Traffic Safety Improvement Program

Site-Specific Category
FY 2022

Applications Received by August 25, 2020

Applications listed in alphabetical order by applicant.

Page No.	Applicant	Title/Subject	$ $ $		
			Project	Safety	Request
5	City of Altoona	1st Ave and 9th St	$3,938,711	$582,162	$500,000
29	City of Ames	S Dayton Ave at SE 16th St and S Dayton Ave at US 30 ramps	$1,079,700	$842,300	$500,000
41	City of Ankeny	IA 160/Oralabor Rd at IA 415/State St	$1,798,170	$1,798,170	$500,000
66	City of Camanche	US 67 at 7th Ave	$896,400	$896,400	$500,000
84	City of Cedar Falls	Greenhill Rd at Main St	$2,474,000	$948,700	$500,000
107	City of Cedar Rapids	1st Ave W at Wiley Blvd	$347,031	$288,210	$288,210
132	City of Cedar Rapids	Ellis Blvd at F Ave	$491,400	$491,400	$491,400
158	City of Clinton	19th Ave N	$544,010	$479,010	$479,010
196	City of Clive	US 6 at Berkshire Pkwy	$466,526	$398,335	$398,335
222	City of Des Moines	E University at E 30th St	$1,000,000	$357,000	$357,000
241	City of Fairfield	IA 1	$5,287,200	$1,870,000	$500,000
266	City of Marion	IA 100 and E Post Rd	$960,100	$900,000	$500,000
290	City of Oskaloosa	IA 92 and US 63	$683,000	$593,700	$500,000
323	City of Storm Lake	IA 110 at IA 7	$3,166,000	$952,000	$500,000
348	City of Waterloo	Vinton St at Independence Ave	$110,000	$110,000	$110,000
381	City of Waterloo	W 9th St at South St	$385,000	$385,000	$385,000

403	City of Wayland	W55/Dakota Ave from IA 78 to North City Limits	$216,440	$102,730	$100,000
423	City of West Des Moines	Ashworth Rd at Prairie View Dr	$379,900	$280,900	$280,000
448	Dubuque County	John Deere Rd	$6,815,028	$5,236,610	$500,000
468	Dubuque County	US 20 at Thunder Hills Rd	$327,455	$327,455	$327,455
485	Hancock County	B55	$109,830,000	$79,100	$75,000
505	Henry County	W55/Franklin Ave from Agency Rd to Fremont Ave	$2,510,394	$1,376,329	$500,000
527	Henry County	W55/Dakota Ave from North City Limits of Wayland to Washington Co Line	$428,006	$233,340	$230,000
547	Iowa DOT - District 1	IA 146 at F62	$698,100	$500,000	$500,000
570	Iowa DOT - District 1	IA 163 at Prairie Ave	$500,000	$500,000	$500,000
589	Jones County	E34	$1,850,000	$515,000	$500,000
601	Lee County	255th St	$497,558	$497,558	$497,558
626	Louisa County	X17	$1,900,000	$337,258	$337,258
647	Osceola County	A22	$772,083	$669,284	$500,000
667	Plymouth County	C30 at K64	$486,710	$315,660	$315,660
692	Plymouth County	K64	$223,570	$55,310	$55,310
716	Polk County	NE 56th and NE 94th	$40,000	$40,000	$40,000
732	Polk County	IA 163 and NE 108th St	$50,000	$50,000	$50,000
749	Polk County	NW 44th and NW 118th	$40,000	$40,000	$40,000

765	Washington County	W55	$398,745	$245,832	$245,832
		TOTALS	$151,591,237	**$23,294,753**	**$12,603,028**

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** July 6, 2020

Location / Title of Project 1st Avenue Widening & Roundabout – Phase II

Applicant City of Altoona

Contact Person John Dostart Title City Engineer

Complete Mailing Address City of Altoona, Iowa

900 Venbury Drive, Altoona, IA 50009

Phone (515) 957 - 5116 E-Mail JDostart@altoona-iowa.com
(Area Code)

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	582,162
Total Project Cost	$	3,938,711
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 This intersection was reviewed as part of Altoona's Local Road Safety Plan. It is tied for the third highest Risk Percentage / Risk Factor Points out of 134 high traffic intersections reviewed in the City of Altoona.

☐ 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 Altoona

Signed: _____ 7-6-20
Signature Date Signed

Dean O'Connor
Printed Name

Attest: _____ 7-6-20
Signature Date Signed

Randy Pierce
Printed Name

Narrative

Existing Conditions

1st Avenue is currently two lanes between 2nd Street NW and 9th Street NW. This stretch of road has a rural cross section, raised above the surrounding residential and commercial properties, and draining to ditches on both sides of the road. The speed limit for the whole stretch of road is 40 miles per hour. The existing conditions on the south portion of this project consist of a divided 4-lane section with a narrow median through the railroad crossing. The existing conditions on the north portion of this project consist of a divided 4-lane section with a raised grass median from 9th Street NW to Interstate 80.

The intersection of 1st Avenue N and 9th Street NW in Altoona is currently a two-way stop-controlled intersection with stop signs on the east and west legs. 9th Street NW is a residential neighborhood employing a 25 mile per hour speed limit with a rural cross section, and drainage ditches on both sides of the road. 9th Street NE is a two-lane rural road with commercial business and agriculture along the road. Water drains to ditches on both sides and has a 35 mile per hour speed limit east of 1st Avenue.

At the intersection, 1st Avenue has a left turn lane in both the northbound and southbound directions, both of which are approximately 200 feet long. Southbound traffic on 1st Avenue has a right turn lane but there is no right turn lane from the south leg of the intersection. 9th Street NE has a 150-foot right turn lane onto 1st Avenue and no left turn lane. 9th Street NW does not have a designated left or right turn lane at 1st Avenue.

This segment of 1st Avenue serves an annual average daily traffic (AADT) volume (total of both directions) of 9,136 vehicles per day (vpd). The southbound to eastbound turning movement at the intersection of 1st Avenue and 9th Street NE has a significant volume, with 108 vehicles turning at the peak afternoon hour. The westbound to northbound turning movement also has a considerable volume at the peak afternoon hour, with 59 vehicles making that movement.

From 2015 through 2019, there were 19 crashes in this span of road, including five crashes at the intersection of 1st Avenue and 9th Street NE. Seven of the crashes were possible/unknown injury crashes, or more severe and twelve of the crashes were property damage only. The most common manners of crash were rear-ending and broadside collisions, with eight and six crashes, respectively.

Proposed Concept

The 1st Avenue corridor in Altoona has been targeted as a location in Altoona that will need to be improved to meet current and expected traffic increases. Recent improvements to 1st Avenue were constructed in 2019 near the Interstate Railroad to widen the road to four lanes and increase vehicle and pedestrian safety at the railroad crossing.

As the next phase of the 1st Avenue corridor improvement, the widening to four lanes from 2nd Street NW to 9th Street is currently in the design phase. The conversion of the intersection at 9th Street to a roundabout is also being proposed to increase the safety and capacity of the corridor. The general layout of proposed road widening and roundabout is seen in Section G.

B. Narrative

The widening portion of this project is expected to improve safety and volume problems that exist on the current roadway. With the proximity to the Interstate Railroad, a queue of up to a quarter mile regularly occurs during afternoon train crossings. This leads to significant delays and increased chances for rear-end collisions from unexpecting drivers. Converting the road from two lanes to four lanes will reduce the physical queue spread during these train crossings. Designated left turn lanes for side roads and businesses will also provide opportunities for vehicles to turn without causing through drivers to wait.

The proposed roundabout on the project will also provide considerable safety improvements. Research has shown that roundabouts reduce conflict points and severity of collisions at intersections. With the 40 mile per hour speed limit on 1st Avenue, another benefit from the roundabout is that speeds will be reduced through the intersection.

The proposed roundabout will be a combination of a single lane and dual lane roundabout. The north and south through movements of the roundabout will have two lanes so as not to interrupt the established flow of traffic on 1st Avenue. The through and left turn movements from the east and west will consist of one lane due to reduced traffic and to continue the number of lanes on 9th Street. Chapters 2B and 3C of the Manual on Uniform Traffic Control Devices (MUTCD) will be followed regarding the signing and markings within the roundabout.

C. Cost Estimate

Itemized Breakdown of Cost

Item	Description	Unit	Quantity	Unit Price	Cost
1	Topsoil On-Site	CY	1,285.78	$4.25	$5,464.57
2	Topsoil, Waste	CY	160.77	$12.32	$1,980.73
3	Excavation, Class 10, Waste	CY	975.00	$5.00	$4,875.00
4	Subgrade Preparation	SY	23,569.00	$2.50	$58,922.50
5	Subbase, Modified	TONS	14,850.00	$32.50	$482,625.00
6	Temporary Driveways, Gravel	TONS	2,500.00	$35.00	$87,500.00
7	Remove Gravel Driveway	TONS	2,500.00	$20.00	$50,000.00
8	Storm Sewer, Trenched, RCP, 15 In.	LF	27.00	$75.00	$2,025.00
9	Storm Sewer, Trenched, RCP, 18 In.	LF	842.00	$80.00	$67,360.00
10	Storm Sewer, Trenched, RCP, 24 In.	LF	1,551.00	$85.00	$131,835.00
11	Storm Sewer, Trenched, RCP, 30 In.	LF	329.00	$135.00	$44,415.00
12	Remove Storm Sewer Pipe Less Than 36 In.	LF	1,858.00	$41.50	$77,107.00
13	Pipe Apron, Concrete, 30 In Dia.	EACH	1.00	$3,500.00	$3,500.00
14	Footing for Concrete Pipe Apron, 30 In Dia.	EACH	1.00	$450.00	$450.00
15	Subdrain, Longitudinal, (Shoulder) 6 In. Dia.	LF	3,295.00	$19.00	$62,605.00
16	Subdrain Cleanout	EACH	8.00	$750.00	$6,000.00
17	Watermain, Trenched, Polyvinyl Chloride Pipe (PVC), 6 In.	LF	119.00	$75.00	$8,925.00
18	Watermain, Trenched, Polyvinyl Chloride Pipe (PVC), 8 In.	LF	75.00	$75.00	$5,625.00
19	Watermain, Trenched, Polyvinyl Chloride Pipe (PVC), 12 In.	LF	2,792.00	$85.00	$237,320.00
20	Fittings by Weight, Ductile Iron	LB	3,754.00	$8.00	$30,032.00
21	Water Service Stub, Copper, 1 In.	EACH	3.00	$1,000.00	$3,000.00
22	Water Service Stub, Copper, 2 In.	EACH	3.00	$1,000.00	$3,000.00
23	Water Service Pipe, Copper, 1 In.	LF	500.00	$25.00	$12,500.00
24	Water Service Pipe, Copper, 2 In.	LF	500.00	$25.00	$12,500.00
25	Valve, Gate, 6 In.	EACH	2.00	$1,300.00	$2,600.00
26	Valve, Gate, 8 In	EACH	1.00	$2,000.00	$2,000.00
27	Valve, Gate, 12 In.	EACH	8.00	$2,500.00	$20,000.00
28	Removal of Water Valves	EACH	5.00	$750.00	$3,750.00
29	Fire Hydrant Assembly	EACH	3.00	$5,500.00	$16,500.00
30	Salvage Fire Hydrant Assembly	EACH	1.00	$1,500.00	$1,500.00
31	Relocate Fire Hydrant Assembly	EACH	3.00	$6,500.00	$19,500.00
32	Remove Curb Stop	EACH	1.00	$1,360.00	$1,360.00
33	Manhole, Storm Sewer, Sw-401, 48 In.	EACH	3.00	$4,200.00	$12,600.00
34	Manhole, Storm Sewer, Sw-401, 72 In.	EACH	1.00	$8,500.00	$8,500.00
35	Intake, Sw-504	EACH	2.00	$6,500.00	$13,000.00
36	Intake, Sw-505	EACH	3.00	$6,500.00	$19,500.00
37	Intake, Sw-505s	EACH	8.00	$7,500.00	$60,000.00

38	Intake, Sw-506	EACH	2.00	$7,500.00	$15,000.00
39	Intake, Sw-506s	EACH	4.00	$7,500.00	$30,000.00
40	Remove Manhole	EACH	10.00	$500.00	$5,000.00
41	Removal of Intakes and Utility Accesses	EACH	3.00	$500.00	$1,500.00
42	Pavement, PCC, 8 In.	SY	85.56	$60.00	$5,133.33
43	Pavement, PCC, 9 In.	SY	17,049.28	$60.00	$1,022,956.80
44	Pavement, PCC, Integral Color, 9 In.	SY	675.78	$3.00	$2,027.33
45	Removal of Sidewalk	SY	974.11	$12.00	$11,689.33
46	Removal of Paved Driveway	SY	1,597.89	$12.00	$19,174.67
47	Removal of Curb	LF	2,512.00	$26.00	$65,312.00
48	Shared Use Path, PCC, 6 In.	SY	2,405.33	$48.00	$115,456.00
49	Sidewalk, PCC, 5 In.	SY	1,094.44	$50.00	$54,722.22
50	Detectable Warnings	SF	304.00	$50.00	$15,200.00
51	Driveway, Paved, PCC, 6 In.	SY	141.00	$60.00	$8,460.00
52	Driveway, Paved, PCC, 8 In.	SY	1,498.89	$60.00	$89,933.33
53	Removal of Pavement, HMA	SY	11,610.00	$6.00	$69,660.00
54	Removal of Pavement, PCC	SY	2,059.67	$12.00	$24,716.05
55	Concrete Median	SY	60	$100.00	$6,000.00
56	Safety Closure	EACH	7.00	$125.00	$875.00
57	Type A Signs, Sheet Aluminum	SF	319.00	$35.00	$11,165.00
58	Sign Posts	EACH	31.00	$250.00	$7,750.00
59	Traffic Control	LS	1.00	$20,000.00	$20,000.00
60	Painted Pavement Marking, Waterborne or Solvent-Based	STA	65.00	$105.00	$6,825.00
61	Painted Symbols and Legends, Waterborne or Solvent-Based	EACH	21.00	$135.00	$2,835.00
62	Removal of Signs	EACH	5.00	$100.00	$500.00
63	Hydraulic Seeding, Seeding, Fertilizing, And Mulching, Type 1	ACRE	5.00	$4,000.00	$20,000.00
64	SWPPP Preparation	LS	1.00	$1,050.00	$1,050.00
65	SWPPP Management	LS	1.00	$3,000.00	$3,000.00
66	SWPPP Qualifying Rainfall Event Inspection	EACH	20.00	$250.00	$5,000.00
67	Filter Sock, 6 Inch	LF	1,000.00	$2.50	$2,500.00
68	Silt Fence	LF	2,000.00	$1.25	$2,500.00
69	Removal of Silt Fence or Silt Fence for Ditch Checks	LF	2,000.00	$0.25	$500.00
70	Fence, Chainlink, Black Vinyl Coated, 72 In.	LF	555.00	$25.00	$13,875.00
71	Remove and Reinstall Fence	LF	161.00	$23.00	$3,703.00
72	Gate, Chain Link, 72 In., Black Vinyl Coated, 18 Ft.	EACH	2.00	$1,500.00	$3,000.00
73	Barbed Wire, Angled Arm, Black	LF	600.00	$3.00	$1,800.00
74	Removal of Fence, Chain Link	LF	572.00	$2.00	$1,144.00

75	Removal of Gate, 72 In.	EACH	2.00	$750.00	$1,500.00
76	Remove Bollard	EACH	1.00	$500.00	$500.00
77	Rip Rap, Type E	TON	28.14	$50.00	$1,406.88
78	Mobilization	LS	1	$250,000.00	$250,000.00
79	Remove Trees	LS	1	$5,000.00	$5,000.00
80	Relocation of Mail Boxes	EACH	6.00	$525.00	$3,150.00
81	Retaining Wall	SF	130.00	$500.00	$65,000.00
				Subtotal	$3,580,646.76
				10% Contingency	$358,064.68
				Total Estimate	**$3,938,711.43**

Summary of Costs

	Proposed Project	Alternative Project	Safety Cost
Construction Cost	$3,938,711	$3,356,549	$582,162

Proposed Project Funding Source

Source	Amount
Traffic Safety Improvement Program Funding	$500,000
City Funding (Estimated)	$3,438,711
Total	**$3,938,711**

D. Time Schedule

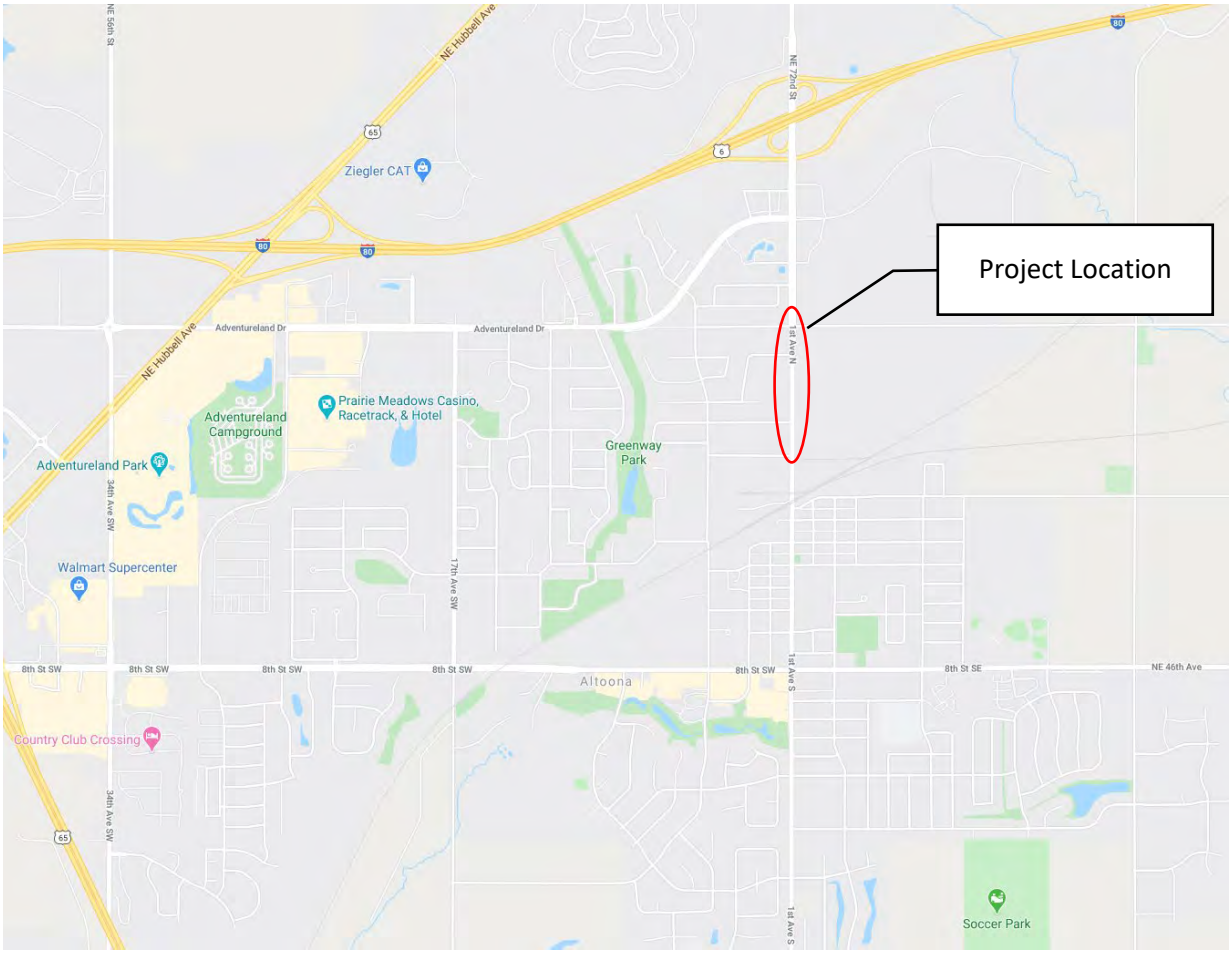
Schedule

Below is the anticipated schedule of major project events.

Present – January 2021	Design
July 2020	Design Review
August 2020	TSIP Funding Application
December 2020	TSIP Funding Award (if selected)
January 2021	TSIP Funding Agreement
February 2021	Project Letting
April 2021	Project Construction Begins
July 2021	TSIP Funding Available
July 2022	Project Completed

Map

Below is a map of Altoona with the 1st Avenue Widening and Roundabout project location circled in red.



Color Pictures

Below are color pictures of the existing site conditions at various locations and at different angles.

View of the southern segment of the project from the south

View of the central segment of the project from the south

F. Color Pictures

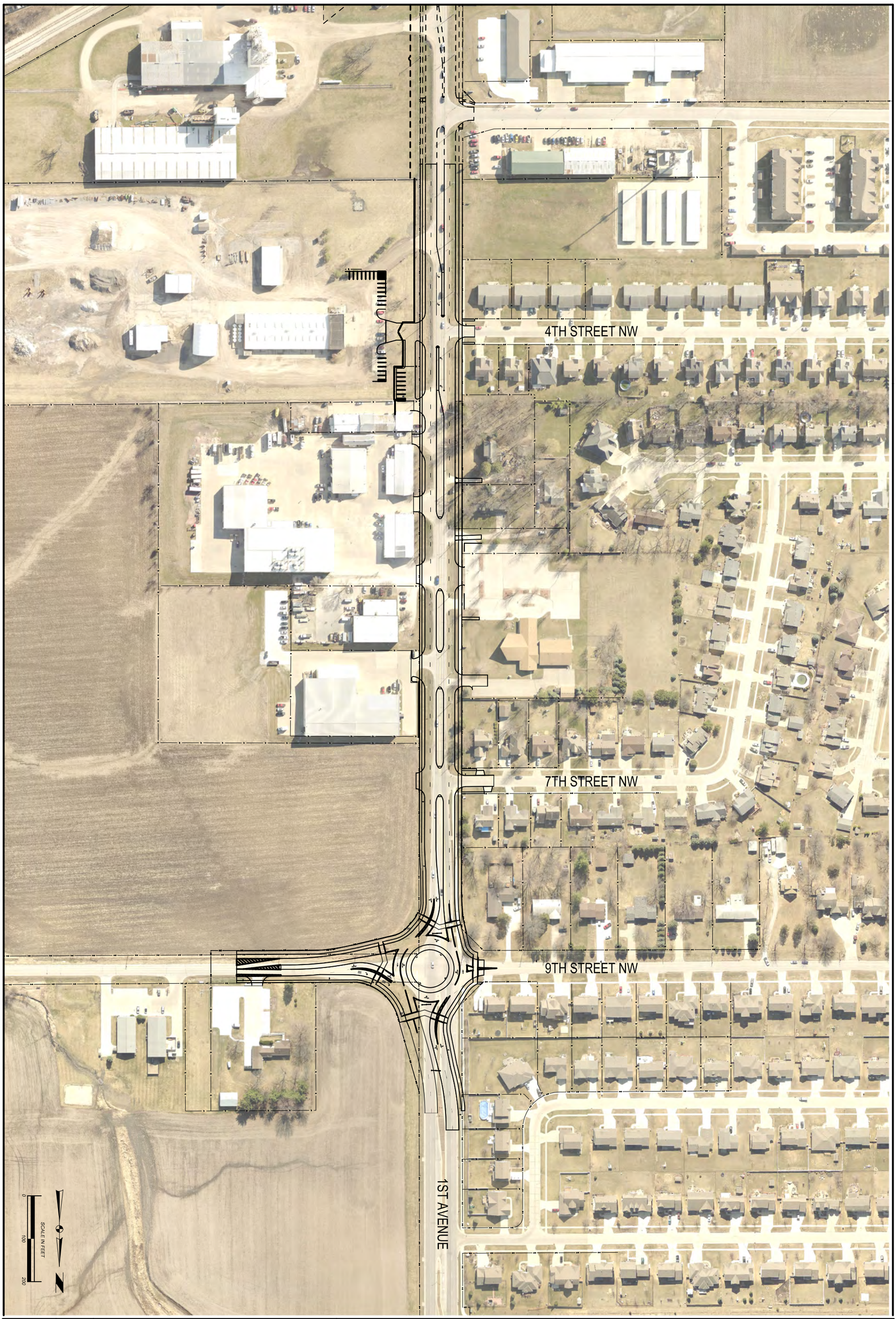
View of the central segment of the project from the north

View of the northern segment (proposed roundabout) from the south

F. Color Pictures

View of the northern segment (proposed roundabout) from the west

View of the northern segment (proposed roundabout) from the north



SHEET
G

PLAN VIEW

ALTOONA IOWA

revisions

KIRKHAM MICHAEL

G. Plan View

Aerial Photograph

Below is an aerial photograph of the project location.

Aerial of southern half of project location

Aerial of northern half of project location

I. ICAT Crash Summary

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	19
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	6
Property Damage Only	12

Injury Status Summary	10
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	1
Possible (complaint of pain/injury)	9
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	163,000.00
Average (per crash dollars):	8,578.95
Total Vehicles:	38.00
Average (per crash):	2.00
Total Occupants:	49.00
Average (per crash):	2.58

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.53
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.05
Possible/Unknown Injuries/Crash:	0.47

Iowa Crash Analysis Tool
Quick Report
2015-2019

Major Cause	19		
Animal	0	Ran traffic signal	0
Ran stop sign	1	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	3	FTYROW: From yield sign	0
FTYROW: Making left turn	1	FTYROW: From driveway	1
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	6
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...	0
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	0
Ran off road - straight	1	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	1	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Monday	0	0	0	1	0	0	1	0	2	0	0	0	0	4
Tuesday	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Wednesday	0	0	0	0	0	0	1	0	1	0	0	0	0	2
Thursday	0	0	0	0	1	0	0	1	0	1	0	0	0	3
Friday	0	1	0	1	0	0	0	0	2	1	0	0	0	5
Saturday	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Total	0	1	0	3	2	2	2	2	5	2	0	0	0	19

Manner of Crash Collision	19
Non-collision (single vehicle)	2
Head-on (front to front)	0
Rear-end (front to rear)	8
Angle, oncoming left turn	1
Broadside (front to side)	6
Sideswipe, same direction	2
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	19
Dry	15
Wet	2
Ice/frost	1
Snow	0
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck	38		
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	1
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	37

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0
= 16	1	0	0	0	1
= 17	2	0	0	0	2
= 18	0	1	0	0	1
= 19	1	0	0	0	1
= 20	0	1	0	0	1
>= 21 and <= 24	0	2	0	0	2
>= 25 and <= 29	2	2	0	0	4
>= 30 and <= 34	1	3	0	0	4
>= 35 and <= 39	3	3	0	0	6
>= 40 and <= 44	0	2	0	0	2
>= 45 and <= 49	0	1	0	0	1
>= 50 and <= 54	1	3	0	0	4
>= 55 and <= 59	3	2	0	0	5
>= 60 and <= 64	0	1	0	0	1
>= 65 and <= 69	1	1	0	0	2
>= 70 and <= 74	1	0	0	0	1
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	16	22	0	0	38

Drug/Alcohol Related	19
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	19

Alcohol Test Given	38
None	38
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	38
None	38
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	38
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	38
Other	0

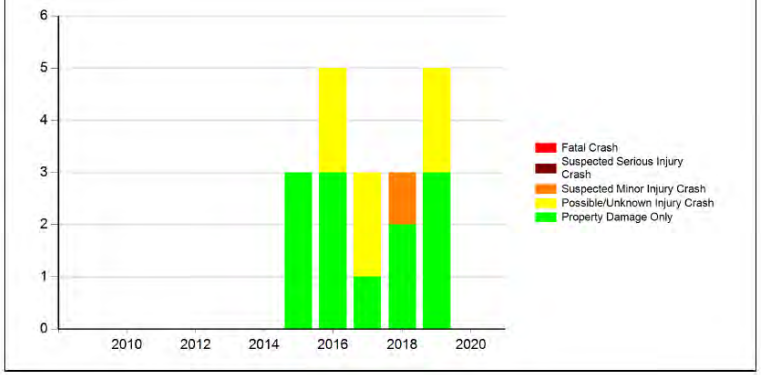
I. ICAT Crash Summary

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	3	3
2016	0	0	0	2	3	5
2017	0	0	0	2	1	3
2018	0	0	1	0	2	3
2019	0	0	0	2	3	5
2020	0	0	0	0	0	0
Total	0	0	1	6	12	19

Severity/Year

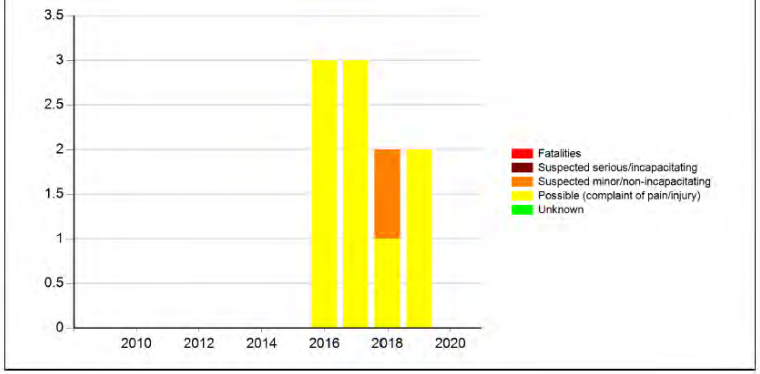


Iowa Crash Analysis Tool
Quick Report
2015-2019

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2009	0	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	3	0	3
2017	0	0	0	3	0	3
2018	0	0	1	1	0	2
2019	0	0	0	2	0	2
2020	0	0	0	0	0	0
Total	0	0	1	9	0	10

Injury Status/Year



I. ICAT Crash Summary

Iowa Crash Analysis Tool
Quick Report
2015-2019

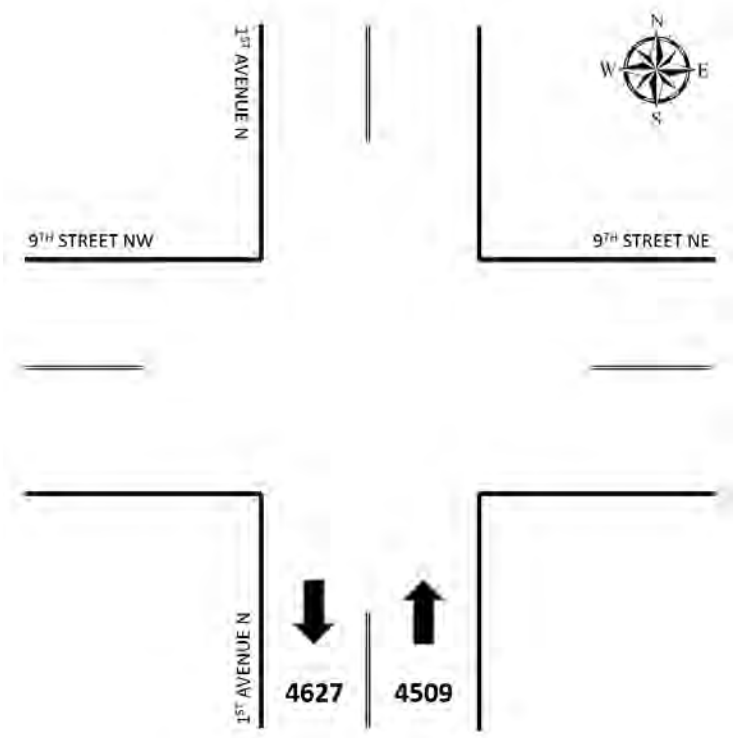
Meeting the following criteria

Jurisdiction: Cities (Altoona)
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

Traffic Volumes and Turning Movement

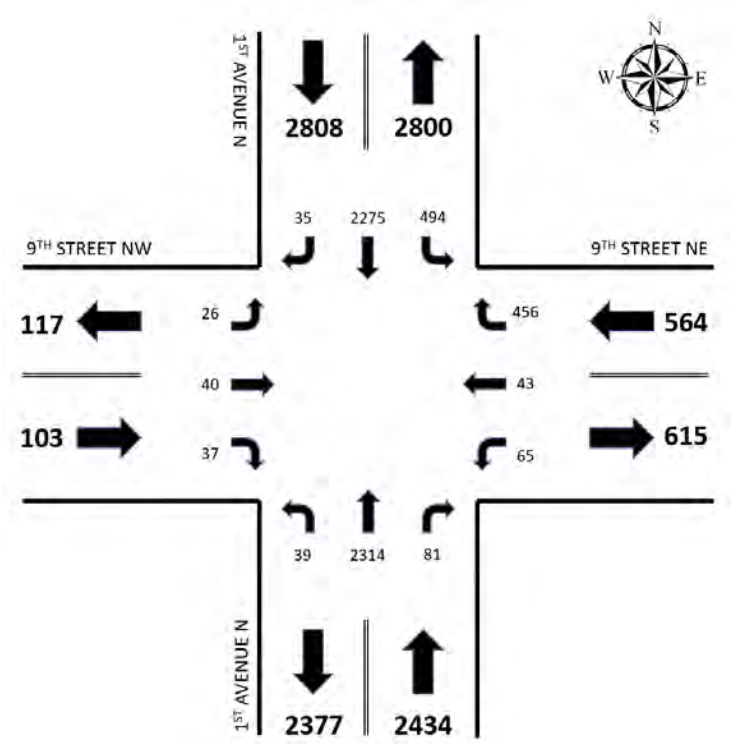
Below are displays for the volume and turning movement for phase 2 of the 1st Avenue Widening and Roundabout project. The first image shows the volume of vehicles on the south leg of the intersection of 1st Avenue and 9th Street. Accompanying the image is the raw data for the traffic count that was completed on May 21, 2020. The second image shows the turning movements for the same intersection on May 21, 2020. The numbers do not include the entire day, but rather the accumulation of the morning (6:30 AM – 8:30 AM), afternoon (11:30 AM – 1:30 PM), and evening (3:00 PM – 6:00 PM) peak periods. A detailed summary of the turning movement is also included.



Raw data

	Southbound Direction	Northbound Direction		Southbound Direction	Northbound Direction		Southbound Direction	Northbound Direction		Southbound Direction	Northbound Direction
12:00 AM	6	5	6:00 AM	24	58	12:00 PM	93	57	6:00 PM	91	69
12:15 AM	8	1	6:15 AM	31	64	12:15 PM	71	97	6:15 PM	79	62
12:30 AM	7	5	6:30 AM	23	97	12:30 PM	62	81	6:30 PM	64	54
12:45 AM	2	5	6:45 AM	51	71	12:45 PM	90	86	6:45 PM	73	52
1:00 AM	10	2	7:00 AM	37	93	1:00 PM	78	73	7:00 PM	67	40
1:15 AM	4	1	7:15 AM	47	110	1:15 PM	87	70	7:15 PM	46	39
1:30 AM	3	2	7:30 AM	58	104	1:30 PM	82	68	7:30 PM	52	35
1:45 AM	2	3	7:45 AM	55	76	1:45 PM	81	71	7:45 PM	51	32
2:00 AM	3	4	8:00 AM	34	63	2:00 PM	90	88	8:00 PM	46	38
2:15 AM	2	2	8:15 AM	50	56	2:15 PM	81	72	8:15 PM	48	31
2:30 AM	2	1	8:30 AM	52	67	2:30 PM	95	82	8:30 PM	41	19
2:45 AM	2	4	8:45 AM	59	49	2:45 PM	92	66	8:45 PM	33	22
3:00 AM	3	3	9:00 AM	50	52	3:00 PM	81	90	9:00 PM	30	21
3:15 AM	2	8	9:15 AM	52	64	3:15 PM	88	76	9:15 PM	17	27
3:30 AM	1	2	9:30 AM	61	63	3:30 PM	98	96	9:30 PM	27	21
3:45 AM	2	2	9:45 AM	53	66	3:45 PM	125	73	9:45 PM	26	17
4:00 AM	5	4	10:00 AM	63	60	4:00 PM	113	92	10:00 PM	22	13
4:15 AM	4	8	10:15 AM	41	62	4:15 PM	115	85	10:15 PM	14	9
4:30 AM	6	18	10:30 AM	73	72	4:30 PM	120	77	10:30 PM	19	12
4:45 AM	8	12	10:45 AM	53	65	4:45 PM	135	88	10:45 PM	15	11
5:00 AM	6	24	11:00 AM	61	62	5:00 PM	109	116	11:00 PM	10	5
5:15 AM	10	31	11:15 AM	75	64	5:15 PM	124	98	11:15 PM	13	3
5:30 AM	8	36	11:30 AM	74	78	5:30 PM	100	83	11:30 PM	11	7
5:45 AM	36	37	11:45 AM	89	82	5:45 PM	103	67	11:45 PM	11	0

J. Traffic Volumes



Summary

		Southbound						Westbound						Northbound						Eastbound						
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	1	195	33	0	229	459	82	5	5	0	92	42	5	374	4	0	383	201	1	4	3	0	8	10	712
Specified Period	%	100%	96%	89%	0%	95%	97%	98%	100%	100%	0%	98%	89%	83%	97%	100%	0%	97%	96%	100%	100%	75%	0%	89%	100%	96%
6:30 AM - 8:30 AM	Other Vehicles	0	8	4	0	12	15	2	0	0	0	2	5	1	12	0	0	13	8	0	0	1	0	1	0	28
One Hour Peak	%	0%	4%	11%	0%	5%	3%	2%	0%	0%	0%	2%	11%	17%	3%	0%	0%	3%	4%	0%	0%	25%	0%	11%	0%	4%
7:00 AM - 8:00 AM	**Total**	**1**	**203**	**37**	**0**	**241**	**474**	**84**	**5**	**5**	**0**	**94**	**47**	**6**	**386**	**4**	**0**	**396**	**209**	**1**	**4**	**4**	**0**	**9**	**10**	**740**
	PHF	0.25	0.82	0.66	0	0.78	0.9	0.88	0.42	0.62	0	0.9	0.69	0.75	0.89	0.5	0	0.89	0.82	0.25	1	0.33	0	0.56	0.62	0.92
	Approach %					33%	64%					13%	6%					54%	28%					1%	1%	
Peak 2	Lights	6	322	58	0	386	357	53	3	8	0	64	85	18	300	7	0	325	334	4	9	4	0	17	16	792
Specified Period	%	100%	97%	95%	0%	97%	97%	95%	75%	100%	0%	94%	96%	95%	97%	100%	0%	97%	97%	100%	100%	100%	0%	100%	94%	97%
11:30 AM - 1:30 PM	Other Vehicles	0	10	3	0	13	12	3	1	0	0	4	4	1	9	0	0	10	10	0	0	0	0	0	1	27
One Hour Peak	%	0%	3%	5%	0%	3%	3%	5%	25%	0%	0%	6%	4%	5%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	6%	3%
12:00 PM - 1:00 PM	**Total**	**6**	**332**	**61**	**0**	**399**	**369**	**56**	**4**	**8**	**0**	**68**	**89**	**19**	**309**	**7**	**0**	**335**	**344**	**4**	**9**	**4**	**0**	**17**	**17**	**819**
	PHF	0.5	0.86	0.85	0	0.9	0.91	0.78	0.5	0.5	0	0.89	0.86	0.79	0.91	0.44	0	0.93	0.86	0.5	0.75	0.5	0	0.71	0.61	0.94
	Approach %					49%	45%					8%	11%					41%	42%					2%	2%	
Peak 3	Lights	5	476	106	0	587	425	56	10	7	0	73	128	12	364	10	0	386	491	8	10	5	0	23	25	1069
Specified Period	%	100%	99%	98%	0%	99%	97%	95%	100%	100%	0%	96%	98%	100%	97%	100%	0%	97%	99%	100%	100%	100%	0%	100%	100%	98%
3:00 PM - 6:00 PM	Other Vehicles	0	3	2	0	5	13	3	0	0	0	3	2	0	10	0	0	10	3	0	0	0	0	0	0	18
One Hour Peak	%	0%	1%	2%	0%	1%	3%	5%	0%	0%	0%	4%	2%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	2%
4:30 PM - 5:30 PM	**Total**	**5**	**479**	**108**	**0**	**592**	**438**	**59**	**10**	**7**	**0**	**76**	**130**	**12**	**374**	**10**	**0**	**396**	**494**	**8**	**10**	**5**	**0**	**23**	**25**	**1087**
	PHF	0.62	0.92	0.87	0	0.92	0.84	0.78	0.83	0.58	0	0.86	0.93	1	0.83	0.62	0	0.85	0.9	0.5	0.62	0.62	0	0.82	0.89	0.96
	Approach %					54%	40%					7%	12%					36%	45%					2%	2%	

Benefit / Cost

The safety cost for this project was estimated as the difference between the proposed project and an alternative option. The alternate option included reconstruction of the road while keeping it as a two-lane road. Additionally, rather than a roundabout, the intersection at 1st Avenue and 9th Street NE would be a signalized intersection. The safety cost associated with construction is $582,162 and used for the cost portion of the benefit/cost analysis on the following page.

The crash reduction factor (CRF) applicable to this project is the conversions of an intersection to a roundabout in an urban setting. Fatal and injury crashes are deemed more important for this location, so the 65 percent reduction is considered for this case. For this reason, property damage only crashes were excluded from the analysis.

The resulting benefit/cost ratio is 1.08/1. This implies that there is slightly more of a benefit to this safety portion of the project. With property damage only crashes excluded from this analysis, the benefits are likely underreported slightly, which would make the true benefit/cost ratio higher.

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk County | Prepared by: Kirkham Michael | Date Prepared: Jun 12, 2020

Intersection: 1st Avenue N & NE 54th Avenue, Altoona

Improvement

Proposed Improvement(s): Convert two-way stop controlled intersection into roundabout.

$ 582,162	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	65	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 582,162	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Kirkham Michael via Miovision | 5/21/2020 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

5,458 (N) | 196 (W) | 1,071 (E) | 4,509 (S)

4,100,410	Current Annual Entering Veh., **AEV** = DEV * 365
13,708	veh / day, Final Year DEV, **FDEV**
90.29	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
11,234	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
7	Injury Crashes	1	Minor Injuries @	$65,000	$ 65,000
		6	Possible Injuries @	$35,000	$ 210,000
0	Property Damage Only		(assumed cost per crash)	$7,400	$ 51,800
			-OR- enter all Property Costs of all crashes:		
7	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 326,800

1.40	Current Crashes / Year, **AA** = TA / T	0.34	Crashes / MEV, Crash Rate, **CR**
$ 46,686	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
30.8	Total Expected Crashes, **TECR** = CR x TMEV	$ 627,519	Present Value of Avoided
0.91	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 42,484	Crash Costs Avoided in First Year, AAR x AVC		
20.0	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $627,519 : $582,162 = **1.08** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 8/13/2020

Location / Title of Project 2020/21 S. Dayton Ave Improvements (US HWY 30 & SE 16th St)

Applicant City of Ames

Contact Person Damion Pregitzer Title Traffic Engineer

Complete Mailing Address 515 Clark Avenue

Ames, IA 50010

Phone 515-239-5275 (Area Code) E-Mail Damion.pregitzer@cityofames.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	$ 842,300
Total Project Cost	$ 1,079,700
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 _____

☒ 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 Ames

Signed: _____ 8/13/2020

Signature Date Signed

Damion Pregitzer

Printed Name

Attest: _____ 8-13-2020

Signature Date Signed

Mark Gansen

Printed Name

RESOLUTION NO. 20-457

RESOLUTION ENDORSING SUBMISSION OF THE TRANSPORTATION SAFETY IMPROVEMENT PROGRAM (TSIP) GRANT FOR THE 2020/21 S. DAYTON AVENUE IMPROVEMENTS FOR THE CITY OF AMES, IOWA

WHEREAS, the Iowa Department of Transportation (DOT) administers a Traffic Safety Improvement Program, which has the intent to distribute funds for roadway safety improvements, traffic control devices, research studies, or public information initiatives; and,

WHEREAS, cities, counties, or the Iowa DOT may request Transportation Safety Improvement Program (TSIP) funds for use on any public roads; and,

WHEREAS, one requirement of the application is a resolution by the local government that the project has the local funding required for the project and that the project will be adequately maintained; and,

WHEREAS, the project includes the signalization of the westbound and eastbound ramp-intersection with S. Dayton and U.S. Highway 30; and,

WHEREAS, at the S. Dayton and S.E. 16th Street intersection, there will be widening that includes a westbound left-turn lane and a southbound right-lane; and,

WHEREAS, these improvements should increase the capacity of the S. Dayton corridor to respond to current and future traffic congestion; and,

WHEREAS, the revenue includes $700,000 in G.O. Bonds, $400,000 in U-STEP Grant (Anticipated) funds, and $500,000 in TSIP Grant (Application) funds.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ames, Iowa, that submission of the TSIP Grant application for the 2020/21 S. Dayton Avenue Improvements is hereby approved, with assurance that any funded improvements will be adequately maintained.

ADOPTED THIS 25th day of August, 2020.

Diane R. Voss, City Clerk

John A. Haila, Mayor

Introduced by: Betcher
Seconded by: Beatty-Hansen
Voting aye: Beatty-Hansen, Betcher, Corrieri, Gartin, Junck, Martin
Voting nay: None Absent: None

Resolution declared adopted and signed by the Mayor this 25th day of August, 2020.

Background:

A request was received from District 1 of the Iowa DOT to study congestion at the EB off-ramp of US HWY 30 onto S. Dayton Avenue in September of 2019. City staff had already been conducting a study of the SE 16th Street and S. Dayton Avenue intersection, which was experiencing significant peak hour delays. Traffic from the S. Bell business district, in combination with the significant amount of trucks accessing US HWY 30 through the S. Dayton interchange, was causing queueing problems at the WB and SB approach of the intersection. The City of Ames programmed a combined signal / intersection project in fiscal year 2020/21 to make improvements to the S. Dayton Interchange corridor.

SE 16th & S. Dayton: This four-way intersection is currently signalized with protected / permissive left turns for NB & SB traffic. The north, south, and eastbound approaches have designated left turn lanes. Westbound has a single lane approach.

US HWY 30 WB & S. Dayton: This ramp terminal is currently stop controlled for WB traffic only. The northbound approach has a designated left turn lane. The westbound off-ramp has a dedicated right turn lane and a combined thru/left lane.

US HWY 30 EB & S. Dayton: This ramp terminal is currently stop controlled for EB traffic only. The southbound approach has a designated left turn lane. The eastbound off-ramp has a dedicated left turn lane and a combined thru/right lane.

The S. Dayton Interchange area is the main gateway to the SE industrial district of the City of Ames. Located at the intersection is a node of Highway Oriented Commercial property. It is also the location of a significant portion of the community's commercial hotels.

The area has seen a significant growth in traffic, including a large percentage of heavy trucks.

Proposed Concept:

The proposed concept, as shown in Attachment G-2, includes the following:

- Signalizing both the EB & WB US HWY 30 ramp terminals.
- Adding a SB left turn lane at S. Dayton & SE 16th Street.
- Adding a WB left turn lane at S. Dayton & SE 16th Street.

Safety Justification:

The City conducted a warrant study and a corridor traffic simulation. The traffic study found that a WB left turn lane and SB right turn lane were needed to improve intersection capacity. The existing traffic signal also required phasing and timing improvements associated with the proposed geometric improvements. The warrant study for the US HWY 30 westbound ramp showed that all 3 volume warrants (Warrants 1, 2, 3) were met. The warrant study for the US HWY 30 eastbound ramp did not indicate volume warrants were met; however, the Coordinated Signal System warrant, and the All-Way Stop Warrant were met. Furthermore, the

signalization of both ramp terminals allows for the implementation of adaptive signal control technology.

The proposed traffic signals and additional turn lanes will reduce delays and queuing and lead to a better Level of Service for users of the corridor and provide a safe transfer of right-of-way. The interchanges along US HWY 30 in Ames have experienced significant queueing in recent history, where peak hour traffic backs up onto the HWY 30 mainline. The S. Dayton Interchange location presents additional complications due to its proximity with the newly reconstructed Interstate 35 – US Highway 30 interchange. Modern traffic signals will also provide urban level street lighting, which is expected to help with nighttime operations, especially during inclement weather.

ENGINEER'S ESTIMATE
S. DAYTON AVE IMPROVEMENTS
PUBLIC WORKS DEPT.- TRAFFIC DIV.
CITY OF AMES, IA
8/12/2020

C

Safety Related Item

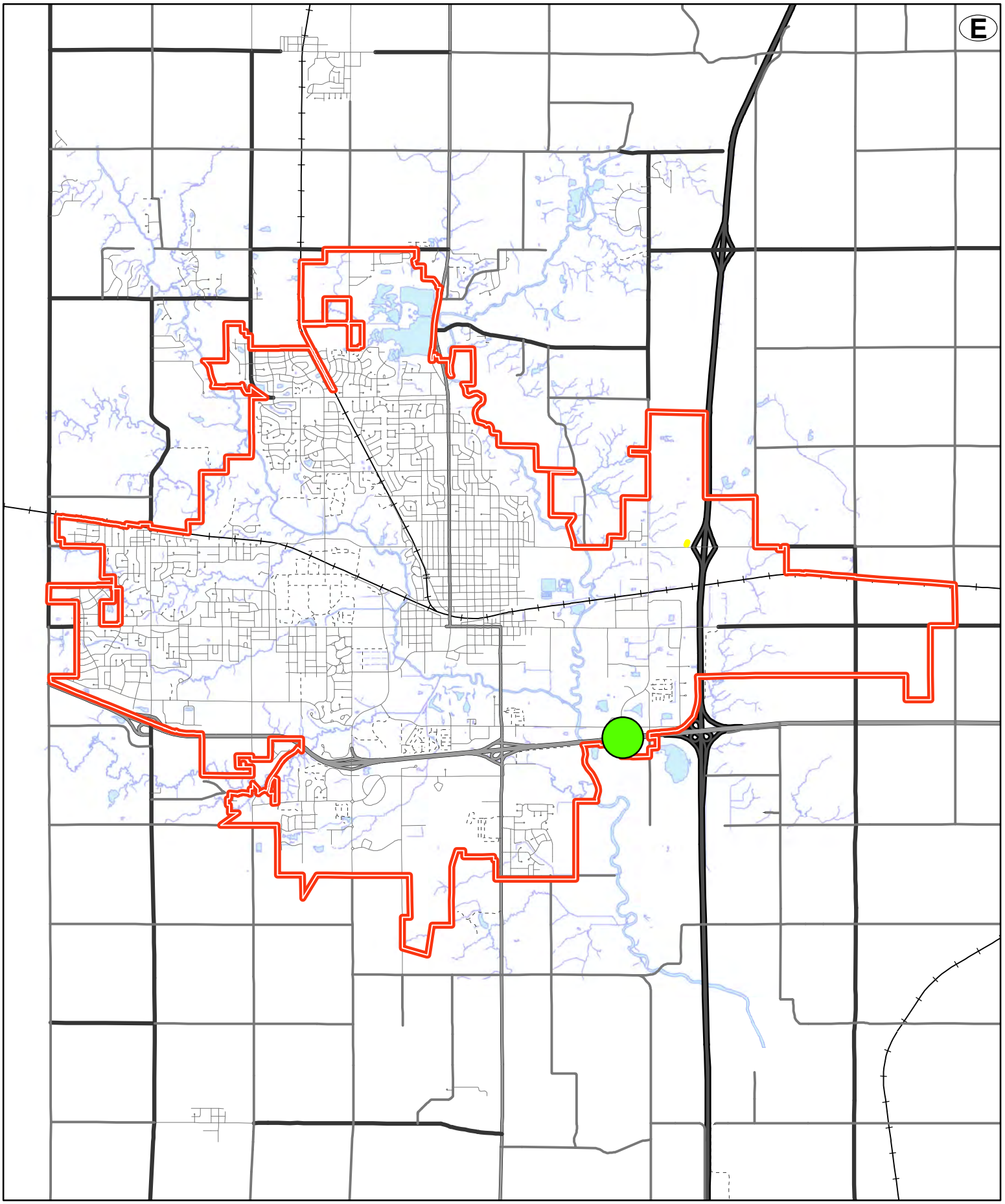
Item #	Item Code	Description	Est Quant	Unit	Unit Price	Amount
		Division 2 - Earthwork				
2.1	2010-108-D-2	Topsoil, Compost-amended, 4" Depth	200	cy	50.00	10,000.00
2.2	2010-108-E-0	Excavation, Class 10	400	cy	30.00	12,000.00
2.3	2010-108-G-0	Subgrade Preparation, 12" Depth	1600	sy	5.00	8,000.00
2.4	2010-108-I-0	Special Backfill, 6" Depth	1600	sy	20.00	32,000.00
		Division 4 - Sewers and Drains				
4.1	4020-108-A-1	Storm Sewer, Trenched, RCP, 15" dia.	16	lf	100.00	1,600.00
4.2	4040-108-A-0	Subdrain and Fittings, Perforated, PVC, 4" dia.	1400	lf	10.00	14,000.00
4.3	4040-108-D-0	Subdrain Outlets & Connections	7	ea	250.00	1,750.00
		Division 6 - Structures for Sanitary and Storm Sewer				
6.1	6010-108-B-0	Intake Type SW-505	1	ea	6000.00	6,000.00
6.2	6010-108-H-0	Remove Manhole/Intake	1	ea	1000.00	1,000.00
		Division 7 - Streets and Related Work				
7.1	7010-108-A-0	Pavement,PCC, 8" Depth	600	sy	65.00	39,000.00
7.2	7010-108-A-0	Pavement,PCC, 10" Depth	700	sy	75.00	52,500.00
7.3	7030-108-A-0	Removal of Sidewalk/Shared Use Path/Driveway	110	sy	10.00	1,100.00
7.4	7030-108-C-0	Shared Use Path, PCC, 6" depth	100	sy	50.00	5,000.00
7.5	7030-108-D-0	Special Subgrade Preparation for Shared Use Path	100	sy	10.00	1,000.00
7.6	7030-108-G-0	Detectable Warning	30	sf	40.00	1,200.00
7.7	7040-108-H-0	Pavement Removal	500	sy	12.00	6,000.00
7.8	7040-xxx-x-x	Granular Shoulder	100	ton	20.00	2,000.00
		Division 8 - Traffic Control				
8.1	8010-108-A-0	Traffic Signal Modifications	1	ls	60000.00	60,000.00
8.2	8010-108-A-0	Traffic Signalization of Ramp	1	ls	600000.00	600,000.00
8.3	8020-108-B-0	Painted Pavement Markings, Solvent/Waterborne	40	sta	200.00	8,000.00
8.4	8020-108-G-0	Painted Symbols and Legends	10	ea	250.00	2,500.00
8.5	8020-108-K-0	Pavement Markings Removed	10	sta	200.00	2,000.00
8.6	8030-108-A-0	Temporary Traffic Control	1	ls	5000.00	5,000.00
		Division 9 - Sitework and Landscaping				
9.1	9010-108-B-0	Hydraulic Seeding, Seeding, Fertilizing, and Mulching	0.2	ac	10000.00	2,000.00
9.2	9040-108-N-1	Silt Fence & Removal	1400	lf	4.00	5,600.00
		Division 11 - Miscellaneous				
11.1	11010-108-A	Construction Survey/Staking	1	ls	3000.00	3,000.00
11.2	11010-108-B	Pedestrian Facility Construction Survey & Staking	1	ls	500.00	500.00
11.3	11020-108-A	Mobilization	1	ls	15000.00	15,000.00
11.4	11060-108-A	Concrete Washout	1	ls	2000.00	2,000.00
		TOTAL OF SAFETY RELATED ITEMS				$ 842,300.00
		SUBTOTAL				**899,750.00**
		ENGINEERING (20%)				179,950.00
		CONTINGENCY (0%)				0.00
		TOTAL				**$1,079,700.00**

FUNDING SOURCES

TSIP FUNDS (APPLIED FOR)	$	500,000
ROAD USE TAX	$	200,000
U-STEP FUNDS	$	400,000
TOTAL	**$**	**1,100,000**

Time Schedule

Date	Activity
August 2020	Submit TSIP Grant Application
November 2020	Prepare Plans and Specifications
December 2020	Grant Approval from Commission
January 2021	Iowa DOT Plan Review
March 2021	Final Plan Revisions
July 2021	Bid Letting
August 2021	Award Project
May-June 2022	Begin Construction
October-November 2022	Project Completion



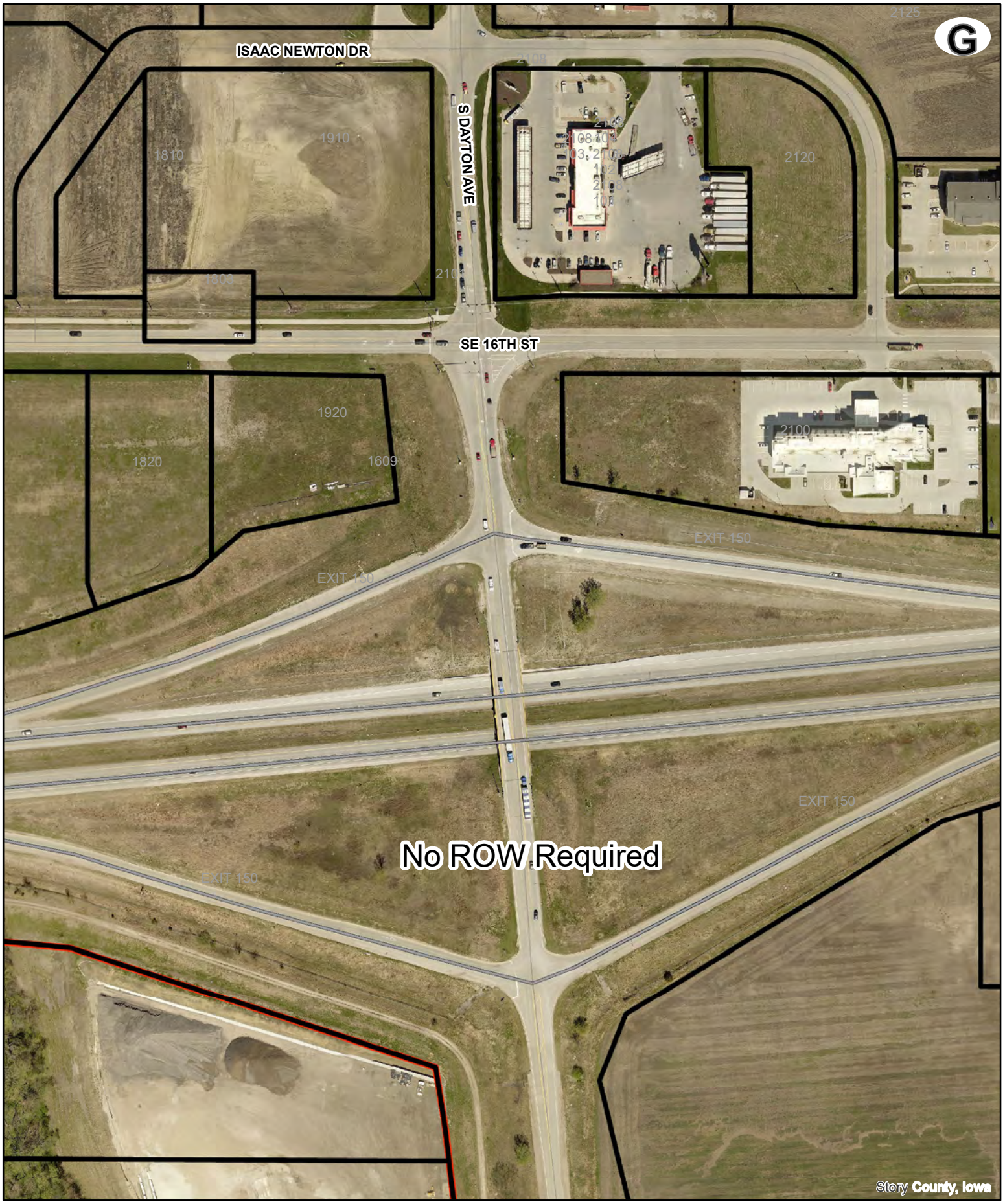
2020/21 S. Dayton Ave Improvements
(US HWY 30 Ramps & SE 16th)
Project Location

NORTH

1 inch = 6,612 feet

Date: 8/12/2020

Looking West-Southwest from SE 16th Street & Isaac Newton Drive



2020/21 S. Dayton Ave Improvements
(US HWY 30 Ramp & SE 16th St)
Existing ROW

NORTH

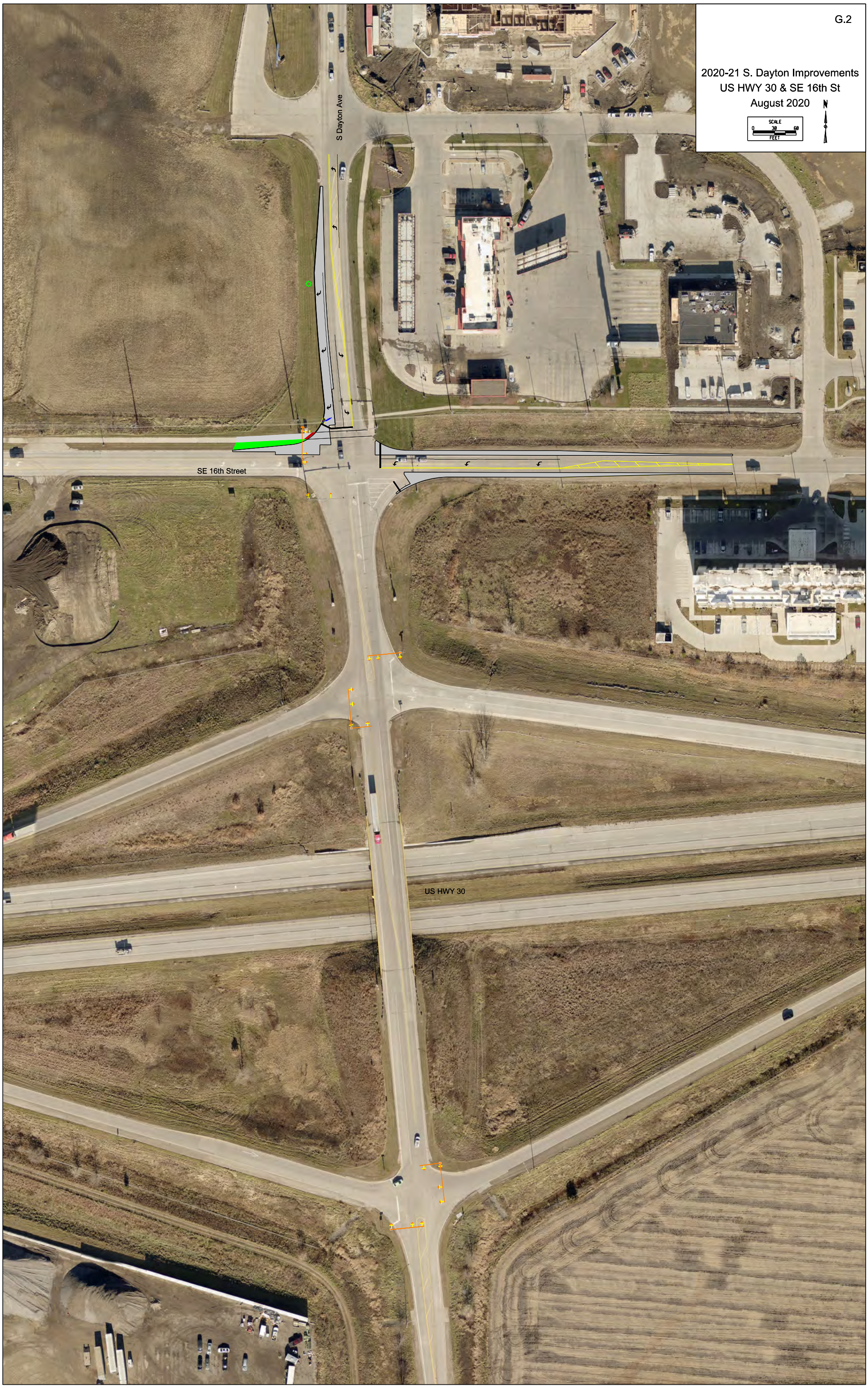
1 inch = 200 feet

Date: 8/13/2020

G.2

2020-21 S. Dayton Improvements
US HWY 30 & SE 16th St
August 2020

SCALE
0 30 60
FEET



2020/21 S. Dayton Ave Improvements
(US HWY 30 Ramp & SE 16th St)
Aerial Photograph

NORTH

1 inch = 200 feet

Date: 8/13/2020

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/20/2020

Location / Title of Project IA415/SW State Street at IA160/SW Oralabor Road Intersection

Applicant City of Ankeny

Contact Person Mark Mueller Title Director of Public Works and City Engineer

Complete Mailing Address 410 W First Street
Ankeny, IA 50023

Phone 515-963-3522 (Area Code) E-Mail mmueller@ankenyiowa.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) Iowa Dept. of Transportation – District 1

Contact Person Tony Gustafson Title Asst. District 1 Engineer

Complete Mailing Address District 1 Office 1020 S. 4th St.
Ankeny, IA 50010

Phone 515-239-1430 (Area Code) E-Mail Tony.Gustafson@iowadot.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 1,798,170.00
Total Project Cost	$ 1,798,170.00
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: The intersection scored 6th highest on the SICL for 2013-2017; safety study by the city in 2019
☐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 Ankeny

Signed: Mark Mueller — 8/05/2020

Signature — Date Signed

Mark Mueller

Printed Name

Attest: Leslie Hart — 8/5/2020

Signature — Date Signed

Leslie Hart

Printed Name

RESOLUTION 2020-289

A RESOLUTION AUTHORIZING THE CITY OF ANKENY, IOWA, TO MAKE AN APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION'S TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FOR THE PARTIAL FUNDING OF A PROJECT FOR SAFETY IMPROVEMENTS AT THE SW ORALABOR ROAD AND SW STATE STREET INTERSECTION WITHIN THE CITY LIMITS OF ANKENY.

WHEREAS, the Traffic Safety Improvement Program is established by the Iowa Department of Transportation (Iowa DOT); and

WHEREAS, said program allows for funding to be provided to states, counties or cities for eligible projects or programs that will contribute to improving traffic safety and operations; and

WHEREAS, the City of Ankeny has determined that improvements at the intersection of SW Oralabor Road and SW State Street will likely improve traffic safety and operations. The proposed improvements include widening to provide dual northbound, southbound and eastbound left-turn lanes, southbound and westbound right-turn lanes, pedestrian ramp upgrades and associated traffic signal reconstruction.

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

1. The City Council supports and approves the application for Traffic Safety Improvement Program (TSIP) funding.

2. The City Council hereby commits the additional funds necessary for construction of the project beyond any Traffic Safety Improvement Program (TSIP) funding.

3. The City Council hereby commits to accepting and maintaining these improvements in accordance with the Iowa DOT's Transportation Safety Improvement Program (TSIP).

4. The Mayor, or Mayor's designee, is hereby authorized to sign and execute the application on behalf of the City.

DATED at Ankeny, Iowa, this 20th day of July, 2020.

Gary Lorenz, Mayor

ATTEST:

Denise L. Hoy, City Clerk

Existing Conditions

IA415/SW State Street at IA160/SW Oralabor Road intersection in the City of Ankeny scored the sixth highest in the state on the Iowa DOT's Office of Traffic and Safety list of Top 200 Safety Improvement Candidate Locations (SICL) list during the 2013-2017 time span. The City of Ankeny is working to improve safety for the intersection by constructing improvements determined after completing an intersection safety study in 2019.

IA415/SW State Street and IA160/SW Oralabor Road are both high speed corridors that serve large volumes of peak hour and daily traffic. The posted speed limit on SW State Street is 55 mph south of the intersection and 45 mph north of the intersection. The posted speed limit on SW Oralabor Road is 50 mph east and west of the intersection. The intersection has a daily entering volume (AADT) of 44,600 vehicles per day based on the Iowa DOT Traffic Flow Map for 2016. SW Oralabor Road and the south leg of SW State Street are state highways and federally functionally classified as Other Principal Arterial. SW State Street south of the intersection and SW Oralabor Road west of the intersection are Highway 415, while SW Oralabor Road east of the intersection is Highway 160. SW State Street north of the intersection is a city street and federally functionally classified as a Minor Arterial.

SW State Street has two through lanes in each direction. There is a southbound left turn lane, a northbound left turn lane, and a northbound right turn lane. South of the intersection is a rural section with a raised median, while north of the intersection is an urban section with a raised median. SW Oralabor Road has two through lanes in each direction. There is an eastbound left turn lane, an eastbound right turn lane, and dual westbound left turn lanes. SW Oralabor Road is a rural section with a grass median.

Parking is prohibited on SW State Street and SW Oralabor Road near the intersection. There is an existing signal at this intersection with poles that meet clear zone requirements, while pedestal poles are break away. Pedestrian crossings are provided with push buttons and pedestrian heads on the north, south and east legs. The Oralabor Gateway Trail crosses the south leg.

Crash Data

A crash review for the intersection of SW State Street at SW Oralabor Road was performed for January 1, 2016 thru December 31, 2018 using the Iowa DOT's Crash Analysis Tool (ICAT) and comparing full police reports obtained by the City of Ankeny for January 1, 2018 through December 31, 2018. There was a total of 79 crashes in the three years with 19 crashes in 2016, 23 crashes in 2017, and 37 crashes in 2018. The ICAT Crash Summary is included in Section I. In the three years studied, there were no fatal or incapacitating Injury crashes reported, seven non incapacitating injury crashes, 16 possible injury crashes, and 56 property damage only (PDO) crashes were reported.

Rear-end crashes made up a disproportionate percentage of crashes during the three study years. 64 crashes or 81% of the total 79 recorded crashes were rear end crashes. Of these rear end crashes, 24 were northbound, 12 were eastbound, 10 were southbound, and 18 were westbound. Right angle and left turn crashes tied as the second highest type with five crashes each. The right-angle crashes included four crashes with eastbound traffic, two being northbound and two being southbound. The other was westbound with northbound. The left turn crashes were more evenly distributed occurring between a southbound vehicle and a westbound, northbound, or eastbound vehicle. Finally, there were also three sideswipe crashes and two non-collision crashes.

"Followed too close" was listed as the main cause of 25 crashes, "Distracted Driving" was listed as the main cause of 8 crashes, and "Ran Traffic Signal" listed as the main cause of seven crashes. The remaining 39 were a variety of other causes with "Other" listed for 19 crashes.

Tthe crash rate for the three years is 1.64 per million entering vehicles (MEV). The statewide average for a Primary Municipal Roadway intersecting a Primary Municipal roadway is 1.0 per MEV.

Capacity Analysis

An additional part of the intersection safety study was to review the existing capacity and traffic to determine what issues exist. Turning movement counts were obtained from the City of Ankeny for December 12, 2017 and new counts were preformed March 25, 2019 and March 26, 2019 to analyze multiple days and timeframes. The capacity analysis shows the existing conditions have Level of Service (LOS) D and E for the AM and PM Peaks. Certain turning movements have a LOS F with delays up to 172 seconds per vehicle with northbound left and eastbound right having the highest delays. These movements also have long queue lengths which can exceed the turn bay storage length. Mitigation of the delays and queues were reviewed with improvements considered based on potential improvements to delays and safety. Mitigation is included below.

Proposed Concept

The intersection safety study reviewed the crash issues and traffic flow. The combination of high traffic volumes for certain movements causes long delays and queues. The long queues and higher speeds are leading to the higher rear end crash frequencies. The improvements that will assist in reducing the crashes at this congested intersection include:

- Adding a second northbound left turn lane to provide dual northbound lefts. Provide matching dual southbound left turn lanes.
- Provide dual eastbound left turn lanes to match existing dual westbound left turn lanes.
- Add a southbound right turn lane
- Add a westbound right turn lane
- Allowing overlap signal changes to provide a green arrow for eastbound right turns when northbound left turns proceed.
- New signal poles placed outside clear zone and heads matching the proposed lane configuration.
- Corresponding traffic signal timing revisions

The proposed improvements provide an expected safety improvement of 29% crash reduction based on Crash Reduction Factors from the Highway Safety Manual and the Crash Modification Factor Clearinghouse. The crash reduction factors used in the crash reduction rate are:

- Providing a right turn lane on an approach was used for both added right turn lanes. CRF = 14%
- Implementing systemic signing and visibility improvements at signalized intersections. CRF = 4%

There is no reduction factor available in the above resources for safety benefits associated with adding a second left-turn lane. A study referenced in FHWA's *Signalized Intersection: An Informational Guide - Safety* (Chapter 11.1.2), indicates a 29% reduction in all fatal/ injury crashes and 26% reduction in all PDO crashes. These were not used in Section L, and are offered for further consideration of the safety benefits of the proposed project.

Engineer's Preliminary Quantities and Cost Estimate

City of Ankeny

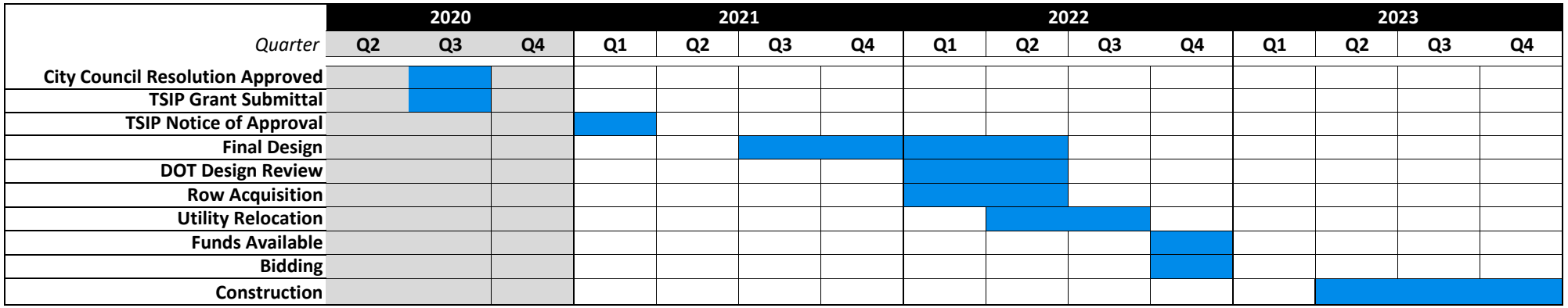
Intersection Safety Study - SW State Street at SW Oralabor Road

Item	Units	Qty	Cost /Unit	Est. Cost
TOPSOIL, ON-SITE, STRIP, SALVAGE, AND RESPREAD	CY	500	$30.00	$15,000.00
EXCAVATION, CLASS 12	CY	1000	$30.00	$30,000.00
SUBBASE	SY	5500	$25.00	$137,500.00
STORM SEWER, TRENCHED	LF	15	$250.00	$3,750.00
SUBDRAIN	LF	500	$20.00	$10,000.00
SUBDRAIN OUTLETS AND CONNECTIONS	EA	4	$1,000.00	$4,000.00
INTAKE, SW-501	EA	2	$5,000.00	$10,000.00
INTAKE, SW-505	EA	1	$6,000.00	$6,000.00
REMOVE INTAKE	EA	3	$1,500.00	$4,500.00
PAVEMENT, PCC	SY	5400	$95.00	$513,000.00
CURB AND GUTTER	LF	2500	$35.00	$87,500.00
REMOVAL OF SIDEWALK	SY	200	$25.00	$5,000.00
REMOVAL OF CURB	LF	2500	$30.00	$75,000.00
SIDEWALK, PCC	SY	200	$75.00	$15,000.00
DETECTABLE WARNING	SF	125	$50.00	$6,250.00
PAVEMENT REMOVAL	SY	1500	$20.00	$30,000.00
PAINTED PAVEMENT MARKINGS	STA	40	$250.00	$10,000.00
PAVEMENT MARKINGS REMOVED	STA	10	$100.00	$1,000.00
TRAFFIC SIGNAL REPLACEMENT	LS	1	$325,000.00	$325,000.00
TEMPORARY TRAFFIC CONTROL	LS	1	$75,000.00	$75,000.00
HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING	AC	0.75	$10,000.00	$7,500.00
MOBILIZATION	LS	1	$125,000.00	$125,000.00
PROPERTY ACQUISITION	AC	0.033	$75,000.00	$2,475.00
Subtotal				$1,498,475.00
Contingency (20%)				$299,695.00
Total				$1,798,170.00

City of Ankeny

SW State Street at SW Oralabor Road Intersection

Project Schedule



Estimated Completion Date: 12/01/2023

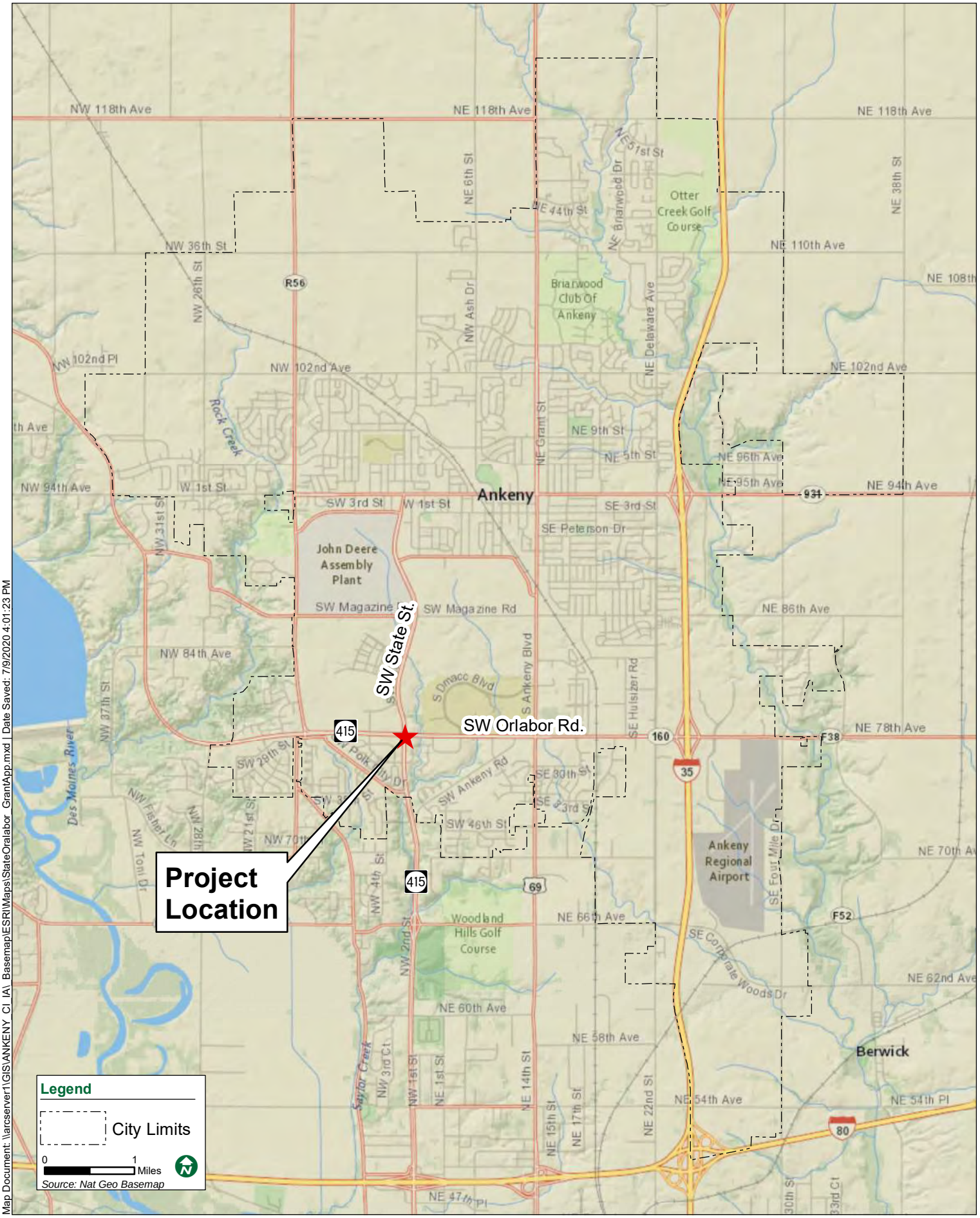
city of Ankeny
bringing it all together

Project Location Map

SW State Street & SW Oralabor Road

July 2020

BOLTON & MENK
Real People. Real Solutions.



Map Document: \\arcserver1\GIS\ANKENY_CI_IA_Basemap\ESRI\Maps\StateOralabor_GrantApp.mxd | Date Saved: 7/9/2020 4:01:23 PM

Looking South at the intersection from the North
Photo 1

Looking South at the intersection from the North
Photo 2

Looking West at the intersection from the East
Photo 1

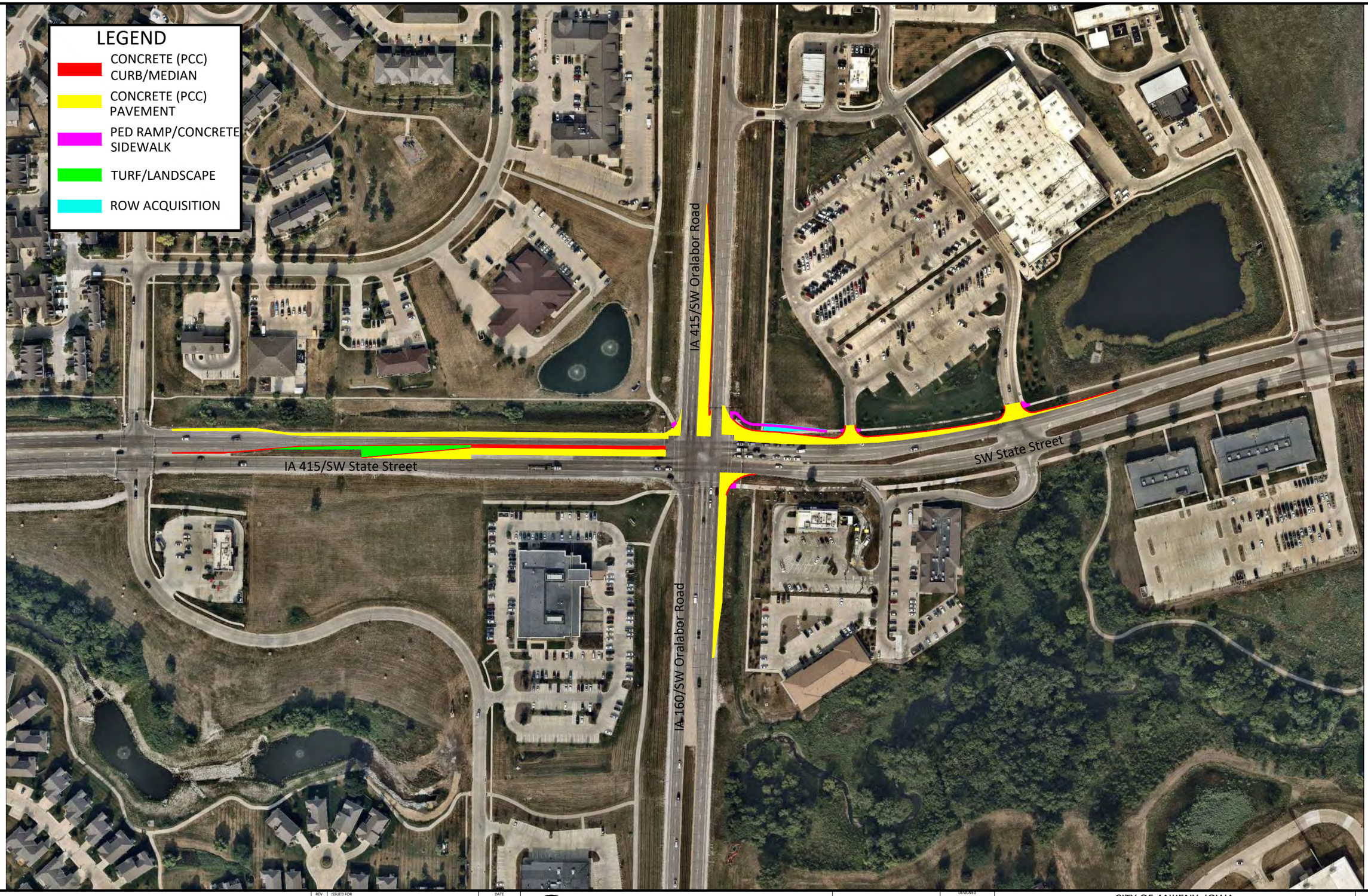
Looking West at the intersection from the East
Photo 2

Looking North at the intersection from the South
Photo 1

Looking North at the intersection from the South
Photo 2

Looking East at the intersection from the West
Photo 1

Looking East at the intersection from the West
Photo 2



HORZ. SCALE 0 100 200 FEET

REV	ISSUED FOR	DATE

BOLTON & MENK
309 E 5TH STREET, SUITE 202
DES MOINES, IOWA 50309
Phone: (515) 259-9190
Email: DesMoines@bolton-menk.com
www.bolton-menk.com

DESIGNED	MW
SEALED	RH
CHECKED	RH
CLIENT PROJ. NO.	T43.121332

CITY OF ANKENY, IOWA

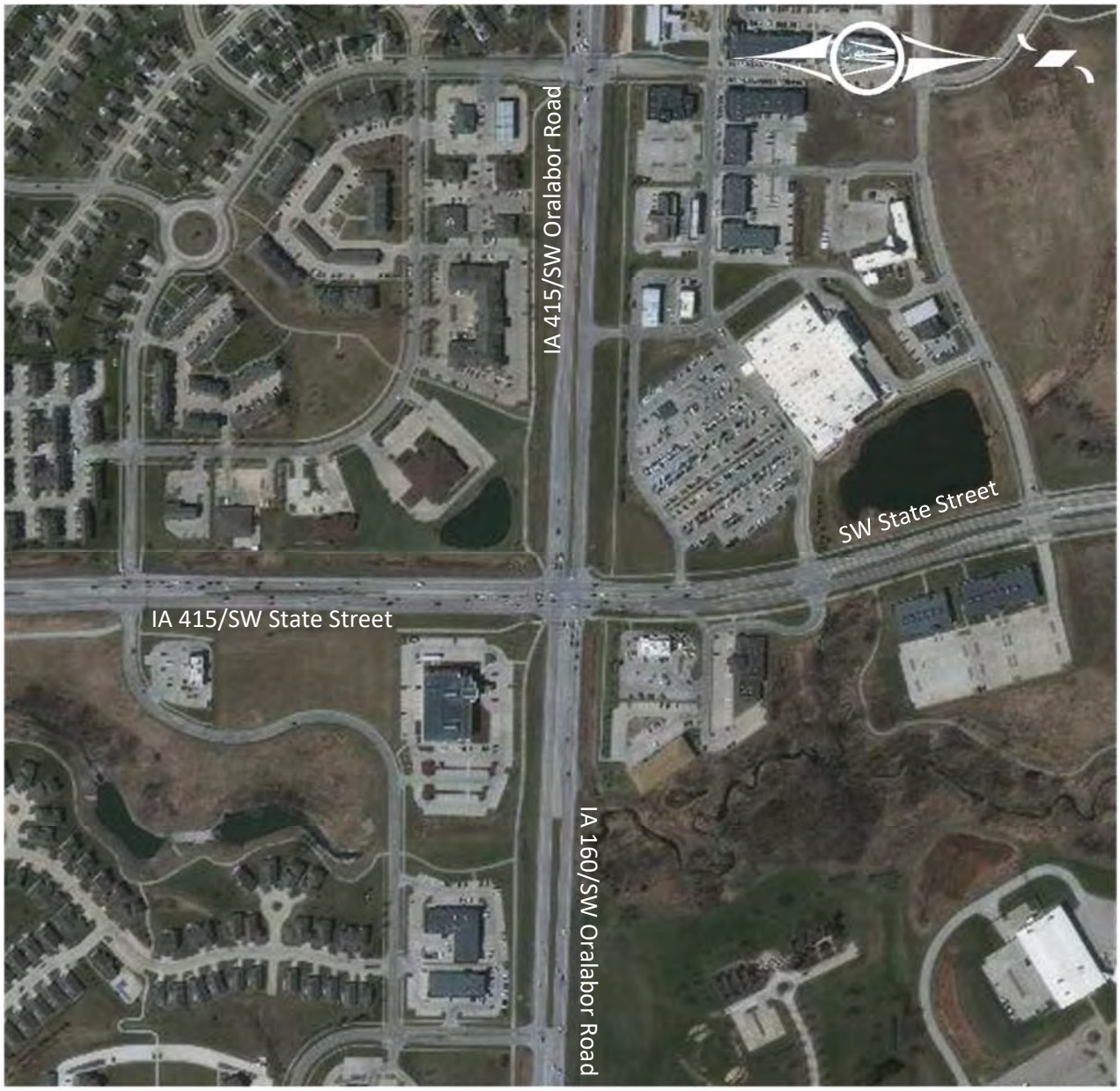
EXISTING & PROPOSED INTERSECTION CONDITIONS

SW STATE STREET AND SW ORALABOR ROAD

SHEET 1

Figure 1 shows an aerial of the existing intersection.

