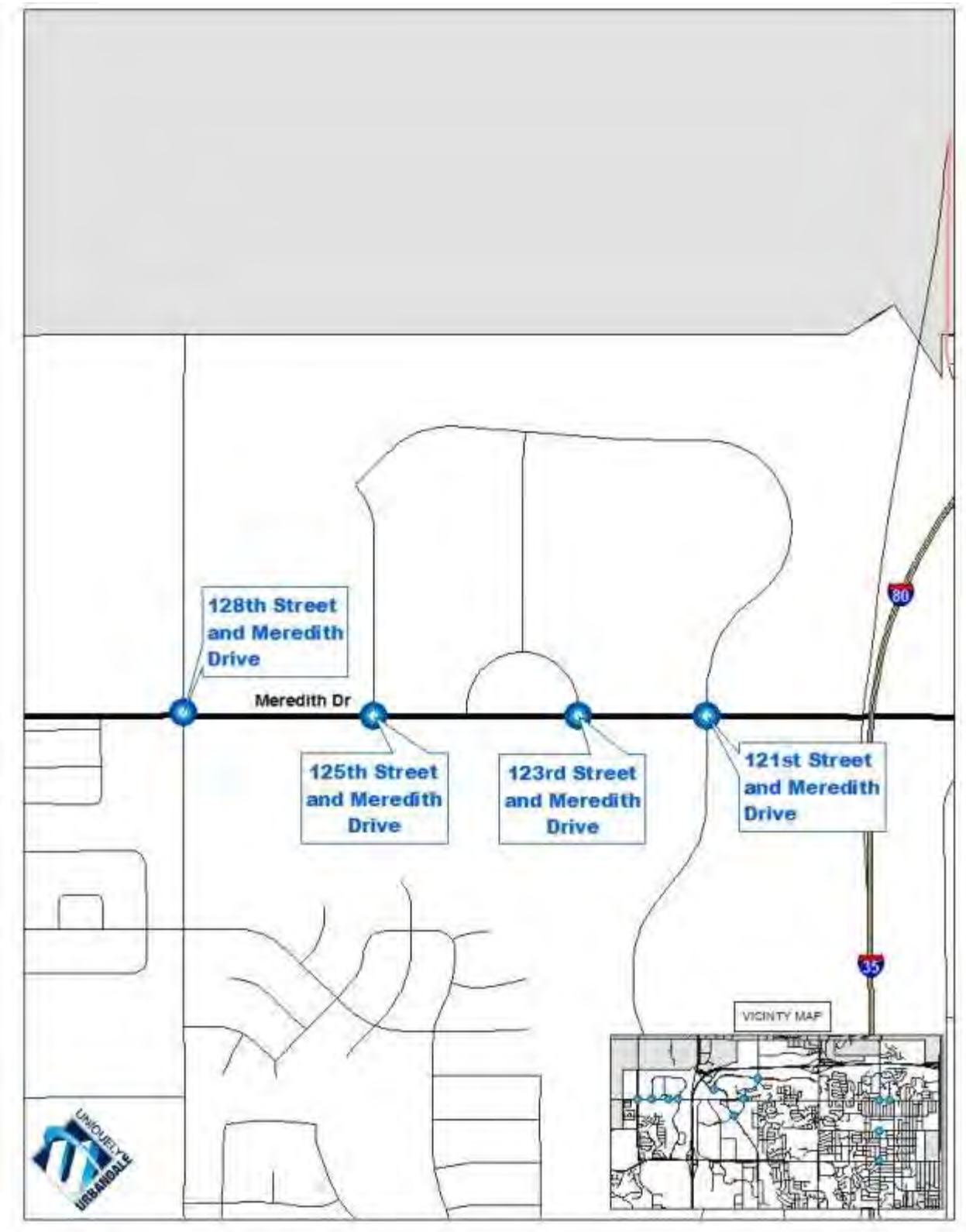
Intersection	Battery Backup	Intersection	Battery Backup
128th Street and Meredith Drive	$6,700.00	NW Urbandale Drive and Plum Drive	$6,700.00
125th Street and Meredith Drive	$6,700.00	100th Street and Plum Drive	$6,700.00
123rd Street and Meredith Drive	$6,700.00	72nd Street and Aurora Avenue	$6,700.00
121st Street and Meredith Drive	$6,700.00	72nd Street and Douglas Avenue	$6,700.00
72nd Street and Meredith Drive	$6,700.00	NW Urbandale Drive and Aurora Avenue	$6,700.00
104th Street and Meredith Drive	$6,700.00		
70th Place and Meredith Drive	$6,700.00		
Proposed Grant Funds		**Subtotal Materials**	**$80,400.00***
City Funds		**Subtotal Installation**	**$15,600.00**
		Total	**$96,000.00**

* Unit prices are based on previously received contractor's bids for installation and material costs provided by suppliers adjusted for the 2021 construction schedule.

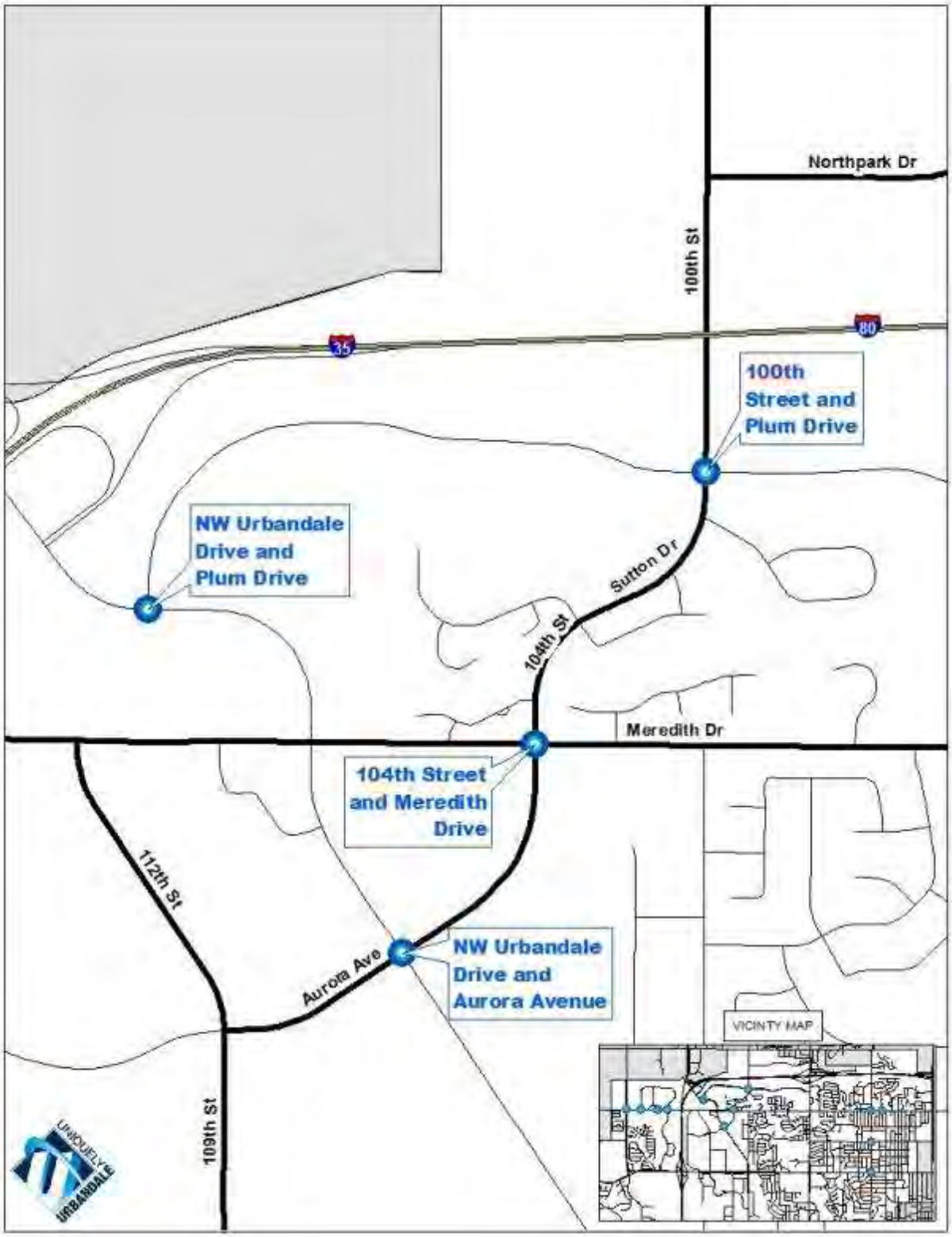
D. TIME SCHEDULE

TSIP Funding Application due	August 15, 2020
TSIP Notification of Award	January 15, 2021
TSIP Funding Available	July 1, 2021
Project Letting	July 16, 2021
Project Construction	August, 2021
Project Completion	November, 2021

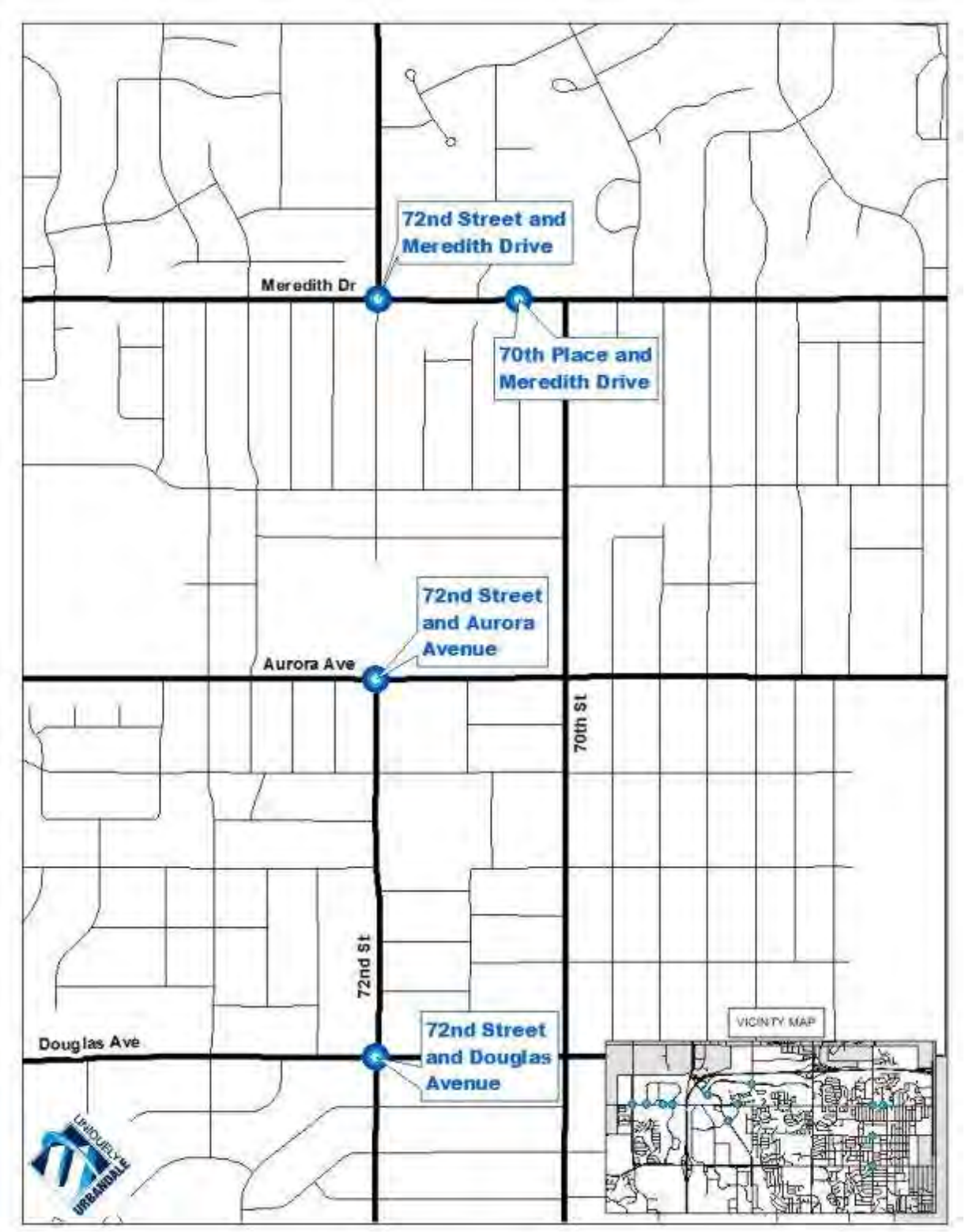
E. LOCATION MAP



E. LOCATION MAP (CONTINUED)



E. LOCATION MAP (CONTINUED)



F. PICTURES

70th Place and Meredith Drive

72nd Street and Meredith Drive

F. PICTURES (CONTINUED)

72nd Street and Aurora Avenue

72nd Street and Douglas Avenue

F. PICTURES (CONTINUED)

NW Urbandale Drive and Plum Drive

NW Urbandale Drive and Aurora Avenue

F. PICTURES (CONTINUED)

100th Street and Plum Drive

104th Street and Meredith Drive

F. PICTURES (CONTINUED)

121st Street and Meredith Drive

123rd Street and Meredith Drive

F. PICTURES (CONTINUED)

125th Street and Meredith Drive

128th Street and Meredith Drive

G. PLAN LAYOUT

NOT APPLICABLE

H. TRAFFIC VOLUMES

2016 Two-Way Daily Traffic Volumes (Vehicles per Day)

Meredith Drive at 70th Place	17,600
NW Urbandale Drive at Plum Drive	17,000
Meredith Drive at 123rd Street	11,700
Meredith Drive at 125th Street	11,700

2016 Intersection Daily Traffic Volumes (Vehicles per Day)

72nd Street and Meredith Drive	22,180
72nd Street and Aurora Avenue	8,050
72nd Street and Douglas Avenue	20,960
NW Urbandale Drive and Aurora Avenue	20,940
104th Street and Meredith Drive	14,040
121st Street and Meredith Drive	15,740
128th Street and Meredith Drive	18,350

2012 Intersection Daily Traffic Volumes (Vehicles per Day)

100th Street and Plum Drive	10,900

I. SIGNAL LAYOUT

NOT APPLICABLE

J. BENEFIT / COST WORKSHEET

NOT APPLICABLE

DUBUQUE COUNTY TSIP APPLICATION FOR TEMPORARY TRAFFIC SIGNALS

FY2022

Dubuque County will be applying for Traffic Safety Improvement Program funds for temporary traffic signals in the category of traffic control devices.

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION **DATE:** 8-10-2020

Location / Title of Project: Dubuque County Temporary Traffic Signals

Applicant: Dubuque County Secondary Roads

Contact Person: Anthony Bardgett Title: County Engineer

Complete Mailing Address: 1225 Seippel Rd
Dubuque, IA 52002

Phone: 563-557-7283 (Area Code) E-Mail: engineer@dubuquecounty.us

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:

Funding Amount

Total Safety Cost	$ 54,500.00
Total Project Cost	$ 54,500.00
Safety Funds Requested	$ 54,500.00

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain _____

☒ No

Rev. 5/18

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 County of Dubuque

Signed: Anthony Bardgett — August 10, 2020
Signature — Date Signed

Anthony Bardgett
Printed Name

Attest: Mary Ann Knapp — August 10, 2020
Signature — Date Signed

Mary Ann Knapp
Printed Name

RESOLUTION NO. 20-179

WHEREAS, The Iowa Department of Transportation has adopted Administrative Rule 761-Chapter 164, which created the Traffic Safety Improvement Program (TSIP) to allow for funding to be provided to local jurisdictions for eligible traffic safety improvement projects; and

WHEREAS, Dubuque County has determined that providing temporary traffic signals will improve the safety of drivers, flaggers, and road crews during road maintenance activities; and

WHEREAS, portable temporary traffic signals are recognized temporary traffic control devices in the Manual on Uniform Traffic Control Devices, 2009 Edition; and

WHEREAS, TSIP Funds are available for traffic control devices; and

WHEREAS, the Dubuque County Engineer recommends a TSIP application be submitted to the Iowa Department of Transportation for possible safety funding of the above-mentioned traffic control devices.

THEREFORE BE IT RESOLVED that the Board of Supervisors of Dubuque County, Iowa hereby supports and approves the application for Iowa Department of Transportation Traffic Safety Improvement Program funding and commits to accepting and maintaining these temporary traffic control signals.

Adopted this 10th day of August, 2020.

David J. Baker, Chair
Dubuque County Board of Supervisors

ATTEST:

Mary J. Habel, Dubuque County Deputy Auditor

B. Narrative

Dubuque County is applying for the Transportation Safety Improvement Program (TSIP) funds in the amount estimated to be 100% of the cost of a pair of portable temporary traffic signals. The primary purpose of the temporary traffic signals would be to replace flagging operations in Secondary Road Department work zones and to allow lane closure areas in overnight closure situations.

The Dubuque County Secondary Roads Department is responsible for the engineering, construction and maintenance of the county's secondary road system. The secondary road system in Dubuque County consists of 216 bridges, 459 miles of paved roads, 304 miles of granular surfacing, and 5 miles of dirt roads totaling 768 miles. Typical paved route daily traffic counts in Dubuque County range from 50 to 4,750 vehicles per day.

Part 6F.84 of the MUTCD provides warrants, standards, guidance, and support for the use of traffic signals in work zones. Additional information regarding signal use is located in Part 4. The primary use of the temporary traffic signals would be in a work zone temporary lane closure scenario for one lane, two-way traffic operation.

Secondary Road Crews routinely are required to close lanes of travel for numerous maintenance activities including, but not limited to, the following: PCC patching, HMA patching, culvert repair and replacement, bridge approach repair and replacement, tile repair and installation, guardrail repair and replacement, bridge rail repair and slope repairs. The deployment of temporary traffic signals utilizing traffic control plan 6H-12 in work zones (see section I) would reduce the number of employees exposed to the traveling public which reduces risk of injury and possible conflicts between drivers and flaggers.

The safety benefits of utilizing temporary traffic signals over flaggers is hard to quantify in dollars. However, a list of safety benefits for maintenance crews and motorists in situations utilizing temporary traffic signals is available below:

- Increased visibility to approaching motorists (additional signage and overhead signal)
- More direct communication with motorist
- Clearer understanding and familiarity with drivers
- Significantly more viable for nighttime operations
- Relieves the physical demands, stress, fatigue and hazards of flagging
- Elimination of two positions from work zone with the highest risk exposure

Dubuque County is requesting TSIP funding for an amount equal to the cost of a pair of temporary traffic signals with pilot car remote and vehicle detection options included. Signals with these options would facilitate safe and efficient traffic flow in and around various work zones on Dubuque County secondary roads. Other County Departments, Cities and other jurisdictions could also benefit from these signals in the event of a signal knock down, disaster event or routine maintenance when not in use by Dubuque County. Additionally, it would allow Dubuque County the flexibility to establish short-term overnight closures for road and bridge repairs and remove employees from high-risk situations in close proximity to an ever-growing inattentive driving population.

C. Itemized Breakdown of Cost

Quotes listed here are for Set of Two Signals, with vehicle detection and pilot car remote for Temporary Traffic Control. These preliminary quotes are attached in appendix A.

Date	Vendor	Price
7/15/2020	OMJC Signal	$54,500.00
7/17/2020	Iowa Plains Signing, Inc.	$61,692.00
7/17/2020	Astro Optics, LLC	$69,768.00

D. Time Schedule

TSIP Application Due	August 15, 2020
TSIP Award Notification	Mid-January 2021
TSIP Funding Available	July 1, 2021
Final Quote Comparison	July 2021 (est.)
Purchase of Traffic Signals	July 2021 (est.)
Use of Temporary Traffic Signals	August 2021 (est.)

E. Map

Project locations would be any County Secondary Road location where lane closure is required.

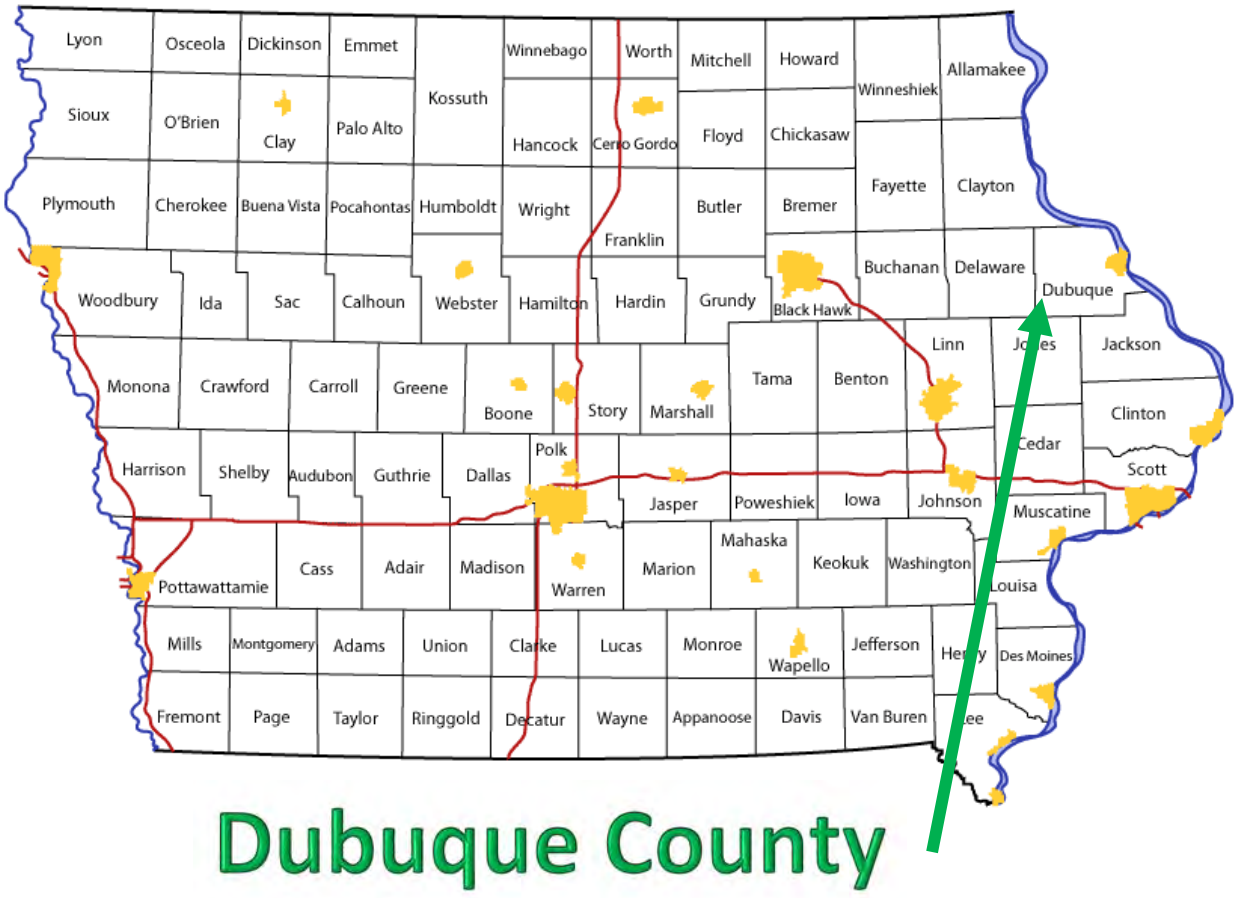


Image source: https://iowadot.gov/maps/digital-maps/city-and-county-maps

F. Pictures

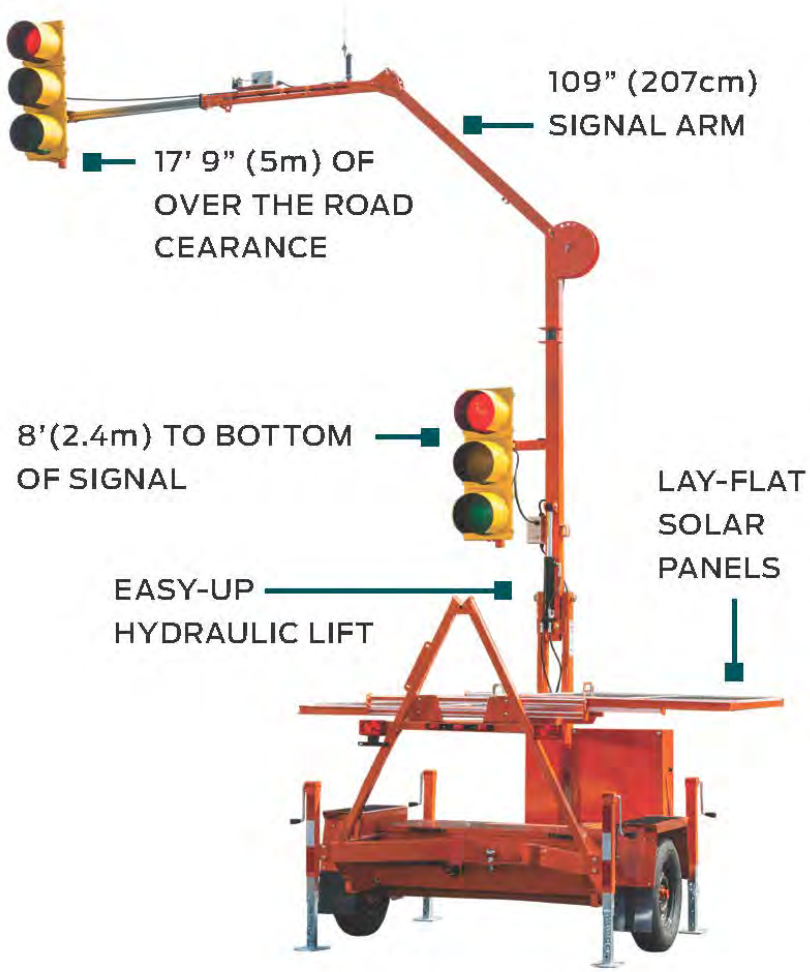
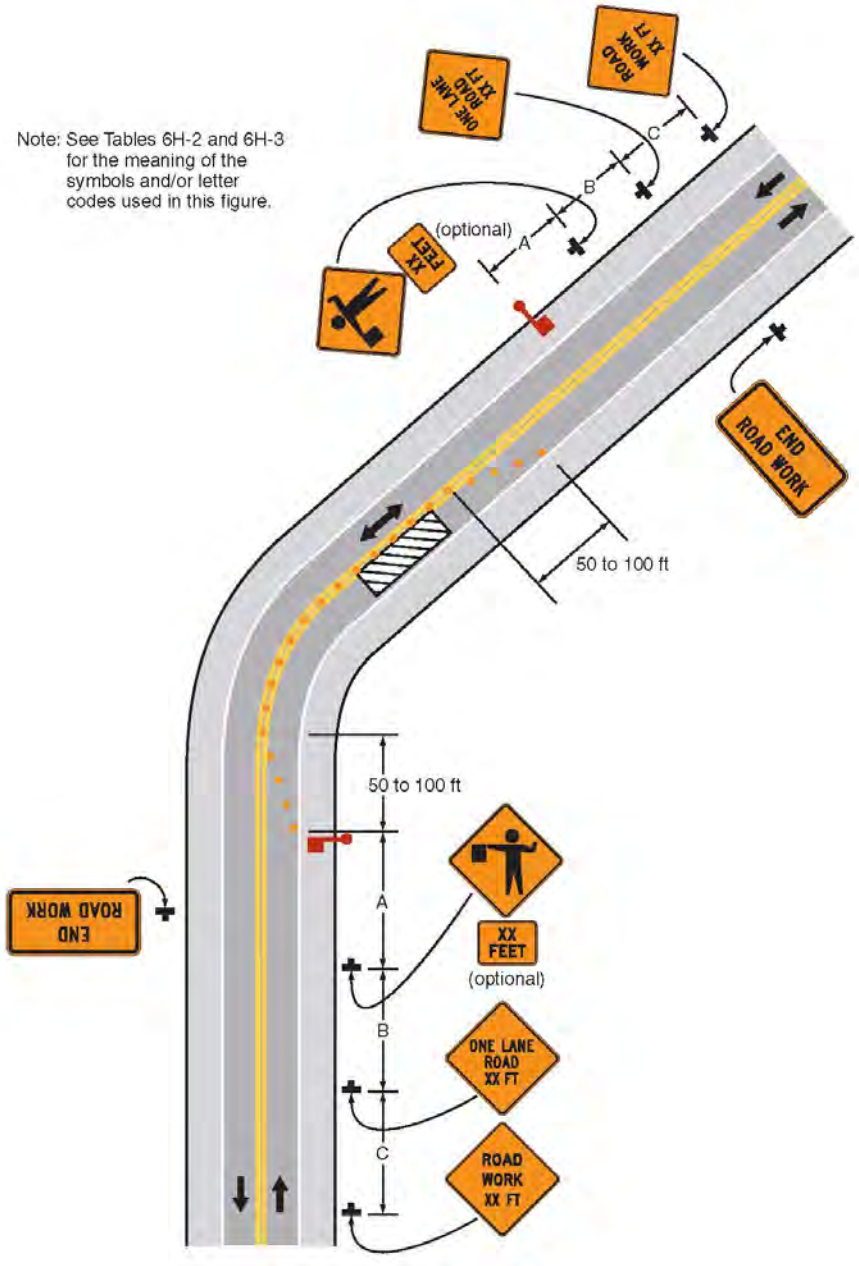


Image Source: Iowa Plains Signing, Inc. Quote

Image Source: OMJC Signal Quote

G. Plan View

Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)

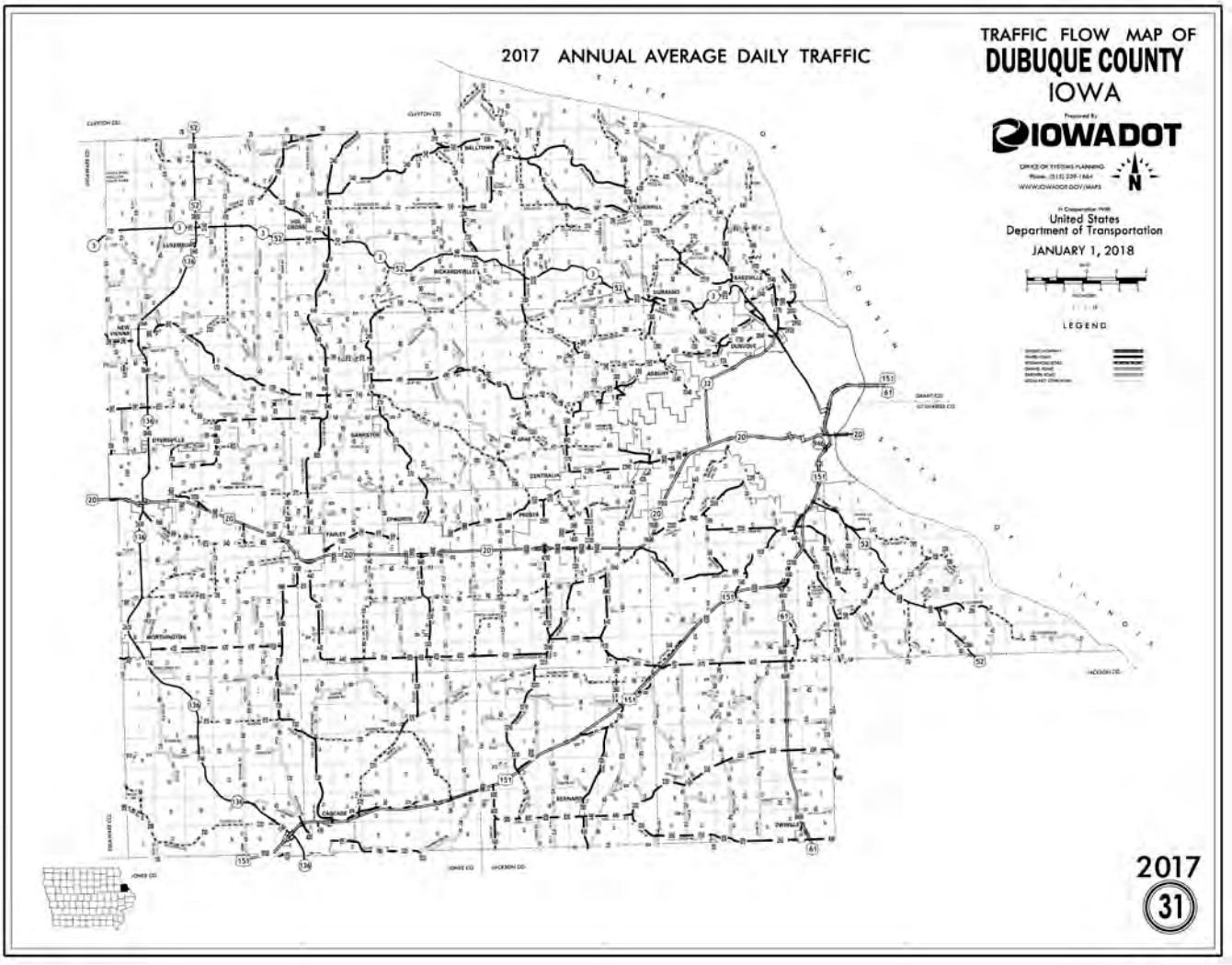


Typical Application 10

Image Source: MUTCD 2009

H. Traffic Volumes

Hyperlink to 2017 ADT MAP - DUBUQUE COUNTY



I. Traffic Signal Layout

Typical Application for Temporary Traffic Signals

2009 Edition

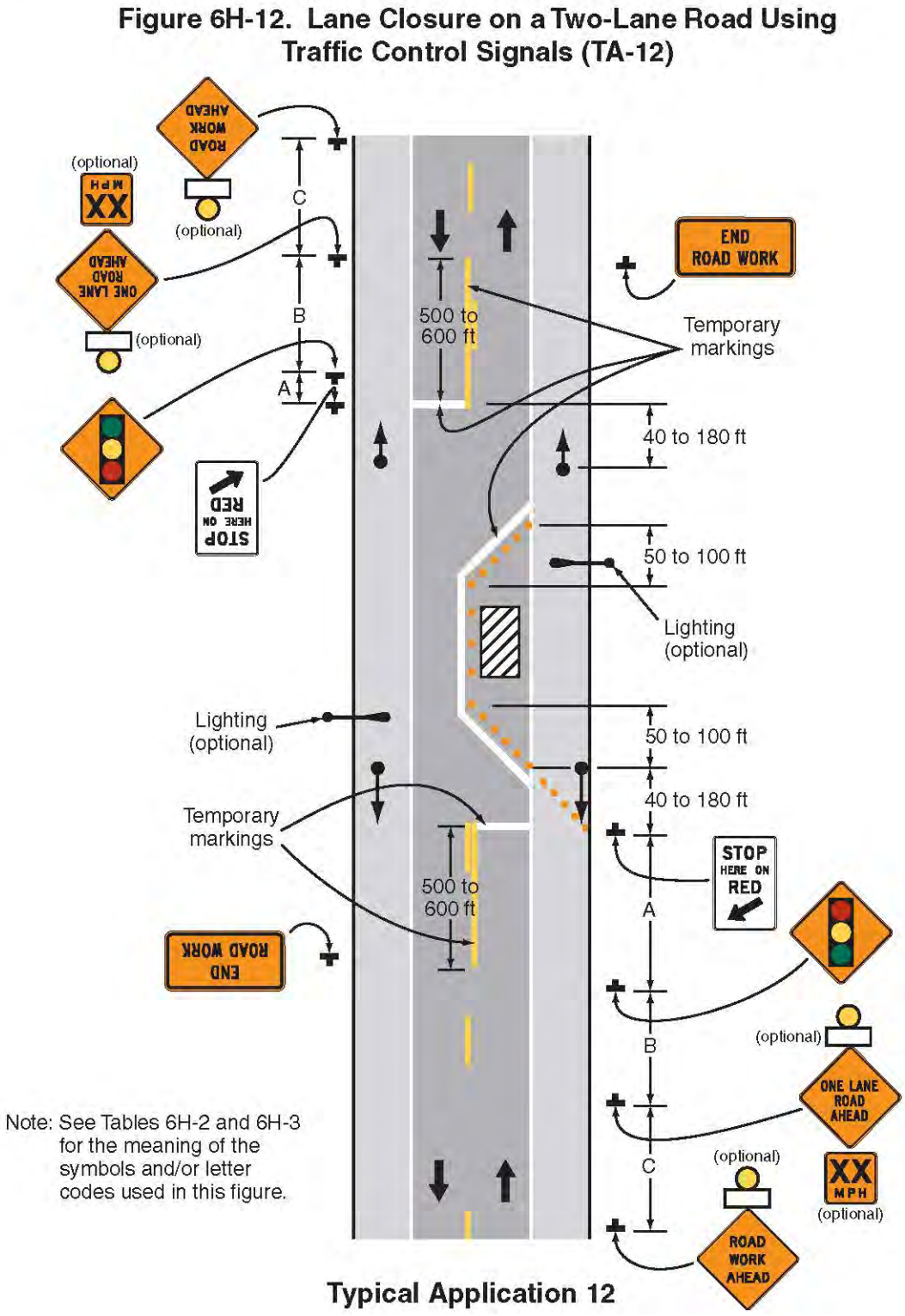


Image Source: MUTCD 2009

I. Traffic Signal Layout - cont.

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

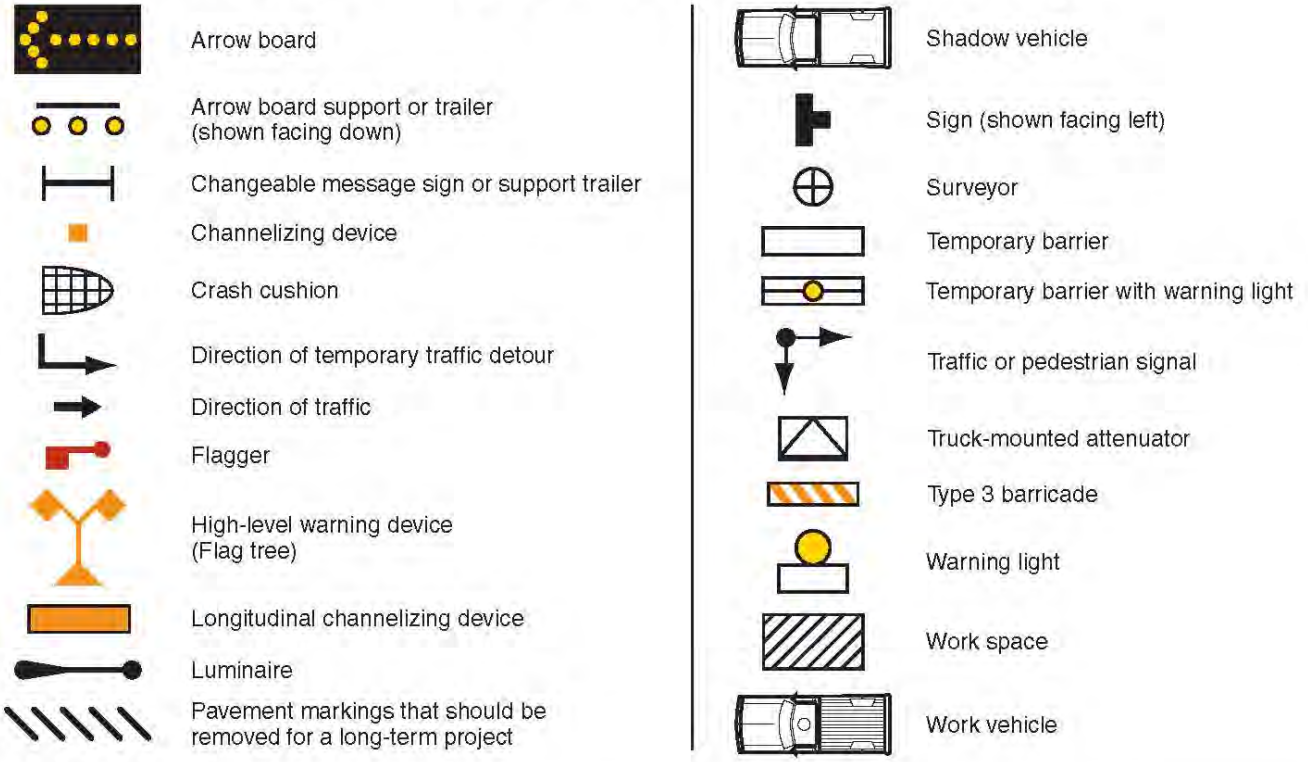


Table 6H-3. Meaning of Letter Codes on Typical Application Diagrams

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* Speed category to be determined by highway agency

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

Image Source: MUTCD 2009

J. Cost/ Benefit Worksheet

Not Applicable

Appendix A

QUOTES

OMJCSignal
PO Box 1594
Waterloo, IA 50704
403 Chestnut St.
Waterloo, IA 50703
800.776.5999
Fax: 319.236.1554
Email: sales@omjcsignal.com
omjcsignal.com

Quotation

Quote Number
7775

Quote Date
July 15, 2020

Quoted to:
ATTN: MARY ANN KNAPP
DUBUQUECOUNTYIOWA

SHIP TO:
DUBUQUECOUNTYIOWA

PH: 5635577283
FAX:

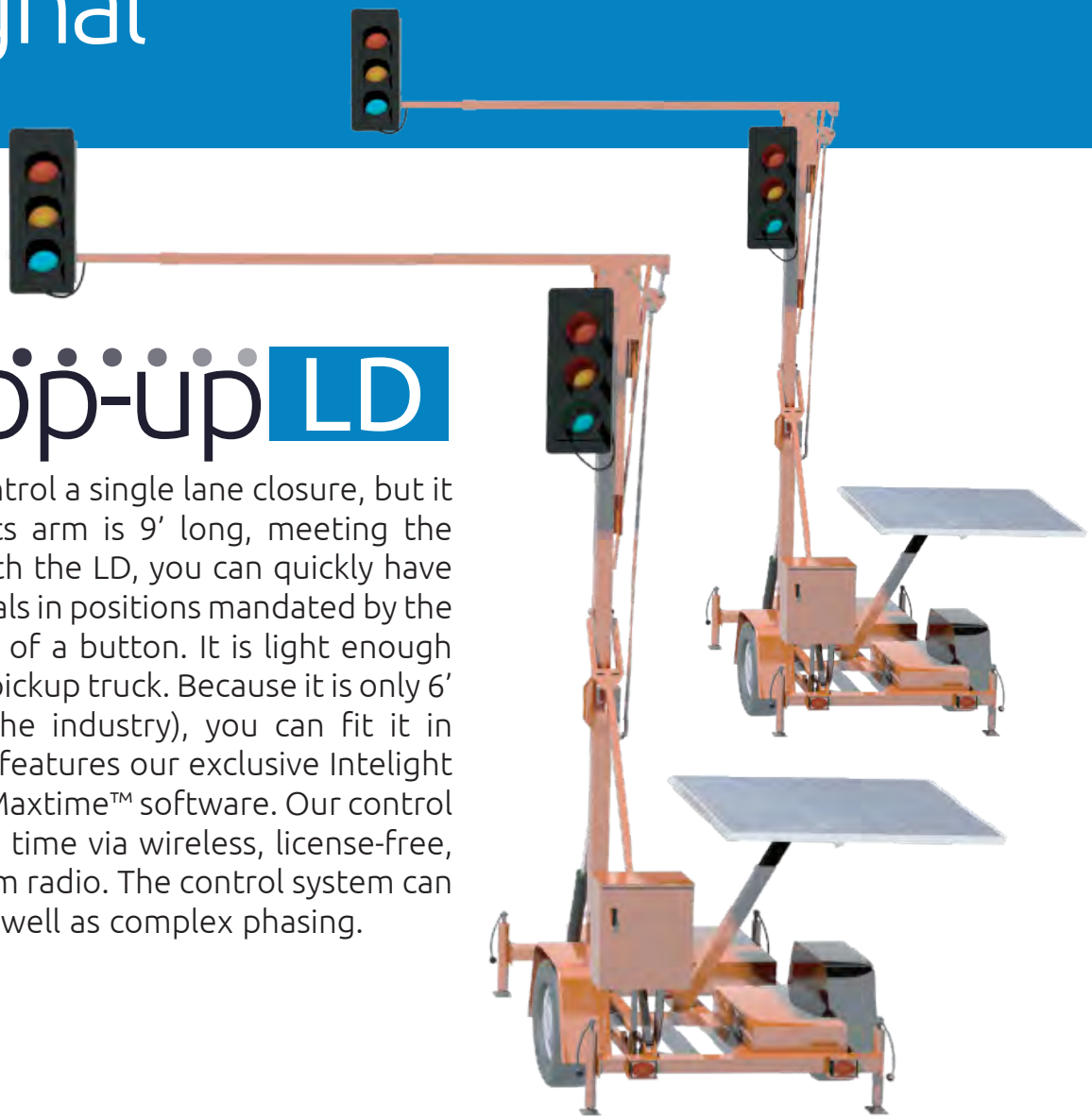
Customer ID	Good Thru	Payment Terms	Sales Rep Name
DUBUQUECOUNTYROADS	8/14/20	Net 30 Days	DAVID T. KNAPP

Quantity	Item	Description	Unit Price	Extension
1.00	LDPTS	ONE PAIR OF POP-UP LIGHT DUTY TRAILERS (ONE MASTER, ONE SECONDARY) W/ WIRELESS TRAFFIC CONTROL AND SOLAR POWER	49,000.00	49,000.00
2.00	TC26-B-OMJC	MICROWAVE VEHICLE DETECTOR	1,000.00	2,000.00
1.00	FALCON-MAX	3 BUTTON REMOTE SYSTEM 900MHZ, 12VDC, ANTENNA BULKHEAD PATCH CABLE, CUSTOM OMJC LABELING FREE FREIGHT AND ON-SITE TRAINING	3,500.00	3,500.00

Freight & handling are in addition to the prices quoted above unless otherwise specified. All parts, materials and components are new unless otherwise specified. OMJC has been in business since July of 1985 to serve you.