Figure 1 – Existing Intersection



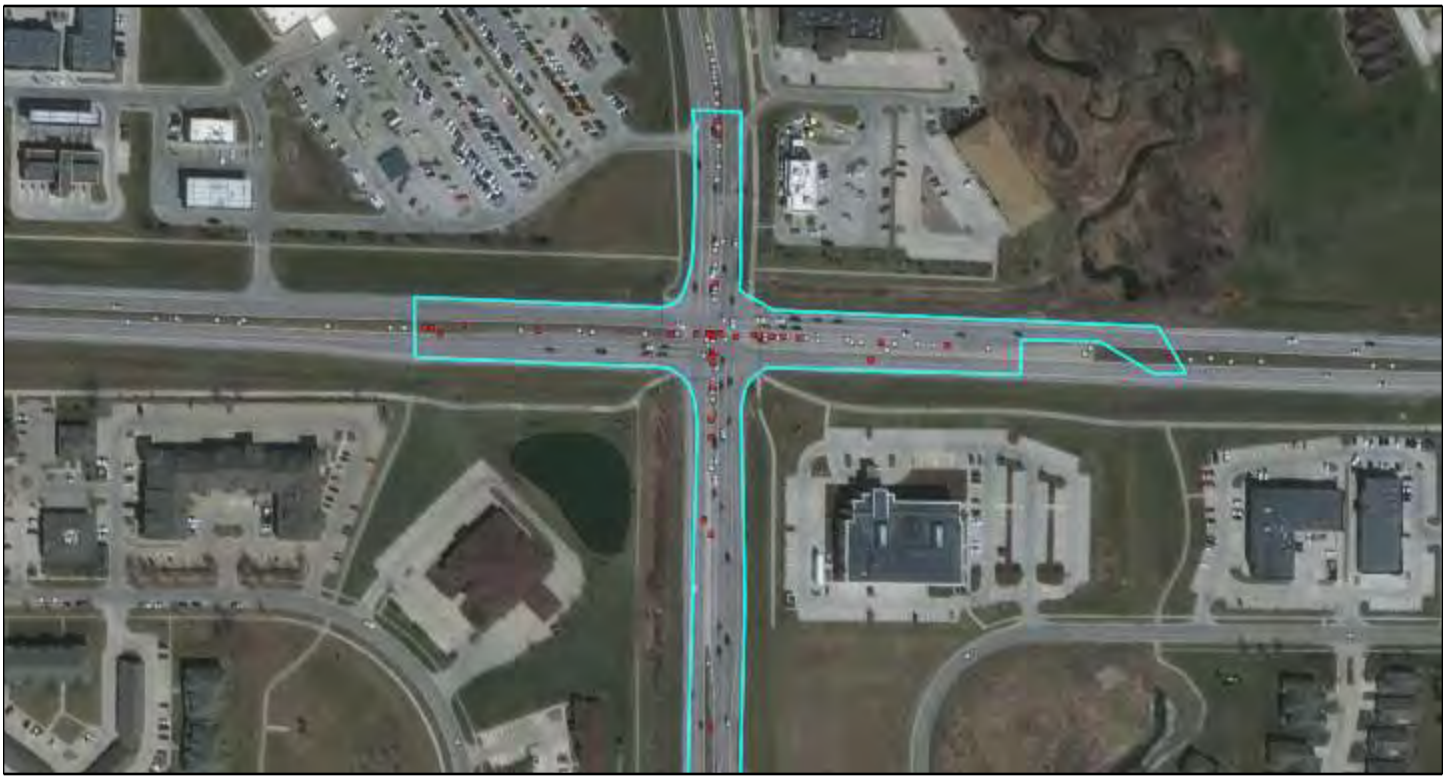
Iowa Crash Analysis Tool
Quick Report
2016-2018

Crash Severity	80
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	8
Possible/Unknown Injury Crash	16
Property Damage Only	56

Injury Status Summary	30
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	8
Possible (complaint of pain/injury)	19
Unknown	3

Property/Vehicles/Occupants	
Property Damage Total (dollars):	442,697.00
Average (per crash dollars):	5,533.71
Total Vehicles:	173.00
Average (per crash):	2.16
Total Occupants:	222.00
Average (per crash):	2.78

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.34
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.10
Possible/Unknown Injuries/Crash:	0.24



Major Cause			79
Animal	1	Ran traffic signal	7
Ran stop sign	0	Failed to yield to emergency vehicle	1
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	1
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	2	FTYROW: From driveway	1
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	1	Driving too fast for conditions	2
Exceeded authorized speed	1	Improper or erratic lane changing	1
Operating vehicle in an reckless, erratic, ca...	3	Followed too close	25
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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...	1
Driver Distraction: Inattentive/lost in thou...	1	Driver Distraction: Other interior distracti...	4
Driver Distraction: Exterior distraction	2	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	1	Swerving/Evasive Action	0
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	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	20
Unknown	3	Not reported	0
Other: No improper action	0		

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	0	0	1	1	1	1	0	1	0	0	1	0	7
Monday	0	0	0	1	2	2	1	2	5	0	1	1	0	15
Tuesday	0	0	0	2	3	0	0	1	5	0	0	0	0	11
Wednesday	0	0	0	4	2	1	0	3	4	0	0	0	0	14
Thursday	0	0	0	1	1	0	0	2	4	3	1	1	0	13
Friday	0	0	0	1	2	0	2	1	2	2	5	0	0	15
Saturday	0	0	0	0	1	1	0	0	1	1	0	1	0	5
Total	1	0	0	10	12	5	4	9	22	6	7	4	0	80

Manner of Crash Collision	80
Non-collision (single vehicle)	2
Head-on (front to front)	0
Rear-end (front to rear)	62
Angle, oncoming left turn	5
Broadside (front to side)	8
Sideswipe, same direction	2
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	1
Unknown	0

Surface Conditions	80
Dry	65
Wet	11
Ice/frost	1
Snow	2
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			173
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	173

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	0	0	0	0	0
= 16	1	1	0	0	2
= 17	4	2	0	0	6
= 18	1	5	0	0	6
= 19	5	4	0	0	9
= 20	5	2	0	0	7
>= 21 and <= 24	11	8	0	0	19
>= 25 and <= 29	12	5	1	0	18
>= 30 and <= 34	6	7	0	0	13
>= 35 and <= 39	12	12	1	0	25
>= 40 and <= 44	5	6	0	0	11
>= 45 and <= 49	5	4	0	0	9
>= 50 and <= 54	4	3	1	0	8
>= 55 and <= 59	8	6	0	0	14
>= 60 and <= 64	4	4	0	0	8
>= 65 and <= 69	1	6	0	0	7
>= 70 and <= 74	1	4	0	0	5
>= 75 and <= 79	1	0	0	0	1
>= 80 and <= 84	1	0	0	0	1
>= 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	87	79	3	0	169

Drug/Alcohol Related	**80**
Drug	0
Alcohol (< Statutory)	1
Alcohol (Statutory)	1
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	2
Under Influence of Alcohol/Drugs/Medications	1
None Indicated	75

Alcohol Test Given	**173**
None	165
Blood	0
Urine	0
Breath	2
Vitreous	0
Refused	2
Not reported	4

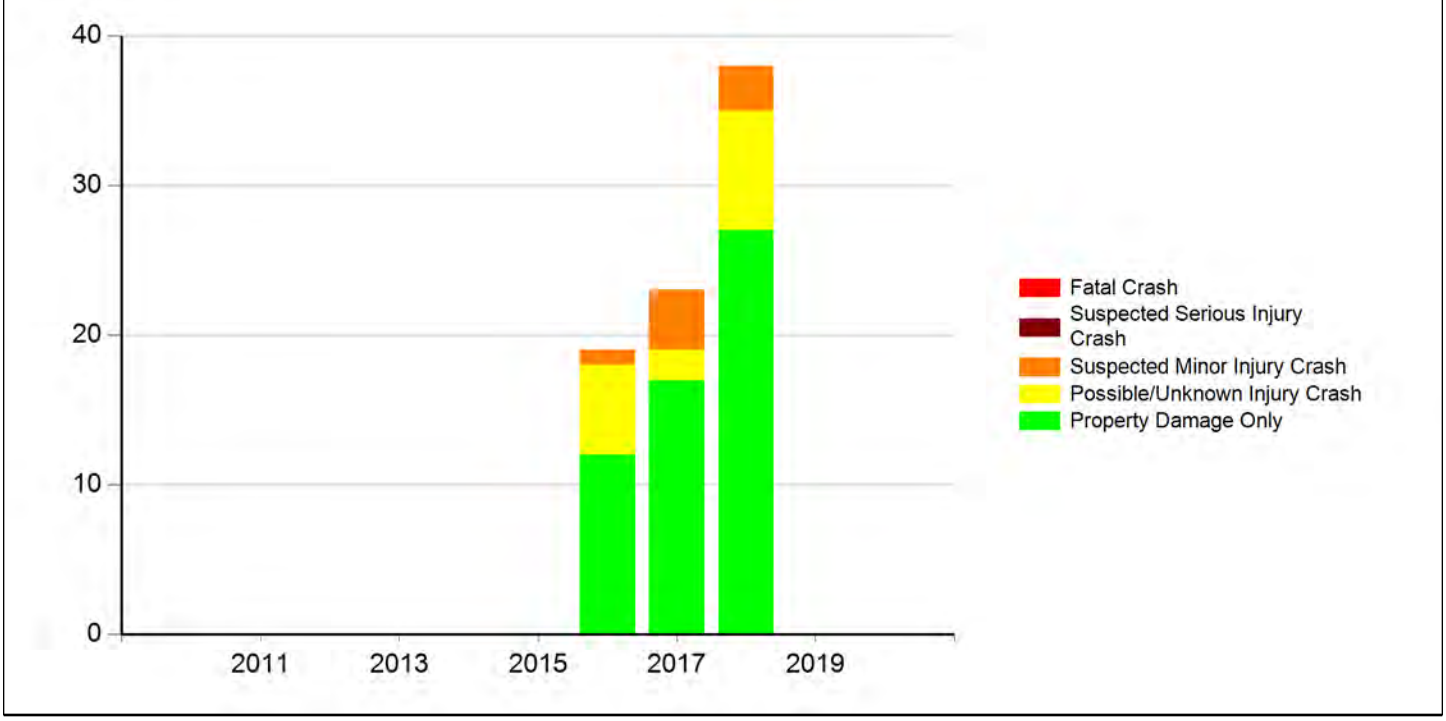
Drug Test Given	**173**
None	168
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	5

Drug Test Result	**173**
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	173
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	1	6	12	19
2017	0	0	4	2	17	23
2018	0	0	3	8	27	38
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	8	16	56	80

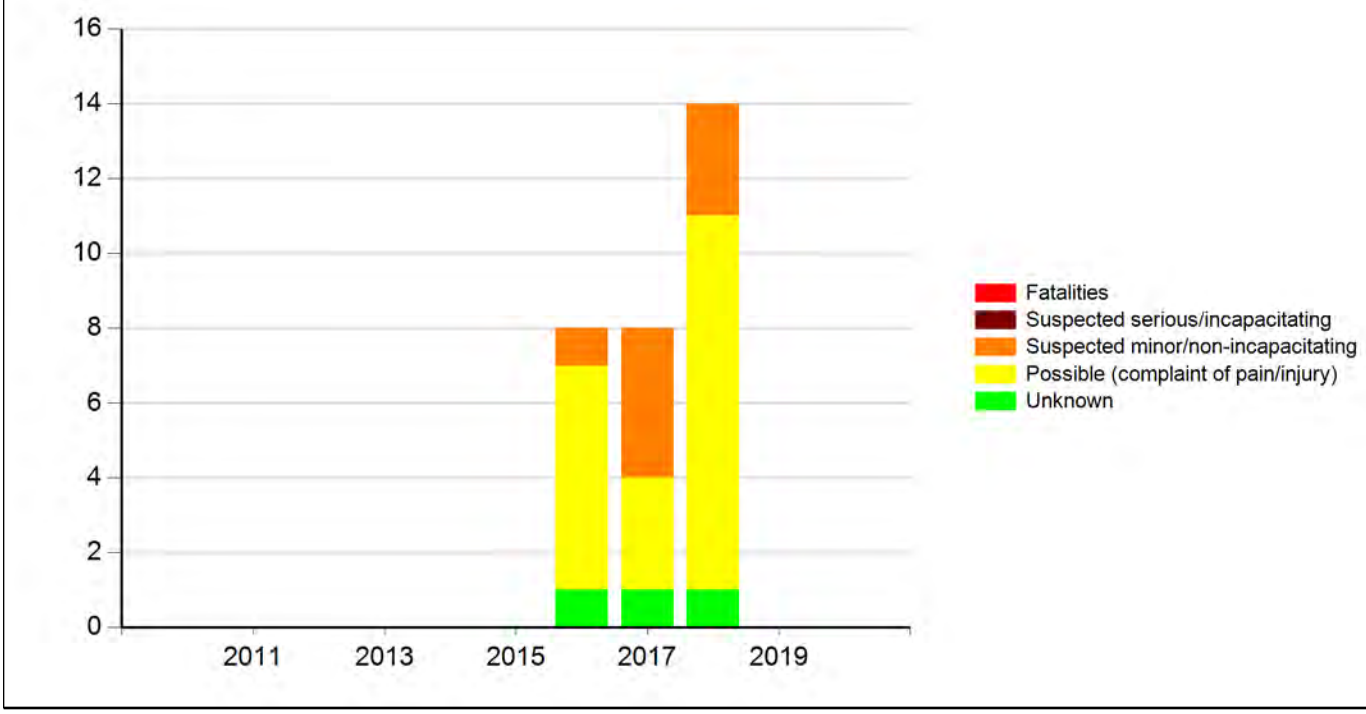
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	1	6	1	8
2017	0	0	4	3	1	8
2018	0	0	3	10	1	14
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	8	19	3	30

Injury Status/Year



Meeting the following criteria

Jurisdiction: Cities (Ankeny)
Year: 2016, 2017, 2018
Map Selection: Yes
Filter: None

Analyst Information

Prepared by, MW

SW State Street at SW Oralabor
Ankeny Iowa
Tuesday, March 26, 2019

	Southbound SW State St.					Westbound SW Oralabor Rd.					Northbound SW State St.					Eastbound SW Oralabor Rd.					
Time	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	TOTAL
12:00 AM	0	2	14	1	0	0	4	5	3	0	0	1	11	1	0	0	0	4	3	0	**49**
12:15 AM	0	1	5	0	0	0	3	5	5	0	0	1	15	4	0	0	1	6	0	0	**46**
12:30 AM	0	3	9	0	0	0	5	5	2	0	0	4	5	2	0	0	0	0	1	0	**36**
12:45 AM	0	2	3	2	0	0	1	1	2	0	0	1	7	3	0	0	1	0	0	0	**23**
Hourly Total	0	8	31	3	0	0	13	16	12	0	0	7	38	10	0	0	2	10	4	0	**154**
1:00 AM	0	1	4	1	0	0	2	2	1	0	0	2	12	3	0	0	0	2	0	0	**30**
1:15 AM	0	1	9	0	0	0	0	7	2	0	0	0	5	1	0	0	0	2	3	0	**30**
1:30 AM	0	0	3	0	0	0	3	4	2	0	0	0	8	1	0	0	0	1	3	0	**25**
1:45 AM	0	1	1	1	0	0	2	3	1	0	0	3	2	1	0	0	0	2	0	0	**17**
Hourly Total	0	3	17	2	0	0	7	16	6	0	0	5	27	6	0	0	0	7	6	0	**102**
2:00 AM	0	2	3	1	0	0	3	1	1	0	0	3	3	2	0	0	2	4	2	0	**27**
2:15 AM	0	2	2	0	0	0	0	1	0	0	0	1	3	1	0	0	0	1	1	0	**12**
2:30 AM	0	0	4	0	0	0	0	6	0	0	0	1	5	1	0	0	1	1	0	0	**19**
2:45 AM	0	0	3	0	0	0	1	1	1	0	0	0	4	0	0	0	0	1	1	0	**12**
Hourly Total	0	4	12	1	0	0	4	9	2	0	0	5	15	4	0	0	3	7	4	0	**70**
3:00 AM	0	1	0	0	0	0	1	2	1	0	0	0	1	2	0	0	2	0	0	0	**10**
3:15 AM	0	2	2	0	0	0	2	2	1	0	0	0	4	1	0	0	0	0	4	0	**18**
3:30 AM	0	1	5	0	0	0	2	2	1	0	0	1	5	4	0	0	0	2	3	0	**26**
3:45 AM	0	0	9	0	0	0	4	2	0	0	0	0	2	4	0	0	1	12	2	0	**36**
Hourly Total	0	4	16	0	0	0	9	8	3	0	0	1	12	11	0	0	3	14	9	0	**90**
4:00 AM	0	0	2	4	0	0	1	6	1	0	0	1	5	4	0	0	1	7	1	0	**33**
4:15 AM	0	5	10	0	0	0	3	5	1	0	0	3	4	5	0	0	1	11	4	0	**52**
4:30 AM	0	3	12	0	0	0	1	5	1	0	0	4	14	4	0	0	4	15	5	0	**68**
4:45 AM	0	3	17	0	0	0	3	13	14	0	0	3	18	11	0	0	2	28	20	0	**132**
Hourly Total	0	11	41	4	0	0	8	29	17	0	0	11	41	24	0	0	8	61	30	0	**285**
5:00 AM	0	7	23	1	0	0	3	12	6	0	0	7	17	4	0	0	2	25	13	0	**120**
5:15 AM	0	6	41	1	0	0	2	4	11	0	0	15	43	4	0	0	4	20	22	0	**173**
5:30 AM	0	8	58	3	0	0	9	14	15	0	0	21	65	6	0	0	10	33	28	0	**270**
5:45 AM	0	13	51	2	0	0	10	33	11	0	0	23	32	10	0	0	10	40	31	0	**266**
Hourly Total	0	34	173	7	0	0	24	63	43	0	0	66	157	24	0	0	26	118	94	0	**829**
6:00 AM	0	18	94	6	0	0	10	33	7	0	0	13	34	15	0	0	8	47	38	0	**323**
6:15 AM	0	26	129	7	0	0	23	26	8	0	0	28	48	14	0	0	11	46	50	0	**416**
6:30 AM	0	22	163	11	0	0	25	42	13	0	0	24	47	15	0	0	15	58	79	0	**514**
6:45 AM	0	34	178	4	0	0	28	61	18	0	0	47	83	18	0	0	27	102	81	0	**681**
Hourly Total	0	100	564	28	0	0	86	162	46	0	0	112	212	62	0	0	61	253	248	0	**1934**
7:00 AM	0	34	276	7	0	0	29	53	17	0	0	37	97	42	0	0	24	95	114	0	**825**
7:15 AM	0	46	222	7	0	0	33	82	23	0	0	34	135	46	0	0	36	144	123	0	**931**
7:30 AM	0	53	289	21	0	0	30	55	20	0	0	32	129	81	0	0	38	157	128	0	**1033**
7:45 AM	0	57	201	19	0	0	33	66	34	0	0	43	115	99	0	0	60	205	107	0	**1039**
Hourly Total	0	190	988	54	0	0	125	256	94	0	0	146	476	268	0	0	158	601	472	0	**3828**
8:00 AM	0	43	202	10	0	0	31	65	27	0	0	41	127	52	0	0	53	126	79	0	**856**
8:15 AM	0	28	169	28	0	0	38	67	24	0	0	40	91	55	0	0	37	97	52	0	**726**
8:30 AM	0	33	147	19	0	0	29	43	24	0	0	26	74	56	0	0	16	91	65	0	**623**
8:45 AM	0	34	98	9	0	0	33	55	29	0	0	47	91	58	0	0	36	90	39	0	**619**
Hourly Total	0	138	616	66	0	0	131	230	104	0	0	154	383	221	0	0	142	404	235	0	**2824**
9:00 AM	0	32	101	7	0	0	45	70	25	0	0	34	60	36	0	0	19	85	49	0	**563**
9:15 AM	0	37	99	7	0	0	38	63	28	0	0	28	82	65	0	0	19	87	36	0	**589**
9:30 AM	0	42	90	14	0	0	55	63	31	0	0	31	71	53	0	0	21	84	42	0	**597**
9:45 AM	0	43	94	15	0	0	52	62	37	0	0	28	69	50	0	0	24	88	28	0	**590**
Hourly Total	0	154	384	43	0	0	190	258	121	0	0	121	282	204	0	0	83	344	155	0	**2339**
10:00 AM	0	35	76	17	0	0	37	78	30	0	0	31	61	39	0	0	13	82	29	0	**528**
10:15 AM	0	34	73	22	0	0	42	68	28	0	0	35	92	32	0	0	20	64	32	0	**542**
10:30 AM	0	39	85	12	0	0	37	70	29	1	0	32	68	30	0	0	17	60	41	0	**520**
10:45 AM	0	39	88	16	0	0	47	61	26	0	0	30	70	42	0	0	24	86	34	0	**563**
Hourly Total	0	147	322	67	0	0	163	277	113	1	0	128	291	143	0	0	74	292	136	0	**2153**
11:00 AM	0	42	83	22	0	0	80	92	36	0	0	29	61	45	0	0	25	100	28	0	**643**
11:15 AM	0	53	92	16	0	0	52	95	38	0	0	30	85	32	1	0	16	89	31	0	**629**
11:30 AM	0	45	87	16	0	0	43	79	44	1	0	33	87	30	0	0	23	85	33	0	**605**
11:45 AM	0	62	86	6	0	0	54	95	42	0	0	41	83	37	0	0	20	110	32	0	**668**
Hourly Total	0	202	348	60	0	0	229	361	160	1	0	133	316	144	1	0	84	384	124	0	**2545**

SW State Street at SW Oralabor
Ankeny Iowa
Tuesday, March 26, 2019

	Southbound SW State St.					Westbound SW Oralabor Rd.					Northbound SW State St.					Eastbound SW Oralabor Rd.					TOTAL
Time	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	U Turns	Left Turns	Straight Through	Right Turns	Peds/ Bicycles	
12:00 PM	0	46	108	23	0	0	69	106	44	1	0	38	95	39	0	0	30	96	30	0	**724**
12:15 PM	0	52	99	16	0	0	59	99	52	0	0	45	85	41	0	0	22	135	31	0	**736**
12:30 PM	0	55	92	17	0	0	46	94	45	0	0	32	66	57	0	0	23	121	31	0	**679**
12:45 PM	0	51	109	14	0	0	94	94	39	0	0	49	96	35	0	0	25	90	32	0	**728**
Hourly Total	0	204	408	70	0	0	268	393	180	1	0	164	342	172	0	0	100	442	124	0	**2867**
1:00 PM	0	57	91	16	0	0	52	93	55	0	0	44	99	30	0	0	21	84	34	0	**676**
1:15 PM	0	49	110	20	0	0	45	76	33	0	0	44	71	37	1	0	19	85	29	0	**618**
1:30 PM	0	34	100	14	0	0	55	82	35	0	0	42	66	45	0	0	19	84	32	0	**608**
1:45 PM	0	41	88	13	0	0	65	89	42	0	0	34	82	31	1	0	23	88	27	0	**623**
Hourly Total	0	181	389	63	0	0	217	340	165	0	0	164	318	143	2	0	82	341	122	0	**2525**
2:00 PM	1	38	94	11	1	0	66	82	31	1	0	35	72	41	0	0	25	76	23	0	**595**
2:15 PM	0	33	104	20	0	0	105	112	35	1	0	36	98	30	0	0	21	87	33	0	**714**
2:30 PM	0	44	129	17	0	0	76	103	42	0	0	44	98	23	0	0	26	70	59	0	**731**
2:45 PM	0	51	96	16	0	0	93	119	41	0	0	60	109	30	0	0	19	80	35	0	**749**
Hourly Total	1	166	423	64	1	0	340	416	149	2	0	175	377	124	0	0	91	313	150	0	**2789**
3:00 PM	0	52	157	30	0	0	65	113	35	0	0	45	122	20	0	0	26	80	47	0	**792**
3:15 PM	0	56	139	20	0	0	80	98	42	0	0	51	126	24	0	0	18	92	42	0	**788**
3:30 PM	0	46	147	22	0	0	67	124	31	0	0	66	158	32	0	0	32	101	51	0	**877**
3:45 PM	0	61	156	25	0	0	80	103	44	0	0	84	166	25	0	0	43	108	47	0	**942**
Hourly Total	0	215	599	97	0	0	292	438	152	0	0	246	572	101	0	0	119	381	187	0	**3399**
4:00 PM	0	55	181	23	0	0	89	139	34	0	0	53	172	28	0	0	41	138	66	2	**1019**
4:15 PM	1	54	121	19	0	0	78	135	42	0	0	97	193	31	0	0	36	96	48	0	**951**
4:30 PM	0	59	180	16	1	0	81	144	48	0	0	80	217	39	0	0	47	129	59	0	**1099**
4:45 PM	1	64	170	23	0	0	89	139	57	0	0	73	195	42	0	0	48	128	59	0	**1088**
Hourly Total	2	232	652	81	1	0	337	557	181	0	0	303	777	140	0	0	172	491	232	2	**4157**
5:00 PM	0	47	148	31	0	0	81	155	42	0	0	89	219	36	0	0	54	155	51	0	**1108**
5:15 PM	0	46	162	37	0	0	85	162	60	0	0	88	237	43	0	0	39	131	55	0	**1145**
5:30 PM	0	41	141	24	0	0	52	119	36	0	0	86	222	48	0	0	61	139	46	0	**1015**
5:45 PM	0	62	118	17	0	0	61	115	63	0	0	73	178	56	0	0	42	123	28	0	**936**
Hourly Total	0	196	569	109	0	0	279	551	201	0	0	336	856	183	0	0	196	548	180	0	**4204**
6:00 PM	0	56	131	17	2	0	45	117	57	0	0	55	165	28	0	0	38	120	40	0	**869**
6:15 PM	0	68	130	22	0	0	54	116	49	0	0	41	138	31	1	0	36	95	28	0	**808**
6:30 PM	0	39	112	21	0	0	39	100	45	0	0	52	124	30	0	0	25	100	29	0	**716**
6:45 PM	0	47	94	15	0	0	41	101	40	0	0	45	102	29	0	0	25	52	21	0	**612**
Hourly Total	0	210	467	75	2	0	179	434	191	0	0	193	529	118	1	0	124	367	118	0	**3005**
7:00 PM	0	45	120	30	0	0	42	91	35	0	0	35	68	15	0	0	26	53	23	0	**583**
7:15 PM	0	34	113	23	0	0	35	78	34	0	0	35	84	22	2	0	19	72	19	0	**568**
7:30 PM	0	29	85	33	0	0	50	85	31	0	0	30	64	22	1	0	14	55	18	0	**516**
7:45 PM	0	49	91	19	0	0	35	58	23	1	0	26	69	18	0	0	11	60	16	0	**475**
Hourly Total	0	157	409	105	0	0	162	312	123	1	0	126	285	77	3	0	70	240	76	0	**2142**
8:00 PM	0	37	89	20	0	0	57	76	21	0	0	24	60	15	0	0	11	49	14	0	**473**
8:15 PM	0	22	69	25	0	0	48	72	23	0	0	25	72	12	0	0	8	36	12	0	**424**
8:30 PM	0	25	65	24	0	0	31	63	20	0	0	27	50	20	0	0	4	21	13	0	**363**
8:45 PM	0	18	56	14	0	0	19	49	18	0	0	20	57	10	0	0	10	36	15	0	**322**
Hourly Total	0	102	279	83	0	0	155	260	82	0	0	96	239	57	0	0	33	142	54	0	**1582**
9:00 PM	0	14	37	10	0	0	32	46	21	0	0	11	58	11	0	0	9	18	8	0	**275**
9:15 PM	0	6	58	10	0	0	25	35	16	0	0	16	55	11	0	0	9	23	11	0	**275**
9:30 PM	0	12	30	9	0	0	25	31	17	0	0	7	51	13	0	0	4	19	3	0	**221**
9:45 PM	0	19	35	17	0	0	24	28	14	0	0	18	46	7	0	0	2	27	6	0	**243**
Hourly Total	0	51	160	46	0	0	106	140	68	0	0	52	210	42	0	0	24	87	28	0	**1014**
10:00 PM	0	16	32	10	0	0	20	18	13	0	0	8	31	7	0	0	4	11	15	0	**185**
10:15 PM	0	11	27	4	0	0	7	16	6	0	0	15	37	3	0	0	4	7	6	0	**143**
10:30 PM	0	6	20	6	0	0	11	11	10	0	0	13	30	6	0	0	3	6	8	0	**130**
10:45 PM	0	8	16	3	0	0	11	12	9	0	0	8	18	3	1	0	2	12	3	0	**105**
Hourly Total	0	41	95	23	0	0	49	57	38	0	0	44	116	19	1	0	13	36	32	0	**563**
11:00 PM	0	10	24	2	0	0	4	8	6	0	0	6	18	4	1	0	4	8	8	0	**102**
11:15 PM	1	3	14	1	0	0	8	6	5	0	0	6	21	3	0	0	4	7	3	0	**82**
11:30 PM	0	5	5	3	0	0	1	10	6	1	0	1	8	7	0	0	1	5	8	0	**60**
11:45 PM	0	2	10	1	0	0	2	4	2	0	0	2	8	5	0	0	1	3	0	0	**40**
Hourly Total	1	20	53	7	0	0	15	28	19	1	0	15	55	19	1	0	10	23	19	0	**284**
DAILY TOTAL	**4**	**2770**	**8015**	**1158**	**4**	**0**	**3388**	**5611**	**2270**	**7**	**0**	**2803**	**6926**	**2316**	**9**	**0**	**1678**	**5906**	**2839**	**2**	**45684**
Cars	4	2716	7845	1144	2	0	3314	5495	2220	7	0	2730	6753	2230	8	0	1659	5794	2774	2	**44678**
Heavy Vehicles	0	54	170	14	2	0	74	116	50	0	0	73	173	86	1	0	19	112	65	0	**1006**
Heavy Vehicle %	0.00%	1.95%	2.12%	1.21%	50.00%	0.00%	2.18%	2.07%	2.20%	0.00%	0.00%	2.60%	2.50%	3.71%	11.11%	0.00%	1.13%	1.90%	2.29%	0.00%	**2.20%**

SW State Street at SW Oralabor
Ankeny Iowa
Tuesday, March 26, 2019

AM Peak Hour

Time	Southbound U Turns	Southbound Left Turns	Southbound Straight Through	Southbound Right Turns	Southbound Peds/ Bicycles	Westbound U Turns	Westbound Left Turns	Westbound Straight Through	Westbound Right Turns	Westbound Peds/ Bicycles	Northbound U Turns	Northbound Left Turns	Northbound Straight Through	Northbound Right Turns	Northbound Peds/ Bicycles	Eastbound U Turns	Eastbound Left Turns	Eastbound Straight Through	Eastbound Right Turns	Eastbound Peds/ Bicycles	VEHICLE TOTAL
7:15 AM	0	46	222	7	0	0	33	82	23	0	0	34	135	46	0	0	36	144	123	0	**931**
7:30 AM	0	53	289	21	0	0	30	55	20	0	0	32	129	81	0	0	38	157	128	0	**1033**
7:45 AM	0	57	201	19	0	0	33	66	34	0	0	43	115	99	0	0	60	205	107	0	**1039**
8:00 AM	0	43	202	10	0	0	31	65	27	0	0	41	127	52	0	0	53	126	79	0	**856**
Peak Hour Total	0	199	914	57	0	0	127	268	104	0	0	150	506	278	0	0	187	632	437	0	**3859**
PHF	0.000	0.873	0.791	0.679	0.000	0.000	0.962	0.817	0.765	0.000	0.000	0.872	0.937	0.702	0.000	0.000	0.779	0.771	0.854	0.000	**0.929**
Heavy Vehicle %	0.00%	4.02%	0.77%	5.26%	0.00%	0.00%	4.72%	3.73%	2.88%	0.00%	0.00%	2.00%	5.73%	2.16%	0.00%	0.00%	2.14%	0.95%	1.14%	0.00%	**2.33%**

PM Peak Hour

Time	Southbound U Turns	Southbound Left Turns	Southbound Straight Through	Southbound Right Turns	Southbound Peds/ Bicycles	Westbound U Turns	Westbound Left Turns	Westbound Straight Through	Westbound Right Turns	Westbound Peds/ Bicycles	Northbound U Turns	Northbound Left Turns	Northbound Straight Through	Northbound Right Turns	Northbound Peds/ Bicycles	Eastbound U Turns	Eastbound Left Turns	Eastbound Straight Through	Eastbound Right Turns	Eastbound Peds/ Bicycles	VEHICLE TOTAL
4:30 PM	0	59	180	16	1	0	81	144	48	0	0	80	217	39	0	0	47	129	59	0	**1099**
4:45 PM	1	64	170	23	0	0	89	139	57	0	0	73	195	42	0	0	48	128	59	0	**1088**
5:00 PM	0	47	148	31	0	0	81	155	42	0	0	89	219	36	0	0	54	155	51	0	**1108**
5:15 PM	0	46	162	37	0	0	85	162	60	0	0	88	237	43	0	0	39	131	55	0	**1145**
Peak Hour Total	1	216	660	107	1	0	336	600	207	0	0	330	868	160	0	0	188	543	224	0	**4440**
PHF	0.250	0.844	0.917	0.723	0.250	0.000	0.944	0.926	0.863	0.000	0.000	0.927	0.916	0.930	0.000	0.000	0.870	0.876	0.949	0.000	**0.969**
Heavy Vehicle %	0.00%	0.46%	1.82%	0.00%	0.00%	0.00%	0.30%	0.50%	0.97%	0.00%	0.00%	0.30%	0.35%	0.00%	0.00%	0.00%	1.06%	2.95%	1.34%	0.00%	**0.99%**

Total Vehicles On Leg 22825					
	Vehicles Entering Intersection 11947		Vehicles Exiting Intersection 10878		
Southbound					
Cars	1144	7845	2716	4	2
Heavy	14	170	54	0	2
Total	**1158**	**8015**	**2770**	**4**	**4**

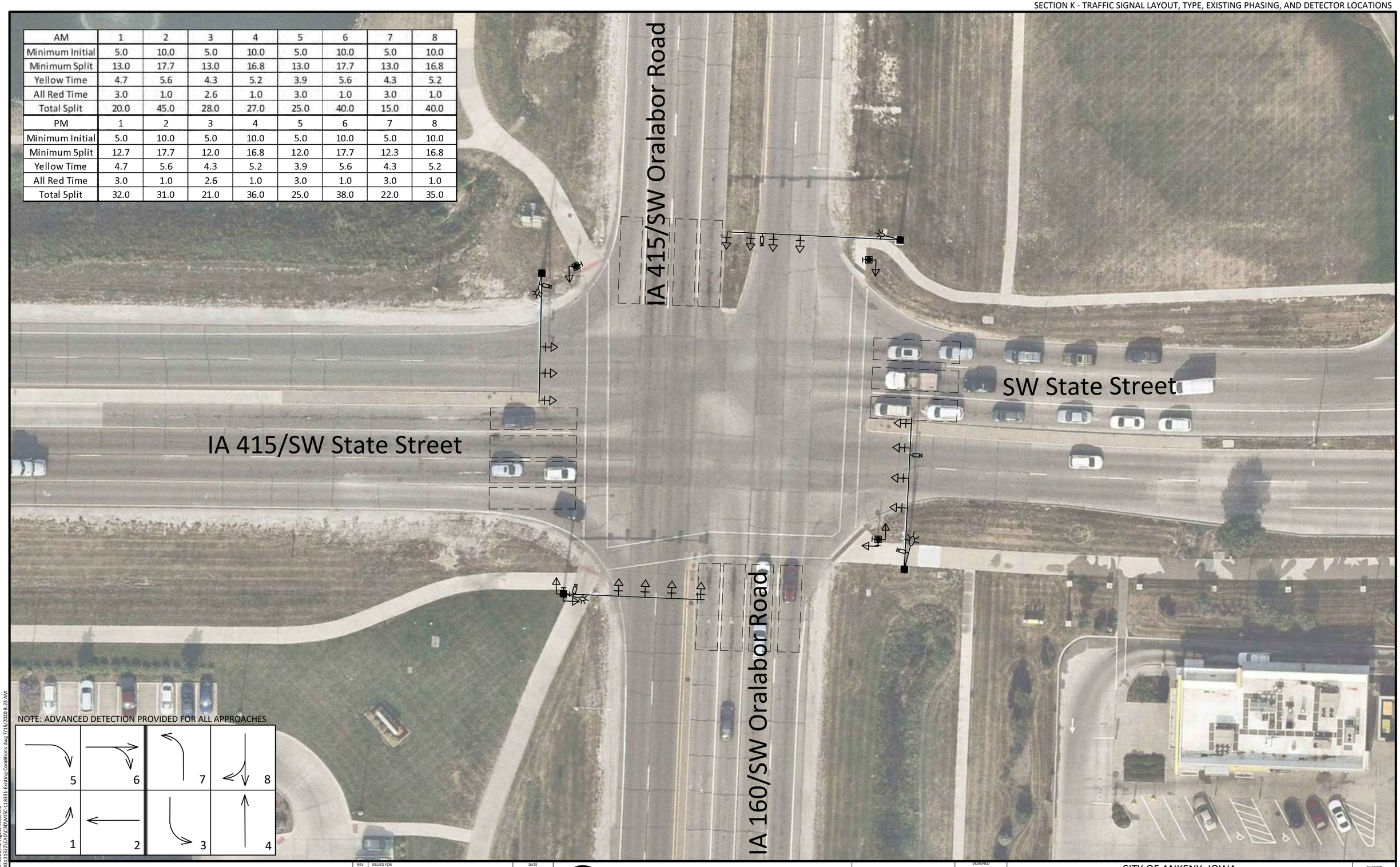
Total Vehicles on Leg 19995			Cars	Heavy	Total
	Vehicles Entering Intersection 10423	**Eastbound**	2	0	**2**
			0	0	**0**
	Vehicles Exiting Intersection 9572		1659	19	**1678**
			5794	112	**5906**
			2774	65	**2839**

Daily Volumes

Cars	Heavy	Total			
2220	50	**2270**	**Westbound**	Vehicles Entering Intersection 11269	Total Vehicles on Leg 22261
5495	116	**5611**			
3314	74	**3388**		Vehicles Exiting Intersection 10992	
0	0	**0**			
7	0	**7**			

Cars	8	0	2730	6753	2230
Heavy	1	0	73	173	86
Total	**9**	**0**	**2803**	**6926**	**2316**
Northbound					
Vehicles Entering Intersection 12045			Vehicles Exiting Intersection 14242		
Total Vehicles On Leg 26287					

AM	1	2	3	4	5	6	7	8
Minimum Initial	5.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split	13.0	17.7	13.0	16.8	13.0	17.7	13.0	16.8
Yellow Time	4.7	5.6	4.3	5.2	3.9	5.6	4.3	5.2
All Red Time	3.0	1.0	2.6	1.0	3.0	1.0	3.0	1.0
Total Split	20.0	45.0	28.0	27.0	25.0	40.0	15.0	40.0
PM	1	2	3	4	5	6	7	8
Minimum Initial	5.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum 5plit	12.7	17.7	12.0	16.8	12.0	17.7	12.3	16.8
Yellow Time	4.7	5.6	4.3	5.2	3.9	5.6	4.3	5.2
All Red Time	3.0	1.0	2.6	1.0	3.0	1.0	3.0	1.0
Total 5plit	32.0	31.0	21.0	36.0	25.0	38.0	22.0	35.0



NOTE: ADVANCED DETECTION PROVIDED FOR ALL APPROACHES

HORZ. SCALE 0 20 40 FEET

REV	ISSUED FOR	DATE

BOLTON & MENK
309 E 5TH STREET, SUITE 202
DES MOINES, IOWA 50309
Phone: (515) 259-9190
Email: DesMoines@bolton-menk.com
www.bolton-menk.com

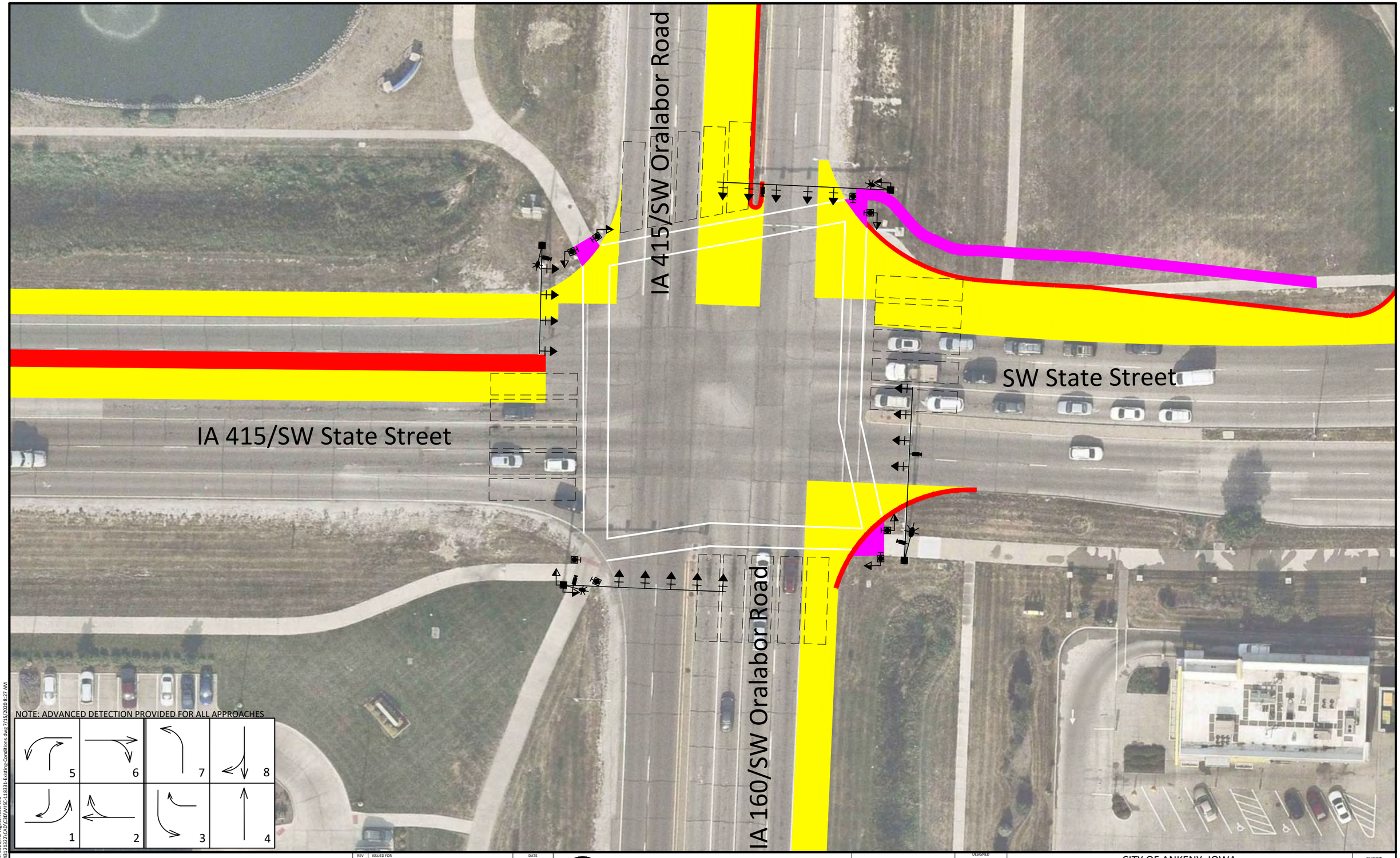
DESIGNED	MW
SEALED	RH
CHECKED	RH
CLIENT PROJ. NO.	T43.121332

CITY OF ANKENY, IOWA

EXISTING INTERSECTION CONDITIONS

SW STATE STREET AND SW ORALABOR ROAD

SHEET 1



NOTE: ADVANCED DETECTION PROVIDED FOR ALL APPROACHES

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SEALED	RH
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CLIENT PROJ. NO.	T43.121332

CITY OF ANKENY, IOWA

PROPOSED INTERSECTION IMPROVMENTS

SW STATE STREET AND SW ORALABOR ROAD

SHEET 1

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: Rob Haaland | Date Prepared: Jun 11, 2020

Intersection: SW State Street at Oralabor Road

Improvement

Proposed Improvement(s): Turn lane improvements and signal replacement

$ 1,798,170	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	29	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 1,798,170**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT | 2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

10,600 (N) | 10,350 (W) | 10,900 (E) | 12,750 (S)

16,279,000 Current Annual Entering Veh., **AEV** = DEV * 365

66,273 veh / day, Final Year DEV, **FDEV**

395.54 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

2.0% Projected Traffic Growth (0%-10%), **G**

44,600 Current Daily Entering Vehicles, **DEV**

Crash Data

2016 First full year --> 2018 Last full year | 3.0 years, Time Period, **T**

0 Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
23	Injury Crashes	7	Minor Injuries @	$65,000	$ 455,000
		16	Possible Injuries @	$35,000	$ 560,000
56	Property Damage Only		(assumed cost per crash)	$7,400	$ 584,600
			-OR- enter all Property Costs of all crashes:		
79	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,599,600

26.33	Current Crashes / Year, **AA** = TA / T	**1.62**	Crashes / MEV, Crash Rate, **CR**
$ 20,248	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
639.8	Total Expected Crashes, **TECR** = CR x TMEV	**$ 2,488,220**	Present Value of Avoided
7.64	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 154,628	Crash Costs Avoided in First Year, AAR x AVC		
185.6	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $2,488,220 : $1,798,170 = **1.38** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/27/2020

Location / Title of Project: US Highway 67 & 7th Ave Roundabout

Applicant: City of Camanche

Contact Person: Andrew Kida Title: City Administrator

Complete Mailing Address: 887 7th Avenue
Camanche, Iowa 52730

Phone: 563-259-8342 (Area Code) E-Mail: akida@camancheia.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): Iowa Department of Transportation District 6

Contact Person: Sam Shea Title: District Planner

Complete Mailing Address: 5455 Kirkwood Blvd. S.W.
Cedar Rapids, IA 52404

Phone: 319-364-0235 (Area Code) E-Mail: sam.shea@iowadot.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 896,400
Total Project Cost	$ 896,400
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 A TEAP study was completed in July 30, 2019
☐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 Camanche

Signed: Andrew S. Kida — 8/6/2020
Signature — Date Signed

Andrew S. Kida
Printed Name

Attest: Toni L Schneider — 08/06/2020
Signature — Date Signed

Toni L. Schneider
Printed Name

2

A. Resolution

RESOLUTION NO. 20-44

RESOLUTION AUTHORIZING THE FILING OF A GRANT APPLICATION WITH THE IOWA DEPARTMENT OF TRANSPORTATION FOR TRAFFIC SAFETY IMPROVEMENTS FUNDING FOR US HIGHWAY 67 & 7TH AVE ROUNDABOUT

Whereas, replacing the current intersection with a single lane entry roundabout improve traffic flow by allowing continuous flow traffic to enter the intersection; and

Whereas, the City of Camanche has determined that improvements to this intersection, as recommended by the Traffic and Safety Traffic Engineering Assistance Program Study, will improve traffic flow; and

Whereas, the City of Camanche is seeking the necessary funding for project implementation, and upon completion, in cooperation with the Iowa Department of Transportation, be responsible for adequately maintaining and operating the project for public use during the project's useful life.

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

Section 1. The City files this grant application for funds through the Traffic Safety Improvement Program to fund Highway 67 & 7th Ave Roundabout.

Passed, approved and adopted this 4th day of August 2020

Paul Varner, Mayor Pro Tem

Attest:

Toni L. Schneider, Clerk

B. Narrative

Existing Conditions

US Highway 67 is a two-lane principal arterial roadway that runs east to west through the study area. To the west, it turns southwest to follow the Mississippi River, and continues south to Davenport before crossing south into Illinois. To the east, it comes to a T-intersection and continues north from that intersection to Clinton before ending at US Highway 52 near Sabula, Iowa. The posted speed limit on this road in the study area is 55 mph for both directions.

The 7th Avenue segment is a two-lane minor arterial roadway that runs north to south through the study area. The road provides access to several industrial businesses north of US Highway 67 in Camanche. According to local officials, this road is often used as a commuter route between Camanche and US Highway 30 to Clinton. The posted speed limit on the north leg of the intersection is 35 mph, and the posted speed limit on the south leg is 25 mph.

US Highway 67 & 7th Avenue Intersection

The intersection of US Highway 67 & 7th Avenue is a four-leg at-grade intersection with stop control on 7th Avenue. Land use near the study intersection is generally residential south of US Highway 67, and industrial to the north. Approximately one half mile to the north of the intersection is an at-grade railroad crossing with 7th Avenue.

The cross section of US Highway 67 in the immediate vicinity of the study intersection contains one approximately 12-foot travel lane in each direction, and one 12-foot right turn lane. The right turn lanes measure approximately 250 feet in length, with 125 feet of taper length. Paved shoulders exist on the east and west legs measuring approximately 6-feet wide.

The north leg of 7th Avenue, in the immediate vicinity of the study intersection, provides an approximately 22-foot cross section, containing one approximately 11-foot travel lane in each direction. The north leg widens near the intersection to accommodate truck turning movements. Unpaved shoulders are provided along both sides of the north leg with a width of approximately 5 feet. The south leg of 7th Avenue, in the immediate vicinity of the study intersection, provides an approximately 40-foot cross section, containing one approximately 12-foot travel lane in each direction with curb and gutter.

On street parking is permitted south of the intersection but prohibited within 175 feet of the intersection. Street lights are placed in the southwest and northeast corners of the intersection. Stop lines are provided for both northbound and southbound approaches. The northbound and southbound stop lines are located approximately 17 feet away from the edge of the thru lanes of US Highway 67.

A Stop Ahead (W3-1, MUTCD) sign is provided for the northbound approach approximately 325 feet from the northbound stop line. An assembly consisting of a flashing LED STOP Sign (R1-1 MUTCD) and Cross Traffic Does Not Stop Plaque (W4-4P, MUTCD) is located at the northbound and southbound 7th Avenue approaches. Additional signs located within the study intersection area include guide signs on the eastbound and westbound Highway 67 approaches, approximately 540 feet from the intersection.

Roundabout Reconfiguration

With the goal of providing improved traffic safety at the study intersection, alternate intersection designs were investigated. An alternative to the existing intersection geometry at US Highway 67 & 7th Avenue includes replacing the current intersection with a single lane entry roundabout.

Roundabouts improve traffic flow by allowing continuous flow traffic to enter the intersection. At a roundabout, all entering vehicles yield to traffic circulating the roundabout. Although each entering vehicle is required to slow down, the time stopped while waiting is significantly reduced.

Roundabouts improve safety by reducing the number of conflict points between vehicle paths. Roundabouts have been shown to reduce crashes when compared to previously stop controlled or signalized intersections. The reduction in crashes is accomplished by eliminating severe crash types including headon crashes, right-angle "broadside" crashes and left turning crashes. The roundabout concept would most likely require a complete reconstruction of the intersection, resulting in higher construction costs and increased complexity of construction staging/maintenance of traffic. Existing vertical grades at the intersection must be regraded to provide adequate approach profiles at each intersection leg and maximize visibility of the central island and curbs. Visibility and awareness are especially important with roundabouts located on roadways where approach speeds are high and driver expectations of speed interruptions are low. Furthermore, the geometric footprint of the roundabout may potentially cause right-of-way and access impacts to the residential properties located in the southwest and southeast quadrants of the intersection that require additional measures to address.

A conceptual single lane roundabout design was prepared to provide context of the roundabout geometry and its effects on nearby land uses and can be seen in Figure 4. The exhibit was created utilizing an AASHTO WB-67 size interstate semitrailer AutoTurn turning path movement traveling through the roundabout. It should be noted that the utilized semi-truck design vehicle would need to encroach onto the truck apron in order to complete several of the left-turn movements through the roundabout. The roundabout concept has an inscribed circle diameter of 100'; however, the overall pavement limits are wider in each quadrant due to the entrance angles of the intersection approaches.

Capacity analysis of the roundabout (RAB) condition as well as the existing Two-Way Stop Control (TWSC) condition was conducted using HCS 7.5 and the results are provided in Table 1

Table 1. RAB Capacity Analysis Result Comparison

Peak Hours	Measures of Effectiveness	AM		MD		PM	
		Delay (sec)	Level of Service	Delay (sec)	Level of Service	Delay (sec)	Level of Service
EB	TWSC	3.1	A	2.9	A	2.8	A
	Full RAB	5.2	A	5.2	A	5.9	A
WB	TWSC	2.2	A	2.6	A	2.6	A
	Full RAB	5.1	A	5.1	A	5.4	A
NB	TWSC	16.4	C	13.7	B	19.8	C
	Full RAB	5.0	A	4.3	A	5.1	A
SB	TWSC	13.8	B	14.0	B	19.1	C
	Full RAB	4.3	A	4.9	A	5.1	A
Overall	TWSC	16.4	C	14.0	B	19.1	C
	Full RAB	5.0	A	5.0	A	5.4	A

From the capacity analysis results shown in Table 1, it can be seen that the roundabout design delivered the better performance for this intersection, as all approaches are operating at a LOS A during all pea hours. lthough each entering vehicle is reu ired to reduce speeds, the dela times are significantly reduced. uring non-pea hours, vehicles will lie ly be able to pass through the roundabout at a slower speed but without stopping.

C. ITEMIZED BREAKDOWN OF ALL COSTS

US Highway 67 and 7th Street Improvements
Opinion of Probable Project Costs
TSIP Application - 7/31/2020

ITEM NO.	ITEM	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL PRICE
1	Excavation, Class 10	CY	$ 7.00	3,500.0	$ 24,500
2	Modified Subbase	SY	$ 10.00	5,500.0	$ 55,000
3	Topsoil, Strip, Salvage and Respread	CY	$ 8.00	2,500.0	$ 20,000
4	Storm Sewer RCP	LF	$ 110.00	350.0	$ 38,500
5	Storm Sewer Intake, SW-510	EA	$ 6,500.00	4.0	$ 26,000
6	Storm Sewer Manhole, SW-501	EA	$ 4,000.00	2.0	$ 8,000
7	Flared End Section	EA	$ 1,500.00	4.0	$ 6,000
8	Removal of Pavement	SY	$ 7.00	4,500.0	$ 31,500
9	PCC Pavement, 10"	SY	$ 65.00	5,500.0	$ 357,500
11	Truck Apron, Colored	SY	$ 105.00	400.0	$ 42,000
12	Pavement Markings	LS	$ 8,000.00	1.0	$ 8,000
13	Mobilization	LS	$ 50,000.00	1.0	$ 50,000
14	Traffic Control	LS	$ 35,000.00	1.0	$ 20,000
15	Lighting	LS	$ 30,000.00	1.0	$ 30,000
16	Construction Survey	LS	$ 15,000.00	1.0	$ 15,000
17	Restoration	LS	$ 8,500.00	1.0	$ 8,500
18	Erosion Control	LS	$ 6,500.00	1.0	$ 6,500

CONSTRUCTION SUBTOTAL	$747,000
CONTINGENCY (20%)	$149,400
TOTAL	**$896,400**

D. TIME SCHEDULE

Description	Date
Grant Application	August 2020
Notice of Funding	December 2020
Approval of Agreement	July 2021
Construction Plan Preparation	December 2020-April 2021
Plans Approval	May 2021
Advertise for Bids	June 2021
Open Bid & Award Contract	August 2021
Notice to Proceed	September 2021
Construction	October 2021 – November 2022
Project Closeout	December 2022

E. MAP

The intersection of i ghwa 67 7th venue is located in the i ty of manche, within l inton Count , o wa. The intersection location and surrounding area is shown in Figure 1.

Figure 1. Project Location Map

F. COLOR PICTURES

Figure 2 depicts the STOP control features at the study intersection.

Figure 2. North Bound 7th Avenue Approach Leg Traffic Control Features

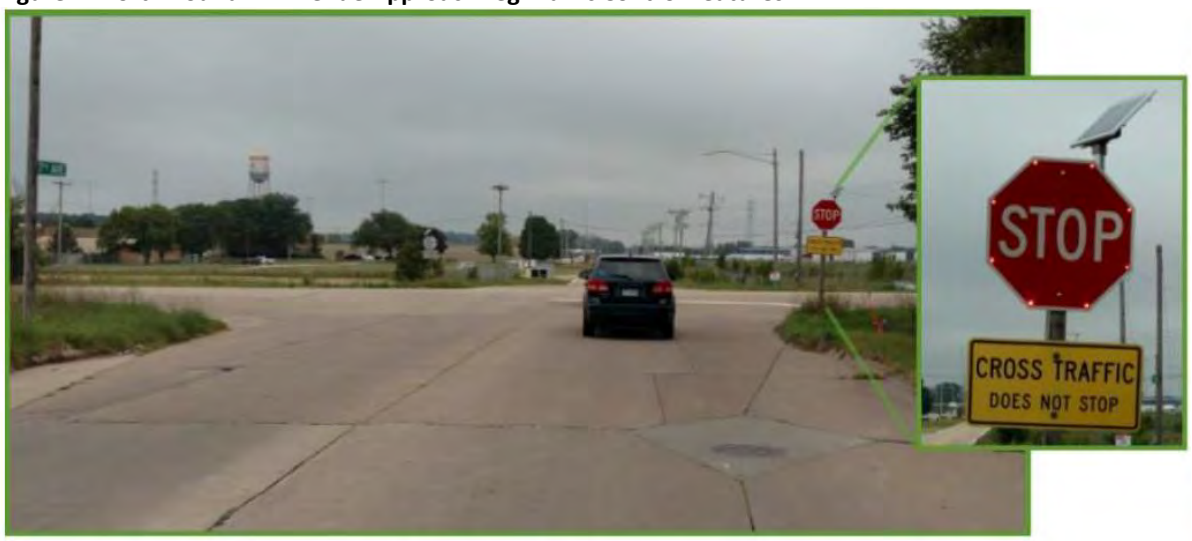
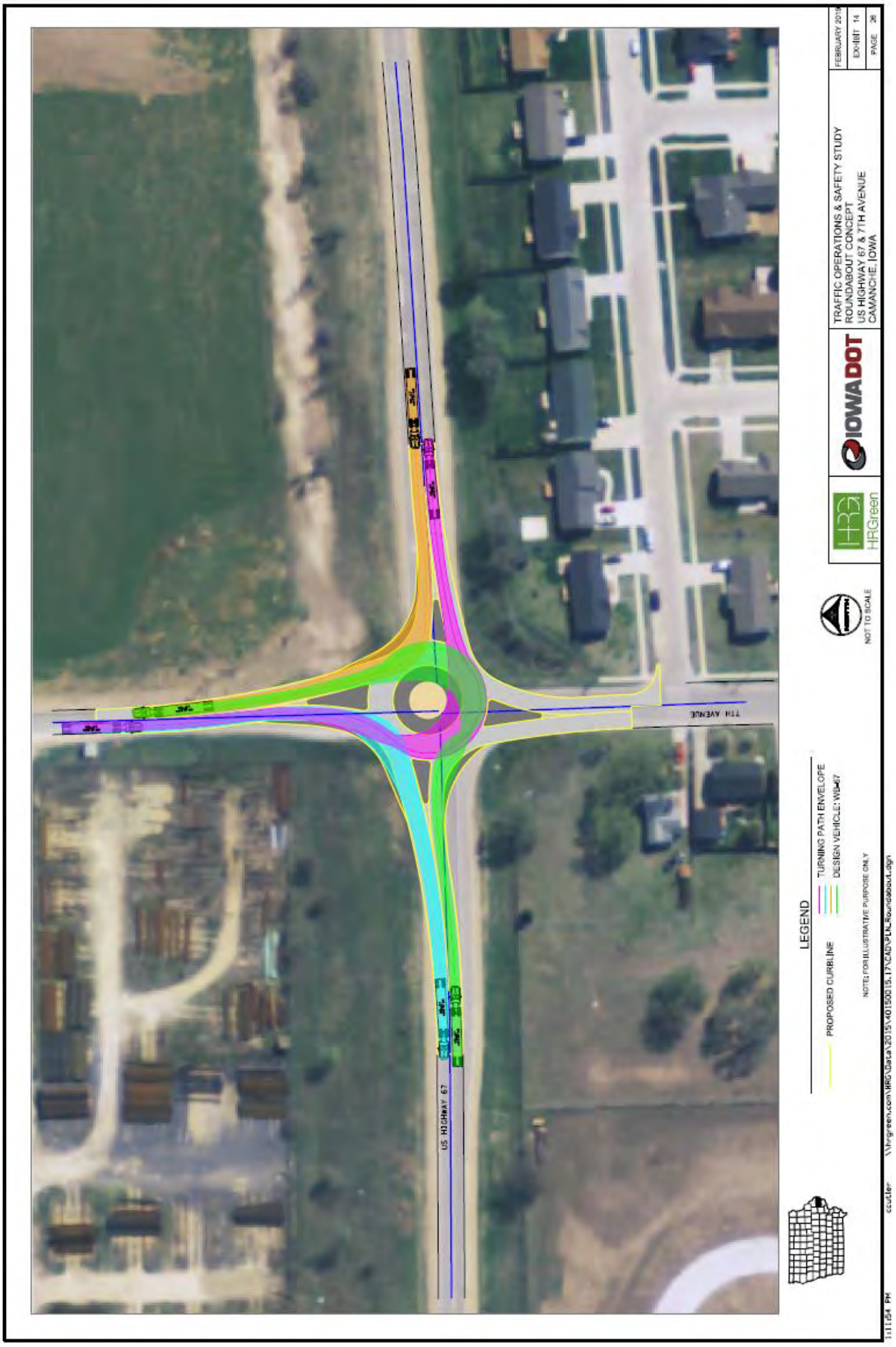


Figure 3 illustrates the view from each approach leg at the study intersection.

Figure 3. US Highway 67 and 7th Avenue Intersection Approach Legs

G. PLAN VIEW

Figure 4. Roundabout Concept



H. AERIAL PHOTOGRAPH

Figure 5. Intersection Aerial Photograph

I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	15
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	6
Possible/Unknown Injury Crash	3
Property Damage Only	6

Injury Status Summary	20
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	6
Possible (complaint of pain/injury)	14
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	166,000.00
Average (per crash dollars):	11,066.67
Total Vehicles:	30.00
Average (per crash):	2.00
Total Occupants:	68.00
Average (per crash):	4.53

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	1.33
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.40
Possible/Unknown Injuries/Crash:	0.93

I. ICAT Summary of Motor Vehicle Accidents

Major Cause			14
Animal	0	Ran traffic signal	0
Ran stop sign	3	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	5	FTYROW: From yield sign	0
FTYROW: Making left turn	3	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	1
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	1	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Monday	0	0	0	0	0	0	1	0	1	1	0	0	0	3
Tuesday	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Wednesday	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Thursday	0	0	0	0	0	0	1	1	1	0	0	0	0	3
Friday	0	0	0	0	0	0	0	1	0	0	0	1	0	2
Saturday	0	0	0	0	0	0	1	0	1	0	1	0	0	3
Total	0	0	0	0	0	0	3	3	4	3	1	1	0	15

Manner of Crash Collision	**15**
Non-collision (single vehicle)	1
Head-on (front to front)	1
Rear-end (front to rear)	2
Angle, oncoming left turn	2
Broadside (front to side)	6
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	2
Unknown	0

Surface Conditions	**15**
Dry	12
Wet	1
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	1
Unknown	1

Fixed Object Struck			**30**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	1	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	29

I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0
= 16	0	1	0	0	1
= 17	1	0	0	0	1
= 18	0	1	0	0	1
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	1	0	0	1
>= 25 and <= 29	2	0	0	0	2
>= 30 and <= 34	2	0	0	0	2
>= 35 and <= 39	6	1	0	0	7
>= 40 and <= 44	0	1	0	0	1
>= 45 and <= 49	0	4	0	0	4
>= 50 and <= 54	2	0	0	0	2
>= 55 and <= 59	0	3	0	0	3
>= 60 and <= 64	0	2	0	0	2
>= 65 and <= 69	0	1	0	0	1
>= 70 and <= 74	1	0	0	0	1
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	1	0	0	0	1
>= 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	15	15	0	0	30

Drug/Alcohol Related	**15**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	15

Alcohol Test Given	**30**
None	30
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	**30**
None	30
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	**30**
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	30
Other	0

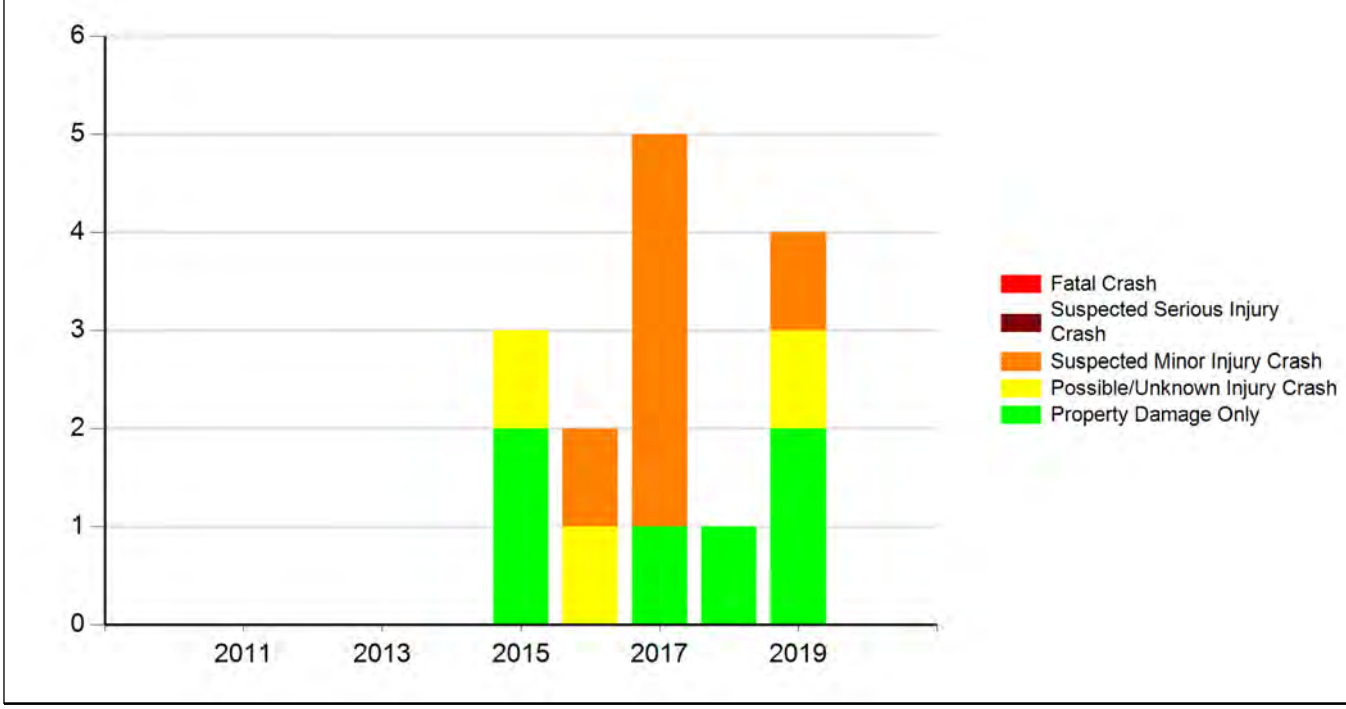
I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	2	3
2016	0	0	1	1	0	2
2017	0	0	4	0	1	5
2018	0	0	0	0	1	1
2019	0	0	1	1	2	4
2020	0	0	0	0	0	0
Total	0	0	6	3	6	15

Severity/Year



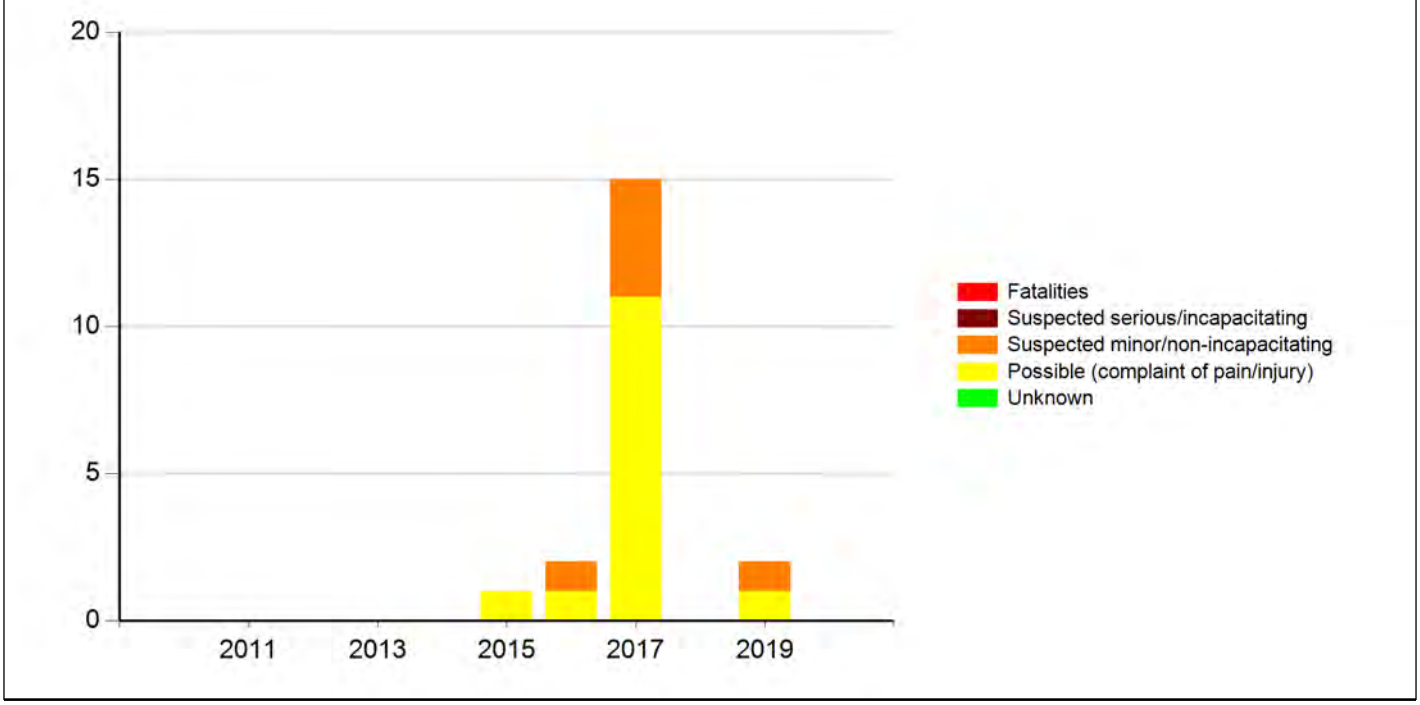
I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	0	1
2016	0	0	1	1	0	2
2017	0	0	4	11	0	15
2018	0	0	0	0	0	0
2019	0	0	1	1	0	2
2020	0	0	0	0	0	0
Total	0	0	6	14	0	20

Injury Status/Year



I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Quick Report
2015-2019

Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

L. Benefit/Cost Ratio

Cmfclearinghouse.org listed several CRFs for conversion of a stop controlled intersection to a roundabout. C v alues for all crashes in an urban area ranged from 4. 9 to 72. To account for the wide range in values, staff averaged three CRF values that had a quality rating of 3 stars or higher. The average CRF that was use in the nn efit/Cost wor sheet came to came to 52.96.

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Clinton | Prepared by: ECIA | Date Prepared: Jul 24, 2020

Intersection: US Highway 67 and 7th Avenue

Improvement

Proposed Improvement(s): Reconfigure intersection with roundabout

$ 896,400	Estimated Improvement Cost, **EC**	30	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	53	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 896,400	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Flow Map of Camanche 2018 AADT | 2018 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

1,620 / 2,130 / 2,130 / 1,620

2,737,500 Current Annual Entering Veh., **AEV** = DEV * 365

130,871 veh / day, Final Year DEV, **FDEV**

450.30 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

10.0% Projected Traffic Growth (0%-10%), **G**

7,500 Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year — 5.0 years, Time Period, **T**

0 Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
9	Injury Crashes	6	Minor Injuries @	$85,000	$ 390,000
		3	Possible Injuries @	$35,000	$ 105,000
6	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 166,000
15	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 661,000

3.00	Current Crashes / Year, **AA** = TA / T	1.10	Crashes / MEV, Crash Rate, **CR**
$ 44,067	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
493.5	Total Expected Crashes, **TECR** = CR x TMEV	$ 5,110,930	Present Value of Avoided
1.59	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 70,013	Crash Costs Avoided in First Year, AAR x AVC		
261.3	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $5,110,930 : $896,400 = 5.70 : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** April 28, 2020

Location / Title of Project: Greenhill Road / South Main Street Reconstruction

Applicant: City of Cedar Falls

Contact Person: Jon Fitch Title: Principal Engineer

Complete Mailing Address: 220 Clay Street
Cedar Falls, IA 50613

Phone: (319) 268-5165 (Area Code) E-Mail: Jon.Fitch@cedarfalls.com

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

Co-Applicant(s): _____

Contact Person: _____ Title: _____

Complete Mailing Address: _____

_____

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 948,700
Total Project Cost	$ 2,474,000
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 Project was identified in 2018 corridor traffic study as an immediate need.

☐ 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 Cedar Falls

Signed: _____ 5/5/2020
Signature Date Signed

Robert M. Green, Mayor
Printed Name

Attest: _____ 5/5/2020
Signature Date Signed

Jacque Danielsen
Printed Name

RESOLUTION NO. 21,954

RESOLUTION APPROVING AND AUTHORIZING SUBMISSION OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDS FOR THE GREENHILL ROAD AND SOUTH MAIN STREET INTERSECTION IMPROVEMENTS TO RECONSTRUCT THE SIGNAL CONTROLLED INTERSECTION TO A ROUNDABOUT

WHEREAS, the Iowa Department of Transportation has established the TSIP and provides funding for locations where vehicular safety is a concern and documented; and

WHEREAS, said program allows for funding to be provided to local jurisdictions for eligible transportation projects or programs that will improve traffic safety at a specific site or corridor with a crash history; and

WHEREAS, the City of Cedar Falls has determined that by reconstructing the intersection of Greenhill Road and South Main Street as a roundabout will help reduce crashes, thus improving safety and operations.

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

1. The City Council supports and approves the attached application for TSIP funding.
2. The City Council hereby commits the additional City funds necessary for construction of the project beyond any TSIP funding.
3. The 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 4th day of May, 2020.

Robert M. Green, Mayor

ATTEST:

Jacqueline Danielsen, City Clerk

Background

Greenhill Road, a primary east/west corridor in Cedar Falls has been a focus of the City's due to the development and increase in traffic demands. In 2017 the City of Cedar Falls commissioned a corridor study for Greenhill Road to evaluate the current and future traffic demands for all modes of transportation. The study concluded that over the next 25 years there is a potential for 60 – 80% growth in traffic volumes. Figure 1 and 2 below show the development that has occurred from 2010 through 2019. In 2017 the Iowa DOT collected Annual Average Daily Traffic (AADT) within the project corridor of 10,200 vehicles. See **Exhibit H** for existing conditions.

Figure 1 – 2010 Google Image - Cedar Falls

Figure 2 – 2019 Iowa Geo Map - Cedar Falls

Greenhill Road currently has four lanes with a width of 52 feet from back-of-curb to back-of-curb and a posted speed limit of 45 mph. These are two factors that have led to many of the crashes. Other safety related factors between these two intersections include:

- Traveling WB on Greenhill approaching S. Main Street the inside through lane is terminated to create a WB left turn lane with the second through lane re-established west of the intersection.
- The NB through lane on S Main Street is offset through the intersection with Greenhill Road.

This corridor serves as a major route for multi-modal transportation uses, connecting multiple trails on the south side of Cedar Falls. There is a 10' shared use trail on both sides of Greenhill Road in this area.

Crash History

Crash history for this intersection was collected from the Iowa DOT Crash Analysis Tool (ICAT) software and was evaluated from 2015 to 2019 to identify trends and safety issues with the current intersection geometries. Over the last 5 years there has been an average of nearly 6 crashes per year with 5 minor injuries and 7 possible injuries. Further analysis of the data showed that there has been a steady increase in the number and severity of crashes year over year. From 2009 through 2014 there was one minor injury reported with an average of 1 to 2 crashes per year. Starting in 2015 that number has increased and in 2019 there were 8 crashes with three of them reporting minor injuries. This section of the corridor

needs improvements to mitigate this rising trend in crashes and severity. Refer to **Exhibit I** for crash history summaries.

Proposed Improvements

The City of Cedar Falls has begun implementing the improvements that were outlined in the 2018 corridor study in preparation for the growth and development that is forecasted for this area. This year a dual-lane roundabout will be constructed at the intersection of Greenhill Road and Cedar Heights Drive, approximately two miles east of S. Main Street. As part of this safety application, the City is proposing to construct a dual-lane roundabout at the intersection of Greenhill Road and S Main Street, which also follows the recommendation of the 2018 corridor study. The roundabout will:

- Serve to reduce speeds and the number of crashes.
- Provide safer pedestrian crossings of Greenhill Road. Additional street lighting will be included to illuminate the approaches and pedestrian crossings.
- Continue the similar intersection type along the corridor.
- Will aid in providing acceptable gaps in traffic.

Refer to **Exhibit G** for the planned proposed improvements.

Public Support

This corridor has been studied and analyzed over the last five years and the public has been involved throughout the entire process. Roundabouts were identified as the preferred method of intersection control for the corridor and approved by the city council. Throughout the remainder of the design process the public will continue to have input on the design and impacts through stakeholder meetings and public outreach meetings.

Proposed Public Improvements -Greenhill Road Corridor
South Main Street to Coneflower Parkway
Cedar Falls, Iowa
Engineer's Rough Order Magnitude of Cost
Estimate of Quantities - April 24, 2020

Item No	Description	Unit	Unit Price	TSIP Eligible Quantity	TSIP Eligible Cost	Non-TSIP Eligible Quantity	Non-TSIP Eligible Cost	Total Cost
1	Excavation, Class 10	CY	$ 5			10,500	$ 52,500	$ 52,500.00
2	Subgrade Preparation	SY	$ 3			15,200	$ 45,600	$ 45,600.00
3	Modified Subbase	CY	$ 7	15,200	$ 106,400			$ 106,400.00
4	Topsoil, Strip, Salvage and Respread	CY	$ 8			3,500	$ 28,000	$ 28,000.00
5	Remove Existing Intake	EA	$ 900			6	$ 5,400	$ 5,400.00
6	Remove Existing Manhole	EA	$ 900			1	$ 900	$ 900.00
7	Remove Storm Sewer	LF	$ 25			540	$ 13,500	$ 13,500.00
8	Storm Sewer RCP	LF	$ 90			1,240	$ 111,600	$ 111,600.00
9	Storm Sewer Intake, SW-510	EA	$ 6,500			8	$ 52,000	$ 52,000.00
10	Storm Sewer Manhole, SW-501	EA	$ 4,000			2	$ 8,000	$ 8,000.00
11	Removal of Pavement	SY	$ 8			9,600	$ 76,800	$ 76,800.00
12	PCC Pavement, 10"	SY	$ 70	10,300	$ 721,000			$ 721,000.00
13	Concrete Median, Colored	SY	$ 90			1,405	$ 126,450	$ 126,450.00
14	Truck Apron, Colored	SY	$ 90	570	$ 51,300			$ 51,300.00
15	Pavement Markings	LS	$ 10,000	1	$ 10,000			$ 10,000.00
16	Removal of Sidewalk	SY	$ 10			2,200	$ 22,000	$ 22,000.00
17	PCC Sidewalk, 5"	SY	$ 45			2,450	$ 110,250	$ 110,250.00
18	Detectable Warnings	SF	$ 45			340	$ 15,300	$ 15,300.00
19	Removal and Replacement of Wood Fence	LF	$ 60			1,200	$ 72,000	$ 72,000.00
20	Retainig Wall	LF	$ 45			2,000	$ 90,000	$ 90,000.00
21	Mobilization		$ 130,000			1	$ 130,000	$ 130,000.00
22	Traffic Control	LS	$ 50,000			1	$ 50,000	$ 50,000.00
23	Traffic Signal Removal	LF	$ 30,000			1	$ 30,000	$ 30,000.00
24	Lighting	LS	$ 60,000	1	$ 60,000			$ 60,000.00
25	Construction Survey	LS	$ 25,000			1	$ 25,000	$ 25,000.00
26	Landscaping / Restoration	LS	$ 45,000			1	$ 45,000	$ 45,000.00
27	Erosion Control	LS	$ 15,000			1	$ 15,000	$ 15,000.00
28	Utility Relocation	LS	$ 400,000			1	$ 400,000	$ 400,000.00
			SubTotal		$ 948,700.00		$ 1,525,300.00	

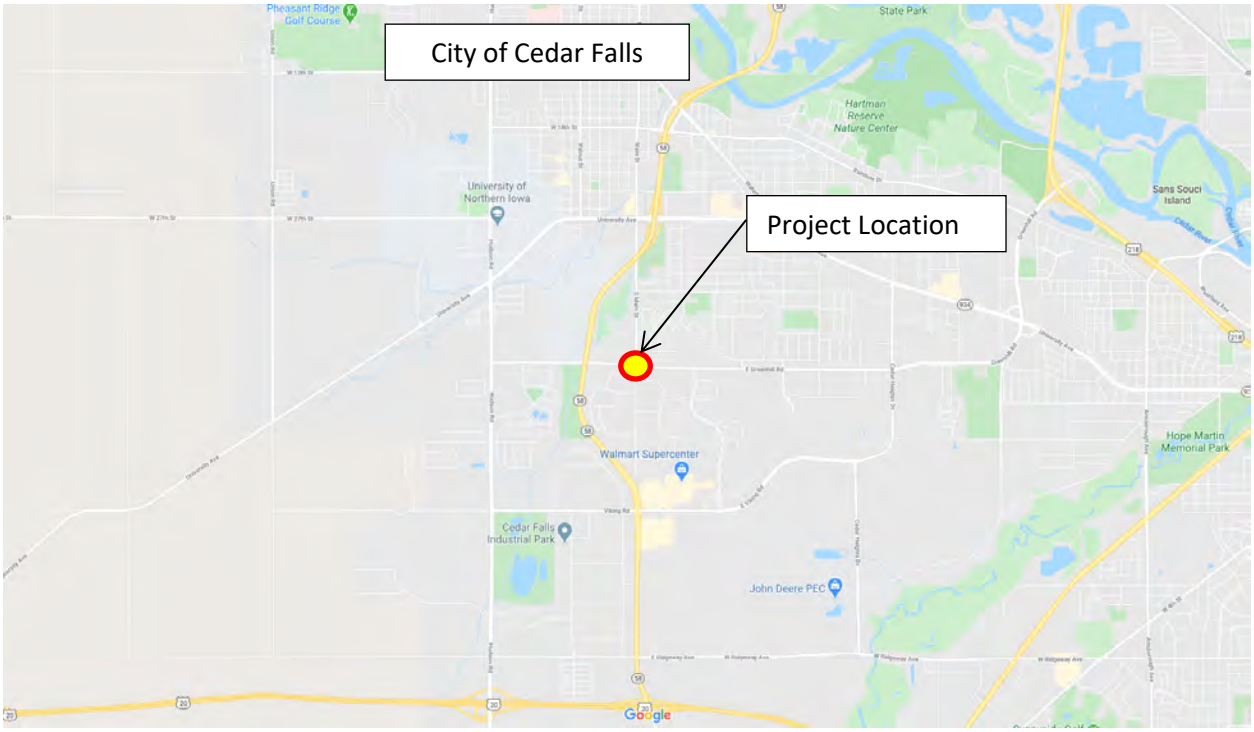
Rough Order of Magnitude Construction Cost $ 2,474,000.00

D. Timeline Schedule

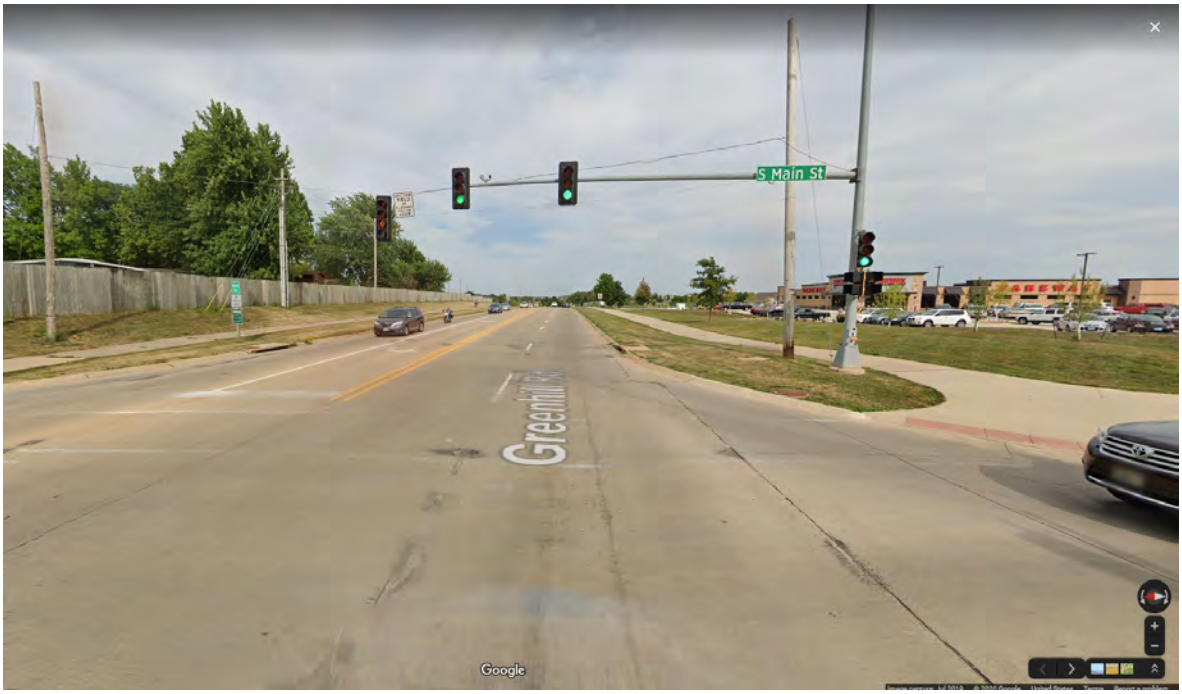
Improvements to the intersection of E Greenhill Road and S Main Street, are to be funded through Traffic Safety Improvement Funds. The schedule proposed for the safety improvements is as follows:

- **May 2020** – Submit for 2021 TSIP Funds
- **April 2020 – December 2020** – Proceed with the design of improvements
- **December 2020** – TSIP funds are awarded
- **February 2021** – Let corridor improvement project
- **April/May 2021** – Construction begins
- **July 2021** – TSIP funds are available for the corridor improvements
- **October 2021** – Construction complete

E. Project Location



Looking West from South Main Street (EB Approach)*



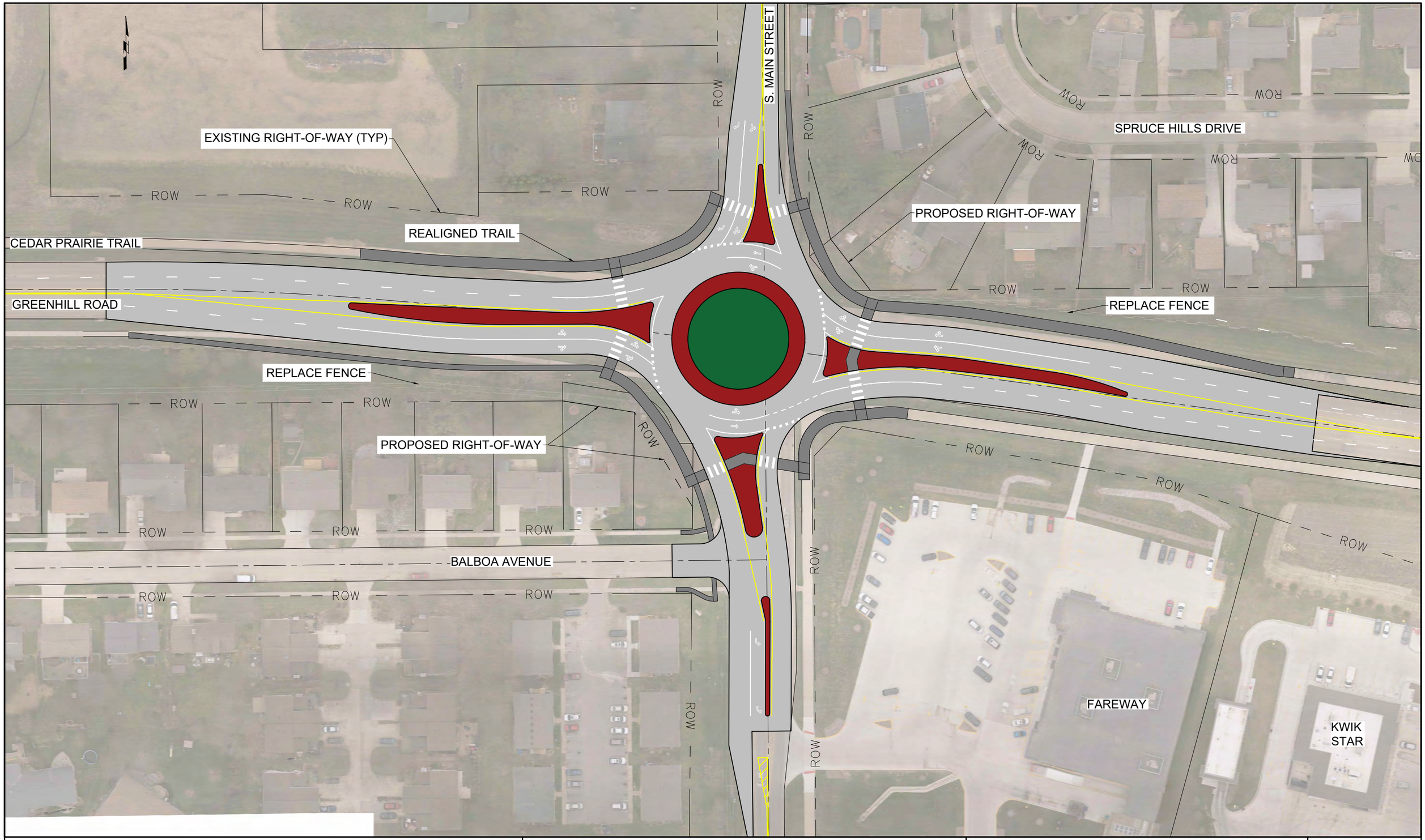
Looking East from South Main Street (WB Approach)*

*Source: Google®

Looking South from East Greenhill Road (NB Approach)*

Looking North from East Greenhill Road (SB Approach)*

*Source: Google®



SHIVEHATTERY
ARCHITECTURE + ENGINEERING

GREENHILL ROAD IMPROVEMENTS
FROM S MAIN STREET TO CONEFLOWER PKWY
CEDAR FALLS, IOWA
04/28/2020

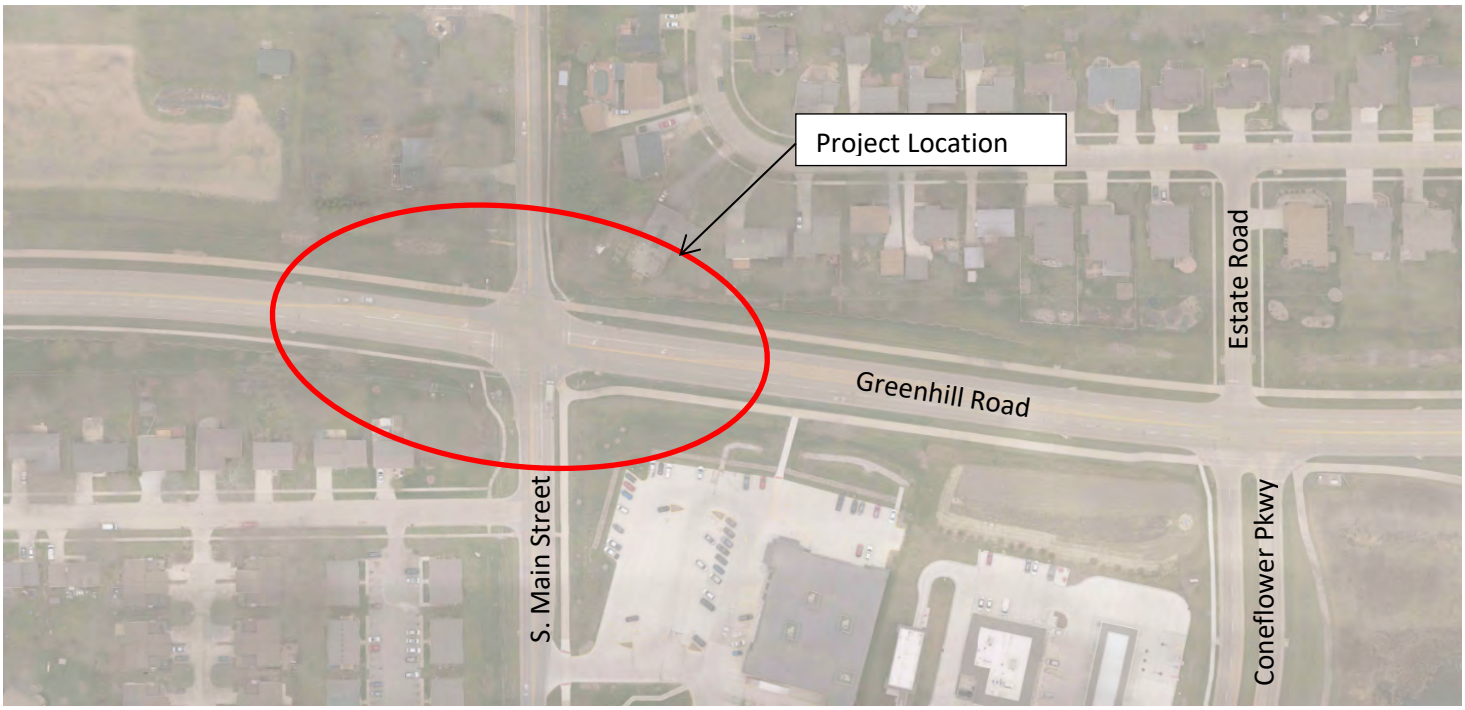
CORRIDOR IMPROVEMENTS CONCEPT

TWO LANE ROUNDABOUT

SCALE
0 10 20 40
SCALE IN FEET

EXHIBIT: G

H. Aerial Photograph



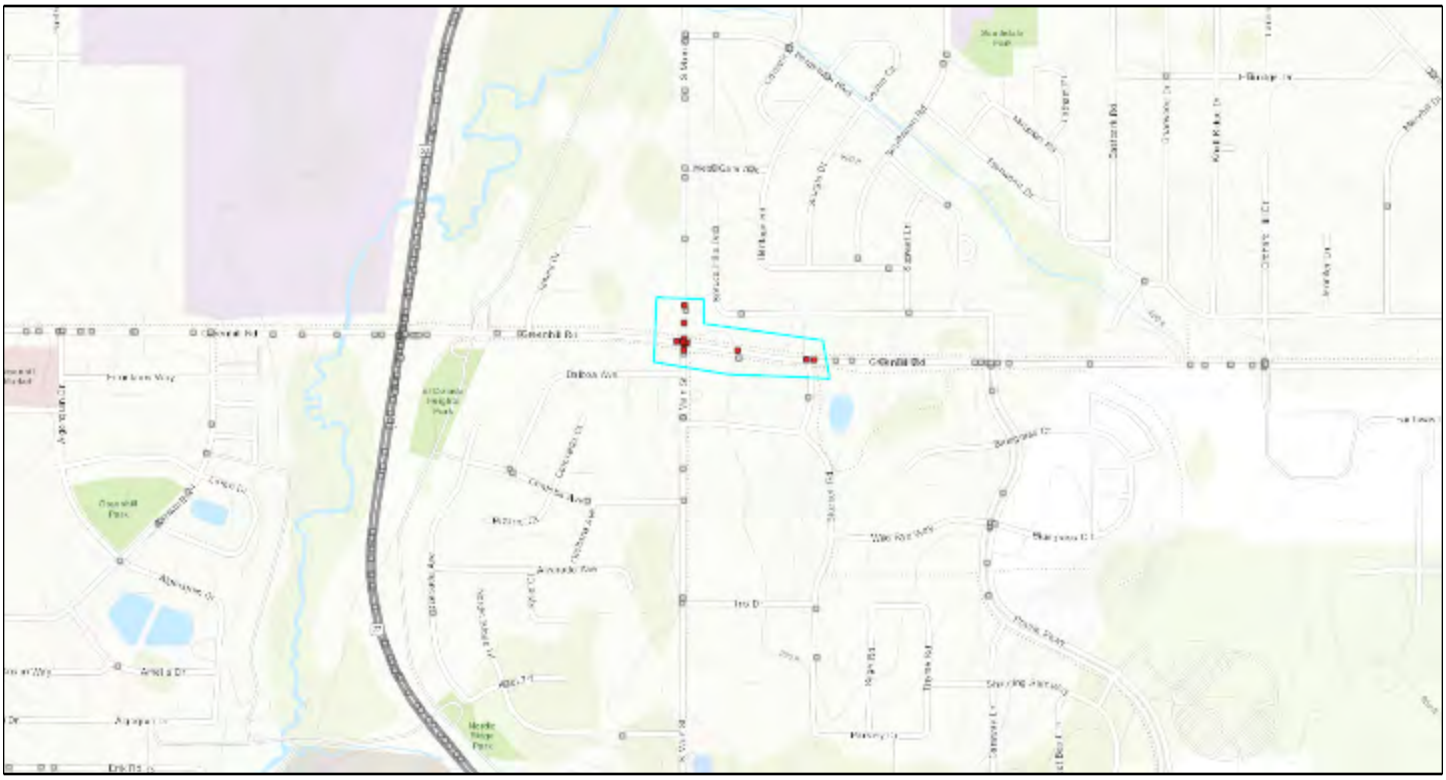
Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	23
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	5
Possible/Unknown Injury Crash	6
Property Damage Only	12

Injury Status Summary	12
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	5
Possible (complaint of pain/injury)	7
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	108,500.00
Average (per crash dollars):	4,717.39
Total Vehicles:	48.00
Average (per crash):	2.09
Total Occupants:	63.00
Average (per crash):	2.74

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.52
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.22
Possible/Unknown Injuries/Crash:	0.30



Iowa Crash Analysis Tool
Quick Report
2015-2019

Major Cause			**23**
Animal	0	Ran traffic signal	1
Ran stop sign	1	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	5	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)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	4
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...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	1
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	2	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	1	Swerving/Evasive Action	0
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	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	4
Unknown	1	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0	0	2	1	0	0	0	0	0	3
Monday	0	0	0	0	0	1	0	1	2	2	0	0	0	6
Tuesday	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Wednesday	0	0	0	0	0	2	0	0	1	0	0	0	0	3
Thursday	0	0	0	0	0	0	0	2	0	1	0	0	0	3
Friday	0	0	0	0	0	0	2	2	1	0	1	0	0	6
Saturday	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	4	5	6	4	3	1	0	0	23

Manner of Crash Collision	**23**
Non-collision (single vehicle)	1
Head-on (front to front)	1
Rear-end (front to rear)	12
Angle, oncoming left turn	5
Broadside (front to side)	3
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	**23**
Dry	20
Wet	2
Ice/frost	0
Snow	0
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			**48**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	48

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	1	1	0	0	2
= 17	2	0	0	0	2
= 18	0	0	0	0	0
= 19	1	0	0	0	1
= 20	1	0	0	0	1
>= 21 and <= 24	5	0	0	0	5
>= 25 and <= 29	2	0	0	0	2
>= 30 and <= 34	3	1	0	0	4
>= 35 and <= 39	1	2	0	0	3
>= 40 and <= 44	1	5	0	0	6
>= 45 and <= 49	0	2	0	0	2
>= 50 and <= 54	2	1	0	0	3
>= 55 and <= 59	5	0	0	0	5
>= 60 and <= 64	2	2	0	0	4
>= 65 and <= 69	2	0	0	0	2
>= 70 and <= 74	0	2	0	0	2
>= 75 and <= 79	2	0	0	0	2
>= 80 and <= 84	1	0	0	0	1
>= 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	32	16	0	0	48

Drug/Alcohol Related	**23**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	23

Alcohol Test Given	**48**
None	48
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	**48**
None	48
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

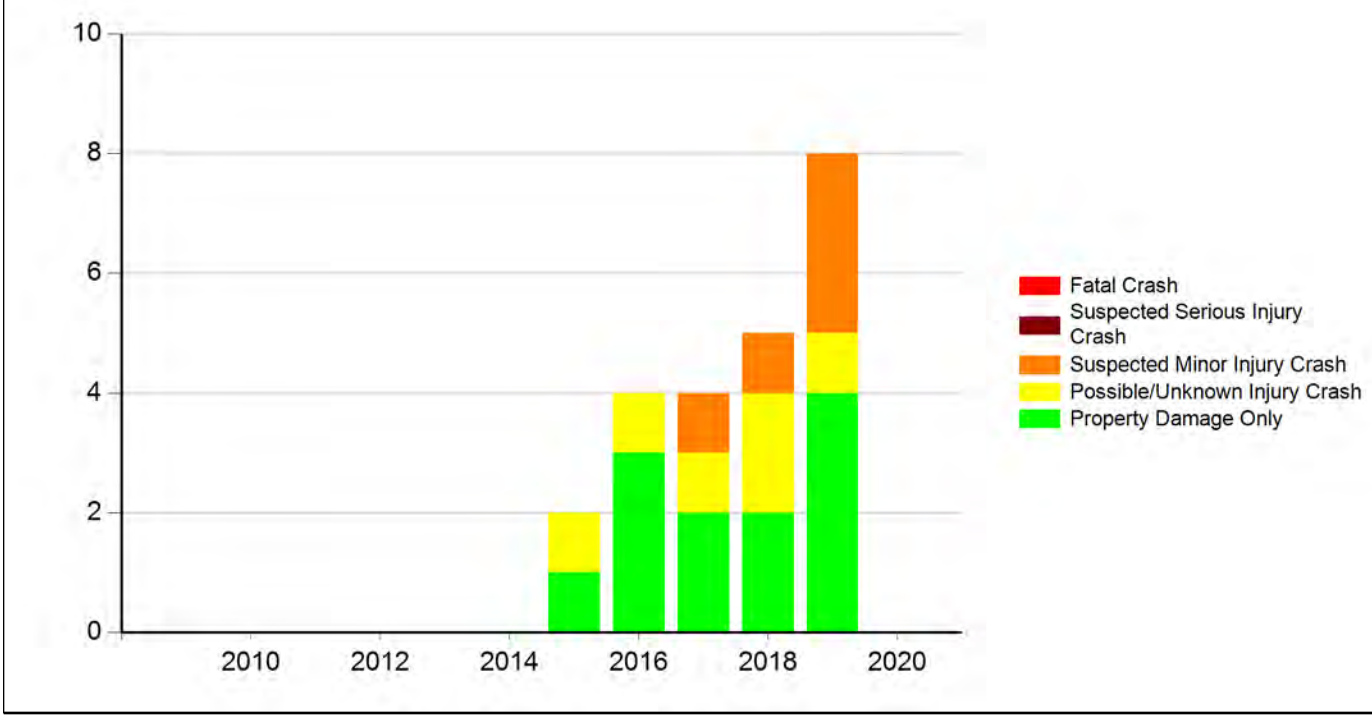
Drug Test Result	**48**
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	48
Other	0

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	1	2
2016	0	0	0	1	3	4
2017	0	0	1	1	2	4
2018	0	0	1	2	2	5
2019	0	0	3	1	4	8
2020	0	0	0	0	0	0
Total	0	0	5	6	12	23

Severity/Year

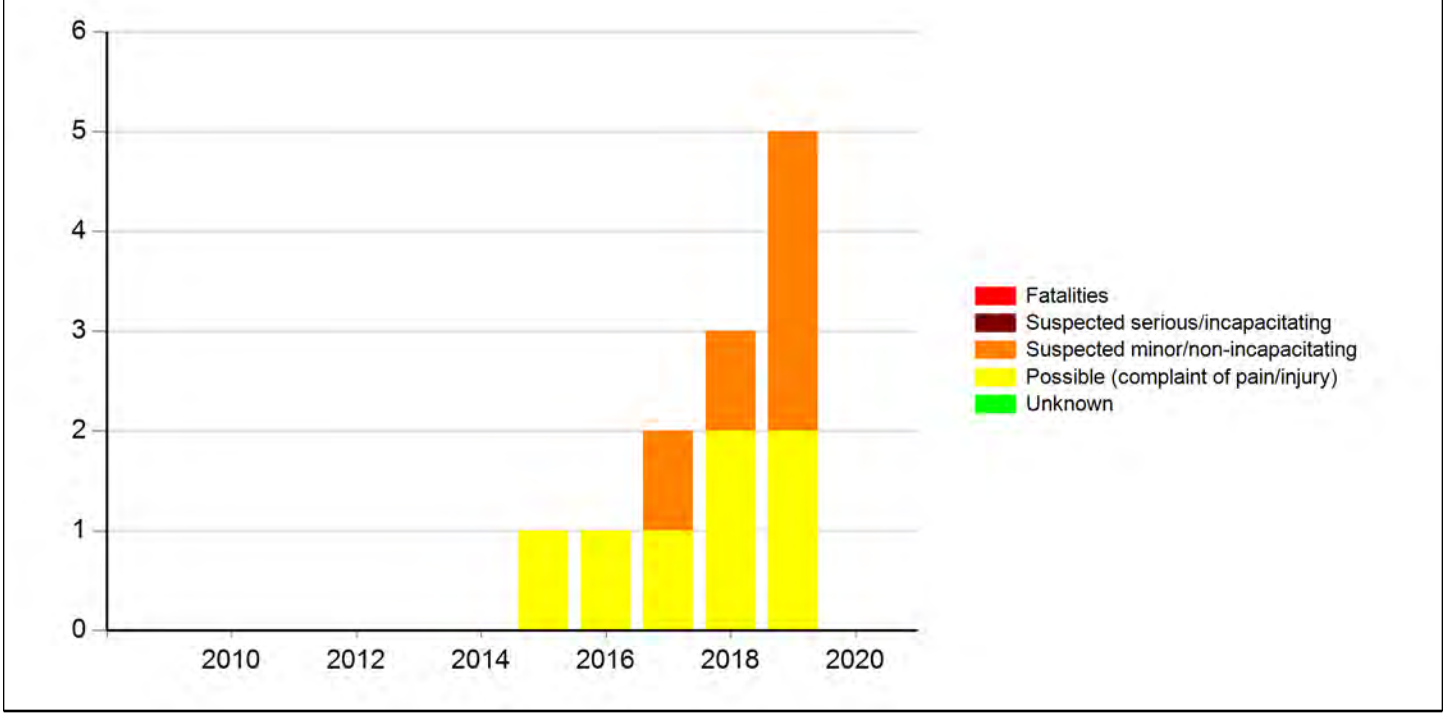


Iowa Crash Analysis Tool
Quick Report
2015-2019

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	**Total**
2009	0	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	0	1
2016	0	0	0	1	0	1
2017	0	0	1	1	0	2
2018	0	0	1	2	0	3
2019	0	0	3	2	0	5
2020	0	0	0	0	0	0
Total	0	0	5	7	0	12

Injury Status/Year

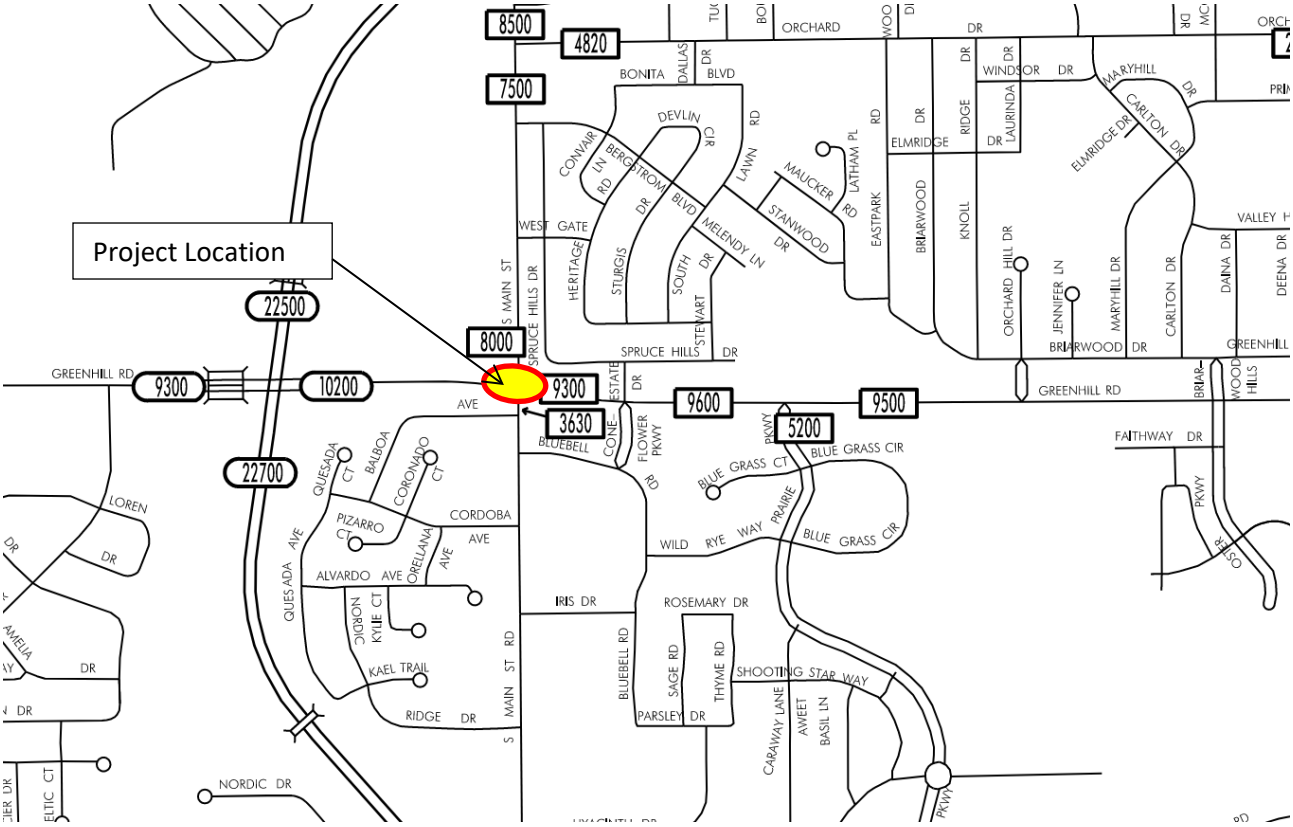


Iowa Crash Analysis Tool
Quick Report
2015-2019

Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information



2017 Iowa DOT Traffic Map

Road Name	2017 Iowa DOT ADT	2018 Traffic Study
Greenhill Road	10200	12157
S Main Street	8000	7750

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Blackhawk | Prepared by: Shive-Hattery | Date Prepared: Apr 20, 2020

Intersection: Greenhill Road and S Main Street

Improvement

Proposed Improvement(s): Conversion of existing traffic signal to a dual-lane roundabout

$ 948,700	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	81	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 948,700**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Cedar Falls Traffic Study | 2018 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

4,760 (N) | 6,079 (W) | 5,721 (E) | 2,163 (S)

6,833,895	Current Annual Entering Veh., **AEV** = DEV * 365
30,680	veh / day, Final Year DEV, **FDEV**
174.57	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.5%	Projected Traffic Growth (0%-10%), **G**
18,723	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

0 Additional months

	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
11	Injury Crashes	5	Minor Injuries @	$65,000	$ 325,000
		6	Possible Injuries @	$35,000	$ 210,000
12	Property Damage Only		(assumed cost per crash)	$7,400	$ 170,200
			-OR- enter all Property Costs of all crashes:		
23	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 705,200

4.60	Current Crashes / Year, **AA** = TA / T	**0.67**	Crashes / MEV, Crash Rate, **CR**
$ 30,661	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
117.5	Total Expected Crashes, **TECR** = CR x TMEV	**$ 1,920,467**	Present Value of Avoided
3.73	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 114,242	Crash Costs Avoided in First Year, AAR x AVC		
95.2	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $1,920,467 : $948,700 = **2.02** : 1

A

Rev. 5/18

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 15, 2020

Location / Title of Project 1st Avenue W and Wiley Boulevard Roundabout

Applicant City of Cedar Rapids

Contact Person John Witt, P.E., PTOE Title Traffic Engineering Program Manager

Complete Mailing Address 500 15th Avenue SW

Cedar Rapids, IA 52404

Phone 319-286-5800 (Area Code) E-Mail j.witt@cedar-rapids.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	$ 288,210
Total Project Cost	$ 347,031
Safety Funds Requested	$ 288,210

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

☐ Yes – Explain _____

☒ No

A

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 Cedar Rapids

Signed: _____ 8/14/20
Signature Date Signed

Nate Kampman, P.E.
Printed Name

Attest: _____ 08/14/2020
Signature Date Signed

MARY OEHLER
Printed Name

MARY K. OEHLER
COMMISSION NUMBER 152619
MY COMMISSION EXPIRES
NOV 10, 2020

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ENG
FIN
AUD FILE
6021016-00

RESOLUTION NO. 0979-07-20

RESOLUTION AUTHORIZING APPLICATION FOR A TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) GRANT FOR CONSTRUCTION OF 1ST AVENUE W AND WILEY BOULEVARD SW INTERSECTION IMPROVEMENT PROJECT (CIP NO. 6021016-00)

WHEREAS, the Iowa Department of Transportation has established the Transportation Safety Improvement Program (TSIP), which provides funding for locations where vehicular safety is a concern and documented, and

WHEREAS, the City of Cedar Rapids has identified 1st Avenue W and Wiley Boulevard SW intersection as a location where vehicular safety could be improved and funded with the TSIP grant, and

WHEREAS, the improvements converting the existing traffic signal controlled intersection to a roundabout will help reduce crashes and improve traffic operations, and

WHEREAS, the City of Cedar Rapids Public Works Department recommends approval of this resolution.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CEDAR RAPIDS, IOWA,

1. Supports the submission of a Traffic Safety Improvement Program Grant application for the improvement of the 1st Avenue W and Wiley Boulevard SW intersection.