Subtota	54,500.00
Sales Ta	
Freight	
Tota	54,500.00

OMJCSignal
Superior Design Intellect.



OMJCPop-up LD

The LD is optimized to control a single lane closure, but it is capable of far more. Its arm is 9' long, meeting the MUTCD requirements. With the LD, you can quickly have two 12" ITE approved signals in positions mandated by the MUTCD at the mere push of a button. It is light enough that you can tow it with a pickup truck. Because it is only 6' wide (the narrowest in the industry), you can fit it in almost anywhere. The LD features our exclusive Intelight ™ ATC controller running Maxtime™ software. Our control units communicate in real time via wireless, license-free, encrypted spread spectrum radio. The control system can easily handle 7 trailers, as well as complex phasing.

DC2070 ATC™ Controller

Our system is based upon Intelight's™ proven ATC controller equipped with their Maxtime™ software. It is capable of dual ring actuated operation, controlling up to 8 phases with pedestrian movements. All inputs and outputs are mappable, providing maximum flexibility. It has inputs for coordination, vehicle detection and preemption. It has internal TBC and a clock/calendar and can be programmed for up to 20 day plans with multiple events. The malfunction management unit is an EDI CMU-212. It monitors the following functions in real time: Power, Voltage, Conflict, Lack of signal, and 10 others.

OMJCPop-up

omjcsignal.com 1.800.776.5999 sales@omjcsignal.com

OMJCPop-up

Pop-Up LD™ Features

•Lift Mechanism - electric over hydraulic with remote pendant, single cylinder both lifts and extends in a single movement
•Arm Extension from side of trailer - 9'
•12" RYG LED signals - ITE compliant, 1 overhead, 1 side of mast
•180 degree signal rotation
•Traffic control equipment - Intelight Controller - ATC w/ Maxtime 2070 software – EZ Interface (Just answer 4 questions) - actuated 8 phase, dual ring, with pedestrian movements, preemption and coordination capable, knock-down capable, encrypted wireless connection between master and secondaries, real time monitoring

Pop-Up LD™ Options

•Vehicle detection option - microwave, video, loop
•Red clearance extender option
•Green recycle option
•Preemption system option
•Pilot Car remote option
•Optional remote monitoring & programming with on-board GPS
•Auto-start generator option

Specs

•Chassis length - 112", removable hitch adds 56" for a 168" total
•Chassis Width - 72" - narrowest in industry
•Travel Height - 114" with solar
•Weight with solar, batteries, and controls - 2700#
•Clearance under arm - 17'

LOCAL DEALERSHIP

omjcsignal.com 1.800.776.5999 sales@omjcsignal.com

IOWA PLAINS SIGNING, INC.

1110 W. 6TH AVENUE (HWY. 210W)
P.O. BOX 654
SLATER, IOWA 50244-0654

TELEPHONE: (515) 685-3536
FAX: (515) 685-3530

Quote For:	Dubuque County Road Dept.	Att.	Mary Ann Knapp
Type of Sale:	SQ3 Signal Set Sale	Phone	563-557-7283
Quote Date:	July 17, 2020	Fax #	

Bid Item #	Description	Quantity	Units	Per Unit	Total
1	SQ3 Signal System (2) Solar-assisted signal trailers with Tandom tow capability. (2) signal heads per trailer, all LED lamps,(2) controllers, (1) PTS Programmer, and wireless radio communication system	1	EA	$ 56,925.00	$ 56,925.00
2	Motion Sensor Motion Detectors for signal actuation, price Includes (2) sensors	1	EA	$ 1,955.00	$ 1,955.00
3	Pilot Car Module Price includes (2) modules and 1 transmitter	1	EA	$ 2,812.00	$ 2,812.00
				Total	**$ 61,692.00**

Conditions or Notes:

Approx. Freight Cost is $3,500
Thanks for the interest. Lead times are around two weeks. To move ahead with the purchase, please sign and date quote and email back to me.

_____ **Date** _____ **Date**

_____ **Signature** _____ **Acceptance Signature**

Mac Campbell
Cell (515) 494-8591

PORTABLE TRAFFIC
SIGNAL SYSTEM

SQ3TS® System

The most advanced portable traffic signal, ever.

NEMA TS-5 Type TR1 Portable Traffic Signal System

DESIGNED FOR THE REAL WORLD WORK ZONE

The SQ3TS Trailer-Mounted PTS is the most dynamic and dependable portable traffic signal available today. With an industry-leading 100-mph wind load, and a 25-year design life, the SQ3TS Portable Traffic Signal is the temporary traffic control workhorse that you can rely on year after year. From a simple one-lane bridge repair project, to complete intersection control, the SQ3TS System has you covered, under even the most demanding conditions.

> **"WE COULD NOT BE HAPPIER WITH THE SQ3TS."**
>
> TAD BROOKS
> Vice President - LMC
> Safety Barricade Corp.

The SQ3TS Portable Traffic Signal exceeds NEMA TS-5 specifications for Type TR1 PTS, and is available with a wide range of add-on components to meet any project requirements.

SQ3TS® Portable Traffic Signal

SPECIFICATIONS

Signal Lamp	12” (300 mm) diameter LED
Signal Arm Extension	68 to 109” (173 to 277 cm)
Solar Charge	520W min
Power Source	12V / (16) 6V batteries
Tow Height	89” (226 cm)
Trailer Width	85” (216 cm)
Trailer Weight	3000 lb. (1361 kg)

SQ3TS FEATURES

- Heavy-duty trailer with 25-year design life
- Dual-Processor Malfunction Management System
- Withstands sustained winds of 100 mph, gusts up to 110 mph
- 10-year structural warranty on trailer
- Lifting Ring for easy signal placement
- Hydraulic lift system
- 30 days run time on batteries alone
- Up to 14 phases of traffic per system
- Tandem-tow trailers
- Exceeds NEMA TS-5 requirements for Type TR1 PTS
- MUTCD Compliant

AVAILABLE OPTIONS

TILTING SOLAR PANELS | Allows for solar panel adjustment on SQ3TS for maximum sun exposure.

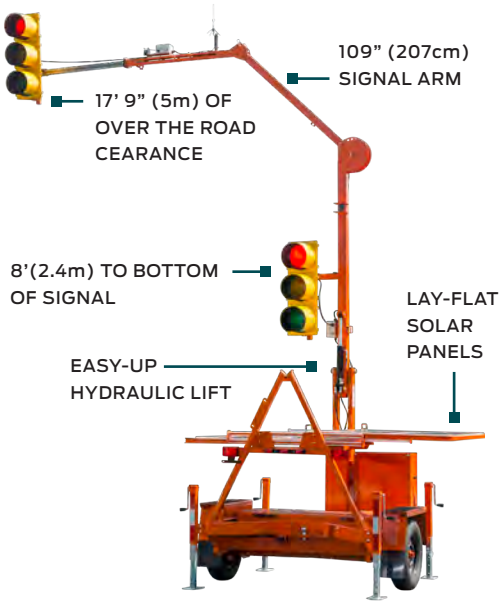
15-FOOT EXTENSION ARM | Longer extension arm for greater horizontal reach on SQ3TS trailer. Ideal for 2-lane applications.

ADVANCED REMOTE MONITORING | Recieve text and/or email alert notifications of signal operation and battery voltage levels.

WIRELESS KNOCKDOWN | Allows signal to operate in conjunction with a standard street corner control cabinet.

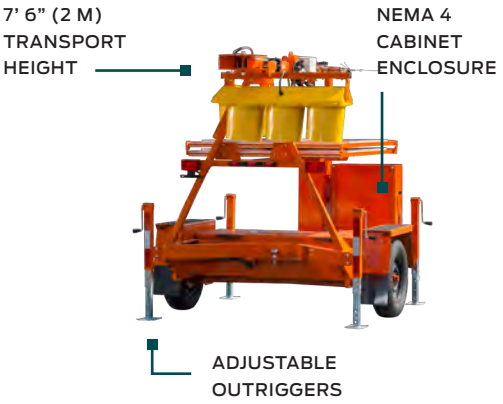
PRE-EMPTION SYSTEM | Recognizes emergency vehicles and provides earliest safe green indications.

WAIT TIME & FAULT DISPLAY | Informs motorists of wait time before next green indication.



EASY TO DEPLOY

The SQ3TS Portable Traffic Signal is equipped with a one-touch, easy-up hydraulic lifting system to make deployments simple.



DISTRIBUTED BY

HORIZON SIGNAL

ADVANCING WORKZONE SAFETY

5 Corporate Blvd
Reading, PA 19608

800.852.8796
horizonsignal.com

Regional Support Centers

Philadelphia, PA
Albuquerque, NM
Birmingham, AL
Chicago, IL
Fargo, ND
Indianapolis, IN
Orlando, FL
St. Catharines, ON
Waco, TX

Astro Optics, LLC
www.astrooptics.com
... a TAPCO (Traffic & Parking Control) company
5100 W. Brown Deer Road, Brown Deer, WI 53223
P (847) 488-9151 | sales@astrooptics.com | F (847) 488-9154

Quote

DATE: July 17, 2020

Mary Ann Knapp
Administrative Assistant
Dubuque County Road Dept.
1225 Seippel Rd
Dubuque, IA 52002

Comments or Special Instructions:

SALESPERSON	P.O. NUMBER	SHIP DATE	SHIP VIA	FREIGHT	TERMS
Rich Brown	Quote		PPA	PPA	

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
1	SQ3TS System (2 solar-assisted signal trailers with tandem tow capability, 2 signal heads per trailer, all LED lamps, 2 controllers, 1 PTS Programmer and wireless radio communication system	$ 65,000.00	$ 65,000.00
			$ -
2	Motion Sensors	$ 978.00	$ 1,956.00
1	Pilot Car/Flagger Module	$ 2,812.00	$ 2,812.00
			$ -
			$ -
			$ -
			$ -
		SUBTOTAL	$ 69,768.00
		TAX RATE	
		SALES TAX	
		SHIPPING & HANDLING	TBD
		TOTAL	$ 69,768.00

THANK YOU FOR YOUR BUSINESS!

PORTABLE TRAFFIC
SIGNAL SYSTEM

SQ3TS® SYSTEM

The most advanced portable traffic signal, ever.

NEMA TS-5 Type TR1 Portable Traffic Signal System

DESIGNED FOR THE REAL WORLD WORK ZONE

The SQ3TS Trailer-Mounted PTS is the most dynamic and dependable portable traffic signal available today. With an industry-leading 100-mph wind load, and a 25-year design life, the SQ3TS Portable Traffic Signal is the temporary traffic control workhorse that you can rely on year after year. From a simple one-lane bridge repair project, to complete intersection control, the SQ3TS System has you covered, under even the most demanding conditions.

> **"WE COULD NOT BE HAPPIER WITH THE SQ3TS."**
>
> TAD BROOKS
> Vice President - LMC
> Safety Barricade Corp.

The SQ3TS Portable Traffic Signal exceeds NEMA TS-5 specifications for Type TR1 PTS, and is available with a wide range of add-on components to meet any project requirements.

SQ3TS® Portable Traffic Signal

SPECIFICATIONS

Signal Lamp	12” (300 mm) diameter LED
Signal Arm Extension	68 to 109” (173 to 277 cm)
Solar Charge	520W min
Power Source	12V / (16) 6V batteries
Tow Height	89” (226 cm)
Trailer Width	85” (216 cm)
Trailer Weight	3000 lb. (1361 kg)

SQ3TS FEATURES

- Heavy-duty trailer with 25-year design life
- Dual-Processor Malfunction Management System
- Withstands sustained winds of 100 mph, gusts up to 110 mph
- 10-year structural warranty on trailer
- Lifting Ring for easy signal placement
- Hydraulic lift system
- 30 days run time on batteries alone
- Up to 14 phases of traffic per system
- Tandem-tow trailers
- Exceeds NEMA TS-5 requirements for Type TR1 PTS
- MUTCD Compliant

AVAILABLE OPTIONS

ADVANCED REMOTE MONITORING | Recieve text and/or email alert notifications of signal operation and battery voltage levels.

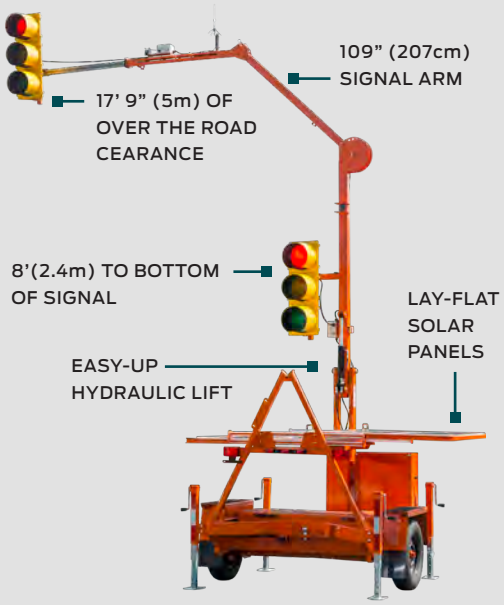
WIRELESS KNOCKDOWN | Allows signal to operate in conjunction with a standard street corner control cabinet.

PRE-EMPTION SYSTEM | Recognizes emergency vehicles and provides earliest safe green indications.

WAIT TIME & FAULT DISPLAY | Informs motorists of wait time before next green indication.

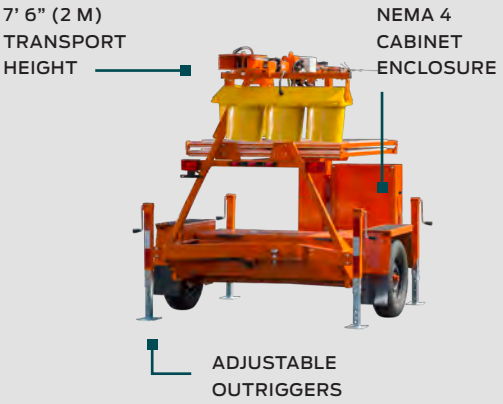
CLEARANCE TIME EXTENDER | Adds extra red time for slow-moving vehicles that need more time to clear the work area.

MESSAGE BOARD INTERFACE | Wireless connectivity with a portable VMS to display signal status messages in real-time.



EASY TO DEPLOY

The SQ3TS Portable Traffic Signal is equipped with a one-touch, easy-up hydraulic lifting system to make deployments simple.



DISTRIBUTED BY

HORIZON SIGNAL

ADVANCING WORKZONE SAFETY

5 Corporate Blvd
Reading, PA 19608

800.852.8796
horizonsignal.com

Regional Support Centers

Philadelphia, PA
Albuquerque, NM
Birmingham, AL
Chicago, IL
Fargo, ND
Indianapolis, IN
Orlando, FL
St. Catharines, ON
Waco, TX

SQ3TS® Upgrades

ADVANCED REMOTE MONITORING (ARM)

The ARM system sends text message and/or email alerts, reporting signal status and operation. Battery voltage, signal location, and fault status is reported in real-time or on demand from our dedicated monitoring website.

VIDEO DETECTION

Video actuation allows for true presence vehicle detection via the creation of customized detection zones. This non-intrusive detection system is easily installed and does not require a PC for configuration.

CABLED REMOTE

Easily place a call for green at either end of the work zone, or rest both signals of a 2-phase operation in red. Programmed red clearance intervals are always inserted between green indications, preventing the possibility of conflict.

PILOT CAR

The Pilot Car / Flagger module allows a pilot car driver to control a Horizon Signal System remotely via a handheld transmitter for simple, all-day operation.

LEFT TURN ARROW

MUTCD-Compliant left turn arrows can be easily added to any Horizon Signal SQ3TS system. This addition allows for dedicated turning lanes through intersections during construction or standard intersection control.

EMERGENCY VEHILCE PREEMPTION

Provides the earliest possible safe green indication in the direction of approaching emergency vehicles. Vehicles can be detected via either optical strobe light patterns or audible siren detection.

WIRELESS REMOTE

With up to a 1/2 mile range, the wireless remote is the most convenient method of manual signal control. The built-in vibration function works as a confirmation of each button press, and the signals can be switched back to automatic mode with just one tap.

WORK ZONE LUMINAIRE

The Work Zone Luminaire increases safety by illuminating the Horizon PTS and surrounding work area during periods of low visibility. Photocell sensors automatically activate the light at dusk.

SQ3TS® Portable Traffic Signal

SPECIFICATIONS

Signal Lamp	12” (300 mm) diameter LED
Signal Arm Extension	68 to 109” (173 to 277 cm)
Solar Charge	520W min
Power Source	12V / (16) 6V batteries
Tow Height	89” (226 cm)
Trailer Width	85” (216 cm)
Trailer Weight	3000 lb. (1361 kg)

SQ3TS FEATURES

- Heavy-duty trailer with 25-year design life
- Dual-Processor Malfunction Management System
- Withstands sustained winds of 100 mph, gusts up to 110 mph
- 10-year structural warranty on trailer
- Lifting Ring for easy signal placement
- Hydraulic lift system
- 30 days run time on batteries alone
- Up to 14 phases of traffic per system
- Tandem-tow trailers
- Meets/exceeds NEMA TS-5 requirements for Type TR1 PTS
- MUTCD Compliant

AVAILABLE OPTIONS

ADVANCED REMOTE MONITORING | Recieve text and/or email alert notifications of signal operation and battery voltage levels.

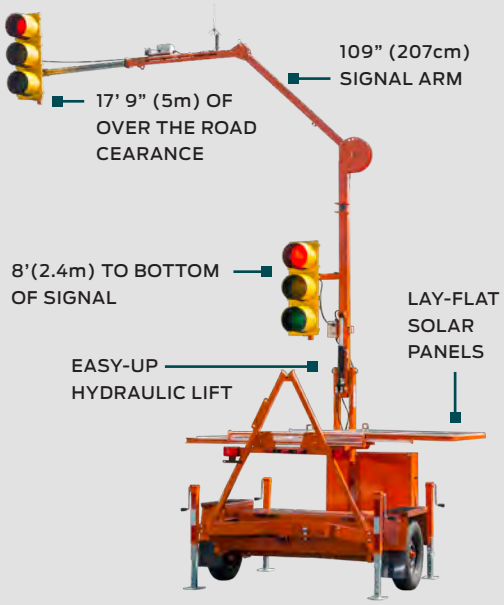
WIRELESS KNOCKDOWN | Allows signal to operate in conjunction with a standard street corner control cabinet.

PRE-EMPTION SYSTEM | Recognizes emergency vehicles and provides earliest safe green indications.

WAIT TIME & FAULT DISPLAY | Informs motorists of wait time before next green indication.

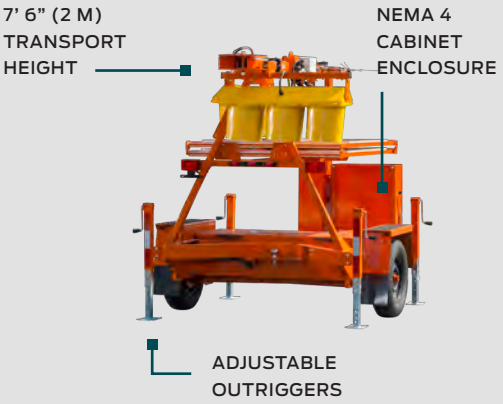
CLEARANCE TIME EXTENDER | Adds extra red time for slow-moving vehicles that need more time to clear the work area.

MESSAGE BOARD INTERFACE | Wireless connectivity with a portable VMS to display signal status messages in real-time.



EASY TO DEPLOY

The SQ3TS Portable Traffic Signal is equipped with a one-touch, easy-up hydraulic lifting system to make deployments simple.