2. The City Manager is authorized and directed to execute any and all application materials required for submission.

3. Contingent upon approval of the TSIP funds from the Iowa Department of Transportation, the City Manager is authorized and directed to execute an agreement with the Iowa Department of Transportation for award of funds to the City of Cedar Rapids.

A

Passed this 28th day of July, 2020.

Voting: Council member Todd moved the adoption of the resolution; seconded by Council member Poe. Adopted, Ayes, Council members Loeffler, Olson (Scott), Olson (Tyler), Overland, Poe, Todd, Vanorny and Mayor Hart.

Bradley G. Hart

Bradley G. Hart, Mayor

Attest:

Amy Stevenson

Amy Stevenson, City Clerk

B

1st Avenue and Wiley Boulevard W
Intersection Improvement Project

Background

1st Avenue W begins at the far west edge of the City of Cedar Rapids at 80th Street SW. It is a two-lane collector street with no turn lanes at its intersection with Wiley Boulevard. It continues easterly as a collector where it meets Williams Boulevard and becomes a major arterial. 1st Avenue then crosses the Cedar River and connects to the east side of Cedar Rapids serving as a major thoroughfare connecting west and east Cedar Rapids. The posted speed limit on 1st Avenue W is 30 mph at its intersection with Wiley Boulevard SW.

Wiley Boulevard NW/SW is a two-lane collector street that runs north-south from Rogers Road NW down through the 1st Avenue W intersection and continues south until it becomes 33rd Avenue SW just south of 31st Avenue SW. Wiley Boulevard is a two-lane street with a two-way left turn lane near the intersection with 1st Avenue W. The posted speed limit is 35 mph. A mini-roundabout was installed in 2018 on Wiley Boulevard at Johnson Avenue NW, which is one quarter mile north of this intersection and is located directly adjacent to Hoover Elementary School.

Traffic data collected in December 2017 found the following average daily traffic volumes:

- 1st Avenue W – west of Wiley Boulevard: 2,615 vehicles per day
- 1st Avenue W – east of Wiley Boulevard: 2,708 vehicles per day
- Wiley Boulevard – north of 1st Avenue W: 8,073 vehicles per day
- Wiley Boulevard – south of 1st Avenue W: 8,822 vehicles per day

1st Avenue and Wiley Boulevard W is currently under traffic signal control. Wiley Boulevard currently has dedicated left turn lanes at the intersection and on-street bike lanes that extend north to Johnson Avenue NW and south to 16th Avenue SW. 1st Avenue has a single shared left/thru/right lane at the intersection. 1st Avenue also has 5 ½ foot marked shoulders.

Crash History

There were 17 reported crashes from January 2010 through December 2019 resulting in an average of 1.7 reported crashes per year. A crash diagram of the 17 reported crashes, which includes three suspected minor injury, two possible injury, and twelve property damage only crashes is attached. There were six broadside crashes, seven angle, oncoming left turn crashes, two non-collision crashes, and two rear end crashes. The broadside and angle, oncoming left turn crashes (total of 13) are correctable crashes.

Proposed Improvements

A traffic signal warrant analysis was completed for the intersection based on the 24-hour turning movement count taken on December 17, 2017. Only three of the required eight hours reached the threshold for Warrant 1B, so the eight hour warrant was not met. None of the eight hours for Warrant 1B met the threshold. No other traffic signal warrants were met. Therefore, a traffic signal is not warranted at 1st Avenue and Wiley Boulevard W.

Thirteen of the seventeen crashes at the intersection are correctable with the removal of the traffic signal and installation of a roundabout. According to a study on conversion of a traffic signal at an urban/suburban intersection into a roundabout, converting this intersection to a roundabout will result in an overall crash reduction of 42%.[1] Although the crash reduction factor recommended for converting the traffic signal into a roundabout for use in the benefit-cost analysis is 20, it can be reasonably expected that the reduction in crashes will be higher since

[1]Gross et al., Safety Effectiveness of Converting Signalized Intersections to Roundabouts, 2012

75% of the crashes at the intersection are correctable with the installation of a roundabout. Therefore, the benefit-cost ratio of 0.39 is considered low and a benefit-cost ratio closer to 0.75 is anticipated.

The proposed project includes removal of the traffic signal and the installation of a single lane mini-roundabout at the intersection of 1st Avenue W and Wiley Boulevard. The roundabout will have a single approach on all four legs. Impacts of the project include removal of the existing traffic signal, pavement, and adjacent sidewalk and installation of the roundabout and sidewalk near the intersection. Pedestrian crossings through the splitter island will be provided on all approaches to the intersection to connect the existing sidewalks. Bike traffic from the on-street bike lanes on Wiley Boulevard NW will exit the roadway via slip ramps, cross 1st Avenue W at the designed marked crosswalks and return on-street on the far side of the intersection. Clear zone, pavement markings and signage associated with the project will follow the standards specified in the Iowa Statewide Urban Design and Specifications as well as the Manual on Uniform Traffic Control Devices.

Installation of a roundabout at the intersection of 1st Avenue and Wiley Boulevard W will enhance safety by reducing severity of the crashes by eliminating the broadside and angle, oncoming left turn crashes and will also optimize efficiency of traffic operations at the intersection.

[1]Gross et al., Safety Effectiveness of Converting Signalized Intersections to Roundabouts, 2012

C

Traffic Safety Improvement Program Cost Opinion
1st Avenue W and Wiley Boulevard SW
Cedar Rapids, IA

	ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Mobilization	LS	1	$50,000.00	$50,000.00
2	Modified Subbase, 6"	SY	700	$20.00	$14,000.00
3	Topsoil	CY	50	$50.00	$2,500.00
4	Pavement Removal	SY	425	$22.00	$9,350.00
5	PCC Pavement, 8"	SY	230	$80.00	$18,400.00
6	PCC Curb and Gutter, 6", 2.5'	LF	800	$50.00	$40,000.00
7	PCC Curb, Sloped	LF	154	$65.00	$10,010.00
8	Pavers, Median	SY	290	$120.00	$34,800.00
9	PCC Sidewalk, 6"	SY	835	$50.00	$41,750.00
10	Truncated Domes	SF	160	$40.00	$6,400.00
11	Traffic Control	LS	1	$20,000.00	$20,000.00
12	Flaggers	DAY	20	$250.00	$5,000.00
13	Street Signs	LS	1	$5,000.00	$5,000.00
14	Pavement Markings	LS	1	$15,000.00	$15,000.00
15	Erosion Control	LS	1	$2,000.00	$2,000.00
16	Sodding	LS	1	$5,000.00	$5,000.00
17	Construction Staking	LS	1	$4,000.00	$4,000.00
18	Traffic Signal Removal	LS	1	$5,000.00	$5,000.00
				Sub-total	$288,210.00
				Engineering	$30,000.00
				Contingency (10%)	$28,821.00
				Grand Total	**$347,031.00**

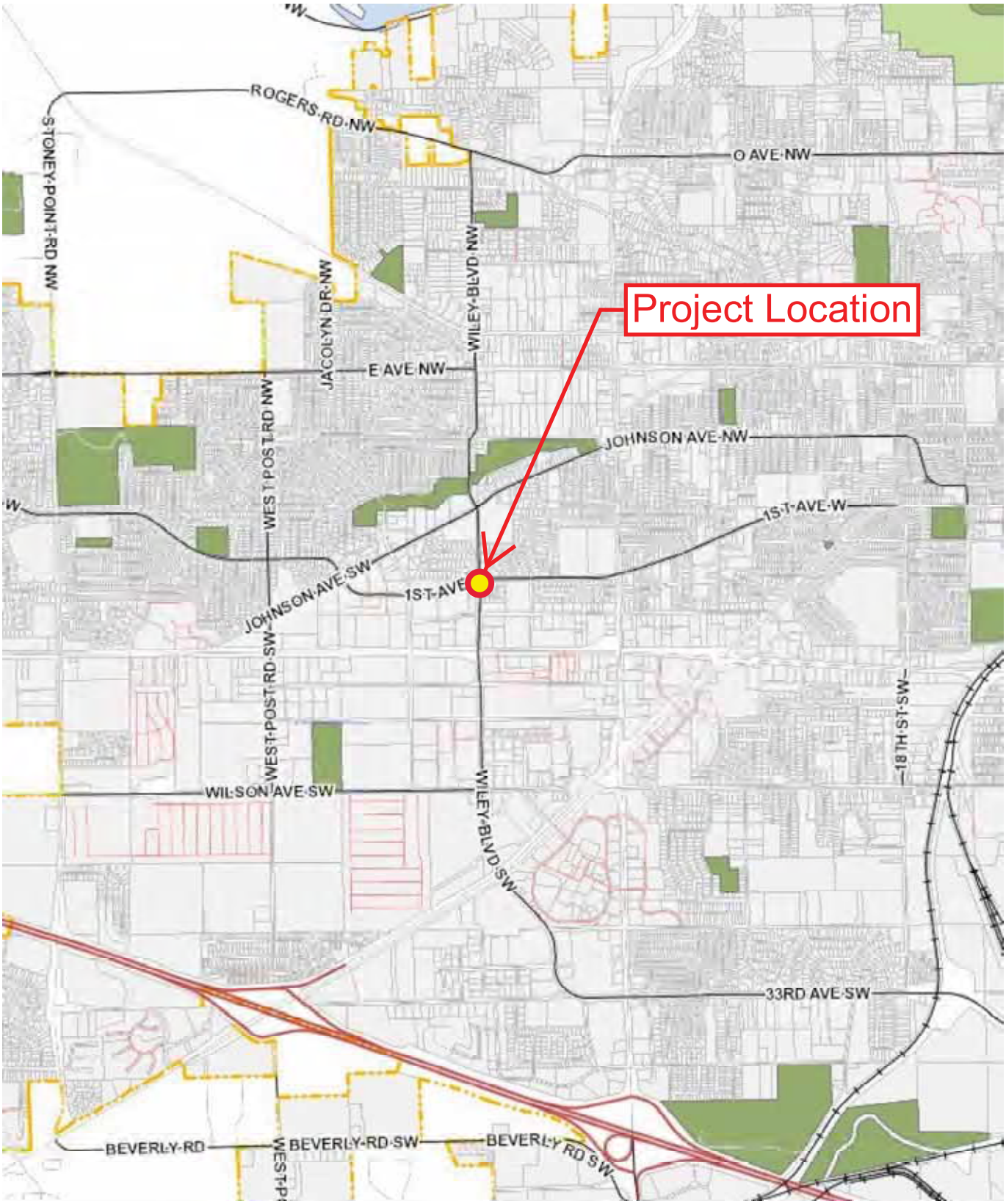
D

TIME SCHEDULE FOR PROPOSED PROJECT

1st Avenue and Wiley Boulevard W Intersection Improvements

August 15, 2020	--	**T.S.I.P. Project submittal deadline**
September 8, 2020	--	**Proceed with design of improvements**
January 15, 2021	--	**Traffic Safety Improvements Program approval**
March 10, 2021	--	**Project letting**
May 3, 2021	--	**Project construction start**
September 17, 2021	--	**Project construction completion**

E


Project Location
ROGERS RD NW
STONEY POINT RD NW
O AVE NW
JACOLYN DR NW
WILEY BLVD NW
E AVE NW
WEST POST RD NW
JOHNSON AVE NW
1ST AVE W
JOHNSON AVE SW
1ST AVE
WEST POST RD SW
18TH ST SW
WILSON AVE SW
WILEY BLVD SW
33RD AVE SW
BEVERLY RD
BEVERLY RD SW
BEVERLY RD SW

F

1st Avenue and Wiley Boulevard W

Figure 1 - Northbound view of Wiley Boulevard South Approach to 1st Avenue W

Figure 4 - Westbound View of 1st Avenue W West Approach to Wiley Boulevard

Figure 2 - Northbound Nearer View of Wiley Boulevard South Approach to 1st Ave W

Figure 5 - Southbound View of North Approach of Wiley Boulevard to 1st Avenue W

Figure 3 - Eastbound View of 1st Avenue W West Approach to Wiley Boulevard

Figure 6 - Southbound Nearer View of North Approach of Wiley Boulevard to 1st Avenue W

PREPARED BY: CITY OF CEDAR RAPIDS, PUBLIC WORKS 500 15TH AVENUE SW, CEDAR RAPIDS, IA 52404 PHONE: 319-286-5802				CEDAR RAPIDS City of Five Seasons	Date: 3/13/2019 Drawn By: RGGriffith Approved By: CIP No:	**1st Avenue & Wiley Boulevard W Intersection Improvements**	**TSIP Application**	SHEET No. **N20**
	XX No.							

PREPARED BY:
CITY OF CEDAR RAPIDS, PUBLIC WORKS
500 15TH AVENUE SW, CEDAR RAPIDS, IA 52404
PHONE: 319-286-5802

No.			
XX	1st Ave & Willey Boulevard W Roundabout	XXX	08/15/2020
No.		APPROVED	DATE

CEDAR RAPIDS
City of Five Seasons

Date:	07/30/2020
Drawn By:	CRPauli
Approved By:	
CIP No:	

TSIP Application

1st Avenue & Wiley Blvd W Roundabout

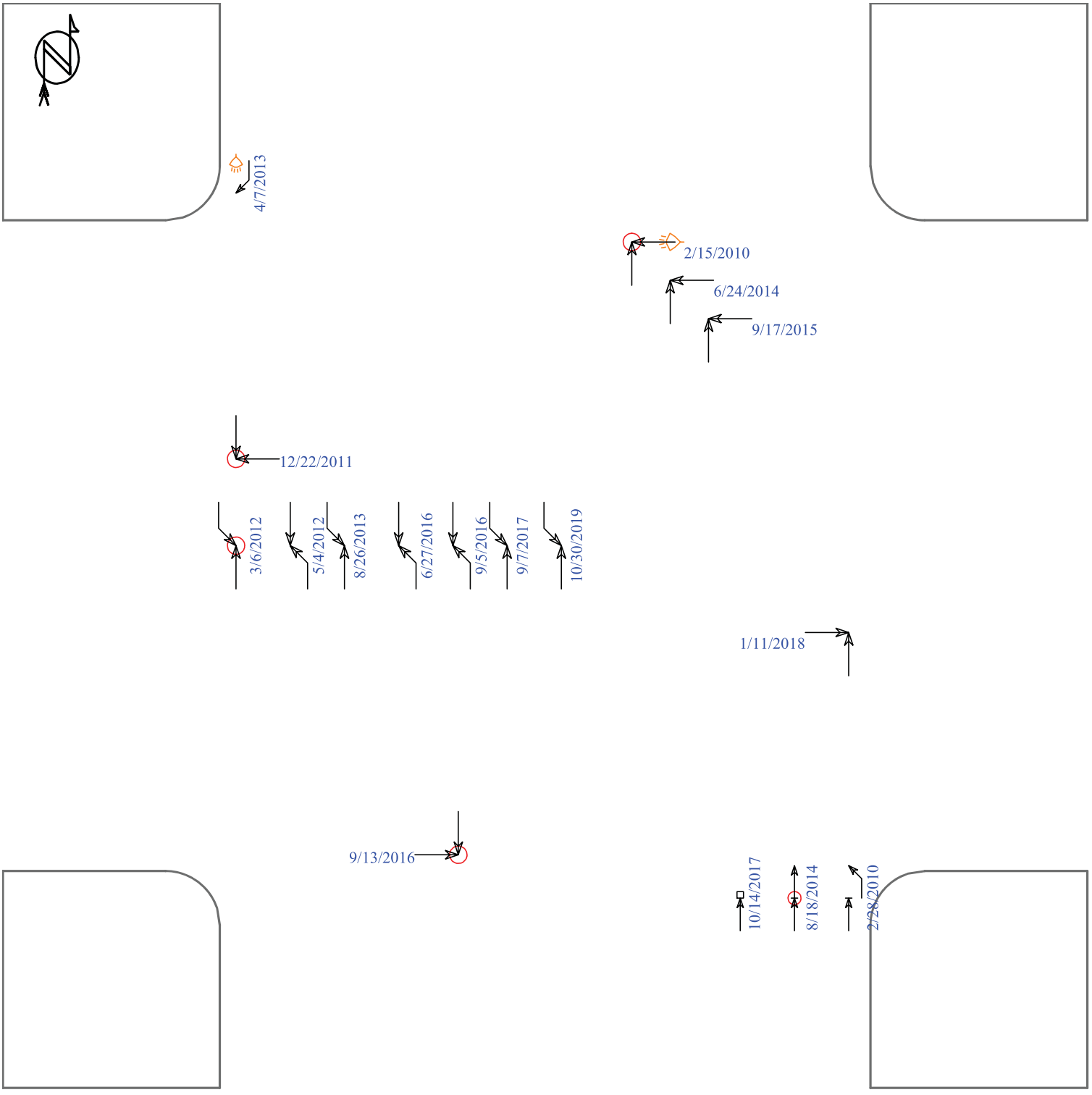
SHEET No. 1 / 1

PW Dates: ---
File Names: \\citynt2\public\shared\docs\pw\traffic\locations\1st ave w\1st ave w at wiley blvd w\sip\wiley1.h - 1st ave & wiley blvd w map.dgn

Collision Diagram 2010 - 2019
8/6/2020 - 8/6/2020

17 Crashes

Clear



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

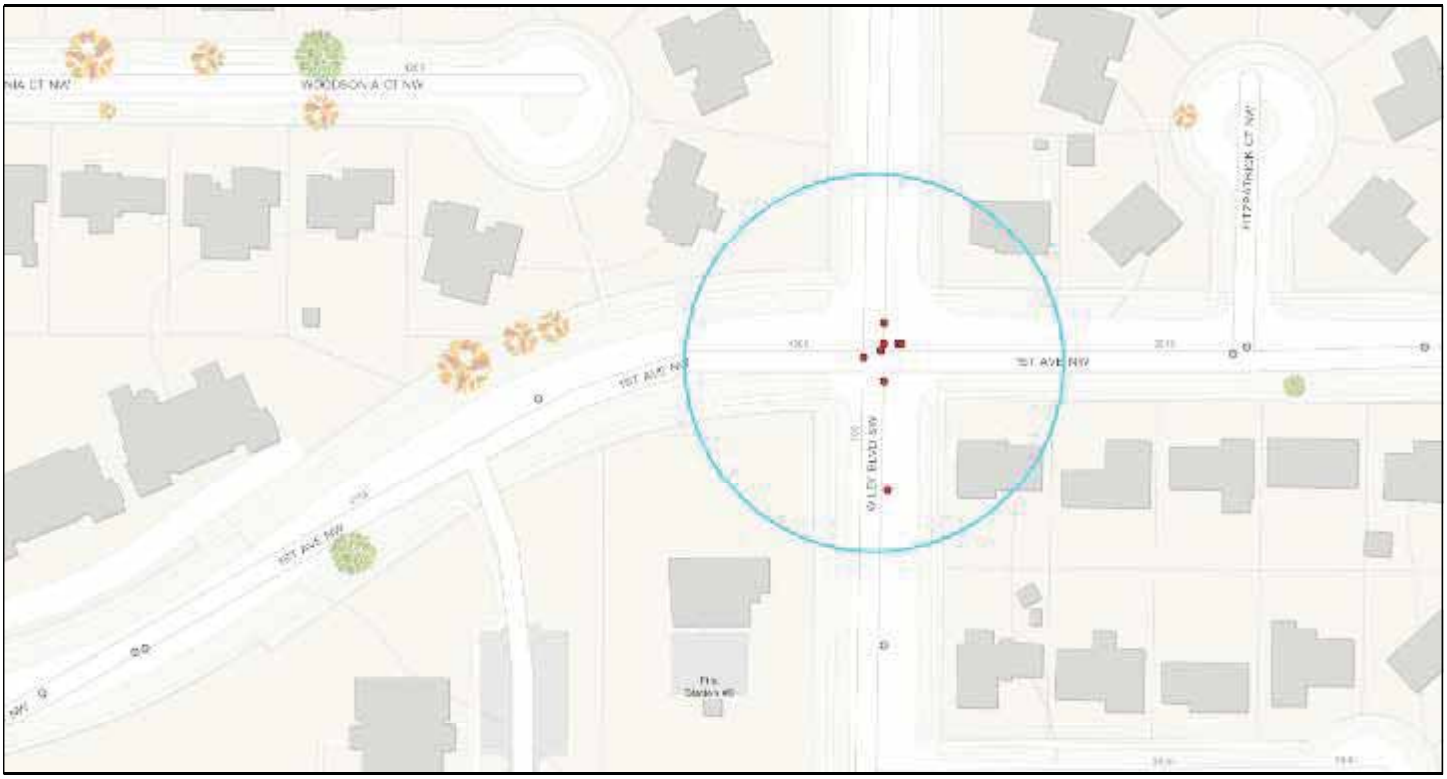
Iowa Crash Analysis Tool
Event Characteristics
2010-2019

Crash Severity	17
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	2
Property Damage Only	12

Injury Status Summary	8
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	5
Possible (complaint of pain/injury)	3
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	151,750.00
Average (per crash dollars):	8,926.47
Total Vehicles:	33.00
Average (per crash):	1.94
Total Occupants:	46.00
Average (per crash):	2.71

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.47
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.29
Possible/Unknown Injuries/Crash:	0.18



Manner of Crash Collision	17
Non-collision (single vehicle)	2
Head-on (front to front)	0
Rear-end (front to rear)	2
Angle, oncoming left turn	7
Broadside (front to side)	6
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Location of First Harmful Event	17
On roadway	17
Shoulder	0
Median	0
Roadside	0
Gore	0
Outside trafficway	0
In parking lane/zone	0
Continuous left turn lane	0
Separator	0
Not reported	0
Other	0
Unknown	0

Event Summary - Non-Collision — **Total Vehicles: 33**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	1	0	1	0	0	Overturn/rollover
0	0	0	0	0	0	Jackknife
0	0	0	0	0	0	Non-contact vehicle (phantom)
0	0	0	0	0	0	Vehicle went airborne
0	0	0	0	0	0	Fell/jumped from vehicle

Event Summary - Collision With **Total Vehicles: 33**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Thrown or falling object
0	0	0	0	0	0	Animal
0	0	0	0	0	0	Non-motorist (see non-motorist section - NOT ...
15	28	27	7	2	2	Vehicle in traffic
0	0	0	0	0	0	Re-entering roadway
0	0	0	0	0	0	Parked motor vehicle
0	0	0	0	0	0	Work zone maintenance equipment
0	0	0	0	0	0	Railway vehicle/train
0	0	0	0	0	0	Struck/struck by object/cargo/person from oth...
0	0	0	0	0	0	Other non-fixed object

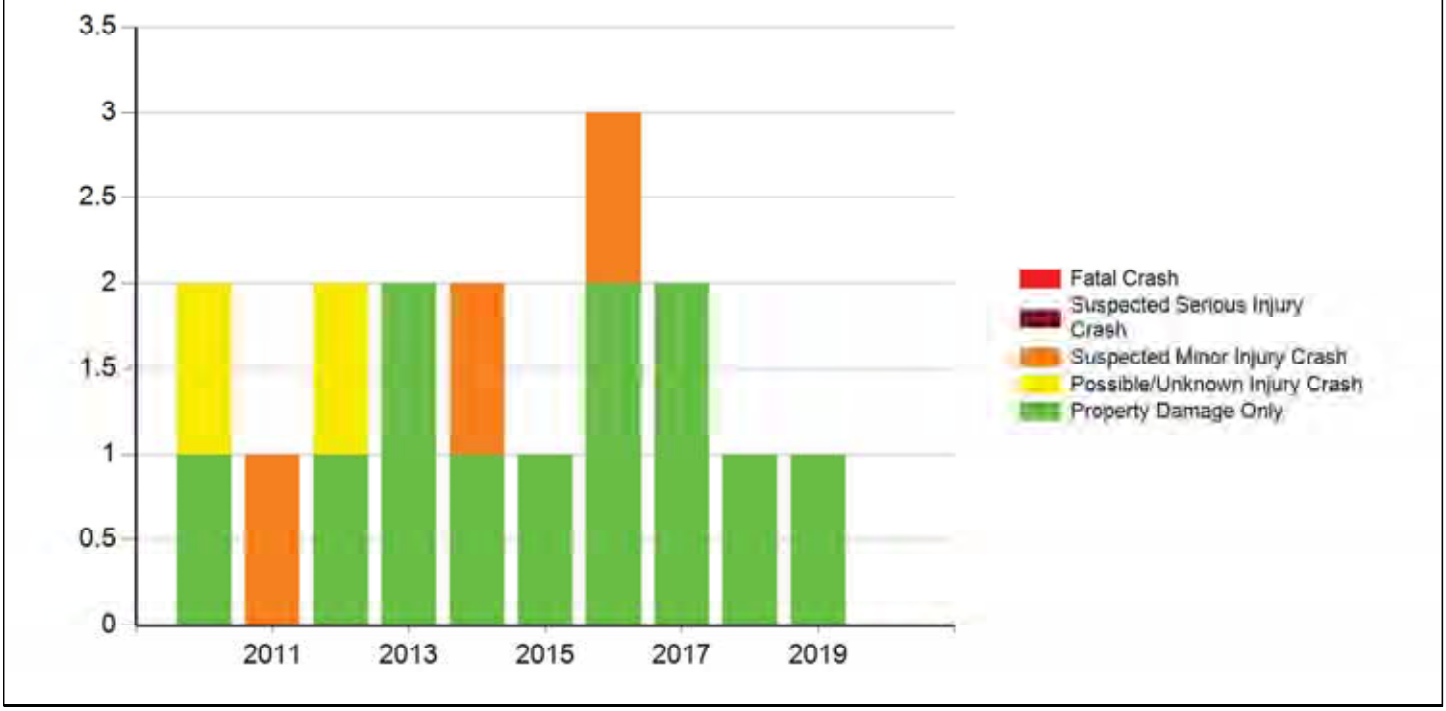
Event Summary - Collision With Fixed Object **Total Vehicles: 33**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Bridge overhead structure
0	0	0	0	0	0	Bridge pier or support
0	0	0	0	0	0	Bridge/bridge rail parapet
1	0	0	1	0	0	Curb/island/raised median
0	0	0	0	0	0	Ditch
0	0	0	0	0	0	Embankment
0	0	0	0	0	0	Ground
0	0	0	0	0	0	Culvert/pipe opening
0	0	0	0	0	0	Guardrail - face
0	0	0	0	0	0	Guardrail - end
0	0	0	0	0	0	Concrete traffic barrier (median or right sid...
0	0	0	0	0	0	Other traffic barrier
0	0	0	0	0	0	Cable barrier
0	0	0	0	0	0	Impact attenuator/crash cushion
0	0	0	0	0	0	Utility pole/light support
0	0	0	0	0	0	Traffic sign support
0	1	0	0	1	0	Traffic signal support
0	0	0	0	0	0	Other post/pole/support
0	0	0	0	0	0	Fire hydrant
0	0	0	0	0	0	Mailbox
0	0	0	0	0	0	Tree
0	0	0	0	0	1	Landscape/shrubbery
0	0	0	0	0	0	Snow bank
0	0	0	0	0	0	Fence
0	0	0	0	0	0	Wall
0	0	0	0	0	0	Building
0	0	0	0	0	0	Other fixed object

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2010	0	0	0	1	1	2
2011	0	0	1	0	0	1
2012	0	0	0	1	1	2
2013	0	0	0	0	2	2
2014	0	0	1	0	1	2
2015	0	0	0	0	1	1
2016	0	0	1	0	2	3
2017	0	0	0	0	2	2
2018	0	0	0	0	1	1
2019	0	0	0	0	1	1
2020	0	0	0	0	0	0
Total	0	0	3	2	12	17

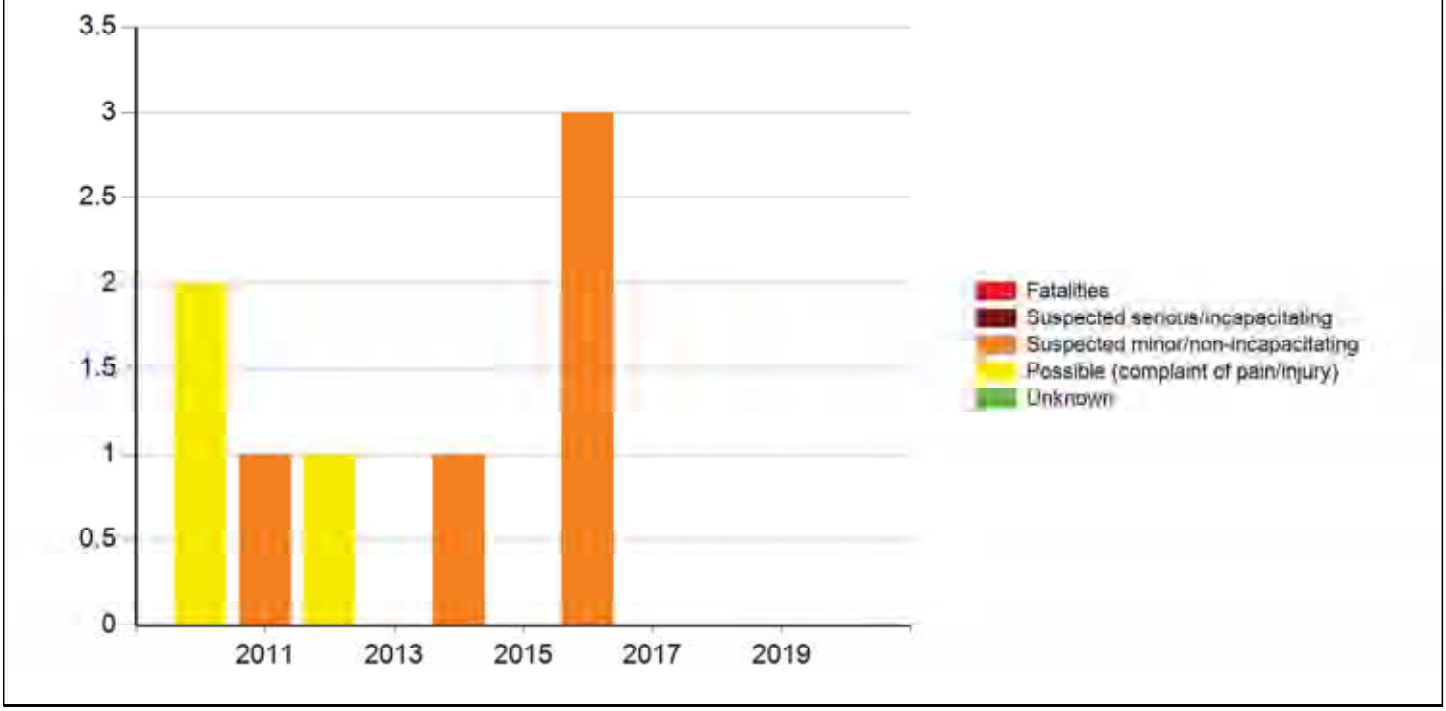
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	2	0	2
2011	0	0	1	0	0	1
2012	0	0	0	1	0	1
2013	0	0	0	0	0	0
2014	0	0	1	0	0	1
2015	0	0	0	0	0	0
2016	0	0	3	0	0	3
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	5	3	0	8

Injury Status - Annual



City of Cedar Rapids

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1st Avenue at Wiley Blvd W

File Name : 1st_Avenue_at_Wiley_Blvd_W_479526_12-07-2017
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Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Crosswalk - Pedestrians

	Wiley Blvd NW Southbound					1st Avenue W Westbound					Wiley Blvd SW Northbound					1st Avenue W 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
12:00 AM	0	3	1	0	4	0	6	1	0	7	5	9	0	0	14	0	1	3	0	4	29
12:15 AM	0	4	0	0	4	0	1	0	0	1	5	6	0	0	11	0	1	0	0	1	17
12:30 AM	0	2	3	0	5	0	3	0	0	3	2	6	0	0	8	0	1	1	0	2	18
12:45 AM	1	3	0	0	4	0	1	1	0	2	3	2	1	0	6	0	1	2	0	3	15
Total	1	12	4	0	17	0	11	2	0	13	15	23	1	0	39	0	4	6	0	10	79
01:00 AM	0	6	0	0	6	0	1	1	0	2	2	5	1	0	8	0	3	2	0	5	21
01:15 AM	0	2	0	0	2	0	1	0	0	1	1	4	1	0	6	0	0	0	0	0	9
01:30 AM	0	3	0	0	3	0	0	0	0	0	0	4	1	0	5	0	2	1	0	3	11
01:45 AM	0	3	1	0	4	1	3	0	0	4	0	4	0	0	4	0	0	2	0	2	14
Total	0	14	1	0	15	1	5	1	0	7	3	17	3	0	23	0	5	5	0	10	55
02:00 AM	0	0	0	0	0	0	1	1	0	2	1	2	0	0	3	0	1	2	0	3	8
02:15 AM	0	1	0	0	1	0	3	0	0	3	1	2	0	0	3	0	1	1	0	2	9
02:30 AM	0	1	0	0	1	0	1	0	0	1	1	2	2	0	5	1	0	2	0	3	10
02:45 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	4
Total	0	4	0	0	4	0	6	1	0	7	3	7	2	0	12	1	2	5	0	8	31
03:00 AM	0	3	0	0	3	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	7
03:15 AM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	6
03:30 AM	0	3	0	0	3	0	1	0	0	1	1	0	0	0	1	0	0	1	0	1	6
03:45 AM	0	4	0	0	4	0	0	0	0	0	0	1	1	0	2	0	0	1	0	1	7
Total	0	14	0	0	14	0	1	0	0	1	2	5	1	0	8	0	1	2	0	3	26
04:00 AM	0	0	0	0	0	0	1	0	0	1	1	1	2	0	4	0	2	1	0	3	8
04:15 AM	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	0	1	4	0	5	12
04:30 AM	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	1	1	1	0	3	13
04:45 AM	0	13	0	0	13	2	2	0	0	4	2	3	1	0	6	0	1	0	0	1	24
Total	0	23	1	0	24	2	3	0	0	5	3	10	3	0	16	1	5	6	0	12	57
05:00 AM	0	4	1	0	5	1	0	0	0	1	1	1	0	0	2	0	2	3	0	5	13
05:15 AM	0	10	2	0	12	0	1	0	0	1	3	4	0	0	7	1	2	4	0	7	27
05:30 AM	1	19	0	0	20	0	3	0	0	3	0	7	1	0	8	0	4	1	0	5	36
05:45 AM	0	28	3	0	31	3	6	0	0	9	0	10	0	0	10	2	1	6	0	9	59
Total	1	61	6	0	68	4	10	0	0	14	4	22	1	0	27	3	9	14	0	26	135
06:00 AM	1	28	0	0	29	2	0	0	0	2	2	11	0	0	13	0	5	2	0	7	51
06:15 AM	4	35	1	0	40	2	0	0	0	2	4	23	1	0	28	2	1	4	0	7	77
06:30 AM	4	47	0	0	51	0	6	0	0	6	2	8	4	0	14	4	12	3	0	19	90
06:45 AM	4	49	0	0	53	4	7	3	0	14	1	26	3	0	30	0	12	7	0	19	116
Total	13	159	1	0	173	8	13	3	0	24	9	68	8	0	85	6	30	16	0	52	334
07:00 AM	1	44	0	0	45	3	5	1	0	9	1	31	3	0	35	2	9	8	0	19	108
07:15 AM	1	78	2	0	81	8	9	4	1	22	2	33	5	0	40	1	14	11	0	26	169
07:30 AM	10	76	1	0	87	9	8	8	0	25	4	44	6	0	54	4	15	5	0	24	190

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Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Crosswalk - Pedestrians

	Wiley Blvd NW Southbound					1st Avenue W Westbound					Wiley Blvd SW Northbound					1st Avenue W 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
07:45 AM	4	73	1	0	78	6	3	6	0	15	7	38	6	0	51	3	21	6	0	30	174
Total	16	271	4	0	291	26	25	19	1	71	14	146	20	0	180	10	59	30	0	99	641
08:00 AM	12	46	1	0	59	10	19	7	0	36	10	45	12	4	71	7	22	3	0	32	198
08:15 AM	11	36	3	0	50	5	12	14	0	31	7	53	11	0	71	9	13	5	0	27	179
08:30 AM	6	36	2	0	44	4	12	18	0	34	3	52	4	0	59	18	8	3	0	29	166
08:45 AM	3	43	3	0	49	5	14	3	0	22	5	43	5	0	53	9	9	4	0	22	146
Total	32	161	9	0	202	24	57	42	0	123	25	193	32	4	254	43	52	15	0	110	689
09:00 AM	0	65	1	0	66	5	10	1	0	16	6	34	5	0	45	1	10	3	0	14	141
09:15 AM	6	45	1	0	52	5	10	3	0	18	4	34	4	0	42	0	10	5	0	15	127
09:30 AM	0	56	4	0	60	4	7	4	0	15	5	61	3	0	69	6	8	5	1	20	164
09:45 AM	2	48	1	0	51	4	7	2	0	13	3	39	1	0	43	5	7	5	0	17	124
Total	8	214	7	0	229	18	34	10	0	62	18	168	13	0	199	12	35	18	1	66	556
10:00 AM	1	60	0	0	61	4	10	3	1	18	9	50	3	0	62	4	9	9	0	22	163
10:15 AM	2	51	2	0	55	6	7	0	0	13	3	49	4	0	56	2	6	6	2	16	140
10:30 AM	1	54	1	0	56	4	3	3	0	10	5	45	3	0	53	3	8	9	0	20	139
10:45 AM	1	58	1	0	60	1	14	1	1	17	5	50	2	0	57	1	3	9	0	13	147
Total	5	223	4	0	232	15	34	7	2	58	22	194	12	0	228	10	26	33	2	71	589
11:00 AM	5	47	1	0	53	4	10	5	0	19	10	69	4	0	83	0	7	8	0	15	170
11:15 AM	2	50	2	0	54	5	12	7	0	24	9	67	7	0	83	1	7	7	0	15	176
11:30 AM	3	75	3	0	81	7	10	4	0	21	12	66	6	0	84	7	5	5	0	17	203
11:45 AM	2	61	5	0	68	7	7	3	0	17	8	72	7	0	87	6	4	13	0	23	195
Total	12	233	11	0	256	23	39	19	0	81	39	274	24	0	337	14	23	33	0	70	744
12:00 PM	3	54	1	0	58	7	16	3	0	26	7	77	10	0	94	1	10	6	0	17	195
12:15 PM	1	60	2	0	63	10	14	4	0	28	13	69	3	0	85	2	7	6	0	15	191
12:30 PM	2	66	1	0	69	3	17	8	0	28	10	54	4	1	69	6	5	11	0	22	188
12:45 PM	1	72	2	0	75	9	8	3	0	20	10	64	8	0	82	3	8	9	0	20	197
Total	7	252	6	0	265	29	55	18	0	102	40	264	25	1	330	12	30	32	0	74	771
01:00 PM	2	50	2	0	54	11	15	5	0	31	4	63	2	0	69	6	5	7	0	18	172
01:15 PM	1	48	2	0	51	10	6	1	1	18	7	45	13	0	65	1	13	7	0	21	155
01:30 PM	4	41	2	0	47	6	13	3	0	22	9	56	3	0	68	0	7	10	1	18	155
01:45 PM	4	58	0	0	62	6	8	1	0	15	10	59	10	0	79	2	7	10	0	19	175
Total	11	197	6	0	214	33	42	10	1	86	30	223	28	0	281	9	32	34	1	76	657
02:00 PM	2	62	2	0	66	5	13	5	0	23	2	44	4	0	50	3	3	3	0	9	148
02:15 PM	0	53	1	0	54	4	15	5	0	24	4	76	7	0	87	4	6	5	0	15	180
02:30 PM	1	75	3	0	79	8	17	3	0	28	10	87	3	0	100	3	3	4	0	10	217
02:45 PM	2	65	1	0	68	7	15	4	0	26	5	63	7	0	75	1	7	10	0	18	187
Total	5	255	7	0	267	24	60	17	0	101	21	270	21	0	312	11	19	22	0	52	732
03:00 PM	4	50	2	0	56	3	15	7	0	25	13	75	10	0	98	4	9	3	0	16	195

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Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Crosswalk - Pedestrians

	Wiley Blvd NW Southbound					1st Avenue W Westbound					Wiley Blvd SW Northbound					1st Avenue W 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
03:15 PM	6	74	2	0	82	11	22	6	0	39	12	95	11	0	118	3	17	5	0	25	264
03:30 PM	13	67	4	0	84	28	24	19	0	71	4	103	11	0	118	6	13	4	1	24	297
03:45 PM	4	78	3	0	85	16	16	12	0	44	9	106	19	0	134	3	10	11	0	24	287
Total	27	269	11	0	307	58	77	44	0	179	38	379	51	0	468	16	49	23	1	89	1043
04:00 PM	10	92	10	2	114	11	15	8	0	34	4	114	5	0	123	8	8	8	0	24	295
04:15 PM	3	60	3	0	66	18	20	6	0	44	9	93	21	1	124	3	5	7	1	16	250
04:30 PM	5	73	3	0	81	12	30	5	0	47	9	109	7	0	125	3	14	5	0	22	275
04:45 PM	3	69	6	0	78	12	19	9	0	40	11	116	7	0	134	1	5	9	0	15	267
Total	21	294	22	2	339	53	84	28	0	165	33	432	40	1	506	15	32	29	1	77	1087
05:00 PM	1	77	1	0	79	9	18	8	0	35	18	131	7	0	156	7	9	8	2	26	296
05:15 PM	1	71	7	0	79	9	26	11	0	46	8	124	9	0	141	9	16	8	0	33	299
05:30 PM	4	71	7	0	82	14	21	5	0	40	12	84	11	0	107	4	8	3	0	15	244
05:45 PM	9	58	1	0	68	13	9	8	0	30	12	99	4	0	115	2	15	7	0	24	237
Total	15	277	16	0	308	45	74	32	0	151	50	438	31	0	519	22	48	26	2	98	1076
06:00 PM	6	49	4	0	59	7	7	5	0	19	7	85	6	0	98	1	10	2	0	13	189
06:15 PM	7	43	2	0	52	5	14	2	0	21	4	64	8	0	76	0	9	2	0	11	160
06:30 PM	1	39	4	0	44	4	11	1	0	16	3	49	4	0	56	3	7	3	0	13	129
06:45 PM	4	37	1	0	42	3	15	4	0	22	1	54	3	0	58	3	14	5	0	22	144
Total	18	168	11	0	197	19	47	12	0	78	15	252	21	0	288	7	40	12	0	59	622
07:00 PM	2	24	1	0	27	2	12	4	0	18	5	49	4	0	58	1	4	5	0	10	113
07:15 PM	0	33	4	0	37	6	12	7	0	25	5	38	3	0	46	1	5	1	0	7	115
07:30 PM	1	24	4	0	29	4	13	4	0	21	3	34	5	0	42	2	2	4	0	8	100
07:45 PM	4	15	1	0	20	3	10	4	1	18	4	34	1	0	39	8	7	7	0	22	99
Total	7	96	10	0	113	15	47	19	1	82	17	155	13	0	185	12	18	17	0	47	427
08:00 PM	0	20	4	0	24	7	11	5	0	23	2	35	4	0	41	0	6	3	0	9	97
08:15 PM	1	12	2	0	15	5	8	4	0	17	6	28	4	0	38	0	6	2	0	8	78
08:30 PM	0	12	1	0	13	1	11	1	0	13	0	32	0	0	32	1	3	2	0	6	64
08:45 PM	0	11	0	0	11	2	4	3	0	9	1	23	1	0	25	2	9	0	0	11	56
Total	1	55	7	0	63	15	34	13	0	62	9	118	9	0	136	3	24	7	0	34	295
09:00 PM	2	15	2	0	19	2	3	1	0	6	2	25	2	1	30	3	6	0	0	9	64
09:15 PM	0	15	1	0	16	2	6	5	0	13	3	27	4	0	34	0	5	2	0	7	70
09:30 PM	1	10	3	0	14	1	7	3	0	11	3	24	1	0	28	3	1	0	0	4	57
09:45 PM	0	11	3	0	14	1	7	3	0	11	4	12	2	0	18	1	4	1	0	6	49
Total	3	51	9	0	63	6	23	12	0	41	12	88	9	1	110	7	16	3	0	26	240
10:00 PM	0	11	1	0	12	1	7	2	0	10	1	14	1	0	16	0	5	0	0	5	43
10:15 PM	0	5	1	0	6	0	5	0	0	5	4	9	0	0	13	0	3	0	0	3	27
10:30 PM	0	13	2	0	15	1	2	0	0	3	2	6	0	0	8	0	4	2	0	6	32
10:45 PM	1	3	1	0	5	0	2	2	0	4	5	12	0	0	17	0	1	4	0	5	31
Total	1	32	5	0	38	2	16	4	0	22	12	41	1	0	54	0	13	6	0	19	133

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Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Crosswalk - Pedestrians

	Wiley Blvd NW Southbound					1st Avenue W Westbound					Wiley Blvd SW Northbound					1st Avenue W 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
11:00 PM	0	5	0	0	5	0	2	0	0	2	3	13	1	0	17	0	4	1	0	5	29
11:15 PM	1	7	2	0	10	1	9	0	0	10	2	12	1	0	15	0	1	1	0	2	37
11:30 PM	0	4	0	0	4	1	4	0	0	5	2	6	1	0	9	0	1	1	0	2	20
11:45 PM	0	5	0	0	5	0	0	0	0	0	3	4	1	0	8	1	0	1	0	2	15
Total	1	21	2	0	24	2	15	0	0	17	10	35	4	0	49	1	6	4	0	11	101
Grand Total	205	3356	160	2	3723	422	812	313	5	1552	444	3822	373	7	4646	215	578	398	8	1199	11120
Apprch %	5.5	90.1	4.3	0.1		27.2	52.3	20.2	0.3		9.6	82.3	8	0.2		17.9	48.2	33.2	0.7		
Total %	1.8	30.2	1.4	0	33.5	3.8	7.3	2.8	0	14	4	34.4	3.4	0.1	41.8	1.9	5.2	3.6	0.1	10.8	
Lights	201	3322	146	0	3669	417	803	307	0	1527	438	3780	366	0	4584	214	570	371	0	1155	10935
% Lights	98	99	91.2	0	98.5	98.8	98.9	98.1	0	98.4	98.6	98.9	98.1	0	98.7	99.5	98.6	93.2	0	96.3	98.3
Mediums	4	31	14	0	49	4	8	6	0	18	5	38	5	0	48	1	8	27	0	36	151
% Mediums	2	0.9	8.8	0	1.3	0.9	1	1.9	0	1.2	1.1	1	1.3	0	1	0.5	1.4	6.8	0	3	1.4
Articulated Trucks	0	3	0	0	3	1	1	0	0	2	1	4	2	0	7	0	0	0	0	0	12
% Articulated Trucks	0	0.1	0	0	0.1	0.2	0.1	0	0	0.1	0.2	0.1	0.5	0	0.2	0	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	2	2	0	0	0	5	5	0	0	0	7	7	0	0	0	8	8	22
% Pedestrians	0	0	0	100	0.1	0	0	0	100	0.3	0	0	0	100	0.2	0	0	0	100	0.7	0.2

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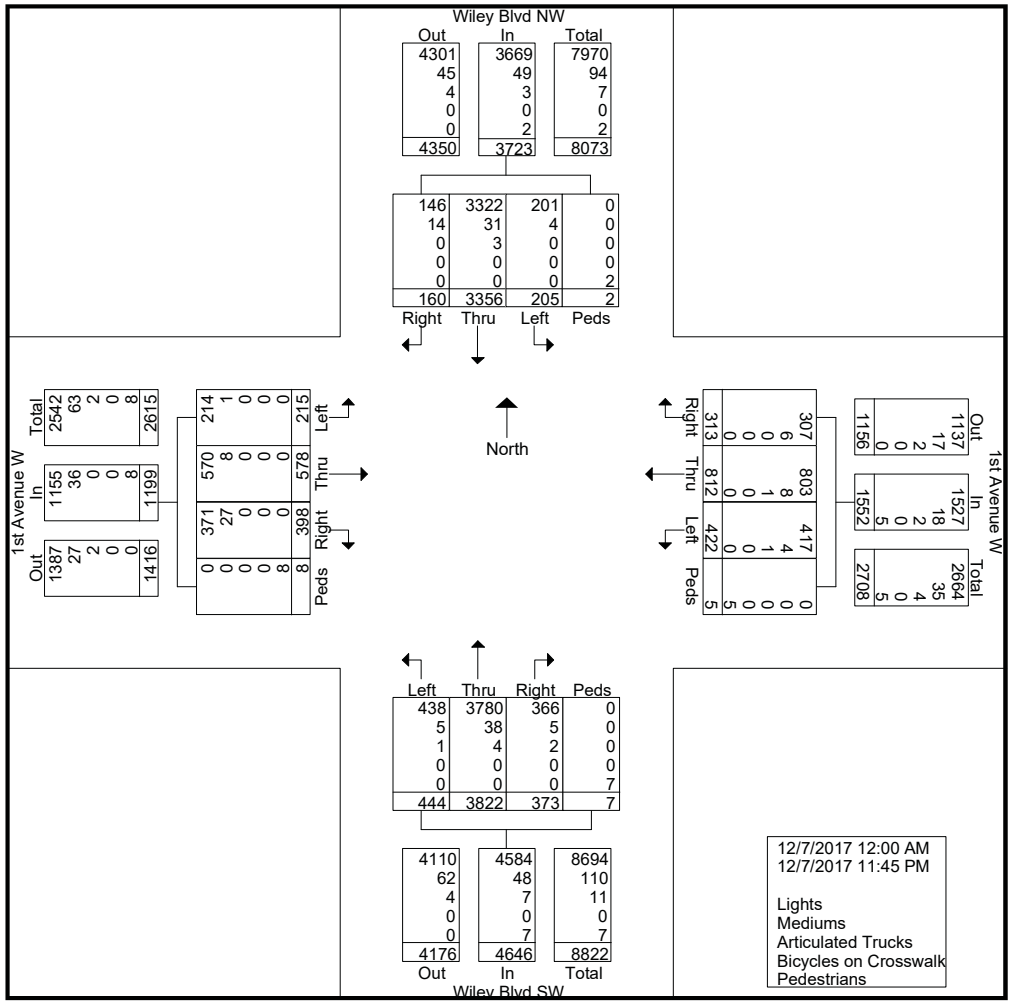
Start Date : 12/7/2017
Page No : 5



Rev. 5/18

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: LINN | Prepared by: City of Cedar Rapids | Date Prepared: Aug 15, 2020

Intersection: 1st Avenue and Wiley Boulevard W

Improvement

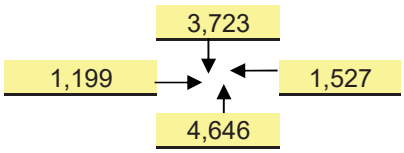
Proposed Improvement(s): Conversion of a signalized intersection to a roundabout

$ 288,210	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	20	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 288,210	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Turning Movement Count - City of Cedar Rapids | 12/7/2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,049,675 Current Annual Entering Veh., **AEV** = DEV * 365

13,538 veh / day, Final Year DEV, **FDEV**

89.17 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

1.0% Projected Traffic Growth (0%-10%), **G**

11,095 Current Daily Entering Vehicles, **DEV**

Crash Data

2010 First full year --> 2019 Last full year — 10.0 years, Time Period, **T**

Additional months

	Fatal Crashes →		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
5	Injury Crashes →	3	Minor Injuries @	$65,000	$ 195,000
		2	Possible Injuries @	$35,000	$ 70,000
12	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 116,750
17	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 381,750

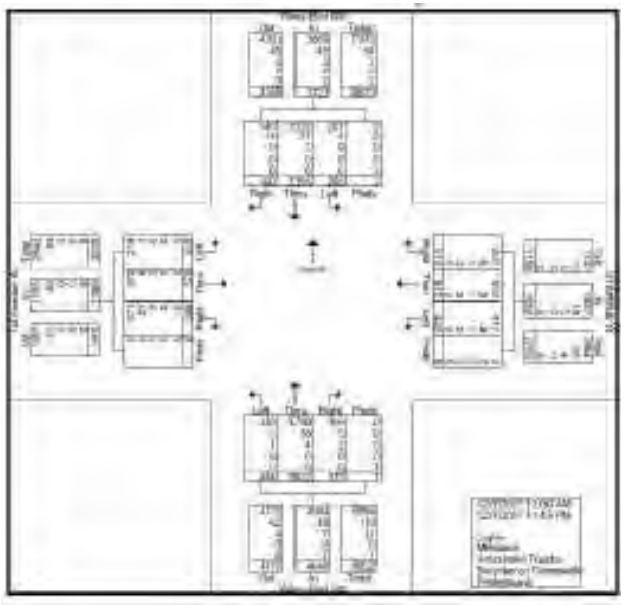
1.70	Current Crashes / Year, **AA** = TA / T	**0.42**	Crashes / MEV, Crash Rate, **CR**
$ 22,456	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
37.4	Total Expected Crashes, **TECR** = CR x TMEV	$ 112,774	Present Value of Avoided
0.34	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 7,635	Crash Costs Avoided in First Year, AAR x AVC		
7.5	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $112,774 : $288,210 = **0.39** : 1

2017 Turning Movement Count



2045 MPO Projected Traffic Volumes

Volumes from 2017 Turning Movement Count

		8,073		
1st Ave W	2,615	11,120	2,708	1st Ave W
		8,822		

Volumes from 2045 MPO Projection

		10,795		
1st Ave W	3,898	14,659	2,132	1st Ave W
		12,492		

2045-2017 = 28 years

11,120*(1+x)^28 = 14,659

x = .0992

Growth Rate = 1.0%

A

Rev. 5/18

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 15, 2020

Location / Title of Project F Avenue and Ellis Boulevard NW Roundabout

Applicant City of Cedar Rapids

Contact Person John Witt, P.E., PTOE Title Traffic Engineering Program Manager

Complete Mailing Address 500 15th Avenue SW

Cedar Rapids, IA 52404

Phone 319-286-5800 (Area Code) E-Mail j.witt@cedar-rapids.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	$ 491,400
Total Project Cost	$ 491,400
Safety Funds Requested	$ 491,400

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

☐ Yes – Explain _____

☒ No

A

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 Cedar Rapids

Signed: _____ 8/14/20
Signature Date Signed

Nate Kampman, P.E.
Printed Name

Attest: _____ 08/14/2020
Signature Date Signed

MARY OEHLER
Printed Name

MARY K. OEHLER
COMMISSION NUMBER 152619
MY COMMISSION EXPIRES
NOV 10, 2020

TED
ENG
FIN
AUD FILE
301963-00

RESOLUTION NO. 1088-08-20

RESOLUTION AUTHORIZING APPLICATION FOR A TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) GRANT FOR THE CONSTRUCTION OF ELLIS BOULEVARD NW AND F AVENUE INTERSECTION IMPROVEMENT PROJECT (CIP NO. 301963-00)

WHEREAS, the Iowa Department of Transportation has established the Transportation Safety Improvement Program (TSIP), which provides funding for locations where vehicular safety is a concern and documented, and

WHEREAS, the City of Cedar Rapids has identified the Ellis Boulevard and F Avenue NW intersection as a location where vehicular safety could be improved and funded with the TSIP grant, and

WHEREAS, the improvements converting the existing traffic signal controlled intersection to a roundabout will help reduce crashes and improve traffic operations, and

WHEREAS, the City of Cedar Rapids Public Works Department recommends approval of this resolution.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CEDAR RAPIDS, IOWA,

1. Supports the submission of a Traffic Safety Improvement Program Grant application for the improvement of the Ellis Boulevard and F Avenue NW intersection.

2. The City Manager is authorized and directed to execute any and all application materials required for submission.

3. Contingent upon approval of the TSIP funds from the Iowa Department of Transportation, the City Manager is authorized and directed to execute an agreement with the Iowa Department of Transportation for award of funds to the City of Cedar Rapids.

Passed this 25th day of August, 2020.

Voting: Council member Overland moved the adoption of the resolution; seconded by Council member Poe. Adopted, Ayes, Council members Hoeger, Loeffler, Olson (Scott), Olson (Tyler), Overland, Poe, Todd, Vanorny and Mayor Hart.

Bradley G. Hart

Bradley G. Hart, Mayor

Attest:

Amy Stevenson

Amy Stevenson, City Clerk

B

Ellis Boulevard and F Avenue NW
Intersection Improvement Project

Background

Ellis Boulevard enters the City of Cedar Rapids on the west edge of the City as a two lane local road. It transitions to a minor arterial at its intersection with Edgewood Road SW where it terminates at its intersection with F Avenue NW, just a block south of the intersection with F Avenue NW. The Ellis Boulevard extension project will extend Ellis Boulevard south of E Avenue and connect into the existing 6th Street SW. 6th Street is a 4 lane minor arterial that extends from 1st Avenue W down south of the City limits where it becomes Highway 965. Ellis Boulevard NW has a posted speed limit of 30 mph. A mini-roundabout is scheduled for installation at Ellis Boulevard and E Avenue NW just one block south of this intersection as part of the Ellis Boulevard extension project.

F Avenue NW is a two-lane minor arterial street that runs east-west. It transitions from Covington Road west of the City limits to F Avenue NW within the City limits. It continues easterly where it transitions to a one-way street westbound at 3rd Street NW. It then combines with E Avenue NW at 1st Street NW and further transitions to a two-way four-lane collector east of the Cedar River as A Avenue NE. F Avenue NW is a two-lane street with left turn lanes at its intersection with Ellis Boulevard NW. The posted speed limit is 30 mph.

Traffic data collected in December 2017 found the following average daily traffic volumes:

- F Avenue NW – west of Ellis Boulevard: 2,864 vehicles per day
- F Avenue NW – east of Ellis Boulevard: 5,001 vehicles per day
- Ellis Boulevard – north of F Avenue NW: 2,997 vehicles per day
- Ellis Boulevard – south of F Avenue NW: 941 vehicles per day

The intersection of F Avenue and Ellis Boulevard NW is currently under traffic signal control. The eastbound and westbound approaches on F Avenue NW have 150 foot left turn bays at the intersection. Ellis Boulevard currently has a single shared left/thru/right lane on both the north and south approaches. Ellis Boulevard currently has on-street bike lanes on either side of the street north of the intersection with F Avenue NW.

Crash History

There were 16 reported crashes from January 2010 through December 2019 resulting in an average of 1.6 reported crashes per year. Table 1 below shows a summary of the crash severity and type of crash. A crash diagram of the 16 reported crashes is attached. Just under half of the crashes (five broadside crashes and two angle, oncoming left turn crashes) are correctable crashes.

Table 1: Intersection Crash Summary (2010 to 2019)

Intersection	Crash Severity						Common Crash Types						
	Fatal	Major Injury	Minor Injury	Possible Injury	Property Damage Only	Total Crashes	Non-Collision	Head On	Rear End	Angle, Oncoming Left Turn	Broadside	Sideswipe, Same Direction	Unknown
Ellis Boulevard & F Avenue NW	0	0	0	3	13	**16**	1	0	6	2	5	2	0

B

Proposed Improvements

A traffic signal warrant analysis was completed for the intersection based on the 24-hour turning movement count taken on July 13, 2017. Only four of the required eight hours reached the threshold for Warrant 1A and none of the eight hours for Warrant 1B met the threshold. No other traffic signal warrants were met. Therefore, a traffic signal is not warranted at F Avenue and Ellis Boulevard NW.

Seven of the sixteen crashes at the intersection are correctable with the removal of the traffic signal and installation of a roundabout. According to a study on conversion of a traffic signal at an urban/suburban intersection into a roundabout, converting this intersection to a roundabout will result in an overall crash reduction of 42%.[1] This percentage looks consistent as seven of the sixteen crashes are correctable, which is 44% of the total crashes at the intersection. The Iowa DOT gives recommended values to use for the CRF of 20%. Although the Benefit/Cost Ratio for this intersection is 0.14 with a CRF of 20, it could be assumed that the Benefit/Cost would be higher as the expected crash reduction based on the crash history would be closer to 44%.

The proposed project includes removal of the traffic signal and the installation of a single lane mini-roundabout at the intersection of F Avenue and Ellis Boulevard NW. The roundabout will include one-lane entrances and exits on all approaches. Pedestrian crossings through the splitter islands will be provided on all approaches to the intersection to connect the existing sidewalks. Bike lanes will be added on F Avenue NW east of Ellis Boulevard to provide a route for bikes to downtown Cedar Rapids. Bike traffic from the on-street bike lanes on Ellis Boulevard NW will exit the roadway via slip ramps, cross F Avenue NW at the designed marked crosswalks and return on-street on the far side of the intersection. Impacts of the project include removal of the existing traffic signal, pavement, and adjacent sidewalk and installation of the roundabout and sidewalk near the intersection. Clear zone, pavement markings and signage associated with the project will follow the standards specified in the Iowa Statewide Urban Design and Specifications as well as the Manual on Uniform Traffic Control Devices.

The F Avenue and Ellis Boulevard NW roundabout project is part of a larger project that involves the extension of Ellis Boulevard southerly beyond E Avenue NW to connect to 6th Street SW, which continues to 1st Avenue W. This provides an important connection to make a continuous minor arterial that will connect the northwest side of Cedar Rapids to the south side of Cedar Rapids where 6th Street SW continues southerly beyond the City limits and transitions to Highway 965, which continues to Coralville, IA. The extension project will also remove the all-way stop at E Avenue and Ellis Boulevard NW (just a block south of the F Avenue and Ellis Boulevard intersection) and convert the intersection to a single lane mini-roundabout.

Installation of a roundabout at the intersection of F Avenue and Ellis Boulevard NW will enhance safety by reducing broadside and angle, oncoming left turn crashes, reduce crash severity, and will also optimize efficiency of traffic operations at the intersection.

[1]Gross et al., Safety Effectiveness of Converting Signalized Intersections to Roundabouts, 2012

C

Traffic Safety Improvement Program Cost Opinion
F Avenue and Ellis Boulevard NW
Cedar Rapids, IA

	ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Mobilization	LS	1	$40,000.00	$40,000.00
2	Modified Subbase, 6"	SY	850	$20.00	$17,000.00
3	Topsoil	CY	200	$50.00	$10,000.00
4	Pavement Removal	SY	2350	$22.00	$51,700.00
5	PCC Pavement, 8"	SY	2150	$80.00	$172,000.00
6	Storm Sewer	LF	310	$75.00	$23,250.00
7	Storm Intake	EA	6	$5,000.00	$30,000.00
8	Median PCC, Per Plan	SY	270	$95.00	$25,650.00
9	PCC Sidewalk, 6"	SY	920	$50.00	$46,000.00
10	Truncated Domes	SF	470	$40.00	$18,800.00
11	Traffic Control	LS	1	$15,000.00	$15,000.00
12	Street Signs	LS	1	$5,000.00	$5,000.00
13	Pavement Markings	LS	1	$15,000.00	$15,000.00
14	Erosion Control	LS	1	$2,000.00	$2,000.00
15	Sodding	LS	1	$5,000.00	$5,000.00
16	Construction Staking	LS	1	$7,000.00	$7,000.00
17	Traffic Signal Removal	LS	1	$8,000.00	$8,000.00
				Sub-total	$491,400.00
				Contingency (10%)	$49,140.00
				Grand Total	**$540,540.00**

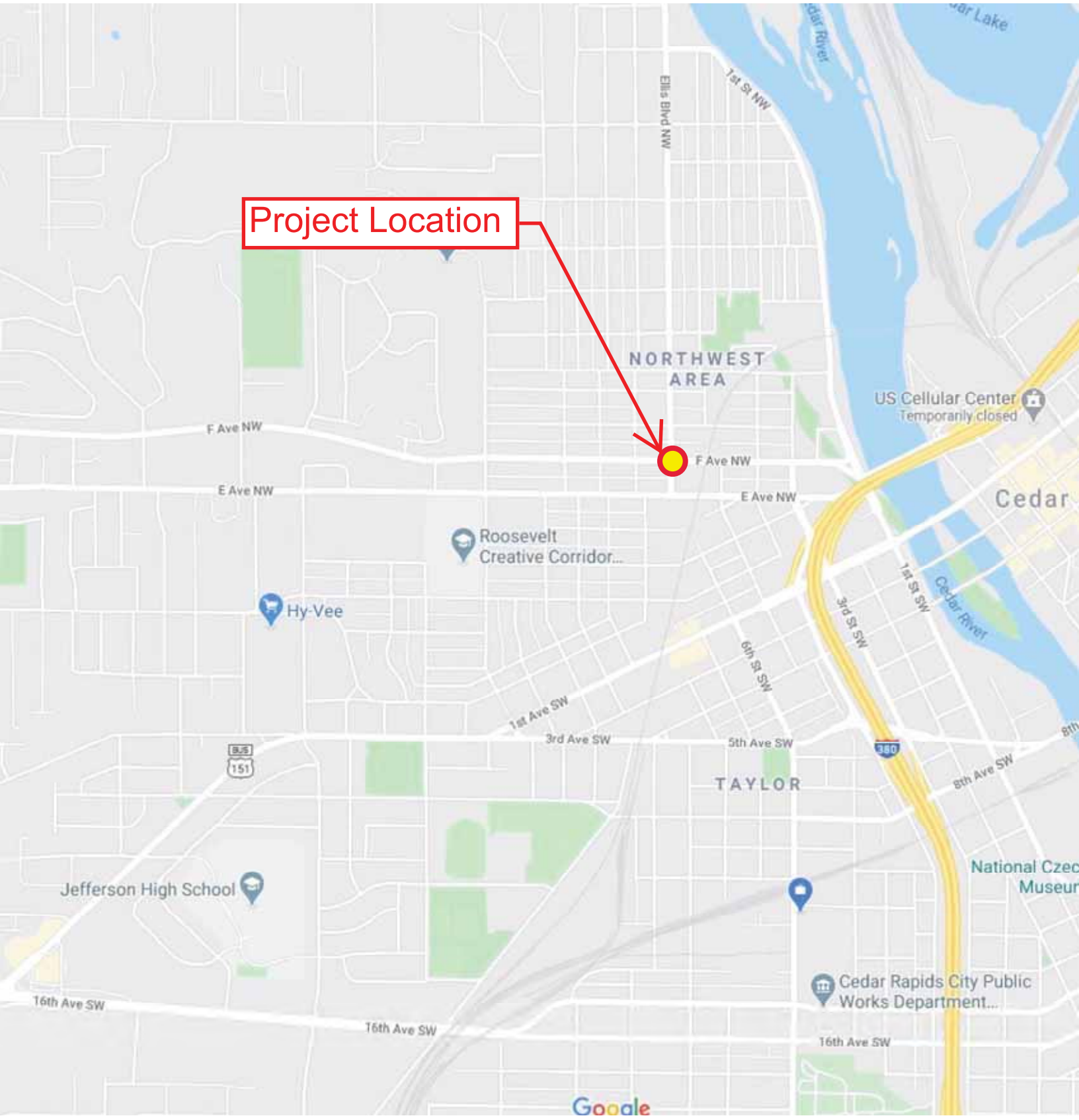
D

TIME SCHEDULE FOR PROPOSED PROJECT

Ellis Boulevard & F Avenue NW
Intersection Improvements

August 15, 2020	**--**	**T.S.I.P. Project submittal deadline**
September 1, 2020	**--**	**Proceed with design of improvements**
January 15, 2021	**--**	**Traffic Safety Improvement Program approval**
October 19, 2021	**--**	**Project letting**
April 1, 2022	**--**	**Project construction start (November 15 – April 1 free Winter Work)**
May 26, 2023	**--**	**Project construction completion**

E


Project Location
NORTHWEST AREA
F Ave NW
E Ave NW
Roosevelt Creative Corridor...
Hy-Vee
Jefferson High School
TAYLOR
US Cellular Center
Temporarily closed
Cedar
1st St NW
Ellis Blvd NW
1st St SW
3rd St SW
6th St SW
1st Ave SW
3rd Ave SW
5th Ave SW
8th Ave SW
16th Ave SW
Cedar Rapids City Public Works Department...
National Czec Museur
Google

F

F Avenue and Ellis Boulevard NW

Figure 1 - Eastbound view of F Avenue West Approach to Ellis Boulevard

Figure 2 - Eastbound Nearer View of F Avenue West Approach to Ellis Boulevard

Figure 3 - Westbound View of F Avenue East Approach to Ellis Boulevard

Figure 4 - Westbound Nearer View of F Avenue East Approach to Ellis Boulevard

Figure 5 - Southbound View of Ellis Boulevard North Approach to F Avenue

Figure 6 - Southbound View of North Approach of Ellis Boulevard to F Avenue

F Avenue and Ellis Boulevard NW

Figure 7 - Southbound Nearer View of North Approach of Ellis Boulevard to F Avenue

Figure 8 - Northbound View of South Approach of Ellis Boulevard to F Avenue

7/31/2020
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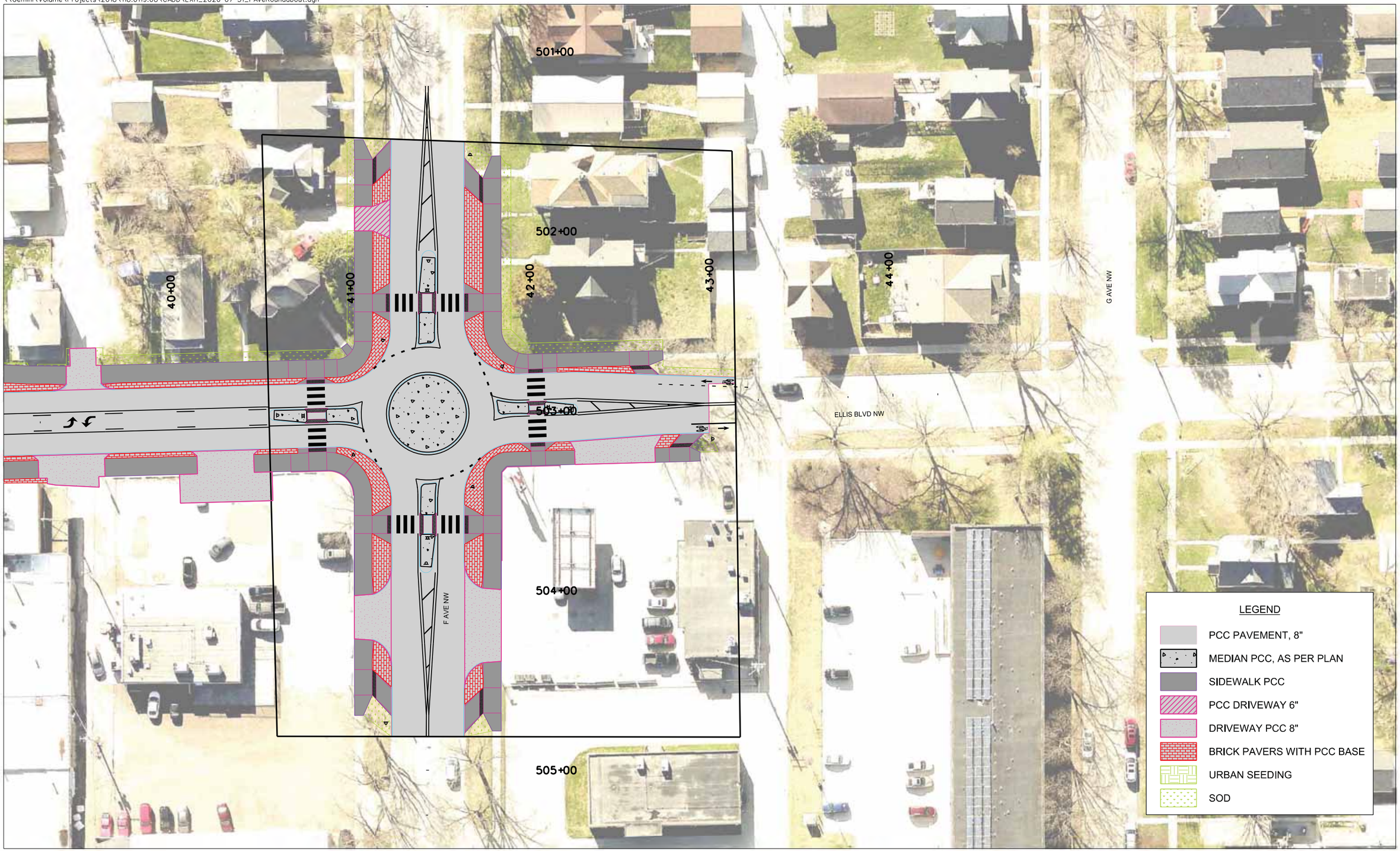
G



SNYDER & ASSOCIATES

0 25 50
FEET

N

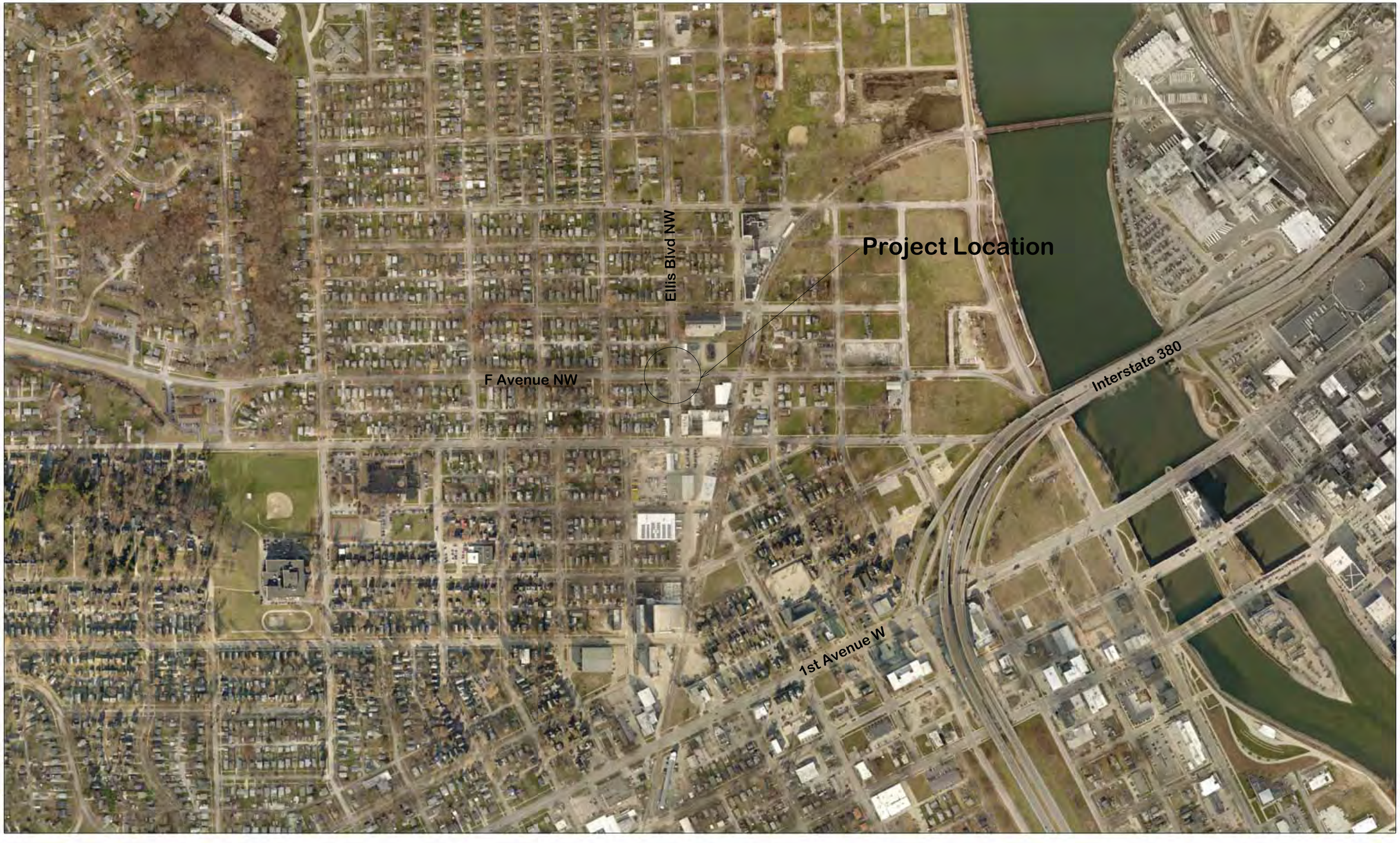
Ellis Blvd & 6th St NW Connector

Traffic Safety Improvements - F Ave NW

Cedar Rapids, Iowa

07/31/2020

H



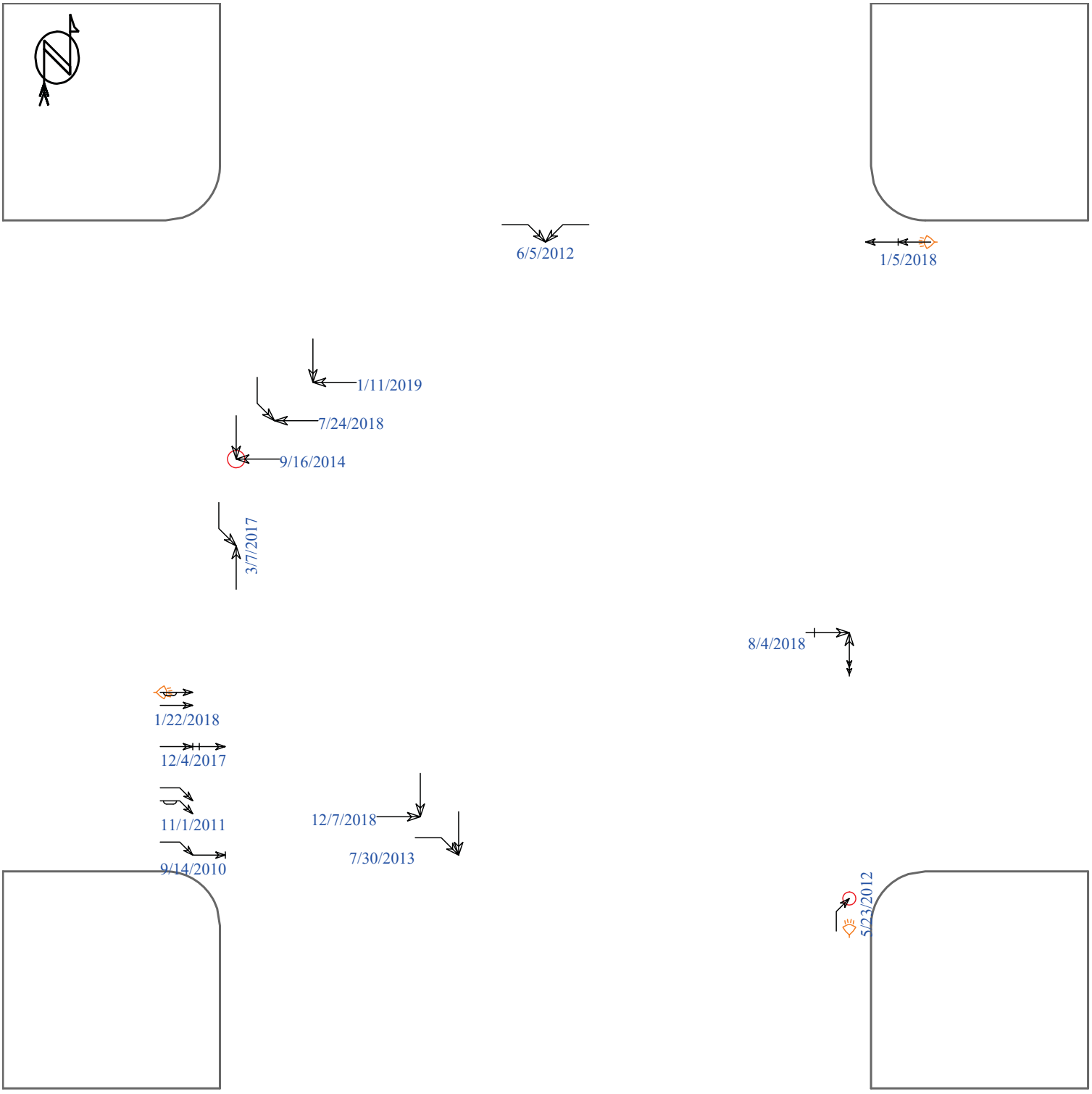
PREPARED BY: CITY OF CEDAR RAPIDS, PUBLIC WORKS 500 15TH AVENUE SW, CEDAR RAPIDS, IA 52404 PHONE: 319-286-5802					CEDAR RAPIDS City of Five Seasons	Date: 07/30/2020 Drawn By: CRPauli Approved By: CIP No:	TSIP Application	Ellis Boulevard and F Avenue NW Roundabout	SHEET No. 1 1
	XX	Ellis Blvd & F Ave NW Roundabout	XXX	08/15/2020					
	No.		APPROVED	DATE					

Plot Date: ---
File Name: \\cityny2\pcdata\shared\cos\pw\traffic\locations\nw\ellis blvd nw\ellis blvd nw at e ave and f ave\tsip\exhibit h - ellis blvd & f ave nw rms.dgn

Collision Diagram
8/6/2020 - 8/6/2020

16 Crashes

Clear



(2) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Crash Severity	16
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	3
Property Damage Only	13

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	86,650.00
Average (per crash dollars):	5,415.63
Total Vehicles:	31.00
Average (per crash):	1.94
Total Occupants:	37.00
Average (per crash):	2.31

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

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	1	0	0	0	1	0	1	0	0	0	0	3
Tuesday	0	0	0	2	1	1	0	2	1	0	0	0	0	7
Wednesday	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Thursday	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	1	1	1	0	0	0	3
Saturday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	1	3	1	1	1	4	3	1	1	0	0	16

Month	16
January	3
February	1
March	1
April	0
May	1
June	1
July	2
August	1
September	2
October	1
November	1
December	2
Not reported	0

Lighting	16
Daylight	14
Darkness	2
Morning Twilight (dawn 30 minutes after sunri...	0
Evening Twilight (dusk 30 minutes before suns...	0
Unknown	0

Weather Conditions	16
Clear	11
Cloudy	5
Fog, smoke, smog	0
Freezing rain/drizzle	0
Rain	0
Sleet, hail	0
Snow	0
Blowing snow	0
Severe winds	0
Blowing sand, soil, dirt	0
Not reported	0
Other	0
Unknown	0

Contributing Circumstance - Environment	16
None apparent	13
Weather conditions	0
Visual obstruction	0
Non-motorist action	0
Glare	0
Animal in roadway	0
Severe crosswind	0
Not reported	3
Other	0
Unknown	0

Light Condition	16
Daylight	13
Dusk	1
Dawn	0
Dark - roadway lighted	2
Dark - roadway not lighted	0
Dark - unknown roadway lighting	0
Unknown	0
Not reported	0

Surface Conditions	16
Dry	16
Wet	0
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Major Cause			16
Animal	0	Ran traffic signal	3
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	2	FTYROW: From driveway	1
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	2
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...	0
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...	1
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	1	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	1	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	3	Not reported	0
Other: No improper action	0		

Manner of Crash Collision	16
Non-collision (single vehicle)	1
Head-on (front to front)	0
Rear-end (front to rear)	5
Angle, oncoming left turn	2
Broadside (front to side)	5
Sideswipe, same direction	2
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	1
Not reported	0
Other	0
Unknown	0

Location of First Harmful Event	16
On roadway	16
Shoulder	0
Median	0
Roadside	0
Gore	0
Outside trafficway	0
In parking lane/zone	0
Continuous left turn lane	0
Separator	0
Not reported	0
Other	0
Unknown	0

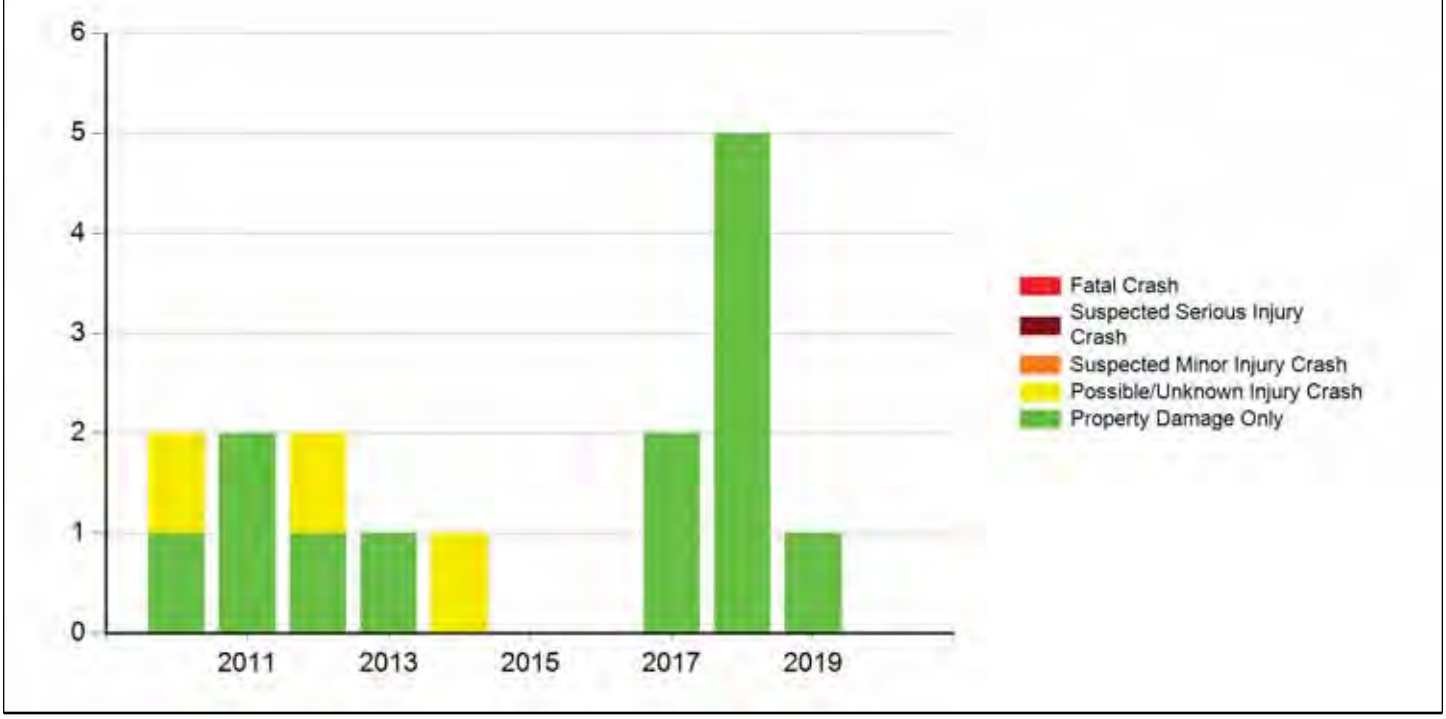
Event Summary - Non-Collision — **Total Vehicles: 31**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Overturn/rollover
0	0	0	0	0	0	Jackknife
0	0	0	0	0	0	Non-contact vehicle (phantom)
0	0	0	0	0	0	Vehicle went airborne
0	0	0	0	0	0	Fell/jumped from vehicle

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	1	1	2
2011	0	0	0	0	2	2
2012	0	0	0	1	1	2
2013	0	0	0	0	1	1
2014	0	0	0	1	0	1
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	2	2
2018	0	0	0	0	5	5
2019	0	0	0	0	1	1
2020	0	0	0	0	0	0
Total	0	0	0	3	13	16

Severity/Year



City of Cedar Rapids

500 15th Avenue SW
Cedar Rapids, IA 52404

J

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F Ave NW at Ellis Blvd NW
Cedar Rapids, IA

Groups Printed- Lights - Mediums - Articulated Trucks - Pedestrians

	Ellis Blvd NW Southbound					F Avenue NW Westbound					Ellis Blvd NW Northbound					F Avenue NW 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
12:00 AM	2	4	0	0	6	1	8	3	0	12	2	1	0	0	3	2	2	0	0	4	25
12:15 AM	0	1	0	0	1	0	4	4	0	8	0	3	0	0	3	0	4	2	0	6	18
12:30 AM	1	5	0	0	6	0	5	2	0	7	0	0	0	0	0	0	7	0	0	7	20
12:45 AM	0	1	3	0	4	0	4	1	0	5	1	1	0	0	2	1	4	0	0	5	16
Total	3	11	3	0	17	1	21	10	0	32	3	5	0	0	8	3	17	2	0	22	79
01:00 AM	1	5	0	0	6	1	6	2	0	9	0	2	0	0	2	0	3	1	0	4	21
01:15 AM	0	0	1	0	1	0	8	1	0	9	0	2	0	0	2	0	1	4	0	5	17
01:30 AM	0	2	2	0	4	1	6	3	0	10	0	0	0	0	0	0	2	1	0	3	17
01:45 AM	0	3	1	0	4	0	4	2	0	6	0	0	0	0	0	0	2	1	0	3	13
Total	1	10	4	0	15	2	24	8	0	34	0	4	0	0	4	0	8	7	0	15	68
02:00 AM	1	4	0	0	5	1	3	3	0	7	0	0	0	0	0	0	1	0	0	1	13
02:15 AM	0	2	0	0	2	1	4	0	0	5	0	0	0	0	0	0	4	1	0	5	12
02:30 AM	0	0	0	0	0	0	4	1	0	5	0	1	0	0	1	0	0	3	0	3	9
02:45 AM	0	1	0	2	3	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	6
Total	1	7	0	2	10	2	13	4	0	19	0	1	0	0	1	0	5	5	0	10	40
03:00 AM	0	4	1	0	5	0	4	1	0	5	0	0	0	0	0	0	1	0	0	1	11
03:15 AM	0	2	0	0	2	0	3	0	0	3	0	2	0	0	2	1	1	2	0	4	11
03:30 AM	0	4	0	0	4	0	3	1	0	4	0	0	0	0	0	0	3	1	0	4	12
03:45 AM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3	3	0	0	6	8
Total	0	10	2	0	12	0	11	2	0	13	0	2	0	0	2	4	8	3	0	15	42
04:00 AM	0	6	0	0	6	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	9
04:15 AM	0	3	1	0	4	0	1	1	0	2	0	1	0	0	1	0	2	0	0	2	9
04:30 AM	1	3	0	0	4	0	2	0	0	2	0	0	0	0	0	0	5	0	1	6	12
04:45 AM	1	4	1	0	6	0	4	0	0	4	0	0	0	0	0	0	13	0	0	13	23
Total	2	16	2	0	20	0	8	1	0	9	0	1	0	0	1	0	21	1	1	23	53
05:00 AM	0	5	0	0	5	0	1	2	0	3	0	0	0	0	0	0	8	2	0	10	18
05:15 AM	3	5	2	0	10	0	8	4	0	12	0	2	0	0	2	2	10	2	0	14	38
05:30 AM	2	21	0	0	23	1	18	3	0	22	0	1	0	0	1	1	23	3	0	27	73
05:45 AM	4	12	2	0	18	0	17	3	0	20	0	2	0	0	2	1	13	3	0	17	57
Total	9	43	4	0	56	1	44	12	0	57	0	5	0	0	5	4	54	10	0	68	186
06:00 AM	4	16	4	0	24	0	8	0	0	8	0	0	0	0	0	3	29	2	0	34	66
06:15 AM	4	17	6	0	27	1	15	7	0	23	0	5	0	0	5	6	34	1	0	41	96
06:30 AM	5	33	3	0	41	0	21	4	2	27	0	9	0	0	9	7	45	9	0	61	138
06:45 AM	1	36	4	0	41	1	20	7	0	28	0	7	0	0	7	3	59	6	0	68	144
Total	14	102	17	0	133	2	64	18	2	86	0	21	0	0	21	19	167	18	0	204	444
07:00 AM	5	33	6	0	44	0	32	9	0	41	0	11	0	0	11	5	44	6	0	55	151
07:15 AM	11	37	6	0	54	3	25	12	0	40	0	7	0	0	7	6	60	8	0	74	175

City of Cedar Rapids

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Groups Printed- Lights - Mediums - Articulated Trucks - Pedestrians

	Ellis Blvd NW Southbound					F Avenue NW Westbound					Ellis Blvd NW Northbound					F Avenue NW 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
07:30 AM	7	41	20	0	68	3	27	10	0	40	0	13	0	0	13	8	94	5	1	108	229
07:45 AM	8	40	8	1	57	7	40	7	0	54	0	12	1	0	13	8	79	5	2	94	218
Total	31	151	40	1	223	13	124	38	0	175	0	43	1	0	44	27	277	24	3	331	773
08:00 AM	8	23	3	2	36	6	38	8	2	54	0	4	0	0	4	3	44	8	0	55	149
08:15 AM	7	29	1	0	37	5	42	9	0	56	0	13	0	0	13	6	40	5	0	51	157
08:30 AM	4	23	8	0	35	2	47	12	0	61	0	7	0	0	7	7	32	6	0	45	148
08:45 AM	3	19	7	0	29	0	39	6	0	45	0	14	0	0	14	8	38	6	0	52	140
Total	22	94	19	2	137	13	166	35	2	216	0	38	0	0	38	24	154	25	0	203	594
09:00 AM	4	31	7	0	42	3	33	4	0	40	0	14	0	0	14	3	22	4	0	29	125
09:15 AM	2	18	4	4	28	6	33	9	0	48	1	11	1	1	14	5	22	9	2	38	128
09:30 AM	2	23	4	5	34	4	35	11	0	50	0	4	1	0	5	5	30	6	0	41	130
09:45 AM	4	27	4	0	35	2	28	8	0	38	0	6	1	0	7	4	28	5	0	37	117
Total	12	99	19	9	139	15	129	32	0	176	1	35	3	1	40	17	102	24	2	145	500
10:00 AM	0	36	8	0	44	3	39	7	0	49	0	12	0	0	12	7	31	8	0	46	151
10:15 AM	2	26	2	4	34	3	42	10	1	56	0	12	0	3	15	5	27	4	0	36	141
10:30 AM	2	32	10	0	44	4	38	13	0	55	0	6	1	0	7	5	29	2	0	36	142
10:45 AM	5	32	8	0	45	3	45	11	0	59	0	6	1	0	7	6	24	6	0	36	147
Total	9	126	28	4	167	13	164	41	1	219	0	36	2	3	41	23	111	20	0	154	581
11:00 AM	2	19	5	0	26	2	35	17	0	54	0	11	0	0	11	8	20	3	0	31	122
11:15 AM	5	26	9	0	40	5	43	12	0	60	1	16	1	0	18	2	29	7	3	41	159
11:30 AM	5	34	2	0	41	3	47	35	0	85	1	9	0	0	10	9	24	3	0	36	172
11:45 AM	2	29	9	0	40	4	49	15	1	69	0	11	1	0	12	6	27	7	0	40	161
Total	14	108	25	0	147	14	174	79	1	268	2	47	2	0	51	25	100	20	3	148	614
12:00 PM	7	31	4	1	43	11	56	20	0	87	1	8	1	1	11	8	31	5	1	45	186
12:15 PM	1	35	8	1	45	6	48	9	2	65	2	10	1	0	13	7	21	3	0	31	154
12:30 PM	0	25	9	0	34	2	39	11	1	53	1	13	0	0	14	9	30	13	0	52	153
12:45 PM	2	32	8	1	43	3	56	16	1	76	0	13	1	0	14	8	31	7	0	46	179
Total	10	123	29	3	165	22	199	56	4	281	4	44	3	1	52	32	113	28	1	174	672
01:00 PM	5	23	11	1	40	5	38	15	2	60	2	15	2	1	20	4	32	8	0	44	164
01:15 PM	3	27	8	3	41	12	46	15	0	73	0	17	0	1	18	3	18	10	0	31	163
01:30 PM	6	32	1	1	40	5	65	23	0	93	0	7	0	0	7	6	24	5	0	35	175
01:45 PM	2	25	5	1	33	1	52	17	0	70	0	12	0	0	12	4	24	5	2	35	150
Total	16	107	25	6	154	23	201	70	2	296	2	51	2	2	57	17	98	28	2	145	652
02:00 PM	5	40	8	0	53	3	63	19	0	85	0	8	0	0	8	7	29	4	0	40	186
02:15 PM	1	34	3	0	38	9	54	14	3	80	2	25	3	0	30	8	26	9	2	45	193
02:30 PM	4	34	4	3	45	2	62	20	0	84	0	6	1	0	7	2	27	9	0	38	174
02:45 PM	2	34	9	0	45	1	61	21	5	88	2	14	1	1	18	5	32	6	0	43	194
Total	12	142	24	3	181	15	240	74	8	337	4	53	5	1	63	22	114	28	2	166	747

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Groups Printed- Lights - Mediums - Articulated Trucks - Pedestrians

	Ellis Blvd NW Southbound					F Avenue NW Westbound					Ellis Blvd NW Northbound					F Avenue NW 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
03:00 PM	1	30	7	2	40	6	78	15	0	99	0	7	0	0	7	3	27	7	0	37	183
03:15 PM	2	33	5	2	42	9	62	17	0	88	1	17	1	0	19	6	26	9	0	41	190
03:30 PM	5	38	10	0	53	6	67	18	3	94	2	19	0	0	21	9	31	8	0	48	216
03:45 PM	2	36	14	1	53	9	104	26	0	139	1	12	0	0	13	5	33	5	0	43	248
Total	10	137	36	5	188	30	311	76	3	420	4	55	1	0	60	23	117	29	0	169	837
04:00 PM	4	29	8	0	41	6	119	21	0	146	1	25	1	1	28	4	35	10	0	49	264
04:15 PM	4	43	5	0	52	5	93	21	0	119	0	26	1	0	27	8	25	7	0	40	238
04:30 PM	4	36	3	0	43	7	119	27	0	153	3	22	0	0	25	7	22	6	0	35	256
04:45 PM	6	39	15	0	60	8	113	25	1	147	1	27	1	0	29	8	30	8	0	46	282
Total	18	147	31	0	196	26	444	94	1	565	5	100	3	1	109	27	112	31	0	170	1040
05:00 PM	10	38	6	0	54	5	128	26	1	160	0	23	1	0	24	6	35	12	0	53	291
05:15 PM	2	28	11	2	43	6	114	29	1	150	2	16	2	0	20	9	24	4	0	37	250
05:30 PM	3	31	9	0	43	5	73	32	0	110	1	22	1	2	26	10	24	10	0	44	223
05:45 PM	3	36	14	0	53	8	70	23	0	101	2	15	0	0	17	15	21	9	0	45	216
Total	18	133	40	2	193	24	385	110	2	521	5	76	4	2	87	40	104	35	0	179	980
06:00 PM	5	39	13	0	57	3	63	25	0	91	1	11	2	0	14	8	30	1	0	39	201
06:15 PM	4	35	7	0	46	4	47	34	1	86	1	20	0	0	21	5	30	6	0	41	194
06:30 PM	0	35	5	0	40	4	43	14	0	61	1	19	1	0	21	8	22	2	0	32	154
06:45 PM	5	26	4	0	35	3	33	24	0	60	2	21	1	0	24	6	21	8	0	35	154
Total	14	135	29	0	178	14	186	97	1	298	5	71	4	0	80	27	103	17	0	147	703
07:00 PM	2	31	9	2	44	1	56	16	0	73	2	12	3	0	17	11	23	10	2	46	180
07:15 PM	2	25	9	0	36	3	39	24	0	66	2	11	2	0	15	5	16	4	0	25	142
07:30 PM	4	31	5	1	41	1	30	15	0	46	0	8	1	0	9	6	18	6	0	30	126
07:45 PM	2	50	7	0	59	7	38	11	0	56	0	7	1	0	8	6	9	6	0	21	144
Total	10	137	30	3	180	12	163	66	0	241	4	38	7	0	49	28	66	26	2	122	592
08:00 PM	7	41	3	0	51	4	55	16	0	75	0	12	1	0	13	2	14	3	0	19	158
08:15 PM	5	71	12	0	88	2	42	16	0	60	0	10	0	0	10	7	15	1	0	23	181
08:30 PM	7	33	11	0	51	3	26	12	1	42	2	12	2	1	17	5	17	0	0	22	132
08:45 PM	4	36	7	0	47	3	45	14	1	63	1	10	3	0	14	9	15	3	1	28	152
Total	23	181	33	0	237	12	168	58	2	240	3	44	6	1	54	23	61	7	1	92	623
09:00 PM	3	24	7	1	35	2	47	13	0	62	1	10	0	0	11	4	12	3	0	19	127
09:15 PM	0	23	3	1	27	5	43	20	0	68	1	7	0	0	8	5	15	3	0	23	126
09:30 PM	4	26	1	0	31	4	49	8	0	61	2	11	0	0	13	2	12	2	0	16	121
09:45 PM	5	15	7	1	28	2	33	10	0	45	0	4	0	0	4	2	10	4	0	16	93
Total	12	88	18	3	121	13	172	51	0	236	4	32	0	0	36	13	49	12	0	74	467
10:00 PM	6	20	6	0	32	3	16	8	1	28	0	1	0	0	1	3	19	3	1	26	87
10:15 PM	6	16	4	0	26	2	18	11	1	32	0	12	1	0	13	5	7	3	0	15	86
10:30 PM	3	16	3	0	22	4	24	4	0	32	1	6	1	1	9	2	9	2	0	13	76

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Groups Printed- Lights - Mediums - Articulated Trucks - Pedestrians

	Ellis Blvd NW Southbound					F Avenue NW Westbound					Ellis Blvd NW Northbound					F Avenue NW 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
10:45 PM	2	8	5	0	15	4	21	6	0	31	0	5	1	1	7	1	3	1	0	5	58
Total	17	60	18	0	95	13	79	29	2	123	1	24	3	2	30	11	38	9	1	59	307
11:00 PM	2	10	1	0	13	1	43	8	1	53	1	1	0	0	2	1	2	1	0	4	72
11:15 PM	0	6	2	1	9	1	18	11	0	30	1	2	0	0	3	0	5	1	0	6	48
11:30 PM	0	3	1	0	4	2	20	9	0	31	1	1	0	0	2	1	6	3	1	11	48
11:45 PM	1	5	1	0	7	4	15	6	0	25	1	0	0	0	1	1	4	3	0	8	41
Total	3	24	5	1	33	8	96	34	1	139	4	4	0	0	8	3	17	8	1	29	209
Grand Total	281	2191	481	44	2997	288	3586	1095	32	5001	51	830	46	14	941	412	2016	417	19	2864	11803
Apprch %	9.4	73.1	16	1.5		5.8	71.7	21.9	0.6		5.4	88.2	4.9	1.5		14.4	70.4	14.6	0.7		
Total %	2.4	18.6	4.1	0.4	25.4	2.4	30.4	9.3	0.3	42.4	0.4	7	0.4	0.1	8	3.5	17.1	3.5	0.2	24.3	
Lights	276	2145	462	0	2883	283	3508	1077	0	4868	48	814	46	0	908	393	1949	408	0	2750	11409
% Lights	98.2	97.9	96	0	96.2	98.3	97.8	98.4	0	97.3	94.1	98.1	100	0	96.5	95.4	96.7	97.8	0	96	96.7
Mediums	2	37	17	0	56	3	62	12	0	77	3	13	0	0	16	19	52	6	0	77	226
% Mediums	0.7	1.7	3.5	0	1.9	1	1.7	1.1	0	1.5	5.9	1.6	0	0	1.7	4.6	2.6	1.4	0	2.7	1.9
Articulated Trucks	3	9	2	0	14	2	16	6	0	24	0	3	0	0	3	0	15	3	0	18	59
% Articulated Trucks	1.1	0.4	0.4	0	0.5	0.7	0.4	0.5	0	0.5	0	0.4	0	0	0.3	0	0.7	0.7	0	0.6	0.5
Pedestrians	0	0	0	44	44	0	0	0	32	32	0	0	0	14	14	0	0	0	19	19	109
% Pedestrians	0	0	0	100	1.5	0	0	0	100	0.6	0	0	0	100	1.5	0	0	0	100	0.7	0.9

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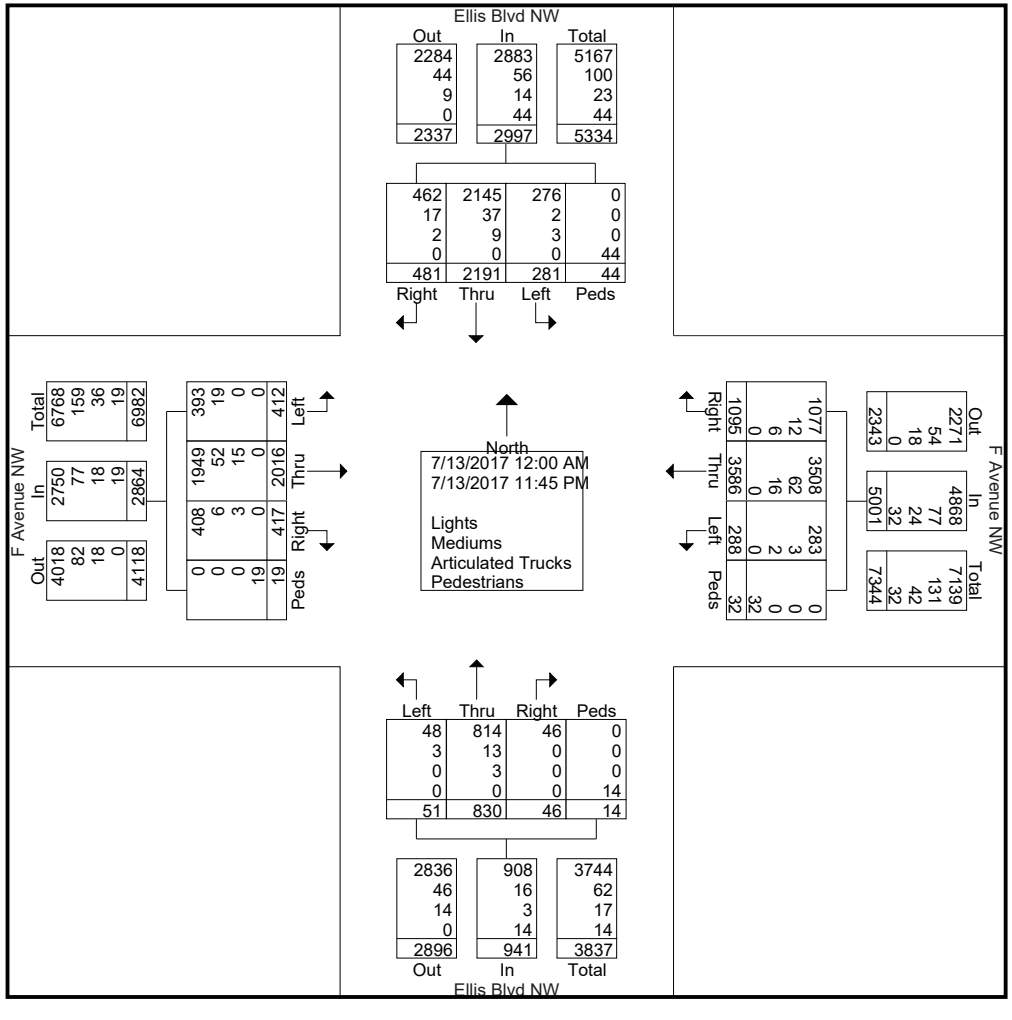


Rev. 5/18

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: LINN Prepared by: City of Cedar Rapids Date Prepared: Aug 15, 2020

Intersection: Ellis Boulevard and F Avenue NW

Improvement

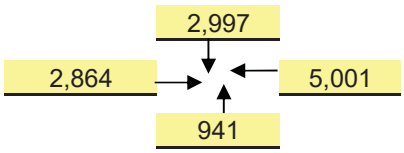
Proposed Improvement(s): Conversion of a signalized intersection to a roundabout. This project will be part of a larger project to extend Ellis Boulevard southerly to connect to 6th Street NW north of 1st Avenue W

$ 491,400	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	20	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 491,400	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Turning Movement Count - City of Cedar Rapids 7/13/2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,308,095 Current Annual Entering Veh., **AEV** = DEV * 365

14,983 veh / day, Final Year DEV, **FDEV**

96.73 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

1.2% Projected Traffic Growth (0%-10%), **G**

11,803 Current Daily Entering Vehicles, **DEV**

Crash Data

2010 First full year --> 2019 Last full year 10.0 years, Time Period, **T**

Additional months

	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
3	Injury Crashes		Minor Injuries @	$65,000	$ -
		3	Possible Injuries @	$35,000	$ 105,000
13	Property Damage Only		(assumed cost per crash)	$7,400	$ 118,400
		-OR-	enter all Property Costs of all crashes:		
16	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 223,400

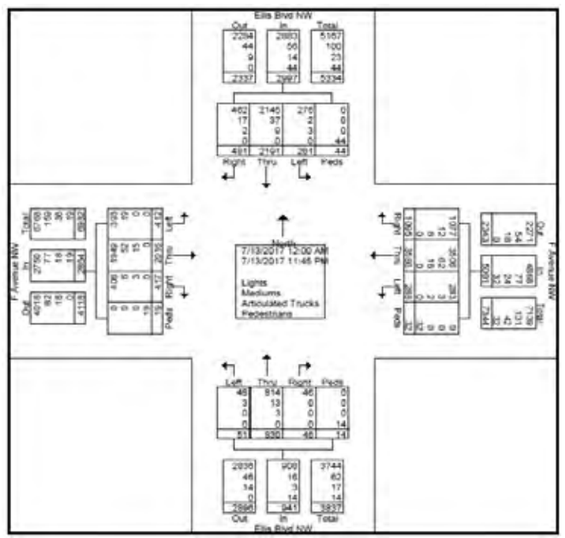
1.60	Current Crashes / Year, **AA** = TA / T	0.37	Crashes / MEV, Crash Rate, **CR**
$ 13,963	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
35.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 67,123	Present Value of Avoided
0.32	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 4,468	Crash Costs Avoided in First Year, AAR x AVC		
7.2	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $67,123 : $491,400 = **0.14** : 1

2017 Turning Movement Count



Traffic Forecasts

AM and PM peak hour traffic volumes were forecasted for the proposed build year of 2022 and a future analysis year of 2040 (figures showing these counts are attached as a PDF). The 2022 traffic volumes were determined by rerouting traffic based on the following data and information:

- Extensive turning movement and ADT counts collected at intersections adjacent to the project area. The existing traffic counts for Ellis Blvd NW at E and F Avenues are attached for reference.
- 6th Street NW will be extended and connected to E Ave NW.
- Multiple road/railroad crossing closures adjacent to the surrounding area that are required to add the new crossing on 6th St NW.

The 2040 traffic volumes were determined using a combination of the 2022 forecasted traffic volumes and 2040 forecasted traffic volumes from the Cedar Rapids Metro Area travel demand model, which was provided by the Corridor MPO. Annual growth rates for each leg of both intersection were calculated based on the existing and forecasted travel demand volumes. The annual growth rates used are as follows:

- Ellis Blvd NW at E Ave
  - o North Leg = 2.6% per year
  - o South Leg = 3.3% per year
  - o East Leg = 2.5% per year
  - o West Leg = 1.4% per year
- Ellis Blvd NW at F Ave
  - o North Leg = 0.7% per year
  - o South Leg = 2.6% per year
  - o East Leg = 0.9% per year
  - o West Leg = 1.6% per year

Volumes from 2017 Turning Movement Count

		Ellis Blvd NW		
		2,997		
F Avenue NW	2,864	11,803	5,001	F Avenue NW
		941		
		Ellis Blvd NW		

Annual Growth Rate

					Growth Rate
		Ellis Blvd NW			1.15%
		3,018			
F Avenue NW	2,910	11,939	5,046	F Avenue NW	
		965			
		Ellis Blvd NW			

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project 19th Avenue North Traffic Safety Improvements Project

Applicant City of Clinton, Iowa

Contact Person Jason Craft Title City Engineer

Complete Mailing Address 611 South 3rd Street

Clinton, Iowa 52732

Phone 563-244-3423 (Area Code) E-Mail jasoncraft@cityofclintoniowa.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	$	479,010
Total Project Cost	$	544,010
Safety Funds Requested	$	479,010

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 Clinton, Iowa

Signed: Scott Maddasion 08/11/2020

Signature Date Signed

Scott Maddasion

Printed Name

Attest: Lisa M. Frederici 08/11/2020

Signature Date Signed

Lisa M. Frederici

Printed Name

RESOLUTION NO. 2020-466

A RESOLUTION OF OFFICIAL ENDORSEMENT OF FUNDING APPLICATION FOR THE FY 2022 TRAFFIC SAFETY IMPROVEMENT PROGRAM TO IOWA DEPARTMENT OF TRANSPORTATION FOR THE 19TH AVENUE NORTH TRAFFIC SAFETY IMPROVEMENTS PROJECT

WHEREAS, the Iowa Department of Transportation is accepting applications for the Traffic Safety Improvement Program (TSIP) on August 15, 2020; and,

WHEREAS, the TSIP allows cities and counties throughout Iowa to apply for funding for traffic safety improvements on public roads under local jurisdiction; and,

WHEREAS, the crash history and traffic volumes at along 19th Avenue North from the intersection of North 2nd Street to the Highway 136 Bridge indicate that improvements are warranted to improve safety and efficiency of the corridor; and,

WHEREAS, the City Engineering Department recommends reconstruction of the intersection pavement and all new traffic signal infrastructure at the intersection, including new signalization components, video detection, larger signal heads, durable pavement markings, and flashing yellow arrows; and,

WHEREAS, the total estimated cost for safety related items on this project is $479,010.

THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CLINTON, IOWA that the that the City Council is supportive of the Traffic Safety Improvement Program Funding Application for the 19th Avenue North Traffic Safety Improvements Project. The City Engineering Department is hereby authorized to submit the funding application on or before August 15, 2020, for the amount of $479,010.

This resolution is adopted by the City of Clinton and approved by the Mayor this 11 day of August 2020

Mayor

ATTEST:

Resolution NO. 2020-466 - A RESOLUTION OF OFFICIAL ENDORSEMENT OF FUNDING APPLICATION FOR THE FY 2022 TRAFFIC SAFETY IMPROVEMENT PROGRAM TO IOWA DEPARTMENT OF TRANSPORTATION FOR THE 19TH AVENUE NORTH TRAFFIC SAFETY IMPROVEMENTS PROJECT

Lisa M. Frederici

City Clerk

Resolution NO. 2020-466 - A RESOLUTION OF OFFICIAL ENDORSEMENT OF FUNDING APPLICATION FOR THE FY 2022 TRAFFIC SAFETY IMPROVEMENT PROGRAM TO IOWA DEPARTMENT OF TRANSPORTATION FOR THE 19TH AVENUE NORTH TRAFFIC SAFETY IMPROVEMENTS PROJECT

19th Avenue North (136)
Traffic Safety Improvements Project

Traffic Safety Improvement Program Narrative

Project B-2022

Overview of Existing & Proposed Conditions

The existing infrastructure at 19th Avenue North & North 2nd Street was constructed in the 1960s by the Iowa DOT and City of Clinton. The intersection includes obsolete signals with rusted steel tube poles/arms and mechanically timed signals. The intersection functions poorly by any standard, including long queuing times and high crash rates. The intersection desperately needs a makeover, and much can be done to improve the safety and efficiency of the existing signalization system.

In addition to the signals, the intersection also includes redundant departure lanes at the north and east leg of the intersection, which has contributed to accidents in the past. The street pavement is in disrepair, including potholes and cracking along most joints, which causes dangerous conditions for pedestrian crossings. The sidewalks are not even close to ADA compliant, and must be replaced as a part of any project at this intersection.

The section of 19th Avenue North to the east of North 2nd Street is unnecessarily confusing. This could easily be straightened out by reduction in the number of lanes available for traffic. We have suggested an asphalt overlay coupled with revised pavement marking detail using durable pavement markings, along with revised over-sized signage prohibiting left turns onto the side street from this state highway.

1. Total Traffic Volume

The following table shows a summary of traffic counts on the various legs of the intersection of 19th Avenue North & North 2nd Street. The most recent Iowa DOT traffic count conducted in 2018 was used. The 2038 traffic volumes are also shown for planning purposes, which is considering 1% traffic growth per year for the next 20 years (which is unlikely). Traffic is not expected to increase at this pace for 20 consecutive years, so this is a very conservative estimate, developed in order to project the highest possible volume of traffic generated over this time period.

19th Ave N & N 2nd St Traffic Counts (2018)	
Leg of intersection	AADT
East	9,724
North	6,566
West	4,095
South	9,785

19th Ave N & N 2nd St Traffic Counts (2038)	
Leg of intersection	AADT
East	11,865
North	8,012
West	4,997
South	11,940

This information is useful when determining the types of left turn signal heads and the necessary number of departure lanes from each leg of the intersection. Further count data, including peak hour counts can be found on the attached Iowa DOT traffic count chart.

An optimization of signal timing using these counts, peak hour counts, and video detection should result in crash reductions during peak hours. For the purposes of this study, we used CRF of 5.0 for retroreflective back plates (Iowa DOT), 3.0 for 12-inch lenses (Iowa DOT), and 1.0 each for signal optimization and video detection (assumed). This is a total of 10% crash mitigation just for upgrading the signal infrastructure to current standards. Following is additional more specific information and details regarding peak hour left turn counts and through traffic use of departure lanes.

2. Left Turn Movements

Existing peak hour left-turning volumes are relatively high at the intersection of 19th Avenue North & North 2nd Street, per the attached Iowa DOT turning movement exhibits:

- north to west bound (26 Left Turns during Peak Hour) – 229 opposing through traffic
- east to north bound (15 Left Turns during Peak Hour) – 154 opposing through traffic
- south to east bound (94 Left Turns during Peak Hour) – 189 opposing through traffic
- west to south bound (233 Left Turns during Peak Hour) – 81 opposing through traffic

When looking at the above peak hour counts, it can be deduced that protected left turns should be used for all legs of the intersection. This is both due to a high count of left turning traffic and through traffic in opposing directions. The traffic data indicates that there should be no mobility challenges or significant level of service reduction due to the addition of flashing yellow left turn phases, especially if coupled with video detection and optimized timing throughout the intersection.

The project includes addition of new 4 section left turn heads at all four legs of the intersection. The corresponding CRF is 14.3 for this change, per the Crash Modification Factors Clearinghouse.

3. Departure Lanes from intersection

The number of departure lanes can easily be reduced to one for all legs of the intersection, which will improve overall safety of the intersection. The peak hour through traffic counts for each direction are listed below.

- North bound (204 vehicles)
- East bound (169 vehicles)
- South bound (229 vehicles)
- West bound (163 vehicles)

Even the highest count of 229 vehicles per hour is less than half of what can safely and efficiently be handled by one lane of traffic during an hour. Therefore, the traffic data indicates that there should be no mobility challenges or significant level of service reduction due to the reduction in departure lanes to one per leg, especially if coupled with video detection and optimized timing throughout the intersection.

The project includes removal of the additional departure lane in the north bound and east bound direction of travel through the intersection. No crash reduction factors could be found for this tactic, but reduction factors of up to 50% are found for three lane conversions. Since the reduction on the east leg will effectively convert to a three-lane road, we can interpolate a total reduction of 50% crash reduction for this corridor (from intersection to the east limits). The added possible reduction in accidents for north bound traffic merging north of the project area will be a bonus to the overall crash mitigation for this project.

Overview of Acident Types & Patterns

Accident rates along this 19th Avenue North corridor have been above the statewide average over the past five years.

Table 1: Intersection Crash Analysis (2015-2019)

Intersection	ADT - Entering	Total Crashes	Crash Rate (per million vehicles)	Average Crash Rate
19th Ave N & N 2nd St	15,085	16	0.6	0.7

Table 2: Corridor Segment Crash Analysis (2015-2019)

Section	ADT	Total Crashes	Crash Rate (per Million VMT)	Average Crash Rate
North 2nd Street to Bridge	9,724	26	12.21	4.01

As shown on Tables #1 and #2 above, traffic accidents are well above the state-wide averages for accidents for this type of road corridor. Though the intersection crashes are near the state-wide average, it is very likely at least 24.3% of these accidents could be avoided based on simple improvements to the traffic signalization as described above.

The corridor from east of intersection to the bridge is prone to crashes, which we believe could be reduced by 50% for this section just be a reduction in departure lanes.

The table below shows the total expected number of crashes to be mitigated by implementation of these changes.

Table 3: Total Crash Reduction Interpolation

Location	Crashes	CRF	Reduction
Intersection	16	24.30%	4
East Corridor	26	50.00%	13
Total Crashes	42	40.21%	17

Based on this data, it is evident that improvements are warranted at 19th Avenue North, including the intersection of North 2nd Street, and to the Mississippi River bridge narrowing.

Pedestrian and Bicycle Factors

An additional benefit to the proposed construction will be the advanced level of protection offered to pedestrians and cyclists. There are many pedestrians and cyclists using this route between the 19th Avenue North trail and the Highway 136 Bridge. Plans included ADA crossing and pedestrian ramp accommodations, including upgrading push button and pedestrian signal heads in accordance with ADA and MUTCD standards.

Conclusion & Recommendation

This project includes full replacement of all signalization infrastructure at the intersection of 19th Avenue North & North 2nd Street, which includes the following items, all of which would have a positive effect on reducing traffic accidents at this busy intersection:

1. Full replacement of all signalization infrastructure and equipment which would modernize the intersection and bring up to current standards.

2. Implementation of a fully actuated signal system which would allow for safer and more efficient movement through the intersection for all movements. This includes video detection and multiple phases during peak and off-peak hours.

3. Added flashing left turn phases on four section heads in all directions, which has proven to be an effective countermeasure.

4. Added street lighting, retro-reflective back plating, over-sized heads.

This project also includes asphalt overlay from the intersection of North 2nd Street to the narrower pavement at the bridge just east of Roosevelt Street. Geometric changes would be made to lanes using durable pavement markings to better convey traffic through the corridor from both directions, reducing departure lanes, and adding hatched zones. Traffic signage prohibiting left turns onto Roosevelt Street will be over-sized

All sidewalk curb ramps and crosswalks would be reconstructed to allow safe pedestrian movements throughout, and all distressed pavement within the intersection will be replaced

The project cost estimate for this work is just under $500,000, and it is expected to have a Crash Reduction Factor of up to 40% once the work is completed.

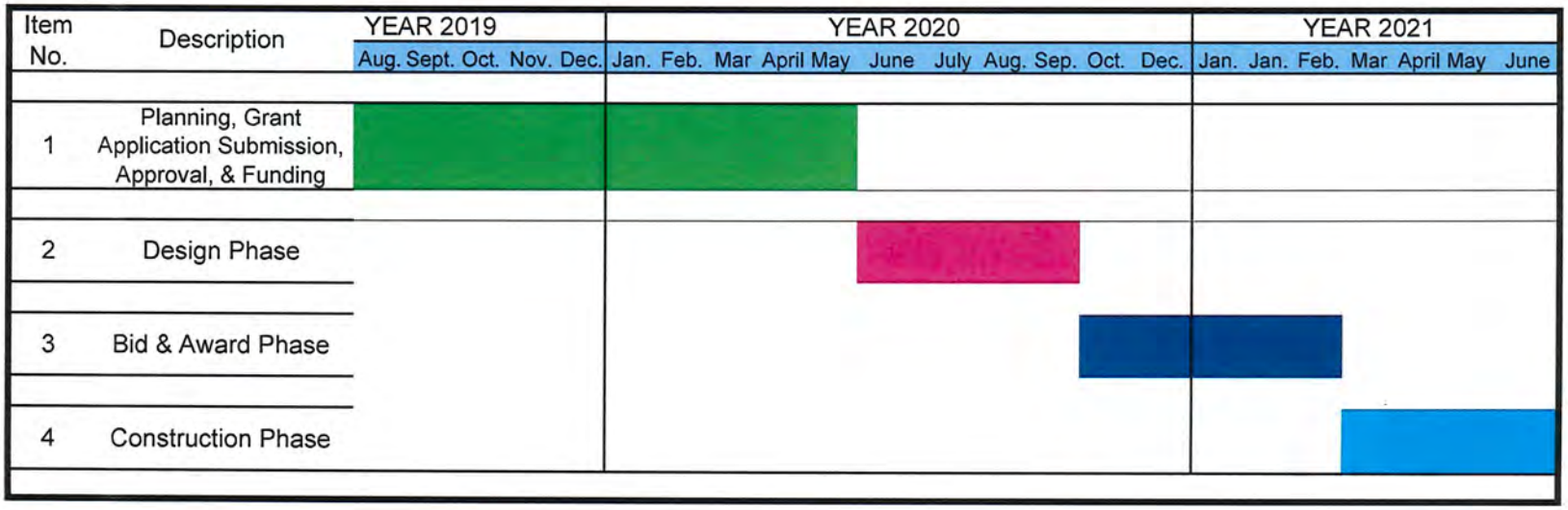
A proposed design layout of the project including aerial photographs and traffic signal information are available as attachments to this Narrative.

Please contact Jason Craft, P.E., City Engineer, City of Clinton, Iowa, for any questions related to this report. He can be reached at 563-244-3423.

City of Clinton Engineering Department
13th Avenue North Traffic Safety Improvements Project
Project D-2020

				Engineer's Estimate	
	IA DOT Eligible Items	Qty.	Unit	Unit Price	Total Price
1	Traffic Signalization at 19th Avenue North & North 2nd Street	1.00	LS	$ 225,000.00	$ 225,000.00
2	Traffic Signal Removals	1.00	LS	$ 10,000.00	$ 10,000.00
3	Painted Pavement Markings (Durable) Linear	35.00	STA	$ 130.00	$ 4,550.00
4	Painted Pavement Markings (Durable) - Symbols	20.00	EA	$ 175.00	$ 3,500.00
5	Concrete Repair/Rehab of 19th Avenue North & North 2nd Street	1,000.00	SY	$ 100.00	$ 100,000.00
6	ADA Curb Ramps at 19th Ave N & North 2nd Street	2,000.00	SF	$ 12.00	$ 24,000.00
7	ADA Curb Ramps at Roosevelt Street	800.00	SF	$ 12.00	$ 9,600.00
8	3" Asphalt Resurfacing of 13th Avenue North	616.00	Ton	$ 85.00	$ 52,360.00
9	Surveying & Engineering	1.00	LS	$ 50,000.00	$ 50,000.00
10	Trail on North side of 19th Ave N	6,500.00	SF	$ 10.00	$ 65,000.00
	Total Project Costs				$ 544,010.00
	TSIP Eligible	$ 479,010.00			
	City of Clinton Funded	$ 65,000.00			

Project Schedule
CITY OF CLINTON TSIP PROJECT
NORTH 3RD STREET 3 LANE CONVERSION PROJECT



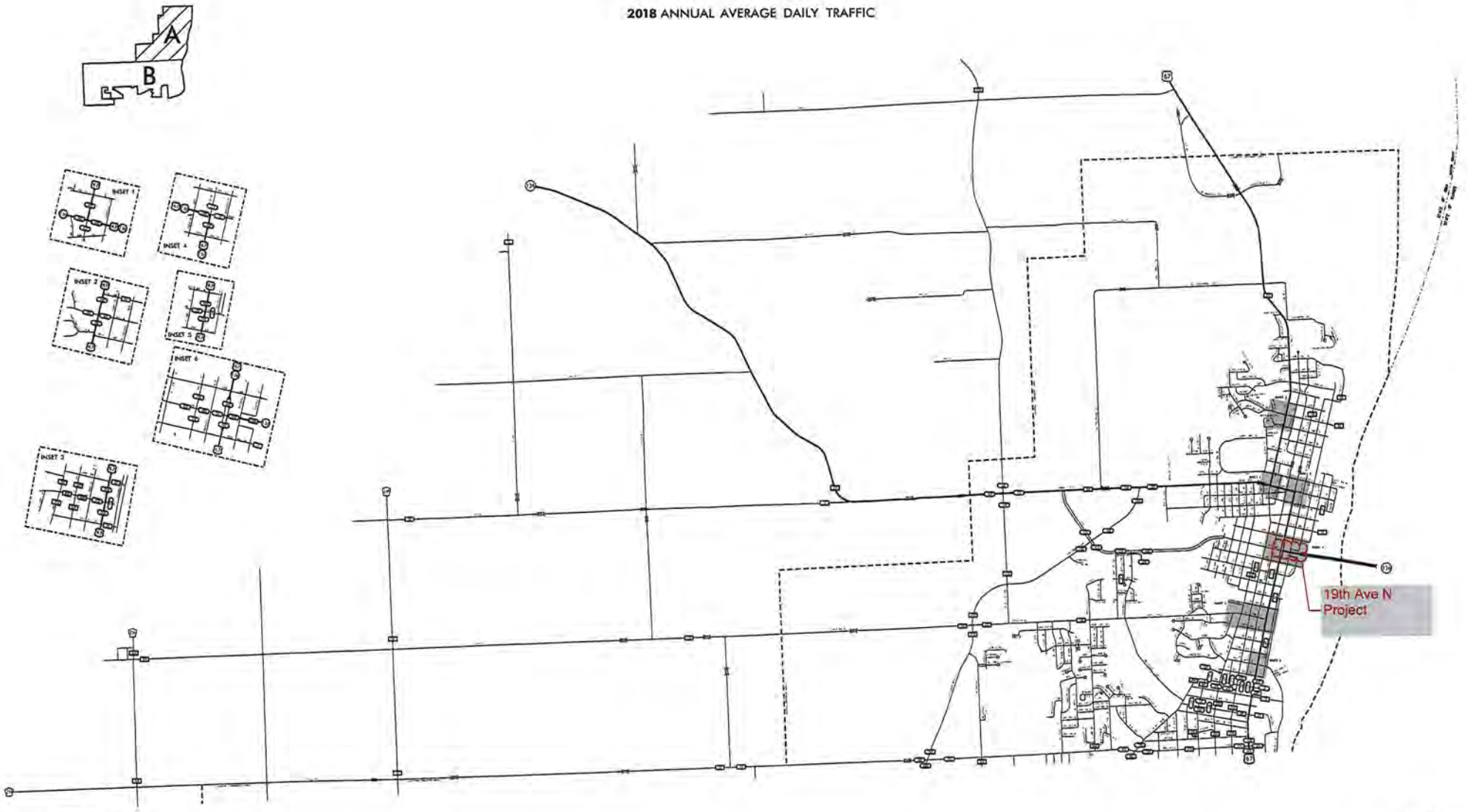
IOWADOT

TRAFFIC FLOW MAP OF

CLINTON A

CLINTON COUNTY

2018 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 00

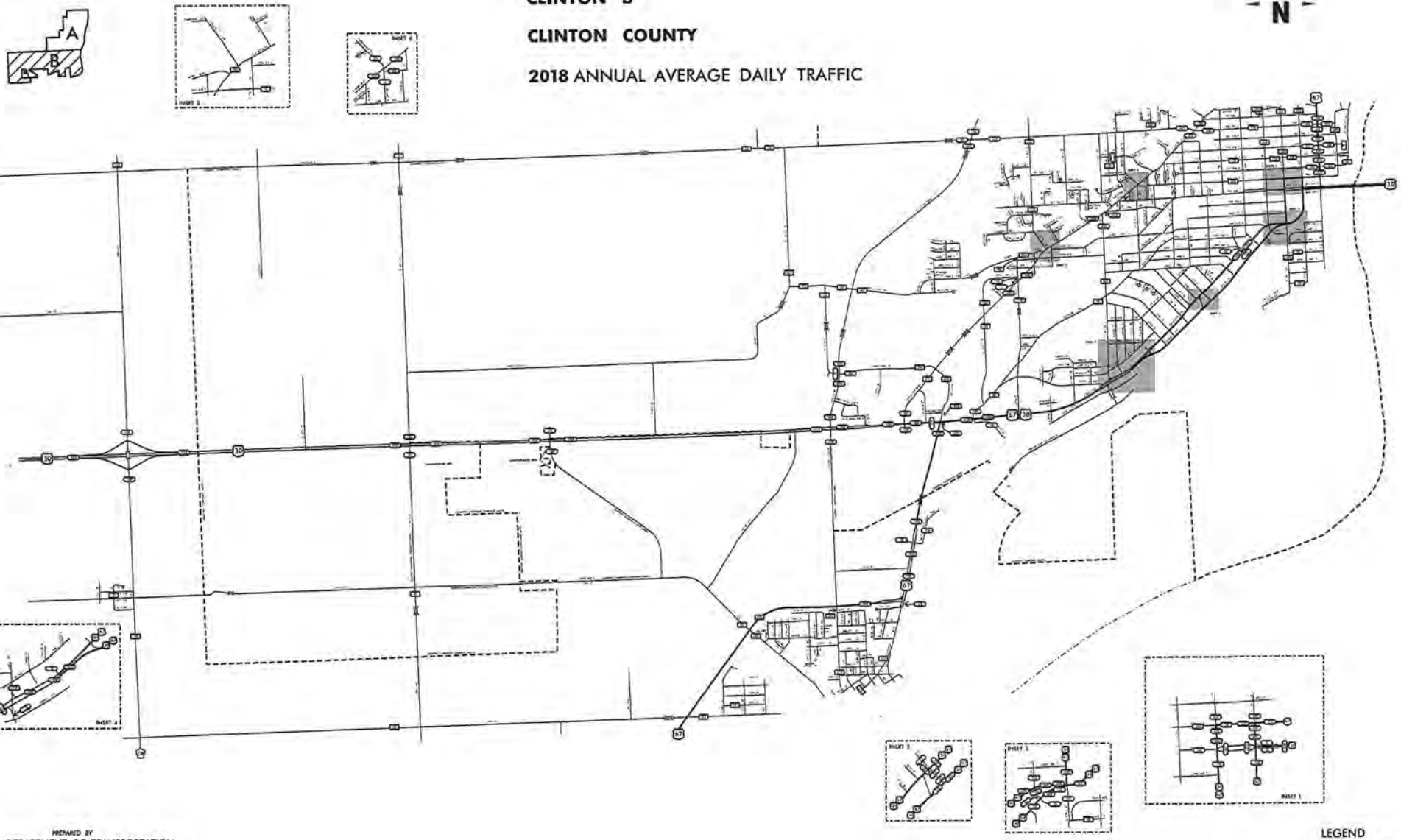
IOWA DOT

TRAFFIC FLOW MAP OF

CLINTON B

CLINTON COUNTY

2018 ANNUAL AVERAGE DAILY TRAFFIC



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

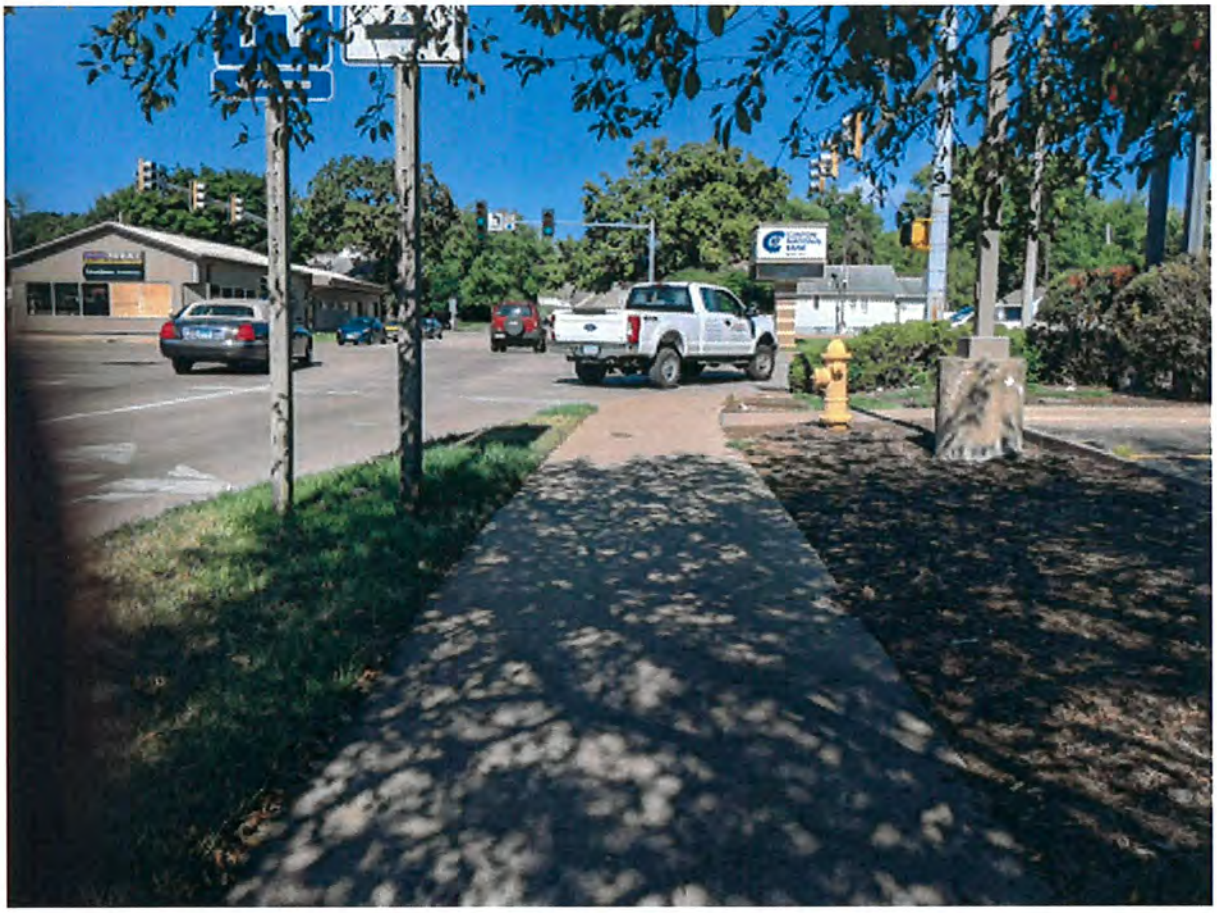
19th Avenue North & North 2nd Street

Note: Picture taken facing easterly along 19th Avenue N toward North 2nd Street

Improvements to the signal need to be made as follows:

- Addition of Protected Left Turn Arrows with flashing arrows for 19th Avenue North Traffic
- Modification of Traffic Signal Timing & Phasing
- Replacement & Modernization of signalization infrastructure
- ADA Curb ramps and pedestrian poles

19th Avenue North & North 2nd Street

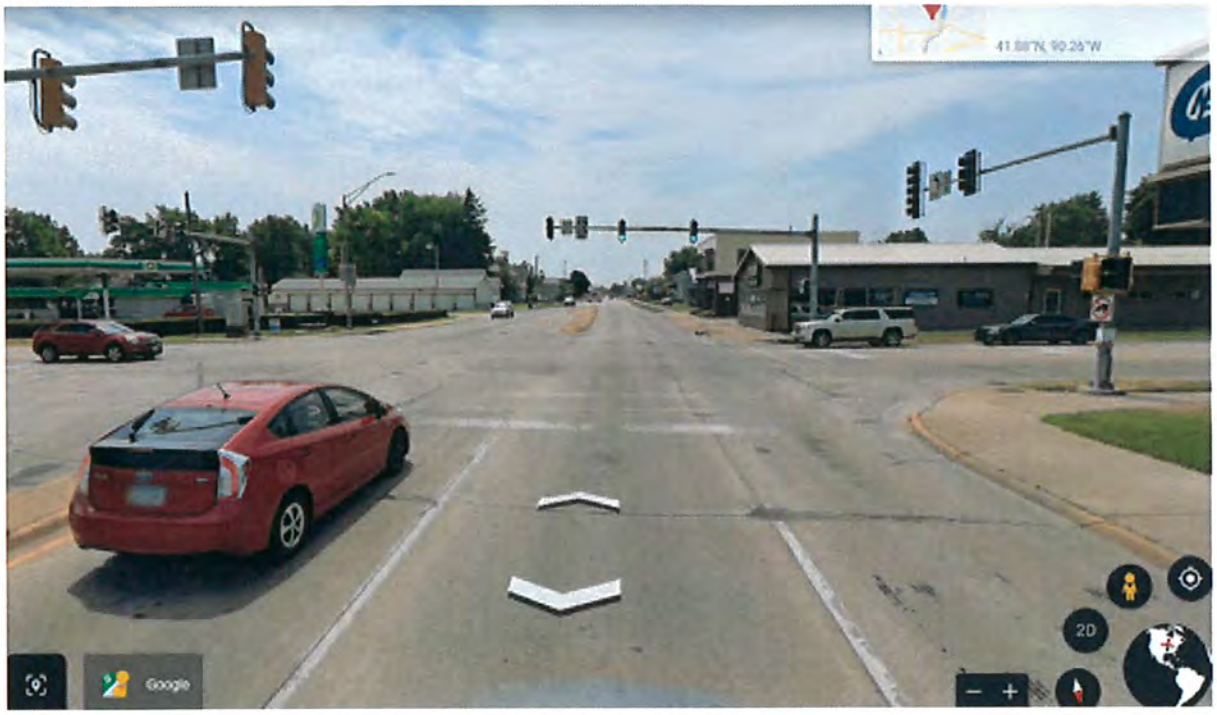


Note: Picture taken facing westerly along 19th Avenue N toward North 2nd Street

Improvements to the signal need to be made as follows:

- Addition of Protected left turn flashing arrows for 19th Avenue North traffic
- Modification of Traffic Signal Timing & Phasing
- Replacement & Modernization of signalization infrastructure
- ADA Curb ramps and pedestrian poles

19th Avenue North & North 2nd Street

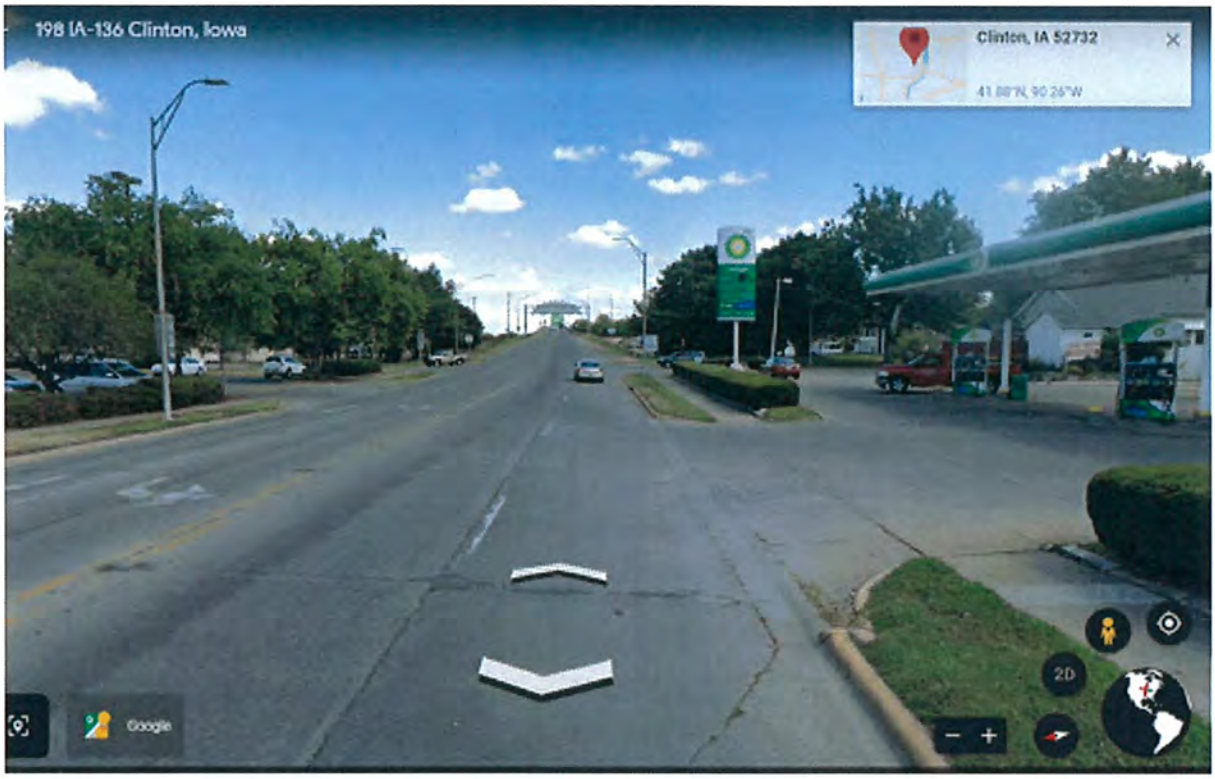


Note: Google Earth street view along North 2nd Street facing south toward 19th Avenue North

Improvements to the signal need to be made as follows:

- Addition of Protected Left Turn Arrows with flashing arrows for North 2nd Street Traffic
- Modification of Traffic Signal Timing & Phasing
- Replacement & Modernization of signalization infrastructure
- ADA Curb ramps and pedestrian poles

19th Avenue North (Highway 136)

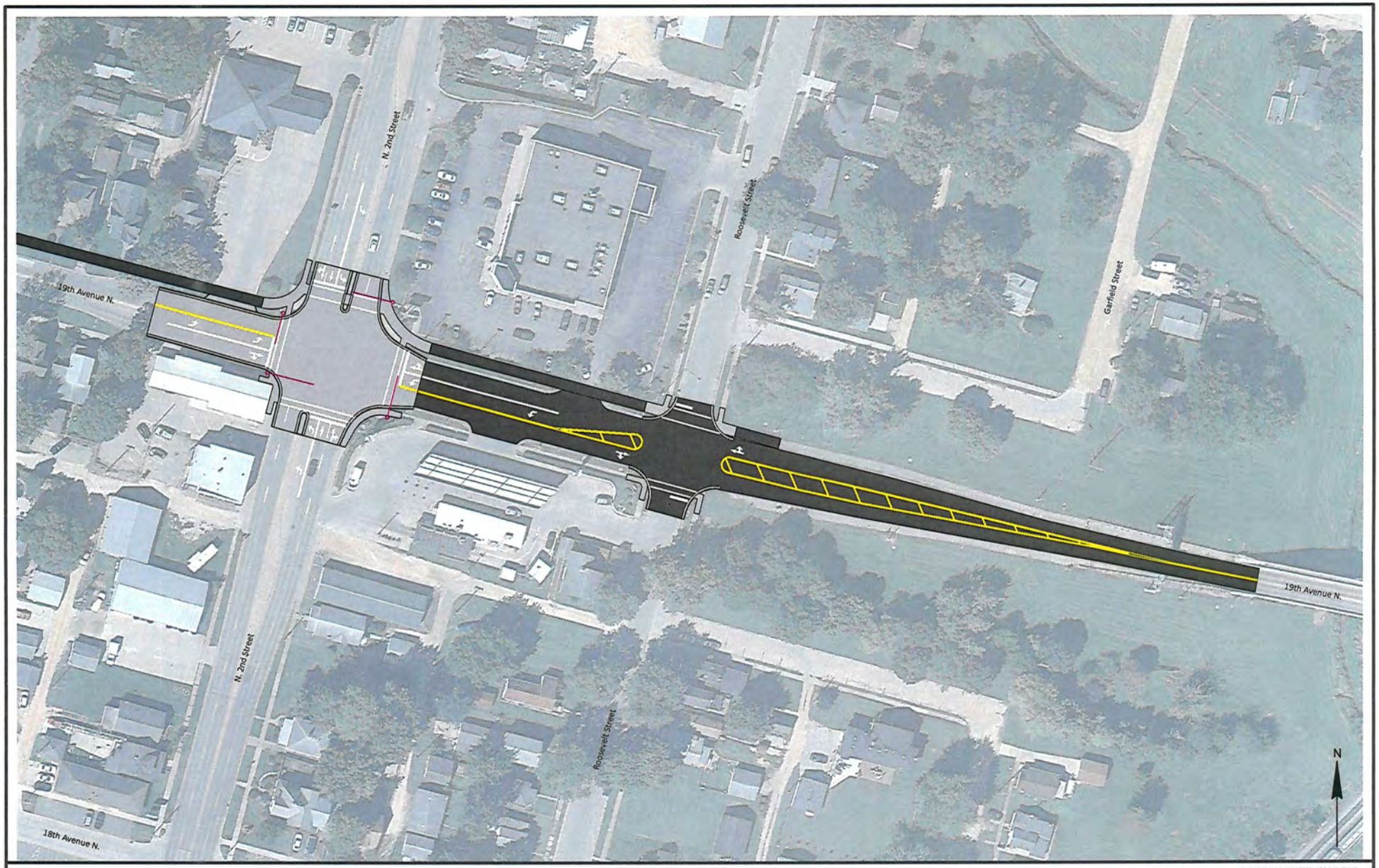


Note: Google Earth street view along 19th Avenue North facing east from intersection of North 2nd Street toward Mississippi River bridge

Improvements to the street to be made as follows:

- Conversion of the road to a three-lane road with one east bound lane to avoid conflicts from unnecessary side by side departure lanes

- Asphalt overlay and durable pavement markings
- ADA Curb ramps at Roosevelt Street
- Enhanced Signage



N. 2ND STREET & 19TH AVENUE N.
CONCEPTUAL SIGNALIZED ALTERNATIVE
CLINTON, IA

MSA
ENGINEERING | ARCHITECTURE | SURVEYING
FUNDING | PLANNING | ENVIRONMENTAL
www.msa-ps.com

PLOT DATE: Monday, July 13, 2020 2:58:24 PM, G:\1111\1192411192400\CADD\Signalized Intersection Concept.dwg


Project Area Limits
20th AVE. N.
21st AVE. N.
19th AVE. N.
GRANT ST.
MC KINLEY ST.
IA 136 19th AVE. N.
18th AVE. N.
200 ft

Iowa Crash Analysis Tool
Quick Report
2015-2020

Crash Severity	41
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	12
Property Damage Only	25

Injury Status Summary	22
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	5
Possible (complaint of pain/injury)	15
Unknown	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	247,742.00
Average (per crash dollars):	6,042.49
Total Vehicles:	82.00
Average (per crash):	2.00
Total Occupants:	118.00
Average (per crash):	2.88

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.51
Major Injuries/Crash:	0.02
Minor Injuries/Crash:	0.12
Possible/Unknown Injuries/Crash:	0.37

Major Cause			39
Animal	0	Ran traffic signal	2
Ran stop sign	2	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	1
FTYROW: From stop sign	8	FTYROW: From yield sign	0
FTYROW: Making left turn	4	FTYROW: From driveway	2
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	1	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	2
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	1	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...	1
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	1	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	8
Unknown	6	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	2	0	2	0	5
Monday	0	0	0	0	0	2	3	1	1	0	0	0	0	7
Tuesday	0	0	0	0	0	0	0	3	1	0	0	0	0	4
Wednesday	0	1	0	0	0	0	2	1	2	0	0	0	0	6
Thursday	0	0	0	0	0	0	1	3	1	0	0	0	0	5
Friday	0	0	0	0	0	0	1	4	1	2	0	1	0	9
Saturday	0	1	0	0	1	1	0	0	0	1	0	1	0	5
Total	1	2	0	0	1	3	7	12	6	5	0	4	0	41

Manner of Crash Collision	41
Non-collision (single vehicle)	3
Head-on (front to front)	0
Rear-end (front to rear)	8
Angle, oncoming left turn	5
Broadside (front to side)	15
Sideswipe, same direction	5
Sideswipe, opposite direction	1
Rear to rear	0
Rear to side	0
Not reported	0
Other	3
Unknown	1

Surface Conditions	41
Dry	35
Wet	5
Ice/frost	0
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			82
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	1
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	1
Snow bank	0	Fence	0
Wall	0	Building	1
Other fixed object	0	None (no fixed object struck)	79

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	0	0	0	0	0
= 16	1	2	0	0	3
= 17	1	1	1	0	3
= 18	3	0	1	0	4
= 19	0	3	1	0	4
= 20	1	1	0	0	2
>= 21 and <= 24	3	6	0	0	9
>= 25 and <= 29	4	1	1	0	6
>= 30 and <= 34	1	2	0	0	3
>= 35 and <= 39	2	3	0	0	5
>= 40 and <= 44	6	2	0	0	8
>= 45 and <= 49	1	3	0	0	4
>= 50 and <= 54	1	0	2	0	3
>= 55 and <= 59	1	0	0	0	1
>= 60 and <= 64	2	0	1	0	3
>= 65 and <= 69	1	3	1	0	5
>= 70 and <= 74	1	1	0	0	2
>= 75 and <= 79	0	1	1	0	2
>= 80 and <= 84	0	1	0	0	1
>= 85 and <= 89	0	1	0	0	1
>= 90 and <= 94	0	2	0	0	2
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	3	0	3
Total	29	33	12	0	74

Drug/Alcohol Related	41
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	41

Alcohol Test Given	82
None	68
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	14

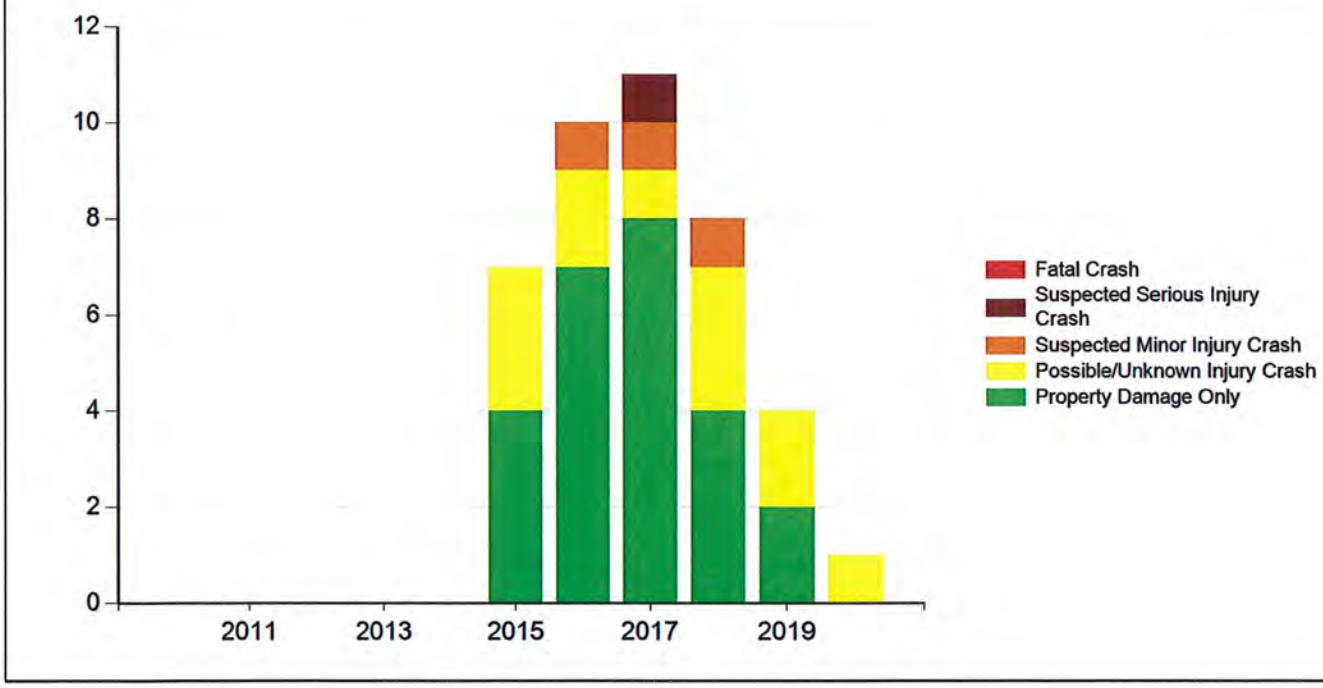
Drug Test Given	82
None	68
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	14

Drug Test Result	82
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	82
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
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	3	4	7
2016	0	0	1	2	7	10
2017	0	1	1	1	8	11
2018	0	0	1	3	4	8
2019	0	0	0	2	2	4
2020	0	0	0	1	0	1
Total	0	1	3	12	25	41

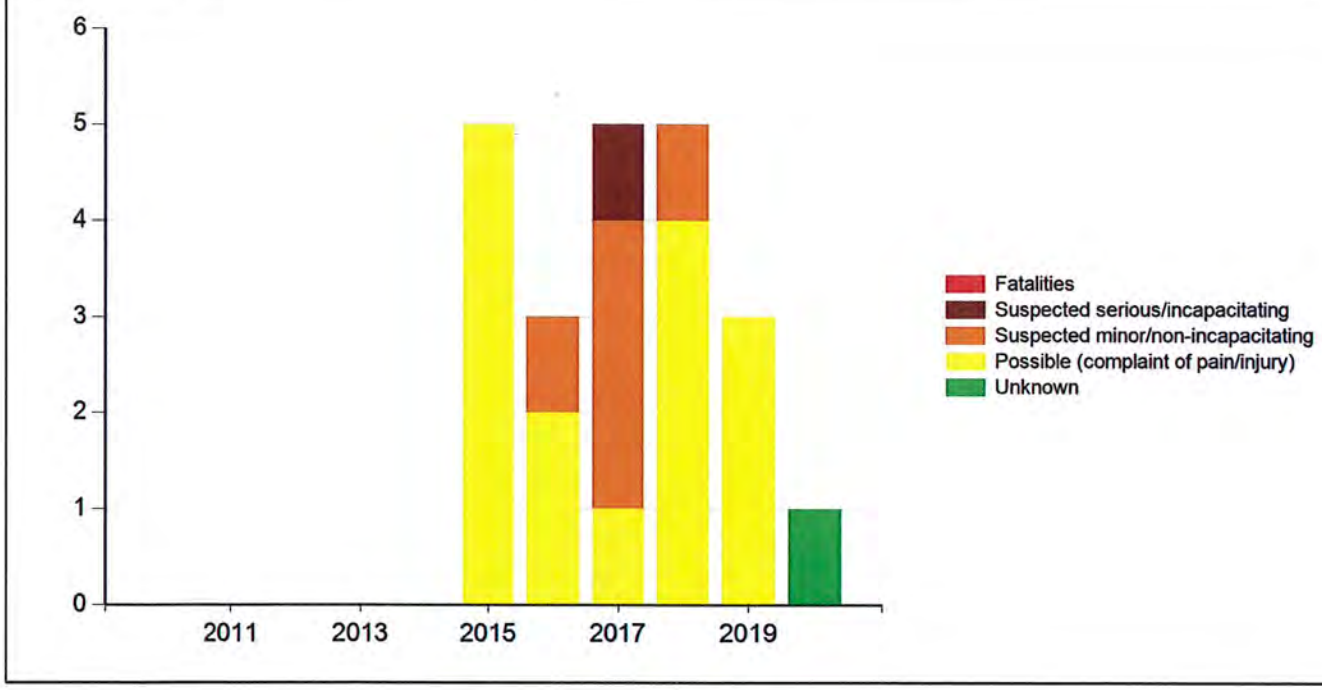
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	5	0	5
2016	0	0	1	2	0	3
2017	0	1	3	1	0	5
2018	0	0	1	4	0	5
2019	0	0	0	3	0	3
2020	0	0	0	0	1	1
Total	0	1	5	15	1	22

Injury Status/Year



Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

19th Avenue North & 2nd Street, and to Roosevelt Street

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

23270915099

Count Date:

Wednesday, June 20, 2018

County:

Clinton

Location Description:

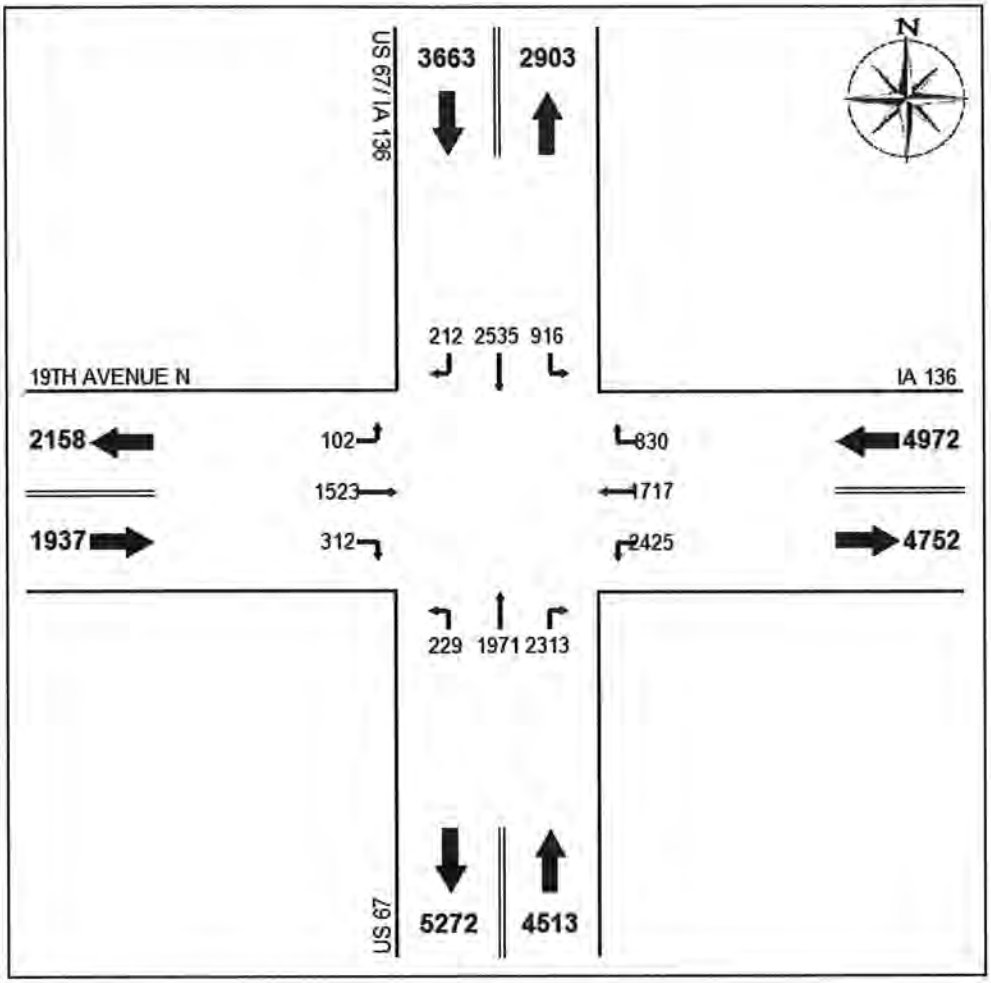
US67, IA136 & 19TH AVE N

Volume Factor: 0.880

Pass Class Factor: 0.895

SU Class Factor: 0.753

Combo Class Factor: 0.725



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	5	14	3	26	6	5	3	23	19	2	8	2
01:00	1	11	1	10	13	4	0	18	13	1	13	0
02:00	8	16	1	10	7	11	0	13	5	0	2	2
03:00	7	11	1	6	2	3	1	7	6	0	6	1
04:00	7	12	0	14	8	9	0	4	13	0	21	0
05:00	19	43	0	46	70	13	5	12	32	0	41	4
06:00	39	129	12	107	99	39	6	40	65	1	76	14
07:00	48	162	14	188	147	41	13	81	83	0	76	26
08:00	64	168	14	162	123	44	13	102	84	7	75	24
09:00	57	201	16	153	99	59	12	152	147	12	89	26
10:00	65	217	16	180	106	47	21	139	138	9	93	27
11:00	74	219	13	187	93	51	12	121	171	7	100	25
12:00	73	229	27	233	122	61	26	167	201	8	81	25
13:00	69	203	17	183	131	66	20	160	199	9	105	35
14:00	71	197	20	202	139	64	24	204	211	7	133	25
15:00	74	188	22	216	154	84	23	184	220	15	167	27
16:00	94	207	24	215	163	78	22	123	204	12	169	12
17:00	84	177	11	176	139	106	15	189	222	8	164	25
18:00	59	137	8	158	114	49	13	169	186	7	116	15

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
19:00	39	80	6	88	64	33	5	101	127	3	64	12
20:00	32	82	8	49	40	21	7	79	84	2	48	12
21:00	28	55	3	46	29	21	2	61	72	3	28	5
22:00	10	61	1	40	32	21	6	36	48	1	20	2
23:00	12	37	2	22	23	11	7	33	41	0	12	4

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

Station Number:
23270915099

Count Date:
Wednesday, June 20, 2018

County:
Clinton

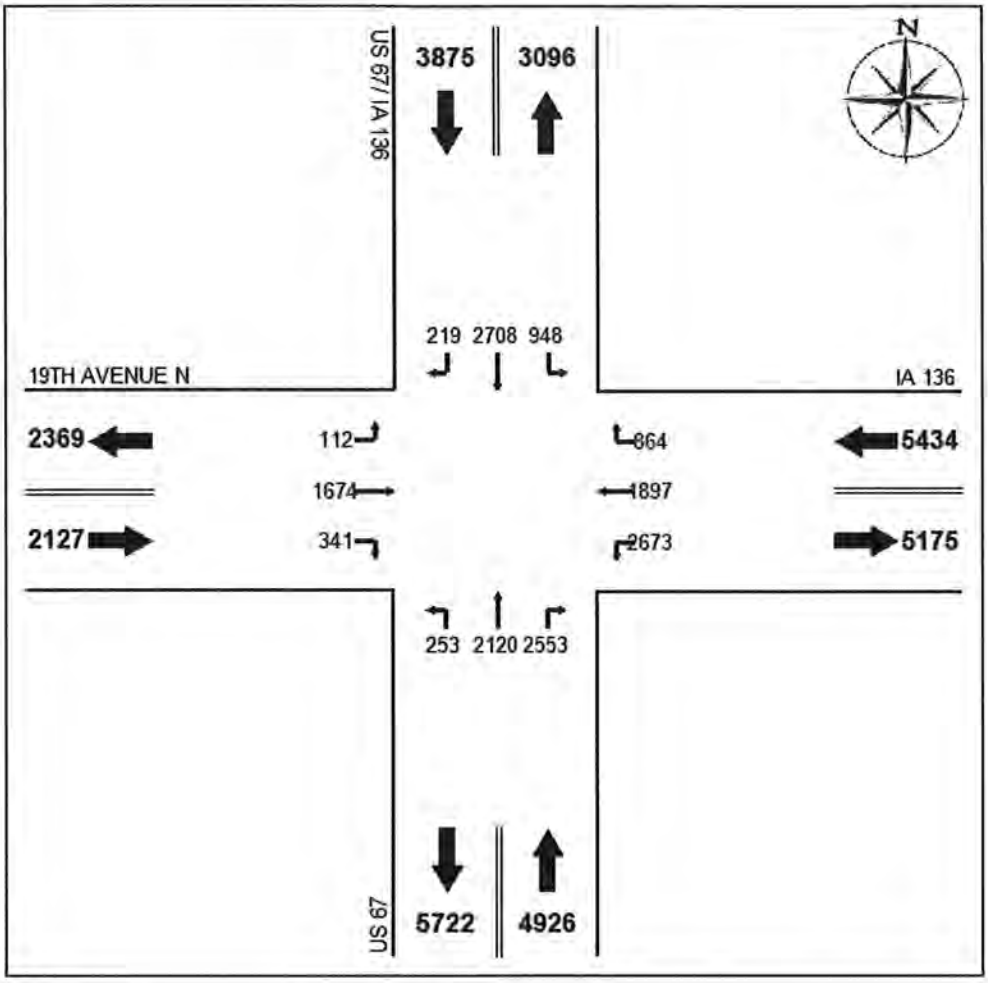
Location Description:
US67, IA136 & 19TH AVE N

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

Combo Class Factor: N/A



Raw Data-Passenger Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
00:00	5	14	3	26	6	5	2	23	19	2	8	2
01:00	1	11	1	10	13	4	0	18	13	1	13	0
02:00	8	16	1	10	6	11	0	13	4	0	2	2
03:00	5	11	1	5	2	3	1	7	6	0	6	1
04:00	6	11	0	13	8	9	0	3	13	0	21	0
05:00	16	43	0	46	70	12	5	11	32	0	41	4
06:00	33	124	12	104	99	38	6	32	65	1	73	14
07:00	41	158	14	180	146	39	13	73	82	0	74	25
08:00	55	162	14	159	120	34	13	92	81	7	72	23
09:00	44	191	15	151	99	52	12	134	142	10	84	24
10:00	57	211	16	176	104	42	21	129	134	9	90	25
11:00	67	211	12	185	90	46	12	115	168	7	99	25
12:00	68	218	24	231	122	58	25	160	195	8	78	25
13:00	63	177	16	180	130	59	20	154	196	9	102	34
14:00	66	167	17	197	133	59	24	197	206	7	131	24
15:00	69	175	22	213	151	78	22	177	216	15	165	27
16:00	89	196	17	211	160	70	22	120	204	12	166	12
17:00	82	170	10	176	138	96	15	184	222	8	163	24
18:00	53	130	4	158	112	44	13	168	184	7	114	15

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
19:00	38	79	6	88	64	33	5	101	127	3	64	12
20:00	32	81	8	47	40	21	7	79	84	2	48	12
21:00	28	55	3	46	29	19	2	61	72	3	28	5
22:00	10	60	1	40	32	21	6	36	48	1	20	2
23:00	12	37	2	21	23	11	7	33	40	0	12	4

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

Station Number:
23270915099

Count Date:
Wednesday, June 20, 2018

County:
Clinton

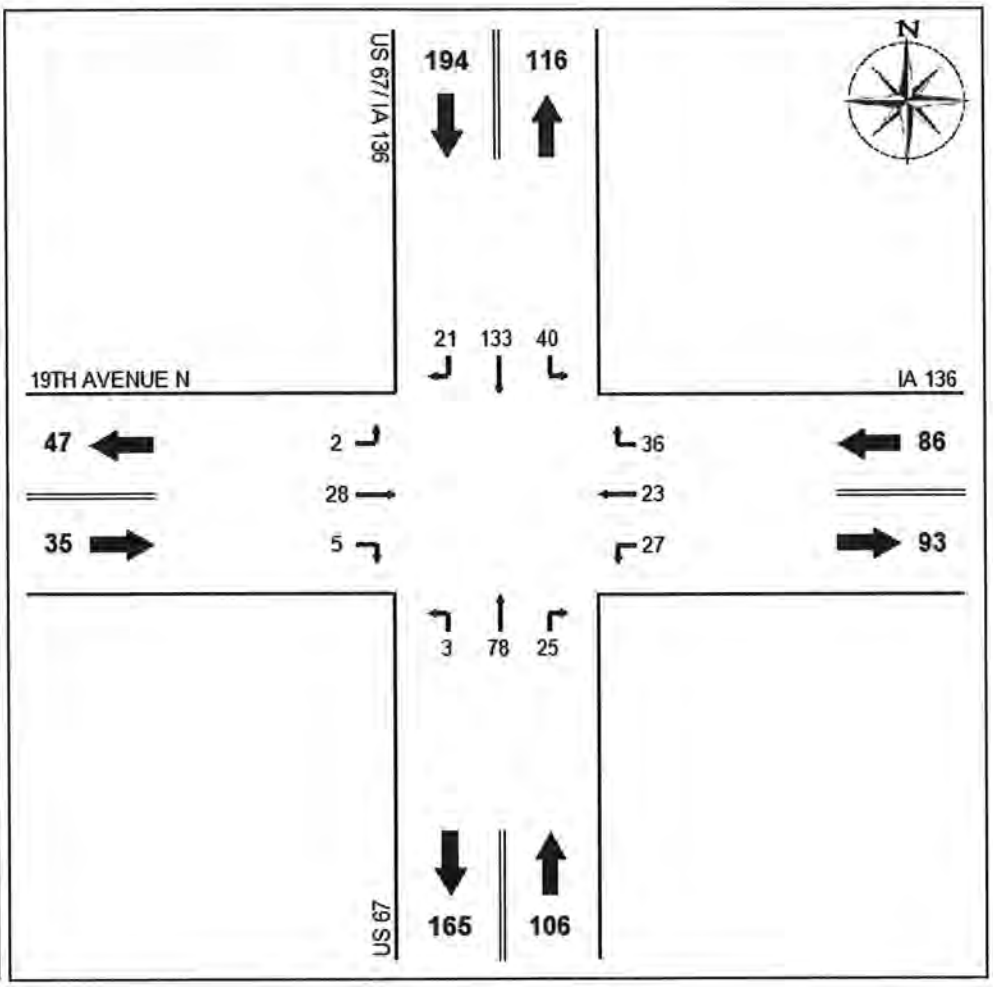
Location Description:
US67, IA136 & 19TH AVE N

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

Combo Class Factor: N/A



Raw Data-Single-Unit Trucks:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
00:00	0	0	0	0	0	0	1	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	1	0	0	0
03:00	0	0	0	1	0	0	0	0	0	0	0	0
04:00	0	1	0	0	0	0	0	1	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	4	0	2	0	0	0	7	0	0	3	0
07:00	4	4	0	6	1	0	0	6	1	0	1	0
08:00	3	5	0	3	2	1	0	10	1	0	3	0
09:00	4	10	1	0	0	4	0	13	3	2	3	1
10:00	4	5	0	4	2	1	0	8	4	0	3	1
11:00	3	7	1	1	2	3	0	3	2	0	1	0
12:00	3	11	3	0	0	2	1	6	4	0	2	0
13:00	5	20	1	2	1	2	0	4	1	0	2	1
14:00	1	29	3	4	6	3	0	4	4	0	2	1
15:00	3	10	0	1	3	4	1	7	2	0	2	0
16:00	3	10	7	2	3	6	0	3	0	0	3	0
17:00	2	7	1	0	1	5	0	5	0	0	1	1
18:00	4	7	4	0	2	4	0	1	2	0	2	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
19:00	1	1	0	0	0	0	0	0	0	0	0	0
20:00	0	1	0	1	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	1	0	0	0	0	0	0
22:00	0	1	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

Station Number:

23270915099

Count Date:

Wednesday, June 20, 2018

County:

Clinton

Location Description:

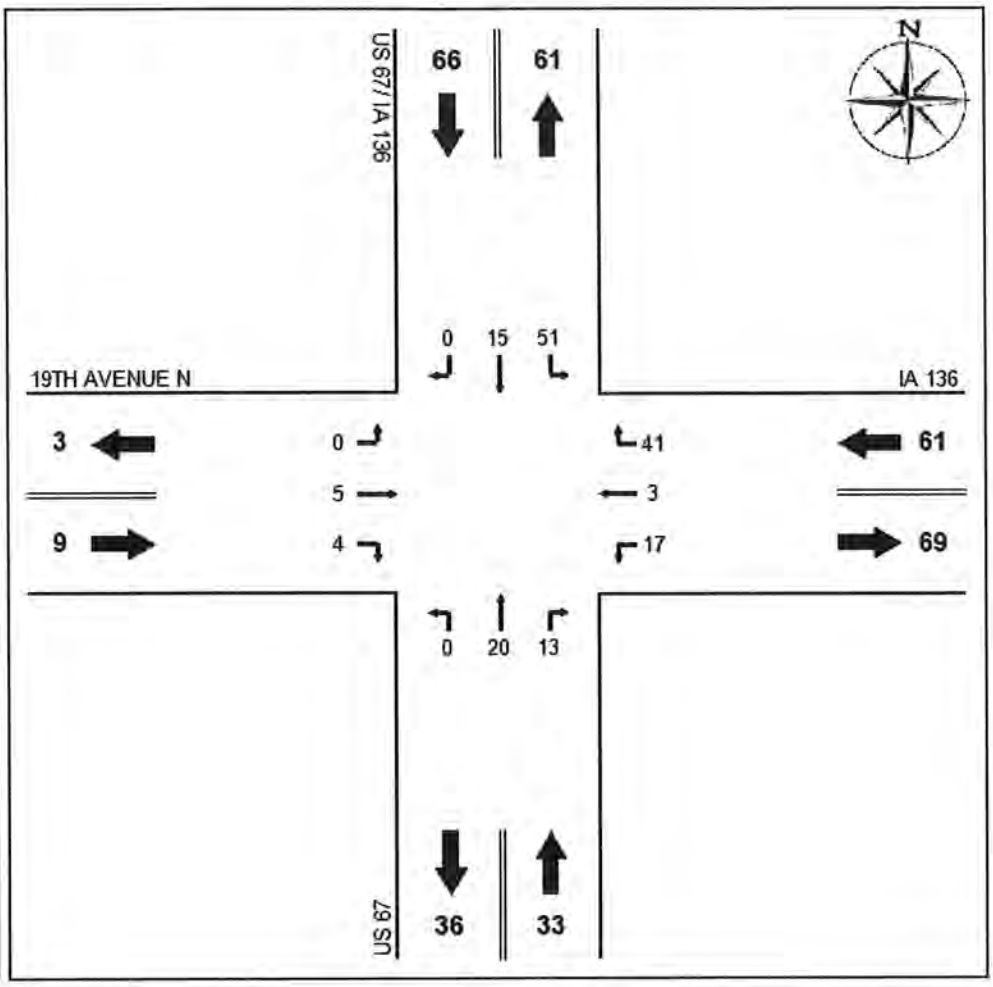
US67, IA136 & 19TH AVE N

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

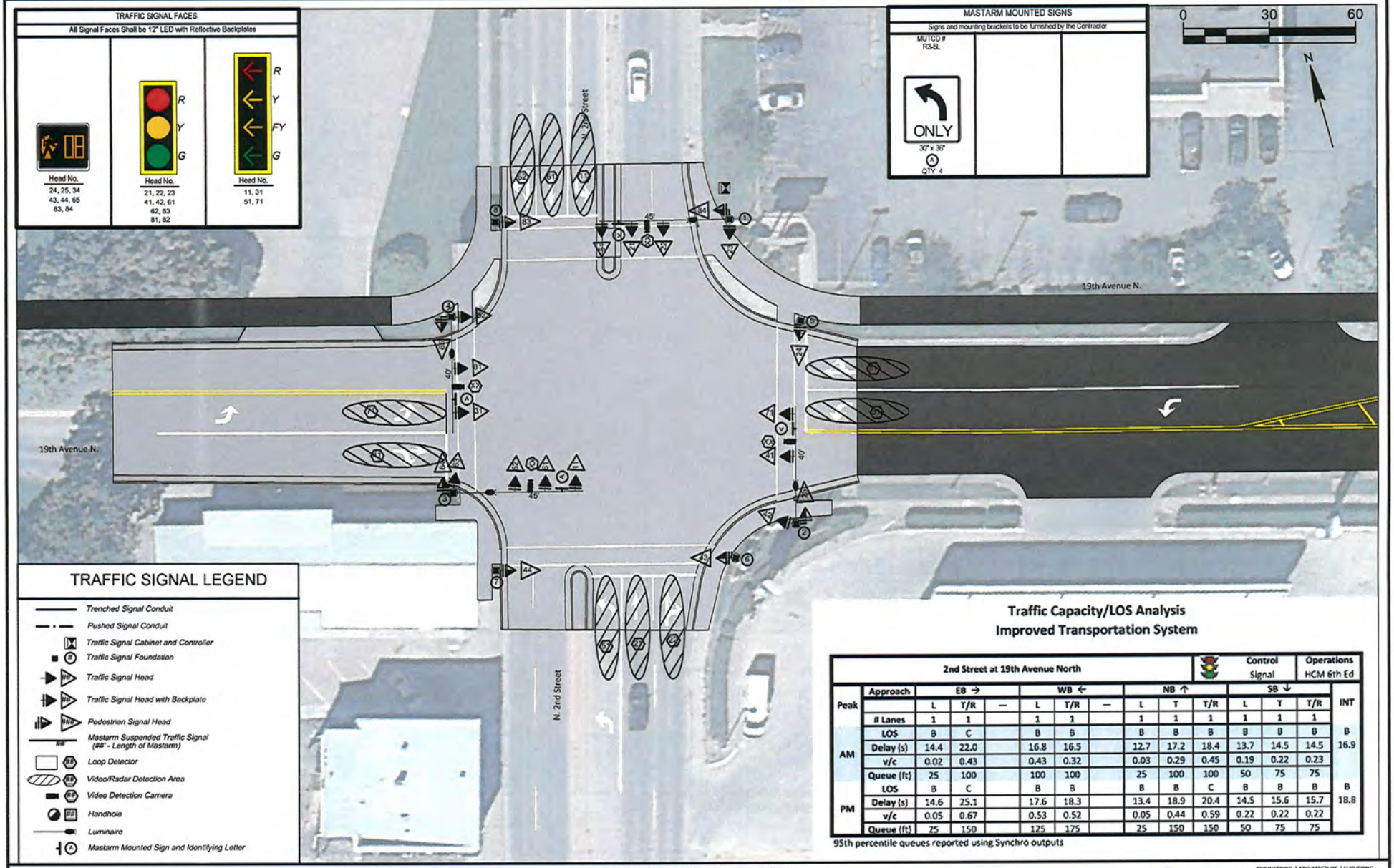
Combo Class Factor: N/A



Raw Data-Combination Trucks:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
00:00	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	1	0	0	0	0	0	0	0
03:00	2	0	0	0	0	0	0	0	0	0	0	0
04:00	1	0	0	1	0	0	0	0	0	0	0	0
05:00	3	0	0	0	0	1	0	1	0	0	0	0
06:00	6	1	0	1	0	1	0	1	0	0	0	0
07:00	3	0	0	2	0	2	0	2	0	0	1	1
08:00	6	1	0	0	1	9	0	0	2	0	0	1
09:00	9	0	0	2	0	3	0	5	2	0	2	1
10:00	4	1	0	0	0	4	0	2	0	0	0	1
11:00	4	1	0	1	1	2	0	3	1	0	0	0
12:00	2	0	0	2	0	1	0	1	2	0	1	0
13:00	1	6	0	1	0	5	0	2	2	0	1	0
14:00	4	1	0	1	0	2	0	3	1	0	0	0
15:00	2	3	0	2	0	2	0	0	2	0	0	0
16:00	2	1	0	2	0	2	0	0	0	0	0	0
17:00	0	0	0	0	0	5	0	0	0	0	0	0
18:00	2	0	0	0	0	1	0	0	0	0	0	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
19:00	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	1	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	1	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	1	0	0	0	0	1	0	0	0



Traffic Capacity/LOS Analysis
Improved Transportation System

2nd Street at 19th Avenue North															Control: Signal	Operations: HCM 6th Ed
	Approach	EB →			WB ←			NB ↑			SB ↓					
Peak		L	T/R	—	L	T/R	—	L	T	T/R	L	T	T/R			
	# Lanes	1	1		1	1		1	1	1	1	1	1			
AM	LOS	B	C		B	B		B	B	B	B	B	B		B	
	Delay (s)	14.4	22.0		16.8	16.5		12.7	17.2	18.4	13.7	14.5	14.5		16.9	
	v/c	0.02	0.43		0.43	0.32		0.03	0.29	0.45	0.19	0.22	0.23			
	Queue (ft)	25	100		100	100		25	100	100	50	75	75			
PM	LOS	B	C		B	B		B	B	C	B	B	B		B	
	Delay (s)	14.6	25.1		17.6	18.3		13.4	18.9	20.4	14.5	15.6	15.7		18.8	
	v/c	0.05	0.67		0.53	0.52		0.05	0.44	0.59	0.22	0.22	0.22			
	Queue (ft)	25	150		125	175		25	150	150	50	75	75			

95th percentile queues reported using Synchro outputs

N. 2ND STREET & 19TH AVENUE N.
SIGNAL LAYOUT CONCEPT
CLINTON, IA

MSA
ENGINEERING | ARCHITECTURE | SURVEYING
FUNDING | PLANNING | ENVIRONMENTAL
www.msa-ps.com

PLOT DATE: Monday, August 3, 2020 3:10:35 PM, \\msa-ps.com\msfiles\Projects\111\182\41\132400\TECH\DOCS\Signalized Intersection Concept.dwg

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Clinton | Prepared by: Jason Craft | Date Prepared: Jul 28, 2020

Location: 19th Avenue North & North 2nd Street

Improvement

Proposed Improvement(s): Traffic Safety Improvements to 19th Avenue North & North 2nd Street

New Traffic Signals with coordination, controller/cabinet, detection, flashing arrows, backplates, lighting, lane reductions

$ 479,010	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ 2,500	Other Annual Cost (after initial year), **AC**	40	Crash Reduction Factor (integer), **CRF**
$ 33,976	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 512,986**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IADOT | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.13	9,724	East Leg to Bridge
0.04	4,095	West Leg
0.04	6,566	North Leg
0.04	9,785	South Leg
0.25	miles total	

1.0% Projected Traffic Growth (0%-10%), **G**

2,082 Current Vehicle Miles / Day, **VM**

2,540 End of Life Veh. Miles / Day

759,915 Current Veh. Miles / Year, **AM**

16,732,580 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
16	Injury Crashes →	3	Minor Injuries @	$65,000	$ 195,000
		12	Possible Injuries @	$35,000	$ 420,000
25	Property Damage Only		(assumed cost per crash)	$7,400	$ 303,400
			-OR- enter all Property Costs of all crashes:		
41	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,243,400

8.20	Current Crashes / Year, **AA** = TA / T	**1,079.1**	Crashes / HMVM, Crash Rate, **CR**
$ 30,327	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
180.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 1,469,272**	Present Value of Avoided Crashes, **BENEFIT**
3.28	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 99,472	Crash Costs Avoided in First Year, AAR x AVCR		
72.2	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $1,469,272 : $512,986 = **2.86** : 1

Signature: Scott Maddasion (Aug 13, 2020 10:02 CDT)

Email: smaddasion@cityofclintoniowa.us

Full TSIP Application - 19th Ave N

Final Audit Report 2020-08-13

Created:	2020-08-13
By:	Lisa Frederick (lisafrederick@cityofclintoniowa.us)
Status:	Signed
Transaction ID:	CBJCHBCAABAAIkZ_ZV0I6SHDAa4scBauOOmLWM4vyJbD

"Full TSIP Application - 19th Ave N" History

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2020-08-13 - 2:41:37 PM GMT

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Signature Date: 2020-08-13 - 3:02:27 PM GMT - Time Source: server- IP address: 174.192.141.212

Signed document emailed to Lisa Frederick (lisafrederick@cityofclintoniowa.us) and Scott Maddasion (smaddasion@cityofclintoniowa.us)
2020-08-13 - 3:02:27 PM GMT

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 13, 2020

Location / Title of Project US 6 & Berkshire Pkwy/SE Waco Pl

Applicant City of Clive

Contact Person Jeff May, PE Title Public Works Director

Complete Mailing Address 2123 NW 111th Street

Clive, Iowa 50325-7077

Phone (515) 223-6231 (Area Code) E-Mail JMay@cityofclive.com

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

Co-Applicant(s) City of Waukee

Contact Person Rudy Koester, PE Title Public Works Director

Complete Mailing Address 805 University Avenue

Waukee, Iowa

Phone (515) 978-7920 (Area Code) E-Mail rkoester@waukee.org

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 398,335
Total Project Cost	$ 466,526
Safety Funds Requested	$ 398,335

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 **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 CLIVE

Signed: _____ 8/11/2020
Signature Date Signed

JEFF M MAY
Printed Name

Attest: _____ 8/11/2020
Signature Date Signed

Tienyn Potratz
Printed Name

RESOLUTION NO. 2020-211

A RESOLUTION AUTHORIZING THE CITY OF CLIVE, IOWA, TO SUBMIT AN IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION FOR PARTIAL FUNDING OF THE US 6 & BERKSHIRE PARKWAY/SE WACO PLACE TRAFFIC SIGNALIZATION AND INTERSECTION PROJECT

WHEREAS, the City of Clive, Iowa, recognizes the need for traffic capacity and safety improvements at the US 6 & Berkshire Parkway/SE Waco Place intersection; and

WHEREAS, the proposed improvements to the intersection of US 6 & Berkshire Parkway/SE Waco Place includes the addition of traffic signalization and the extension of left and right turn lanes on US 6 to improve traffic operations; and

WHEREAS, the funding application would be submitted jointly with the City of Waukee due to the joint intersection ownership;

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

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

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

3. The Clive 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 27 day of August, 2020.

CITY OF CLIVE, IOWA

By: _____
Scott Cirksena, Mayor

Attest:

_____
Matthew Graham, City Clerk

THE CITY OF WAUKEE, IOWA

RESOLUTION 2020-314

AUTHORIZING THE CITY OF WAUKEE, IOWA, TO SUBMIT AN IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION FOR PARTIAL FUNDING OF THE US 6 & BERKSHIRE PARKWAY/SE WACO PLACE TRAFFIC SIGNALIZATION AND INTERSECTION PROJECT

IN THE NAME AND BY THE AUTHORITY OF THE CITY OF WAUKEE, IOWA

WHEREAS, the City of Waukee, Dallas County, State of Iowa, is a duly organized Municipal Organization; **AND,**

WHEREAS, the City of Waukee, Iowa, recognizes the need for traffic capacity and safety improvements at the US 6 & Berkshire Parkway/SE Waco Place intersection; **AND,**

WHEREAS, the proposed improvements to the intersection of US 6 & Berkshire Parkway/SE Waco Place includes the addition of traffic signalization and the extension of left and right turn lanes on US 6 to improve traffic operations; **AND,**

WHEREAS, the funding application would be submitted jointly with the City of Clive due to the joint intersection ownership;

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

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

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

3. The 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 17th day of August, 2020.

Courtney Clarke, Mayor

Attest:

Rebecca D. Schuett, City Clerk

RESULTS OF VOTE:	AYE	NAY	ABSENT	ABSTAIN
Anna Bergman	X			
R. Charles Bottenberg	X			
Chris Crone	X			
Larry R. Lyon	X			
Ben Sinclair	X			

NARRATIVE

Existing Conditions

The project includes improvements to the intersection of Hickman Road (U.S. Highway 6) and Berkshire Parkway/SE Waco Place in the cities of Clive and Waukee. The limits of the project extend just past the existing turn lanes of the intersection.