DISTRIBUTED BY

HORIZON SIGNAL

ADVANCING WORKZONE SAFETY

5 Corporate Blvd
Reading, PA 19608

800.852.8796
horizonsignal.com

Regional Support Centers

Philadelphia, PA
Albuquerque, NM
Birmingham, AL
Chicago, IL
Fargo, ND
Indianapolis, IN
Orlando, FL
St. Catharines, ON
Waco, TX

Application for TRAFFIC CONTROL DEVICE TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/28/2020

Location / Title of Project Sign Replacement Program for Cities/Counties

Applicant Iowa Department of Transportation

Contact Person Tim Crouch Title State Traffic Engineer

Complete Mailing Address 800 Lincoln Way

Ames, IA 50010

Phone (515) 239-1513 E-Mail tim.crouch@dot.iowa.gov
(Area Code)

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 200,000.00
Total Project Cost	$ 200,000.00
Safety Funds Requested	$ 200,000.00

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project? ☐ Yes – Explain _____
☒ No

A. Not applicable

B. A county sign replacement program was initiated in FY 2017. The program is similar to the Department's city sign replacement program. Each city/county is allowed to submit one application per year for the replacement of signs eligible within the program guidelines. The applications are limited to a maximum of $10,000 per county and $5,000 per city. Interest in this program has been higher than past sign replacement programs and additional funding will be needed in FY 2022. The current program fund balance is approximately $163,000, we have approximately $210,000 committed to approved applications. Over the past 3 years we have averaged $150,000 in applications. Considering the numbers, we will need at least $200,000 in additional FY2022 funding to meet the expected demand for the program.

C. Additional funding will allow the program to continue into the next fiscal year.

D. There is no application deadline. Counties may apply for funds year-round. Funding is limited and applications are received and processed on a first-come, first-served basis.

LEE AND VAN BUREN COUNTIES

TSIP APPLICATION FOR TEMPORARY TRAFFIC SIGNALS

FY 2022

Table of Contents

A. Application for TRAFFIC CONTROL DEVICE TSIP FUNDS

GENERAL INFORMATION **DATE:** August 4, 2020

Location / Title of Project Lee County Temporary Traffic Signals

Applicant Lee County Secondary Roads

Contact Person Ben Hull Title Lee County Engineer

Complete Mailing Address 933 Avenue H, P.O. Box 158

Fort Madison, Iowa 52627

Phone (319) 372-2541 (Area Code) E-Mail bhull@leecounty.org

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) Van Buren County Highway Department

Contact Person Ryne Thornburg Title Van Buren County Engineer

Complete Mailing Address P.O. Box 494

Keosauqua, Iowa 52565

Phone (319) 293-3663 (Area Code) E-Mail rthornburg@vbcoeng.org

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 65,000.00
Total Project Cost	$ 65,000.00
Safety Funds Requested	$ 65,000.00

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐Yes – Explain _____

☒No

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Lee County Secondary Roads

Signed: Benjamin J Hull 8/4/20

Signature Date Signed

Benjamin J. Hull, P.E.

Printed Name

Attest: Denise Fraise 8.4.2020

Signature Date Signed

Denise Fraise

Printed Name

RESOLUTION - LEE

RESOLUTION 2020-90

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

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

WHEREAS Lee and Van Buren Counties have determined that providing temporary traffic signals will improve the safety of drivers, flaggers, and road crews during road maintenance; and

WHEREAS State Traffic Safety Improvement Program funding is available through the Iowa Department of Transportation to partially fund roadway safety improvements;

NOW THEREFORE, BE IT RESOLVED, that the Board of Supervisors of Lee County supports and approves the attached application for Iowa Department of Transportation Traffic Safety Improvement Program funding and hereby commits to accepting and maintaining these improvements.

BE IT ALSO RESOLVED, that the Lee County Board of Supervisors in cooperation with the Van Buren County Board of Supervisors share and maintain the traffic signals in a manner acceptable to Iowa DOT.

LEE COUNTY BOARD OF SUPERVISORS

Ron Fedler

Ron Fedler, Chair

Matt Pflug

Matt Pflug, Vice Chair

Gary Folluo

Gary Folluo, Supervisor

Rich Harlow

Rich Harlow, Supervisor

Rick Larkin

Rick Larkin, Supervisor

Attest: Denise Fraise

Denise Fraise, County Auditor

RESOLUTION – VAN BUREN

RESOLUTION

Van Buren County Resolution # 7-27-2020 A

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

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

WHEREAS Lee and Van Buren Counties have determined that providing temporary traffic signals will improve the safety of drivers, flaggers, and road crews during road maintenance; and

WHEREAS State Traffic Safety Improvement Program funding is available through the Iowa Department of Transportation to partially fund roadway safety improvements;

NOW THEREFORE, BE IT RESOLVED, that the Board of Supervisors of Van Buren County supports and approves the attached application for Iowa Department of Transportation Traffic Safety Improvement Program funding and hereby commits to accepting and maintaining these improvements.

BE IT ALSO RESOLVED, that Lee County Board of Supervisors in cooperation with Van Buren County Board of Supervisors share and maintain the traffic signals in a manner acceptable to Iowa DOT.

VAN BUREN COUNTY BOARD OF SUPERVISORS

Dale House, Chair

Robert V. Waugh

Mark D Mesh

Van Bren County Board of Supervisors

Laurie Burgason

Attest: Lisa Plecker, County Auditor

Laurie Burgason
Deputy Auditor for

B. NARRATIVE

Lee and Van Buren Counties are applying for a joint Transportation Safety Improvement Program (TSIP) funds in the amount estimated to be 100% of the cost of a pair of portable temporary traffic signals. The primary purpose of the temporary traffic signals would be to replace flagging operations using personnel in an effort to provide safer work zones for the maintenance crews and to move traffic through the work zone more efficiently and safely, even in overnight closure situations.

Lee and Van Buren Counties are requesting TSIP funding for an amount equal to the cost of a pair of temporary traffic signals with pilot car remote and vehicle detection options included. Signals with these options would facilitate safe and efficient traffic flow in and around various work zones in Lee and Van Buren Counties Secondary Roads System, consisting of 1,485 miles (737 Lee, 748 Van Buren), of which 300 miles (199 miles Lee, 101 miles Van Buren) are located on hard surfaces, according to the Iowa Department of Transportation's IOWA MILES OF RURAL SECONDARY ROADS AS OF JANUARY 1, 2017. The signals would improve work zone safety for both Secondary Road Departments.

Portable traffic signals would primarily be used on two lane paved roads during construction projects that require one lane to be closed. Potential safety benefits include:

- Increased visibility for approaching motorists during day and nighttime operations
- Improved traffic flow efficiency through construction/ maintenance zones
- Elimination of two human flaggers from highest risk areas in work zones
- Relief of the physical demands associated with human flaggers such as fatigue, stress, heat exposure, and longevity

C. COST

Preliminary Quotes for set of two Temporary Traffic Signals with vehicle detection and pilot car remote.

OMJC Signal	**$48,700.00** (Price includes delivery and training)
Horizon Signal	**$52,595.00** (Price includes training and warranty)

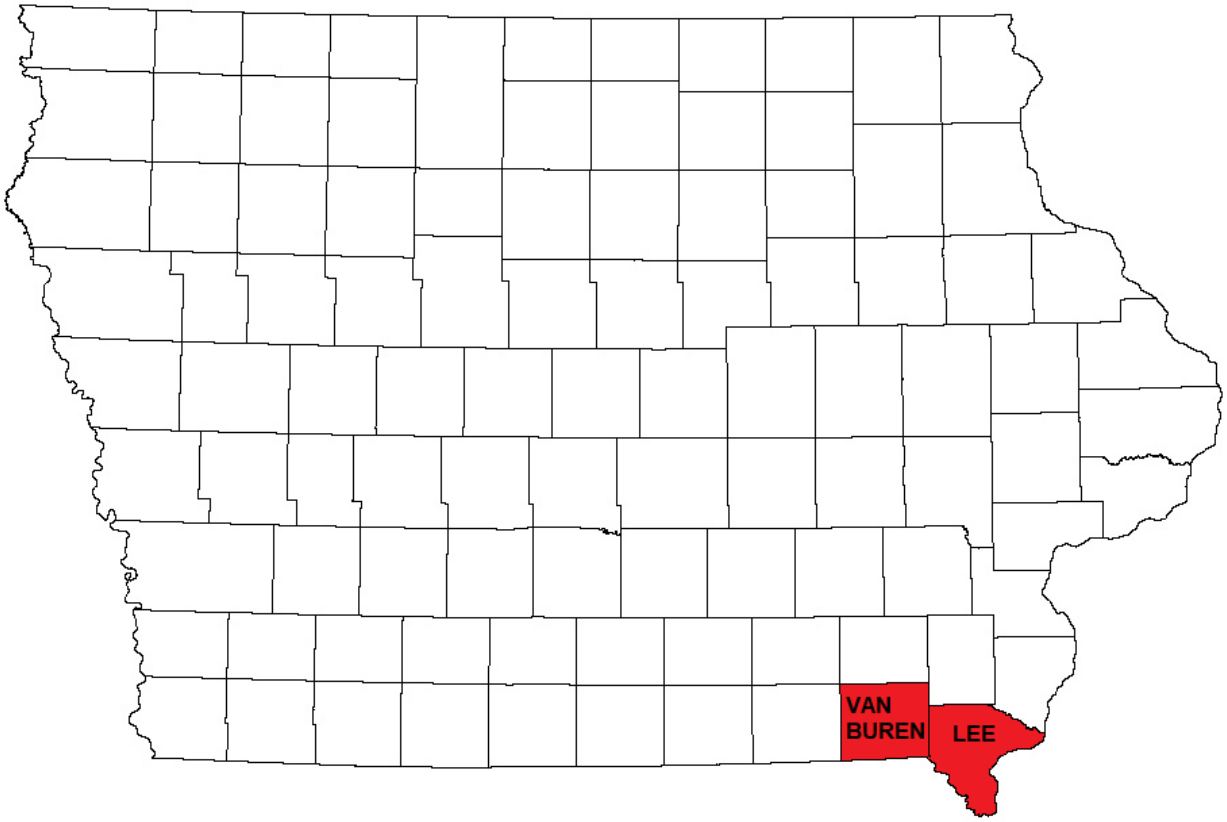
Estimated purchase price includes cost for; traffic signals along, additional advanced warning signs with stands (One Lane Road Ahead, Traffic Signal Ahead ...etc.) in order to comply with Standard Road Plans TC-215 & TC-218, and portable rumble strips.

Signals	**$55,000**
Additional Signage and Rumble Strips	**$10,000**
Total	**$65,000**

D. Time Schedule

TSIP APPLICATION DUE	August 15, 2020
TSIP Award Notification	Mid-January 2021
TSIP Funding Available	July 1, 2021
Final Quote Comparison	August 2021 (est.)
Purchase of Traffic Signals	October 2021 (est.)
Usage of Temporary Traffic Signals	December 2021 (est.)

E. MAP Location of devices to be used



F. Temporary Traffic Signal Devices

SQ3TS from Horizon Signal

Benefits

- **25 YEAR DESIGN LIFE**
  The SQ3TS trailer is built with only the highest-quality materials to ensure your signals function at the highest level year after year. No other PTS comes close.
- **100 MPH WIND LOAD**
  Independent 3rd-party analyses have concluded that the SQ3TS can withstand sustained winds of 100 MPH, and gusts of 110 MPH.
- **10 YEAR STRUCTURAL WARRANTY**
  The SQ3TS comes backed by an industry-leading 10-year structural warranty.
- **DUAL-PROCESSOR MMS**
  Each Horizon PTS features the built-in redundancy of TWO conflict monitors -- the most secure system in the industry.
- **LIFTING RING**
  Facilitates placement of the SQ3TS behind guardrail, fences, barriers, or other work zone obstacles
- **HYDRAULIC LIFTING SYSTEM**
  Simple pushbutton activation lifts the overhead mast arm into the operating position with no failure-prone cables or winches.
- **(16) 6-VOLT BATTERIES STANDARD**
  30+ days of runtime on every SQ3TS system
- **520 WATTS SOLAR**
  Lay-flat solar panels aid in achieving our high wind load ratings, and also help prevent theft or vandalism.

Specs

- **SIGNAL LAMP –** 12” (300m mm) diameter LED
- **SIGNAL ARM EXTENSION –** 68” to 109” (173 to 277 cm)
- **SOLAR CHARGE –** 520w minimum
- **POWER –** 12V / (16) 6-volt batteries
- **TOW HEIGHT –** 89” (226 cm)
- **TRAILER WIDTH –** 85” (216 cm)
- **TRAILER WEIGHT –** 3000 lb. (1361 kg)

OMJC Signal

Benefits

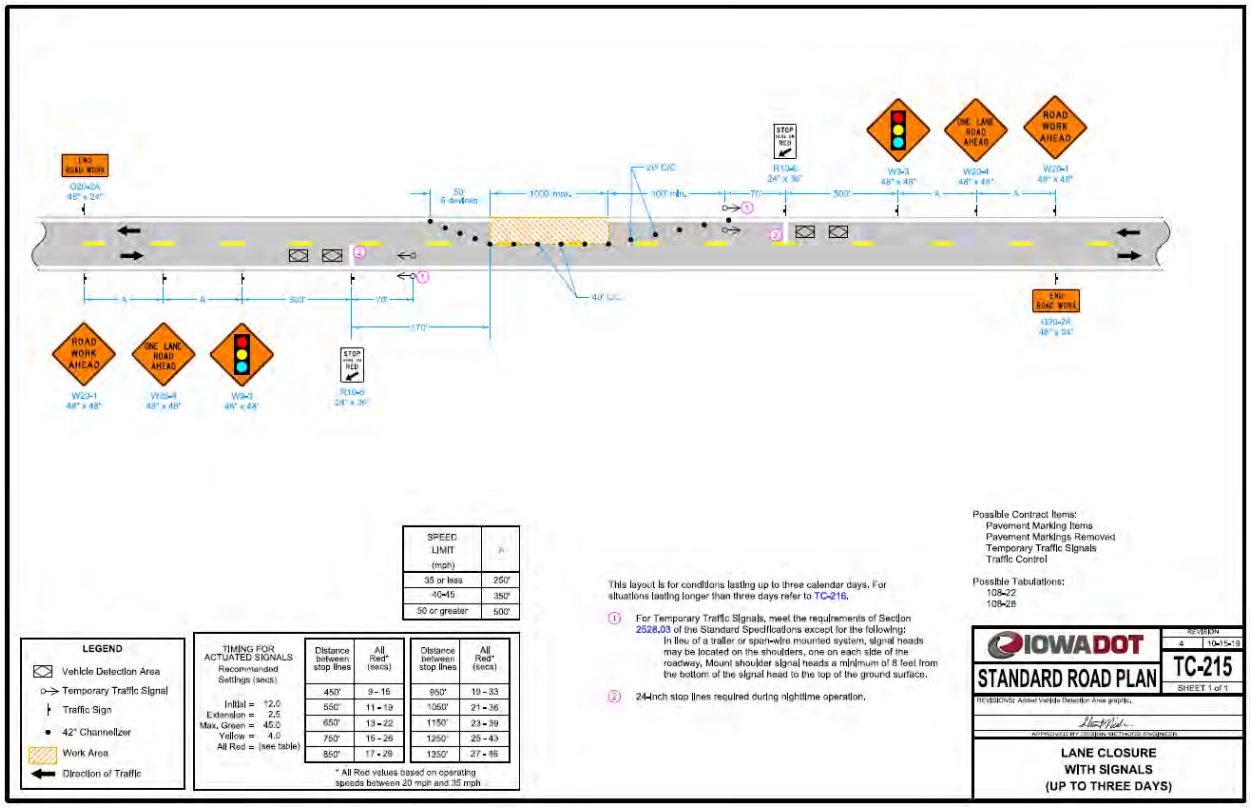
- Lift Mechanism - electric over hydraulic with remote pendant, single
- cylinder both lifts and extends in a single movement
- Arm Extension from side of trailer - 9'
- 12" RYG LED signals - ITE compliant, 1 overhead, 1 side of mast
- 180 degree signal rotation
- Traffic control equipment - Intelight Controller - ATC w/ Maxtime 2070 software – EZ Interface (Just answer 4 questions) - actuated 8 phase, dual ring, with pedestrian movements, preemption and coordination capable, knock-down capable, encrypted wireless connection between master and secondaries, real time monitoring
- Vehicle detection option - microwave, video, loop
- Red clearance extender option
- Green recycle option
- Preemption system option
- Pilot Car remote detection
- Optional remote monitoring & programming with on-board GPS
- Auto-start generator option

Specs

- **Chassis length** - 112", removable hitch adds 56" for a 168" total
- **Chassis Width** - 72" - narrowest in industry
- **Travel Height** - 114" with solar
- **Weight with solar, batteries, and controls** - 2700#
- **Clearance under arm** - 17'

G. Plan View

TC-215



SPEED LIMIT (mph)	A
35 or less	250'
40-45	350'
50 or greater	500'

This layout is for conditions lasting up to three calendar days. For situations lasting longer than three days refer to TC-216.

① For Temporary Traffic Signals, meet the requirements of Section 2528.03 of the Standard Specifications except for the following:
In lieu of a trailer or span-wire mounted system, signal heads may be located on the shoulders, one on each side of the roadway. Mount shoulder signal heads a minimum of 8 feet from the bottom of the signal head to the top of the ground surface.

② 24-inch stop lines required during nighttime operation.

Possible Contract Items:
Pavement Marking Items
Pavement Markings Removed
Temporary Traffic Signals
Traffic Control

Possible Tabulations:
108-22
108-28

LEGEND

- Vehicle Detection Area
- Temporary Traffic Signal
- Traffic Sign
- 42" Channelizer
- Work Area
- Direction of Traffic

TIMING FOR ACTUATED SIGNALS
Recommended Settings (secs)

Initial = 12.0
Extension = 2.5
Max. Green = 45.0
Yellow = 4.0
All Red = (see table)

Distance between stop lines	All Red* (secs)	Distance between stop lines	All Red* (secs)
450'	9 - 15	950'	19 - 33
550'	11 - 19	1050'	21 - 36
650'	13 - 22	1150'	23 - 39
750'	15 - 26	1250'	25 - 43
850'	17 - 29	1350'	27 - 46

* All Red values based on operating speeds between 20 mph and 35 mph

IOWADOT

STANDARD ROAD PLAN

TC-215

SHEET 1 of 1

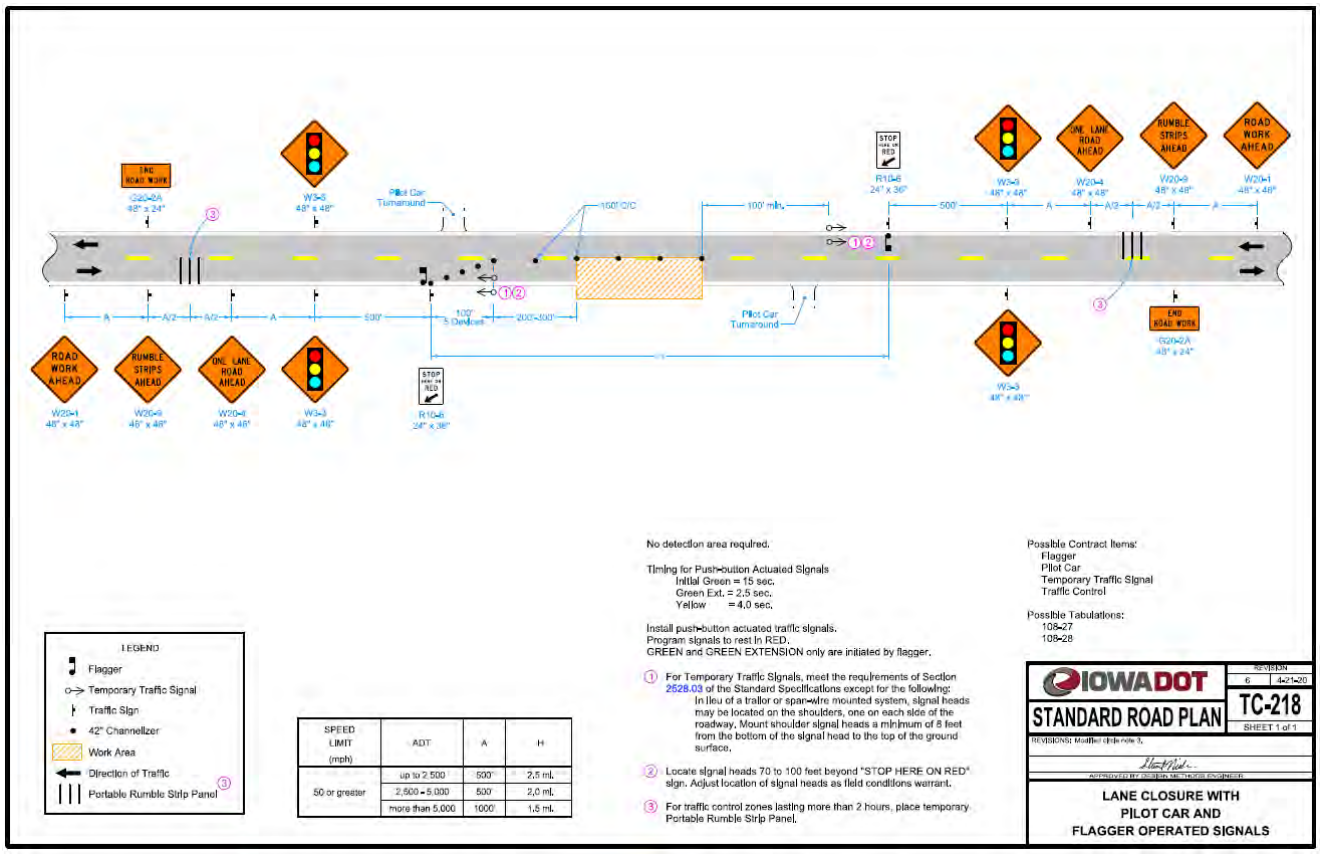
REVISION 4 10-15-19

REVISIONS: Added Vehicle Detection Area graphic.

APPROVED BY DESIGN METHODS ENGINEER

LANE CLOSURE
WITH SIGNALS
(UP TO THREE DAYS)

TC-218



LEGEND

- Flagger
- Temporary Traffic Signal
- Traffic Sign
- 42" Channelizer
- Work Area
- Direction of Traffic
- Portable Rumble Strip Panel ③

SPEED LIMIT (mph)	ADT	A	H
50 or greater	up to 2,500	500'	2.5 mi.
	2,500 – 5,000	500'	2.0 mi.
	more than 5,000	1000'	1.5 mi.