The current U.S. 6-Hickman Road (east and west approaches) is a U.S. Highway consisting of two through lanes with a center median and right and left turn lanes at each approach. On the westbound approach of U.S. 6-Hickman Road the left and right turn lanes include approximately 200 feet and 150 feet of storage, respectively. The eastbound approach of U.S. 6-Hickman Road includes a left turn lane of approximately 160 feet and a right turn lane of approximately 110 feet. The speed limit on U.S. 6-Hickman Road is 50 MPH.

Berkshire Parkway (north approach) is a neighborhood collector in the City of Clive. At the intersection it is a two lane facility with a center median. There are right and left turn lanes in the southbound direction of approximately 110 feet. The next closest intersection is located approximately 360 feet north of the study intersection. The speed limit on Berkshire Parkway is 25 MPH.

SE Waco Place (south approach) is a major collector in the City of Waukee. It is a two lane divided street with left and right turn lanes in the northbound direction at the intersection. The right turn lane at the intersection with U.S. 6-Hickman Road is approximately 140 feet. The left turn lane on SE Waco Place is approximately 290 feet. The next closest intersection is located approximately 440 feet south of the study intersection. The speed limit on SE Waco Place is 35 MPH.

The Raccoon River Valley Trail (RRVT) travels parallel to U.S. 6-Hickman Road through the cities of Clive and Waukee. The RRVT crosses the north approach of the intersection at a designated trail crossing located south of the median. Trail "Yield" signs are located at each trail approach of the crossing. A City of Waukee trail is located west of SE Waco Place and has a curb cut leading to a non-designated crossing U.S. 6-Hickman Road. The north-south trail crossing location traverses the center raised median on U.S. 6-Hickman Road, but no pedestrian refuge is currently accessible.

Refer to the *2020 Traffic Signal Warrant Study* for additional detail on existing conditions of the corridor.

Traffic Data

Turning movement counts were collected by Snyder & Associates between June 3, 2020 and June 5, 2020. Due to the on-going Covid-19 pandemic, the turning movement counts were adjusted using Iowa DOT traffic count factors to determine appropriate traffic volumes at the study intersection. Collected turning movement counts and adjusted traffic volumes are attached. Based on these counts the average daily traffic on Hickman Road is approximately 31,000 vehicles per day. SE Waco Place carries approximately 2,100 vehicles per day and Berkshire Parkway carries approximately 1,800 vehicles per day.

Crash History

Crash data for the most recent five-year period (2015- May 22, 2020) was collected for the study intersection from the Iowa DOT – Iowa Crash Analysis Tool (https://icat.iowadot.gov/). During that time period, 29 crashes were reported, including 1 serious injury crash, 9 minor injury crashes and 6 possible/unknown crashes. The injury crashes included 1 serious injury, 10 minor injuries, 9 possible injuries, and 2 unknown injuries.

The predominant crash types along the corridor were broadside (15 crashes); angle, oncoming left turn (5 crashes); non-collision, single vehicle (4 crashes); and rear-end (3 crashes). In general, the most common crash types were as a result of running a stop sign, failing to yield the right of way, or other driver errors.

MUTCD Analysis

The *2020 Traffic Signal Warrant Study* analyzed the potential for the intersection to meet the criteria for traffic signalization. As concluded in the study, the intersection currently meets Warrant 1 (8 hour volumes), Warrant 2 (4 hour volumes), and Warrant 3 (peak hour volumes). Warrant 7 (crash experience) was also examined, but was determined to not be met by current conditions at the intersection.

Proposed Improvements

The proposed improvements include installing a traffic signalization at the intersection to improve safety for vehicles turning from the minor approaches as well as pedestrians and bicyclists crossing U.S. 6-Hickman Road. The traffic signals would be interconnected and coordinated wth the existing traffic signal system along U.S. 6-Hickman Road. Improvements would also include the extension of left and right turn lanes on U.S. 6-Hickman Road to accommodate additional storage capacity and safe deceleration at the intersection. Pedestrian and bicycle crossing treatments would be addressed to improve safety for the Raccoon River Valley Trail users as well as pedestrians and bicyclists travelling between Clive and Waukee.

The *2020 Traffic Signal Warrant Study* examined the potential to convert the intersection from two-way stop control to traffic signalization. In addition to the 2020 Warrant Study, the Iowa DOT 2018 *US Highway 6 Corridor Study* identified this intersection as a potential future traffic signal location. A Cooperative Agreement between the Iowa DOT, the Cities of Waukee and Adel, and Dallas County for access management for U.S. 6-Hickman Road identified the intersection as "Future Full Access – May Be Signalized."

The improvements to the traffic signal system will also provide new opportunities for traffic signal coordination between the cities of Clive and Waukee along U.S. Highway 6.

OPINION OF PROBABLE PROJECT COSTS

SNYDER & ASSOCIATES

CLIVE/WAUKEE
HICKMAN ROAD (US 6) & BERKSHIRE PKWY/SE WACO PL
TRAFFIC SIGNAL CONCEPT STUDY
PROJECT NUMBER: 120.0532.01

ITEM #	ITEM CODE	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENDED PRICE	COMMENTS
		GENERAL PROVISIONS					
1	2302-1200100	PORTLAND CEMENT CONCRETE PAVEMENT WIDENING, 10 IN.	729	SY	$100.00	$72,900.00	Safety Item
2	2510-6745850	REMOVAL OF PAVEMENT	432	SY	$12.00	$5,184.00	Safety Item
3	2511-6745900	REMOVAL OF SIDEWALK	103.8	SY	$12.00	$1,245.60	Safety Item
4	2511-7526006	SIDEWALK, P.C. CONCRETE, 6 IN.	118.3	SY	$100.00	$11,830.00	Safety Item
5	2511-7528101	DETECTABLE WARNINGS	96	SF	$50.00	$4,800.00	Safety Item
6	2512-1725256	CURB AND GUTTER, P.C. CONCRETE, 2.5 FT.	65	LF	$35.00	$2,275.00	Safety Item
7	2526-8285000	CONSTRUCTION SURVEY	1	LS	$3,500.00	$3,500.00	
8	2528-8445110	TRAFFIC CONTROL	1	LS	$7,500.00	$7,500.00	Safety Item
9	2529-5070110	PATCHES, FULL-DEPTH FINISH, BY AREA	69	SY	$100.00	$6,900.00	Safety Item
10	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT	2	EACH	$350.00	$700.00	Safety Item
11	2533-4980005	MOBILIZATION	1	LS	$10,000.00	$10,000.00	Safety Item
12	2599-9999010	TRAFFIC SIGNILIZATION	1	LS	$275,000.00	$275,000.00	Safety Item
13	2601-2639010	SODDING	10	SQ	$200.00	$2,000.00	
14	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION	1.5	MGAL	$60.00	$90.00	
15	2602-0000309	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 9 IN. DIA.	150	LF	$4.00	$600.00	
16	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	150	LF	$1.00	$150.00	
17	2602-0010010	MOBILIZATIONS, EROSION CONTROL	2	EACH	$500.00	$1,000.00	

Subtotal:	$	405,674.60
Contingency (15%):	$	60,851.19
CONSTRUCTION TOTAL:	$	466,525.79
TOTAL SAFETY COST:	**$**	**398,334.60**
TOTAL PROJECT COST:	**$**	**466,525.79**

PROPOSED PROJECT SCHEDULE
US 6 & BERKSHIRE PKWY/SE WACO PL TRAFFIC SIGNAL
CLIVE, IOWA & WAUKEE, IOWA

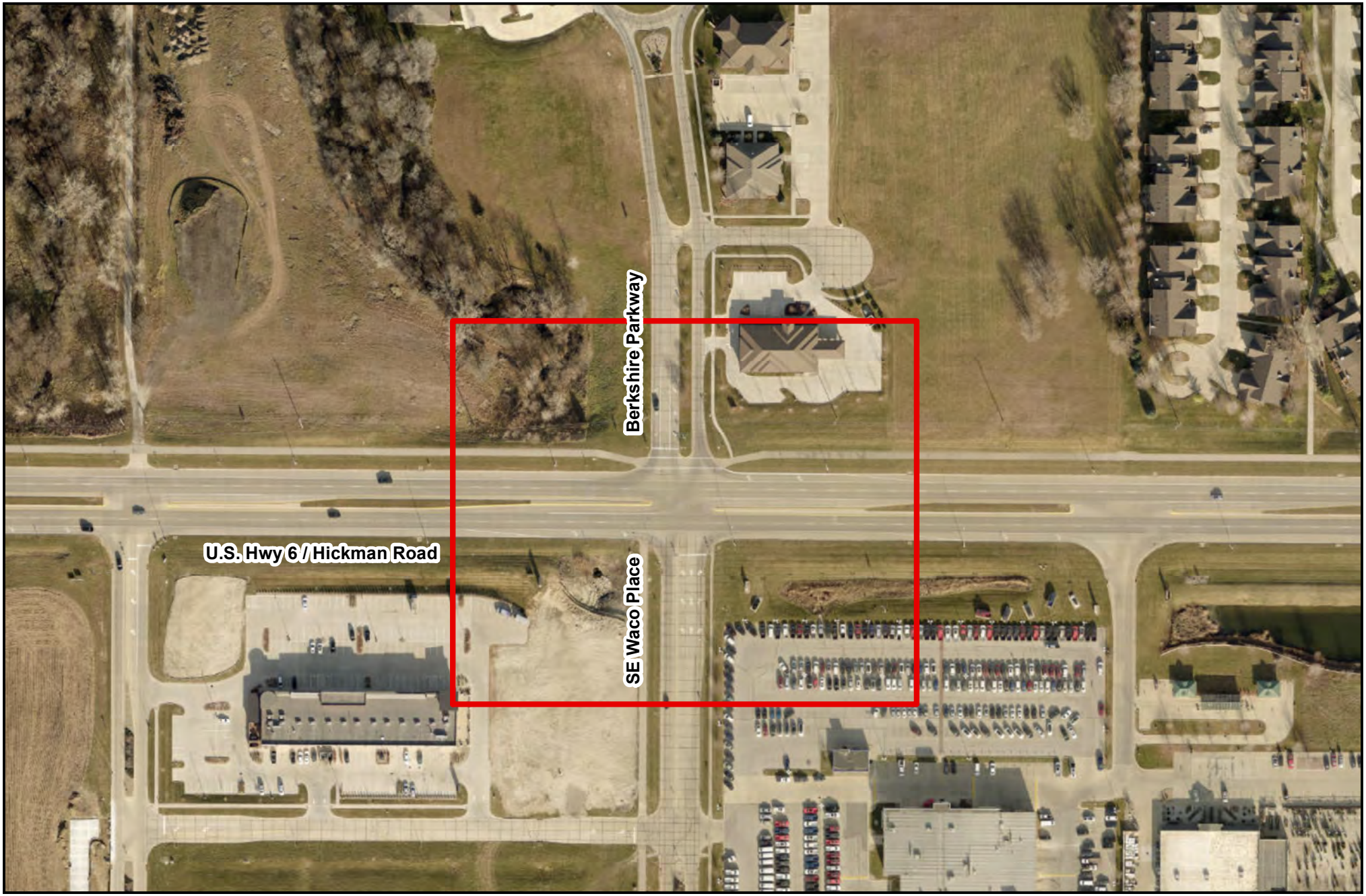
August 2020	TSIP Application
January 2021	Iowa DOT Approval
March 2021	TSIP Agreement
January 2021 – April 2021	Project Engineering
March 2021	Project Letting
May 2021 – November 2021	Project Construction[1]

[1] Any TSIP Funding Reimbursement Requests would occur after July 1, 2021

FILE PATH: Z:\E_Map.mxd

SOURCES: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

E



SNYDER & ASSOCIATES

N

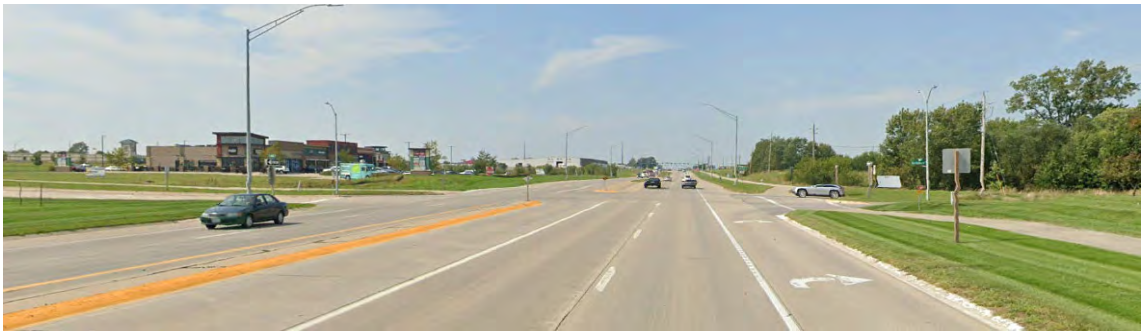
0 100 200

Feet

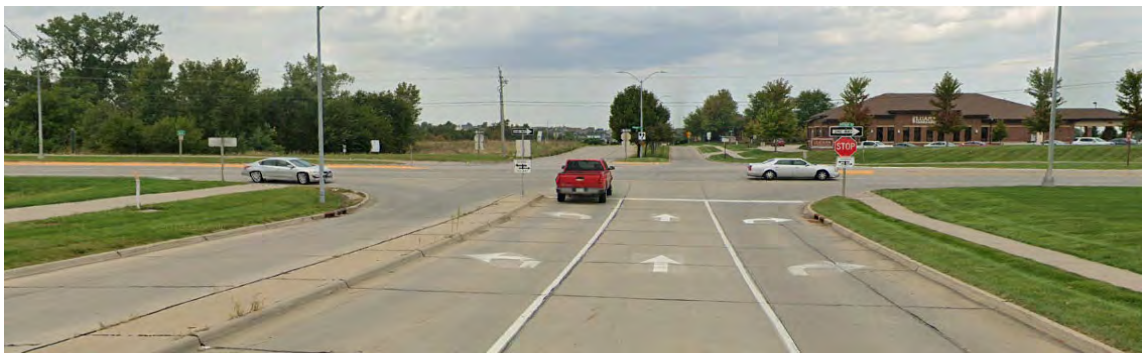
Exhibit E - Map

US 6 & Berkshire Pkwy/SE Waco Pl Traffic Signal TSIP Application | Clive, Iowa | 7/9/2020

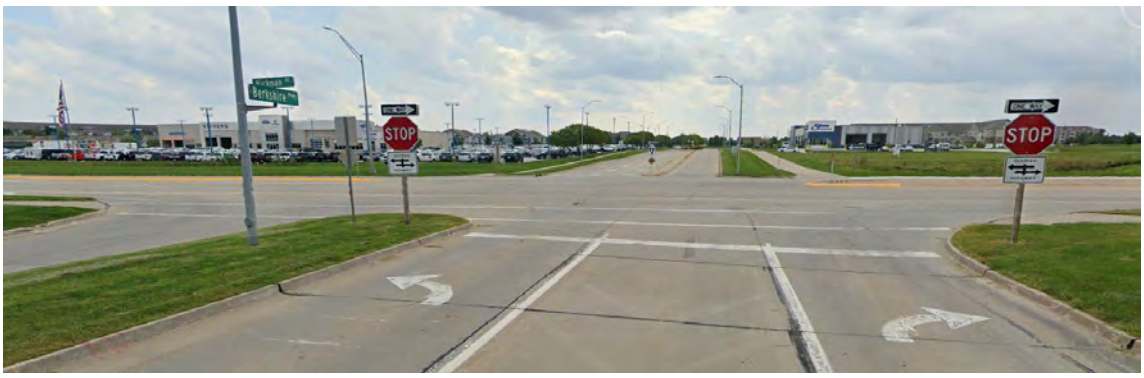
U.S. HIGHWAY 6 (HICKMAN ROAD) & BERKSHIRE PKWY/SE WACO PL - Looking East



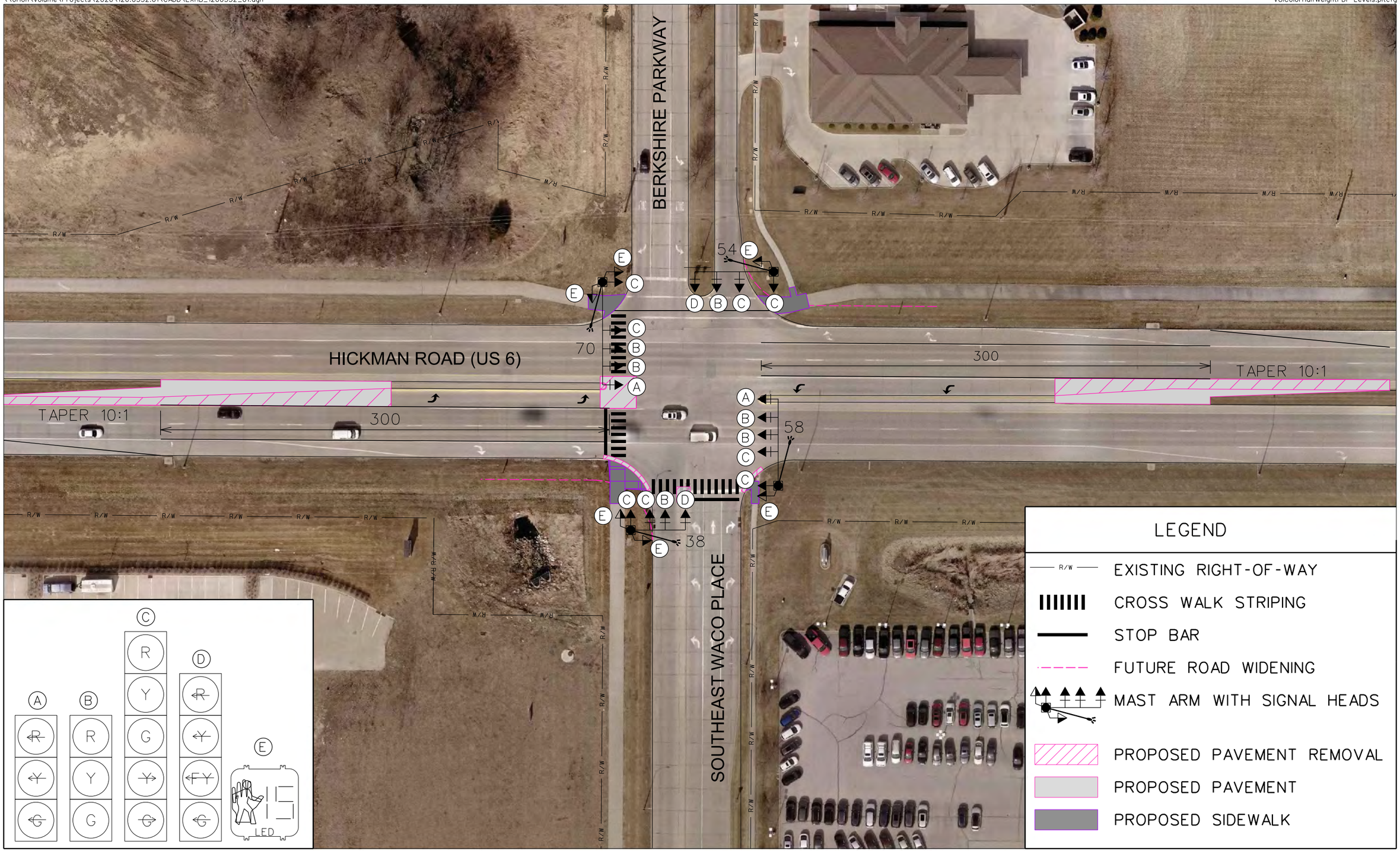
U.S. HIGHWAY 6 (HICKMAN ROAD) & BERKSHIRE PKWY/SE WACO PL - Looking West



U.S. HIGHWAY 6 (HICKMAN ROAD) & BERKSHIRE PKWY/SE WACO PL - Looking North



U.S. HIGHWAY 6 (HICKMAN ROAD) & BERKSHIRE PKWY/SE WACO PL - Looking South



SNYDER & ASSOCIATES

0 30 60
FEET

Waukee - Hickman Road (US 6) & Berkshire Pkwy/SE Waco Pl — Concept Drawing

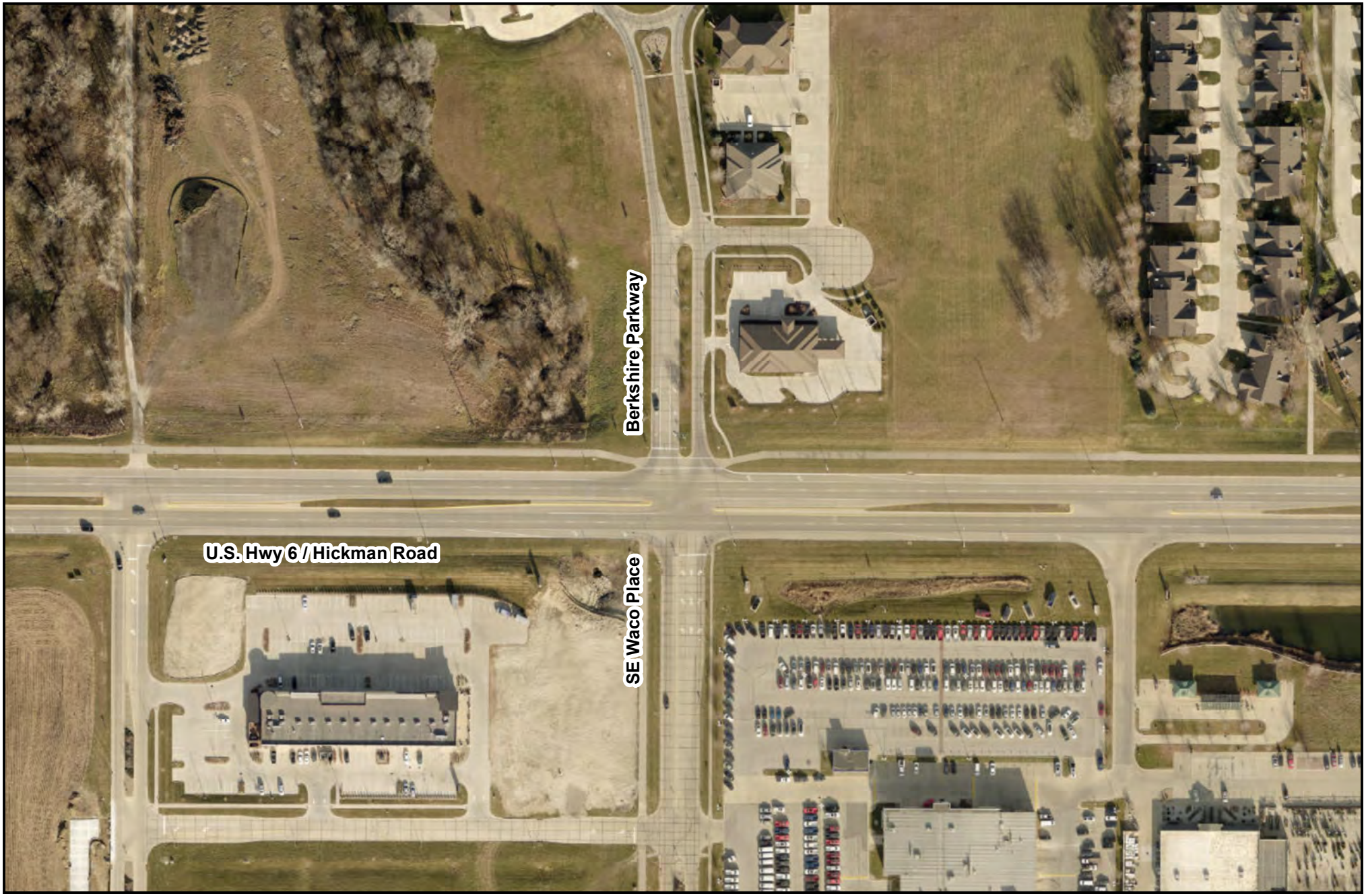
Waukee / Dallas County, Iowa

08/03/2020

FILE PATH: Z:\H_Aerial.mxd

SOURCES: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

H



SNYDER & ASSOCIATES

0 100 200

Feet

Exhibit H - Aerial

US 6 & Berkshire Pkwy/SE Waco Pl Traffic Signal TSIP Application | Clive, Iowa | 7/28/2020

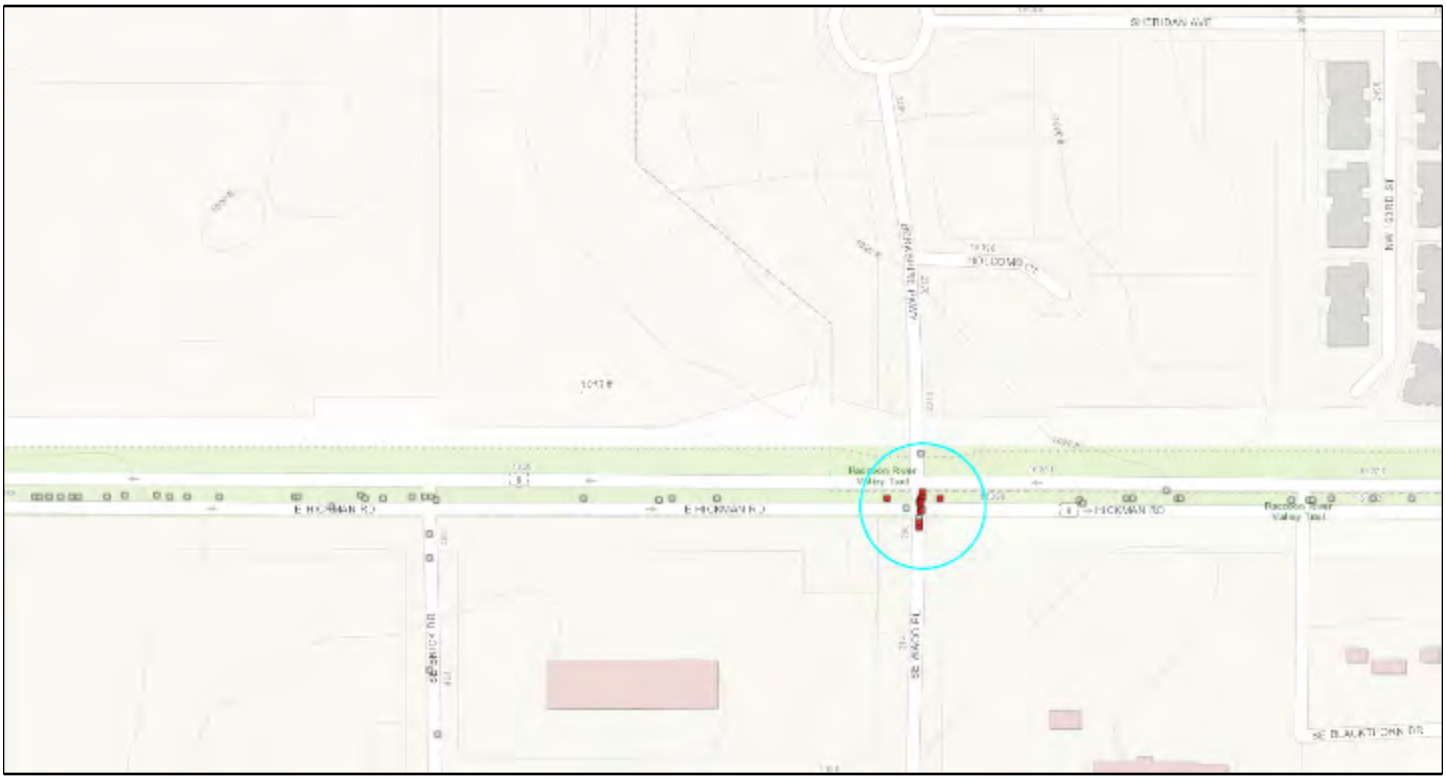
Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	28
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	9
Possible/Unknown Injury Crash	5
Property Damage Only	13

Injury Status Summary	21
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	10
Possible (complaint of pain/injury)	9
Unknown	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	260,450.00
Average (per crash dollars):	9,301.79
Total Vehicles:	53.00
Average (per crash):	1.89
Total Occupants:	72.00
Average (per crash):	2.57

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.71
Major Injuries/Crash:	0.04
Minor Injuries/Crash:	0.36
Possible/Unknown Injuries/Crash:	0.32



Major Cause			28
Animal	1	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	6	FTYROW: From yield sign	0
FTYROW: Making left turn	10	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	2
FTYROW: Other	1	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	1	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	1	0	0	0	2	1	0	0	0	0	4
Tuesday	0	0	0	1	1	1	0	0	1	3	0	0	0	7
Wednesday	0	0	0	0	0	1	1	1	1	0	0	0	0	4
Thursday	0	0	0	0	1	0	1	1	2	0	0	0	0	5
Friday	0	0	0	0	0	0	2	1	3	1	0	0	0	7
Saturday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	0	2	2	2	4	6	8	4	0	0	0	28

Manner of Crash Collision	28
Non-collision (single vehicle)	3
Head-on (front to front)	0
Rear-end (front to rear)	3
Angle, oncoming left turn	5
Broadside (front to side)	15
Sideswipe, same direction	0
Sideswipe, opposite direction	1
Rear to rear	0
Rear to side	0
Not reported	1
Other	0
Unknown	0

Surface Conditions	28
Dry	20
Wet	5
Ice/frost	1
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	1
Other	0
Unknown	0

Fixed Object Struck	53		
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	1
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	52

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	0	0	0	0	0
= 16	0	1	0	0	1
= 17	0	1	0	0	1
= 18	2	0	0	0	2
= 19	1	1	0	0	2
= 20	1	0	0	0	1
>= 21 and <= 24	2	0	0	0	2
>= 25 and <= 29	4	4	0	0	8
>= 30 and <= 34	1	2	0	0	3
>= 35 and <= 39	1	2	0	0	3
>= 40 and <= 44	2	5	0	0	7
>= 45 and <= 49	2	2	0	0	4
>= 50 and <= 54	2	0	0	0	2
>= 55 and <= 59	2	3	0	0	5
>= 60 and <= 64	1	2	0	0	3
>= 65 and <= 69	3	0	0	0	3
>= 70 and <= 74	0	1	0	0	1
>= 75 and <= 79	1	0	0	0	1
>= 80 and <= 84	0	1	0	0	1
>= 85 and <= 89	1	0	0	0	1
>= 90 and <= 94	1	0	0	0	1
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	27	25	0	0	52

Drug/Alcohol Related	**28**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	28

Alcohol Test Given	**53**
None	52
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

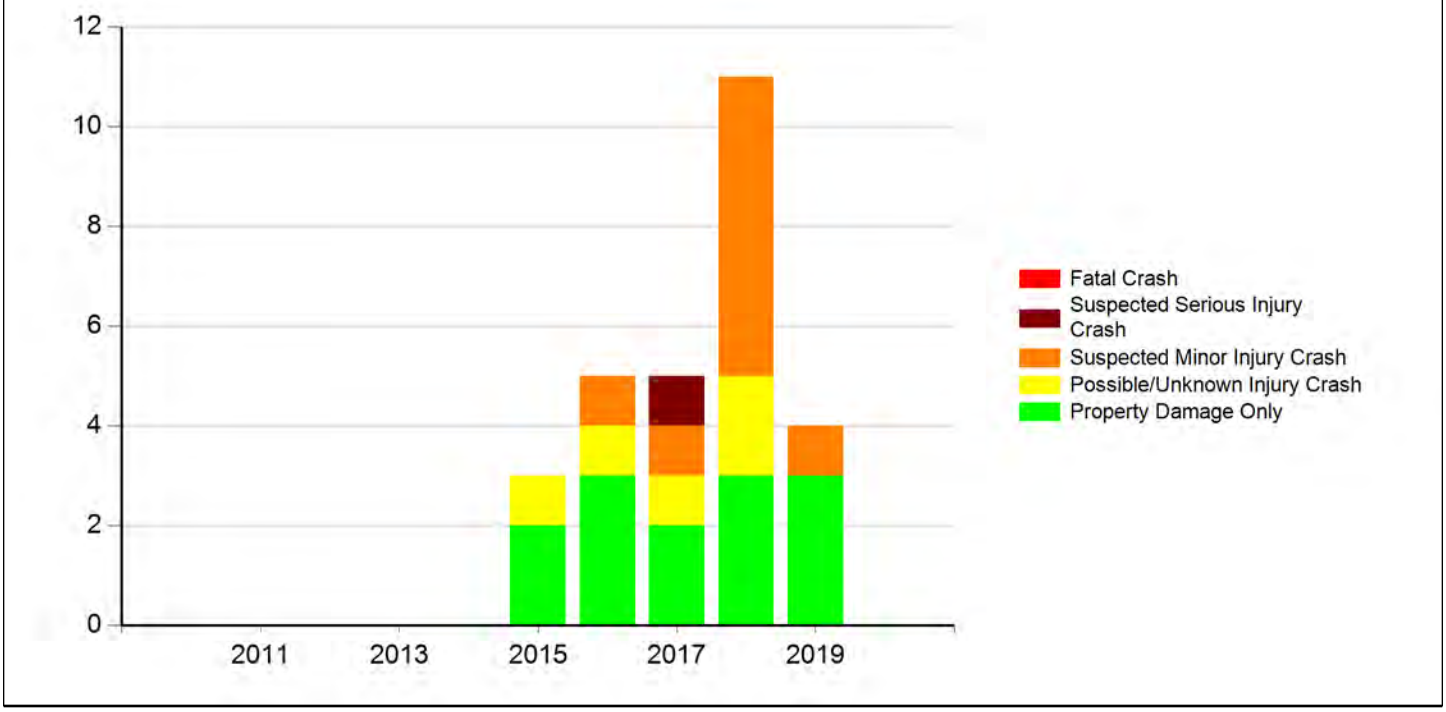
Drug Test Given	**53**
None	52
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Result	**53**
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	53
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	2	3
2016	0	0	1	1	3	5
2017	0	1	1	1	2	5
2018	0	0	6	2	3	11
2019	0	0	1	0	3	4
2020	0	0	0	0	0	0
Total	0	1	9	5	13	28

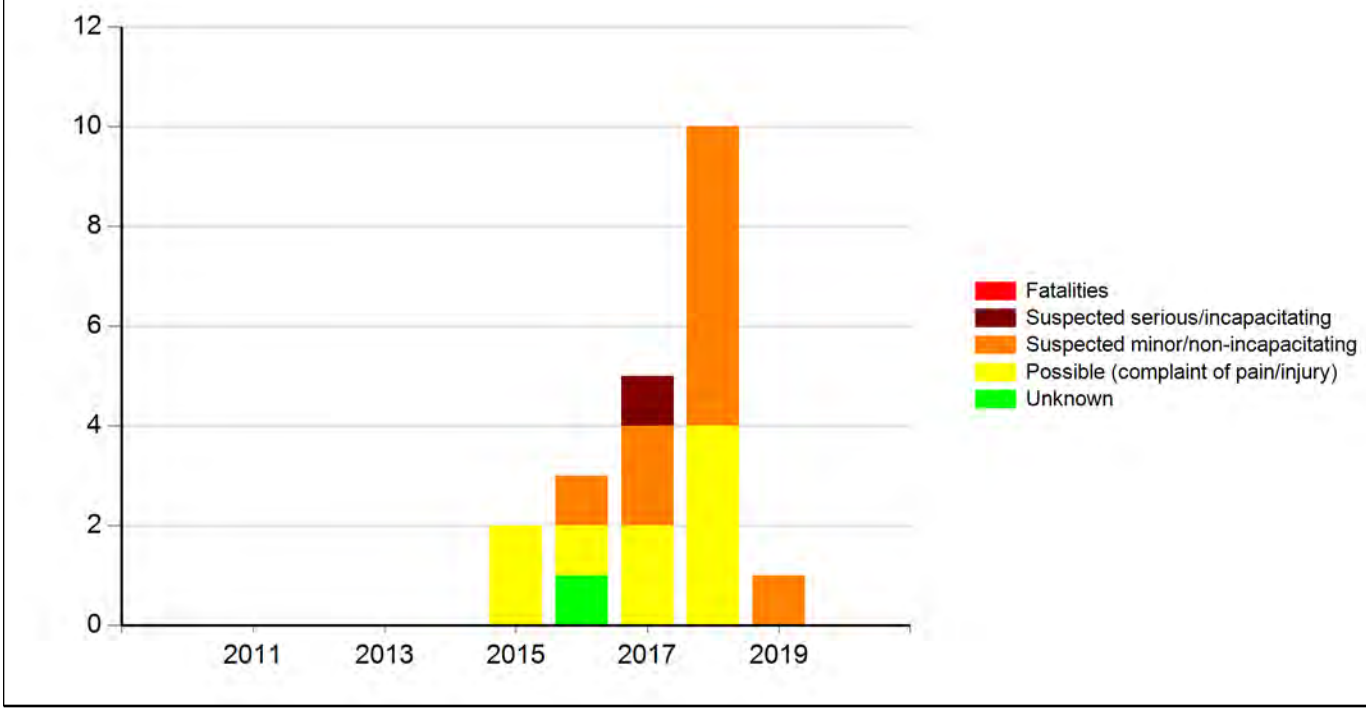
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	2	0	2
2016	0	0	1	1	1	3
2017	0	1	2	2	0	5
2018	0	0	6	4	0	10
2019	0	0	1	0	0	1
2020	0	0	0	0	0	0
Total	0	1	10	9	1	21

Injury Status/Year



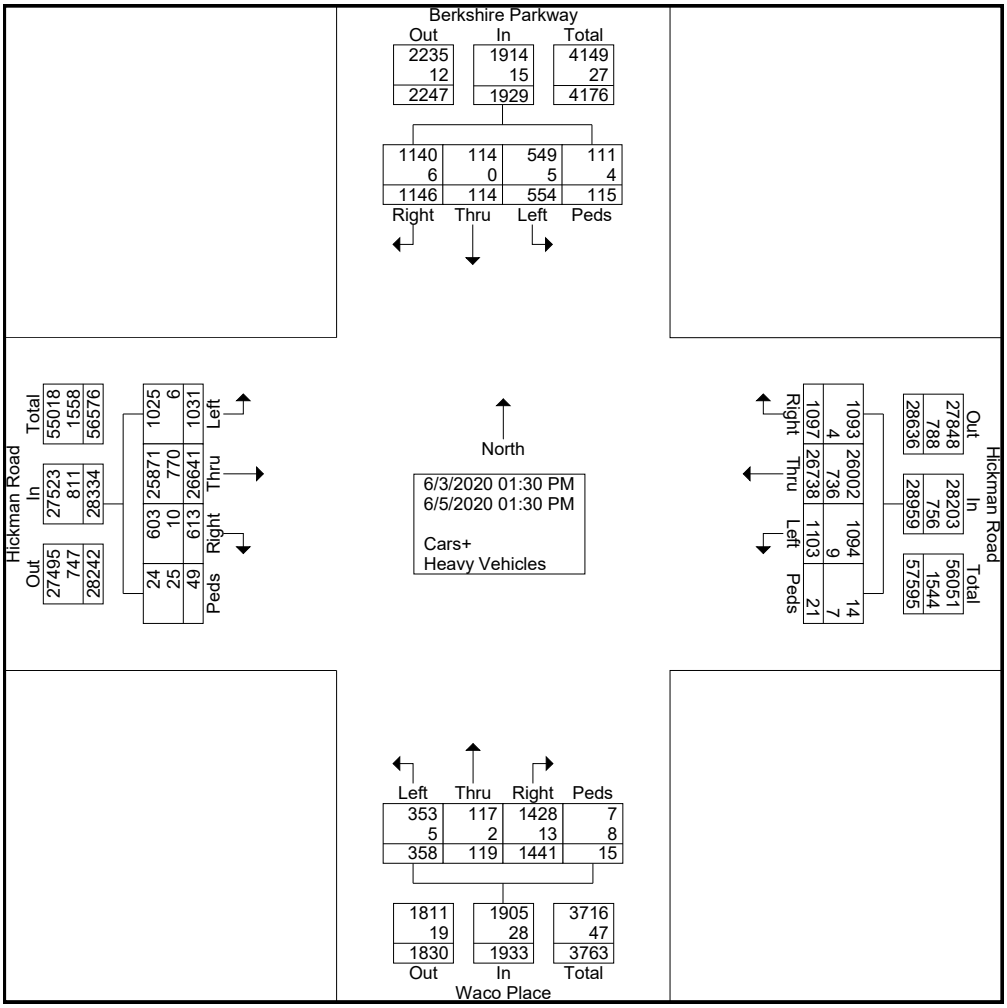
Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

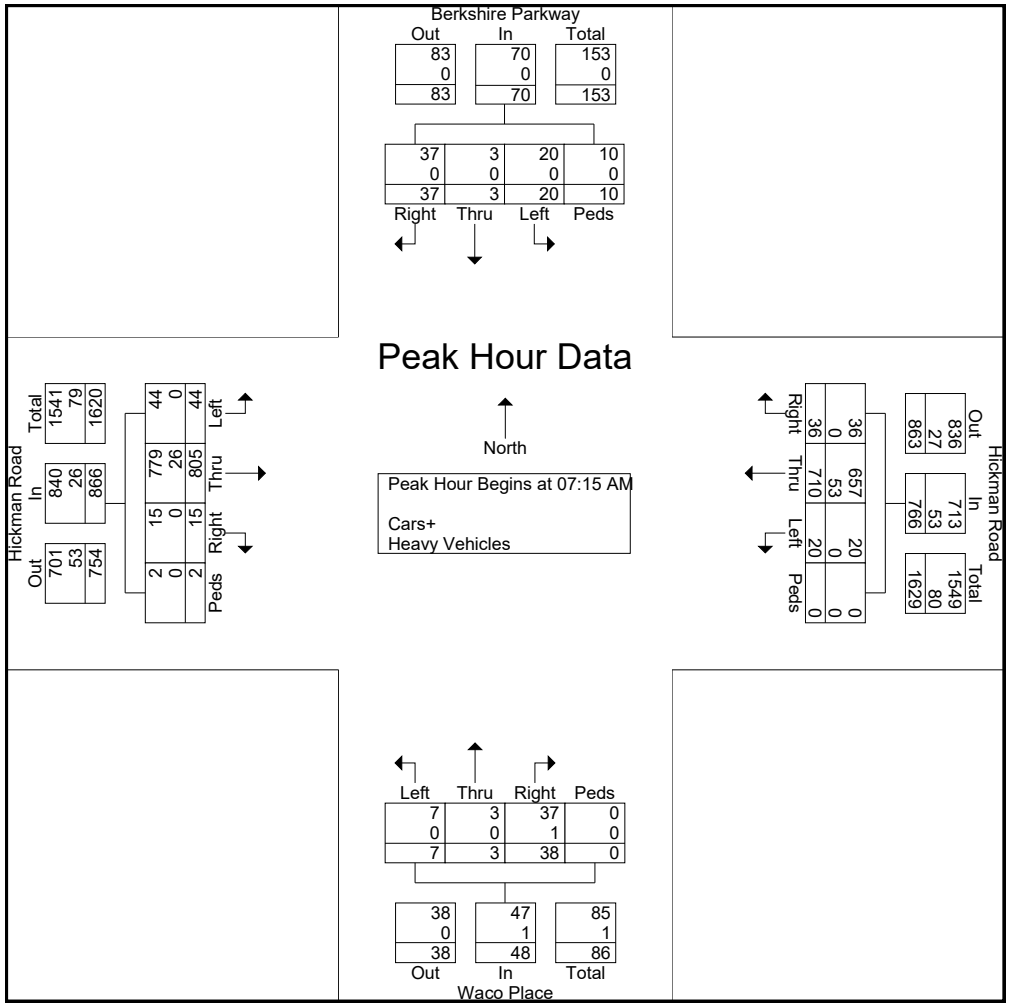
ICAT Crash Summary of Motor Vehicle Crashes
5 most recent years

File Name : 48hrCNT_BerkshireWaco&Hickman_06152020
Site Code : 00000000
Start Date : 6/3/2020
Page No : 7



File Name : 48hrCNT_BerkshireWaco&Hickman_06152020
Site Code : 00000000
Start Date : 6/3/2020
Page No : 8

	Berkshire Parkway From North						Hickman Road From East						Waco Place From South						Hickman Road From West						
Start Time	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	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 07:15 AM																									
07:15 AM	9	**1**	6	0	**3**	19	7	152	**7**	0	0	166	8	1	2	0	0	11	2	203	12	**1**	0	218	414
07:30 AM	**11**	1	5	0	3	**20**	5	172	5	0	0	182	**14**	0	1	0	0	**15**	2	**217**	**13**	1	0	**233**	450
07:45 AM	8	1	2	0	2	13	**15**	**202**	4	0	0	**221**	9	0	1	0	0	10	**6**	215	12	0	0	233	**477**
08:00 AM	9	0	**7**	0	2	18	9	184	4	0	0	197	7	**2**	**3**	0	0	12	5	170	7	0	0	182	409
Total Volume	37	3	20	0	10	70	36	710	20	0	0	766	38	3	7	0	0	48	15	805	44	2	0	866	1750
% App. Total	52.9	4.3	28.6	0	14.3		4.7	92.7	2.6	0	0		79.2	6.2	14.6	0	0		1.7	93	5.1	0.2	0		
PHF	.841	.750	.714	.000	.833	.875	.600	.879	.714	.000	.000	.867	.679	.375	.583	.000	.000	.800	.625	.927	.846	.500	.000	.929	.917
Cars+	37	3	20	0	10	70	36	657	20	0	0	713	37	3	7	0	0	47	15	779	44	2	0	840	1670
% Cars+	100	100	100	0	100	100	100	92.5	100	0	0	93.1	97.4	100	100	0	0	97.9	100	96.8	100	100	0	97.0	95.4
Heavy Vehicles	0	0	0	0	0	0	0	53	0	0	0	53	1	0	0	0	0	1	0	26	0	0	0	26	80
% Heavy Vehicles	0	0	0	0	0	0	0	7.5	0	0	0	6.9	2.6	0	0	0	0	2.1	0	3.2	0	0	0	3.0	4.6



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File Name : 48hrCNT_BerkshireWaco&Hickman_06152020
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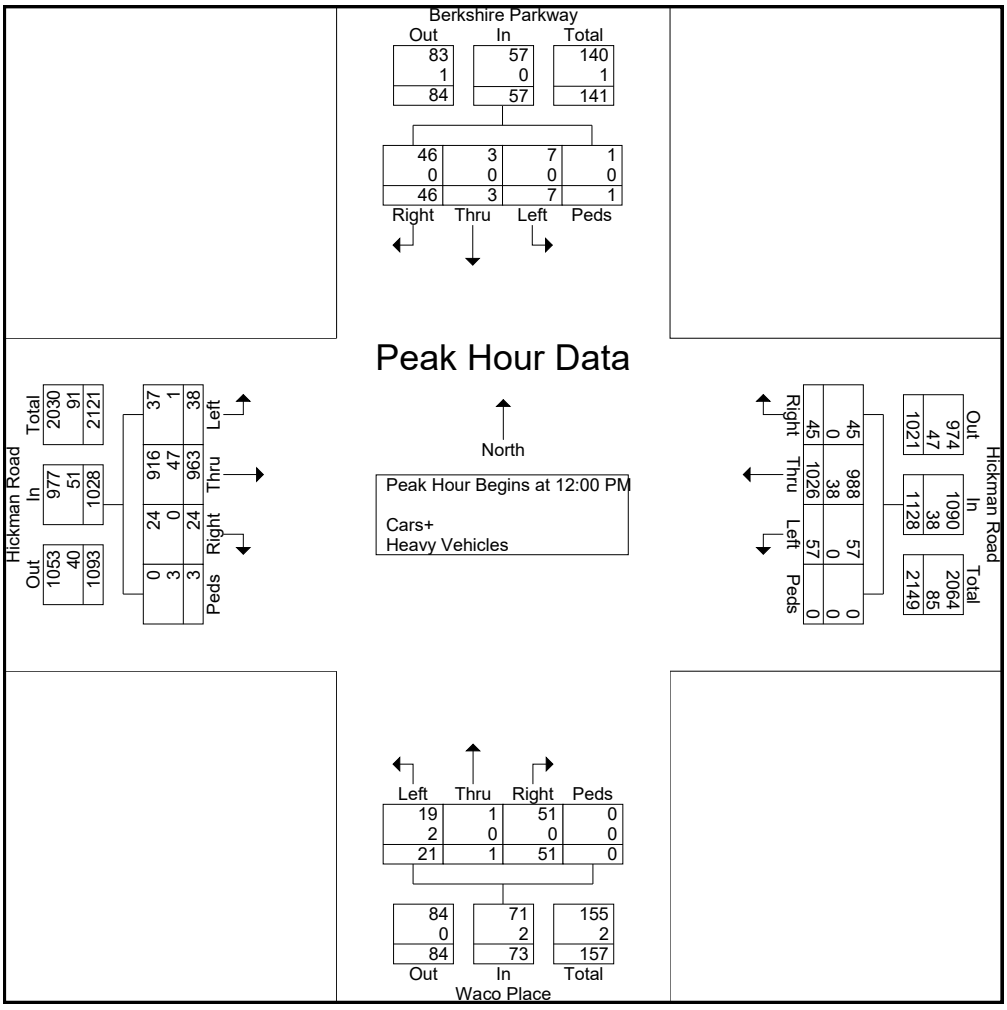
Start Date : 6/3/2020
Page No : 9

	Berkshire Parkway From North						Hickman Road From East						Waco Place From South						Hickman Road From West						
Start Time	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 12:00 PM																									
12:00 PM	**17**	**2**	2	0	0	**21**	11	268	17	0	0	**296**	**18**	0	**7**	0	0	**25**	6	244	9	0	**1**	260	**602**
12:15 PM	11	0	0	**1**	0	12	9	**270**	9	0	0	288	14	**1**	5	0	0	20	2	229	8	0	1	240	560
12:30 PM	9	0	2	0	0	11	6	232	10	0	0	248	9	0	4	0	0	13	**8**	**257**	10	0	0	**275**	547
12:45 PM	9	1	**3**	0	0	13	**19**	256	**21**	0	0	296	10	0	5	0	0	15	8	233	**11**	0	1	253	577
Total Volume	46	3	7	1	0	57	45	1026	57	0	0	1128	51	1	21	0	0	73	24	963	38	0	3	1028	2286
% App. Total	80.7	5.3	12.3	1.8	0		4	91	5.1	0	0		69.9	1.4	28.8	0	0		2.3	93.7	3.7	0	0.3		
PHF	.676	.375	.583	.250	.000	.679	.592	.950	.679	.000	.000	.953	.708	.250	.750	.000	.000	.730	.750	.937	.864	.000	.750	.935	.949
Cars+	46	3	7	1	0	57	45	988	57	0	0	1090	51	1	19	0	0	71	24	916	37	0	0	977	2195
% Cars+	100	100	100	100	0	100	100	96.3	100	0	0	96.6	100	100	90.5	0	0	97.3	100	95.1	97.4	0	0	95.0	96.0
Heavy Vehicles	0	0	0	0	0	0	0	38	0	0	0	38	0	0	2	0	0	2	0	47	1	0	3	51	91
% Heavy Vehicles	0	0	0	0	0	0	0	3.7	0	0	0	3.4	0	0	9.5	0	0	2.7	0	4.9	2.6	0	100	5.0	4.0



File Name : 48hrCNT_BerkshireWaco&Hickman_06152020
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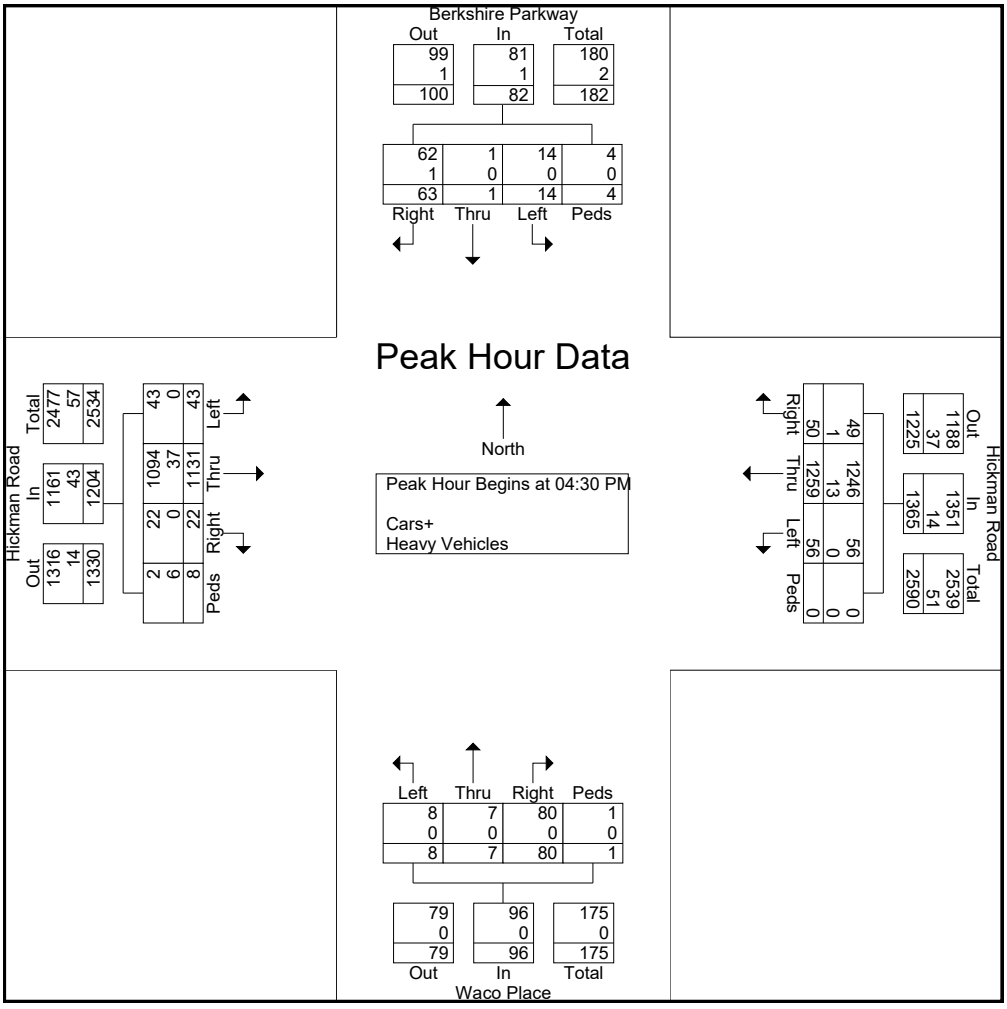
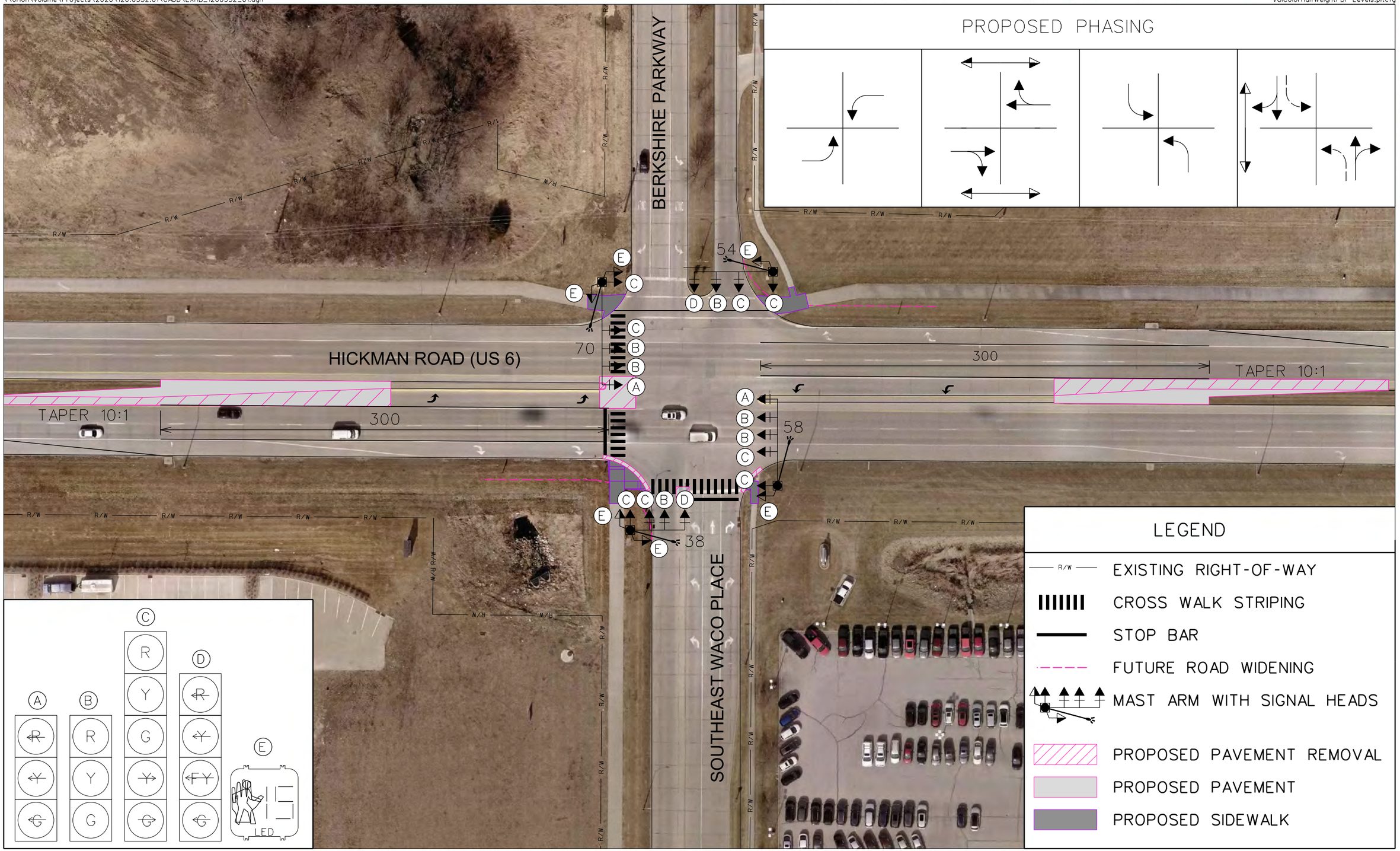
Page No : 10

	Berkshire Parkway From North						Hickman Road From East						Waco Place From South						Hickman Road From West						
Start Time	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Right	Thru	Left	U Turns	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:30 PM																									
04:30 PM	**17**	0	**4**	0	**2**	**23**	7	282	9	0	0	298	**16**	0	**6**	0	0	**22**	8	256	**16**	**1**	**2**	283	626
04:45 PM	10	**1**	3	0	0	14	10	307	14	0	0	331	13	2	4	0	0	19	7	284	15	0	0	**306**	670
05:00 PM	14	0	4	0	0	18	6	299	**17**	0	0	322	15	**3**	4	0	0	22	1	**286**	13	0	0	300	662
05:15 PM	13	1	4	0	1	19	**21**	**340**	7	0	0	**368**	16	1	5	0	0	22	**12**	246	4	0	0	262	**671**
Total Volume	54	2	15	0	3	74	44	1228	47	0	0	1319	60	6	19	0	0	85	28	1072	48	1	2	1151	2629
% App. Total	73	2.7	20.3	0	4.1		3.3	93.1	3.6	0	0		70.6	7.1	22.4	0	0		2.4	93.1	4.2	0.1	0.2		
PHF	.794	.500	.938	.000	.375	.804	.524	.903	.691	.000	.000	.896	.938	.500	.792	.000	.000	.966	.583	.937	.750	.250	.250	.940	.980
Cars+	62	1	14	1	3	81	49	1246	56	0	0	1351	80	7	8	1	0	96	22	1094	43	2	0	1161	2689
% Cars+	114.8	50.0	93.3	0	100	109.5	111.4	101.5	119.1	0	0	102.4	133.3	116.7	42.1	0	0	112.9	78.6	102.1	89.6	200.0	0	100.9	102.3
Heavy Vehicles	1	0	0	0	0	1	1	13	0	0	0	14	0	0	0	0	0	0	0	37	0	0	6	43	58
% Heavy Vehicles	1.9	0	0	0	0	1.4	2.3	1.1	0	0	0	1.1	0	0	0	0	0	0	0	3.5	0	0	300.0	3.7	2.2





SNYDER & ASSOCIATES

0 30 60
FEET

Waukee - Hickman Road (US 6) & Berkshire Pkwy/SE Waco Pl — Concept Drawing

Waukee / Dallas County, Iowa

08/03/2020

L
Rev. 5/18

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Dallas | Prepared by: Marcus Coenen | Date Prepared: Jul 9, 2020

Intersection: U.S. Highway 6 & Berkshire Parkway/SE Waco Place

Improvement

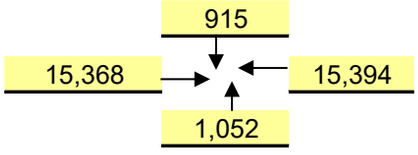
Proposed Improvement(s): Traffic Signal

$ 398,335	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	16	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 398,335**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Snyder & Associates | 6/4/2020 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



11,946,085	Current Annual Entering Veh., **AEV** = DEV * 365
44,049	veh / day, Final Year DEV, **FDEV**
206.59	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
32,729	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year | 5.4 years, Time Period, **T**

5 Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
16	Injury Crashes	10	Minor Injuries @	$65,000	$ 650,000
		9	Possible Injuries @	$35,000	$ 315,000
13	Property Damage Only		(assumed cost per crash)	$7,400	$ 214,600
		-OR-	enter all Property Costs of all crashes:		
29	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,504,600

5.35	Current Crashes / Year, **AA** = TA / T	**0.45**	Crashes / MEV, Crash Rate, **CR**
$ 51,883	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
92.6	Total Expected Crashes, **TECR** = CR x TMEV	**$ 561,516**	Present Value of Avoided
0.86	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 44,444	Crash Costs Avoided in First Year, AAR x AVC		
14.8	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $561,516 : $398,335 = **1.41** : 1

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project E University Avenue and E 30th Street

Applicant City of Des Moines

Contact Person Calvin Miller Title Engineering Administrative Manager

Complete Mailing Address 400 Robert D. Ray Drive

Des Moines, IA 50309-1891

Phone 515-283-4748 (Area Code) E-Mail cbmiller@dmgov.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) N/A

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 357,000
Total Project Cost	$ 1,000,000
Safety Funds Requested	$ 357,000

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

☒Yes – Explain _This intersection is #12 on the SICL developed on 10/5/18

☐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 Des Moines

Signed: T.M. Franklin Cownie 8-5-20
Signature Date Signed

T.M. Franklin Cownie, Mayor
Printed Name

Attest: P. Kay Cmelik 8-5-20
Signature Date Signed

P. Kay Cmelik, City Clerk
Printed Name

★ **Roll Call Number** 20-1226

Agenda Item Number 27

Date August 3, 2020

APPROVING FISCAL YEAR 2022 TRAFFIC SAFETY FUND APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION (IOWA DOT)

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF DES MOINES, IOWA: That the City Manager is hereby authorized to submit an application to the Iowa DOT for Traffic Safety Funds to cover a portion of the construction costs for the E University Avenue and E 30th Street Intersection Improvements project.

The City further agrees that if this project is funded and constructed, the City of Des Moines will provide adequate resources to maintain the improvements for their useful life.

(Council Letter Number 20-339 attached)

Moved by Gatto to adopt.

FORM APPROVED: s/Kathleen Vanderpool
Kathleen Vanderpool
Deputy City Attorney

SLN Funding Source: Traffic Safety Funds in the amount of $357,000 are requested for this project. $643,000 (remaining amount pending funding award) 2020-2021 CIP, Page Street Improvements – 10, E 30th Street and University Avenue, C038EG99 S.

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
BOESEN	✓			
GATTO	✓			
GRAY	✓			
MANDELBAUM	✓			
VOSS	✓			
WESTERGAARD	✓			
TOTAL	7			

MOTION CARRIED APPROVED

J. M. Franklin Cownie Mayor

CERTIFICATE

I, P. Kay Cmelik, City Clerk of said City hereby certify that at a meeting of the City Council of said City of Des Moines, held on the above date, among other proceedings the above was adopted.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year first above written.

P. Kay Cmelik City Clerk

NARRATIVE

Project Description

This project includes capacity, safety, and traffic signal improvements at E University Avenue and E 30th Street in Des Moines. Traffic signal improvements include equipment upgrades, traffic signal retiming including the yellow change and red clearance intervals, and the addition of protected/permissive southbound left phase with flashing yellow arrow. Geometric improvements include the offset of all left turn lanes to create positive offset, removal of right-turn channelizing islands and removal of fixed object in islands, addition of a signal controlled, dedicated northbound right turn-lane, and pedestrian crossing improvements.

The total project cost is estimated to be approximately $1,000,000. The portion of the project that is anticipated to improve safety is estimated to be approximately $357,000. A total of $357,000 is being requested from State Traffic Safety Improvement Program funds.

Existing Conditions

E University Avenue (IA Highway 163) is classified as a Principal Arterial roadway with a posted speed limit of 35 mph. Within the project limits, E University Avenue is a four-lane divided cross-section with left turn-lanes. The eastbound approach has a dedicated left turn lane, two through lanes, and a dedicated right turn lane with a channelizing island at the intersection of E 30th Street. The westbound approach has a dedicated left turn lane and two through lanes. The 2016 Average Daily Traffic for E University was 25,400 vehicles per day (vpd) west of E 30th Street and 24,800 vpd east of E 30th Street.

E 30th Street south of E University Avenue is a four-lane undivided roadway and is classified as a Minor Arterial roadway with a posted speed limit of 35 mph. North of E University Avenue, E 30th Street is a two-lane roadway and is classified as a Collector roadway with a posted speed limit of 25 mph. The northbound approach includes a dedicated left turn lane, one through lane, and a yield-controlled right turn slip lane. The southbound approach includes a dedicated left turn lane, a through lane, and a shared through/right lane. The 2016 Average Daily Traffic for E 30th Street was 5,300 north of E University Avenue and 11,700 south of E University Avenue.

Project Justification

The intersection of E University Avenue and E 30th Street was ranked 12th overall on the Statewide Improvement Candidate List (SICL) developed on October 5, 2018. Crash history was reviewed using the Iowa Crash Analysis Tool (ICAT) for a three-year period from 2017-2019. The leading manner of crashes identified were rear-end and angle/broadside due to left turning vehicles.

Rear-end crashes can be reduced by adjusting the traffic signal timing including the yellow change and red clearance intervals. Traffic signal green time is proposed to be retimed to provide adequate green time for each movement. A review of the traffic signal timings showed that the yellow change and red clearance intervals did not meet current best practices. Based on the ITE's Guidelines for Determining Traffic Signal Change and Clearance Intervals the following signal timing changes are proposed:

		Southbound	Westbound	Northbound	Eastbound
Yellow Change (sec)	**Existing**	3.50	4.00	3.50	4.00
	Proposed	4.10	4.10	4.10	4.10
Red Clearance (sec)	**Existing**	1.00	1.00	1.00	1.00
	Proposed	2.50	2.00	2.50	2.00

Angle/broadside crashes due to left turning vehicles can be reduced by providing positive offset to allow turning vehicles better sight lines to oncoming traffic. This project proposes to modify/remove existing medians for east and westbound traffic and modified pavement markings for north and south bound traffic to allow for positive offset for left turn lanes at all approaches.

Crash reduction factors (CRF) for the proposed intersection improvements were obtained from the Crash Modification Factors Clearinghouse. A CRF of 35.7 for rear-end crashes only was selected for increasing the total change interval (yellow + red). A CRF of 38 for left-turn crashes only was selected for improving the left-turn lane offset to create positive offset.

The traffic signal equipment at the intersection needs updated to meet current City standards. The traffic signal poles in the southwest and southeast quadrants of the intersection are currently in channelizing medians and have been struck on multiple occasions. Moving these poles behind the back of curb will remove two fixed objects within the roadway. The relocation of these signal poles to behind the sidewalk cannot be quantified using CRF; however, it is the City of Des Moines' opinion that this is a significant safety improvement related to the replacement of the traffic signal equipment.

Lastly, this project is proposed to improve pedestrian crossings on all approaches with improved, ADA-compliant curb ramps and pedestrian pushbutton placement as well as pedestrian countdown indications. This improvement cannot be quantified using CRF; however, it is the City of Des Moines' opinion that this is a significant safety improvement for pedestrians.

Based on current Iowa DOT value factors, the total estimated loss from crashes during the described three-year period is $305,600 for rear-end crashes and $1.29 million for angle/broadside crashes (See Exhibit "L"). The request of $357,000 for traffic safety relates benefit-to-cost ratios of 1.31 for the traffic signal improvements and 50.46 for the left turn lane improvements.

ITEMIZED BREAKDOWN OF ALL COSTS

PRELIMINARY ESTIMATE
E UNIVERSITY AVE AND E 30TH ST INTERSECTION IMPROVEMENTS

DATE: 7-15-20

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED UNITS	UNIT PRICE	TOTAL AMOUNT
1	MODIFIED SUBBASE	CY	135	$55.00	$7,425.00
2	EXCAVATION, CLASS 10	LS	1	$10,000.00	$10,000.00
3	BASE WIDENING, PCC	SY	600	$105.00	$63,000.00
4	PAVEMENT SCARIFICATION	SY	8,000	$6.00	$48,000.00
5	HMA OVERLAY	TON	2,000	$130.00	$260,000.00
6	HMA BINDER	TON	100	$750.00	$75,000.00
7	PCC MEDIAN	SY	50	$105.00	$5,250.00
8	REMOVAL OF PCC MEDIAN	SY	160	$50.00	$8,000.00
9	HMA PATCH FOR PCC MEDIAN REMOVAL	SY	110	$50.00	$5,500.00
10	REMOVAL OF PAVEMENT	SY	490	$25.00	$12,250.00
11	REMOVE AND REPLACE CURB	LF	80	$100.00	$8,000.00
12	SUBDRAIN, LONGITUDINAL	LF	220	$50.00	$11,000.00
13	STORM SEWER, 15" RCP	LF	8	$150.00	$1,200.00
14	CONVERT INTAKE TO MANHOLE	EACH	1	$2,500.00	$2,500.00
15	INTAKE	EACH	1	$5,000.00	$5,000.00
16	ADJUST MANHOLE	EACH	1	$2,000.00	$2,000.00
17	SIDEWALK, PCC, 4 IN.	SY	200	$60.00	$12,000.00
18	SIDEWALK, PCC, 6 IN.	SY	60	$70.00	$4,200.00
19	SIDEWALK, BRICK	SY	120	$80.00	$9,600.00
20	DETECTABLE WARNINGS	SF	96	$40.00	$3,840.00
21	REMOVAL OF SIDEWALK	SY	300	$20.00	$6,000.00
22	PAVEMENT MARKINGS REMOVED	STA	15	$200.00	$3,000.00
23	PAVEMENT MARKINGS SYMBOLS REMOVED	EACH	3	$150.00	$450.00
24	DURABLE PAVEMENT MARKINGS (EPOXY)	STA	60	$350.00	$21,000.00
25	DURABLE PAVEMENT MARKING SYMBOLS (EPOXY)	EACH	12	$150.00	$1,800.00
26	REMOVAL OF TRAFFIC SIGNALIZATION	LS	1	$15,000.00	$15,000.00
27	TEMPORARY TRAFFIC SIGNALS	LS	1	$7,000.00	$7,000.00
28	TRAFFIC SIGNALIZATION	LS	1	$290,000.00	$290,000.00
29	TRAFFIC CONTROL	LS	1	$30,000.00	$30,000.00
30	MOBILIZATION	LS	1	$61,985.00	$61,985.00
				TOTAL CONSTRUCTION COST	$990,000.00
				RIGHT-OF-WAY COSTS	$10,000.00
				ESTIMATED TOTAL PROJECT COST	**$1,000,000.00**

PREPARED BY: Gary Hlavka

LEFT TURN LANE COSTS	$45,000.00
TRAFFIC SIGNAL COSTS	$312,000.00

Anticipated Funding Sources

Total Project Cost	$1,000,000
Safety Related Improvements	$357,000 (TSF Funding Request)
Local	$643,000 (Remaining Amount)

TIME SCHEDULE

Preliminary Plan Design ..... January 2021 – July 2021

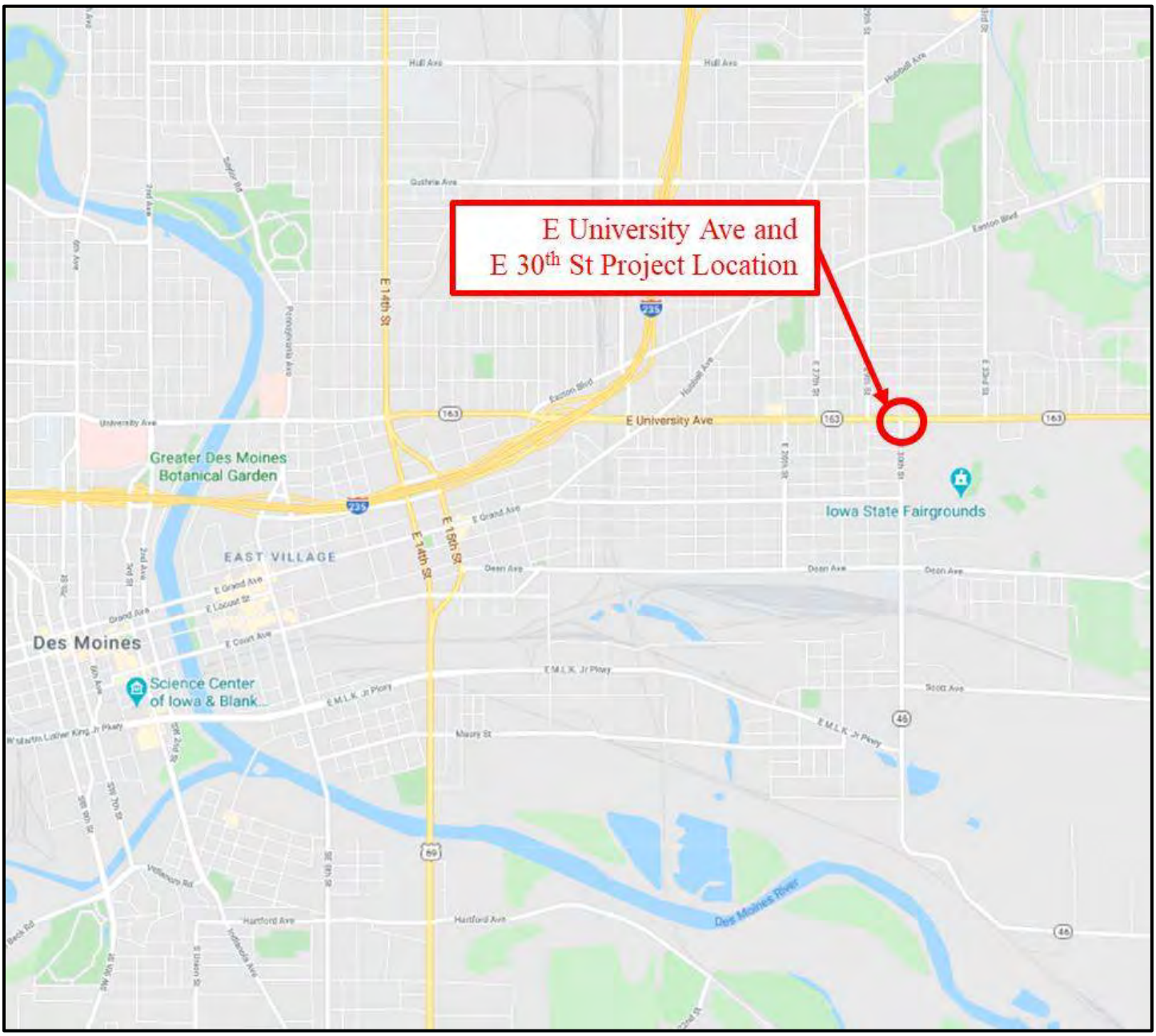
Property Acquisitions (if necessary) ..... July 2021 – December 2021

Final Plan Preparation ..... July 2021 – December 2021

Plan Approval & Project Letting ..... January 2022 – March 2022

Construction ..... August 2022 (after State Fair) – July 2022

MAP


E University Ave and
E 30th St Project Location
E University Ave
Greater Des Moines
Botanical Garden
Iowa State Fairgrounds
EAST VILLAGE
Des Moines
Science Center
of Iowa & Blank...
E 14th St
E 15th St
E Grand Ave
Dean Ave
E Court Ave
E M.L.K. Jr Pkwy
Maury St
Hartford Ave
Des Moines River
Hull Ave
Guthrie Ave
Easton Blvd
Hubbell Ave
Scott Ave
163
235
46
69

COLOR PICTURES

EASTBOUND APPROACH

NORTHBOUND APPROACH

SOUTHBOUND APPROACH

WESTBOUND APPROACH

EXHIBIT G

PLAN VIEW
E UNIVERSITY AVENUE AND E 30TH STREET

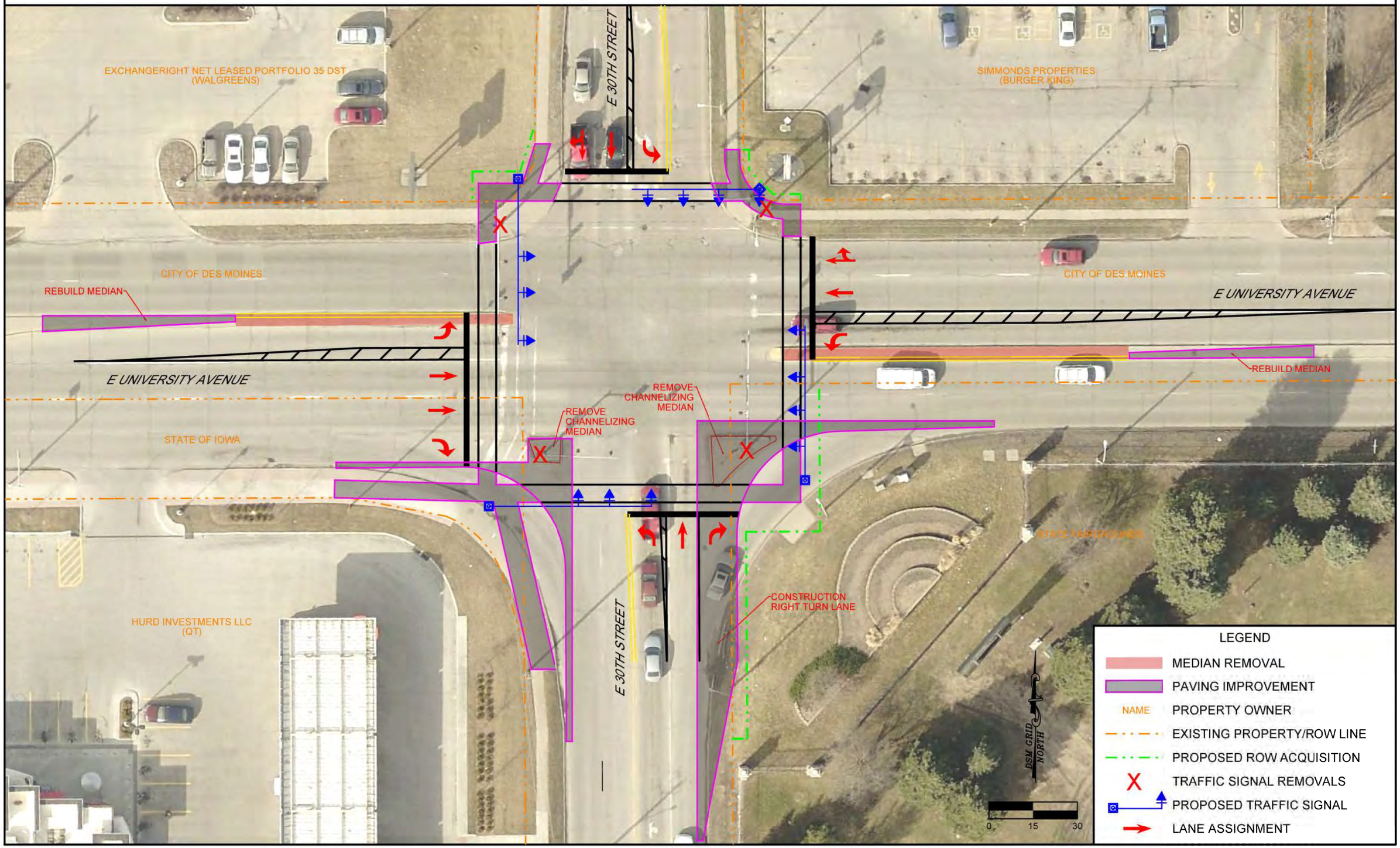


EXHIBIT H

AERIAL PHOTOGRAPHY
E UNIVERSITY AVENUE AND E 30TH STREET

ICAT CRASH SUMMARY OF MOTOR VEHICLE ACCIDENTS

Iowa Crash Analysis Tool
Quick Report
2017-2019

Crash Severity	68
Fatal Crash	0
Suspected Serious Injury Crash	4
Suspected Minor Injury Crash	8
Possible/Unknown Injury Crash	11
Property Damage Only	45

Injury Status Summary	35
Fatalities	0
Suspected serious/incapacitating	4
Suspected minor/non-incapacitating	9
Possible (complaint of pain/injury)	14
Unknown	8

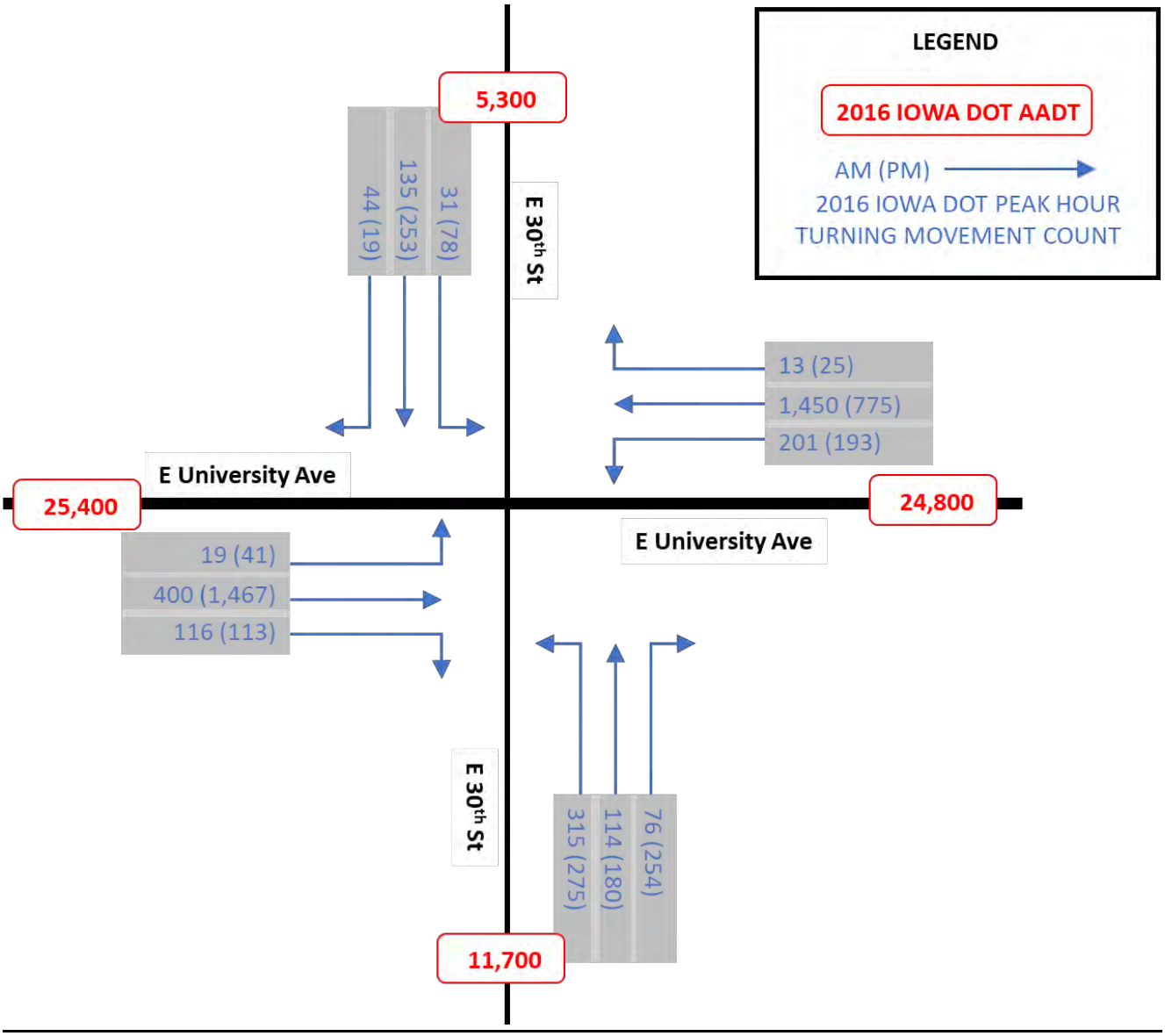
Property/Vehicles/Occupants	
Property Damage Total (dollars):	363,115.00
Average (per crash dollars):	5,339.93
Total Vehicles:	139.00
Average (per crash):	2.04
Total Occupants:	202.00
Average (per crash):	2.97

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.40
Major Injuries/Crash:	0.06
Minor Injuries/Crash:	0.13
Possible/Unknown Injuries/Crash:	0.21

Major Cause			68
Animal	0	Ran traffic signal	6
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	1
FTYROW: From stop sign	0	FTYROW: From yield sign	1
FTYROW: Making left turn	16	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	2	Improper or erratic lane changing	4
Operating vehicle in an reckless, erratic, ca...	2	Followed too close	13
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	3
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	2	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	1
Failure to signal intentions	1	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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	2
Unknown	12	Not reported	0
Other: No improper action	0		

Manner of Crash Collision	68
Non-collision (single vehicle)	4
Head-on (front to front)	2
Rear-end (front to rear)	19
Angle, oncoming left turn	15
Broadside (front to side)	13
Sideswipe, same direction	11
Sideswipe, opposite direction	1
Rear to rear	0
Rear to side	0
Not reported	0
Other	2
Unknown	1

TRAFFIC VOLUMES AND TURNING MOVEMENTS

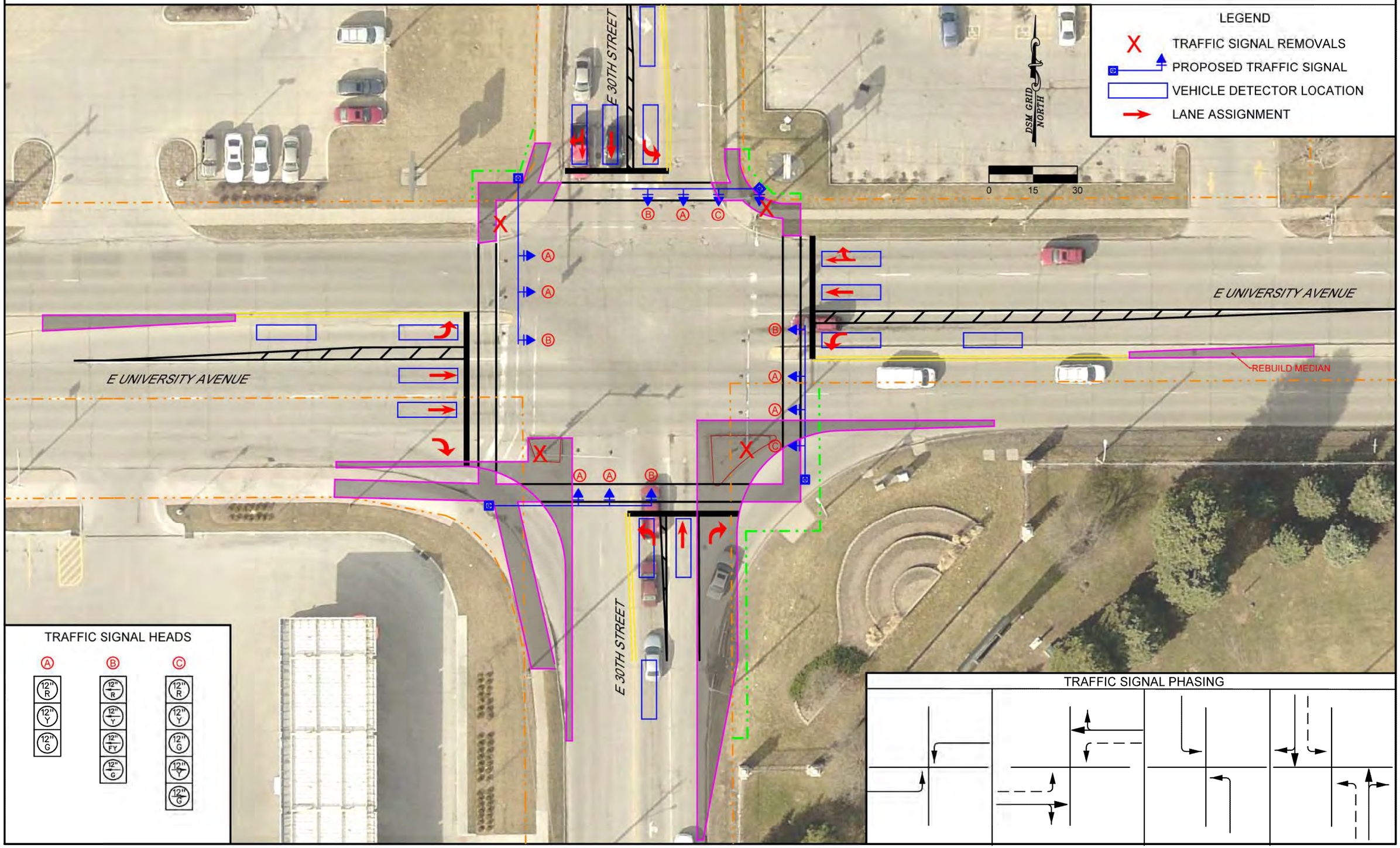


Traffic Volume Notes:

- Source: Iowa DOT 2016 Turning Movement Count Summary
- Date Collected: September 1, 2016
- Recent and accurate traffic data could not be collected due to COVID-19 traffic reductions.

EXHIBIT K

TRAFFIC SIGNAL LAYOUT
E UNIVERSITY AVENUE AND E 30TH STREET



BENEFIT/COST

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: City of Des Moines Date Prepared: Jul 16, 2020

Intersection: E University Avenue & E 30th Street

Improvement

Proposed Improvement(s): Retime traffic signal and increase yellow change and red clearance intervals

$ 312,000 Estimated Improvement Cost, **EC**

$ 100 Other Annual Cost (after initial year), **AC**

$ 1,112 Present Value Other Annual Costs, **OC**

$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^{Y}}\right)$$

15 Estimated Service Life, years, **Y**

36 Crash Reduction Factor (integer), **CRF**

4.0% Discount Rate (time value of $), **INT**

$ 313,112 Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2016 Turning Movement Traffic Count 9/1/2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

3,045 (N)

11,653 (W) → ← 12,407 (E)

6,489 (S)

12,261,810 Current Annual Entering Veh., **AEV** = DEV * 365

34,876 veh / day, Final Year DEV, **FDEV**

187.18 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^{Y}\right) \Big/ 10^{6}$$

0.3% Projected Traffic Growth (0%-10%), **G**

33,594 Current Daily Entering Vehicles, **DEV**

Crash Data

2017 First full year –> 2019 Last full year 3.0 years, Time Period, **T**

Additional months

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
3	Injury Crashes →	2	Minor Injuries @	$65,000	$ 130,000
		1	Possible Injuries @	$35,000	$ 35,000
16	Property Damage Only		(assumed cost per crash)	$7,400	$ 140,600
		-OR-	enter all Property Costs of all crashes:		
19	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 305,600

6.33 Current Crashes / Year, **AA** = TA / T

$ 16,084 Cost per Crash, **AVC** = LOSS / TA

96.7 Total Expected Crashes, **TECR** = CR x TMEV

2.26 Crashes Avoided First Year **AAR** = AA x CRF / 100

$ 36,366 Crash Costs Avoided in First Year, AAR x AVC

34.5 Total Avoided Crashes, TECR x CRF/ 100

0.52 Crashes / MEV, Crash Rate, **CR**
CR = TA x 10^6 / (DEV x 365 x T)

$ 410,741 Present Value of Avoided Crashes, **BENEFIT**

$$BEN = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^{Y}\right)$$

Benefit / Cost Ratio

Benefit : Cost = $410,741 : $313,112 = **1.31** : 1

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: City of Des Moines | Date Prepared: Jul 16, 2020

Intersection: E University Avenue & E 30th Street

Improvement

Proposed Improvement(s): Modify/Remove Median and Pavement Markings to allow for positive offset for left turn lanes at all approaches

$ 45,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	38	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 45,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2016 Turning Movement Traffic Count | 9/1/2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

3,045 (N) | 11,653 (W) | 12,407 (E) | 6,489 (S)

12,261,810 Current Annual Entering Veh., **AEV** = DEV * 365

35,314 veh / day, Final Year DEV, **FDEV**

251.15 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

0.3% Projected Traffic Growth (0%-10%), **G**

33,594 Current Daily Entering Vehicles, **DEV**

Crash Data

2017 First full year --> | 2019 Last full year | 3.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
11	Injury Crashes	4	Minor Injuries @	$65,000	$ 260,000
		5	Possible Injuries @	$35,000	$ 175,000
17	Property Damage Only		(assumed cost per crash)	$7,400	$ 207,200
			-OR- enter all Property Costs of all crashes:		
28	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,292,200

9.33	Current Crashes / Year, **AA** = TA / T	0.76	Crashes / MEV, Crash Rate, **CR**
$ 46,150	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
191.2	Total Expected Crashes, **TECR** = CR x TMEV	$ 2,270,740	Present Value of Avoided
3.55	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 163,679	Crash Costs Avoided in First Year, AAR x AVC		
72.6	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $2,270,740 : $45,000 = **50.46** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/30/2020

Location / Title of Project: City of Fairfield – Highway 1 Improvements

Applicant: City of Fairfield

Contact Person: Melanie Carlson Title: City Engineer

Complete Mailing Address: 118 South Main St.
Fairfield, IA 52556

Phone: 641-472-6193 (Area Code) E-Mail: mcarlson@fairfieldiowa.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	$ 1,870,000
Total Project Cost	$ 5,287,200
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: A traffic study was prepared for Highway 1 and the intersections with Libertyville Road and W Fillmore Avenue, which recommended the proposed improvements

☐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 Fairfield

Signed: Connie Boyer — 7/30/2020
Signature — Date Signed

Connie Boyer
Printed Name

Attest: Rebekah Loper — 7-30-2020
Signature — Date Signed

REBEKAH LOPER
Printed Name

RESOLUTION NO. 3846

A RESOLUTION SUPPORTING THE CITY'S APPLICATION FOR AN IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM GRANT

WHEREAS, the City of Fairfield desires to improve traffic flow and safety where Highway 1 intersects with Libertyville Road and with Fillmore Avenue;

WHEREAS, the above intersections of are eligible locations.

WHEREAS, the City Council of the City of Fairfield approved a letter of support for improvements to this section of roadway. The improvements include a roundabout at the intersection of Highway 1 and Libertyville Road, a three-lane urban road section with a two-way left-turn center land, and a left turn lane at Highway 1 and Fillmore Avenue.

BE IT RESOLVED, that the City Council of the City of Fairfield, Iowa Fairfield authorizes, endorses, and supports an application for an Iowa Department of Transportation Traffic Safety Improvement Program Grant.

BE IT FURTHER RESOLVED, that the City Council of the City of Fairfield does commit to maintain any funded improvements covered by this grant as required by the Cooperative Agreement between the City and he Iowa Department of Transportation.

Dated this 13th day of July, 2020 at Fairfield, Iowa

CITY OF FAIRFIELD, IOWA

Connie Boyer, Mayor City of Fairfield

ATTEST:

Aaron Kooiker, City Administrator

Passed this 13th day of July 2020, and approved for signature this 13th day of July 2020.

The above Resolution No. 3846 having come before the City Council of Fairfield, Iowa on the 13th day of July 2020, having been moved by Councilperson ANDERSON and seconded by Councilperson FLOURNOY is adopted by the following vote:

	AYES	NAYS	ABSTAIN	ABSENT
Twohill	X			
Gandy	X			
Rasmussen	X			
Ham	X			
Halley	X			
Flournoy	X			
Anderson	X			

Traffic Safety Improvement Program Application

Highway 1, from Libertyville Road to W Filmore Avenue

Fairfield, Iowa

August 3, 2020

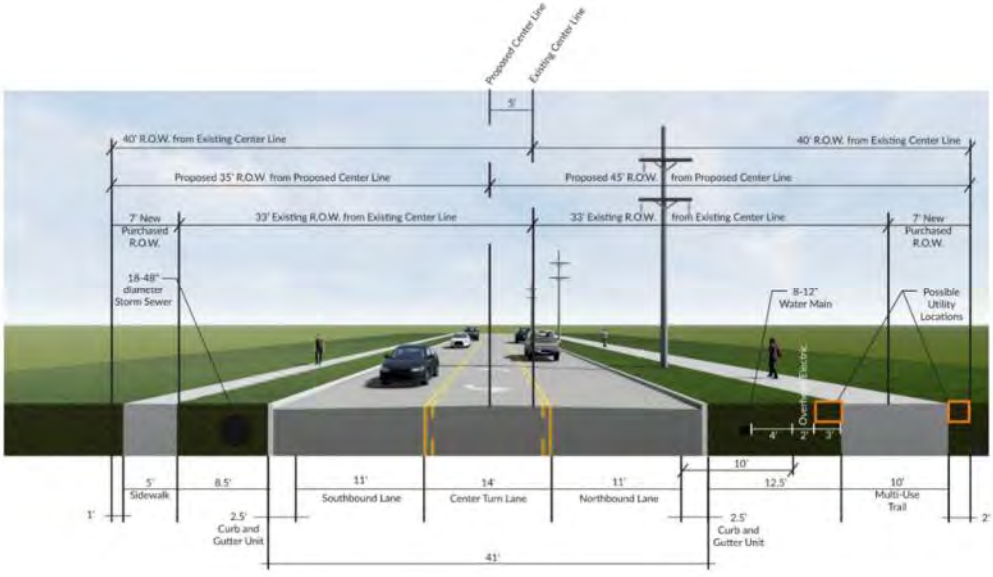
Narrative

Background

The Highway 1 corridor from Libertyville Road to Fillmore Avenue has been and still is a safety concern for the City of Fairfield. In the last 15 years, two noticeable changes occurred in the surrounding area which have impacted and increased the traffic along this stretch of road, specifically at the two-way stop-controlled intersection at Highway 1 and Libertyville Road. First, in 2006, Jefferson County purchased 35 acres in the southwest corner of the intersection and has been developing their new hospital campus. Around the same time, the US 34 bypass and the Fairfield Lop Trail was constructed. This bypass connected to Highway 1 just south of the project corridor and the trail crossing of Highway 1 at the Libertyville Road intersection was established. These improvements have led to additional development, including a 180-child capacity daycare center west of the hospital to be completed later this year. A once very low use entrance into Fairfield is now being used frequently and has seen a significant increase for traffic flow. As traffic increases, the likelihood of poor decision-making increases, which leads to increased crashes.

The City of Fairfield is taking a proactive approach and is working toward constructing improvements to expand the rural 2-lane Highway 1 section to a 3-lane urban section from Fillmore Avenue to Libertyville Road. A right turn lane will be added to Highway 1 north of the Fillmore Avenue intersection and a roundabout will be constructed at the existing two-way stop-controlled intersection of Highway 1 and Libertyville Road.

Proposed 3- Lane Section



Traffic & Safety

Highway 1 is Fairfield's main north-south thoroughfare. This particular section provides access to the Fairfield Middle School, Pence Elementary School, High School Baseball and Softball fields, OB Nelson Park, Jefferson County Health Center, and several businesses, churches and residences. The improvements are planned to improve both operations and safety.

The main safety issues identified along this corridor are:

- High speeds through the corridor with a high driveway density
- Poor decision making at the TWSC intersection as traffic volume increases
- The regional trail network and getting people across Highway 1 safely

Highway 1 is a north/south two-lane (one lane in each direction) principal arterial roadway. Parking is prohibited along Highway 1, and the roadway width is 24 feet north of Libertyville Road intersection. The City has worked with local DOT staff to reduce the speed limit 35 mph, but due to the rural cross-section and many other factors, the 85th percentile is still near 50 mph through this intersection and the high driveway density area. Libertyville Road is an east/west two-lane (one lane in each direction) minor arterial roadway. Parking is permitted along Libertyville Road, the roadway width is 30 feet, and the posted speed limit is 35 mph.

According to the Iowa DOT, 2018 AADT Map, the AADTs along Highway 1, and Libertyville Road within the project limits are

- Highway 1: 5,600 vehicles per day (vpd) south of Libertyville Road, 5,800 vpd from Libertyville Road to E Buchanan Avenue, 6,500 vpd from Buchanan Avenue to Fillmore Avenue, and 5,700 vpd north of Fillmore Avenue.
- Libertyville Road: 2,220 and 350 vpd west and east of Highway 1, respectively.

These roads are expected to see significant growth; the 2040 AADTs are expected to be:

- Highway 1: 7,300 vehicles per day (vpd) south of Liberty Road, 7,550 vpd from Liberty Road to E Buchanan Avenue, 8,450 vpd from Buchanan Avenue to Fillmore Avenue, and 7,400 vpd north of Fillmore Avenue.
- Libertyville Road: 2,890 and 400 vpd west and east of Highway 1, respectively.

The existing intersection control is not able to handle projected future traffic under an acceptable level of service (LOS) with the current two-way stop-control (TWSC). As traffic volumes continue to rise at the intersection of Highway 1 and Libertyville Road, drivers are going to begin to accept smaller gaps in traffic which will result in crashes. The severity will be higher due to broadside crashes and higher speeds.

Regional Trail Network

Part of the project will be constructing a trail along the east side of Highway 1 to connect into the Fairfield Loop Trail that crosses the highway just south of the Libertyville Road intersection. Today, it is not uncommon to see people hustling across the busy and wide Highway 1 at this intersection or walking longitudinally along Highways 1, to access the loop trail, dodging pot holes and vehicles. A roundabout at this intersection will increase the safety of the users looking to cross the Highway 1 as they traverse the trail, allowing them to focus on watching for one direction of traffic at a time while crossing.

Crash History

The Iowa Crash Analysis Tool (ICAT) website administered by Iowa DOT was used to collect available crash data at the study intersections for the ten-year period between January 1, 2015 and December 31, 2019. Over this period a total of 21 crashes were reported within the study corridor, 5 suspected minor injury crashes.

At the Highway 1 and Libertyville Road intersection, broadside, rear-end, angle oncoming left, head-on, sideswipe same direction, and single vehicle were the highest frequency of crash types. No crash trends were identified. Along the roadway corridor, broadside, rear-end, sideswipe same direction, and single vehicle were the highest frequency of crash types. No crash trends were identified.

Local Roads Safety Program Survey

The city of Fairfield also completed a Local Roads Safety Program survey (LRSP). The Highway 1 corridor within the project limits has four intersection that were surveyed. Of the four intersections, three of the intersection were ranked in the top 25 unsignalized intersections with the highest risk factor. The Highway 1 and Libertyville Road intersection was on top of the list, with a 71% risk factor. Also, not to far down the list was the Highway 1 and Fillmore Avenue intersection, with a 58% risk factor and Highway 1 and East Buchanan Ave, with a 50% risk factor.

The intersection of Highway 1 and Fillmore Avenue was further reviewed and the study listed several long-term and short-term improvements. The proposed corridor improvements align with this study and will provide ADA complaint ramps and a westbound dedicated turn lane recommended in the LRSP, to help reduce the vehicle and pedestrian/bike risk factors due to the heavy traffic during school drop off teams.

Proposed Improvements & Conclusion

The proposed improvements of converting the Highway 1 and Libertyville Road intersection into a four-leg one-lane roundabout and reconstructing Highway 1 to be a 3-lane urban section from a current 2-lane rural section, within the project limits will reduce the probability of crashes, specifically rear-end and broadside crashes due to high number of driveways in this section of the highway, and will keep this corridor from becoming a ‘black spot’ on the crash reports. Per the Iowa DOT CRF list, an approximate reduction of 85% due to the installing a roundabout on a rural unsignalized intersection. The Highway Safety Manual Clearinghouse website identifies an approximate expected crash frequency reduction of 36% when introducing a two-way left-turn (TWLTL) on a rural two lane roadway.

The city and the residents are in favor of the improvements, they are confident it is the right solution to slow down traffic and prevent a serious injury ‘accident waiting to happen’.

Highway 1 - Libertyville Road to Fillmore Ave Roadway Improvements
Opinion of Probable Construction Costs
April 3, 2020

ITEM NO.	ITEM	UNIT	UNIT PRICE	QUANTITY	TOTAL PRICE
1	CLEARING AND GRUBBING	LS	$ 5,000.00	1	$ 5,000.00
2	TOPSOIL, OFF-SITE	CY	$ 20.00	2250	$ 45,000.00
3*	EXCAVATION, CLASS 10, CLASS 12, OR CLASS 13	CY	$ 15.00	20000	$ 300,000.00
4*	SUBGRADE PREPARATION, 12"	SY	$ 3.00	21760	$ 65,280.00
5*	SUBBASE, 6", MODIFIED	CY	$ 35.00	3650	$ 127,750.00
6*	COMPACTION TESTING	LS	$ 15,000.00	1	$ 15,000.00
7	TRENCH COMPACTION TESTING	LS	$ 9,000.00	1	$ 9,000.00
8	STORM SEWER, TRENCHED, RCP, VARIOUS"	LF	$ 100.00	2500	$ 250,000.00
9	STORM SEWER, TRENCHED, RCP, 54"	LF	$ 200.00	700	$ 140,000.00
10	REMOVAL OF STORM SEWER, RCP, VARIOUS"	LF	$ 30.00	1100	$ 33,000.00
11	APRON, CONCRETE, 54"	EA	$ 2,000.00	1	$ 2,000.00
12	GRANULAR BACKFILL	TON	$ 50.00	450	$ 22,500.00
13	SUBDRAIN, PERFORATED, 6"	LF	$ 18.00	5000	$ 90,000.00
14	SANITARY SEWER, TRENCHED, PVC, 12"	LF	$ 80.00	200	$ 16,000.00
15	MANHOLE ADJUSTMENT, MAJOR	EA	$ 2,200.00	2	$ 4,400.00
16	REMOVE INTAKE	EA	$ 750.00	20	$ 15,000.00
17	MANHOLE, STORM SEWER	EA	$ 5,000.00	2	$ 10,000.00
18	MANHOLE SANITARY SEWER	EA	$ 8,000.00	2	$ 16,000.00
19	STORM INTAKE	EA	$ 6,000.00	20	$ 120,000.00
20*	PAVEMENT, PCC, 9"	SY	$ 65.00	20050	$ 1,303,250.00
21	SHARED USE PATH, PCC, 5"	SY	$ 50.00	3510	$ 175,500.00
22*	PAVEMENT, COLORED OR STAMPED PCC, 9"	SY	$ 85.00	500	$ 42,500.00
23*	PCC PAVEMENT SAMPLES AND TESTING	LS	$ 15,000.00	1	$ 15,000.00
24	TEMPORARY HMA LANE, 10'	SY	$ 55.00	3670	$ 201,850.00
25	REMOVAL OF SIDEWALK	SY	$ 8.00	780	$ 6,240.00
26	REMOVAL OF DRIVEWAY	SY	$ 9.50	2600	$ 24,700.00
27	SIDEWALK, PCC, 4"	SY	$ 40.00	1240	$ 49,600.00
28	DETECTABLE WARNING	SF	$ 35.00	816	$ 28,560.00
29	PAVEMENT REMOVAL	SY	$ 9.50	17670	$ 167,865.00
30	TRAFFIC CONTROL	LS	$ 150,000.00	1	$ 150,000.00
31	SEEDING	ACRE	$ 2,000.00	3	$ 6,000.00
32	EROSION CONTROL	LS	$ 75,000.00	1	$ 75,000.00
33	CONSTRUCTION SURVEY	LS	$ 20,000.00	1	$ 20,000.00
34	MOBILIZATION	LS	$ 250,000.00	1	$ 250,000.00

CONSTRUCTION SUBTOTAL	$3,801,995
UNDEVELOPED DESIGN CONTINGENCY (20%)	$760,399
TOTAL COST OPINION - ENTIRE PROJECT	**$4,562,394**

*Safety related costs TOTAL	$ 1,868,780.00

*The Architect/Engineer, as a design professional familiar with the construction industry, has prepared this opinion of the Probable Cost of Construction. It is recognized, however, that neither the Architect/Engineer nor the Owner has control over the cost of labor, materials, or equipment, over the Contractor's method of determining bid prices, or over competitive bidding, market, or negotiating conditions. Accordingly, the Architect/Engineer cannot and does not warrant or represent which bids or negotiated prices will not vary from the Probable Cost of Construction.

Improvements to Highway 1 between Libertyville Road and W Fillmore Avenue, including the two intersections are to be funded through Traffic Safety Improvement Funds, other grant funds, and local matching funds. The schedule proposed for the safety improvements is as follows:

- **August 2020** – Submit for 2022 TSIP Funds
- **Mid-January 2021** – TSIP Funds are awarded
- **January 2021 – August 2021** – Proceed with design of improvements
- **July 2021** – TSIP funds are available for the intersection improvements
- **Winter 2021/2022** – Let intersection project
- **April 2022** – Construction begins
- **October 2022** – Construction complete for Highway 1 between Libertyville Road and West Fillmore Avenue

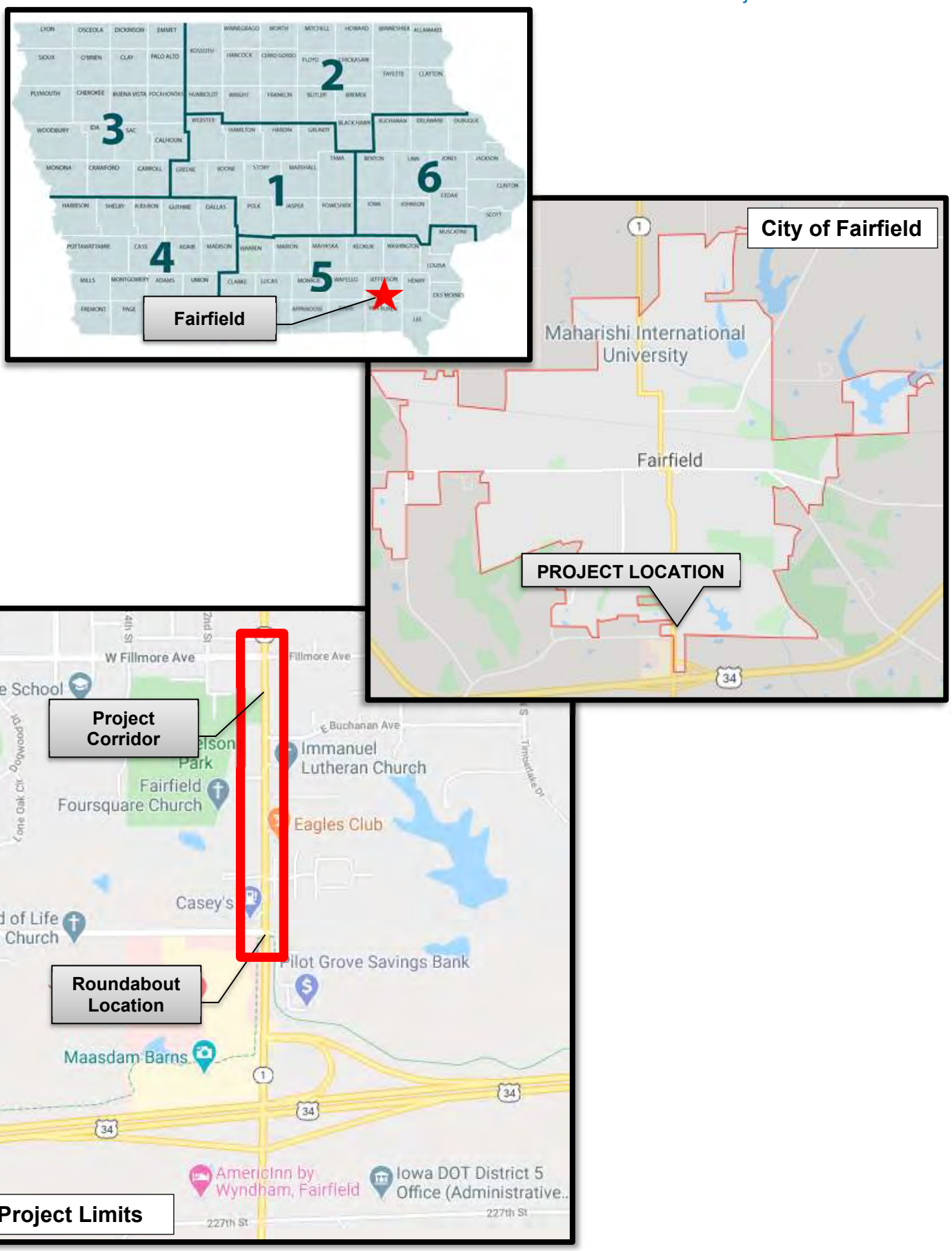
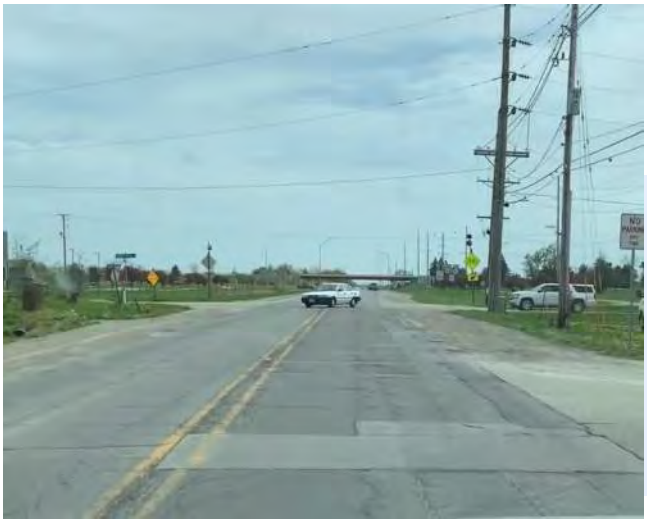

Fairfield
City of Fairfield
Maharishi International University
Fairfield
PROJECT LOCATION
Project Corridor
W Fillmore Ave
Fillmore Ave
Immanuel Lutheran Church
Fairfield Foursquare Church
Eagles Club
Casey's
Pilot Grove Savings Bank
Roundabout Location
Maasdam Barns
AmericInn by Wyndham, Fairfield
Iowa DOT District 5 Office (Administrative..
Project Limits
227th St

PHOTO NUMBER 1 & 2	DESCRIPTION: Intersection of Highway 1 & Libertyville Road

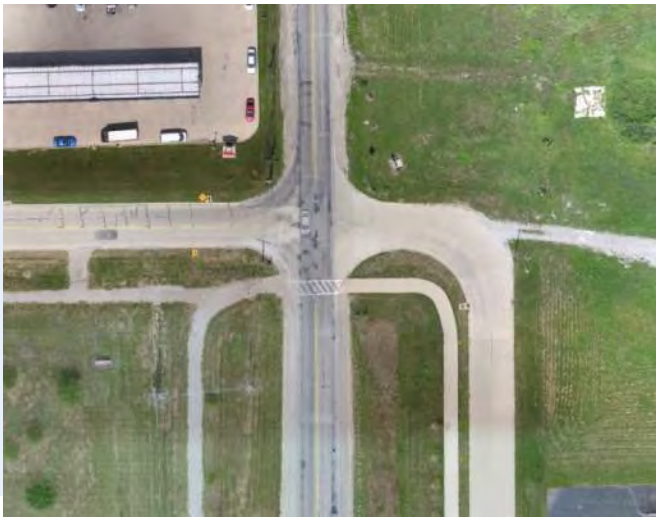
Highway 1 & Libertyville Road
(looking southeast)

Highway 1 & Libertyville Road
(looking northwest)

PHOTO NUMBER 3 & 4	DESCRIPTION: Intersection of Highway 1 & Libertyville Road



Highway 1 & Libertyville Road
(looking north)



Highway 1 & Libertyville Road
(aerial photo)

PHOTO NUMBER 5 & 6	DESCRIPTION: Highway 1 Pavement & Ditch, looking south

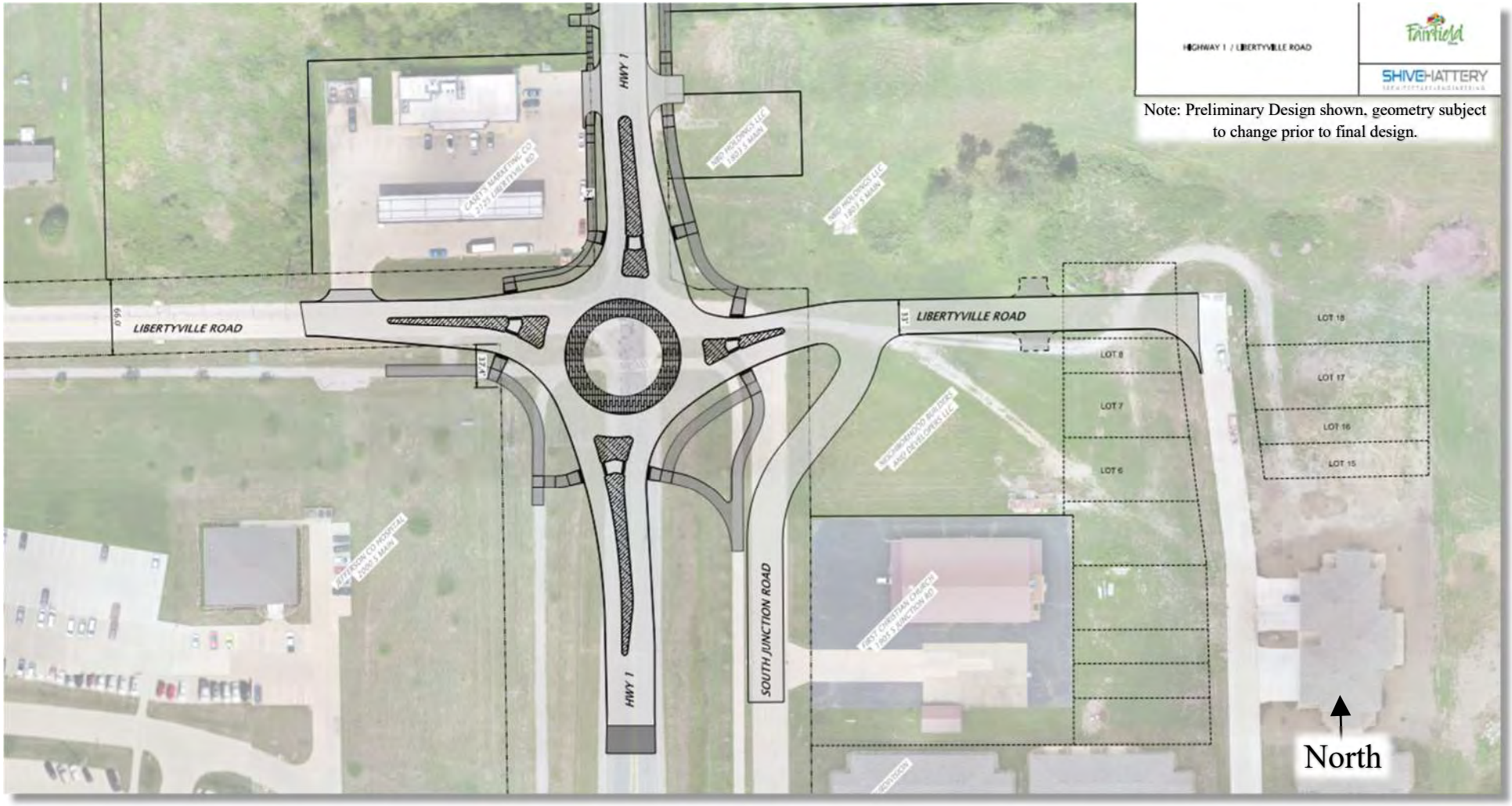
Highway 1 Pavement
(looking south)

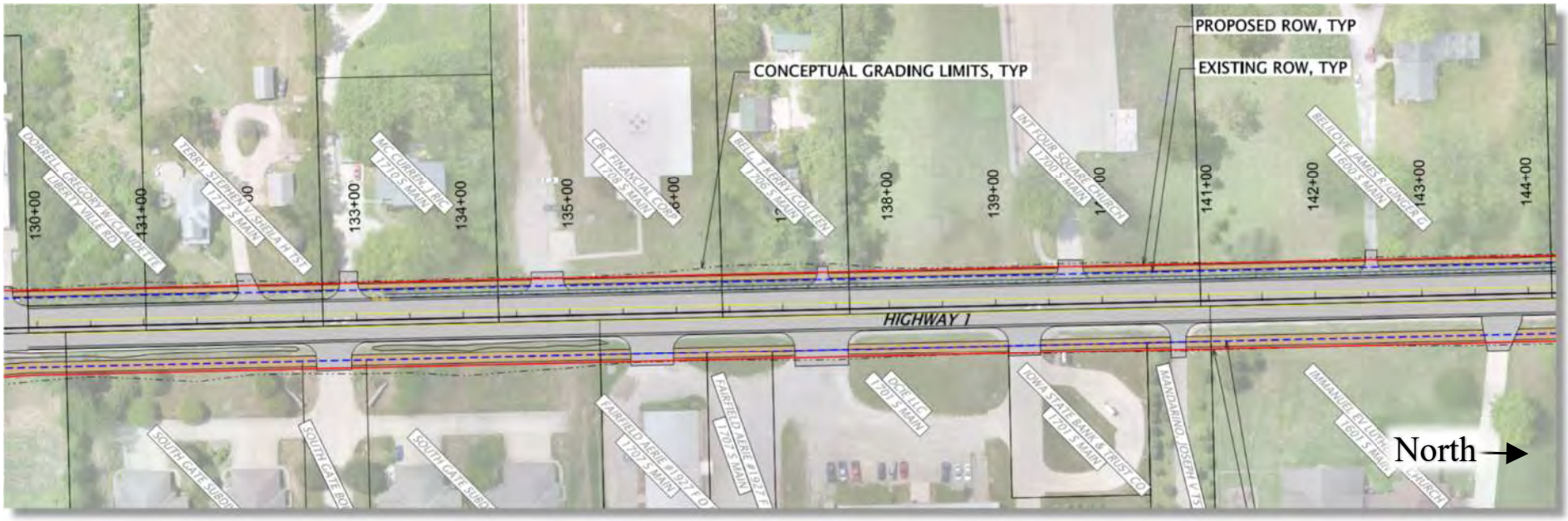
Highway 1 Ditch
(looking south)

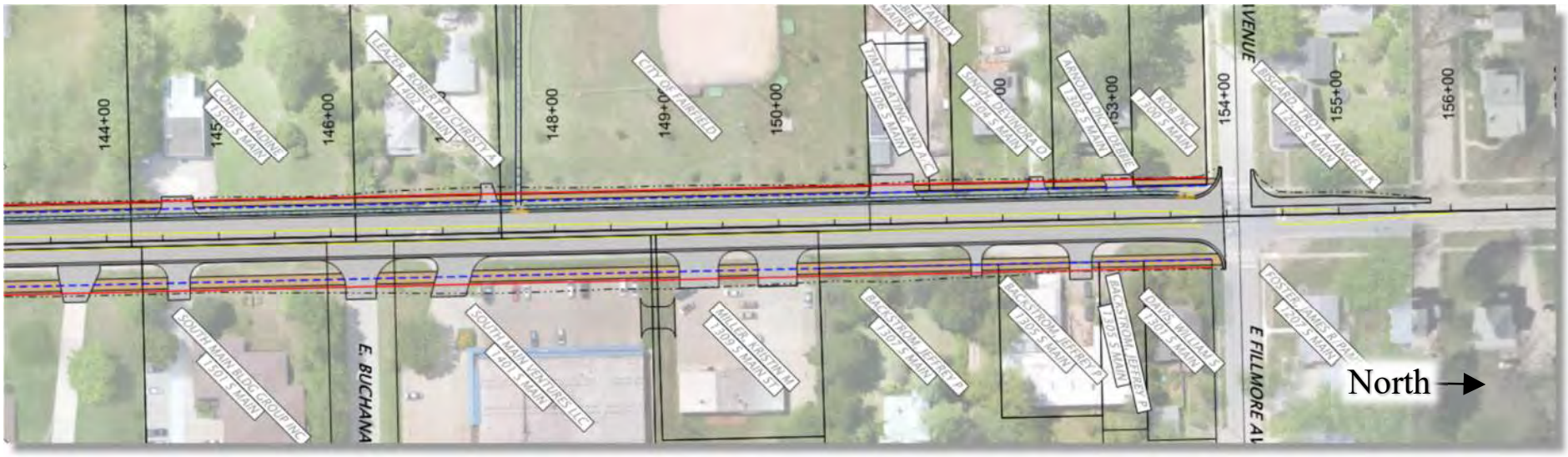
PHOTO NUMBER 7 & 8	DESCRIPTION: Highway 1 pavement & ditch, looking north

Highway 1 Pavement
(looking north)

Highway 1 Ditch
(looking north)


HIGHWAY 1 / LIBERTYVILLE ROAD
Fairfield
SHIVEHATTERY
Note: Preliminary Design shown, geometry subject to change prior to final design.
LIBERTYVILLE ROAD
LIBERTYVILLE ROAD
HWY 1
HWY 1
SOUTH JUNCTION ROAD
LOT 18
LOT 17
LOT 16
LOT 15
LOT 8
LOT 7
LOT 6
North


PROPOSED ROW, TYP
EXISTING ROW, TYP
CONCEPTUAL GRADING LIMITS, TYP
HIGHWAY 1
130+00
131+00
133+00
134+00
135+00
138+00
139+00
141+00
142+00
143+00
144+00
North


144+00
146+00
148+00
149+00
150+00
153+00
154+00
155+00
156+00
E. BUCHANA
E FILLMORE A
North


PENCE ELEMENTARY SCHOOL
B NELSON PARK
FILLMORE AVE
FAIRFIELD MIDDLE SCHOOL
ROADWAY WIDENING (2-LANE to 3-LANE)
BASEBALL/SOFTBALL FIELDS
PROPOSED ROUNDABOUT LOCATION
CASEYS GAS STATION
PROPOSED COMMERCIAL DEVELOPMENT
LIBERTYVILLE RD
PROPOSED RESIDENTIAL DEVELOPMENT
HIGHWAY 1
FAIRFIELD LOOP TRAIL
JEFFERSON COUNTY HEALTH CENTER
US ROUTE 34
DISTRICT 5 OFFICE
North

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	21
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	5
Possible/Unknown Injury Crash	0
Property Damage Only	16

Injury Status Summary	8
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	6
Possible (complaint of pain/injury)	1
Unknown	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	148,050.00
Average (per crash dollars):	7,050.00
Total Vehicles:	38.00
Average (per crash):	1.81
Total Occupants:	57.00
Average (per crash):	2.71

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.33
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.29
Possible/Unknown Injuries/Crash:	0.05

Iowa Crash Analysis Tool
Quick Report
2015-2019

Major Cause			20
Animal	2	Ran traffic signal	0
Ran stop sign	1	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	6	FTYROW: From yield sign	0
FTYROW: Making left turn	0	FTYROW: From driveway	1
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	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...	0
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...	1	Driver Distraction: Other interior distracti...	2
Driver Distraction: Exterior distraction	2	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	1	0	0	0	1	1	0	0	0	0	0	0	3
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	0	0	2	0	0	2	0	0	0	0	0	4
Wednesday	0	0	0	0	0	0	1	0	0	2	0	0	0	3
Thursday	0	0	0	0	2	0	1	1	1	0	1	0	0	6
Friday	0	1	0	0	0	1	0	1	1	1	0	0	0	5
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	4	2	3	4	2	3	1	0	0	21

Manner of Crash Collision	**21**
Non-collision (single vehicle)	4
Head-on (front to front)	0
Rear-end (front to rear)	5
Angle, oncoming left turn	2
Broadside (front to side)	7
Sideswipe, same direction	3
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	**21**
Dry	18
Wet	1
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	2
Other	0
Unknown	0

Fixed Object Struck			**38**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	1	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	37

Iowa Crash Analysis Tool
Quick Report
2015-2019

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	1	0	0	1
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	2	0	0	0	2
>= 21 and <= 24	3	3	0	0	6
>= 25 and <= 29	4	2	0	0	6
>= 30 and <= 34	2	0	0	0	2
>= 35 and <= 39	2	1	0	0	3
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	1	0	0	1
>= 50 and <= 54	1	1	0	0	2
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	2	0	0	0	2
>= 65 and <= 69	0	2	0	0	2
>= 70 and <= 74	1	2	0	0	3
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	1	2	0	0	3
>= 85 and <= 89	1	1	0	0	2
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	1	0	1
Total	19	16	1	0	36

Drug/Alcohol Related	**21**
Drug	0
Alcohol (< Statutory)	1
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	20

Alcohol Test Given	**38**
None	34
Blood	0
Urine	0
Breath	1
Vitreous	0
Refused	0
Not reported	3

Drug Test Given	**38**
None	35
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	3

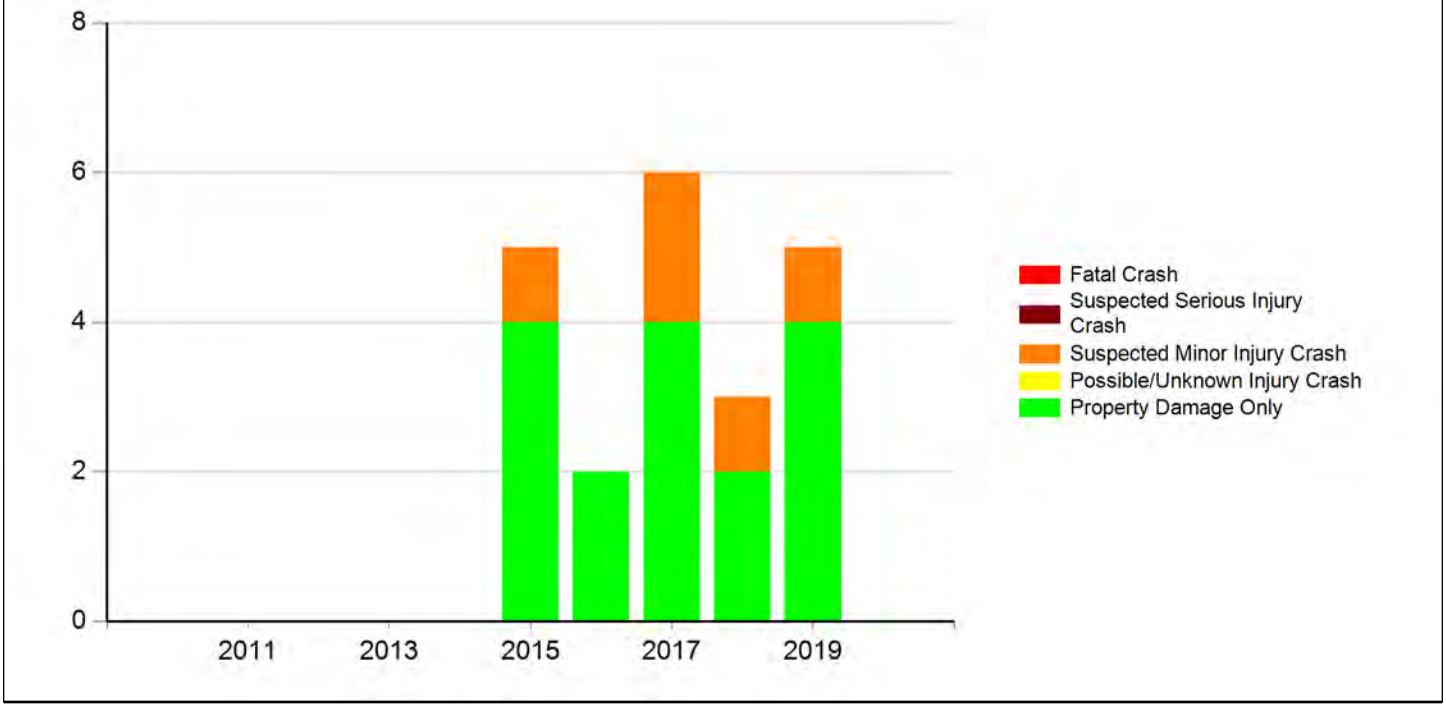
Drug Test Result	**38**
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	38
Other	0

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	1	0	4	5
2016	0	0	0	0	2	2
2017	0	0	2	0	4	6
2018	0	0	1	0	2	3
2019	0	0	1	0	4	5
2020	0	0	0	0	0	0
Total	0	0	5	0	16	21

Severity/Year

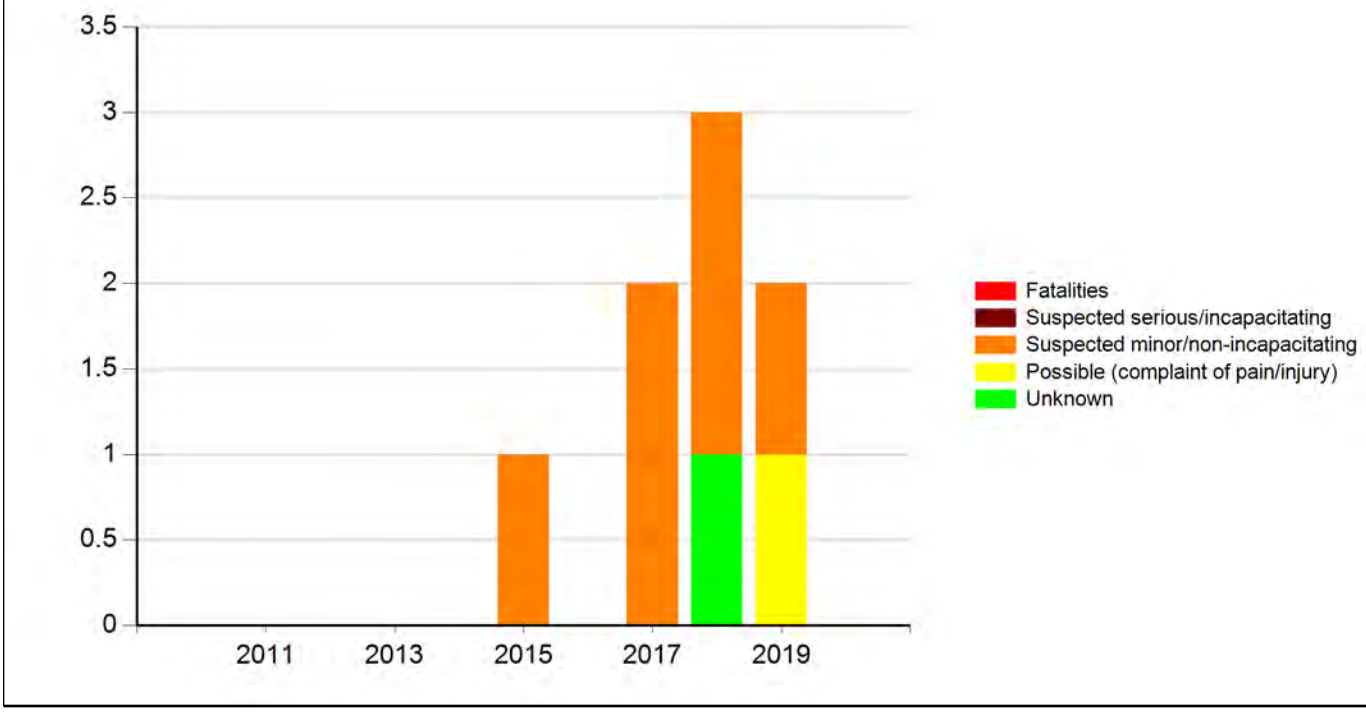


Iowa Crash Analysis Tool
Quick Report
2015-2019

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	1	0	0	1
2016	0	0	0	0	0	0
2017	0	0	2	0	0	2
2018	0	0	2	0	1	3
2019	0	0	1	1	0	2
2020	0	0	0	0	0	0
Total	0	0	6	1	1	8

Injury Status/Year



Iowa Crash Analysis Tool
Quick Report
2015-2019

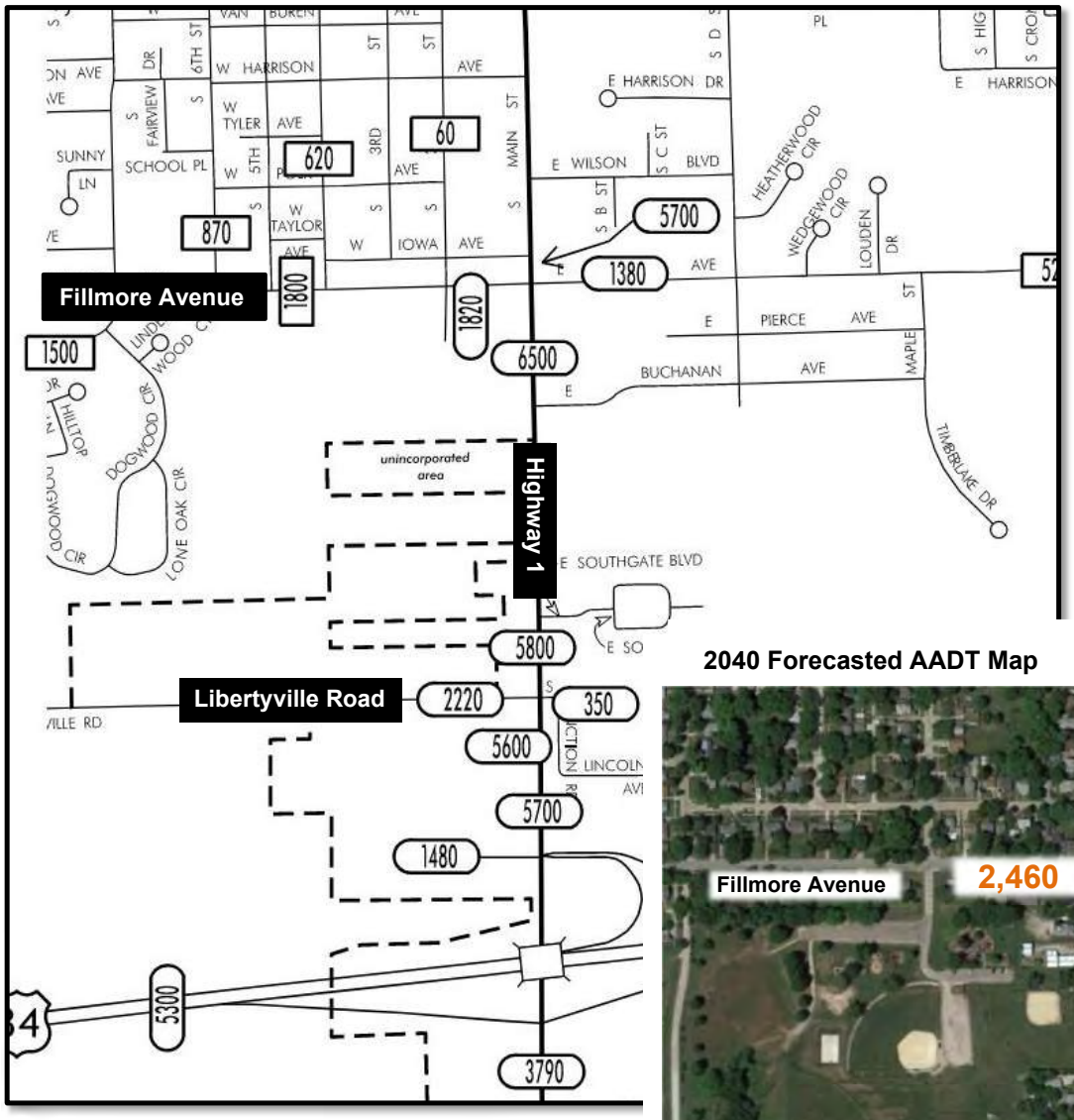
Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

Fairfield Crash Report Highway 1 Project

2018 Iowa DOT AADT Map



2040 Forecasted AADT Map

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Jefferson | Prepared by: Shive-Hattery, Inc | Date Prepared: Aug 3, 2020

Location: Highway 1, from Libertyville Road to Fillmore Avenue with Roundabout, Fairfield, IA

Improvement

Proposed Improvement(s): Road section will be expanded to 3 lanes, with a middle two-way left-turn lane, from existing 2-lane road section. Convert stop-control to a single-lane roundabout.

$1,868,780	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ 1,000	Other Annual Cost (after initial year), **AC**	90	Crash Reduction Factor (integer), **CRF**
$ 13,590	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 1,882,370**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Maps | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.35	5,800	Libertyville Rd through Buchar
0.15	6,500	Buchanan Ave through Fillmor
0.50	miles total	

3,005	Current Vehicle Miles / Day, **VM**
3,815	End of Life Veh. Miles / Day
1,096,825	Current Veh. Miles / Year, **AM**
24,626,862	Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.2% Projected Traffic Growth (0%-10%), **G**

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
5	Injury Crashes →	5	Minor Injuries @	$65,000	$ 325,000
		0	Possible Injuries @	$35,000	$ -
16	Property Damage Only		(assumed cost per crash)	$7,400	$ 155,400
			-OR- enter all Property Costs of all crashes:		
21	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 480,400

4.20	Current Crashes / Year, **AA** = TA / T	**382.9**	Crashes / HMVM, Crash Rate, **CR**
$ 22,876	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
94.3	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 1,304,851**	Present Value of Avoided Crashes, **BENEFIT**
3.80	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 86,856	Crash Costs Avoided in First Year, AAR x AVCR		
85.2	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $1,304,851 : $1,882,370 = **0.69** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 12, 2019

Location / Title of Project 35th Street at 7th Avenue & 10th Avenue

Applicant City of Marion

Contact Person Mike Barkalow Title City Engineer

Complete Mailing Address 1225 6th Avenue, Suite 200

Marion, IA 52302

Phone 319-743-6340 (Area Code) E-Mail Mbarkalow@cityofmarion.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	$ $900,000
Total Project Cost	$ $900,000
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 _____

☒ 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 Marion

Signed: _____ 9/17/20
Signature Date Signed

Mike Barkalow
Printed Name

Attest: _____ 9/17/2020
Signature Date Signed

Seth Kjormoe
Printed Name

RESOLUTION NO. 28660

RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR THE INTERSECTION OF HIGHWAY 100 AND EAST POST ROAD TO RECONFIGURE THE EXISTING INTERSECTION WITH ADDITIONAL LEFT AND RIGHT TURN LANES AND TO UPGRADE THE EXISTING SIGNAL FOR THE NEW TURN LANES, AS WELL AS A QUEUE DETECTION WARNING SYSTEM FOR THE WESTBOUND TRAFFIC AT EAST POST ROAD.

WHEREAS, the Iowa Department of Transportation has established the TSIP and provides funding for locations where vehicular safety is a concern and documented; and

WHEREAS, the Highway 100 and East Post Road intersection has been identified as a location where vehicular safety could be improved and funded by TSIP.

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

1. The City Council supports the application for TSIP funding.
2. The City Council hereby commits the additional City funds necessary for construction of the project beyond any TSIP funding, and;
3. The City Council hereby commits to accepting and maintaining these improvements.

Passed and approved this 23rd day of July 2020.

Nicolas AbouAssaly, Mayor

ATTEST:
I, Rachel Bolender, City Clerk of the City of Marion, 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.

Rachel Bolender, City Clerk

MARION
Engineering Department

Existing Conditions:
The intersection of Highway 100 and East Post Road is a large, four leg, signalized intersection with two through lanes in all directions. There are two left turn lanes for northbound traffic on East Post Road with about 300 feet of storage in each. For every other direction of traffic approaching the intersection there is one left turn bay. The left turn bay for westbound, eastbound, and southbound traffic are 450 feet, 250 feet, and 200 feet, respectively. All left turn movements at this intersection are protected-only signal phasing. Right turn lanes exist for all legs of the intersection except for westbound traffic which operate with permissive-overlap phasing. The posted speed limit of Highway 100 on both sides of the intersection is 55 mph. The posted speed limits for East Post Road are 45 mph and 35 mph south of the intersection and north of the intersection, respectively. There exists a vertical crest curve east of the intersection which limits the approaching stopping sight distance for westbound traffic. There is advanced traffic control (SIGNAL AHEAD W3-3 signs) approximately 1,000 feet east of the intersection as well.

Proposed Concept:
The proposed project will convert one westbound thru lane into a left turn lane while adding an additional thru lane and a right turn lane for westbound traffic. An additional eastbound left turn lane would also be constructed giving each leg of the intersection adequate room for dual left lanes. The traffic signals will be replaced and upgraded to optimize signal timing and interconnectivity with other signals along the Highway 100 corridor. During the AM peak hour, westbound left turning lane is over capacity which leads to excessive queuing that spills into the thru lane. According to the TEAP Study dated February 2020 of this intersection and corridor, the implementation of these intersection improvements would increase the level of service from a LOS F and LOS E during the AM and PM peak hours, respectively to a LOS C for both peak hours.

Safety Justification:
According to the Iowa Crash Analysis Tool (ICAT) over the past 5 years there have been a reported 49 non-animal related crashes at or within a relative proximity of this intersection. Of those 49 crashes, 31 were rear end collisions. Sixteen of the rear end collisions reported at this intersection were westbound traffic, many of which were also reported to be stopped in traffic, and several incidents involved multiple vehicles. Of these westbound rear end collisions, ten were reported to have caused possible or minor injuries.

From the Iowa DOT 2013 traffic counts, Highway 100 had an ADT volume of 19,400 and 19,900 vehicles west and east of the intersection respectively. Also from the 2013 data, East Post Road had a ADT volume of 14,500 and 8,200 vehicles south and north of the

intersection respectively. From the Iowa DOT 2017 traffic counts, Highway 100 had an ADT of 20,500 and 20,800 vehicles west and east of the intersection, respectively. Also, from the 2017 data, East Post Road had a ADT volume of 16,500 and 9,000 vehicles south and north of the intersection respectively.

As mentioned previously, a vertical crest curve exists east of the intersection that limits the stopping sight distance for westbound traffic. By adding additional left and right turn lanes for westbound traffic along with upgrading and optimizing signal timings, it is expected the queuing will be reduced while also providing more storage in the turn lanes. This, in turn, would minimize queuing from spilling into the two westbound thru lanes reducing rear end collisions.

MARION
Engineering Department

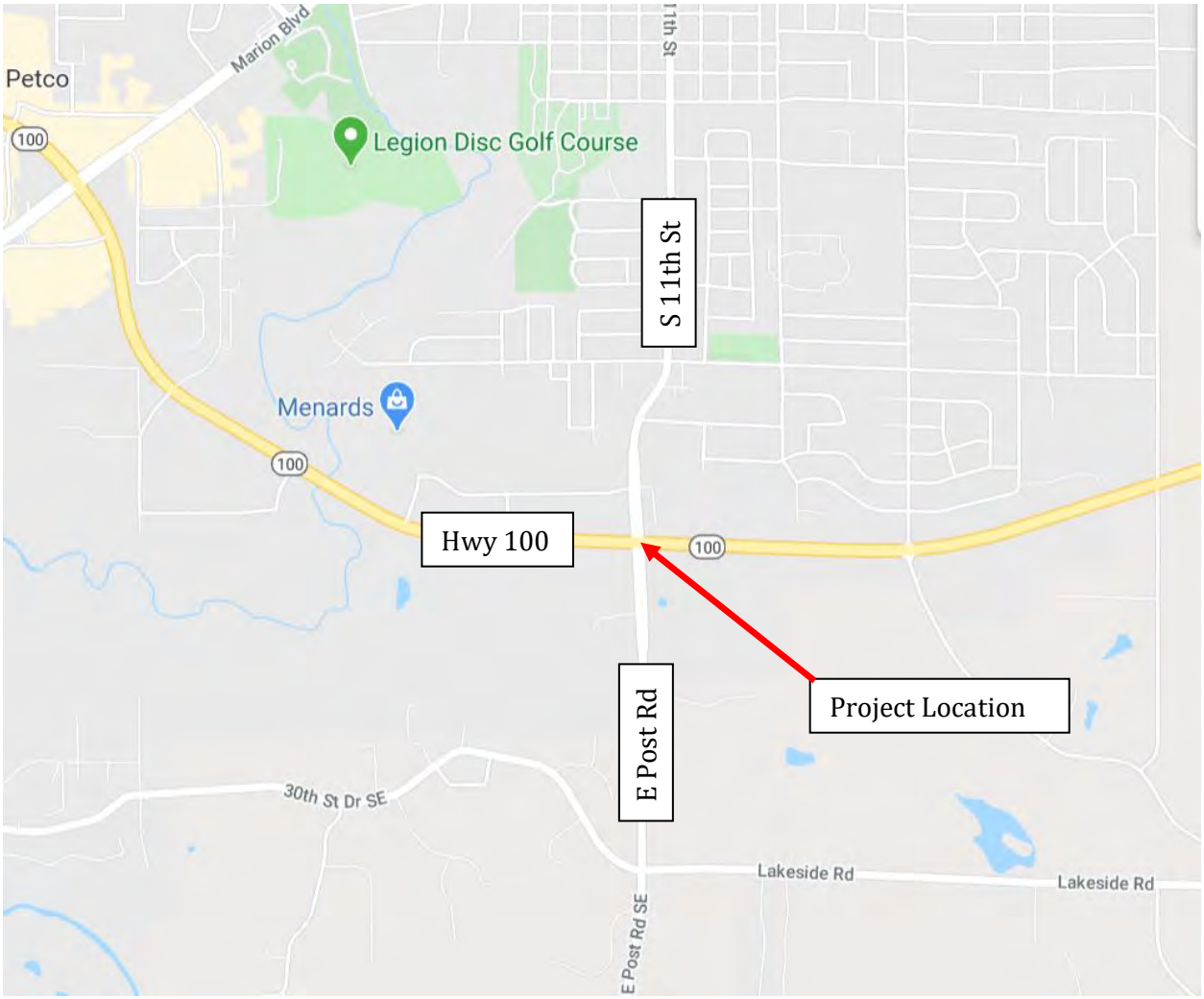
Highway 100 / East Post Road
Opinion of Probable Construction Costs

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	PRICE
1	Excavation, Class 10	CY	1,000	$12	$12,000
2	Granular Subbase, 12"	SY	5,050	$15	$75,750
3	Granular Shoulders, 8'	TON	825	$25	$20,625
4	Compaction Testing	LS	1	$750	$750
5	Pavement, PCC 10"	SY	3,060	$70	$214,200
6	Concrete Median Pavement	SY	3,325	$55	$182,875
7	PCC Pavement Samples and Testing	LS	1	$500	$500
8	Pavement Removal	SY	3,600	$20	$72,000
9	Pavement Markings	STA	100	$100	$10,000
10	Pavement Symbols	EA	16	$100	$1,600
11	Temporary Traffic Control	LS	1	$500	$500
12	Temporary Traffic Signal	LS	1	$10,000	$10,000
13	2" PVC or HDPE	LF	2,100	$8	$16,800
14	Traffic Signal	LS	1	$250,000	$250,000
15	Mobilization	LS	1	$50,000	$50,000
16	Advanced Queue Detection Warning System	LS	1	$37,500	$37,500
17	Traffic Signal Removal	LS	1	$5,000	$5,000
				TOTAL COST OPINION	$960,100

MARION Engineering Department

August 15, 2019:	**Traffic Safety Improvement Program (TSIP) Submittal Deadline**
January 2021:	**Notice of Approval**
May 2021:	**Project Letting**
July 2021:	**Begin Construction of Widening Improvements**
Fall 2021:	**Complete Construction of Widening Improvements**
Winter '21-'22:	**Begin Traffic Signal Construction (Anticipates a Traffic Signal Pole Lead Time Delay)**
May 2022:	**Complete Construction**

MARION
Engineering Department



MARION
Engineering Department

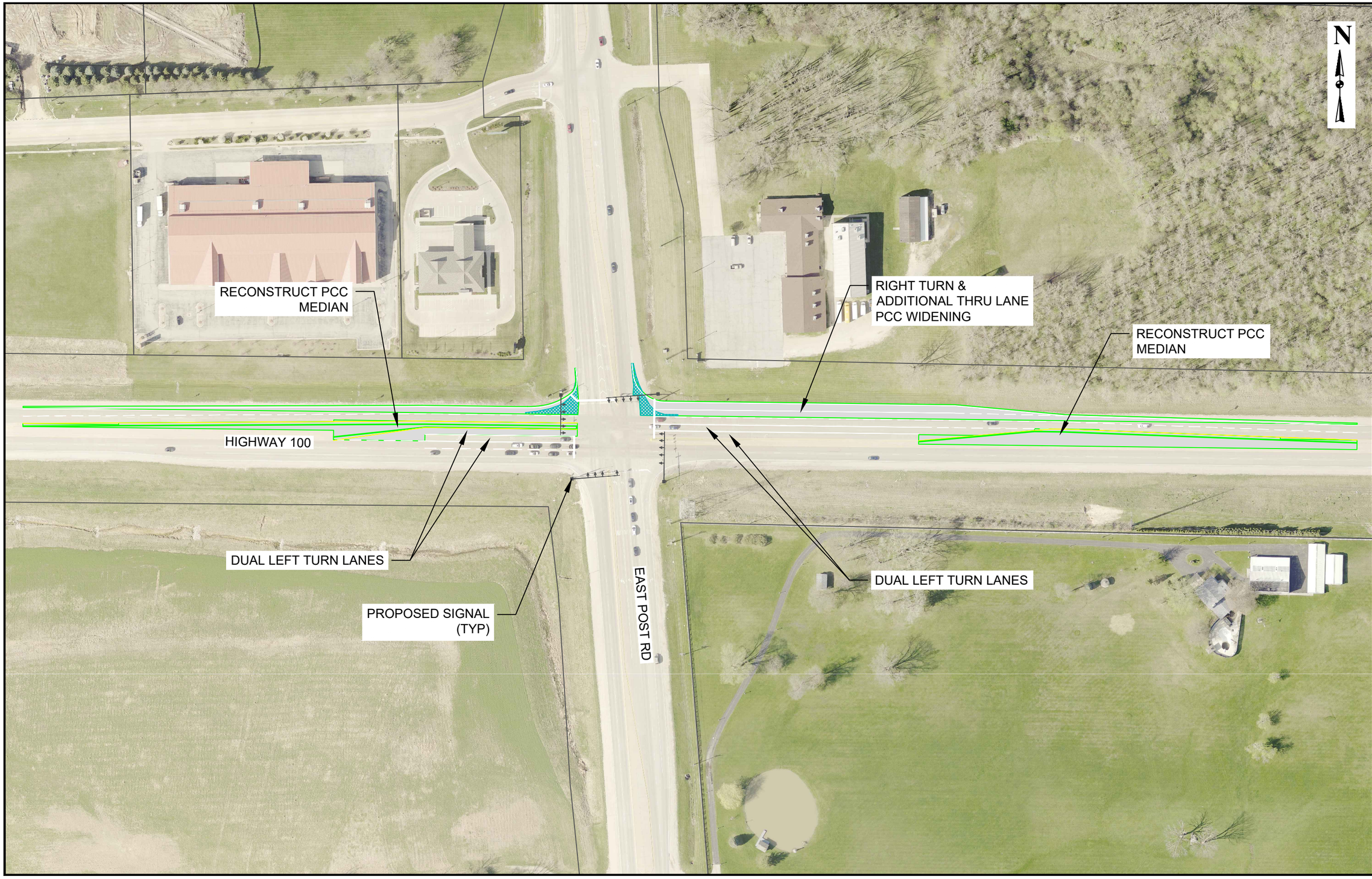
Looking East on Highway 100

Looking West on Highway 100

MARION
Engineering Department

Looking North on East Post Road

Looking South on East Post Road



Sheet Description: G - Plan View

Revisions

No.	Date:

CITY OF MARION
ENGINEERING DEPARTMENT
MARION, IOWA

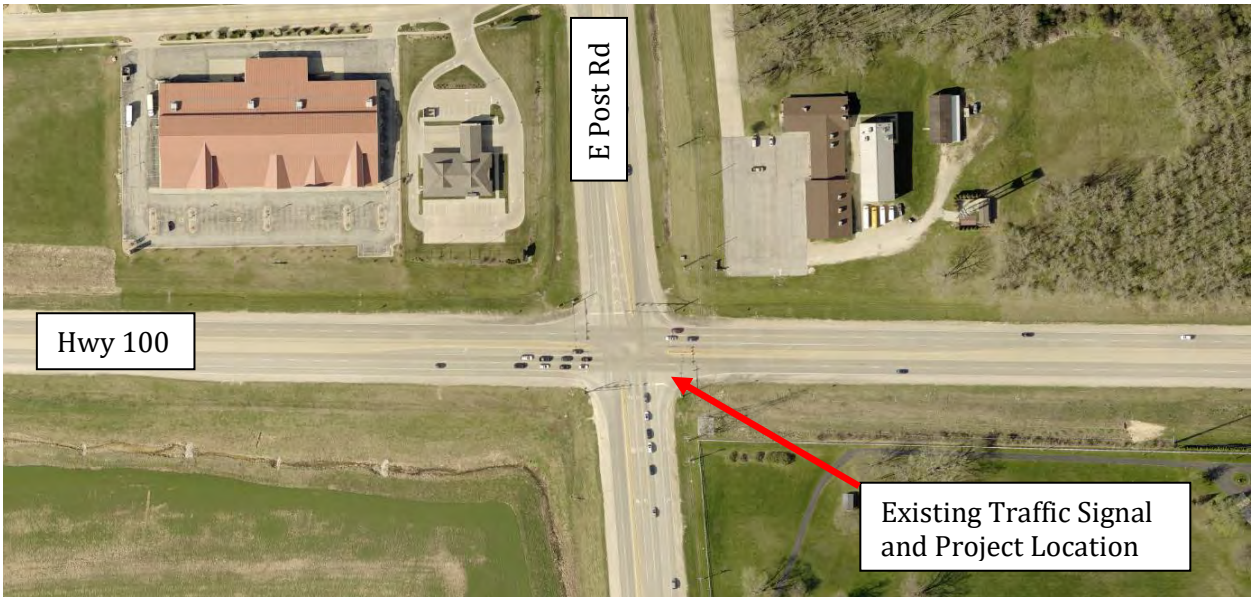
Project: Hwy 100 & East Post Rd TSIP Application

Page 1

Proj. No.

Drawn/Designed By:	Checked:	Reviewed:	Book:	Scale:	S:\ENGINEERING\PROJECTS\2021\HWY 100 & EAST POST ROAD\TSIP APPLICATION\CONCEPT.DWG
SMK	JAH	MDB		1" = 150'	8/24/2020 8:22 AM

MARION Engineering Department



Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Linn | Prepared by: City of Marion | Date Prepared: Oct 7, 2020

Intersection: Highway 100 & East Post Road

Improvement

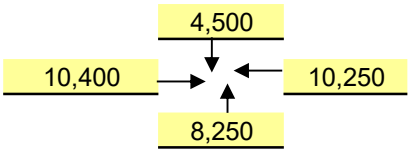
Proposed Improvement(s): Addition of double left turn lanes east and west bound, west bound right turn lane, signal replacement, and advanced detection warning.

$ 960,100	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ 2,000	Other Annual Cost (after initial year), **AC**	60	Crash Reduction Factor (integer), **CRF**
$ 22,237	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 982,337**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT | 2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



12,191,000	Current Annual Entering Veh., **AEV** = DEV * 365	2.5%	Projected Traffic Growth (0%-10%), **G**
48,373	veh / day, Final Year DEV, **FDEV**	33,400	Current Daily Entering Vehicles, **DEV**
218.61	MEV, Total Million Entering Veh. Over life of Project, **TMEV**		

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

0 Additional months | values as of May 2014

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
21	Injury Crashes	5	Minor Injuries @	$65,000	$ 325,000
		15	Possible Injuries @	$35,000	$ 525,000
28	Property Damage Only		(assumed cost per crash)	$7,400	$ 362,600
			-OR- enter all Property Costs of all crashes:		
49	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,537,600

9.80	Current Crashes / Year, **AA** = TA / T	**0.80**	Crashes / MEV, Crash Rate, **CR**
$ 31,380	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
175.7	Total Expected Crashes, **TECR** = CR x TMEV	**$ 2,396,594**	Present Value of Avoided
5.85	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 183,589	Crash Costs Avoided in First Year, AAR x AVC		
104.9	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $2,396,594 : $982,337 = **2.44** : 1

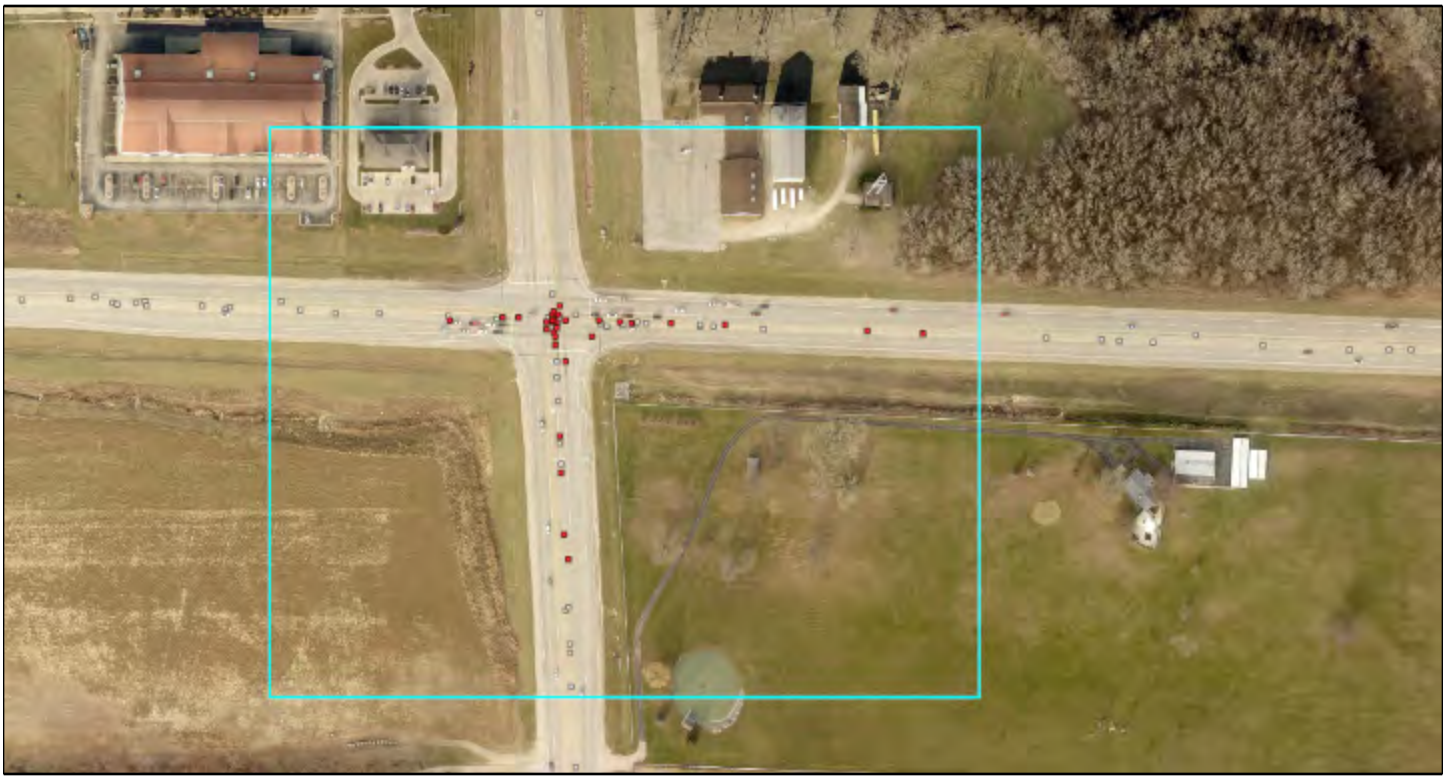
Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	49
Fatal	0
Major Injury	1
Minor Injury	3
Possible/Unknown	12
Property Damage Only	33

Injury Status Summary	21
Fatal	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	4
Possible (complaint of pain/injury)	15
Uninjured	0
Fatal, not crash-related	0
Unknown	1
Not reported	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	306,381.00
Average (per crash dollars):	6,252.67
Total Vehicles:	101.00
Average (per crash):	2.06
Total Occupants:	144.00
Average (per crash):	2.94

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.41
Major Injuries/Crash:	0.02
Minor Injuries/Crash:	0.08
Possible/Unknown Injuries/Crash:	0.31



Major Cause			48
Animal	0	Ran traffic signal	7
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	1
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	1	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
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	0	Improper or erratic lane changing	2
Operating vehicle in an reckless, erratic, ca...	2	Followed too close	17
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...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	1
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	1
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...	1
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	2
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	5
Unknown	2	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	0	0	0	0	1	0	4	0	0	0	0	1	0	6
Monday	0	0	0	0	2	1	2	0	3	0	0	0	0	8
Tuesday	0	0	1	1	1	0	2	1	1	0	0	0	0	7
Wednesday	0	0	0	1	0	1	0	0	3	0	0	0	0	5
Thursday	0	0	0	0	1	1	3	0	2	1	2	0	0	10
Friday	0	0	0	0	1	3	0	1	0	0	1	0	0	6
Saturday	1	0	0	0	2	1	0	0	0	2	0	1	0	7
Total	1	0	1	2	8	7	11	2	9	3	3	2	0	49

Manner of Crash Collision	49
Non-collision (single vehicle)	3
Head-on (front to front)	0
Rear-end (front to rear)	31
Angle, oncoming left turn	2
Broadside (front to side)	7
Sideswipe, same direction	4
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	2
Unknown	0

Surface Conditions	49
Dry	36
Wet	8
Ice/frost	0
Snow	5
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			101
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	1
Ditch	0	Embankment	0
Ground	1	Culvert/pipe opening	0
Guardrail - face	0	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	0	None (no fixed object struck)	98

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	0	0	0	0	0
= 16	1	1	0	0	2
= 17	1	0	0	0	1
= 18	0	2	0	0	2
= 19	0	2	0	0	2
= 20	0	0	0	0	0
>= 21 and <= 24	2	3	0	0	5
>= 25 and <= 29	5	4	0	0	9
>= 30 and <= 34	11	7	0	0	18
>= 35 and <= 39	4	3	0	0	7
>= 40 and <= 44	5	5	0	0	10
>= 45 and <= 49	4	4	0	0	8
>= 50 and <= 54	2	5	0	0	7
>= 55 and <= 59	7	6	0	0	13
>= 60 and <= 64	2	3	0	0	5
>= 65 and <= 69	2	2	0	0	4
>= 70 and <= 74	1	2	0	0	3
>= 75 and <= 79	0	3	0	0	3
>= 80 and <= 84	0	0	0	0	0
>= 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	2	0	2
Total	47	52	2	0	101

Drug/Alcohol Related	**49**
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	47

Alcohol Test Given	**101**
None	95
Blood	1
Urine	0
Breath	1
Vitreous	0
Refused	0
Not reported	4

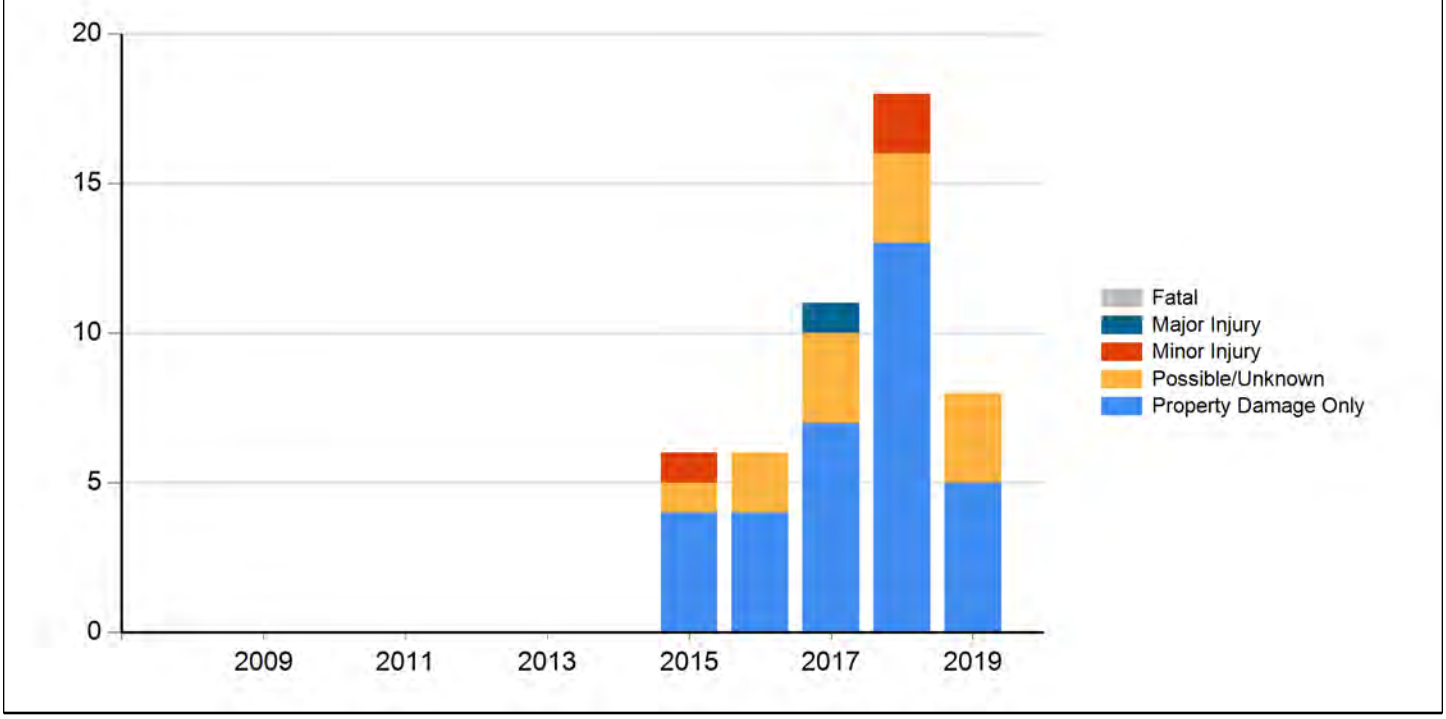
Drug Test Given	**101**
None	97
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	4

Drug Test Result	**101**
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	101
Other	0

Crash Severity - Annual

Crash Year	Fatal	Major Injury	Minor Injury	Possible/Unknown	Property Damage Only	**Total**
2008	0	0	0	0	0	0
2009	0	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	1	1	4	6
2016	0	0	0	2	4	6
2017	0	1	0	3	7	11
2018	0	0	2	3	13	18
2019	0	0	0	3	5	8
Total	0	1	3	12	33	49

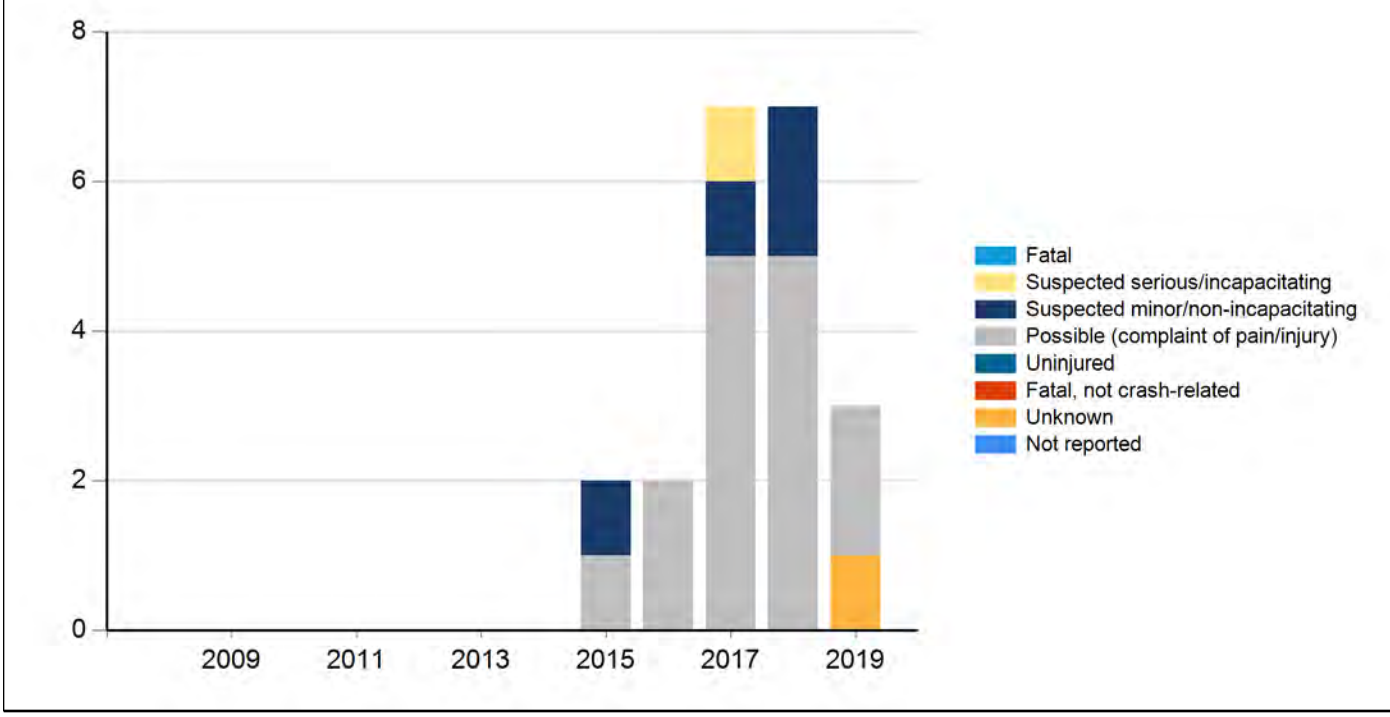
Severity/Year



Injury Status - Annual

Crash Year	Fatal	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Uninjured	Fatal, not crash-related	Unknown	**Total**
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0
2015	0	0	1	1	0	0	0	2
2016	0	0	0	2	0	0	0	2
2017	0	1	1	5	0	0	0	7
2018	0	0	2	5	0	0	0	7
2019	0	0	0	2	0	0	1	3
Total	0	1	4	15	0	0	1	21

Injury Status/Year

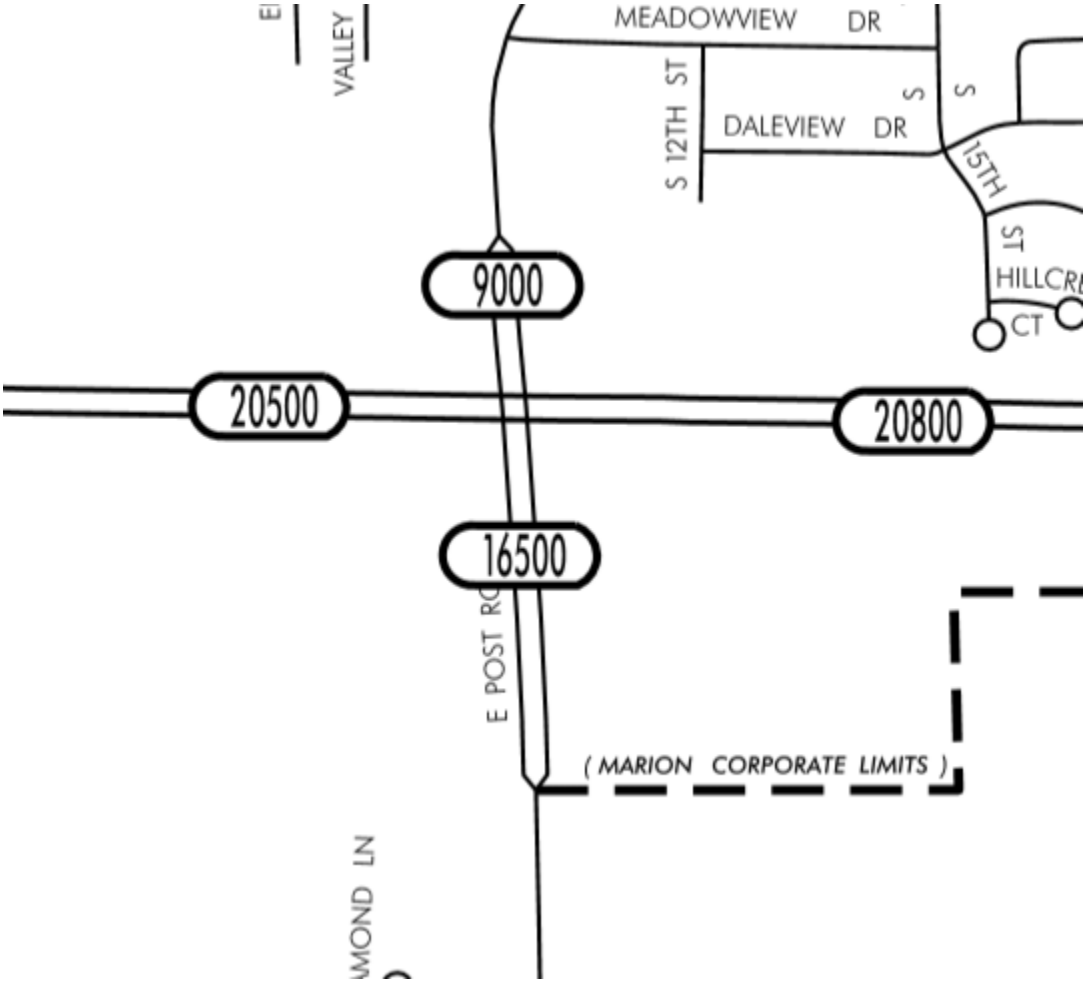


Meeting the following criteria

Jurisdiction: Statewide
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: Non Animal-related

Analyst Information

MARION
Engineering Department

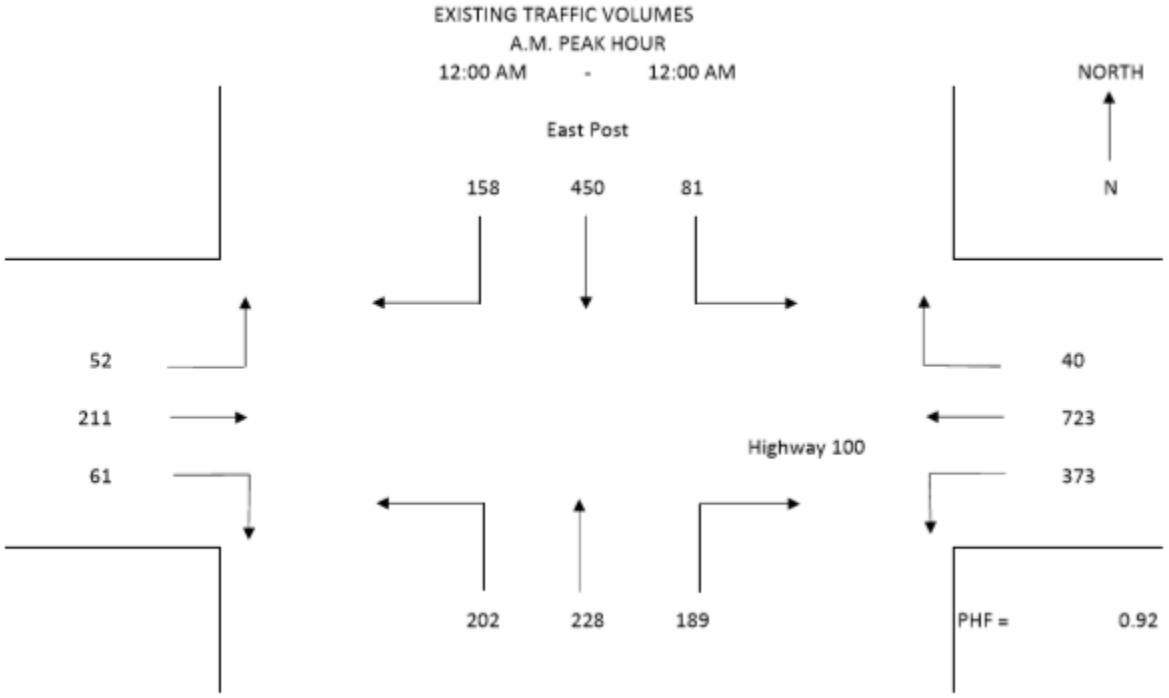


Iowa DOT 2017 AADT

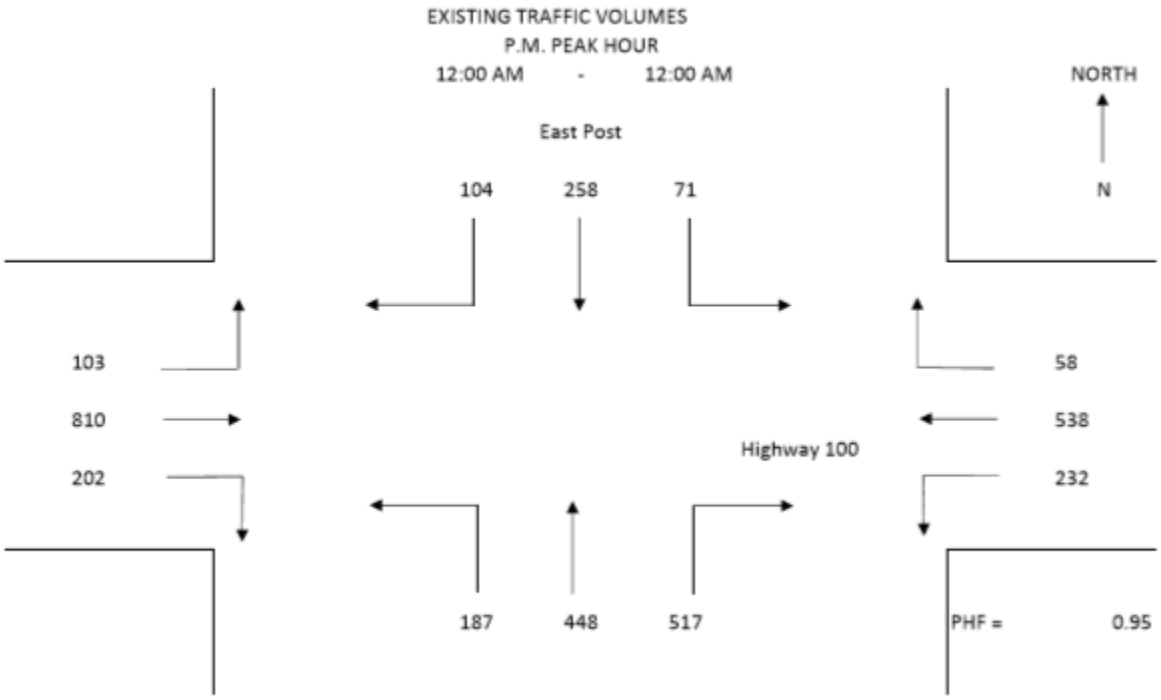
MARION
Engineering Department

10/9/2018

		East Post Road						Highway 100						
		Northbound			Southbound			Eastbound			Westbound			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6:45 AM	7:00 AM	41	31	56	17	39	27	8	72	6	70	154	15	536
7:00 AM	7:15 AM	26	29	31	15	56	22	8	56	8	75	142	9	477
7:15 AM	7:30 AM	49	73	47	18	110	37	15	42	8	101	200	9	709
7:30 AM	7:45 AM	57	53	48	29	125	48	25	53	16	96	173	10	733
7:45 AM	8:00 AM	60	61	55	17	116	40	7	71	16	101	227	15	786
8:00 AM	8:15 AM	36	41	39	17	99	33	5	45	21	70	123	6	535
		202	**228**	**189**	**81**	**450**	**158**	**52**	**211**	**61**	**373**	**723**	**40**	
		0.84	**0.78**	**0.86**	**0.70**	**0.90**	**0.82**	**0.52**	**0.74**	**0.73**	**0.92**	**0.80**	**0.67**	
4:30 PM	4:45 PM	61	77	105	14	60	26	38	197	40	72	117	12	819
4:45 PM	5:00 PM	61	122	138	23	64	24	25	213	42	54	149	12	927
5:00 PM	5:15 PM	38	118	139	15	71	33	31	192	46	65	116	12	876
5:15 PM	5:30 PM	35	121	139	17	67	25	23	209	55	67	115	20	893
5:30 PM	5:45 PM	53	87	101	16	56	22	24	196	59	46	158	14	832
5:45 PM	6:00 PM	47	69	70	8	68	31	27	160	54	43	111	9	697
		187	**448**	**517**	**71**	**258**	**104**	**103**	**810**	**202**	**232**	**538**	**58**	
		0.77	**0.92**	**0.93**	**0.77**	**0.91**	**0.79**	**0.83**	**0.95**	**0.86**	**0.87**	**0.85**	**0.73**	



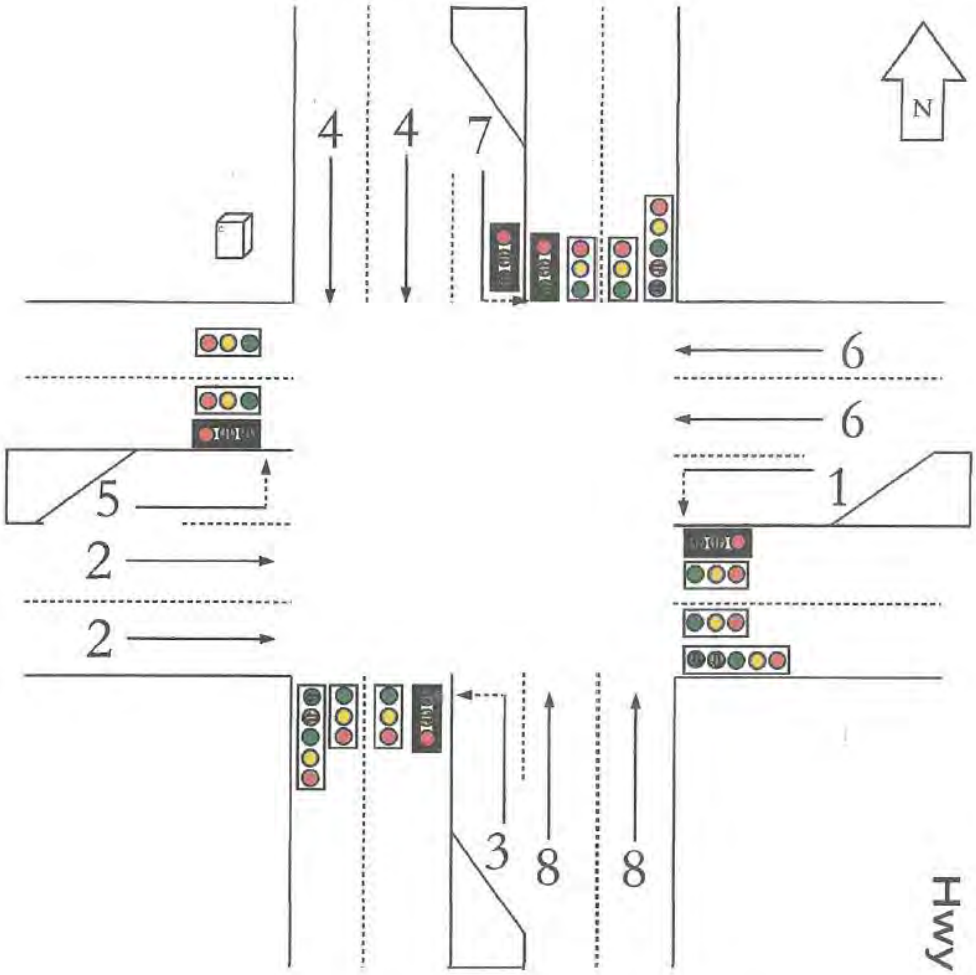
MARION
Engineering Department



Turning Movements

MARION
Engineering Department

A detailed layout of proposed of the proposed signals, detection, and timings could not be produced at time of application due to derecho storm on August 10, 2020. Below is the existing signal timings for Highway 100 and East Post Road.