No detection area required.

Timing for Push-button Actuated Signals
Initial Green = 15 sec.
Green Ext. = 2.5 sec.
Yellow = 4.0 sec.

Install push-button actuated traffic signals.
Program signals to rest in RED.
GREEN and GREEN EXTENSION only are initiated by flagger.

① For Temporary Traffic Signals, meet the requirements of Section 2528.03 of the Standard Specifications except for the following:
In lieu of a trailor or span-wire mounted system, signal heads may be located on the shoulders, one on each side of the roadway. Mount shoulder signal heads a minimum of 8 feet from the bottom of the signal head to the top of the ground surface.

② Locate signal heads 70 to 100 feet beyond "STOP HERE ON RED" sign. Adjust location of signal heads as field conditions warrant.

③ For traffic control zones lasting more than 2 hours, place temporary Portable Rumble Strip Panel.

Possible Contract Items:
Flagger
Pilot Car
Temporary Traffic Signal
Traffic Control

Possible Tabulations:
108-27
108-28

IOWADOT

REVISION	
6	4-21-20

STANDARD ROAD PLAN

TC-218

SHEET 1 of 1

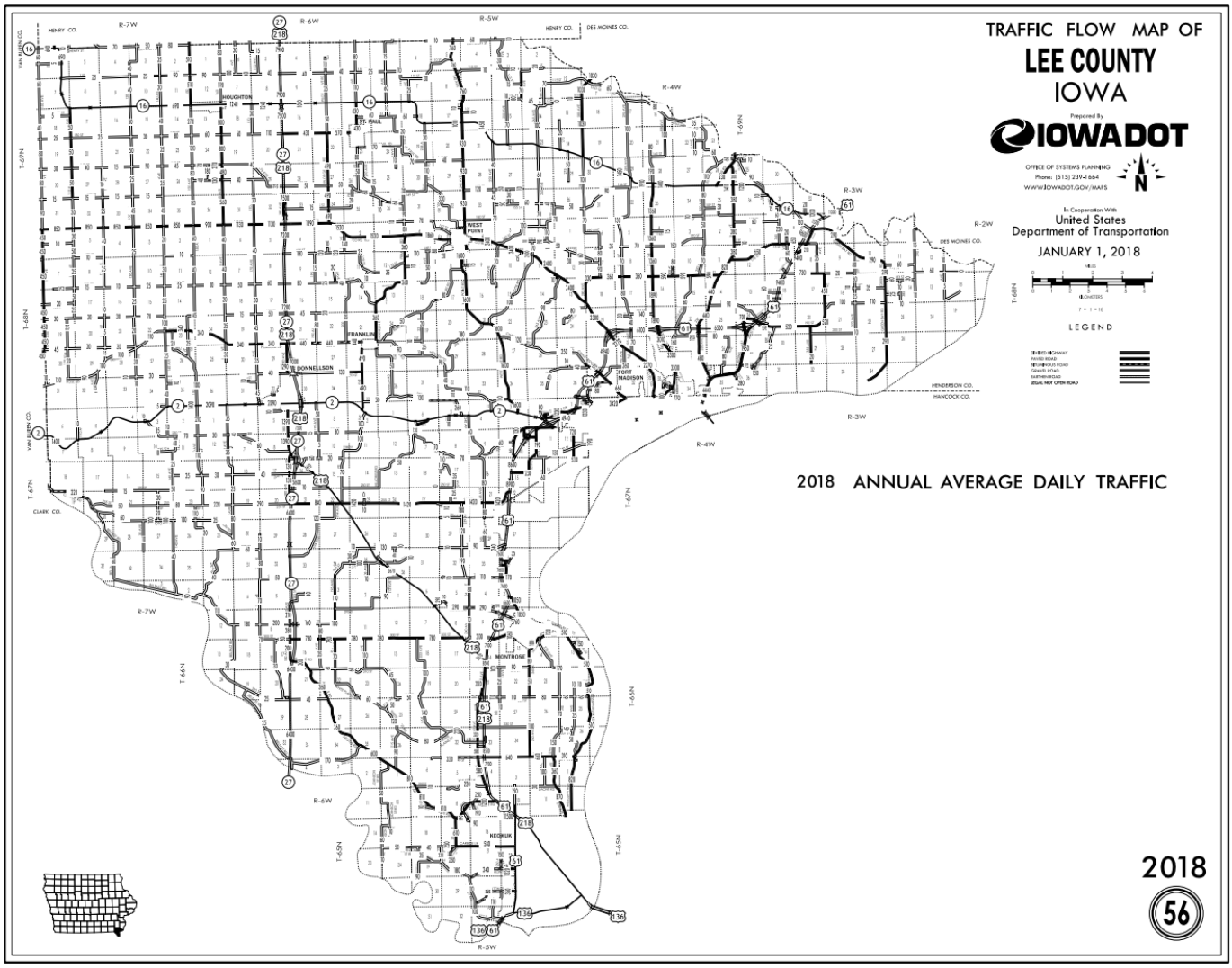
REVISIONS: Modified cycle note 3.

APPROVED BY DESIGN METHODS ENGINEER

LANE CLOSURE WITH PILOT CAR AND FLAGGER OPERATED SIGNALS

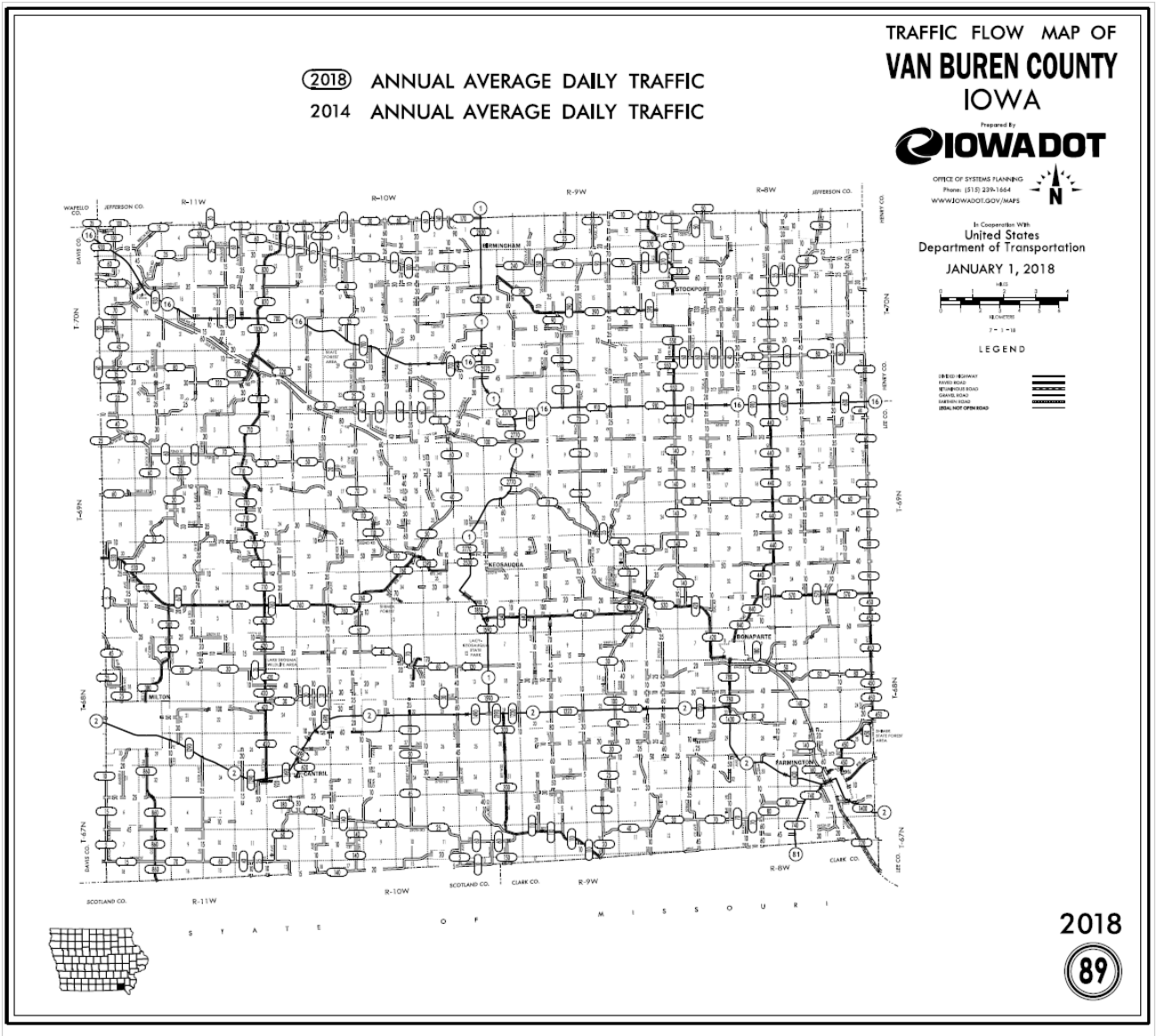
H. Traffic Volumes

Lee County



Source: https://iowadot.gov/maps/msp/traffic/2018/counties/LEE.pdf

Van Buren County



Source: https://iowadot.gov/maps/msp/traffic/2018/counties/VANBUREN.pdf

I. Traffic Signal Layout

Refer to Section G (Plan View)

J. Cost/ Benefit Analysis

Per Traffic Control Device application instructions, a Benefit/Cost worksheet is not required for consideration in the Traffic Control Device category.

MADISON COUNTY

TRAFFIC SAFETY IMPROVEMENT PROGRAM

APPLICATION FOR TRAFFIC CONTROL DEVICE

TEMPORARY TRAFFIC SIGNALS

FY 2022

Madison County is applying for Traffic Safety Improvement Program Funds. The application is for temporary traffic signals in the category of traffic control devices

A. APPLICATION, CERTIFICATION & RESOLUTION

Rev. 5/18

IOWA DOT

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION **DATE:** August 11, 2020

Location / Title of Project: Madison County Temporary Traffic Signals

Applicant: Madison County

Contact Person: Mike Hackett, PE & PLS Title: Assistant County Engineer

Complete Mailing Address: 1105 E. Court AVE.
Winterset, Iowa 50273

Phone: 515-462-1136 (Area Code) E-Mail: mhackett@madisoncoia.us

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:

Funding Amount

Total Safety Cost	$	63,000
Total Project Cost	$	63,000
Safety Funds Requested	$	63,000

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☐ Yes – Explain _____

☒ No

A. APPLICATION, CERTIFICATION & RESOLUTION

Rev. 5/18

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 County of Madison

Signed: _____ 8-11-2020
Signature Date Signed

Mike Hackett
Printed Name

Attest: _____ 8/11/2020
Signature Date Signed

Todd Hagan
Printed Name

A. APPLICATION, CERTIFICATION & RESOLUTION

SR–RESOLUTION-08-11-2020 -B

WHEREAS, The Iowa Department of Transportation has adopted Administrative Rule 761- Chapter 164, which created the Traffic Safety Improvement Program (TSIP) to allow for funding to be provided to local jurisdictions for eligible traffic safety improvement projects, and

WHEREAS, Madison County has determined that providing temporary traffic signals will improve the safety of drivers, flaggers, and road crews during road maintenance activities; and

WHEREAS, portable temporary traffic signals are recognized temporary traffic control devices in the Manual on Uniform Traffic Control Devices, 2009 Edition, and

WHEREAS, Traffic Safety Improvement Program Funds are available for traffic control devices;

BE IT HEREBY RESOLVED:

1. That the Madison County Board of Supervisors supports and approves the attached application for Iowa Department of Transportation Traffic Safety Improvement Program funding; and

2. The Madison County Board of Supervisors hereby commits to accepting and maintaining these improvements.

MADISON COUNTY BOARD OF SUPERVISORS

AYE

Phillip Clifton, Chairman

Diane Fitch, Supervisor

Robert Duff, Supervisor

NAY

Phillip Clifton, Chairman

Diane Fitch, Supervisor

Robert Duff, Supervisor

ATTEST: Shelley D. Kaster, Madison County Auditor

DATE 8/11/2020

B. NARRATIVE

B. Narrative

Madison County is applying for the Transportation Safety Improvement Program (TSIP) funds in the amount estimated to be 100% of the cost of a pair of portable temporary traffic signals and the associated signage and channelizing devices. The purpose of the temporary traffic signals would be to replace flagging operations in the work zones, move traffic through the work zone more safely and efficiently, provide safer work zones for the maintenance crews, and to allow lane closure in the work zone areas for a longer deration including but not limited to an overnight lane closure situation.

The Madison County Secondary Roads Department is responsible for the engineering, construction and maintenance of the county's secondary road system. The secondary road system in Madison County consists of a total of 906 miles of road systems. The 906 miles of road systems include 120 miles of paved roads, 745 miles of granular surfaced roads, and 41 miles of dirt roads. The 906 miles of road systems also includes 214 bridges, listed on the National Bridge Inventory, and an estimated 3800 culverts all maintained by Madison County Secondary Roads Department.

The Madison County Secondary Roads Department has multiple maintenance crews to work on the said systems which require traffic control work zones. The county maintenance crews' traffic control plan often involve one-lane road and flagger operations. The one-lane road and flagger operations require extra personal for each crew. If portable temporary traffic signals are used, the extra personal that was assigned to the crews for traffic control could be used on other maintenance projects. Madison County estimates that this would free up an additional 800 man hours per year.

During bridge and pavement work, the concept and need for temporary/portable traffic signals became evident. As discussions progressed, the available uses for temporary traffic signals for county maintenance crews grew. This evolution included not only bridge construction, bridge repair and pavement patching, but also emergency scenarios, routine maintenance of culverts, ditches, shoulders, guardrail and many other activities on all classifications of secondary roads. Dialogue of the concept amongst county engineers, emergency management and human resources coordinators led to many other potential uses and benefits for the safety of Madison County employees and road users.

Part 6E84 of the MUTCD provides warrants, standards, guidance, and support for the use of traffic signals in work zones. Additional information regarding signal use is located in Part 4. The primary use of the temporary traffic signals would be in a work zone temporary lane closure scenario for one lane, two-way traffic operation. The safety benefits of utilizing temporary traffic signals over flaggers is hard to quantify and little information is available regarding crash modification or reduction factors in these applications. Cost benefits associated with the use of temporary traffic signals in work zones or for one lane closure scenarios are available in section J of this report. However, a list of safety benefits for maintenance crews and motorists in situations utilizing temporary traffic signals is available below:

B. NARRATIVE

B. Narrative

- Increased visibility to approaching motorists (additional signage and overhead signal)
- More direct communication with motorist
- Clearer understanding and familiarity with drivers
- Significantly more viable for nighttime operations
- Relieves the physical demands, stress, fatigue and hazards of flagging
- Elimination of two positions from work zone with the highest risk exposure

Often times the flagger is obstructed by vehicles in the que at the work zone, the signal itself is more visible to approaching motorist due to the height of the mast arm and its projection over the roadway. Signal heads communicate with bright, familiar, comprehendible messages to all motorist both day and night. Detection systems coupled with temporary traffic signals can facilitate more even traffic flow through the work zone in one-lane road situations. This may reduce driver wait times and frustration by providing consistent intervals of passage through the work zone.

Flagging is very stressful, can be physically demanding, and most importantly exposes employees to high-risk situations. Even a responsible flagger is extremely vulnerable to speeding or distracted drivers that do not yield when approaching work zones. The risk associated with flagging is evident in many ways, but can be quantified by looking at examples of worker compensation coverage rates. Various county employees have different rates depending on their job type. These classifications identify which type of work represents the most risk to the employee performing the task. Flagging would fall in a classification that is nearly double that of a peace officer for example. Removing two employees from close proximity to traffic would result in less time spent in the associate classification. This could potentially result in a cost saving to the county, but more importantly significantly reduces the risk of injury or death to an employee.

Madison County is requesting TSIP funding for an amount equal to the cost of a pair of temporary traffic signals with pilot car remote, vehicle detection options included, and the associated signage and channelizing devices. Signals with these options would facilitate safe and efficient traffic flow in and around various work zones on Madison County secondary roads. Cities and other jurisdictions could also benefit from these signals in the event of a signal knock down, disaster event or routine maintenance when not in use by Madison County. Additionally, it would allow Madison County the flexibility to establish short-term overnight closures for road and bridge repairs and remove employees from high-risk situations in close proximity to an ever-growing inattentive driving population.

C. ITEMIZED BREAKDOWN OF COST

C. Itemized Breakdown of Cost

TEMPORARY TRAFFIC SIGNAL PRELIMINARY QUOTES

(Set of Two Signals, with vehicle detection and pilot car remote)

Description	Expenses
OMJC Signal – LDPTS	$52,000.00
Tower Sign and Signal – SX7500	$48,500.00
Horizon Signal – SQ3TS	$52,595.00

See Reference Quotes

TEMPORARY TRAFFIC SIGNS AND CHANNELIZING DEVICES PRELIMINARY QUOTES

W20-1 (48” x 48”), 2 Each	$307.00
W13-1 (24” x 24”), 2 Each	$77.00
R4-1 (36” x 48”), 2 Each	$115.00
W20-4 (48” x 48”), 4 Each	$615.00
W3-3 (48” x 48”), 4 Each	$615.00
R10-6 (24” x 48”), 2 Each	$115.00
W14-3 (48” x 64” x 64”), 2 Each	$234.00
G20-2A (48” x 24”), 2 Each	$154.00
Type “B” high-Intensity flashing waring light, 2 Each	$200.00
Type 3 EZ Kade Barricade mounting legs, 18 Each	$2,200.00
Channelizer Drum Plastic 18In 18000Ldpe Traffix, 40 Each	$2,200.00
Channelizer Drum Base (Only) 18005-Sfb Traffix, 40 Each	$866.00

Pricing From:

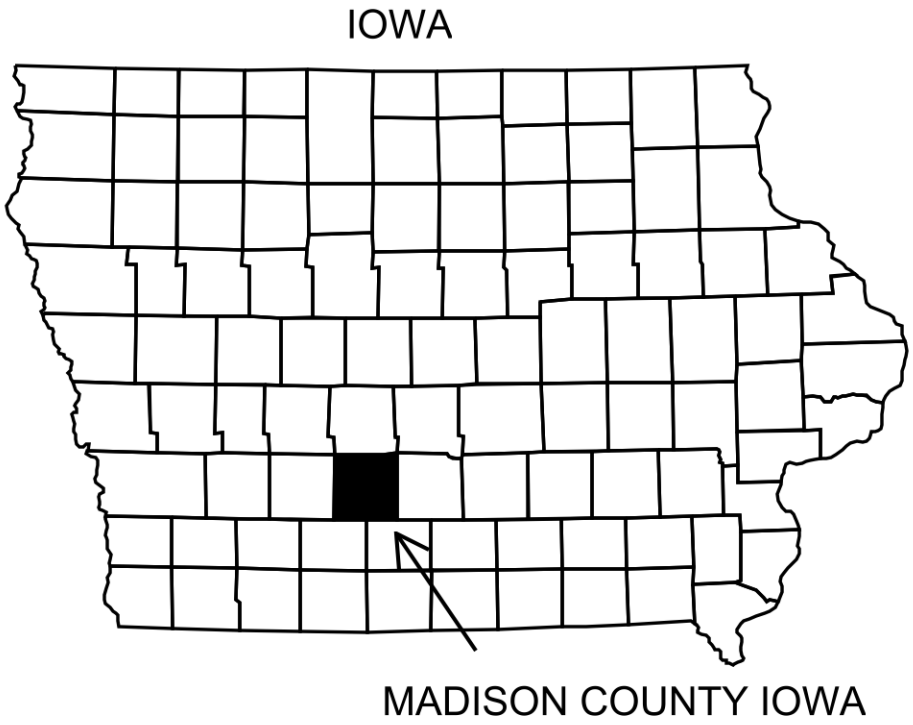
https://www.iaprisonind.com/store/c/262-Temporary-Traffic-Control-Zone.aspx
https://secure.iowadot.gov/centralinventory/Catalog.aspx

D. TIME SCHEDULE

D. Time Schedule

TSIP Application Due	August 15, 2020
TSIP Award Notification	Mid-January 2021
TSIP Funding Available	July 1, 2021
Final Quote Comparison	July 2021 (est.)
Purchase of Traffic Signals	July 2021 (est.)
Use of Temporary Traffic Signals	August 2021(est.)