Phase	1	2	3	4	5	6	7	8
Ped Walk								
Ped Clear								
Min Green	005	008	005	008	005	008	005	008
Passage	1.0	1.5	1.0	2.0	1.0	1.5	1.0	2.0
Max Green	025	035	020	030	035	025	020	030
Yellow	4.0	5.0	4.0	3.9	4.0	5.0	4.0	3.9
Red Clear	1.0	1.6	1.0	1.9	1.0	1.6	1.0	1.9

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project: 3-Lane Conversion, IA 92 (Hwy 432 to City limit) & US 63 (2nd to 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 (Area Code) E-Mail: Michael.Schrock@oskaloosaiowa.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	$	593,700
Total Project Cost	$	683,000
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
IA 92 / A AVENUE 4-LANE TO 3-LANE CONVERSION &
US 63 / MARKET STREET 3-LANE CONVERSION

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.

The study analyzed IA 92/A Avenue from Highway 432 to the east corporate limits and US 63/Market Street from 2nd Avenue to 16th Avenue for reconfiguration from their configuration to a 3-lane cross section with two way left turn lane (TWLTL).

Existing Conditions

The existing cross-section of IA 92/A Avenue varies in width and at its most limiting point is a 41-foot wide roadway, from back of curb to back of curb, composed of 4 10-foot wide through lanes. The speed limit is 45 mph west of L Street, 30 mph from L Street to 11th Street and 35 mph east of 11th Street. The inside lanes essentially function as left turn lanes at all major intersections. This is especially evident at US 63/Market Street.

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 2018 traffic study showed historical traffic count data along IA 92/A Avenue and US 63/Market Street with the annual growth rate from 2006-2014 ranging from -1% to -2%. Updated count data from 2018 shows that in general, there is further substantially declining traffic volumes. The exception is at Gateway Drive which is a 5-lane facility and not part of the 3-lane conversion. Table 1 shows daily traffic volumes as derived from the Iowa Department of Transportation (DOT) Annual Average Daily Traffic (AADT) maps.

Table 1: AADT Volumes

Roadway Segment		Historic Daily Traffic			
		2006	2010	2014	2018
IA 92 A Avenue	Gateway Dr, east of	10,200	11,200	11,700	12,700
	D St, east of	15,300	14,200	13,500	8,400
	Market St, east of	12,100	10,800	11,500	9,700
	11th St, east of	10,300	8,800	9,200	8,000
US 63 Market	C Ave, north of	8,200	8,100	7,300	8,300
	A Ave, south of	7,000	6,500	6,900	6,500
	15th Ave, north of	7,700	7,100	7,400	6,900

Lane Conversion Traffic Volumes

Research has shown that a 3-lane conversion should be feasible with volumes less than 17,000 vpd. The Iowa DOT Design Manual, Section 6C-6 on Continuous Two-Way Left Turn Lanes (TWLTLs) suggests that an ADT of 15,000 to 17,500 should be considered as the maximum capacity a three lane with TWLTL facility can handle. The highest concentration of traffic on either corridor is far less than these maximum thresholds.

Crash History

A safety analysis was part of the 2018 study. It looked at crashes along both corridors and at study intersections to understand current conditions and identify safety deficiencies. In summary:

A Avenue – Hwy 432 to 3rd Street (including 3rd Street intersection crashes)

- The corridor's crash rate is 830 CR/HMVM (crashes per one-hundred million vehicle miles) which is three times the statewide average for similar roads.
- All major intersections within the corridor have a crash rate higher than statewide average.

A Avenue –3rd Street to Iowa 23 (excluding 3rd Street intersection crashes)

- The corridor's crash rate is 288 CR/HMVM which is slightly higher than the statewide average for similar roads.
- All major intersections within the corridor have a crash rate lower than the statewide average.

Market Street –15th Avenue to 2nd Avenue (excluding 2nd Avenue intersection crashes)

- The corridor's crash rate is 389 CR/HMVM which is higher than the statewide average for similar roads.
- All major intersections within the corridor have a crash rate lower than statewide average.

Market Street –2nd Avenue to C Avenue (including 2nd Avenue intersection crashes)

- The corridor's crash rate is 2,140 CR/HMVM, which is eight times higher than the statewide average for similar roads. The crash rate may be inflated relative to the statewide average due to the corridor's short length, close spacing of intersections, and high frequency of crashes at the A Avenue intersection.
- All major intersections within the corridor have a crash rate lower than statewide average except at A Avenue, where half the crashes occurred.

Safety Justification

Failure to yield the right-of-way while making a left turn is a predominate major cause at many intersections and along the corridor where driveways exist. This is a direct correlation to the lack of a dedicated left-turn lane for traffic on the major corridor.

Crash rates are very high when compared to statewide crash rates. There is enough historical crash data to suggest that a reduction in traffic accidents would occur throughout these corridors with a conversion to 3-lane roadways with a TWLTL. The benefit-cost ratio is just over **23:1** suggesting an out-standing benefit for the corridor.

The 3-lane conversion would improve safety on both corridors and rectify the inconsistent cross-section on US 63/Market Street.

Opinion of Probable Cost

IA 92 / A Avenue from Hwy 342 to east corporate limits
US 63 / Market Street from 2nd Avenue to 16th Avenue
3-Lane Conversion

Preliminary Engineer's Estimate

Item No.	Item Code	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	2527-9263180	Pavement Marking Removal	STA	350	$ 110.00	$ 38,500.00
2	2527-9263117	Painted Pavement Markings, Durable	STA	596	$ 165.00	$ 98,340.00
3	2527-9263138	Painted Symbol and Legend	EA	130	$ 165.00	$ 21,450.00
4	Special	Update Signal Controllers	EA	6	$ 6,000.00	$ 36,000.00
5	Special	Replace Signal Cabinet and Controller (L St; 11th St)	EA	2	$ 25,000.00	$ 50,000.00
6	Special	Concrete Pad for Controller and Power Service	EA	2	$ 2,200.00	$ 4,400.00
7	Special	Signal Cables	LS	1	$ 16,500.00	$ 16,500.00
8	Special	Pedestrian Countdown Signal Heads	EA	64	$ 1,100.00	$ 70,400.00
9	Special	Pedestrian Signal Pole	EA	1	$ 4,400.00	$ 4,400.00
10	Special	Push Buttons (A/11th)	EA	8	$ 125.00	$ 1,000.00
11	Special	Concrete Pedestal Base	EA	1	$ 1,100.00	$ 1,100.00
13	Special	2" Rigid PVC Conduit, Trenched	LF	20	$ 70.00	$ 1,400.00
12	Special	Pedestrian Push Button Sign	EA	64	$ 125.00	$ 8,000.00
14	Special	Single Point Stopline Vehicle Detection	EA	6	$ 22,000.00	$ 132,000.00
15	Special	Relocate Outboard Signal Heads to Over Lane Lines	EA	14	$ 900.00	$ 12,600.00
16	Special	ADA Improvements at IA 92 and 11th Street	LS	1	$ 32,600.00	$ 32,600.00
17	Special	Traffic Control	LS	1	$ 15,000.00	$ 15,000.00
18	11020-108-A-0	Mobilization	LS	1	$ 50,000.00	$ 50,000.00
				Construction Total		**$ 593,690.00**
				Engineering - Legal - Administration (15%)		$ 89,053.50
				Project Total		**$ 683,000.00**

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**		

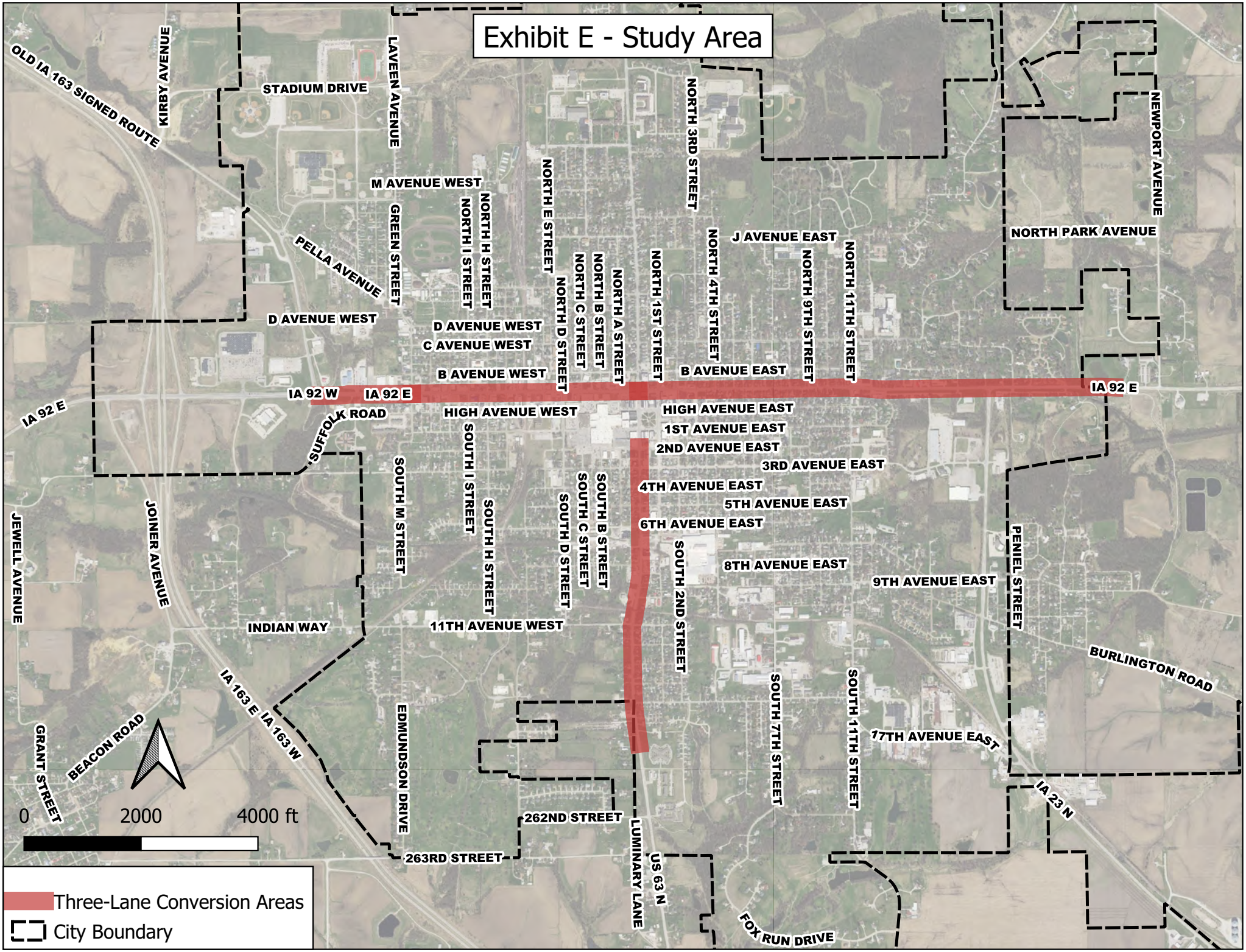


Exhibit E - Study Area
OLD IA 163 SIGNED ROUTE
KIRBY AVENUE
STADIUM DRIVE
LAVEEN AVENUE
M AVENUE WEST
GREEN STREET
NORTH I STREET
NORTH H STREET
NORTH E STREET
NORTH C STREET
NORTH D STREET
NORTH B STREET
NORTH A STREET
NORTH 1ST STREET
NORTH 3RD STREET
NORTH 4TH STREET
NORTH 9TH STREET
NORTH 11TH STREET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

COLOR PHOTOS

Looking west on IA 92 from N E Street

Looking east on IA 92 from N E Street

COLOR PHOTOS

Looking west on IA 92 from N 3rd Street

Looking east on IA 92 from N 3rd Street

COLOR PHOTOS

Looking west on IA 92 from 11th Street

Looking east on IA 92 from 11th Street

COLOR PHOTOS

Looking north on US 63 from 3rd Avenue

Looking south on US 63 from 3rd Avenue

COLOR PHOTOS

Looking north on US 63 from 8th Avenue

Looking south on US 63 from 8th Avenue

COLOR PHOTOS

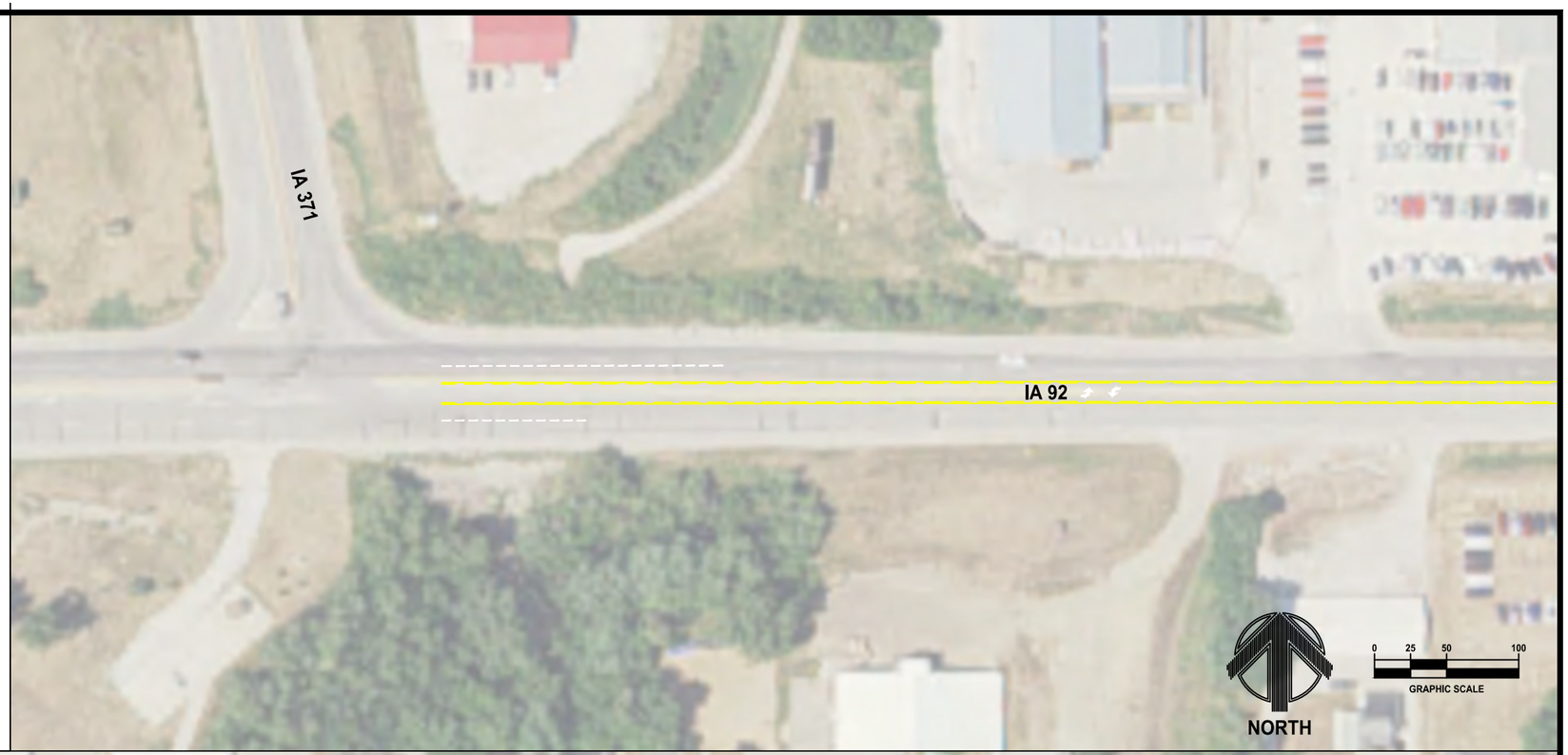
Looking north on US 63 from 15th Avenue

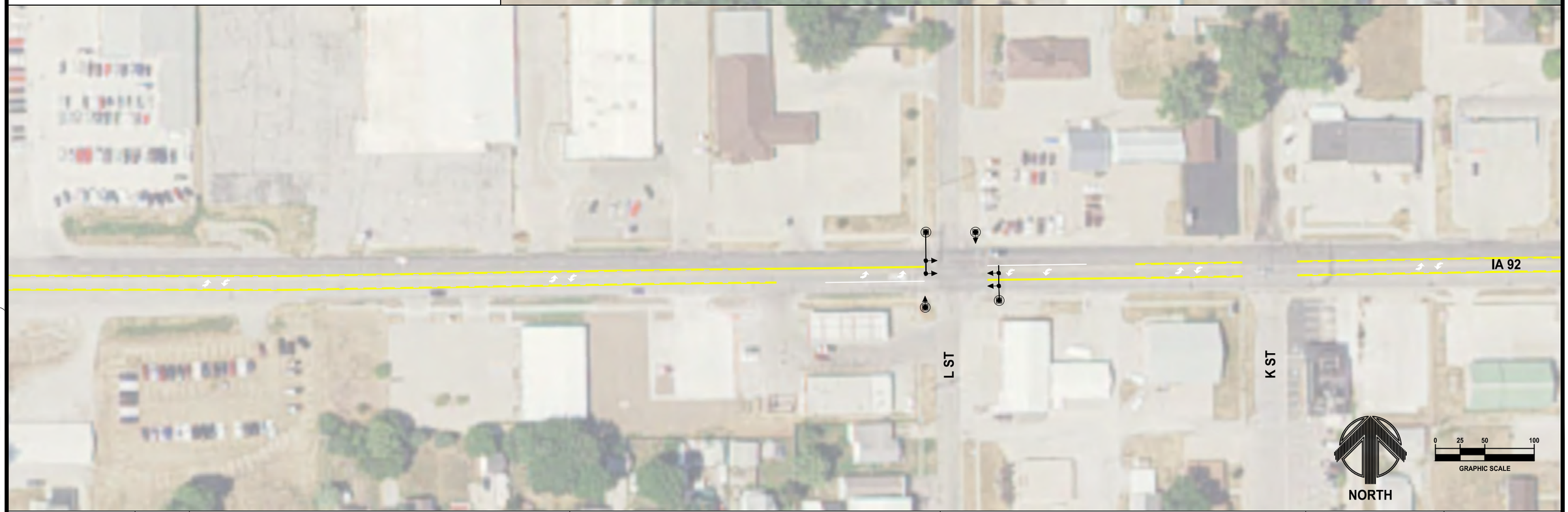
PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TRAFFIC SIGNAL MODIFICATION NOTES:

1. SIGNAL INDICATIONS WILL BE SHIFTED APPROPRIATELY AND AS DEEMED NECESSARY FOR THE NEW 3-LANE ALIGNMENT FOR THE EAST-WEST DIRECTIONS OF IOWA 92.
2. A NEW CONTROLLER CABINET AND INTERNAL COMPONENTS WILL BE INSTALLED AT THE INTERSECTION OF IOWA 92 AND L STREET.
3. A NEW CONTROLLER CABINET AND INTERNAL COMPONENTS WILL BE INSTALLED AT THE INTERSECTION OF IOWA 92 AND 11TH STREET.
4. NEW COUNT-DOWN PEDESTRIAN SIGNAL INDICATIONS WILL BE ADDED TO THE SIGNAL ON IOWA 92 AND 11TH STREET.
5. THE REMAINING EXISTING SIGNAL CONTROLLERS WILL BE UPDATED WITHIN THE PROJECT LIMITS.
6. SINGLE POINT STOPLINE VEHICLE DETECTION WILL BE ADDED TO EXISTING PRETIMED SIGNALIZED INTERSECTIONS WITHIN THE PROJECT LIMITS.
7. EXISTING PEDESTRIAN SIGNAL HEADS WILL BE REMOVED AND COUNT-DOWN PEDESTRIAN SIGNAL HEADS WILL BE INSTALLED AT EACH SIGNALIZED INTERSECTION WITHIN THE PROJECT LIMITS.





FILE NO.	ENGLISH	DESIGN TEAM City of Oskaloosa\McClure Engineering Co.	MAHASKA COUNTY	PROJECT NUMBER .	SHEET NUMBER	G-01

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OSKALOOSA, IOWA

TSIP APPLICATION

McCLURE ENGINEERING COMPANY

PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TSIP APPLICATION

FILE NO.	ENGLISH	DESIGN TEAM	City of Oskaloosa\McClure Engineering Co.	MAHASKA	COUNTY	PROJECT NUMBER	.	SHEET NUMBER	G-02

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OSKALOOSA, IOWA

McCLURE ENGINEERING COMPANY

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FILE NO.

ENGLISH

DESIGN TEAM

City of Oskaloosa
McClure Engineering Co.

MAHASKA
COUNTY

PROJECT NUMBER
.

SHEET NUMBER
G-03

PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TSIP APPLICATION

FILE NO.	ENGLISH	DESIGN TEAM	City of Oskaloosa\McClure Engineering Co.	MAHASKA COUNTY	PROJECT NUMBER .	SHEET NUMBER	G-04

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OSKALOOSA, IOWA

McCLURE ENGINEERING COMPANY

PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TSIP APPLICATION

OSKALOOSA, IOWA

McCLURE ENGINEERING COMPANY

FILE NO.	ENGLISH	DESIGN TEAM	City of Oskaloosa\McClure Engineering Co.	MAHASKA	COUNTY	PROJECT NUMBER	.	SHEET NUMBER	G-05

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PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TSIP APPLICATION

16TH AVE

15TH AVE

NORTH

0 25 50 100
GRAPHIC SCALE

US 63

14TH AVE

13TH AVE

12TH AVE

11TH AVE

NORTH

0 25 50 100
GRAPHIC SCALE

OSKALOOSA, IOWA

McCLURE ENGINEERING COMPANY

FILE NO.	ENGLISH	DESIGN TEAM	City of Oskaloosa\McClure Engineering Co.	MAHASKA	COUNTY	PROJECT NUMBER	.	SHEET NUMBER	G-06

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PAVEMENT MARKING PLAN
AGENCY PROJECT NUMBER

LETTING DATE
DATE

TSIP APPLICATION

6TH AVE
8TH AVE
9TH AVE
8TH AVE
6TH AVE
ROCK ISLAND AVE
6TH AVE
NORTH
0 25 50 100
GRAPHIC SCALE

6TH AVE
2ND AVE
US 63
6TH AVE
5TH AVE
4TH AVE
3RD AVE
NORTH
0 25 50 100
GRAPHIC SCALE

OSKALOOSA, IOWA

McCLURE ENGINEERING COMPANY

FILE NO.	ENGLISH	DESIGN TEAM City of Oskaloosa\McClure Engineering Co.	MAHASKA COUNTY	PROJECT NUMBER .	SHEET NUMBER	G-07

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EXISTING PEDESTRIAN RAMP LEFT IN PLACE
REMOVE AND REPLACE CURB AND GUTTER AND CONSTRUCT ADA COMPLIANT SIDEWALKS
A AVENUE
11TH STREET
11th Street and A Avenue
ADA Improvements
Exhibit G-08
CITY OF OSKALOOSA
McCLURE ENGINEERING CO.
NORTH
0
25
50
GRAPHIC SCALE

FILE PATH: \\orion.snyder-associates.com\volume\Projects\2017\117.0246.01\Design\Traffic\Ex1_AveA Gate to Market Crash Severity.mxd

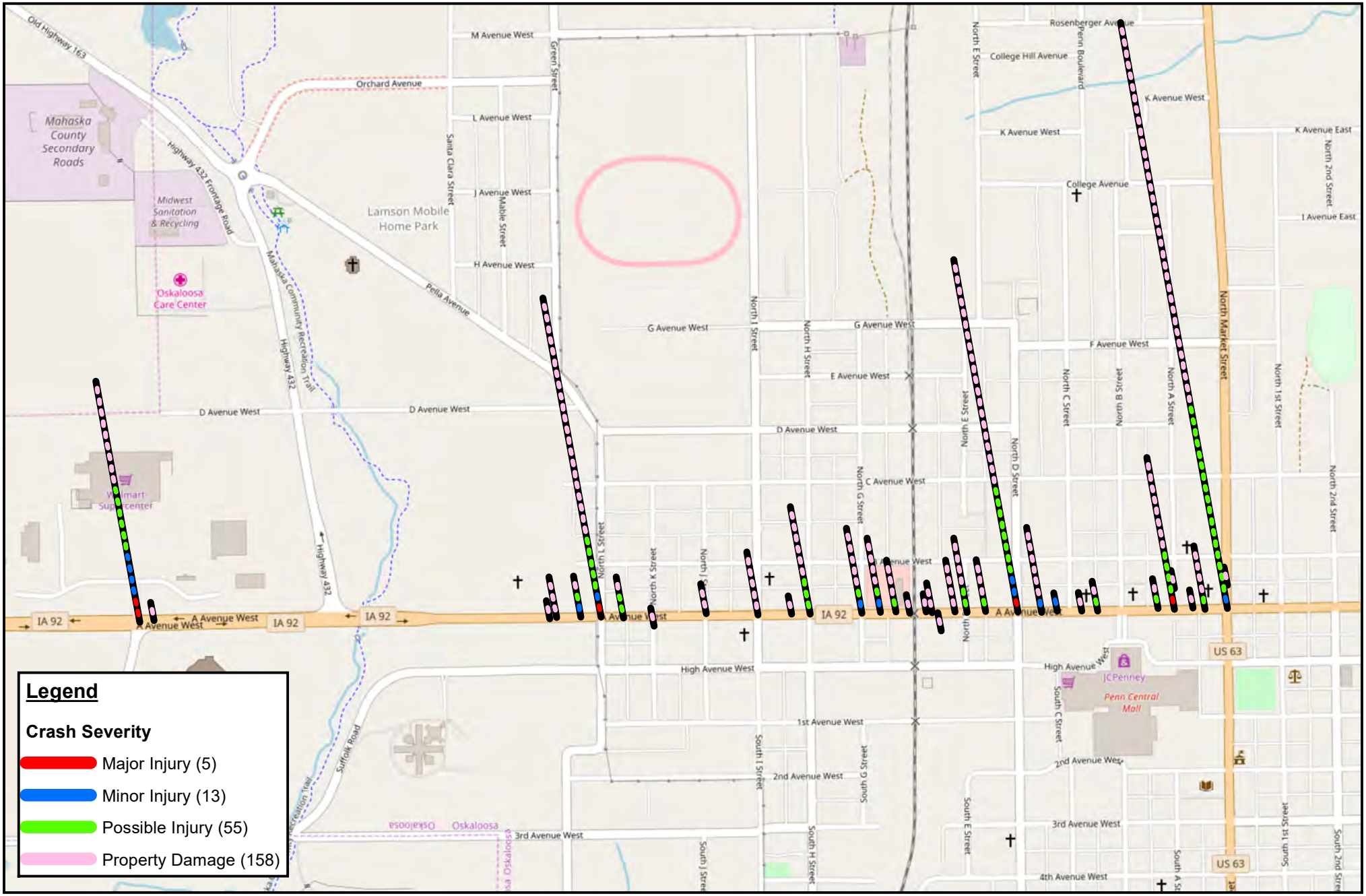

Figure 5: Crashes by Severity A Ave (Gateway Dr to Market St) 2012-2016

SNYDER & ASSOCIATES

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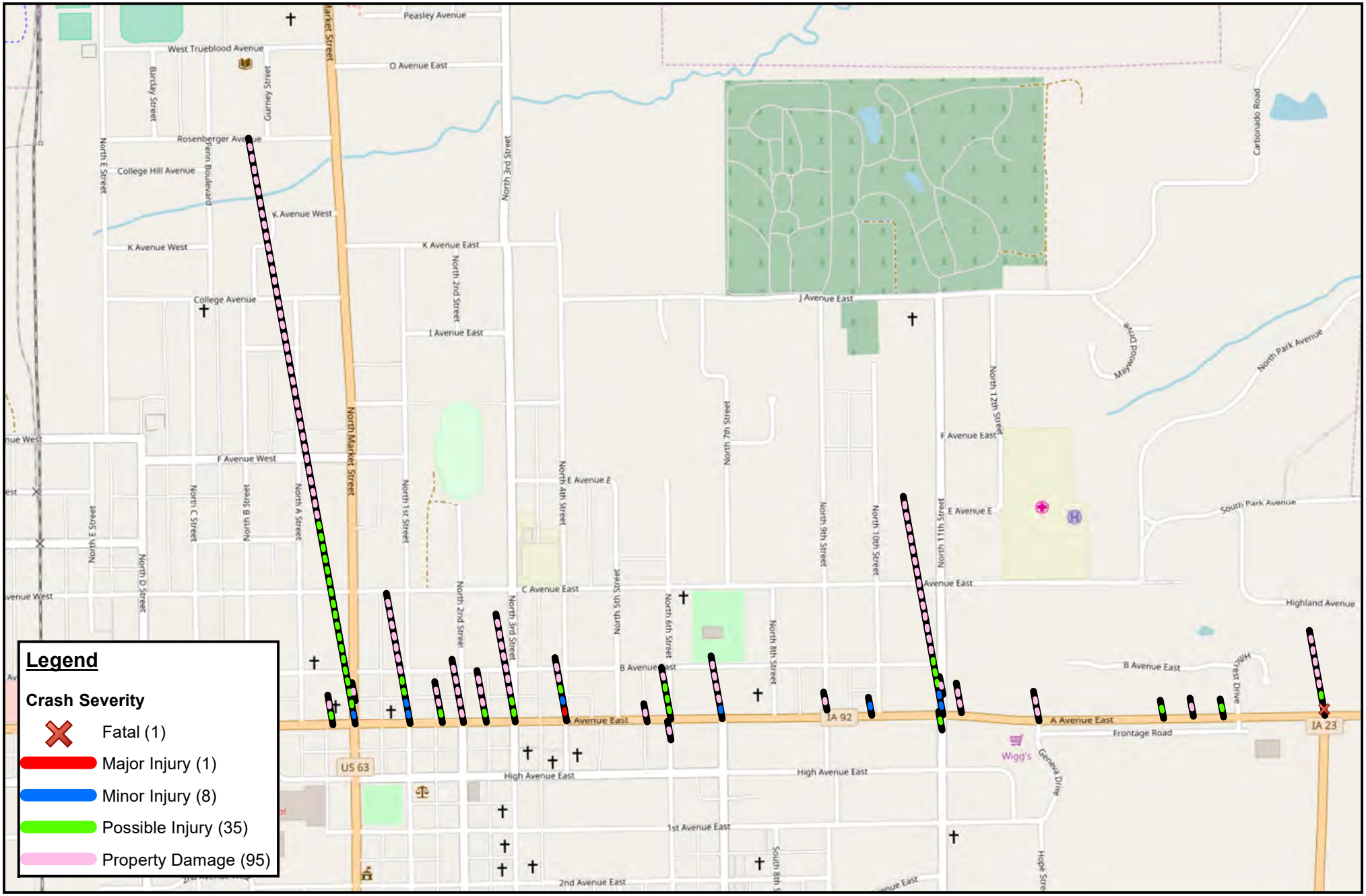


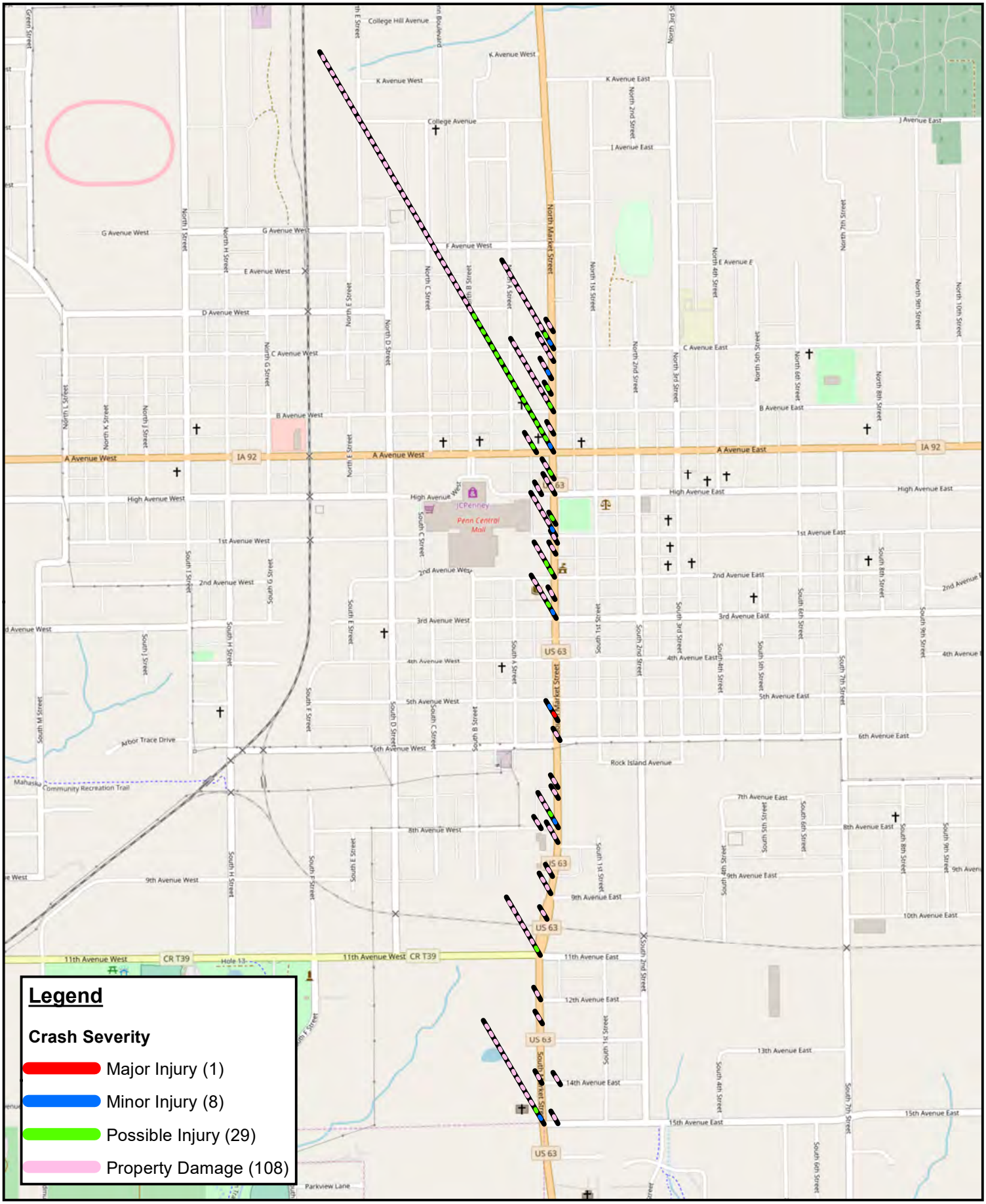
SNYDER & ASSOCIATES

0 400 800

Feet

Figure 6: Crashes by Severity A Ave (Market St to IA 23) 2012-2016

FILE PATH: \\orion.snyder-associates.com\volume\Projects\2017\117.0246.01\Design\Traffic\Ex3_Market Street Crash Severity.mxd



0 500 1,000
Feet

SNYDER & ASSOCIATES

Figure 7: Crashes by Severity Market Street 2012-2016

Table of Crash Totals and Major Cause

Roadway Segment		Total Crashes (Injuries)	Predominant Major Cause (# Crashes)
IA 92 A Avenue	Gateway Dr	21 (18)	FTYROW: Making left turn (6)
	Hwy 432	0 (0)	
	L St	28 (14)	Ran Traffic Signal (8)
	D St	31 (14)	FTYROW: Making left turn (12)
	US 63/Market St	52 (26)	Ran Traffic Signal (12)
	1st St	11 (4)	Ran Traffic Signal (4)
	3rd St	9 (2)	Ran Traffic Signal (3)
	11th St	19 (7)	FTYROW: Making left turn (7)
	IA 23	7 (4)	FTYROW: Making left turn (3)
A Avenue Corridor - Hwy 432 to 3rd St *(including 3rd St Crashes)*		241 (93)	FTYROW: Making left turn (40) Ran Traffic Signal (37)
A Avenue Corridor - 3rd St to IA 23 *(excluding 3rd St Crashes)*		50 (25)	FTYROW: Making left turn (13) Driving Too Fast For Conditions (8)
US 63 Market	C Ave	11 (2)	FTYROW: Making left turn (6)
	High Ave	2 (0)	FTYROW: Making left turn (6)
	1st Ave	5 (1)	FTYROW: Making left turn (6)
	2nd Ave	4 (2)	FTYROW: Making left turn (6)
	15^{th} Ave	13 (2)	FTYROW: Making left turn (6)
US 63/Market St Corridor - C Ave to 2nd Ave *(including 2nd Ave Crashes)*		94 (38)	FTYROW: Making left turn (6)
US 63/Market St Corridor - 2nd Ave to 15th Ave *(excluding 2nd Ave Crashes)*		44 (9)	FTYROW: Making left turn (6)

Exhibit J-01

Snyder & Associates, Inc.

Oskaloosa Traffic Signal Study
Gateway Dr & A Ave
Oskaloosa, IA

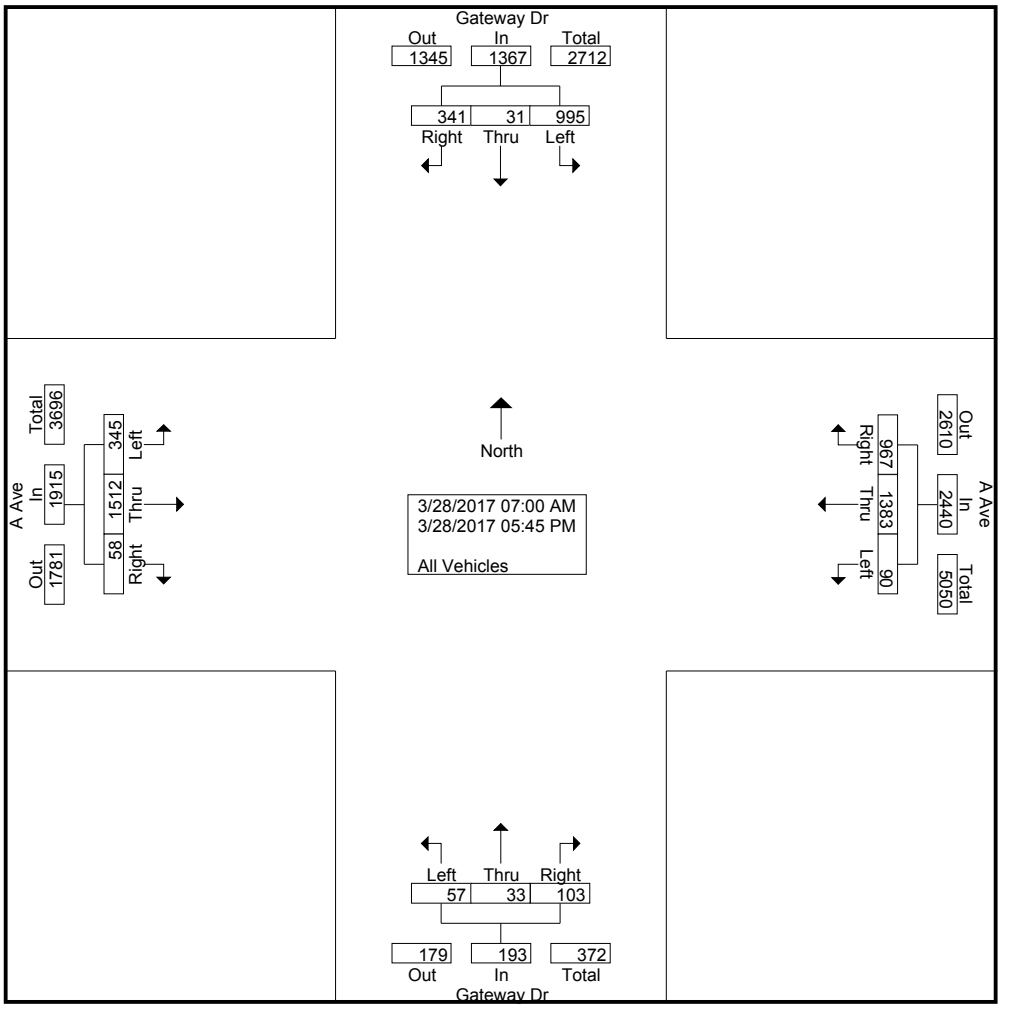
File Name : TMC01_Gateway-A_170328
Site Code : 1
Start Date : 3/28/2017
Page No : 1

Groups Printed- All Vehicles

	Gateway Dr Southbound				A Ave Westbound				Gateway Dr Northbound				A Ave Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	15	4	4	23	25	50	9	84	1	2	1	4	3	40	22	65	176
07:15 AM	9	0	2	11	30	63	10	103	1	0	3	4	8	54	18	80	198
07:30 AM	10	0	6	16	2	77	14	93	0	1	1	2	8	68	1	77	188
07:45 AM	12	0	9	21	1	80	27	108	1	1	0	2	8	120	0	128	259
Total	46	4	21	71	58	270	60	388	3	4	5	12	27	282	41	350	821
08:00 AM	15	1	9	25	2	50	23	75	3	0	1	4	13	75	1	89	193
08:15 AM	15	1	7	23	2	45	33	80	1	1	0	2	9	56	1	66	171
08:30 AM	20	3	3	26	1	49	29	79	0	0	2	2	11	48	1	60	167
08:45 AM	25	0	5	30	5	39	32	76	1	3	0	4	9	52	1	62	172
Total	75	5	24	104	10	183	117	310	5	4	3	12	42	231	4	277	703
*** BREAK ***																	
11:00 AM	55	1	13	69	1	38	43	82	0	0	5	5	11	42	0	53	209
11:15 AM	45	3	6	54	1	44	47	92	1	2	4	7	11	56	1	68	221
11:30 AM	50	1	11	62	0	42	36	78	0	1	1	2	10	48	0	58	200
11:45 AM	46	1	12	59	0	53	53	106	1	0	5	6	11	49	0	60	231
Total	196	6	42	244	2	177	179	358	2	3	15	20	43	195	1	239	861
12:00 PM	41	1	12	54	2	55	44	101	0	0	0	0	8	48	0	56	211
12:15 PM	41	1	10	52	4	40	39	83	1	0	3	4	10	48	1	59	198
12:30 PM	44	2	9	55	5	42	58	105	1	1	1	3	9	52	0	61	224
12:45 PM	64	1	6	71	0	34	39	73	1	1	4	6	5	52	0	57	207
Total	190	5	37	232	11	171	180	362	3	2	8	13	32	200	1	233	840
*** BREAK ***																	
04:00 PM	65	2	34	101	1	65	57	123	26	1	31	58	33	62	1	96	378
04:15 PM	60	1	21	82	1	74	43	118	9	13	29	51	28	89	1	118	369
04:30 PM	59	1	32	92	2	89	70	161	1	0	6	7	22	80	1	103	363
04:45 PM	61	2	27	90	0	67	45	112	4	1	1	6	22	77	1	100	308
Total	245	6	114	365	4	295	215	514	40	15	67	122	105	308	4	417	1418
05:00 PM	53	0	20	73	0	86	50	136	3	2	2	7	25	72	0	97	313
05:15 PM	64	0	23	87	2	89	66	157	0	2	1	3	25	91	4	120	367
05:30 PM	66	2	33	101	1	55	62	118	0	0	2	2	23	71	0	94	315
05:45 PM	60	3	27	90	2	57	38	97	1	1	0	2	23	62	3	88	277
Total	243	5	103	351	5	287	216	508	4	5	5	14	96	296	7	399	1272
Grand Total	995	31	341	1367	90	1383	967	2440	57	33	103	193	345	1512	58	1915	5915
Apprch %	72.8	2.3	24.9		3.7	56.7	39.6		29.5	17.1	53.4		18	79	3		
Total %	16.8	0.5	5.8	23.1	1.5	23.4	16.3	41.3	1	0.6	1.7	3.3	5.8	25.6	1	32.4	

Oskaloosa Traffic Signal Study
Gateway Dr & A Ave
Oskaloosa, IA

File Name : TMC01_Gateway-A_170328
Site Code : 1
Start Date : 3/28/2017
Page No : 2



Snyder & Associates, Inc.

Exhibit J-03

Oskaloosa Traffic Signal Study
A Ave & Market St
Oskaloosa, IA

File Name : TMC05_Aave _Market_170411
Site Code : 5
Start Date : 4/11/2017
Page No : 1

Groups Printed- Cars - Hvy Veh

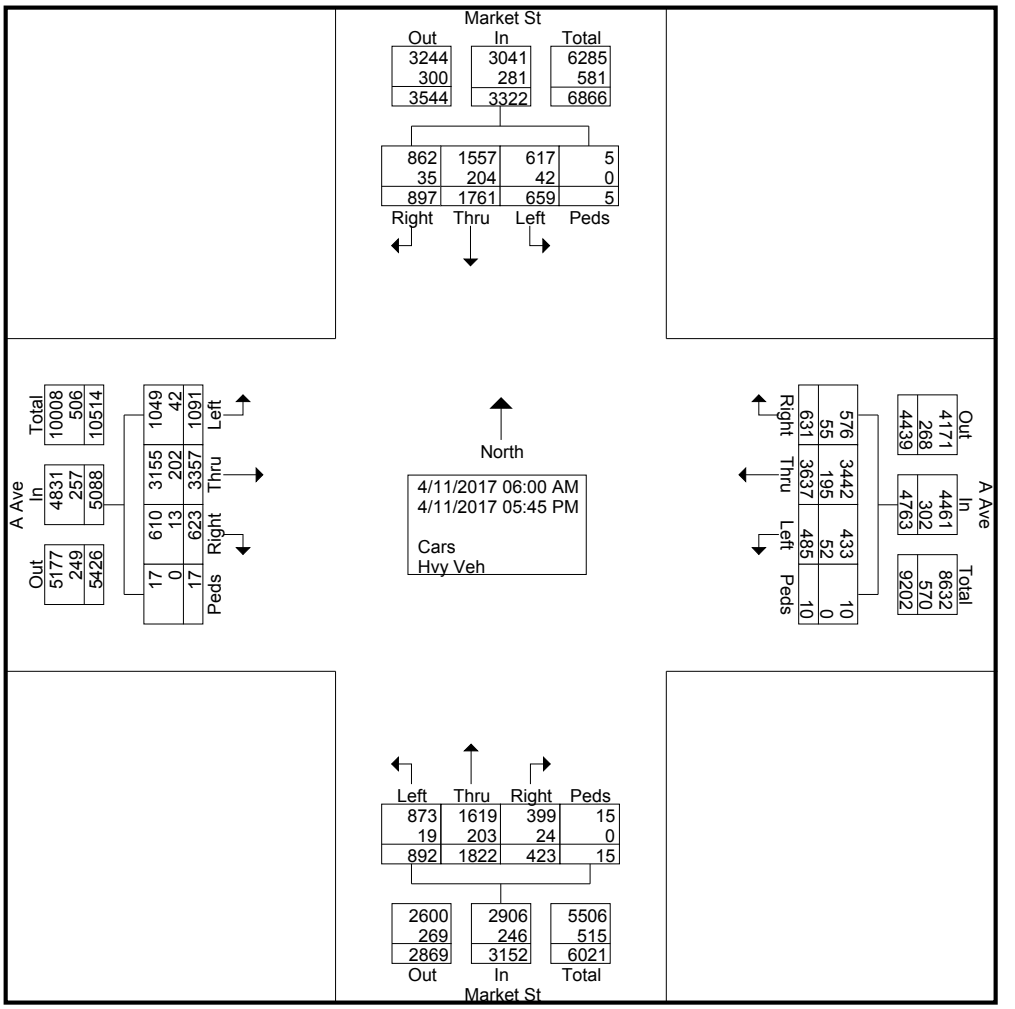
	Market St Southbound					A Ave Westbound					Market St Northbound					A Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	6	22	11	1	40	10	33	7	0	50	6	16	4	0	26	9	18	2	0	29	145
06:15 AM	4	24	8	1	37	9	54	10	0	73	8	17	4	0	29	10	26	4	1	41	180
06:30 AM	8	18	17	0	43	6	47	15	0	68	9	27	5	0	41	11	28	4	0	43	195
06:45 AM	5	42	7	0	54	5	48	10	0	63	7	44	5	0	56	11	38	3	0	52	225
Total	23	106	43	2	174	30	182	42	0	254	30	104	18	0	152	41	110	13	1	165	745
07:00 AM	9	33	14	0	56	11	56	11	0	78	7	17	3	0	27	12	29	6	0	47	208
07:15 AM	10	44	15	0	69	11	52	12	0	75	14	7	3	1	25	21	47	5	0	73	242
07:30 AM	16	39	11	0	66	7	91	9	0	107	19	44	7	0	70	19	47	10	0	76	319
07:45 AM	28	50	12	0	90	12	96	27	0	135	10	77	6	0	93	28	81	8	0	117	435
Total	63	166	52	0	281	41	295	59	0	395	50	145	19	1	215	80	204	29	0	313	1204
08:00 AM	18	38	19	0	75	8	86	25	0	119	10	77	4	0	91	40	76	15	0	131	416
08:15 AM	15	42	18	0	75	18	72	18	0	108	14	30	5	0	49	24	76	10	0	110	342
08:30 AM	8	28	11	0	47	13	50	13	0	76	22	32	4	0	58	15	36	15	0	66	247
08:45 AM	16	26	16	0	58	6	53	11	0	70	15	30	7	0	52	14	50	15	0	79	259
Total	57	134	64	0	255	45	261	67	0	373	61	169	20	0	250	93	238	55	0	386	1264
09:00 AM	11	26	12	0	49	7	61	11	0	79	11	26	5	0	42	13	57	12	0	82	252
09:15 AM	12	27	23	0	62	4	64	9	0	77	24	28	4	1	57	17	42	12	0	71	267
09:30 AM	10	37	12	0	59	9	66	18	0	93	16	27	9	0	52	19	61	13	0	93	297
09:45 AM	6	32	17	0	55	3	64	10	1	78	16	32	4	0	52	15	53	11	0	79	264
Total	39	122	64	0	225	23	255	48	1	327	67	113	22	1	203	64	213	48	0	325	1080
10:00 AM	13	27	25	0	65	8	70	10	1	89	26	28	12	0	66	14	52	15	0	81	301
10:15 AM	11	35	14	0	60	13	74	13	0	100	27	34	10	0	71	18	54	9	0	81	312
10:30 AM	9	29	20	0	58	8	75	8	0	91	19	29	9	0	57	22	55	16	0	93	299
10:45 AM	10	37	17	0	64	14	78	15	0	107	19	40	6	1	66	30	78	13	0	121	358
Total	43	128	76	0	247	43	297	46	1	387	91	131	37	1	260	84	239	53	0	376	1270
11:00 AM	15	36	21	1	73	10	64	9	0	83	16	38	12	0	66	19	74	19	0	112	334
11:15 AM	15	33	21	0	69	13	87	12	0	112	20	29	12	0	61	25	74	18	0	117	359
11:30 AM	12	38	24	0	74	6	71	15	0	92	18	28	17	1	64	19	52	11	0	82	312
11:45 AM	15	24	23	2	64	12	74	9	1	96	18	37	8	1	64	31	54	12	0	97	321
Total	57	131	89	3	280	41	296	45	1	383	72	132	49	2	255	94	254	60	0	408	1326
12:00 PM	21	41	26	0	88	15	97	22	0	134	33	43	9	0	85	30	72	14	0	116	423
12:15 PM	21	37	13	0	71	14	89	11	0	114	23	43	10	0	76	31	78	19	0	128	389
12:30 PM	16	20	29	0	65	6	85	5	1	97	26	28	4	0	58	31	90	20	0	141	361
12:45 PM	14	42	20	0	76	11	69	6	0	86	20	37	11	0	68	37	74	24	2	137	367
Total	72	140	88	0	300	46	340	44	1	431	102	151	34	0	287	129	314	77	2	522	1540
01:00 PM	16	34	24	0	74	9	112	9	0	130	18	33	11	1	63	26	82	19	2	129	396
01:15 PM	8	43	15	0	66	17	71	7	0	95	20	44	13	1	78	23	98	12	2	135	374
01:30 PM	20	34	20	0	74	5	61	18	0	84	16	34	10	2	62	15	69	14	0	98	318
01:45 PM	8	22	16	0	46	8	76	16	1	101	13	42	12	4	71	25	76	15	0	116	334
Total	52	133	75	0	260	39	320	50	1	410	67	153	46	8	274	89	325	60	4	478	1422
02:00 PM	10	35	17	0	62	13	74	10	2	99	18	30	10	0	58	25	72	6	3	106	325
02:15 PM	16	23	24	0	63	7	79	9	0	95	19	44	12	0	75	14	57	20	0	91	324
02:30 PM	11	36	24	0	71	12	81	22	0	115	25	43	5	0	73	28	67	9	2	106	365
02:45 PM	20	46	19	0	85	7	96	18	1	122	25	54	8	1	88	20	70	15	1	106	401
Total	57	140	84	0	281	39	330	59	3	431	87	171	35	1	294	87	266	50	6	409	1415
03:00 PM	16	53	15	0	84	9	88	16	0	113	19	34	15	0	68	26	86	10	0	122	387
03:15 PM	12	46	9	0	67	13	59	9	0	81	22	44	14	0	80	25	100	16	0	141	369
03:30 PM	23	64	19	0	106	16	95	16	0	127	23	36	8	0	67	25	123	27	1	176	476
03:45 PM	24	57	30	0	111	13	81	8	0	102	20	50	14	0	84	21	105	16	0	142	439
Total	75	220	73	0	368	51	323	49	0	423	84	164	51	0	299	97	414	69	1	581	1671
04:00 PM	12	33	37	0	82	9	94	22	1	126	22	38	7	1	68	27	105	9	0	141	417
04:15 PM	21	46	17	0	84	8	93	11	0	112	23	43	11	0	77	29	118	19	0	166	439
04:30 PM	15	43	27	0	85	13	92	10	0	115	30	61	14	0	105	29	83	13	0	125	430

Oskaloosa Traffic Signal Study
A Ave & Market St
Oskaloosa, IA

File Name : TMC05_Aave _Market_170411
Site Code : 5
Start Date : 4/11/2017
Page No : 2

Groups Printed- Cars - Hvy Veh

	Market St Southbound					A Ave Westbound					Market St Northbound					A 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	16	41	15	0	72	14	105	21	0	140	29	45	12	0	86	35	99	11	0	145	443
Total	64	163	96	0	323	44	384	64	1	493	104	187	44	1	336	120	405	52	0	577	1729
05:00 PM	20	50	22	0	92	14	83	24	0	121	21	71	14	0	106	32	96	20	0	148	467
05:15 PM	12	42	26	0	80	14	104	15	0	133	23	48	10	0	81	25	89	14	1	129	423
05:30 PM	12	43	19	0	74	10	89	5	1	105	17	44	7	0	68	25	109	12	2	148	395
05:45 PM	13	43	26	0	82	5	78	14	0	97	16	39	17	0	72	31	81	11	0	123	374
Total	57	178	93	0	328	43	354	58	1	456	77	202	48	0	327	113	375	57	3	548	1659
Grand Total	659	1761	897	5	3322	485	3637	631	10	4763	892	1822	423	15	3152	1091	3357	623	17	5088	16325
Apprch %	19.8	53	27	0.2		10.2	76.4	13.2	0.2		28.3	57.8	13.4	0.5		21.4	66	12.2	0.3		
Total %	4	10.8	5.5	0	20.3	3	22.3	3.9	0.1	29.2	5.5	11.2	2.6	0.1	19.3	6.7	20.6	3.8	0.1	31.2	
Cars	617	1557	862	5	3041	433	3442	576	10	4461	873	1619	399	15	2906	1049	3155	610	17	4831	15239
% Cars	93.6	88.4	96.1	100	91.5	89.3	94.6	91.3	100	93.7	97.9	88.9	94.3	100	92.2	96.2	94	97.9	100	94.9	93.3
Hvy Veh	42	204	35	0	281	52	195	55	0	302	19	203	24	0	246	42	202	13	0	257	1086
% Hvy Veh	6.4	11.6	3.9	0	8.5	10.7	5.4	8.7	0	6.3	2.1	11.1	5.7	0	7.8	3.8	6	2.1	0	5.1	6.7



Snyder & Associates, Inc.

Exhibit J-05

Oskaloosa Traffic Signal Study
Market St & 2nd St
Oskaloosa, IA

File Name : TMC11_2nd-Market_170413
Site Code : 11
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Hvy Veh

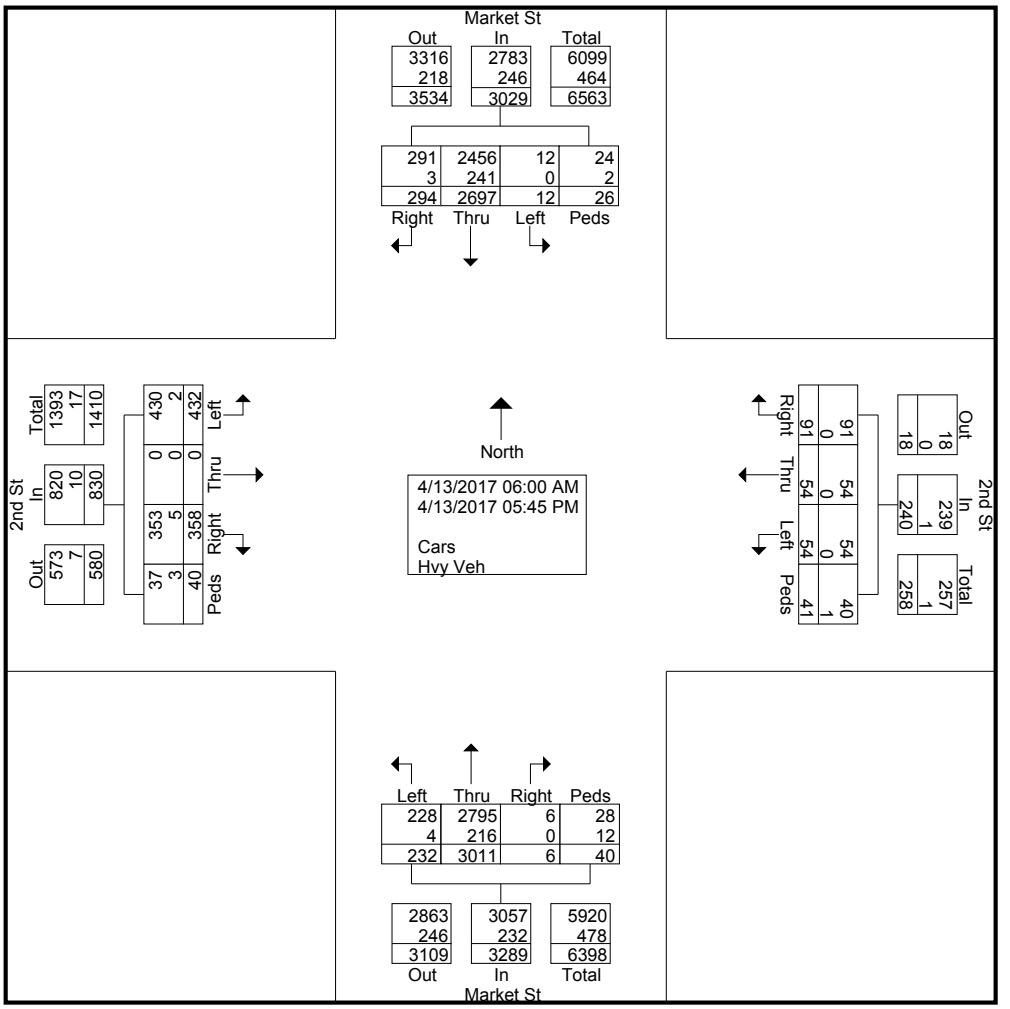
	Market St Southbound					2nd St Westbound					Market St Northbound					2nd St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	33	3	0	36	0	0	0	1	1	1	30	0	0	31	0	0	0	0	0	68
06:15 AM	0	39	1	0	40	0	1	0	0	1	3	36	0	0	39	1	0	0	1	2	82
06:30 AM	0	45	0	0	45	0	0	0	0	0	1	39	0	0	40	0	0	0	0	0	85
06:45 AM	0	39	2	1	42	0	0	0	1	1	1	50	1	0	52	1	0	0	0	1	96
Total	0	156	6	1	163	0	1	0	2	3	6	155	1	0	162	2	0	0	1	3	331
07:00 AM	0	43	3	0	46	0	0	0	0	0	6	27	0	1	34	0	0	1	1	2	82
07:15 AM	0	56	2	1	59	1	1	1	0	3	2	53	0	0	55	2	0	1	0	3	120
07:30 AM	0	40	6	0	46	2	1	1	0	4	4	77	0	0	81	6	0	1	0	7	138
07:45 AM	0	46	12	2	60	1	0	4	0	5	12	101	1	0	114	6	0	3	0	9	188
Total	0	185	23	3	211	4	2	6	0	12	24	258	1	1	284	14	0	6	1	21	528
08:00 AM	0	43	8	0	51	1	1	2	1	5	14	78	2	0	94	14	0	2	0	16	166
08:15 AM	0	50	6	0	56	0	1	3	0	4	6	47	1	1	55	4	0	4	1	9	124
08:30 AM	1	38	4	1	44	0	0	3	1	4	2	58	0	0	60	2	0	2	0	4	112
08:45 AM	0	38	4	0	42	1	2	2	0	5	4	50	0	0	54	9	0	3	0	12	113
Total	1	169	22	1	193	2	4	10	2	18	26	233	3	1	263	29	0	11	1	41	515
09:00 AM	0	50	2	0	52	0	0	3	0	3	3	40	0	0	43	3	0	1	0	4	102
09:15 AM	1	44	6	0	51	1	1	2	0	4	6	59	0	1	66	7	0	6	0	13	134
09:30 AM	0	34	8	0	42	0	1	0	0	1	2	42	0	0	44	2	0	3	0	5	92
09:45 AM	0	46	3	0	49	0	3	2	0	5	8	54	0	0	62	5	0	5	0	10	126
Total	1	174	19	0	194	1	5	7	0	13	19	195	0	1	215	17	0	15	0	32	454
10:00 AM	0	51	4	0	55	1	0	1	1	3	2	59	0	0	61	9	0	8	1	18	137
10:15 AM	1	52	2	0	55	2	0	2	0	4	1	65	0	0	66	8	0	3	0	11	136
10:30 AM	0	57	10	0	67	0	3	0	0	3	3	50	0	0	53	12	0	9	2	23	146
10:45 AM	0	45	9	4	58	1	0	2	0	3	3	51	0	0	54	8	0	7	0	15	130
Total	1	205	25	4	235	4	3	5	1	13	9	225	0	0	234	37	0	27	3	67	549
11:00 AM	0	58	10	1	69	2	0	2	3	7	3	57	0	2	62	10	0	11	0	21	159
11:15 AM	0	51	4	0	55	1	1	2	0	4	3	59	0	0	62	7	0	13	0	20	141
11:30 AM	0	59	4	1	64	0	4	3	0	7	6	66	0	2	74	11	0	5	0	16	161
11:45 AM	0	49	5	1	55	1	0	2	0	3	5	60	0	1	66	13	0	17	1	31	155
Total	0	217	23	3	243	4	5	9	3	21	17	242	0	5	264	41	0	46	1	88	616
12:00 PM	1	49	11	0	61	1	1	0	1	3	8	72	0	0	80	17	0	14	0	31	175
12:15 PM	1	55	7	3	66	2	0	2	1	5	2	70	0	0	72	8	0	7	1	16	159
12:30 PM	0	72	3	1	76	3	2	4	3	12	5	73	0	1	79	11	0	8	0	19	186
12:45 PM	0	54	11	2	67	3	1	3	2	9	11	53	1	2	67	16	0	6	1	23	166
Total	2	230	32	6	270	9	4	9	7	29	26	268	1	3	298	52	0	35	2	89	686
01:00 PM	1	65	18	0	84	1	1	1	0	3	11	76	0	2	89	10	0	8	1	19	195
01:15 PM	0	52	4	1	57	1	0	1	5	7	2	55	0	1	58	7	0	7	0	14	136
01:30 PM	0	60	5	0	65	0	2	3	0	5	5	60	0	0	65	8	0	4	1	13	148
01:45 PM	0	47	7	1	55	1	2	3	0	6	2	58	0	0	60	7	0	5	7	19	140
Total	1	224	34	2	261	3	5	8	5	21	20	249	0	3	272	32	0	24	9	65	619
02:00 PM	1	62	4	0	67	3	0	5	0	8	8	52	0	3	63	8	0	6	4	18	156
02:15 PM	1	55	5	2	63	1	0	1	0	2	3	71	0	0	74	14	0	4	1	19	158
02:30 PM	0	73	4	0	77	2	3	0	1	6	1	71	0	1	73	12	0	6	0	18	174
02:45 PM	0	70	9	1	80	1	2	2	0	5	5	72	0	1	78	11	0	10	0	21	184
Total	2	260	22	3	287	7	5	8	1	21	17	266	0	5	288	45	0	26	5	76	672
03:00 PM	0	74	11	0	85	1	1	5	0	7	4	56	0	1	61	8	0	13	3	24	177
03:15 PM	1	63	4	0	68	1	1	0	2	4	3	63	0	2	68	12	0	12	2	26	166
03:30 PM	0	94	10	0	104	2	2	4	2	10	3	90	0	2	95	12	0	8	1	21	230
03:45 PM	0	77	5	0	82	3	3	0	0	6	7	77	0	0	84	11	0	21	1	33	205
Total	1	308	30	0	339	7	7	9	4	27	17	286	0	5	308	43	0	54	7	104	778
04:00 PM	0	72	8	2	82	6	1	3	4	14	8	76	0	5	89	9	0	14	2	25	210
04:15 PM	1	77	10	0	88	1	1	1	5	8	6	70	0	2	78	14	0	13	1	28	202
04:30 PM	1	77	11	0	89	2	4	3	1	10	12	87	0	3	102	23	0	12	2	37	238

Oskaloosa Traffic Signal Study
Market St & 2nd St
Oskaloosa, IA

File Name : TMC11_2nd-Market_170413
Site Code : 11
Start Date : 4/13/2017
Page No : 2

Groups Printed- Cars - Hvy Veh

	Market St Southbound					2nd St Westbound					Market St Northbound					2nd St 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	0	77	8	1	86	1	0	3	1	5	5	95	0	1	101	14	0	20	1	35	227
Total	2	303	37	3	345	10	6	10	11	37	31	328	0	11	370	60	0	59	6	125	877
05:00 PM	0	94	6	0	100	0	1	2	0	3	4	88	0	0	92	22	0	23	0	45	240
05:15 PM	1	61	4	0	66	0	3	7	2	12	7	78	0	1	86	15	0	11	2	28	192
05:30 PM	0	47	4	0	51	0	1	1	1	3	5	72	0	2	79	12	0	7	2	21	154
05:45 PM	0	64	7	0	71	3	2	0	2	7	4	68	0	2	74	11	0	14	0	25	177
Total	1	266	21	0	288	3	7	10	5	25	20	306	0	5	331	60	0	55	4	119	763
Grand Total	12	2697	294	26	3029	54	54	91	41	240	232	3011	6	40	3289	432	0	358	40	830	7388
Apprch %	0.4	89	9.7	0.9		22.5	22.5	37.9	17.1		7.1	91.5	0.2	1.2		52	0	43.1	4.8		
Total %	0.2	36.5	4	0.4	41	0.7	0.7	1.2	0.6	3.2	3.1	40.8	0.1	0.5	44.5	5.8	0	4.8	0.5	11.2	
Cars	12	2456	291	24	2783	54	54	91	40	239	228	2795	6	28	3057	430	0	353	37	820	6899
% Cars	100	91.1	99	92.3	91.9	100	100	100	97.6	99.6	98.3	92.8	100	70	92.9	99.5	0	98.6	92.5	98.8	93.4
Hvy Veh	0	241	3	2	246	0	0	0	1	1	4	216	0	12	232	2	0	5	3	10	489
% Hvy Veh	0	8.9	1	7.7	8.1	0	0	0	2.4	0.4	1.7	7.2	0	30	7.1	0.5	0	1.4	7.5	1.2	6.6



Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Mahaska | Prepared by: McClure, LMV | Date Prepared: May 4, 2020

Location: IA 92 / A Avenue from Hwy 432 to 2300' east of IA 23/S 17th Street; US 63 / Market St from 2nd to 16th

Improvement

Proposed Improvement(s): Conversion to 3-lane roadways with TWLTL.

$ 593,700	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	30	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 593,700**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.55	12,500	IA 92, Gateway to H St
0.49	10,400	IA 92, H St to US 63/Market
1.14	9,300	IA 92, US 63 to IA 23
0.88	7,500	US 63, 2nd Ave to 16th Ave
3.06	miles total	

29,171	Current Vehicle Miles / Day, **VM**
35,594	End of Life Veh. Miles / Day
10,647,458	Current Veh. Miles / Year, **AM**
234,446,417	Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2012 First full year --> 2016 Last full year | 5.0 years, Time Period, **T**

Additional months

1	Fatal Crashes →	1	Fatalities @	$4,500,000	$ 4,500,000
		5	Major Injuries @	$325,000	$ 1,625,000
123	Injury Crashes →	26	Minor Injuries @	$65,000	$ 1,690,000
		133	Possible Injuries @	$35,000	$ 4,655,000
306	Property Damage Only		(assumed cost per crash)	$7,400	$ 3,182,000
			-OR- enter all Property Costs of all crashes:		
430	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 15,652,000

86.00	Current Crashes / Year, **AA** = TA / T	**807.7**	Crashes / HMVM, Crash Rate, **CR**
$ 36,400	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
1,893.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 13,871,466**	Present Value of Avoided Crashes, **BENEFIT**
25.80	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 939,120	Crash Costs Avoided in First Year, AAR x AVCR		
568.1	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $13,871,466 : $593,700 = **23.36** : 1

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project: Intersection of Highway 110 and Highway 7

Applicant: City of Storm Lake

Contact Person: Keri Navratil Title: City Manager

Complete Mailing Address: PO Box 1086
Storm Lake, IA 50588

Phone: 712-732-8000 (Area Code) E-Mail: navratil@stormlake.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): Iowa Department of Transportation

Contact Person: Tony Lazarowicz Title: District Engineer

Complete Mailing Address: 2800 Gordon Drive
Sioux City, IA 51102-0987

Phone: 712-276-1451 (Area Code) E-Mail: Tony.lazarowicz@iowadot.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 952,000.00
Total Project Cost	$ 3,166,000.00
Safety Funds Requested	$ 500,000.00

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

☐ Yes – Explain _____

☒ No

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 Storm Lake

Signed: Michael Porsch 8/3/20
Signature Date Signed

Michael Porsch, Mayor
Printed Name

Attest: Mayra A. Martinez 8/3/20
Signature Date Signed

Mayra Martinez, City Clerk
Printed Name

RESOLUTION NO. 09-R-2020-2021

A RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR THE INTERSECTION OF HIGHWAY 7 AND HIGHWAY 110 FOR THE PURPOSE OF RECONFIGURATION OF THE INTERSECTION TO IMPROVE AND ENHANCE THE SAFETY OF TRAFFIC WITHIN THE INTERSECTION.

WHEREAS, the Iowa Department of Transportation has established the Traffic Safety Improvement Program (TSIP) and provides funding for locations where vehicular safety is a concern and has been documented through independent studies; and,

WHEREAS, the Highway 7 and Highway 110 intersection has been identified as a location where vehicular safety and traffic flow are such that serious injury, including death, has occurred, and where additional traffic due to imminent new development will only increase the traffic flow and increase safety concerns; and,

` the improvements being designed in conjunction with Iowa Department of Transportation staff, City staff, the City's Project Engineer, and the Buena Vista County Engineer will improve the safety and flow of traffic at the intersection; and,

WHEREAS, the proposed improvements project is eligible for funding through the IDOT's TSIP program; and,

WHEREAS, the proposed improvements including the addition of turn lanes, railroad crossing improvements, and traffic signals will help reduce crashes, injuries, and deaths while improving traffic operations.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Storm Lake, Iowa as follows:

SECTION 1. That the City Council of the City of Storm Lake, Iowa supports and approves the application for TSIP funding through the Iowa Department of Transportation.

SECTION 2. The City Council hereby commits the additional City funds necessary for construction of the project beyond TSIP funding for the project.

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

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

PASSED and APPROVED this 20th day of July, 2020.

Michael Porsch, Mayor

ATTEST

Mayra A. Martinez, City Clerk

The proposed project involves the reconstruction of the intersection of State HWY 110 / 90th Avenue and State HWY 7 in an effort to improve safety at the intersection in response to past accidents, including a death, and an increase in future traffic due to the development of a new Early Childhood Center currently under construction by the Storm Lake Community School District.

EXISTING CONDITIONS

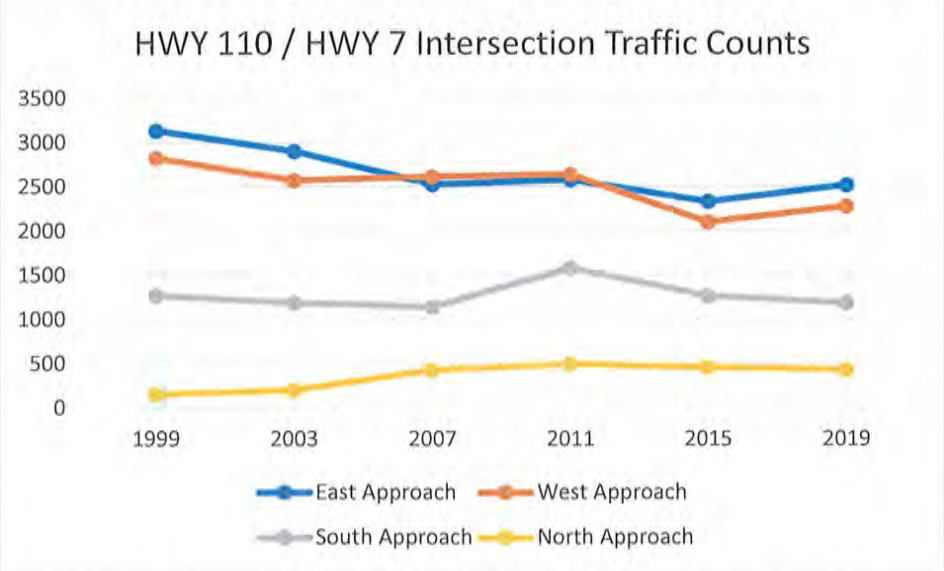
The current conditions are as follows:

State Highway 7 (West Milwaukee Avenue) is a two-lane rural roadway with the addition of a 400-foot right turn lane, at the intersection, for eastbound traffic. The speed limit on HWY 7 at the intersection is 50 MPH.

State Highway 110 (90th Avenue) is a two-lane rural roadway which includes a railroad crossing approximately 80 feet south of the intersection. The speed limit on HWY 110 at the intersection is 45 MPH.

The intersection is currently stop controlled for north and south movements.

Traffic counts at the intersection since 1999 show a decrease following a high in 1999 followed by a steady growth in traffic in the recent term as shown in the following chart. The 2019 counts were taken in July which would not have taken into consideration the traffic related to school activities.



In addition to the DOT traffic counts the City of Storm Lake conducted its own daily counts in 2019 and recorded 7,960 vehicles per day on the east leg of the intersection and 3,251 vehicles per day on the south leg of the intersection.

Reviewing traffic crash history for the intersection between 2010 and 2019 the intersection has seen a total of 37 crashes, including one fatality and three suspected serious/incapacitating injuries. In total there were 27 injuries recorded as part of these accidents.

The intersection is a main entry point for workers coming into Storm Lake from the west including the rural subdivision of Lake Creek and the Cities of Alta, Aurelia, and Cherokee. Additionally, the

intersection serves as an entry point to the Storm Lake Middle and Elementary schools which are located south of the intersection. These two schools have an estimated student population of 1,700 students and a staff population of 277. Other businesses including Hope Haven's facility are located along HWY 7 and increase traffic demands at this intersection.

PROPOSED IMPROVEMENTS

Two traffic studies were completed for this intersection, the first study was conducted in 2018 by the Storm Lake Community School District (completed by I&S Group) to provide the community, and the City, with an analysis of the impacts of traffic around the intersection of HWY 110 and HWY 7 related to the development of the District's new Early Childhood Center north of the intersection on 90th Avenue. The second study was commissioned by the City of Storm Lake and completed by Snyder and Associates in October 2019. Both studies identified the need for improved traffic control at the intersection to eliminate the potential for serious injury accidents and to better facilitate the flow of traffic to high traffic facilities currently existing and under development.

The Storm Lake Community School District has a significant overcrowding problem within their existing buildings especially at the elementary and middle schools. To help alleviate this issue the District brought to the citizens a plan to ease overcrowding through the construction of an early childhood center in two phases. The project currently under construction, will house kindergarten and transitional kindergarten students, expected to be 260 students plus an additional 40 staff members. These numbers will increase the traffic flow in the area.

Following the completion of the City's study in 2019 the City hired Bolton & Menk Engineering to help design, in conjunction with regional IDOT staff, a solution that can improve the overall flow and control of traffic at the intersection. The proposed improvements include the following key safety elements:

- Addition of turning lanes for east and west bound traffic on HWY 7
- Addition of turning lanes for south bound traffic on 90th Avenue
- Installation of Traffic Signals timed and in conjunction with the railroad crossing located on the east side and parallel to HWY 7

In addition to the key safety elements, above, the proposed project will require the purchase of a small portion of right-of-way (coordinated with IDOT staff), and reconstruction of the intersection, at the request of IDOT, due to poor subbase conditions.

The City, their project engineer, and regional DOT staff have been working together over the past eight months to develop a design for the project and to start the acquisition of the needed right-of-way. Pending acquisition of funding, the project is set to begin construction in 2021 with a completion in mid-2022.

LINKS TO TRAFFIC STUDIES

ISG Traffic Study 2018 - https://www.stormlake.org/DocumentCenter/View/2458/Storm-Lake-Traffic-Study-ISG---2018

Snyder Traffic Study 2019 - https://www.stormlake.org/DocumentCenter/View/2459/Storm-Lake-Traffic-Study-Snyder---2019

CITY OF STORM LAKE
HWY 7/ IA 110 INTERSECTION
OPINION OF PROBABLE COSTS
Wednesday, August 12, 2020

No.	Item	Units	Unit Price	Safety		Non-Safety	
1	EMBANKMENT-IN-PLACE	CY	$22.00	2000	$44,000	300	$6,600
2	EXCAVATION, CL 10, RDWY+BORROW	CY	$6.00	7500	$45,000	8650	$51,900
3	SPECIAL BACKFILL	CY	$33.50	1650	$55,275	4150	$139,025
4	TOPSOIL, STRIP, SALVAGE+SPREAD	CY	$6.00			4000	$24,000
5	COMPACTION W/MOISTURE+DENSITY CONTROL	CY	$1.50	1650	$2,475	4150	$6,225
6	SPECIAL COMPACTION OF SUBGRADE	STA	$560.00	10	$5,600	26	$14,560
7	GRANULAR SUBBASE	SY	$8.00	7000	$56,000	9250	$74,000
8	SUBGRADE STABILIZATION MATERIAL, Polymer Grid	SY	$2.50	7000	$17,500	9250	$23,125
9	PAVED SHLD, PCC, 6"	SY	$50.00	2070	$103,500	2070	$103,500
11	STD/S-F PCC PAV'T, QM-C CL 3, 10"	SY	$60.00	4870	$292,200	11440	$686,400
12	SURF, DRIVEWAY, CL A CR STONE	TON	$30.00			100	$3,000
13	RMVL OF CONC FOUNDATION OF LIGHT POLE	EACH	$550.00			2	$1,100
14	RMVL OF LIGHT POLE	EACH	$475.00			2	$950
15	CULV, CONC RDWY PIPE, 24"	LF	$50.00			80	$4,000
16	MANHOLE ADJUSTMENT, MAJOR	EACH	$1,900.00			2	$3,800
17	SUBDRAIN, LONGITUDINAL, (BACKSLOPE) 6"	LF	$15.00			250	$3,750
18	SUBDRAIN, LONGITUDINAL, (SHLD) 6"	LF	$12.00			5000	$60,000
19	RMVL+CRUSH OF PAV'T	SY	$8.25			13600	$112,200
20	DRIVEWAY, PCC, 6"	SY	$60.00			170	$10,200
21	RMVL OF PAVED DRIVEWAY	SY	$10.00			170	$1,700
22	RMVL/REINSTALL FENCE, FIELD	LF	$15.00			300	$4,500
23	LUMINAIRE, TOWER FLOODLIGHT	EACH	$2,000.00	4	$8,000		
24	ELECTRICAL CIRCUIT	LF	$15.00	400	$6,000		
25	HANDHOLE+JUNCTION BOX	EACH	$1,100.00	5	$5,500		
26	CONTROL CABINET	EACH	$10,300.00	1	$10,300		
27	RMV+REINSTALL SIGN	EACH	$150.00			10	$1,500
28	RMVL OF TYPE A SIGN	EACH	$25.00			2	$50
29	TRAFFIC SIGNALIZATION	LS	$300,000.00	1	$300,000		
				Subtotal:	**$952,000**	**Subtotal:**	**$1,337,000**

Total Construction Costs **$2,289,000**

Funding

U-STEP	$	200,000
TSIP	$	500,000
Local Share	$	2,466,000

Administrative Costs

Construction Contingencies 20%	$	450,000
Prelim Engineering	$	53,400
Design Plans And Specifications	$	143,000
Funding Assistance	$	15,000
Construction Contract Administration	$	54,000
Resident Project Representative - Full Time	$	162,000
Subtotal	**$**	**877,400**

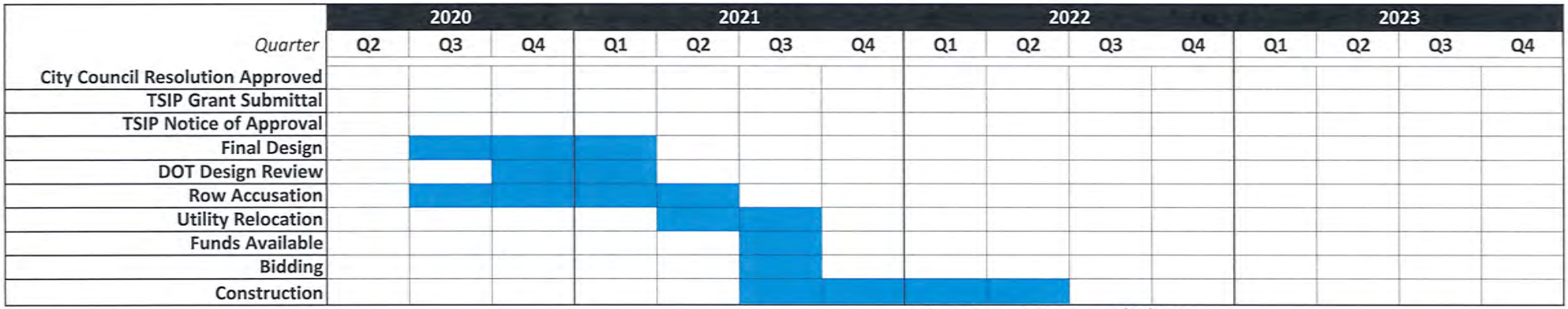
TOTAL OF FUNDING SOURCES $ 3,166,000

TOTAL OPINION OF IMPROVEMENT COST $ 3,166,000

City of Storm Lake

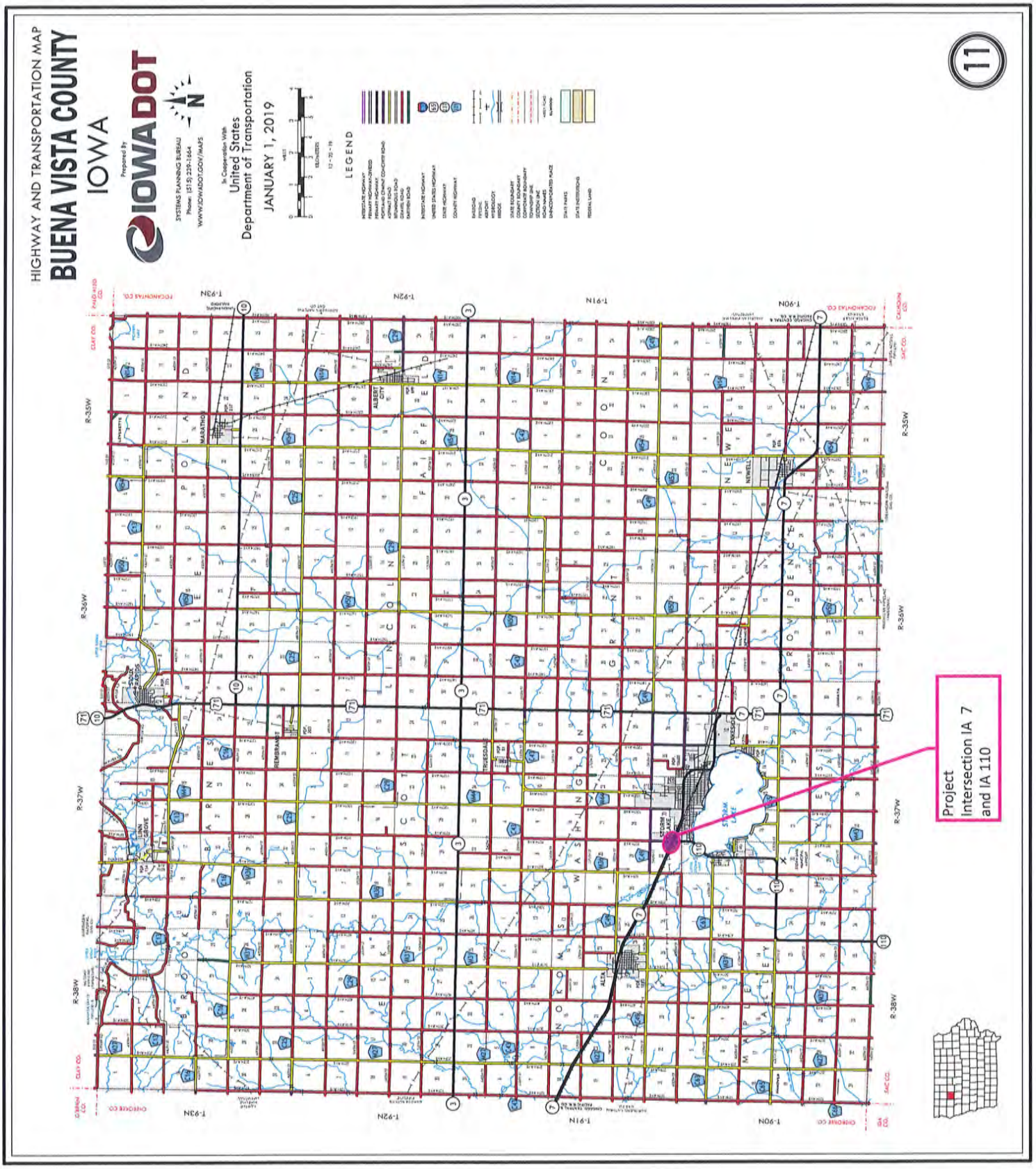
Hwy 7 / Hwy 110 Intersection Improvements

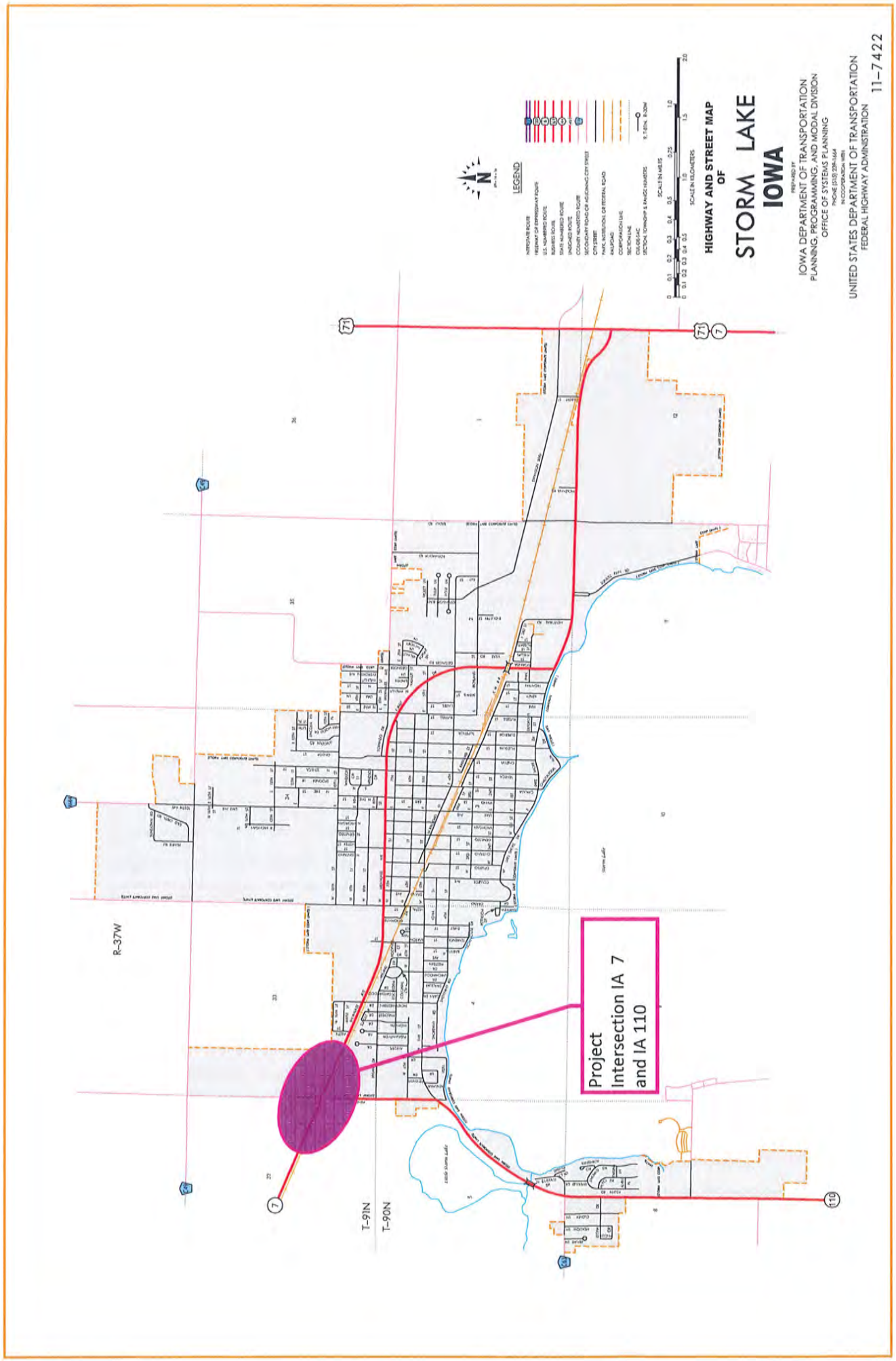
Project Schedule



Estimated Completion Date: 5/01/2022

SECTION D


HIGHWAY AND TRANSPORTATION MAP
BUENA VISTA COUNTY
IOWA
Prepared by
IOWA DOT
SYSTEMS PLANNING BUREAU
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS
In Cooperation With
United States
Department of Transportation
JANUARY 1, 2019
LEGEND
11
Project
Intersection IA 7
and IA 110


HIGHWAY AND STREET MAP
OF
STORM LAKE
IOWA
IOWA DEPARTMENT OF TRANSPORTATION
PLANNING, PROGRAMMING, AND MODAL DIVISION
OFFICE OF SYSTEMS PLANNING
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
11-7422
LEGEND
SCALE IN MILES
SCALE IN KILOMETERS
Project
Intersection IA 7
and IA 110
R-37W
T-91N
T-90N

SECTION F

Storm Lake HWY 110 / HWY 7 Color Pictures

90th Avenue Looking South (HWY 7 Crossing East West)

HWY 110 Looking North (HWY 7 Crossing East West)

SECTION F
Storm Lake HWY 110 / HWY 7 Color Pictures

HWY 7 Looking East

HWY 7 Looking West

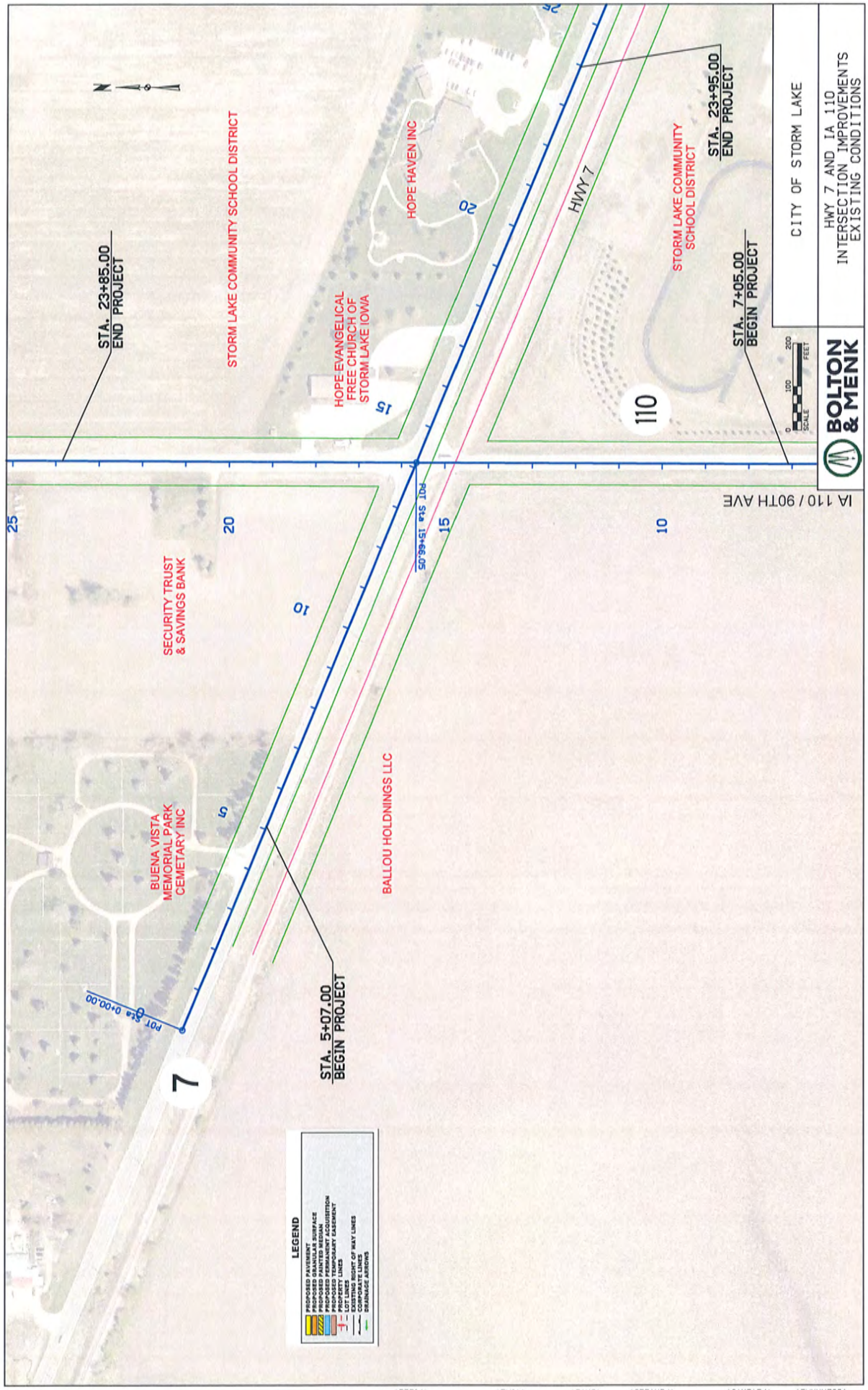
SECTION F
Storm Lake HWY 110 / HWY 7 Color Pictures