E. MAP



E. MAP

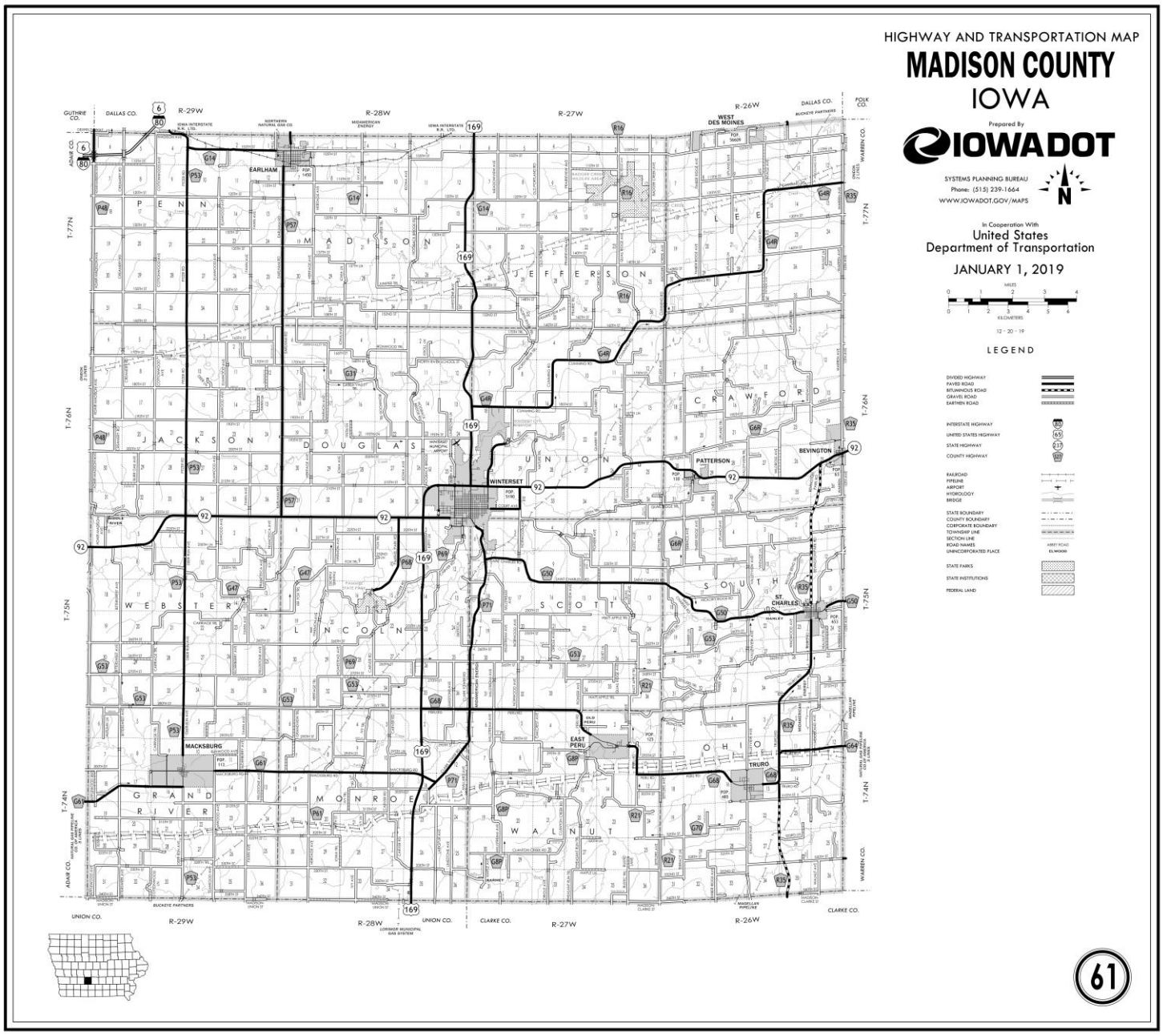


Image Source: https://iowadot.gov/maps/msp/pdf/madison-bwco.pdf

F. Pictures

(Example Photos)

Image Source:

http://horizonsignal.com/portable-traffic-signal-sq3ts/

Image Source:

http://omjcsignal.com/portable-traffic-signals/

Image Source:

http://horizonsignal.com/portable-traffic-signal-sq3ts/

G. PLAN VIEW

F

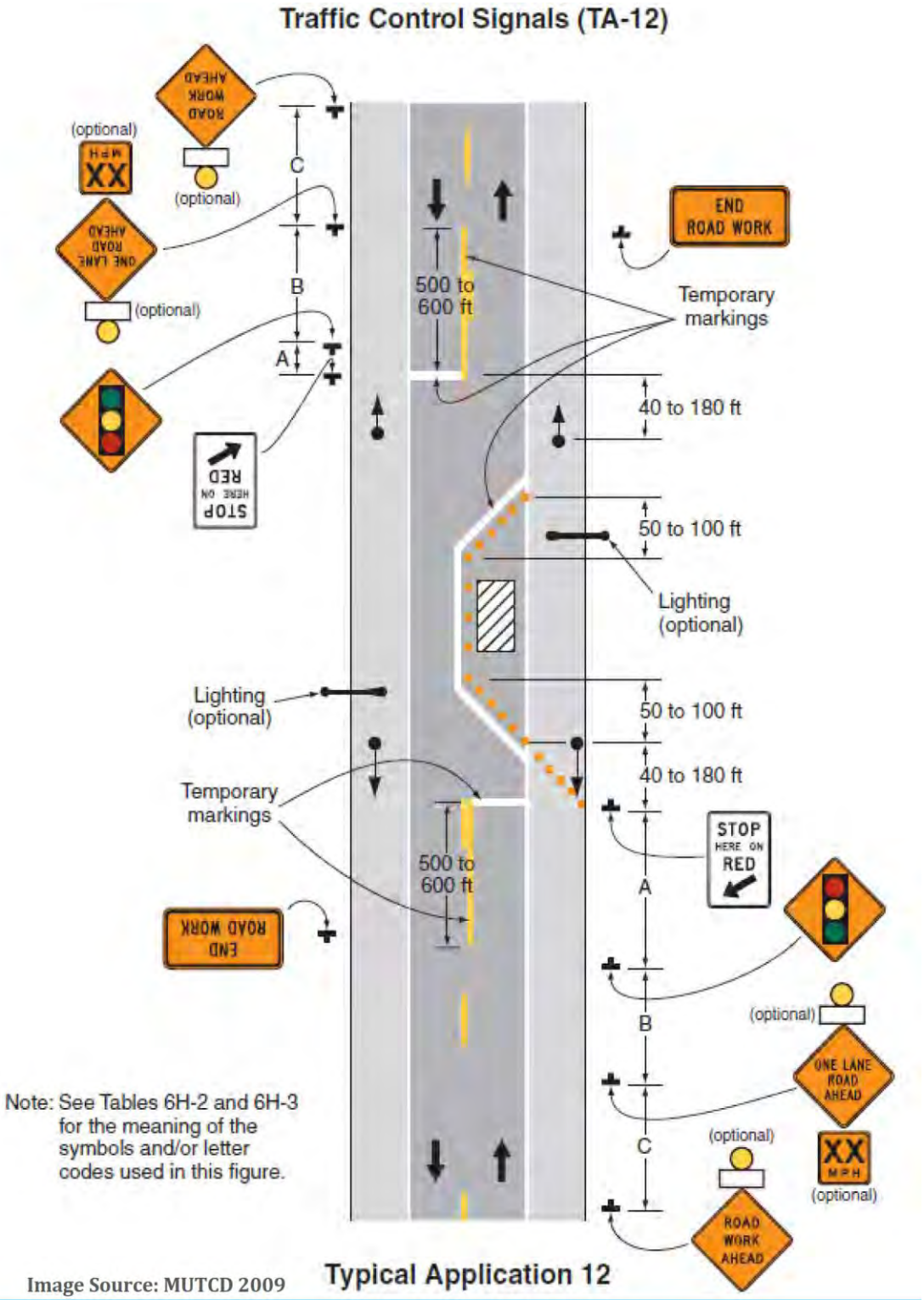


Image Source: MUTCD 2009

Typical Application 12

G. PLAN VIEW

F. Plan View

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

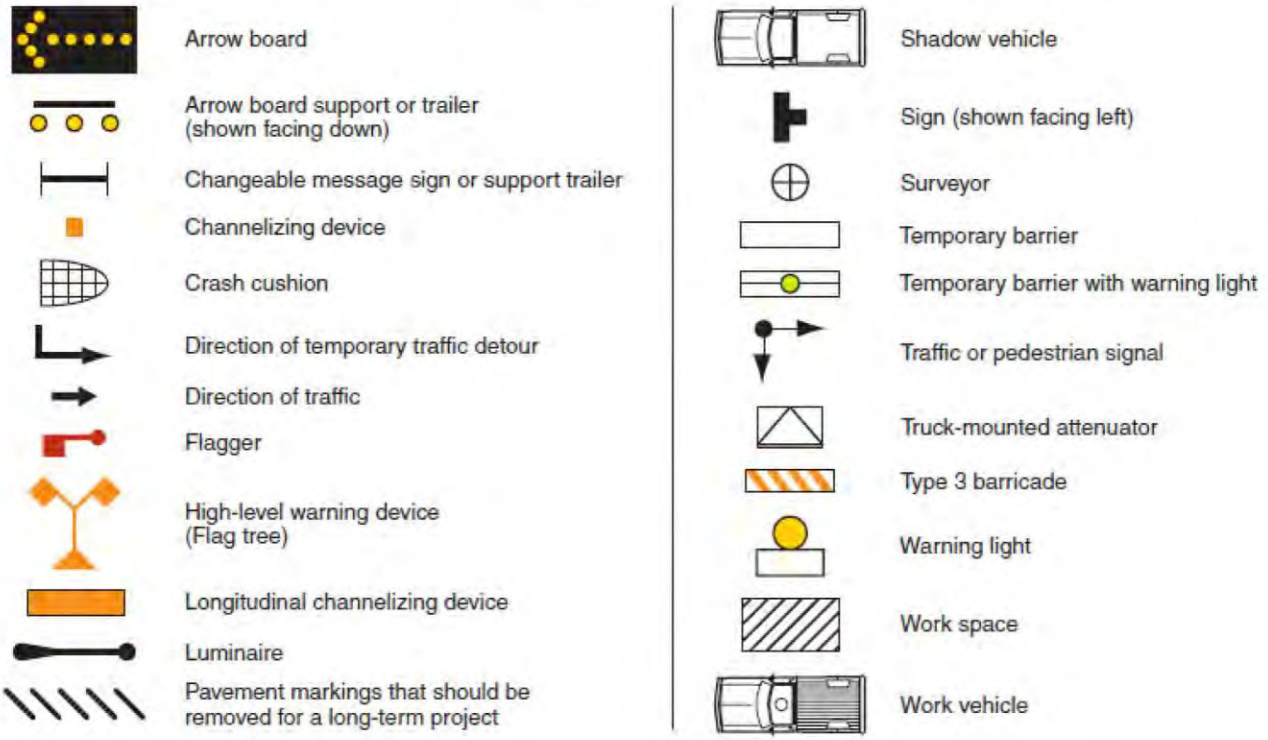


Image Source: MUTCD 2009

G. PLAN VIEW

F. Plan View

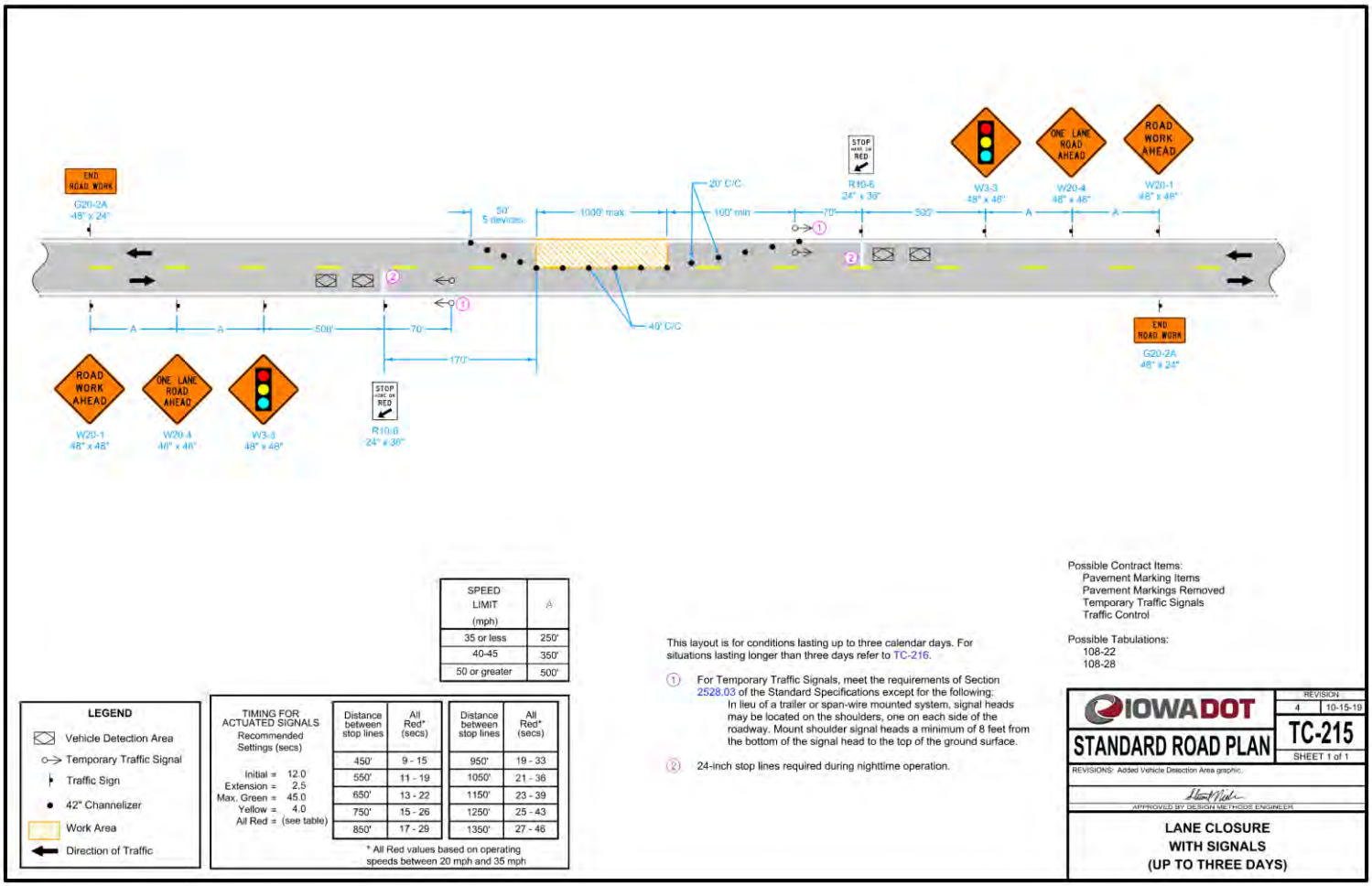


Image Source: https://iowadot.gov/design/SRP/IndividualStandards/etc215.pdf

G. PLAN VIEW

F. Plan View

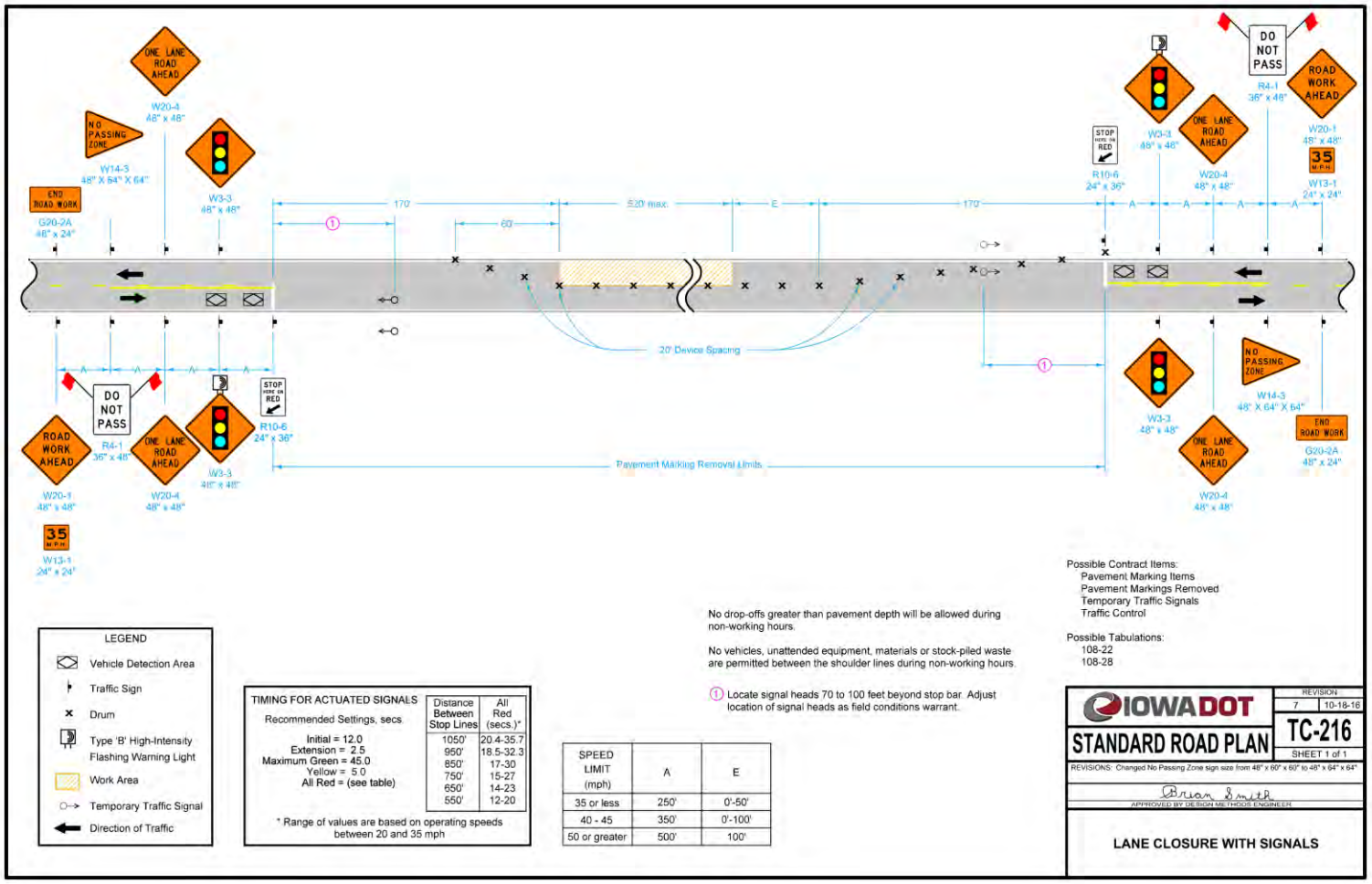
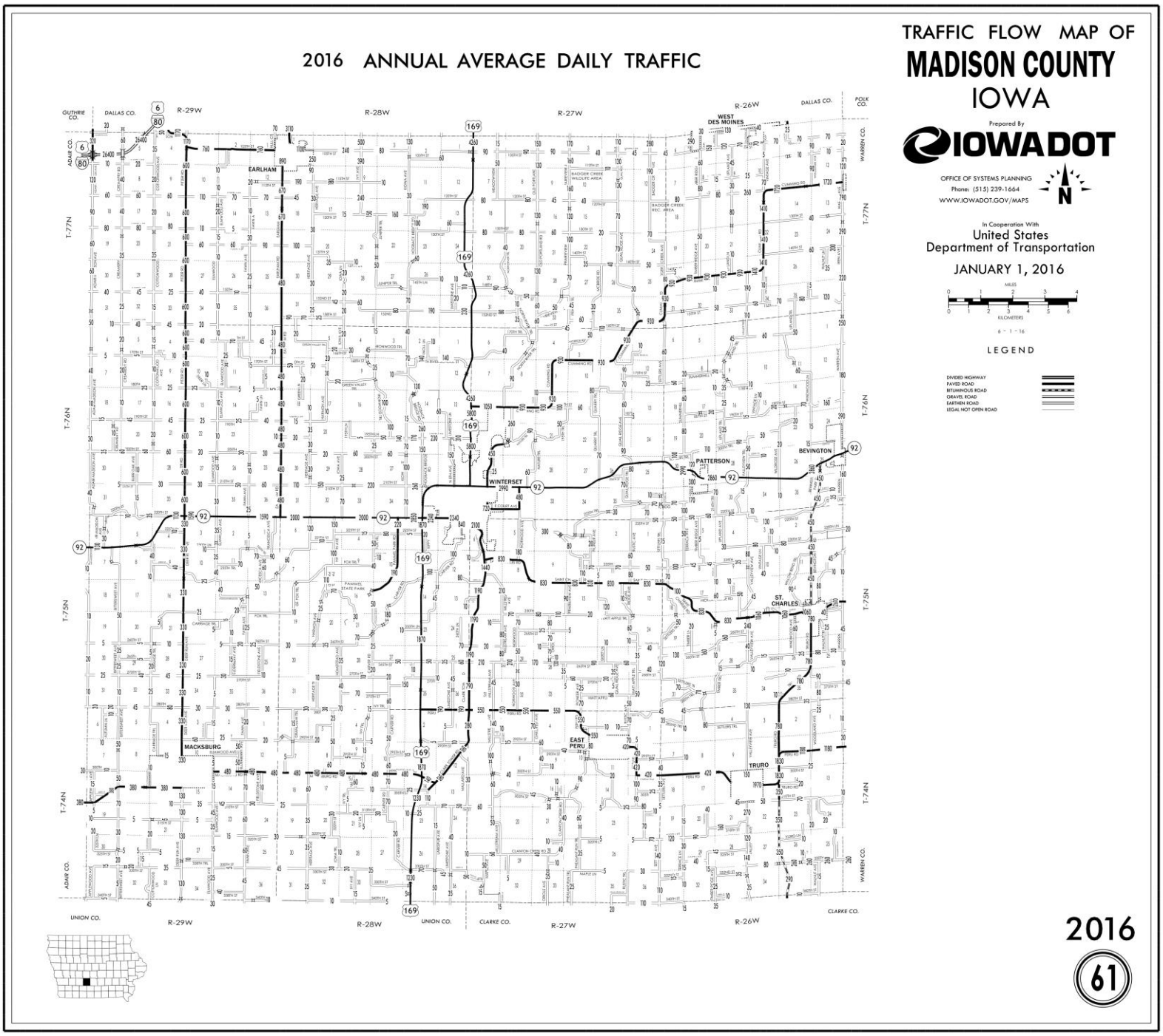


Image Source: https://iowadot.gov/design/SRP/IndividualStandards/etc216.pdf

H. TRAFFIC VOLUMES

H. Traffic Volumes



MADISON COUTY TRAFFIC VOLUMES

https://iowadot.gov/maps/msp/traffic/2016/counties/MADISON.pdf

H. Traffic Volumes

Traffic volumes in Madison County continue to increase due to the locating of the county. The county is bordered by Interstates 80 and 29. The Des Moines metropolitan area borders the county and is part of Madison County. Madison County is often referred to as a bedroom community for the Des Moines metropolitan area. Madison County has seven towns and multiple rural subdivision that generate a large amounts of traffic to the surrounding communities. For perspective, two of Madison County's highest volume roads have an Annual Average Daily Traffic (AADT) of 3110 VPD and 2610 VPD. These factors all contribute to the large traffic volumes the Madison County Road Department encounters on a daily basis. For that reason, the temporary traffic signals would provide a great benefit to the road users and traveling public, but also to the safety of our work zones and employees during maintenance operations. Included above is the 2016 AADT map for Madison County.

I. TRAFFIC SIGNAL LAYOUT

I. Traffic SIGNAL LAYOUT

Refer to Section G (PLAN View) for the temporary traffic signals Layout information.

J. COST / BENEFIT

J. Cost / Benefit

Per Traffic Control Device application instructions, a Benefit/Cost worksheet is not required for consideration in the Traffic Control Device category. However, it is pertinent to mention the cost benefits associated with the use of temporary traffic signals.

Our research did reveal cost benefit information from various research projects and studies executed in regards to feasibility, use, and efficiencies of temporary traffic signals in work zones. Although hard to quantitatively measure, it is worthwhile to mention the cost benefits shown below:

- Reduction in significant motorist delay compared to flagging operation
- Relieves the physical demands, stress, fatigue and hazards of flagging o Result may be quantifiable in workers compensation and insurance premiums
- Elimination of two positions from work zone with the highest risk exposure
- Increase productivity, efficiency and flexibility within the crew
- Elimination of a pilot car (depending on scenario)
- Cost benefits increase rapidly with more frequent use

REFERENCES

References

1. Evaluation of Alternative Methods of Temporary Traffic Control on Rural One-lane, Two-way Highways. Texas A&M Transportation Institute, April 2015.
2. Feasibility of Portable Traffic Signals to Replace Flaggers in Maintenance Operations. Texas transportation Institute, Texas MN University, 2000.
3. Guidelines for the Use of Portable Traffic Signals in Rural, Two-lane Maintenance Operations. Texas Transportation Institute, February 2000.
4. Manual on Uniform Traffic Control Devices. United States Department of Transportation, Federal Highway Administration, 2009. MUTCD Part 6F.84, MUTCD Part 4D.32, and MUTCD Part 41-I.
5. Portable Traffic Signals in the Work Zone. International Municipal Signal Association, March/ April 2011.

REFERENCES

OMJCSignal
PO Box 1594
Waterloo, IA 50704
403 Chestnut St.
Waterloo, IA 50703
800.776.5999
Fax: 319.236.1554
Email: sales@omjcsignal.com
omjcsignal.com

Quotation

Quote Numbe
7786

Quote Date
August 3, 2020

Page
1

Quoted to:
ATTN: MIKE HACKETT
MADISONCOIOWA

SHIP TO:
MADISONCOIOWA

PH: 5154621136
FAX:

Customer ID	Good Thru	Payment Terms	Sales Rep Name
MADISONCOUNTYIA	9/2/20	Net 30 Days	DAVID T. KNAPP

Quantity	Item	Description	Unit Price	Extension
1.00	LDPTS	ONE PAIR OF POP-UP LIGHT DUTY TRAILERS (ONE MASTER, ONE SECONDARY) W/ WIRELESS TRAFFIC CONTROL AND SOLAR POWER	47,500.00	47,500.00
2.00	TC26-B-OMJC	VEHICLE DETECTOR	1,000.00	2,000.00
1.00	YJ	Hand Held Wireless Pendant Transmitter/Receiver w/ all cables & antenna, Yellow Jacket w/ 5 momentary pushbuttons - 1 yr wrnty **DELIVERY AND On-site training included at no additional cost if done on the same date	2,500.00	2,500.00

Freight & handling are in addition to the prices quoted above unless otherwise specified. All parts, materials and components are new unless otherwise specified. OMJC has been in business since July of 1985 to serve you.

Subtota	52,000.00
Sales Ta	
Freight	
Tota	52,000.00

REFERENCES

HORIZON SIGNAL

ADVANCING WORKZONE SAFETY

Quotation

Quote #JGH2049
8-3-20

CUSTOMER
Madison County Secondary Roads Dept.
Attn: Mike Hackett
1105 E. Court Ave.
Winterset, IA 50273
Phone: 515-462-1136
Email: mhackett@madisoncoia.us

Part #	Item/Description	Unit Price	Qty	Total Price
	SQ3TS System (2) solar-assisted signal trailers with tandem tow capability, (2) signal heads per trailer, all LED lamps, (2) controllers, (1) PTS Programmer, and wireless radio communication system.	**$ 24,225.00**	**2**	**$ 48,450.00**
	Motion Sensors Houston Radar Motion Sensor. Price includes two sensors	**$ 850.00 Ea.**	**2**	**$ 1,700.00**
	Pilot Car Module Allows pilot car driver to operate signals remotely using a handheld transmitter. Price includes 2 modules and 1 transmitter.	**$ 2,445.00**	**1**	**$ 2,445.00**
	Training at your facility. 24/7 technical support for the life of the system.	**Included**		**Included**
	10-year limited warranty on the structural trailer. 5-year warranty on LED lights. Signals and components are warranted for a period of 2 years, excluding batteries and tires.			
	Total			**$ 52,595.00**

Terms: Net 30 days
FOB: Reading, PA
Mike,
Thank you for interest in Horizon Signal Technologies, Inc. Current lead times once we receive a signed quote are approx. 1-2 weeks from receipt of your purchase order.
Should you decide to purchase the SQ3 Signal System, please sign and date this quote and email back to me at jheitkamp@horizonsignal.com.
Please call me with any questions!
Thanks,
Jesse Heitkamp

800.852.8796
horizonsignal.com

1

5 Corporate Blvd
Reading PA, 19608

REFERENCES

TOWER SIGN AND SIGNAL

24838 Hettick-Scottville Rd
Hettick, Illinois 62649
ph 618-778-5250
towersignandsignal@frontiernet.net

QUOTE

DATE	8/3/2020
QUOTE #	
CUSTOMER ID	
VALID UNTIL	9/2/2020

CUSTOMER
Mike Hackett
Madison County Secondary Road Dept
1105 E. Court Ave
Winterset, IA 50273

PH. 515-462-1136
FAX
EMAIL mhackett@madisoncoia.u

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
Portable wireless stoplight package (new) Standard SX7500 trailer mounted unit w/ solar assist, radar detection, dual communications battery backup, touch screen control panel multimode self repairing system 1 yr warranty, plus applicable tax F.O.B. TSS shop	2	ea	$24,000.00	$48,000.00
pilot car remote *In pilot car mode both trailers will hang on RED until the pilot car operator(s) requests GREEN*	1	system	$500.00	$500.00

customer acceptance: _____

subtotal
tax rate
tax due
total due

thanks for your business

Marion County Road Department
402 Willets Drive, Knoxville, IA 50138
Tel (641) 828-2225
Fax (641) 828-7349

MARION COUNTY TSIP APPLICATION - SOLAR FLASHING STOP BEACONS

FY 2022

Marion County will be applying for Traffic Safety Improvement Program funds for solar flashing stop beacons in the category of traffic control devices for various secondary/secondary paved road intersections.

TABLE OF CONTENTS

Contents

A. APPLICATION & CERTIFICATION

A. Application & Certification

APPLICATION

See Appendix A for Original

Rev. 5/18 **A**

IOWA DOT

Application for TRAFFIC CONTROL DEVICE
TSIP FUNDS

GENERAL INFORMATION DATE: August 14, 2020

Location / Title of Project: Flashing Red Beacon Installations at various Secondary/Secondary Road intersections

Applicant: Marion County

Contact Person: Tyler Christian Title: Marion County Engineer

Complete Mailing Address: 402 Willetts Dr.
Knoxville, IA 50138

Phone: 641-828-2225 (Area Code) E-Mail: tchristian@marioncountyiowa.gov

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:

Funding Amount

Total Safety Cost	$	16,464.00
Total Project Cost	$	16,464.00
Safety Funds Requested	$	16,464.00

Does this project appear on a Safety Improvement Candidate List or is there a safety study recommendation for this project?

☒Yes – Explain Two locations have Intersection Project Sheets as part of a Local Road Safety plan, G28/T15 and T15/Idaho Dr, listing flashing beacons as potential improvements.
☐No

A. APPLICATION & CERTIFICATION

CERTIFICATION

See Appendix A for Original

Rev. 5/18 **A**

APPLICATION CERTIFICATION FOR PUBLIC AGENCY

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 public agency(ies). I understand the attached resolution(s), where applicable, binds the participating public agency(ies) to assume responsibility for any additional funds, if required, to complete the project. In addition, the participating public agency(ies) agrees to maintain any new or improved public streets or roadways for a minimum of five years.

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 Marion County Board of Supervisors

Signed: _____ 8/14/2020
Signature Date Signed

Mark Raymie, Chairman
Printed Name, Title

Attest: _____ 8/14/2020
Signature Date Signed

Jake Grandia, Auditor
Printed Name

B. NARRATIVE

B. Narrative

Marion County is applying for the Transportation Safety Improvement Program (TSIP) funds in an amount estimated to be 100% of the cost for purchase of solar flashing stop beacons. The primary purpose of the beacons would be to reduce crash potential by increasing the conspicuity, enhance visibility, and reinforce the stop-controlled condition for approaching motorists.

Stop sign locations throughout Marion County for which we are applying exist at various secondary/secondary paved road intersections, many of which have high volumes of stopping and turning traffic. These intersections are all located in areas with 55 mph approaches to the stop condition, which includes rumbles, but without geometric features or otherwise to naturally slow the approaching traffic. Therefore, Marion County is proposing the installation of solar powered red flashing beacons in accordance with MUTCD Chapter 4L to reduce the potential for crashes at these intersections and enhance the visibility in all lighting and weather conditions.

Location 1: The first location is 'T' intersection of Co. Rd. G28 and T15, just west of the Pella corporate limit. Only one approach is controlled with T15 as the stop condition for NB traffic and G28 being the through route. This location has experienced four 'ran stop sign' crashes and a total of seven intersection related crashes, resulting in three minor injuries in the last five years. The following conditions exist at this proposed site:

- G28:
  - SL = 45 mph (recent speed study shows 85th Percentile at 53.9 mph EB, 52.1 mph WB)
  - AADT = 2330 (2018)
- T15
  - AADT = 2930 (2018)
  - NB double 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
  - Includes 'Cross Traffic Does Not Stop' plaque

Location 2: This location is a 4-way intersection of Co. Rd. T15 and Idaho Dr., just west of the Pella corporate limit. Only one highway approach is controlled with Idaho Dr. as the stop condition for WB traffic and T15 being the through route. The EB traffic is also stop controlled from a 25 mph residential subdivision road. This location has experienced two 'ran stop sign' crashes and a total of three intersection related crashes, resulting in two serious and two minor injuries the last five years. The following conditions exist at this proposed site:

- T15:
  - AADT = 3060 NB, 2930 SB (2018)
  - NB & SB advanced intersection warning signage with flashing amber beacons
- Idaho Dr.
  - AADT = 3420 WB (2018)
  - WB double 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
  - Includes 'Cross Traffic Does Not Stop' plaque

B. NARRATIVE

Location 3: This location is a 'T' intersection of Co. Rd. T17 and 228th Ave. south of the Pella. Two highway approaches, both on T17, are controlled as stop conditions for SB & EB traffic and 228th Ave. also being a stop condition as a gravel approach. This location already includes a flashing red beacon for EB traffic that has been in place for 10 years. This location has experienced two 'ran stop sign' crashes and a total of four intersection related crashes, resulting in only property damage the last five years. The following conditions exist at this proposed site:

- T17:
  - AADT = 3980 SB approach, 2790 EB approach (2018)
  - SB & EB double 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
  - Includes 'All Way' plaques
- 228th Ave.
  - AADT = 100 NB (2018)
  - Gravel Approach
  - 'All Way' plaque and reflective strips on sign post

Location 4: This location is a 4-way intersection of Co. Rd. T17 and Old Hwy 92. All four highway approaches are controlled as stop conditions for SB, NB, WB, & EB traffic. This location has no intersection related crash history, however; residents, road department staff, and law enforcement all report many instances of running the stop signs and near misses. The following conditions exist at this proposed site:

- T17:
  - AADT = 1370 SB approach, 1270 NB approach (2018)
  - SB & NB single 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
  - Includes 'All Way' plaques
- Old Hwy 92
  - AADT = 180 EB approach, 160 WB approach (2018)
  - EB & WB single 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
  - Includes 'All Way' plaques

Location 5: This location is a 4-way intersection of Co. Rd. S45, 50th, Ave. and G76 south of the Melcher-Dallas. The highway approach on S45 is controlled as stop conditions for NB traffic and 50th also being a stop condition as a gravel approach, with G76 as the through route. This location has experienced one 'FTYROW from stop sign' crashes and a total of two intersection related crashes, resulting in one possible injury in the last five years. The following conditions exist at this proposed site:

- S45:
  - AADT = 1050 NB (2018)
  - NB single 'Stop Ahead' are present
  - Reflective strips on 'Stop' & 'Stop Ahead' sign posts
- G76
  - AADT = 530 EB & 1510 WB (2018)

C. ITEMIZED BREAKDOWN OF COST

C. Itemized Breakdown of Cost

Marion County solicited a quote from Mobotrex Mobility & Traff Experts (previously Brown Traffic Products, Inc.) as they sell a Carmanah Solar 24-hour Flashing Beacons. Marion County has had one of these beacons installed for 10 years with no issues and is very pleased with the product. Marion County will perform the installation of the devices once purchased and will budget adequately for subsequent reimbursement following successful award of TSIP funding.

mobotreX

Quote

Quote Number: 1086120

109 West 55th Street | Davenport, IA 52806 | (563) 323-0009

Date: 08/14/2020
Expire Date: 9/14/2020
Prepared By: Zank, Justin D

Customer: CONTRR4
Contractor Quote - Region 4
General Delivery
Davenport IA 52806
United States

Description: Marion County, Iowa / tchristian@marioncountyiowa.gov

Part #	Description	Quantity	Price	Extended
R247-E	24-Hour Beacons	8	$2,058.00	$16,464.00
PMT10285-002	ENGINE:R247-E,SOL,BLK	8	$0.00	$0.00
PMR10677-002	TOP MT:2-2.25"SQ,2.38-2.88"OD,R920,BLK	8	$0.00	$0.00
PBB09290-001	BATTERY:7A/Hr,EXTENDED TEMP,(E-SERIES)	16	$0.00	$0.00
PMR10286-001	LED MOD:12",RED	8	$0.00	$0.00
PMR09044-002	SIG-HEAD:12",POLY,VISR,STIFF PLT,BLK	8	$0.00	$0.00
PBW10287-002	MOD HARNESS:4',LED,(INTEGRATED HEAD)	8	$0.00	$0.00

Sale Amount:	**$16,464.00**
Sales Tax:	0.00
Misc Charges:	0.00
Total Amount:	**$16,464.00**

Notes:
Shipping included

Terms:
THIS QUOTE IS BASED ON THE ENTIRE VALUE AND VOLUME OF ALL LINE ITEMS - Prices listed on this quote are valid only in the event of purchase of all line items in the quantities listed, in their entirety. Purchases of individual line items will require a new quote prior to acceptance of any purchase orders.

Shipment of the material will be approximately 90 days after receipt of both an acceptable purchase order and approved submittal data if required. PAYMENT TERMS ARE NET 30 DAYS with prior approved credit. MoboTrex, Inc. retains title to material until paid in full. A service charge of 1.5% per month (18% annual rate) will be assessed against all past due accounts. Prices and delivery quoted are firm for 30 days from the data of bid. The above quote does not include installation of the products quoted. On-Site technical assistance is available and will be quoted upon request.

Quotation does not include sales tax. Sales tax will be added at time of invoice unless a valid Sales Tax Exempt certificate has been provided. Sales tax exempt certificate should accompany customer Purchase Order.

Limited Warranty: MoboTrex, Inc. only obligations shall be to replace such quantity of the product proven to be defective.

Warranty Period: The length of warranty manufacturers have conveyed to the seller and which can be passed on to the buyer.

Additional terms and conditions apply - See MoboTrex, Inc. Terms & Conditions document at our website: www.mobotrex.com.

Thank you for the opportunity to provide this quote.

Mobotrex, Inc Friday, August 14, 2020 08:48 AM Page 1 of 1

D. TIME SCHEDULE

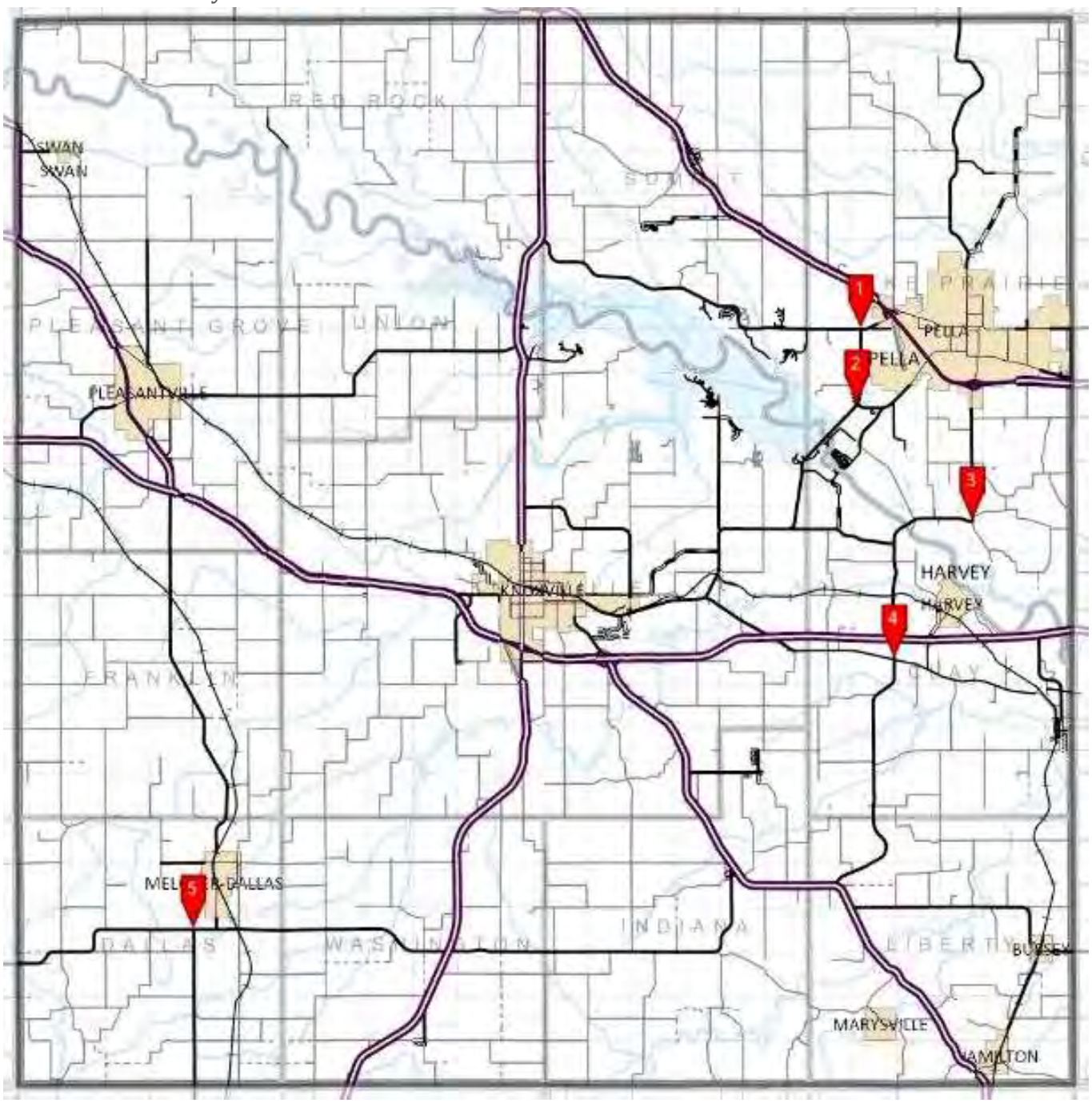
D. Time Schedule

TSIP Application Due	August 15, 2020
TSIP Award Notification	January, 2021
TSIP Funding Available	July 1, 2021
Final Quote Comparison	July 2021 (est.)
Purchase of Flashing Beacons	July 2021 (est.)
Installation of Beacons	August 2021 (est.)

E. MAP

E. Map

Marion County Locations



F. PICTURES

F. Pictures

Product Photos:

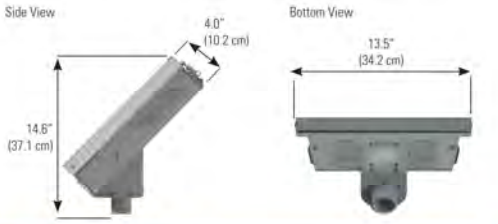
F. PICTURES

R247-E
SOLAR 24-HOUR FLASHING BEACON

1.844.412.8395 | traffic@carmanah.com | carmanahtraffic.com

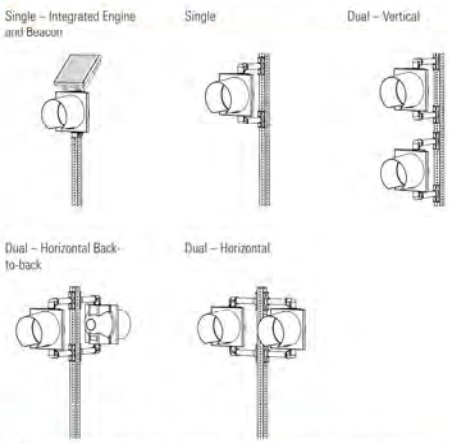
carmanah® Traffic

DIMENSIONS



SOLAR ENGINE MOUNTING

BEACON MOUNTING



*** Other solar engine and beacon mounting configurations are available.**

On-Board User Interface (OBUI)	Adjustable system settings with auto-scrolling LED display on our latest EMS
	System test, status, and fault detection: battery, solar, button, beacon, radio, day/night
	Flash patterns: RFB1 (WW+S), RFB2 (WSDOT), 0.5 sec. alternating (MUTCD), 0.5 sec. unison (MUTCD), 0.1 sec. unison, 0.25 sec. unison, 0.1 sec. x3 quick flashes unison, 0.1 sec. x3 quick flashes alternating
	Input: momentary for push button activation, normally open switch, normally closed switch
	Flash duration: 5 sec. to 1 hr.
	Intensity setting: 20 to 1400 mA for multiple circular beacons, RRFBs, or LED enhanced signs
	Nighttime dimming: 10 to 100% of daytime intensity
	Ambient Auto Adjust: increases intensity during bright daytime
	Automatic Light Control: reduces intensity if the battery is extremely low
	Temperature correction: yellow or red beacons
	Calendar: internal time clock function
	Radio settings: enable/disable, selectable channel from 1 to 14
	Output: enabled when beacons flashing daytime and nighttime, or nighttime only
	Activation counts and data reporting via OBUI or optional USB connection
Optical	**MUTCD compliant:** 2009 MUTCD, Chapter 4L, Flashing Beacons, Manual on Uniform Traffic Control Devices (MUTCD)
	ITE VTCSH-LED Circular Signal Supplement compliant: meets ITE or 1.7x ITE intensity when used as recommended
	12 in (305 mm) or 8 in (203 mm) diameter LED modules, yellow or red
	High-power LEDs: +90% lumen maintenance (L90) based on IES LM-80
	Yellow, black, or green signal heads in UV-resistant polycarbonate or aluminum
Connectivity	Optional encrypted, wireless radio with 2.4 GHz mesh technology
	Optional radio allows calendar program, manual override switch, or input device from one system to remotely control other systems
	User-selectable multiple channels to group different beacons and ensure a robust wireless signal
	Instantaneous wireless activation: <150 ms
	Wireless range: 1000 ft (305 m)
	Integrated, vandal-proof antenna
Energy Collection	13 W high-efficiency photovoltaic solar panel
	45 deg tilt for optimal energy collection
	Maximum Power Point Tracking with Temperature Compensation (MPPT-TC) battery charger for optimal energy collection in all solar and battery conditions
Energy Storage	12 V 14 Ahr. battery system
	Replaceable, recyclable, sealed, maintenance-free, best-in-class AGM batteries offer the widest temperature range and longest life
	Battery design life: +5 yrs.
	Tool-less battery change with quick connect terminals and strapping for easy installation
Solar Engine Construction	Weatherproof, gasketed enclosure with vents for ambient air transfer (NEMA 3R)
	Lockable, hinged lid for access to on-board user interface and batteries
	Corrosion-resistant aluminum with stainless steel hardware
	Raw aluminum finish or yellow, black, or green powder coated
	Prewired to minimize installation time
	High-efficiency optics and EMS = the most compact, lightweight system
	19 lb (8.6 kg) including batteries, excluding beacons and push button
Environmental	-40 to 165° F (-40 to 74° C) system operating temperature
	-40 to 140° F (-40 to 60° C) battery operating temperature
	150 mph (241 kph) wind speed as per AASHTO LTS-6
Activation	Standard operation is flashing 24 hrs./day
	Optional internal time clock for calendar programming
	Optional manual override switch allows local control of beacons
	Optional junction box: lockable, hinged door, corrosion-resistant aluminum enclosure allows easy calendar programming and access to manual override switch
Warranty	**5-year limited warranty**

Specifications subject to local environmental conditions, and may be subject to change.

Document: SPEC_TRA_R247-E_RevJ

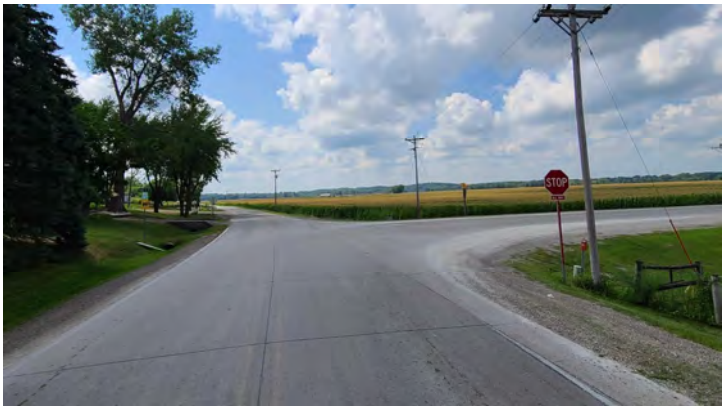
F. PICTURES

Location Photos:

Location 1

Location 2

Location 3



F. PICTURES

Location 4

Location 5

G. PLAN VIEW

G. Plan View

Location 1

Location 2

G. PLAN VIEW

Location 3

Location 4

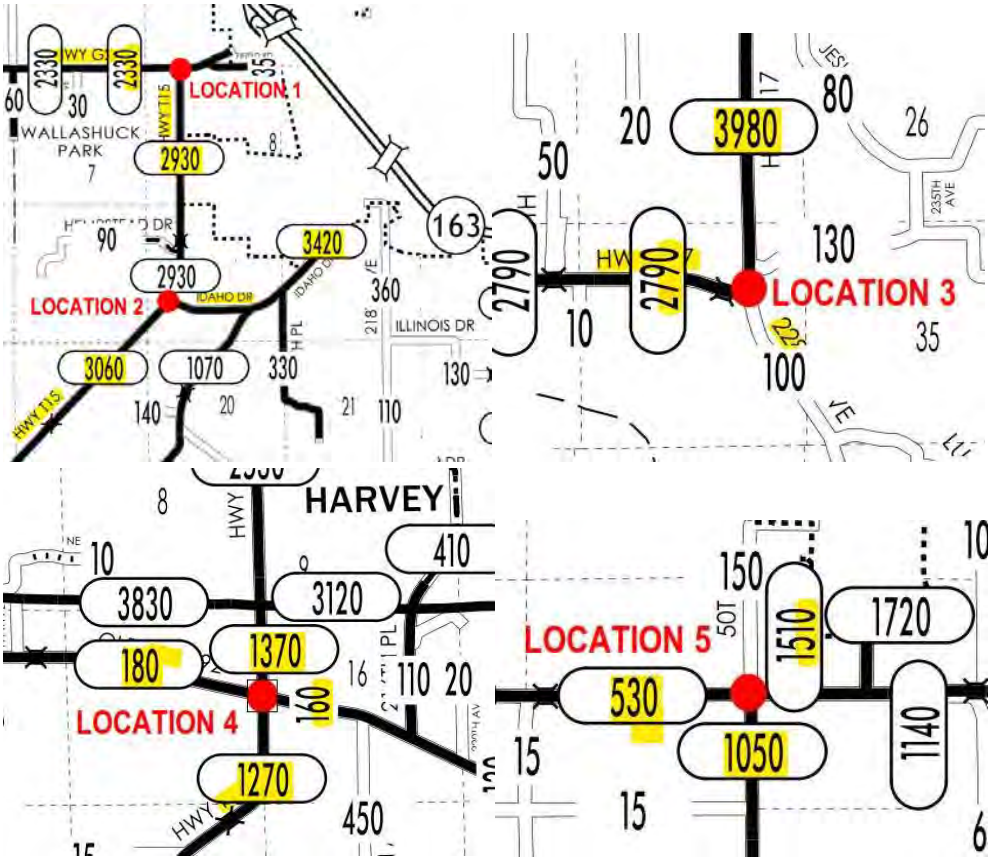
G. PLAN VIEW

Location 5

H. TRAFFIC VOLUMES

H. Traffic Volumes

Traffic volumes represented at the various intersections locations are from the Iowa DOT 2018 counts.



I. TRAFFIC SIGNAL LAYOUT

I. Traffic Signal Layout

Please refer to Section G (Plan View) for Solar Flashing Beacon layout information.

J. COST / BENEFIT WORKSHEET

J. Cost / Benefit Worksheet

Per Traffic Control Device application instructions, a Benefit/Cost worksheet is not required for consideration in the Traffic Control Device category. Our research of the Planning-Level Crash Reduction Factor (CRF) List indicates a CRF of 5 for installation of Flashing Beacons on Existing Stop Signs. Furthermore, we reviewed cmfclearinghouse.org for crash medication factor (CMF) information which indicated a possible CMF of 0.95 for all crashes and severities, which would coincide with the Iowa DOT Planning-Level CRF.

PRINCIPAL CONTACT/ COMPANY INFORMATION

Principal Contact/ Company Information

Tyler Christian, P.E.
Marion County Engineer
tchristian@co.marion.ia.us

Marion County Road Department
402 Willets Drive, Knoxville, IA 50138
Tel (641) 828-2225
Fax (641) 828-7349

APPENDIX A

Appendix A

MARION COUNTY LOCAL ROAD SAFETY PLAN INTERSECTION PROJECT SHEETS RELEVANT TO LOCATIONS 1 AND 2

Local Road Safety Plan
Project Description for Intersection Improvements

Risk Factor Points: 14

Project Name: Co Rd G28 & Co Rd T15
Agency Name: Marion County
Contact Name: Christian, Tyler
E-mail: tchristian@co.marion.ia.us

Date: 11/2/16
Prepared By: DJG/DVM
Checked By: MMO

INTERSECTION

Location Description

Road: **Co Rd G28**
Road: **Co Rd T15**
Closest City: **PELLA**
GPS ID: 359477

This intersection is located on the following high scoring segments: GPS IDs 1142 and 1154

County to coordinate with local agency to implement improvements that are on right-of-way that is not under control of the County.

Project Location Maps



Intersection Information and Systemic Ranking Summary

Systemic Ranking Summary	Value	Points
Daily Entering Vehicles	5,910	6
Distance from Previous Stop	5 mi	4
Approach Angle (Degrees)	90	0
Intersection within Curve	0	0
Roads/Driveways within 250 Feet	3	2
K or A Crashes	1	2
Total Risk Factor Points (22 max)		**14**

Other Information	
Number of Approaches	3
Number of Paved Approaches	3
Major ADT	7,800
Minor ADT	2,240
Destination Lighting	No
Transverse Rumble Strips (Number of Approaches)	1
Control Type	One-way stop

Crash Data, 2006-2015	
Total Crashes	6
K and A Crashes	1
Right Angle,Rear-end,or Turning Crashes	2
Total Nighttime Crashes	1
Nighttime/Daytime Crash Ratio*	0.8

Key Emphasis Area
Intersections
Local Roads

Opinion of Probable Cost (Project Selection Decision Tree Results)

Item Description	Quantity	Unit	Unit Price	Item Cost
Coordinate with Local Jurisdiction on Signal Modifications	0	EA	$ 2,500	$ -
Signal Warrant Analysis to Consider Removal of Signal	0	EA	$ 5,000	$ -
Intersection Configuration Evaluation (ICE)	1	EA	$ 25,000	$ 25,000
Implement Results of ICE	1	EA	$ 750,000	$ 750,000
All-Way Stop Analysis and Converting Two-Way Stop to All-Way Stop	0	EA	$ 5,000	$ -
All-Way Stop Analysis and Removal of Stop Signs on Major Approaches	0	EA	$ 5,000	$ -
Install Destination Lighting	1	LEG	$ 8,000	$ 8,000
Upgrade Signs and Pavement Markings	1	LEG	$ 2,200	$ 2,200
Upgrade Signs (Unpaved Approaches)	0	LEG	$ 1,000	$ -
Install Second Stop Sign and Stop Ahead Sign	1	LEG	$ 1,200	$ 1,200
Install Solar-Powered Flashing Beacon on Stop Sign	2	EA	$ 2,500	$ 5,000
Install Transverse Rumble Strips	0	LEG	$ 1,000	$ -
Install Intersection Warning Signs and Advance Street Name Plaques on Major Approaches	2	LEG	$ 1,200	$ 2,400
Clear and Grub within Sight Triangle	2	LEG	$ 1,500	$ 3,000
			Project Selection Decision Tree Systemic Improvements Subtotal:	$ 796,800

Continued on back of this page.

* Nighttime/Daytime Crash Ratio = 3 x nighttime crashes/daytime crashes per Iowa DOT I.M. 2.110 Attachment A.

Project Location Map Sources:
Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013, DigitalGlobe, GeoEye, i-cubed, USDA, AEX, Getmapping, Aerogrip, IGN, IGP, swisstopo, and the GIS User Community

Kimley»Horn

Local Road Safety Plan
Project Description for Intersection Improvements

Risk Factor Points: 14

Project Name: Co Rd G28 & Co Rd T15
Agency Name: Marion County
Contact Name: Christian, Tyler
E-mail: tchristian@co.marion.ia.us

Date: 11/2/16
Prepared By: DJG/DVM
Checked By: MMO

INTERSECTION

Opinion of Probable Cost (Additional Potential Improvements)

GPS ID: 359477

County to check the box for those improvements recommended for consideration.

Item Description	NB	SB	EB	WB	Quantity	Unit	Unit Price	Item Cost
Provide Left-Turn Lanes at Intersection						LEG	$ 75,000	$ -
Provide Right-Turn Lanes at Intersection						LEG	$ 75,000	$ -
Realign Intersection Approaches to Reduce or Eliminate Intersection Skew						LEG	$ 200,000	$ -
Provide Bypass Lane on Shoulder at T-intersection						EA	$ 50,000	$ -
Convert Offset T-Intersection to Four-Legged Intersection						EA	$ 300,000	$ -
Use Indirect Left-Turn Treatments to Minimize Conflicts at Divided Highway Intersection						LEG	$ 75,000	$ -
Convert Four-Legged Intersection to Offset T-Intersection						EA	$ 300,000	$ -
Install Solar-Powered Flashing Beacon on Intersection Warning Sign						LEG	$ 2,500	$ -
Install Stop Signs with LED Flashing Lights						LEG	$ 2,500	$ -
Install Retroreflective Strips on Stop Sign Posts						EA	$ 100	$ -
Other:								
Other:								
Other:								
Other:								
							Additional Potential Improvements Subtotal:	$ -
							Project Selection Decision Tree Systemic Improvements Subtotal:	$ 796,800
							Subtotal:	$ 796,800
							Mobilization: (% +/-)* 10%	$ 75,000
							Traffic Control: (% +/-) 5%	$ 39,840
							Contingency: (% +/-) 20%	$ 159,360
							Estimated Project Cost	**$ 1,071,000**

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000

Opinion of Probable Construction Cost Disclaimer:
Kimley-Horn has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Kimley-Horn at this time and represent only Kimley-Horn's judgment as a design professional familiar with the construction industry. Kimley-Horn cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Project Description Form Disclaimer:
The recommended improvements contained in this project description form were developed through a Geographic Information System (GIS) database risk assessment and project decision tree selection process, as specifically stated in our scope of services. Kimley-Horn has no control over the accuracy of the GIS databases nor the suitability of the specific improvements for the location, and has provided recommended improvements for consideration by the County Engineer. The County Engineer may use this project description form to aid in the selection and development of projects, but this project description form should not be used as the sole basis for the County Engineer's decision making process. We endeavored to research issues and constraints to the extent practical given the scope, budget, and schedule agreed to with the Client. Our assessment is based in large part on information provided to us by others (DOT, county staff, etc.) and therefore is only as accurate and complete as the information provided to us. No formal assessment was made for the improvement recommendations contained on this page, if in question, it is recommended that a study/analysis of this location be made to warrant the above indicated improvements. This project description form is based on our knowledge as of October 2016.

End of Project Description

Back Page

Local Road Safety Plan
Project Description for Intersection Improvements

Risk Factor Points: 13

Project Name: Co Rd T15 & IDAHO DR & HEMPSTEAD DR
Agency Name: Marion County
Contact Name: Christian, Tyler
E-mail: tchristian@co.marion.ia.us

Date: 11/2/16
Prepared By: DJG/DVM
Checked By: MMO

INTERSECTION

Location Description

Road: **Co Rd T15** Closest City: **PELLA** **GPS ID: 359512**
Road: **IDAHO DR & HEMPSTEAD DR**

This intersection is located on the following high scoring segments: GPS IDs 1154 and 1160

County to coordinate with local agency to implement improvements that are on right-of-way that is not under control of the County.

Project Location Maps

Intersection Information and Systemic Ranking Summary

Systemic Ranking Summary	Value	Points
Daily Entering Vehicles	4,010	6
Distance from Previous Stop	0.5 mi	0
Approach Angle (Degrees)	90	0
Intersection within Curve	1	4
Roads/Driveways within 250 Feet	1	1
K or A Crashes	1	2
Total Risk Factor Points (22 max)		**13**

Other Information	
Number of Approaches	4
Number of Paved Approaches	4
Major ADT	3,060
Minor ADT	2,320
Destination Lighting	Yes
Transverse Rumble Strips (Number of Approaches)	1
Control Type	Two-way stop

Crash Data, 2006-2015	
Total Crashes	13
K and A Crashes	1
Right Angle,Rear-end,or Turning Crashes	7
Total Nighttime Crashes	1
Nighttime/Daytime Crash Ratio*	0.3

Key Emphasis Area
Intersections
Local Roads

Opinion of Probable Cost (Project Selection Decision Tree Results)

Item Description	Quantity	Unit	Unit Price	Item Cost
Coordinate with Local Jurisdiction on Signal Modifications	0	EA	$ 2,500	$ -
Signal Warrant Analysis to Consider Removal of Signal	0	EA	$ 5,000	$ -
Intersection Configuration Evaluation (ICE)	0	EA	$ 25,000	$ -
Implement Results of ICE	0	EA	$ 750,000	$ -
All-Way Stop Analysis and Converting Two-Way Stop to All-Way Stop	0	EA	$ 5,000	$ -
All-Way Stop Analysis and Removal of Stop Signs on Major Approaches	0	EA	$ 5,000	$ -
Install Destination Lighting	0	LEG	$ 8,000	$ -
Upgrade Signs and Pavement Markings	2	LEG	$ 2,200	$ 4,400
Upgrade Signs (Unpaved Approaches)	0	LEG	$ 1,000	$ -
Install Second Stop Sign and Stop Ahead Sign	2	LEG	$ 1,200	$ 2,400
Install Solar-Powered Flashing Beacon on Stop Sign	4	EA	$ 2,500	$ 10,000
Install Transverse Rumble Strips	1	LEG	$ 1,000	$ 1,000
Install Intersection Warning Signs and Advance Street Name Plaques on Major Approaches	2	LEG	$ 1,200	$ 2,400
Clear and Grub within Sight Triangle	4	LEG	$ 1,500	$ 6,000
			Project Selection Decision Tree Systemic Improvements Subtotal:	$ 26,200

Continued on back of this page.

* Nighttime/Daytime Crash Ratio = 3 x nighttime crashes/daytime crashes per Iowa DOT I.M. 2.110 Attachment A.

Project Location Map Sources:
Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013, DigitalGlobe, GeoEye, i-cubed, USDA, AEX, Getmapping, Aerogrip, IGN, IGP, swisstopo, and the GIS User Community

Kimley»Horn

Local Road Safety Plan
Project Description for Intersection Improvements

Risk Factor Points: 13

Project Name: Co Rd T15 & IDAHO DR & HEMPSTEAD DR
Agency Name: Marion County
Contact Name: Christian, Tyler
E-mail: tchristian@co.marion.ia.us

Date: 11/2/16
Prepared By: DJG/DVM
Checked By: MMO

INTERSECTION

Opinion of Probable Cost (Additional Potential Improvements)

GPS ID: 359512

County to check the box for those improvements recommended for consideration.

Item Description	NB	SB	EB	WB	Quantity	Unit	Unit Price	Item Cost
Provide Left-Turn Lanes at Intersection						LEG	$ 75,000	$ -
Provide Right-Turn Lanes at Intersection						LEG	$ 75,000	$ -
Realign Intersection Approaches to Reduce or Eliminate Intersection Skew						LEG	$ 200,000	$ -
Provide Bypass Lane on Shoulder at T-intersection						EA	$ 50,000	$ -
Convert Offset T-Intersection to Four-Legged Intersection						EA	$ 300,000	$ -
Use Indirect Left-Turn Treatments to Minimize Conflicts at Divided Highway Intersection						LEG	$ 75,000	$ -
Convert Four-Legged Intersection to Offset T-Intersection						EA	$ 300,000	$ -
Install Solar-Powered Flashing Beacon on Intersection Warning Sign						LEG	$ 2,500	$ -
Install Stop Signs with LED Flashing Lights						LEG	$ 2,500	$ -
Install Retroreflective Strips on Stop Sign Posts						EA	$ 100	$ -
Other:								
Other:								
Other:								
Other:								
							Additional Potential Improvements Subtotal:	$ -
							Project Selection Decision Tree Systemic Improvements Subtotal:	$ 26,200
							Subtotal:	$ 26,200
							Mobilization: (% +/-)* 10%	$ 2,620
							Traffic Control: (% +/-) 5%	$ 1,436
							Contingency: (% +/-) 20%	$ 5,744
							Estimated Project Cost	**$ 36,000**

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000

Opinion of Probable Construction Cost Disclaimer:
Kimley-Horn has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Kimley-Horn at this time and represent only Kimley-Horn's judgment as a design professional familiar with the construction industry. Kimley-Horn cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Project Description Form Disclaimer:
The recommended improvements contained in this project description form were developed through a Geographic Information System (GIS) database risk assessment and project decision tree selection process, as specifically stated in our scope of services. Kimley-Horn has no control over the accuracy of the GIS databases nor the suitability of the specific improvements for the location, and has provided recommended improvements for consideration by the County Engineer. The County Engineer may use this project description form to aid in the selection and development of projects, but this project description form should not be used as the sole basis for the County Engineer's decision making process. We endeavored to research issues and constraints to the extent practical given the scope, budget, and schedule agreed to with the Client. Our assessment is based in large part on information provided to us by others (DOT, county staff, etc.) and therefore is only as accurate and complete as the information provided to us. No formal assessment was made for the improvement recommendations contained on this page, if in question, it is recommended that a study/analysis of this location be made to warrant the above indicated improvements. This project description form is based on our knowledge as of October 2016.

End of Project Description

Back Page

REFERENCES

References

1. *Srinivasan, Raghavan; Daniel Carter; Kimberly Eccles; Bhagwant Persaud; Nancy Lefler; Craig Lyon; and Roya Amjadi, "Safety Evaluation of Flashing Beacons at STOP-Controlled Intersections", Federal Highway Administration, FHWA-HRT-08-044, Washington, D.C., December 2007.*

2. *Manual on Uniform Traffic Control Devices.* United States Department of Transportation, Federal Highway Administration, 2009. MUTCD Chapter 4L Flashing Beacons