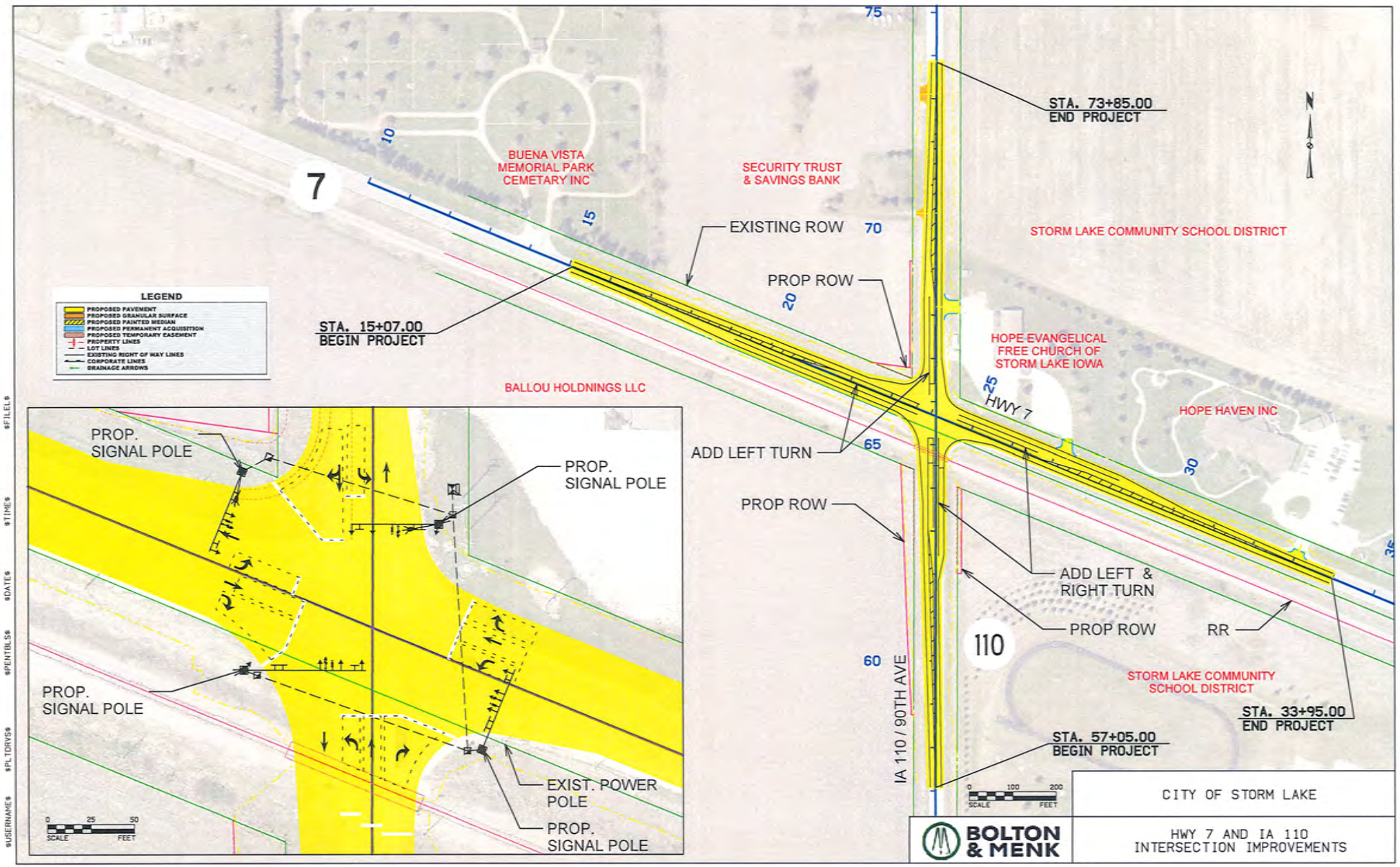
Centerline Looking East

Centerline Looking West

Centerline Looking North

Centerline Looking South


CITY OF STORM LAKE
HWY 7 AND IA 110
INTERSECTION IMPROVEMENTS
EXISTING CONDITIONS
BOLTON & MENK
SCALE 0 100 200 FEET
STA. 5+07.00
BEGIN PROJECT
STA. 23+85.00
END PROJECT
STA. 7+05.00
BEGIN PROJECT
STA. 23+95.00
END PROJECT
SECURITY TRUST & SAVINGS BANK
BUENA VISTA MEMORIAL PARK CEMETARY INC
BALLOU HOLDNINGS LLC
STORM LAKE COMMUNITY SCHOOL DISTRICT
HOPE EVANGELICAL FREE CHURCH OF STORM LAKE IOWA
HOPE HAVEN INC
STORM LAKE COMMUNITY SCHOOL DISTRICT
HWY 7
IA 110 / 90TH AVE
LEGEND
PROPOSED PAVEMENT
PROPOSED PAINTED MEDIAN
PROPOSED PERMANENT ACQUISITION
PROPOSED TEMPORARY EASEMENT
PROPERTY LINES
LOT LINES
CENTER LINE
CORPORATE LINES
DRAINAGE ARROWS


LEGEND
PROPOSED PAVEMENT
PROPOSED GRANULAR SURFACE
PROPOSED PAINTED MEDIAN
PROPOSED PERMANENT ACQUISITION
PROPOSED TEMPORARY EASEMENT
PROPERTY LINES
LOT LINES
EXISTING RIGHT OF WAY LINES
CORPORATE LINES
DRAINAGE ARROWS
STA. 15+07.00
BEGIN PROJECT
STA. 73+85.00
END PROJECT
EXISTING ROW
PROP ROW
ADD LEFT TURN
ADD LEFT &
RIGHT TURN
PROP ROW
RR
STA. 33+95.00
END PROJECT
STA. 57+05.00
BEGIN PROJECT
BUENA VISTA
MEMORIAL PARK
CEMETARY INC
SECURITY TRUST
& SAVINGS BANK
STORM LAKE COMMUNITY SCHOOL DISTRICT
HOPE EVANGELICAL
FREE CHURCH OF
STORM LAKE IOWA
HOPE HAVEN INC
BALLOU HOLDNINGS LLC
STORM LAKE COMMUNITY
SCHOOL DISTRICT
HWY 7
IA 110 / 90TH AVE
7
110
10
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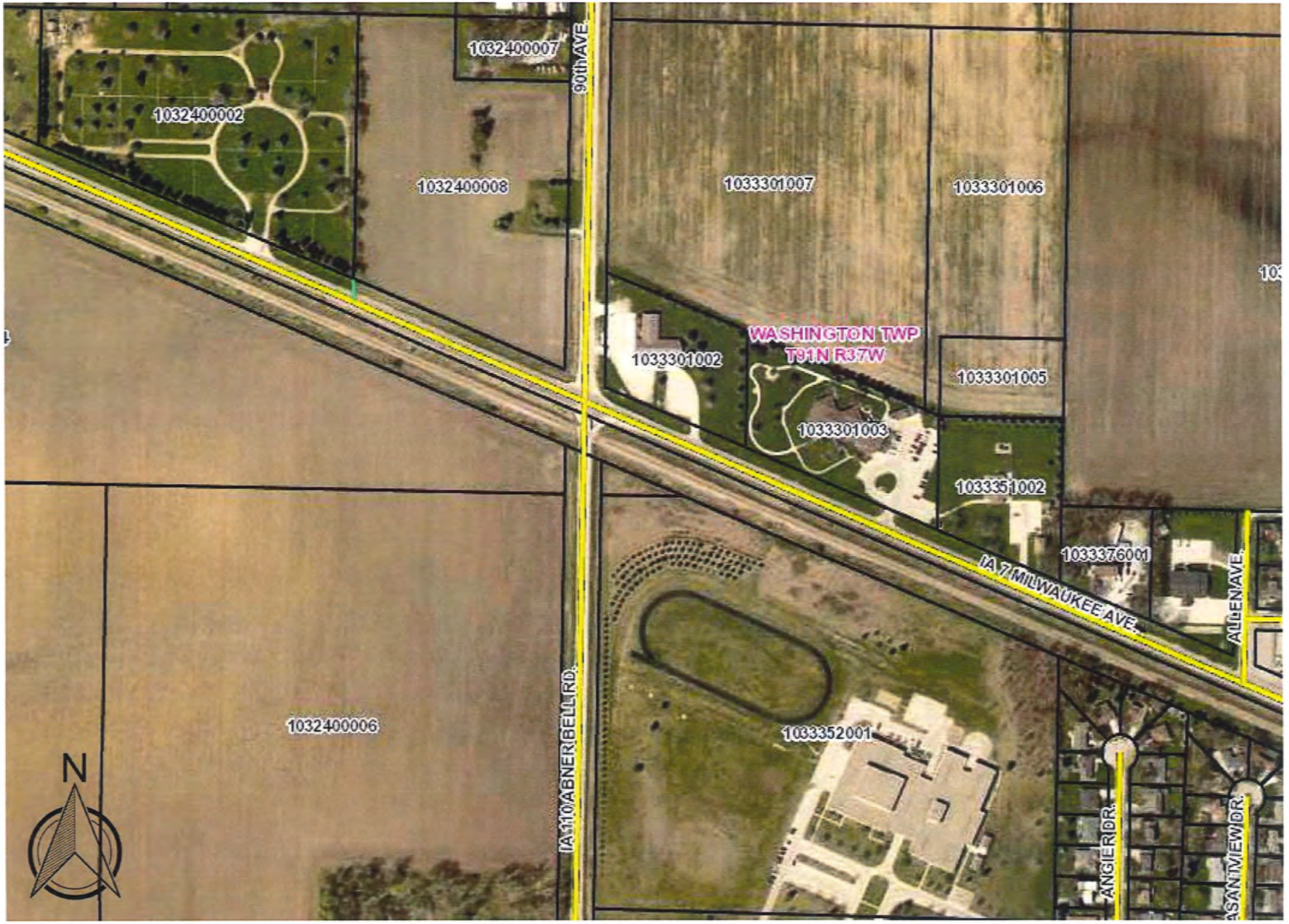
20
25
30
60
65
70
75
PROP.
SIGNAL POLE
PROP.
SIGNAL POLE
PROP.
SIGNAL POLE
EXIST. POWER
POLE
PROP.
SIGNAL POLE
0 25 50
SCALE FEET
0 100 200
SCALE FEET
CITY OF STORM LAKE
BOLTON
& MENK
HWY 7 AND IA 110
INTERSECTION IMPROVEMENTS

SECTION G



SECTION H
Storm Lake HWY 110 / HWY 7 Aerial Photograph

SECTION H

IOWA DOT

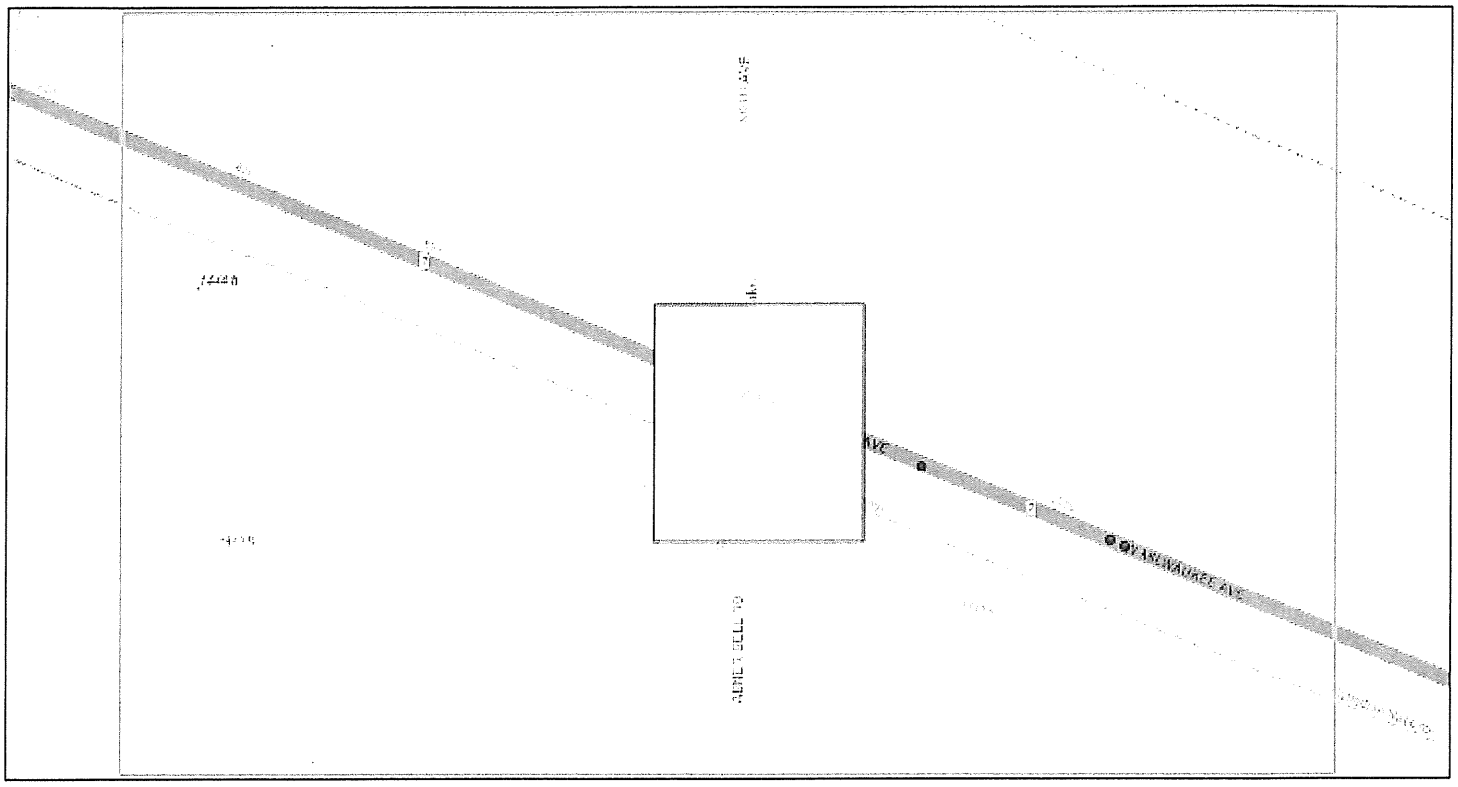
Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity	37
Fatal Crash	1
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	7
Possible/Unknown Injury Crash	7
Property Damage Only	21

Injury Status Summary	27
Fatalities	1
Suspected serious/incapacitating	3
Suspected minor/non-incapacitating	10
Possible (complaint of pain/injury)	13
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	313,030.00
Average (per crash dollars):	8,460.27
Total Vehicles:	67.00
Average (per crash):	1.81
Total Occupants:	101.00
Average (per crash):	2.73

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.03
Injuries/Crash:	0.70
Major Injuries/Crash:	0.08
Minor Injuries/Crash:	0.27
Possible/Unknown Injuries/Crash:	0.35



IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

Major Cause			35
Animal	0	Ran traffic signal	0
Ran stop sign	3	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	1
FTYROW: From stop sign	13	FTYROW: From yield sign	0
FTYROW: Making left turn	2	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	2
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...	2	Driver Distraction: Talking on a hand-held d...	0
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...	1
Driver Distraction: Exterior distraction	1	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
Over correcting/over steering	1	Failed to keep in proper lane	1
Failure to signal intentions	1	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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	6
Unknown	0	Not reported	0
Other: No improper action	0		

IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

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	0	1	0	0	0	0	0	0	1	0	0	0	0	2
Monday	0	0	0	0	0	1	0	0	1	1	0	0	0	3
Tuesday	0	0	0	2	0	0	1	1	1	0	0	0	0	5
Wednesday	0	0	1	0	2	0	4	2	1	1	0	0	0	11
Thursday	0	0	0	2	0	1	0	1	1	0	0	0	0	5
Friday	0	0	0	0	2	1	2	0	2	1	0	0	0	8
Saturday	0	0	0	0	1	1	0	1	0	0	0	0	0	3
Total	0	1	1	4	5	4	7	5	7	3	0	0	0	37

Manner of Crash Collision	37
Non-collision (single vehicle)	8
Head-on (front to front)	1
Rear-end (front to rear)	4
Angle, oncoming left turn	1
Broadside (front to side)	22
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	1
Unknown	0

Surface Conditions	37
Dry	30
Wet	4
Ice/frost	0
Snow	2
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			67
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	2	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	8
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	0	None (no fixed object struck)	57

IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

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	0	0	0	0	0
= 16	2	0	0	0	2
= 17	1	0	0	0	1
= 18	0	2	0	0	2
= 19	0	1	0	0	1
= 20	1	0	0	0	1
>= 21 and <= 24	0	2	0	0	2
>= 25 and <= 29	5	3	0	0	8
>= 30 and <= 34	7	3	0	0	10
>= 35 and <= 39	2	3	0	0	5
>= 40 and <= 44	3	3	0	0	6
>= 45 and <= 49	1	4	0	0	5
>= 50 and <= 54	1	4	0	0	5
>= 55 and <= 59	2	1	0	0	3
>= 60 and <= 64	0	1	0	0	1
>= 65 and <= 69	1	4	0	0	5
>= 70 and <= 74	1	2	0	0	3
>= 75 and <= 79	1	1	0	0	2
>= 80 and <= 84	1	2	0	0	3
>= 85 and <= 89	0	2	0	0	2
>= 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	29	38	0	0	67

Drug/Alcohol Related	37
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	37

Alcohol Test Given	67
None	66
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Given	67
None	66
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

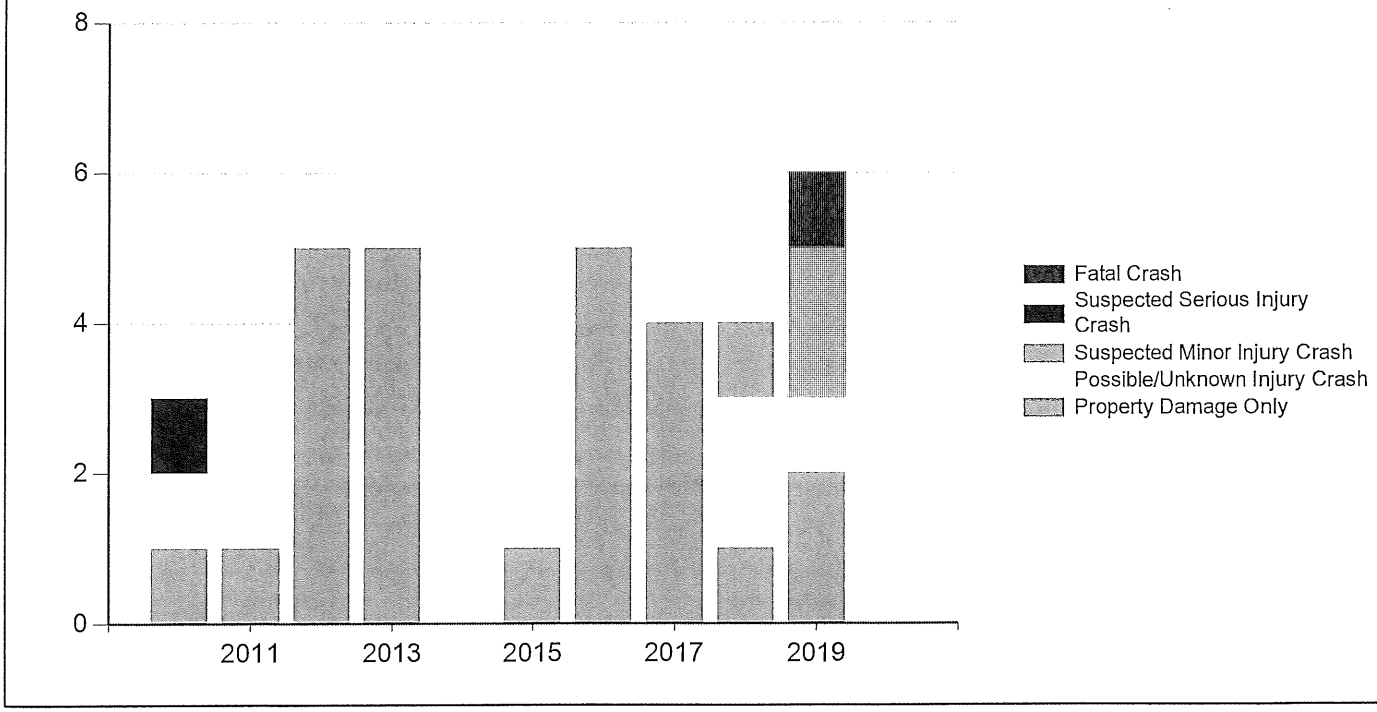
Drug Test Result	67
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	67
Other	0

Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2010	0	1	0	1	1	3
2011	0	0	0	1	1	2
2012	0	0	2	0	3	5
2013	0	0	0	1	5	6
2014	0	0	0	0	0	0
2015	0	0	0	1	1	2
2016	0	0	1	0	4	5
2017	0	0	1	0	3	4
2018	0	0	1	2	1	4
2019	1	0	2	1	2	6
2020	0	0	0	0	0	0
Total	1	1	7	7	21	37

Severity/Year



Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

11220633099

Count Date:

Thursday, July 25, 2019

County:

Buena Vista

Location Description:

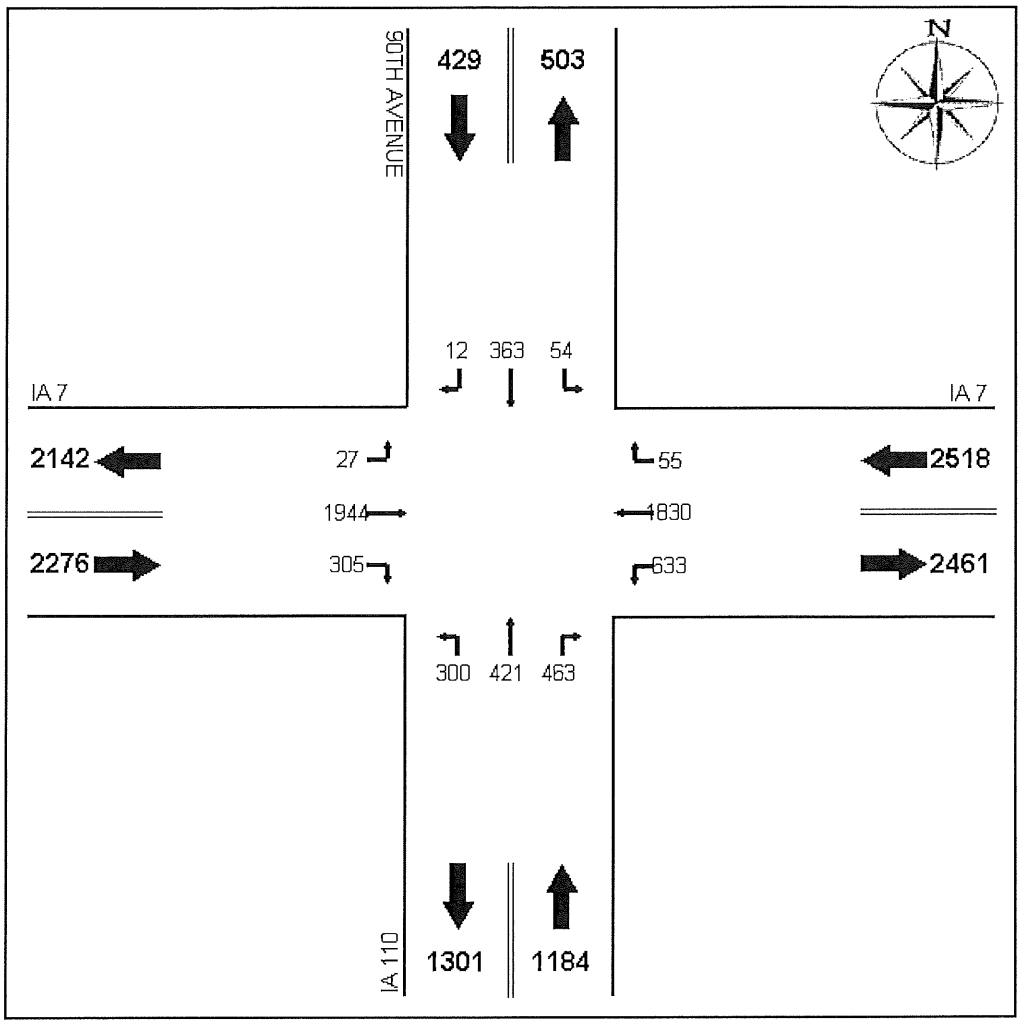
IA 7, IA 110 & 90TH AVE

Volume Factor: 0.886

Pass Class Factor: 0.907

SU Class Factor: 0.802

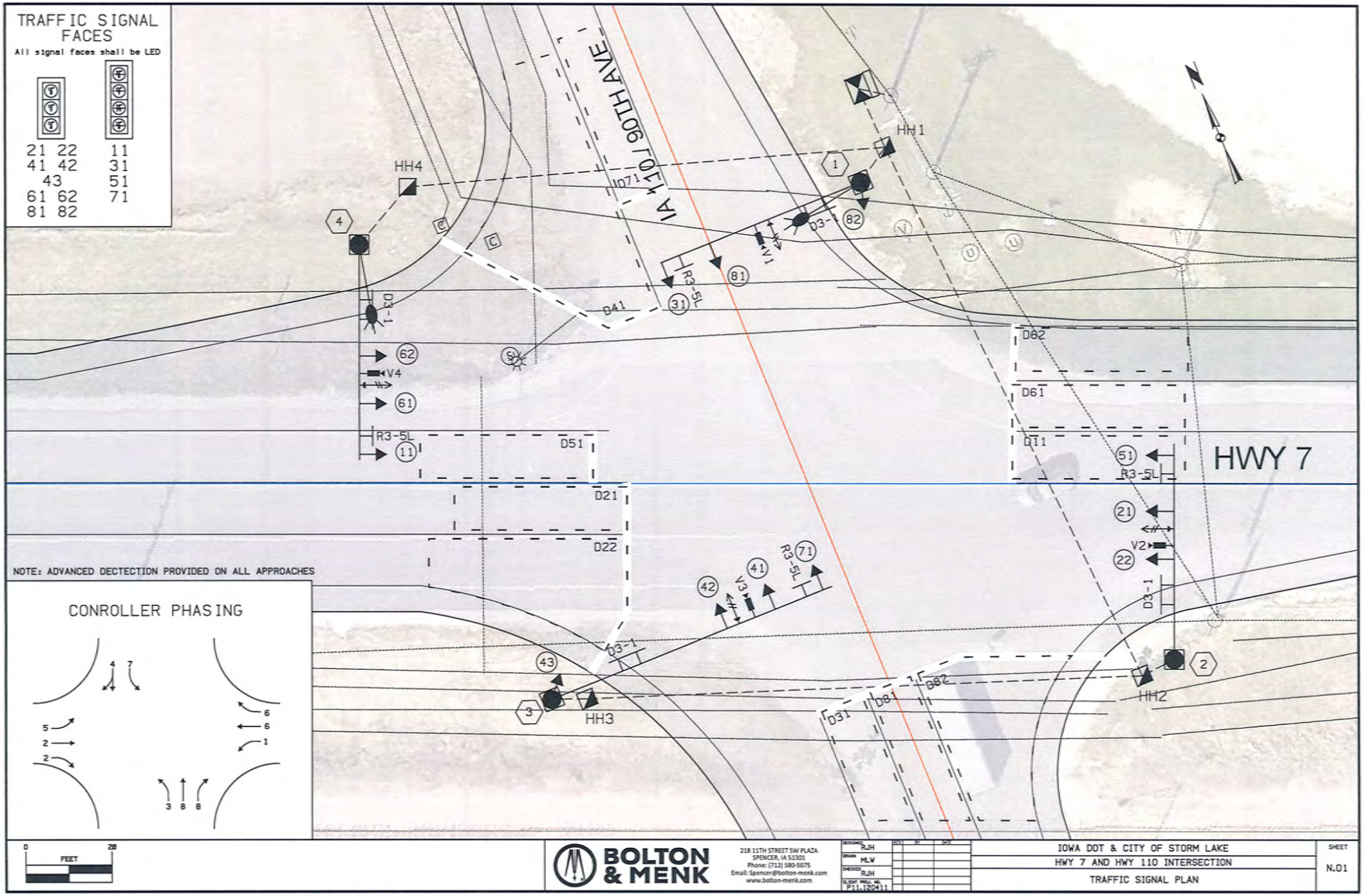
Combo Class Factor: 0.761



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	0	0	0	0	15	0	2	0	3	0	6	1
01:00	0	0	0	0	4	0	0	1	0	0	0	0
02:00	0	1	0	0	2	0	0	0	0	0	3	0
03:00	0	1	0	1	0	0	0	0	1	0	2	0
04:00	0	1	0	1	18	0	2	0	3	0	28	1
05:00	4	8	2	16	37	0	6	3	13	0	103	13
06:00	1	11	0	21	67	0	15	22	13	0	101	9
07:00	6	14	0	30	93	4	25	52	41	3	212	51
08:00	2	14	0	28	79	0	13	31	40	1	133	24
09:00	5	20	0	41	98	7	15	24	32	2	125	31
10:00	6	16	0	42	86	4	25	27	40	2	124	22
11:00	1	33	0	55	113	2	22	38	50	2	135	17
12:00	3	27	2	47	135	1	17	33	32	4	150	16
13:00	1	26	0	52	134	6	26	25	27	1	141	12
14:00	6	27	2	55	134	8	19	39	31	4	141	16
15:00	6	29	1	52	155	4	22	32	33	4	158	26
16:00	5	34	0	71	213	9	26	35	30	0	141	20
17:00	3	57	2	44	215	6	28	29	38	1	154	26

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
18:00	3	26	0	43	142	6	17	20	30	3	111	19
19:00	3	10	0	34	83	0	12	16	31	1	71	6
20:00	2	17	3	26	69	1	20	20	11	2	52	9
21:00	2	16	1	30	67	3	9	17	13	0	33	14
22:00	0	9	0	12	47	0	2	2	6	1	21	2
23:00	0	6	0	4	31	0	9	1	2	0	17	3



9:18:56 AM 7/14/2020 Mitchell.Wall H:\SMLK\P11120411\CAD\MS\plans\N Sheets - Signals Signs\120411N02.dgn

SECTION K

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Buena Vista Prepared by: Simmering Cory Date Prepared: Aug 4, 2020

Intersection: Highway 7 and Highway 110, Storm Lake

Improvement

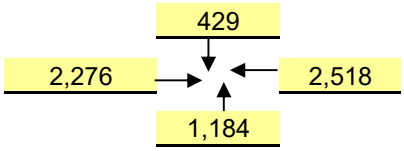
Proposed Improvement(s): Installation of a traffic signal and construction of turning lanes at the intersection of Hwy. 7 and Hwy. 110 where a new early childhood education facility will be constructed.

$ 952,000	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	51	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^{Y}}\right)$$		$ 952,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa Department of Transportation 25-Jul-19 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



2,338,555	Current Annual Entering Veh., **AEV** = DEV * 365
8,623	veh / day, Final Year DEV, **FDEV**
40.44	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
6,407	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{G}\left(\left(\frac{1+G}{1}\right)^{Y} - 1\right) \Big/ 10^{6}$$

Crash Data

2010 First full year --> 2019 Last full year 10.6 years, Time Period, **T**

7 Additional months

1	Fatal Crashes	1	Fatalities @	$4,500,000	$ 4,500,000
		1	Major Injuries @	$325,000	$ 325,000
15	Injury Crashes	7	Minor Injuries @	$65,000	$ 455,000
		7	Possible Injuries @	$35,000	$ 245,000
21	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 313,030
37	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 5,838,030

3.50	Current Crashes / Year, **AA** = TA / T	1.49	Crashes / MEV, Crash Rate, **CR**
$ 157,785	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
60.5	Total Expected Crashes, **TECR** = CR x TMEV	$ 3,554,406	Present Value of Avoided
1.78	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 281,329	Crash Costs Avoided in First Year, AAR x AVC		
30.8	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^{Y}\right)$$

Benefit / Cost Ratio

Benefit : Cost = $3,554,406 : $952,000 = **3.73** : 1

For Information Only -- Not Required for B/C

All values imported from Intersection worksheet

INTERSECTION YEARLY DETAILS

Factors from Intersection Tab

2.0%	Traffic Growth Factor	1.49	Crash Rate, Per MEV
4.0%	Discount Rate	51	Crash Reduction Factor
$157,785	Cost Per Crash	15	Project Life in Years
$3,554,406	Present Value of All Crashes Avoided		

	Traffic - Entering Veh.		Crashes		Savings	
Year	Daily	Ann MEV	Annual	Avoided	$ Saved	PV $ saved
	TOTALS	**40.442**	**60.46**	**30.83**	**$ 4,865,134**	**$ 3,554,406**
1	6,407	2.339	3.50	1.78	$ 281,329	$ 270,508
2	6,535	2.385	3.57	1.82	$ 286,955	$ 265,306
3	6,666	2.433	3.64	1.86	$ 292,694	$ 260,204
4	6,799	2.482	3.71	1.89	$ 298,548	$ 255,200
5	6,935	2.531	3.78	1.93	$ 304,519	$ 250,293
6	7,074	2.582	3.86	1.97	$ 310,610	$ 245,479
7	7,215	2.634	3.94	2.01	$ 316,822	$ 240,759
8	7,360	2.686	4.02	2.05	$ 323,158	$ 236,129
9	7,507	2.740	4.10	2.09	$ 329,621	$ 231,588
10	7,657	2.795	4.18	2.13	$ 336,214	$ 227,134
11	7,810	2.851	4.26	2.17	$ 342,938	$ 222,766
12	7,966	2.908	4.35	2.22	$ 349,797	$ 218,482
13	8,126	2.966	4.43	2.26	$ 356,793	$ 214,281
14	8,288	3.025	4.52	2.31	$ 363,929	$ 210,160
15	8,454	3.086	4.61	2.35	$ 371,207	$ 206,118
16						
17						
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31						

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** _____

Location / Title of Project: Intersection of Vinton St & Independence Ave Traffic Safety Improvements

Applicant: City of Waterloo

Contact Person: Mohammad Elahi Title: Traffic Engineer

Complete Mailing Address: 625 Glenwood Street
Waterloo, Iowa 50703

Phone: 319-429-8761 (Area Code) E-Mail: Mohammad.elahi@waterloo-ia.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	$ 110,000
Total Project Cost	$ 110,000
Safety Funds Requested	$ 110,000

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 Waterloo

Signed: Quentin Hart 8/3/2020

Signature Date Signed

Quentin Hart

Printed Name

Attest: Kelley Felchle 8/3/2020

Signature Date Signed

Kelley Felchle

Printed Name

Prepared by LeAnn M. Even, Deputy City Clerk, City of Waterloo, 715 Mulberry Street, Waterloo, IA 50703, (319) 291-4323.

RESOLUTION NO. 2020-583

RESOLUTION APPROVING SUBMISSION OF AN IOWA DOT TRAFFIC SAFETY FUND GRANT APPLICATION, IN THE AMOUNT OF $128,000, IN CONJUNCTION WITH TRAFFIC SAFETY IMPROVEMENTS AT THE INTERSECTION OF VINTON AVENUE AND INDEPENDENCE AVENUE, AND AUTHORIZING THE MAYOR AND CITY CLERK TO EXECUTE SAID DOCUMENT.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WATERLOO, IOWA, that the Iowa Department of Transportation Traffic Safety Grant Application dated August 3, 2020, between the Iowa Department of Transportation and the City of Waterloo, Iowa, in the amount of $128,000, for traffic safety improvements, at the intersection of Vinton Avenue and Independence Avenue, is hereby approved, and the Mayor and City Clerk are authorized and directed to execute said document on behalf of the City of Waterloo, Iowa.

PASSED AND ADOPTED this 3rd day of August 2020.

Quentin Hart
Quentin Hart, Mayor

ATTEST:

Kelley Felchle
Kelley Felchle
City Clerk

CITY WATERLOO IOWA SEAL

NARRATIVE

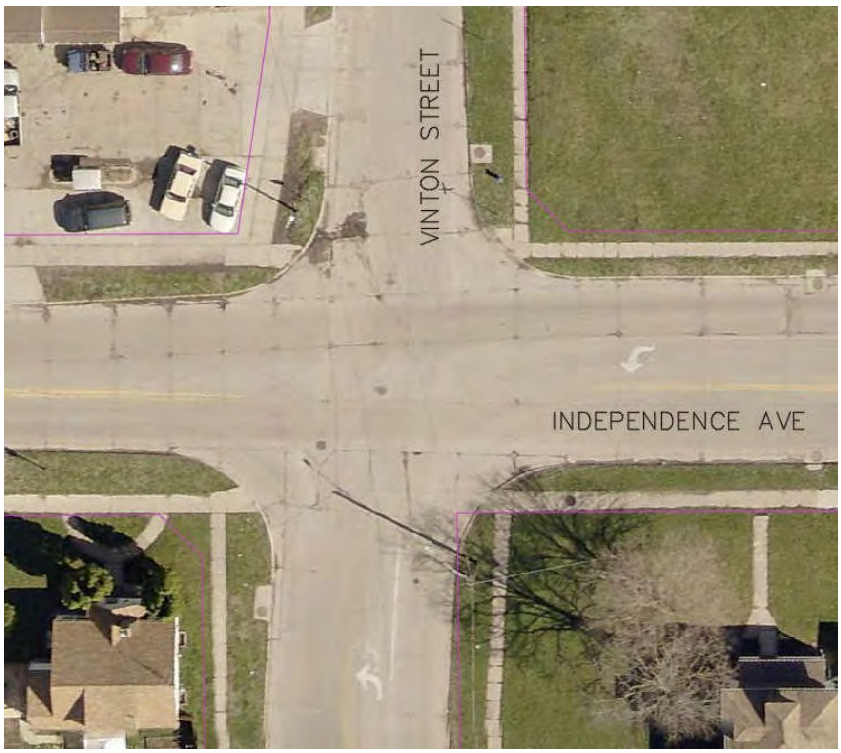
Existing Conditions

The intersection is in an urban area. Posted speed limits on both approach roadways are 30 mph. Westbound Independence Avenue approach has 2 lanes, a left turn pocket and a through-right lane. Eastbound Independence has 1 approach lane. Vinton Street's northbound approach has 2 lanes one of which is a left turn lane. Vinton Street has a 1-lane southbound approach. Independence Avenue is the through street. Vinton Street has stop signs. Both streets have urban curb and gutter cross sections. Independence Avenue is east-west aligned. Both streets are 2-way streets.

Problem

It is difficult to enter Independence Avenue from behind the stop sign on Vinton Street particularly during peak hours. Independence Avenue's vertical profile east of the intersection causes some sight distance limitations. This leads to the difficulty of recognizing gaps with appropriate size for departing from behind the stop sign.

Aerial View of the Intersection



Crash history covering 5 years shows 18 crashes including 4 injury crashes. The Collision diagram shows 13 of the crashes involved a vehicle from stop sign colliding with a vehicle on Independence Avenue at right angle.

Proposed Solution

Install an Intersection Conflict Warning System (ICWS). The proposed system will target right angle collisions between minor and major road traffic. These right angle crashes constitute 72% of the total crashes. ICWS can improve crashes caused by several factor such as the sight distance, inattentiveness, poor stop sign cognition, and accepting inadequate gaps. When the system is active, all drives would have a raised state of awareness that may result in reduction in other types of crashes. ACWS can also reduce severity by reducing speeds.

At the proposed location collisions between a vehicle departing from stop sign and a vehicle on the main roadway is the predominate pattern. The proposed ICWS not only warns about the conflict but also increases the visibility of the stop signs when active.

ICWS enhances driver awareness of the traffic situation. It warns all of approaching, crossing, or entering vehicular traffic. A problem in this urban setting could be related to the sight distance of west leg's vertical profile approaching from under the railroad bridge. Proper warning will partially help the sight distance situation. At this 2-way stop controlled intersection gap misjudgment or inappropriate gap acceptance could also be part of the problem. ICWS will help gap acceptance.

The system will be setup based on the required departure sight distance and gap. The system will be designed based on AASHTO green book critical gap distance. Warning signs would have been activated when there is a vehicle behind a stop sign and a vehicle is within the design speed critical gap distance. The idea is to measure the speed of vehicles approaching the critical gap zone. If the approach speed equals to at least the "speed limit minus 5" the warnings will be activated prior to the vehicle entering the critical gap distance to give the drivers time to react. For speeds smaller than "speed limit-5" there will be a delay before the warnings are displayed. Therefore the warnings will be activated based on at least 2 speeds. This is to reduce excessive actuations, and to reduce the number of actuations with lower speeds when the gap is adequate.

Warnings will be activated for the drivers behind the stop signs and for the drivers on Independence Avenue. In both urban and rural situations confusion and inattentiveness also play a rule in crashes. When the warning system is activated it will bring awareness to all drivers and there is a chance that some other collisions types could also be reduced. Dynamic signs are more successful in grabbing driver's attention than static signs. Another benefit is possible reduction in speeds due to raised awareness. Speed reductions can reduce crash severity.

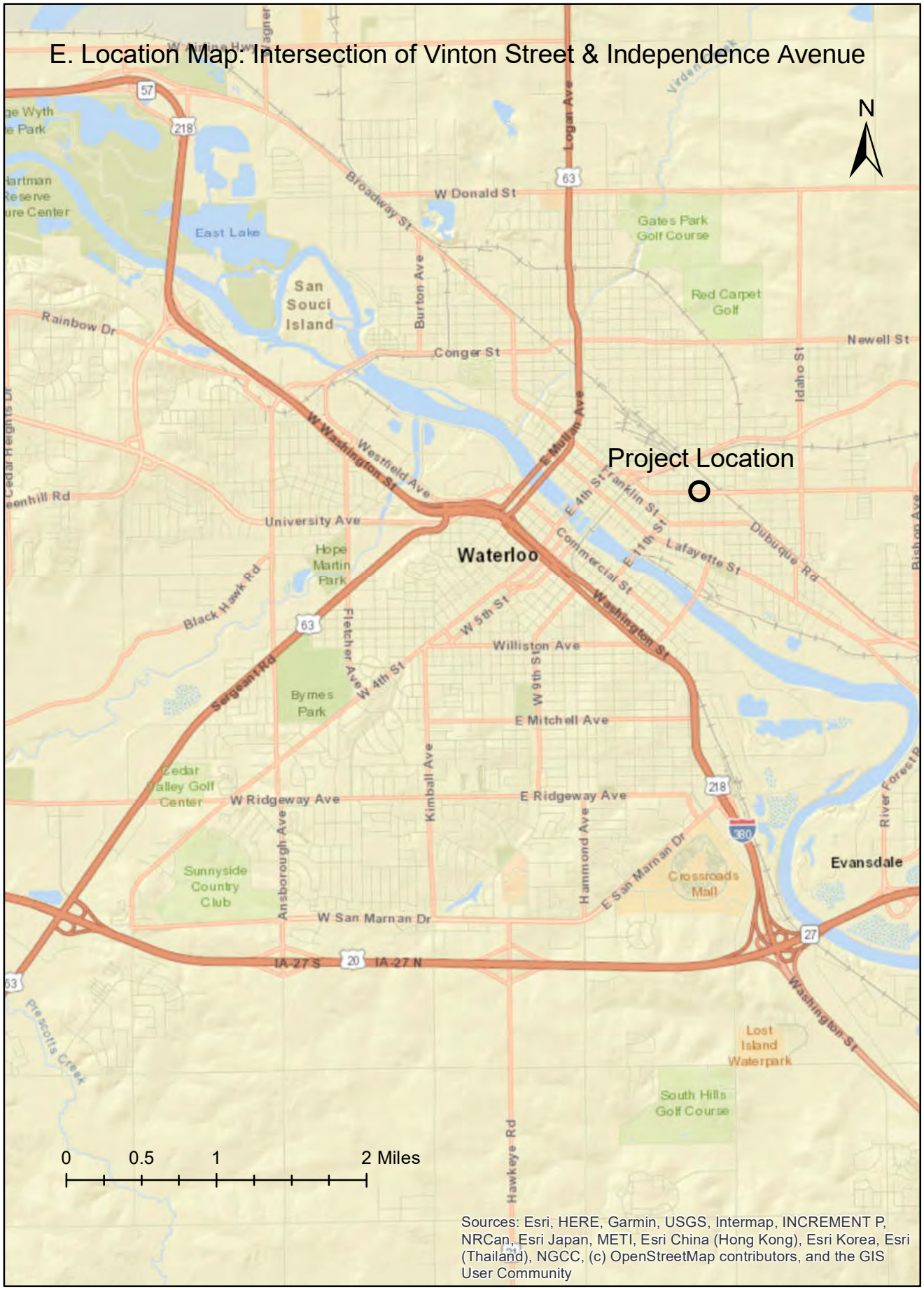
C. Cost Estimate

NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL ITEM COST
1	Controller & Control Cabinet	1	EA	14,000	14,000
2	Detection System	1	LS	38,000	38,000
3	Dynamic Sign Assembly Complete	2	EA	8,500	17,000
4	Flashin Beacons, Red	4	EA	200	800
5	Beacon Brackets	4	EA	150	600
6	Handholes	2	EA	500	1,000
7	Poles, Complete with Base	2	EA	5,000	10,000
8	Concrete- Sidewalk Repair	1	LS	500	500
9	Conduits- Trench	1,400	FT	4	5,600
10	Conduits-Bore	200	FT	14	2,800
11	Signs	2	EA	100	200
12	Warning Sign	2	EA	400	800
13	Wiring	1	LS	3,000	3,000
14	Ground Restoration	1	LS	1,000	1,000
15	Erosion Control	1	LS	2,000	2,000
16	Mobilization	1	LS	8,000	8,000
17	Traffic Control	1	LS	5,000	5,000
	TOTAL				$ 110,300

D. TIME SCHEDULE

July 1, 2021	Funds Available
December 2021	Final Design
January 2022	Project Letting
May 2022	Start Construction
August 2022	Project Completion

E. Location Map: Intersection of Vinton Street & Independence Avenue



F. COLOR PICTURES

Looking East Approaching the Intersection on Independence Avenue

East Approach Has Sight Distance Difficulties Due to the Vertical Profile

Looking South Vinton Street

Looking West Independence Avenue

Looking North Vinton Street

INTERSECTION OF INDEPENDENCE AVENUE AND VINTON STREET

N

G. Plan

Beacon on Top of Stop Sign

New Pole

Existing Pole

Beacon and Warning Sign

Radar

Handhole

Conduit

Beacon and Warning Sign

Independence Ave.

Radar

Control Cabinet

R.O.W.

Beacon on Top of Stop Sign

Feet
0 5 10 20 30 40

Vinton St.

TRAFFIC OPERATIONS DEPARTMENT	CITY OF WATERLOO	BLACK HAWK COUNTY	ADVANCE CONFLICT WARNING SYSTEM CONCEPT	SHEET NO.	

NOTES
1- East leg will also have a dynamic message sign assembly directed towards westbound approach.
2- Installation locations may be adjustmented during the design phase depending on the technology that will be selected.

TRAFFIC OPERATIONS DEPARTMENT	CITY OF WATERLOO	BLACK HAWK COUNTY	ADVANCE CONFLICT WARNING SYSTEM CONCEPT	SHEET NO.

H. AERIAL


N
Independence Ave.
City
Property
Vinton St.
Feet
0 12.525 50 75 100

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	18
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	4
Property Damage Only	14

Injury Status Summary	5
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	5
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	106,500.00
Average (per crash dollars):	5,916.67
Total Vehicles:	36.00
Average (per crash):	2.00
Total Occupants:	55.00
Average (per crash):	3.06

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.28
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.28

Major Cause			18
Animal	0	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	6	FTYROW: From yield sign	0
FTYROW: Making left turn	3	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	0
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	2
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	1	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	1	0	1	1	1	2	0	0	0	6
Thursday	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Friday	0	0	0	1	1	1	0	3	0	0	0	0	0	6
Saturday	0	0	0	0	0	0	0	2	1	0	0	1	0	4
Total	0	0	0	1	2	1	1	7	3	2	0	1	0	18

Manner of Crash Collision	18
Non-collision (single vehicle)	0
Head-on (front to front)	0
Rear-end (front to rear)	2
Angle, oncoming left turn	5
Broadside (front to side)	11
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	18
Dry	12
Wet	4
Ice/frost	1
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			36
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	36

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	1	0	0	0	1
= 17	1	2	0	0	3
= 18	0	0	1	0	1
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	3	3	0	0	6
>= 25 and <= 29	1	1	0	0	2
>= 30 and <= 34	1	4	0	0	5
>= 35 and <= 39	2	5	0	0	7
>= 40 and <= 44	2	1	0	0	3
>= 45 and <= 49	1	2	0	0	3
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	2	0	0	0	2
>= 60 and <= 64	0	1	0	0	1
>= 65 and <= 69	0	1	0	0	1
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	15	20	1	0	36

Drug/Alcohol Related	**18**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	1
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	17

Alcohol Test Given	**36**
None	35
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	1
Not reported	0

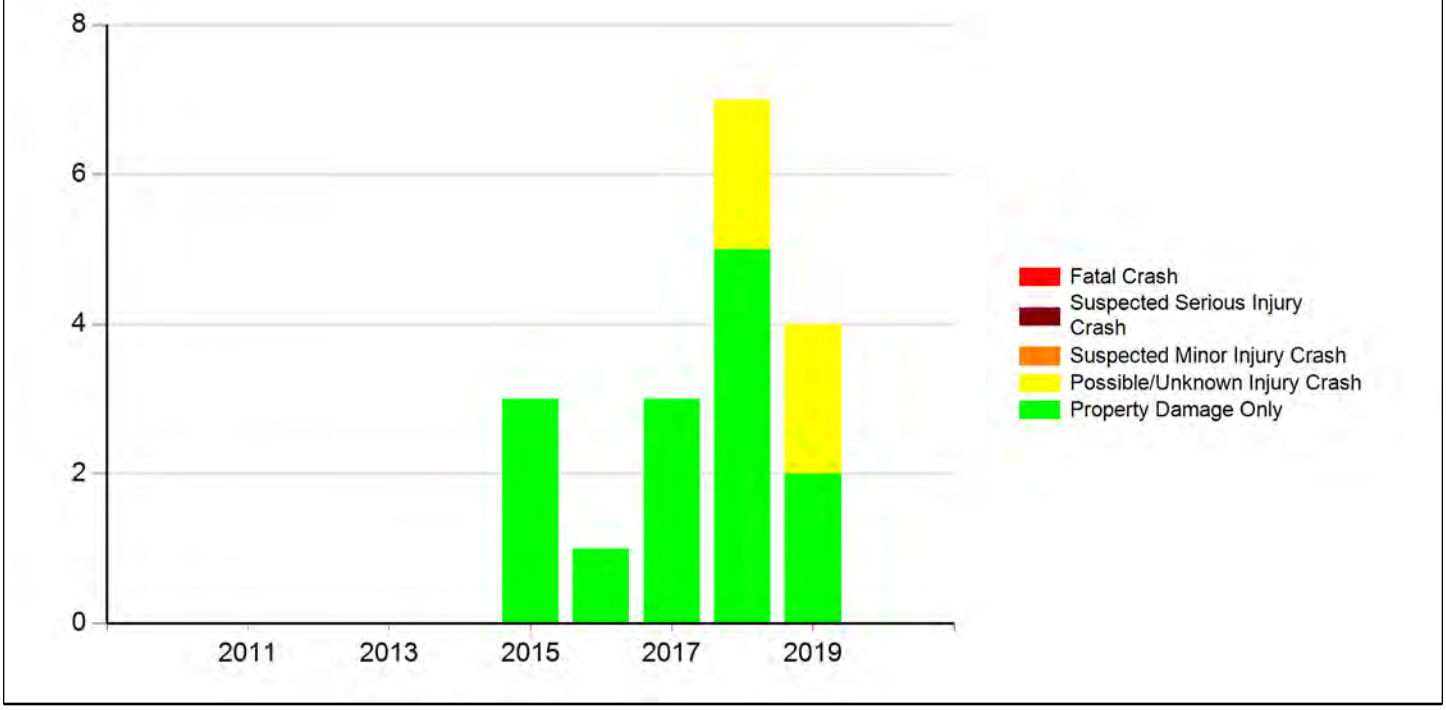
Drug Test Given	**36**
None	36
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	**36**
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	36
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	3	3
2016	0	0	0	0	1	1
2017	0	0	0	0	3	3
2018	0	0	0	2	5	7
2019	0	0	0	2	2	4
2020	0	0	0	0	0	0
Total	0	0	0	4	14	18

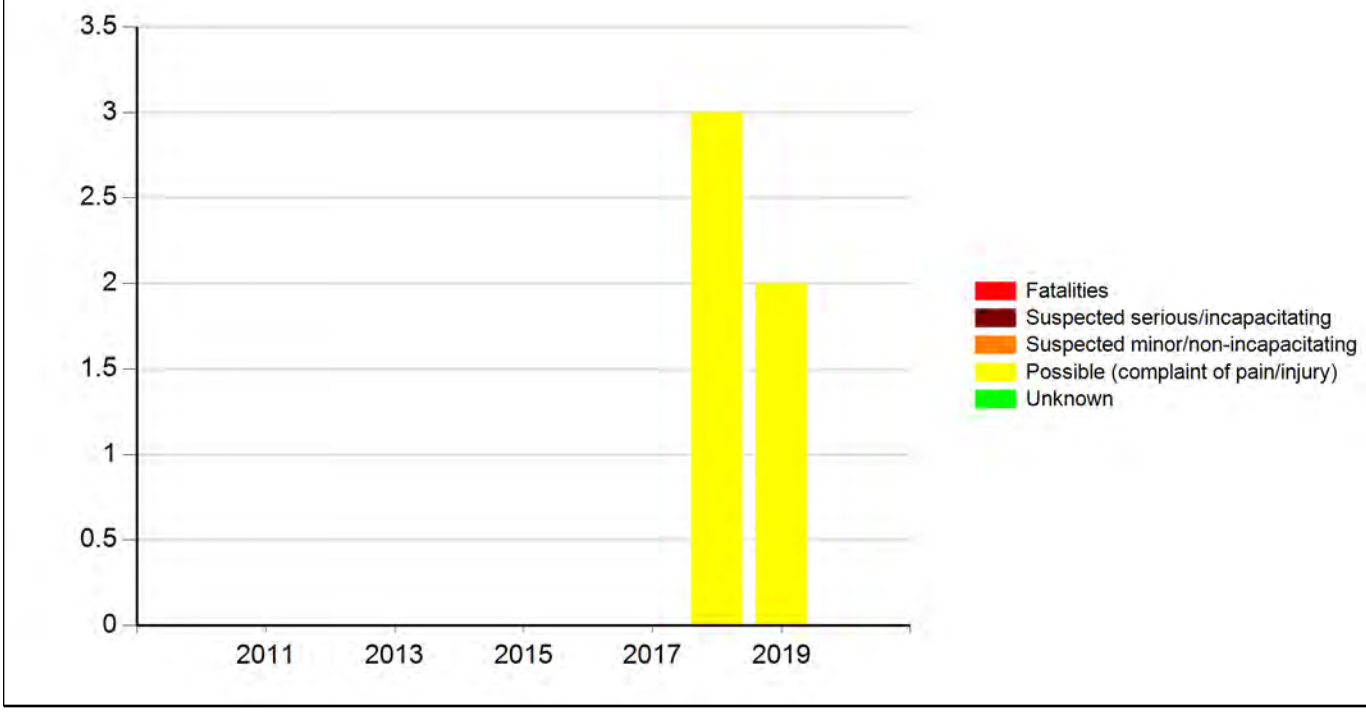
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	3	0	3
2019	0	0	0	2	0	2
2020	0	0	0	0	0	0
Total	0	0	0	5	0	5

Injury Status/Year



Meeting the following criteria

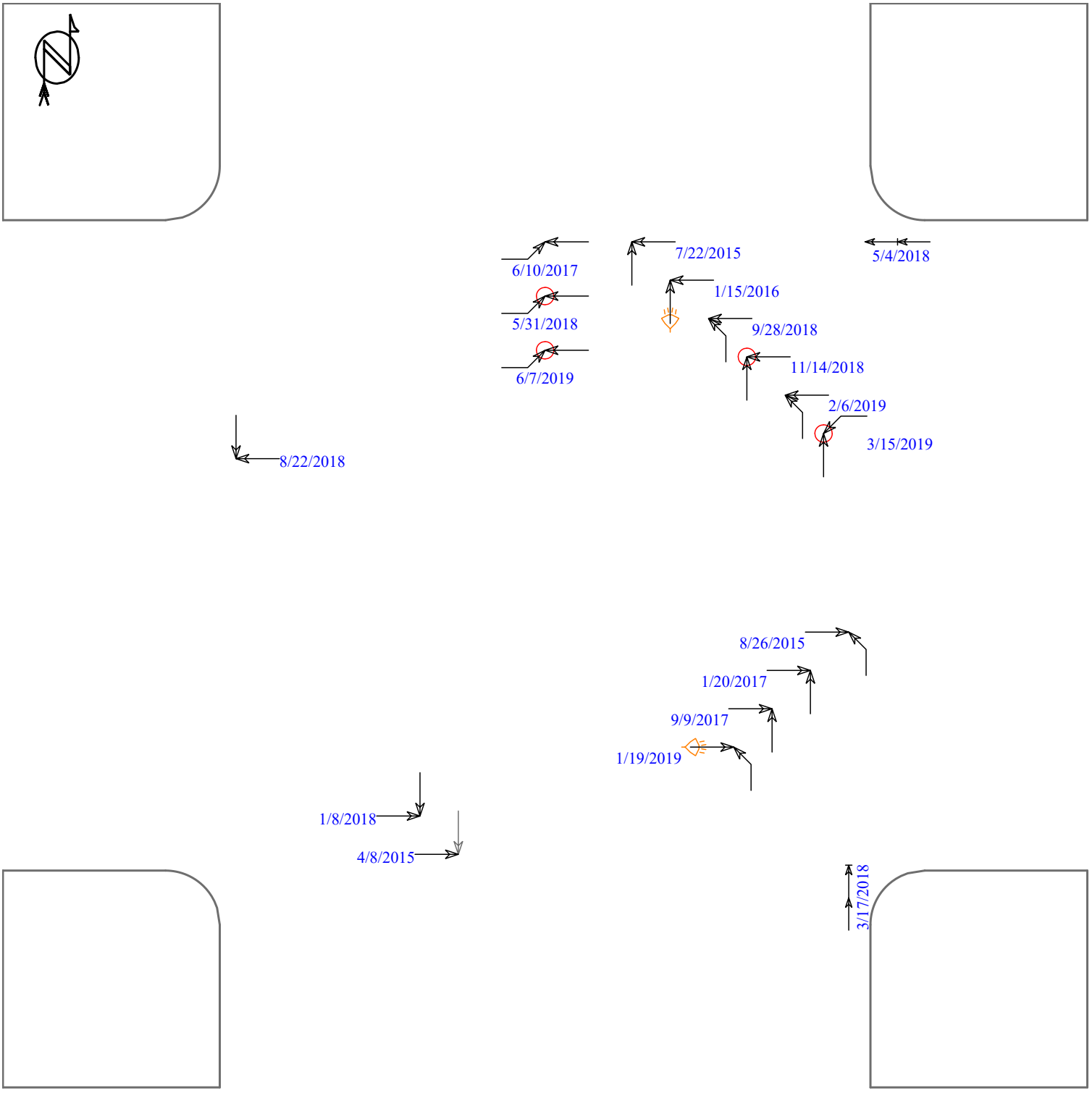
Jurisdiction: Cities (Waterloo)
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

Crash Diagram
1/1/2015 - 12/31/2019

18 Crashes

Clear



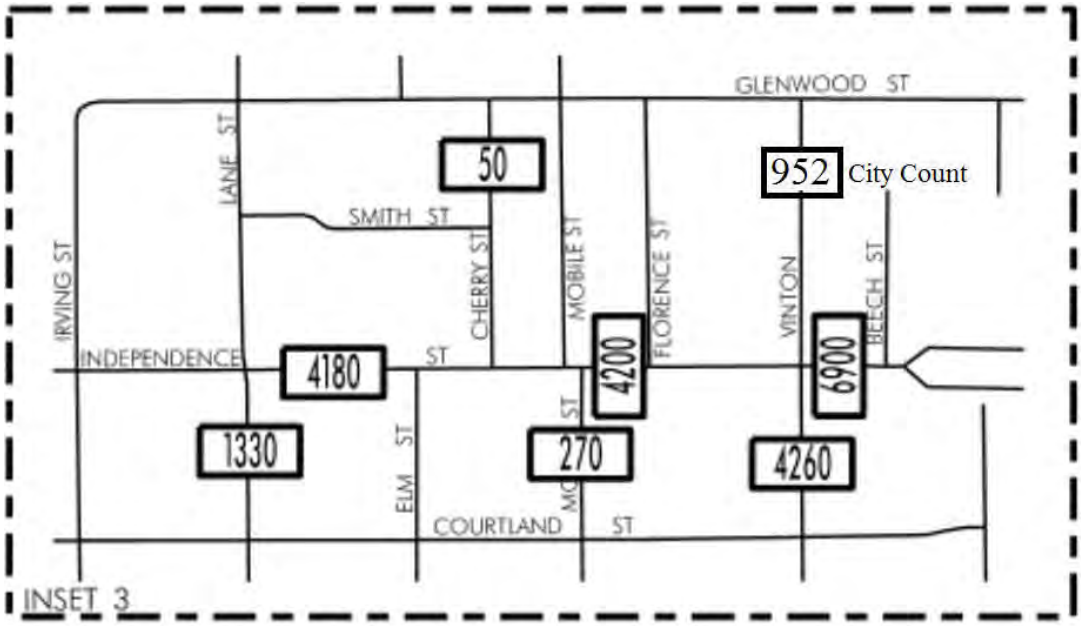
(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

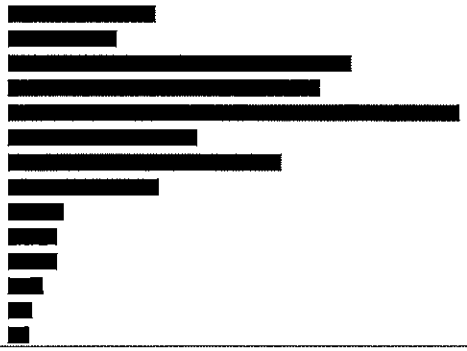
- 3rd vehicle
- Extra data



2018 (DOT) and 2017 (CITY – NORTH LEG) VOLUMES

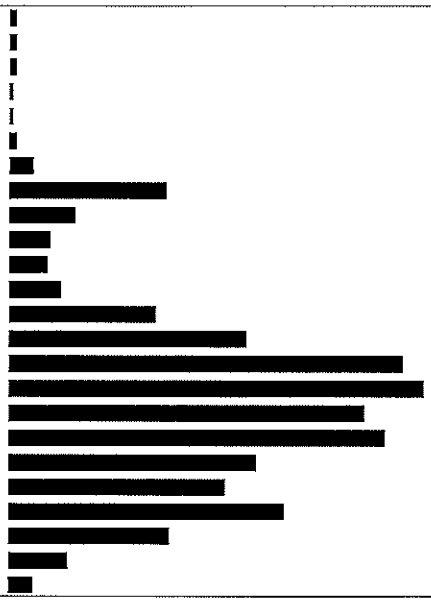
Traffic Operations Department

Start Time	30-Oct-17 Mon	NB	SB	Combined Total
12:00 AM		*	*	*
01:00		*	*	*
02:00		*	*	*
03:00		*	*	*
04:00		*	*	*
05:00		*	*	*
06:00		*	*	*
07:00		*	*	*
08:00		*	*	*
09:00		*	*	*
10:00		18	24	42
11:00		13	18	31
12:00 PM		58	40	98
01:00		30	59	89
02:00		53	76	129
03:00		28	26	54
04:00		32	46	78
05:00		18	25	43
06:00		7	9	16
07:00		9	5	14
08:00		4	10	14
09:00		2	8	10
10:00		2	5	7
11:00		5	1	6
Total		279	352	
Percent		44.2%	55.8%	



Traffic Operations Department

Start Time	31-Oct-17 Tue	NB	SB	Combined Total
12:00 AM		1	1	2
01:00		1	1	2
02:00		1	1	2
03:00		1	0	1
04:00		0	1	1
05:00		1	1	2
06:00		4	3	7
07:00		8	37	45
08:00		4	15	19
09:00		5	7	12
10:00		5	6	11
11:00		7	8	15
12:00 PM		20	22	42
01:00		30	38	68
02:00		36	77	113
03:00		67	52	119
04:00		48	54	102
05:00		47	61	108
06:00		24	47	71
07:00		25	37	62
08:00		29	50	79
09:00		12	34	46
10:00		4	13	17
11:00		3	4	7
Total		383	570	
Percent		40.2%	59.8%	

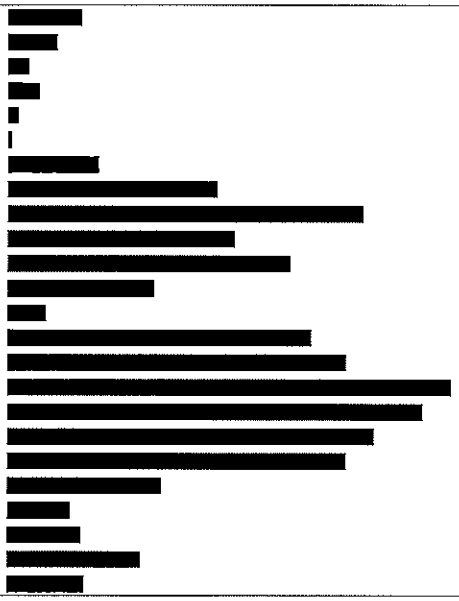


Traffic Operations Department

Start Time	01-Nov-17 Wed	NB	SB	Combined Total
12:00 AM		2	3	5
01:00		0	0	0
02:00		1	2	3
03:00		0	1	1
04:00		0	1	1
05:00		7	4	11
06:00		13	16	29
07:00		18	39	57
08:00		45	54	99
09:00		40	35	75
10:00		34	35	69
11:00		21	26	47
12:00 PM		7	10	17
01:00		27	47	74
02:00		48	60	108
03:00		61	76	137
04:00		41	72	113
05:00		46	68	114
06:00		31	41	72
07:00		27	40	67
08:00		17	33	50
09:00		19	20	39
10:00		9	22	31
11:00		9	10	19
Total		523	715	
Percent		42.2%	57.8%	

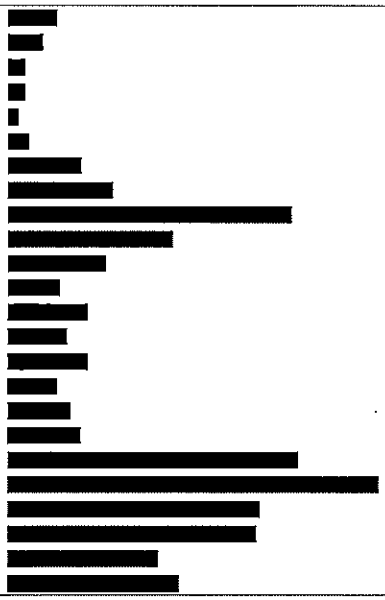
Traffic Operations Department

Start Time	02-Nov-17 Thu	NB	SB	Combined Total
12:00 AM		11	10	21
01:00		9	5	14
02:00		3	3	6
03:00		2	7	9
04:00		0	3	3
05:00		1	0	1
06:00		15	11	26
07:00		30	30	60
08:00		33	69	102
09:00		39	26	65
10:00		43	38	81
11:00		18	24	42
12:00 PM		5	6	11
01:00		28	59	87
02:00		32	65	97
03:00		60	67	127
04:00		52	67	119
05:00		52	53	105
06:00		38	59	97
07:00		14	30	44
08:00		11	7	18
09:00		8	13	21
10:00		10	28	38
11:00		8	14	22
Total		522	694	
Percent		42.9%	57.1%	



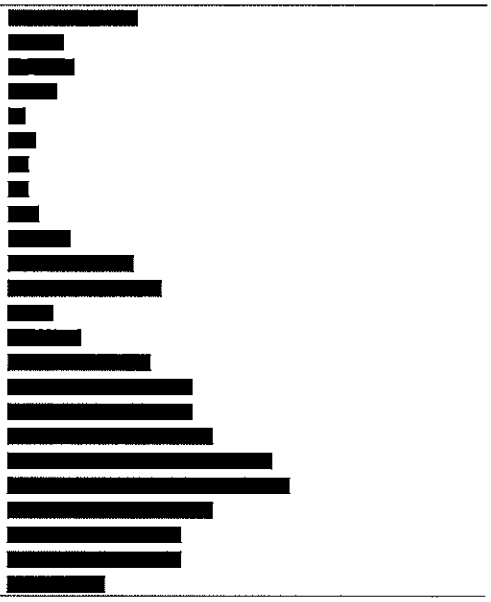
Traffic Operations Department

Start Time	03-Nov-17 Fri	NB	SB	Combined Total
12:00 AM		5	9	14
01:00		5	5	10
02:00		1	4	5
03:00		3	2	5
04:00		1	2	3
05:00		4	2	6
06:00		11	10	21
07:00		14	16	30
08:00		20	61	81
09:00		13	34	47
10:00		9	19	28
11:00		7	8	15
12:00 PM		12	11	23
01:00		7	10	17
02:00		10	13	23
03:00		5	9	14
04:00		6	12	18
05:00		12	9	21
06:00		26	57	83
07:00		50	56	106
08:00		31	41	72
09:00		33	38	71
10:00		10	33	43
11:00		12	37	49
Total		307	498	
Percent		38.1%	61.9%	



Traffic Operations Department

Start Time	04-Nov-17 Sat	NB	SB	Combined Total
12:00 AM		17	20	37
01:00		6	10	16
02:00		9	10	19
03:00		8	6	14
04:00		2	3	5
05:00		5	3	8
06:00		5	1	6
07:00		2	4	6
08:00		6	3	9
09:00		8	10	18
10:00		16	20	36
11:00		27	17	44
12:00 PM		7	6	13
01:00		10	11	21
02:00		20	21	41
03:00		17	36	53
04:00		23	30	53
05:00		27	32	59
06:00		31	45	76
07:00		34	47	81
08:00		22	37	59
09:00		19	31	50
10:00		26	24	50
11:00		15	13	28
Total		362	440	
Percent		45.1%	54.9%	



Traffic Operations Department

Start Time	05-Nov-17 Sun	NB	SB	Combined Total
12:00 AM		21	21	42
01:00		16	27	43
02:00		8	10	18
03:00		8	10	18
04:00		5	2	7
05:00		4	9	13
06:00		3	3	6
07:00		4	3	7
08:00		4	1	5
09:00		3	1	4
10:00		13	13	26
11:00		14	12	26
12:00 PM		21	16	37
01:00		18	10	28
02:00		15	23	38
03:00		24	24	48
04:00		45	36	81
05:00		40	36	76
06:00		18	45	63
07:00		21	36	57
08:00		33	44	77
09:00		16	40	56
10:00		13	29	42
11:00		7	21	28
Total		374	472	
Percent		44.2%	55.8%	

Traffic Operations Department

Start Time	06-Nov-17 Mon	NB	SB	Combined Total	
12:00 AM		15	13	28	
01:00		11	8	19	
02:00		9	4	13	
03:00		5	3	8	
04:00		1	2	3	
05:00		1	4	5	
06:00		3	3	6	
07:00		2	3	5	
08:00		9	3	12	
09:00		15	17	32	
10:00		34	57	91	
11:00		*	*	*	
12:00 PM		*	*	*	
01:00		*	*	*	
02:00		*	*	*	
03:00		*	*	*	
04:00		*	*	*	
05:00		*	*	*	
06:00		*	*	*	
07:00		*	*	*	
08:00		*	*	*	
09:00		*	*	*	
10:00		*	*	*	
11:00		*	*	*	
Total		105	117		
Percent		47.3%	52.7%		
Grand Total		2855	3858		
Percentage		42.5%	57.5%		
ADT		ADT 952		AADT 952	

Benefit-Cost

Both Iowa planning-level crash reduction factor (CRF) list and the national clearing house list show numbers for rural areas only. There is no urban CRF data. A Monte Carlo simulation approach is used to examine benefit cost ratio. At this particular intersection and due to the distinct predominate crash pattern activated warning system can help improve safety by reducing crashes.

We use traffic signals project life of 15 years. Very similar to traffic signals there is a controller cabinet, a detection system, flashing beacons and message signs that are turned on and off, wiring, poles, and conduits.

CRF analysis indicates that the proposed solution can have b/c of >1 at CRF 16. Probability of achieving the desired benefits can be assumed to be high due to low required CRF.

Benefit-Cost and CRF								
CRF	10	15	16	20	25	30	35	40
B/C	0.63	0.95	1.01	1.26	1.58	1.89	2.21	2.17

In lack of urban CRF we take a look at rural CRF. The available values are 25 and 35. CRF in the following table is presented for comparative purposes only and does not apply to urban settings. If the proposed solution would even be partially as successful as a rural setting it will still have a positive benefit cost ratio. Treatment and benefits are the same in both rural and urban settings and 16 is much lower than 25 (36% lower).

NOTE: CRF in this Table Applies to Rural Areas

CRF #	Existing Facility Type	Countermeasure Name	Intersection or Roadway	Prior Condition	Area Type	Crash Type	Crash Severity	CRF Value
US-35	Unsignalized Intersection	Install Intersection Conflict	4-leg 2-lane or 4-lane	Two-Way Stop-Controlled	Rural	All	All	25
US-35A	Unsignalized Intersection	Install Intersection Conflict	4-leg 2-lane or 4-lane	Two-Way Stop-Controlled	Rural	All	Fatal and Injury (K,A,B,C)	30

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Black Hawk | Prepared by: ME | Date Prepared: Jul 1, 2020

Intersection: Independence Avenue & Vinton Street

Improvement

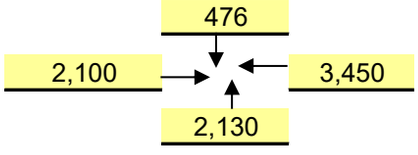
Proposed Improvement(s): Intersection Conflict Warning System

$ 110,000	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
$ 100	Other Annual Cost (after initial year), **AC**	16	Crash Reduction Factor (integer), **CRF**
$ 1,112	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 111,112**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: City of Waterloo Traffic Operations & IOWA DOT | 2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



2,976,940 Current Annual Entering Veh., **AEV** = DEV * 365

8,790 veh / day, Final Year DEV, **FDEV**

46.25 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

0.5% Projected Traffic Growth (0%-10%), **G**

8,156 Current Daily Entering Vehicles, **DEV**

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

Fatal Crashes		Fatalities @	$4,500,000	$	-
		Major Injuries @	$325,000	$	-
4	Injury Crashes	Minor Injuries @	$65,000	$	-
		5 Possible Injuries @	$35,000	$	175,000
14	Property Damage Only	(assumed cost per crash)	$7,400	$	133,200
		-OR- enter all Property Costs of all crashes:			
18	Total Crashes, **TA**		Total $ Loss, **LOSS**	$	308,200

3.60	Current Crashes / Year, **AA** = TA / T	**1.21**	Crashes / MEV, Crash Rate, **CR**
$ 17,122	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
55.9	Total Expected Crashes, **TECR** = CR x TMEV	**$ 113,164**	Present Value of Avoided
0.58	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 9,862	Crash Costs Avoided in First Year, AAR x AVC		
8.9	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $113,164 : $111,112 = **1.02** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/27/2020

Location / Title of Project: Intersection of W.9th & South Streets Traffic Safety Improvements

Applicant: City of Waterloo

Contact Person: Mohammad Elahi Title: Traffic Engineer

Complete Mailing Address: 625 Glenwood Street
Waterloo, Iowa 50703

Phone: 319-429-8761 (Area Code) E-Mail: Mohammad.elahi@waterloo-ia.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	$ 385,000
Total Project Cost	$ 385,000
Safety Funds Requested	$ 385,000

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

☐ Yes – Explain _____

☒ No Could not locate SICL (https://iowadot.gov/crashanalysis/top200.aspx)

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 Waterloo

Signed: Quentin Hart 7/27/2020

Signature Date Signed

Quentin Hart

Printed Name

Attest: Kelley Felchle 7/27/2020

Signature Date Signed

Kelley Felchle

Printed Name

Prepared by LeAnn M. Even, Deputy City Clerk, City of Waterloo, 715 Mulberry Street, Waterloo, IA 50703, (319) 291-4323.

RESOLUTION NO. 2020-569

RESOLUTION AUTHORIZING DOT TRAFFIC SAFETY IMPROVEMENT GRANT APPLICATION, IN THE AMOUNT OF $385,000, FOR TRAFFIC SAFETY IMPROVEMENT AT THE INTERSECTION OF W. 9TH STREET AND SOUTH STREET, COMMITTING TO MAINTAINING IMPROVEMENTS FOR A MINIMUM OF FIVE (5) YEARS, AND AUTHORIZING THE MAYOR TO EXECUTE SAID DOCUMENT.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WATERLOO, IOWA, that the Iowa Department of Transportation Traffic Safety Grant Application dated July 27, 2020, between the Iowa Department of Transportation and the City of Waterloo, Iowa, in the amount of $385,000, for traffic safety improvement at the intersection of W. 9th Street and South Street, committing to maintaining improvements for a minimum of five (5) years, is hereby approved, and the Mayor is authorized and directed to execute said document on behalf of the City of Waterloo, Iowa.

PASSED AND ADOPTED this 27th day of July 2020.

Quentin Hart
Quentin Hart, Mayor

ATTEST:

Kelley Felchle
Kelley Felchle
City Clerk

CITY WATERLOO IOWA SEAL

The Problem

The intersection of W.9th Street and South Street is 2-way stop controlled. South Street has stop signs. The intersection experiences a large number of crashes. Right angle crashes caused by stop-sign violations form the predominate pattern. A roundabout can reduce the crashes considerably. Exhibit 1 shows 27 crashes in 5 years including 10 injury crashes.

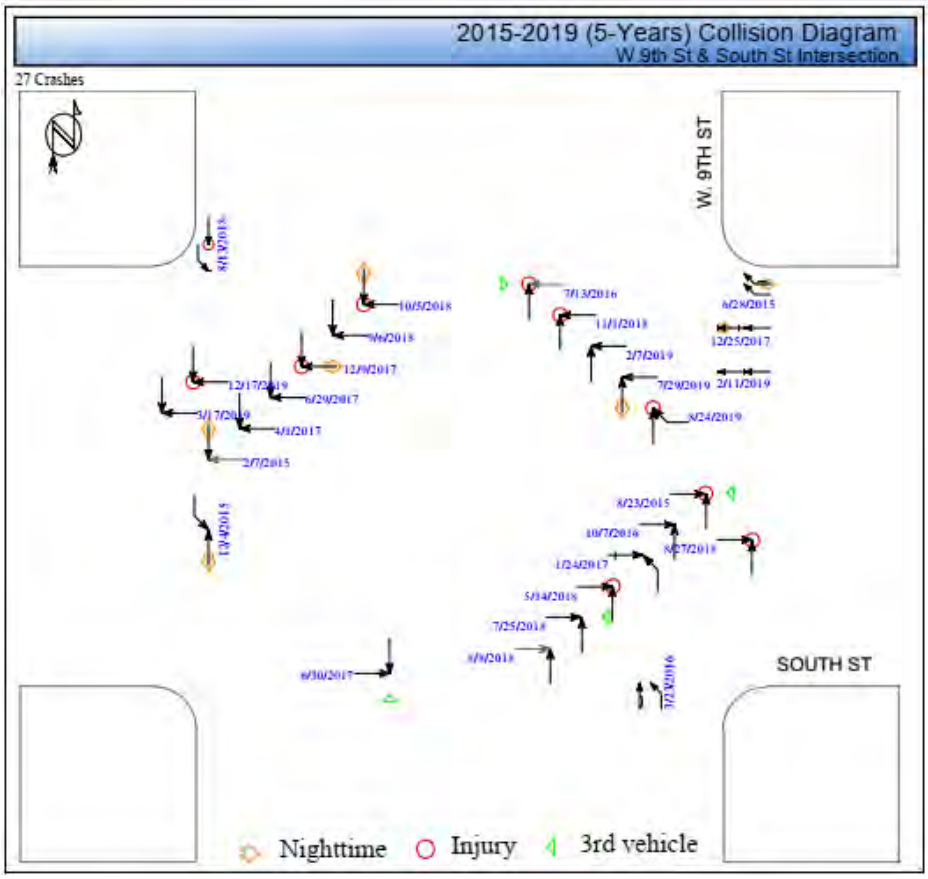


Exhibit 1: 20 Crashes in 5 Years

Exhibit 2 shows a summary of crashes for the same period.

IOWA DOT

Iowa Crash Analysis Tool
Crash Characteristics
2015-2019

Crash Severity	27
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	9
Property Damage Only	17

Injury Status Summary	14
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	1
Possible (complaint of pain/injury)	13
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	144,550.00
Average (per crash dollars):	5,353.70
Total Vehicles:	58.00
Average (per crash):	2.15
Total Occupants:	91.00
Average (per crash):	3.37

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.52
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.04
Possible/Unknown Injuries/Crash:	0.48

Exhibit 2: ICAT Crash Summary Report

Existing Condition

Iowa DOT traffic map shows ADT of 2400 on the west leg of South Street, 4470 on the east leg of South Street, and 9100 and 7600 on W. 9th Street legs. W. 9th is the through street. Posted speed limit on both streets is 30 MPH. Both streets have 1 lane approaches. Northbound W. 9th Street has a 2 departure lanes.

Proposed Solution

A single lane roundabout is proposed. A roundabout can improve safety by 1) controlling speeds, 2) reducing angles of collisions, 3) reducing the number of conflict points, and 4) resulting in simpler decision making.

1) Speed: Posted speed limit on W. 9th is 30 mph. When a roundabout is installed the speed limit through the intersection will go down to 15 mph. This reduction in speed limit would make the crashes less severe.
2) Angle of Collision: The collision diagram indicates 22 out of 27 crashes are right angle crashes. When a roundabout is installed, angles of collisions and the severity of crashes would be reduced.
3) Conflict: The proposed single lane roundabout would significantly reduce the number of vehicular conflict points. Fewer points of conflict means possibility of reduction in the number of crashes.
4) Decision Point: Drivers entering the proposed roundabout are faced with a simplified decision making. Drivers will have only the conflicting vehicular traffic to their left. Simplifying decision making would improve reaction time and behavior resulting in reduced number of accidents. Currently the driver has to be mindful of several conflicting traffic movements.

There is 1 street light on a wood pole at the south-west corner of the intersection. Installing a roundabout requires removal of the wooden pole. Proper roundabout lighting will improve safety and reduce risk of nighttime crashes.

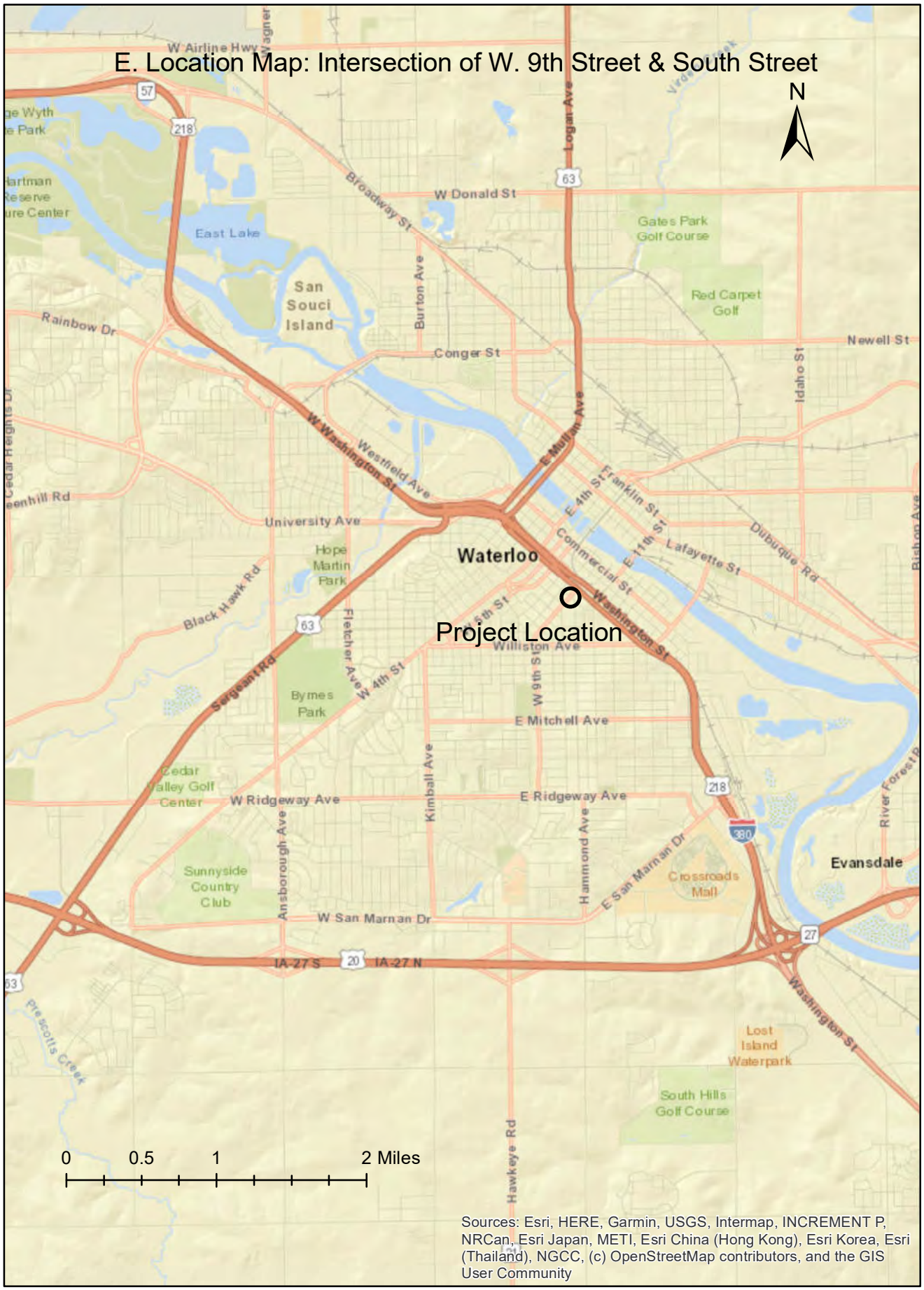
SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Proposed Public Improvements - Roundabout
South Street and W 9th Street
Waterloo, Iowa
Engineer's Rough Order Magnitude of Cost
Estimate of Quantities -July 10th, 2020

Item No	Description	Unit	Unit Price	Quantity	Cost
1	Removal of Pavement	SY	$ 12	1,900	$ 22,800
2	Removal of Sidewalk	SY	$ 8	300	$ 2,400
3	Removal of Light Pole	EA	$ 500	1	$ 500
4	PCC roadway, 8"	SY	$ 62	1,500	$ 93,000
5	PCC Driveway, 6"	SY	$ 40	100	$ 4,000
6	PCC Colored - Median & Crosswalk	SY	$ 115	300	$ 34,500
7	PCC Sidewalk, 4"	SY	$ 35	200	$ 7,000
8	PCC Sidewalk Ramp	SY	$ 50	85	$ 4,250
9	ADA Detectable Surface	SF	$ 90	55	$ 4,950
10	Curb & Gutter, 2'	LF	$ 35	1,750	$ 61,250
11	Granular Subbase, 6"	SY	$ 8	1,600	$ 12,800
12	Storm Improvements	LS	$ 15,000	1	$ 15,000
13	Pavement Markings and Signage	LS	$ 6,000	1	$ 6,000
14	Street Lighting	EA	$ 8,000	8	$ 64,000
15	Imported Top Soil	CY	$ 30	200	$ 6,000
16	Seeding	LS	$ 2,500	1	$ 2,500
17	Erosion Control & Administration	LS	$ 1,000	1	$ 1,000
18	Construction Survey	LS	$ 8,000	1	$ 8,000
19	Traffic Control	LS	$ 20,000	1	$ 20,000
20	Mobilization	LS	$ 15,000	1	$ 15,000
	Rough Order of Magnitude Construction Cost				$ 384,950

D. TIME SCHEDULE

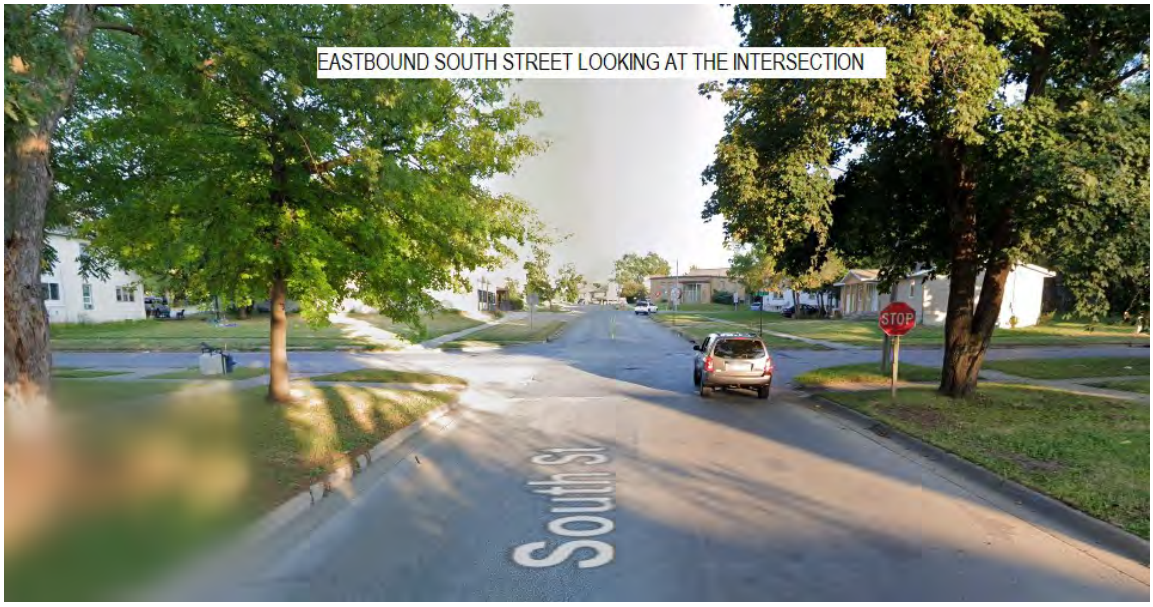
July 1, 2021	Funds Available
November 2021	Final Design
December 2021	Project Letting
May 2022	Start Construction
September 2022	Project Completion

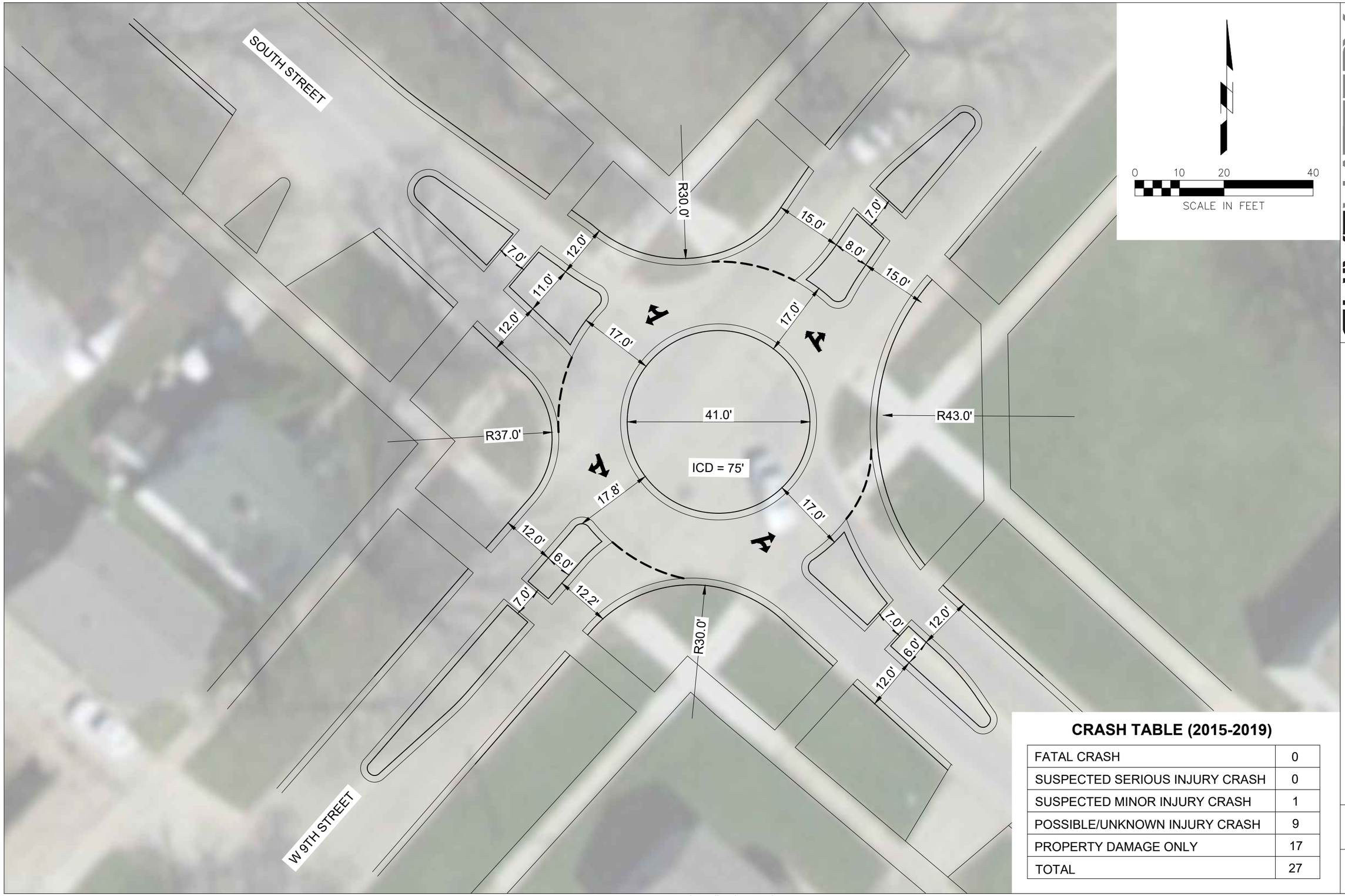

E. Location Map: Intersection of W. 9th Street & South Street
N
Project Location
Waterloo
Evansdale
W Airline Hwy
W Donald St
East Lake
San Souci Island
Gates Park Golf Course
Red Carpet Golf
Rainbow Dr
Conger St
Newell St
Idaho St
Logan Ave
Broadway St
Burton Ave
W Washington St
Westfield Ave
E Mullan Ave
University Ave
Hope Martin Park
Black Hawk Rd
Sergeant Rd
Fletcher Ave
W 4th St
Bymes Park
Williston Ave
W 9th St
E Mitchell Ave
E 4th St
Franklin St
E 11th St
Lafayette St
Dubuque Rd
Commercial St
Washington St
Cedar Valley Golf Center
W Ridgeway Ave
E Ridgeway Ave
Kimball Ave
Hammond Ave
Ansborough Ave
Sunnyside Country Club
W San Marnan Dr
E San Marnan Dr
Crossroads Mall
IA-27 S
IA-27 N
Lost Island Waterpark
South Hills Golf Course
Hawkeye Rd
Prescotts Creek
River Forest Dr
0
0.5
1
2 Miles
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

F. COLORED PICTURES

F


WESTBOUND SOUTH STREET LOOKING AT THE INTERSECTION
STOP
South St
Google


EASTBOUND SOUTH STREET LOOKING AT THE INTERSECTION
STOP
South St



CRASH TABLE (2015-2019)

FATAL CRASH	0
SUSPECTED SERIOUS INJURY CRASH	0
SUSPECTED MINOR INJURY CRASH	1
POSSIBLE/UNKNOWN INJURY CRASH	9
PROPERTY DAMAGE ONLY	17
TOTAL	27

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
222 Third Avenue SE, Suite 300 | Cedar Rapids, Iowa 52406
319.364.0227 | www.shive-hattery.com
Iowa | Illinois | Indiana

CONCEPT 2
W 9TH ST AND SOUTH ST MINI ROUNDABOUT
CITY OF WATERLOO
WATERLOO, IOWA

DATE		SCALE	1" = 30'
DRAWN	JPL	FIELD BOOK	---
APPROVED	JHC	REVISION	---

PROJECT NO.
####

SHEET NO.
EX. 2

1/23/2020 9:50:39 AM

P:\General Administration-CRITeam\Government\Project Development\Waterloo\South Street and W 9th Street\XREF\XR-Civil 2.dwg

H. AERIAL PHOTO

W. 9th St & South St Intersection

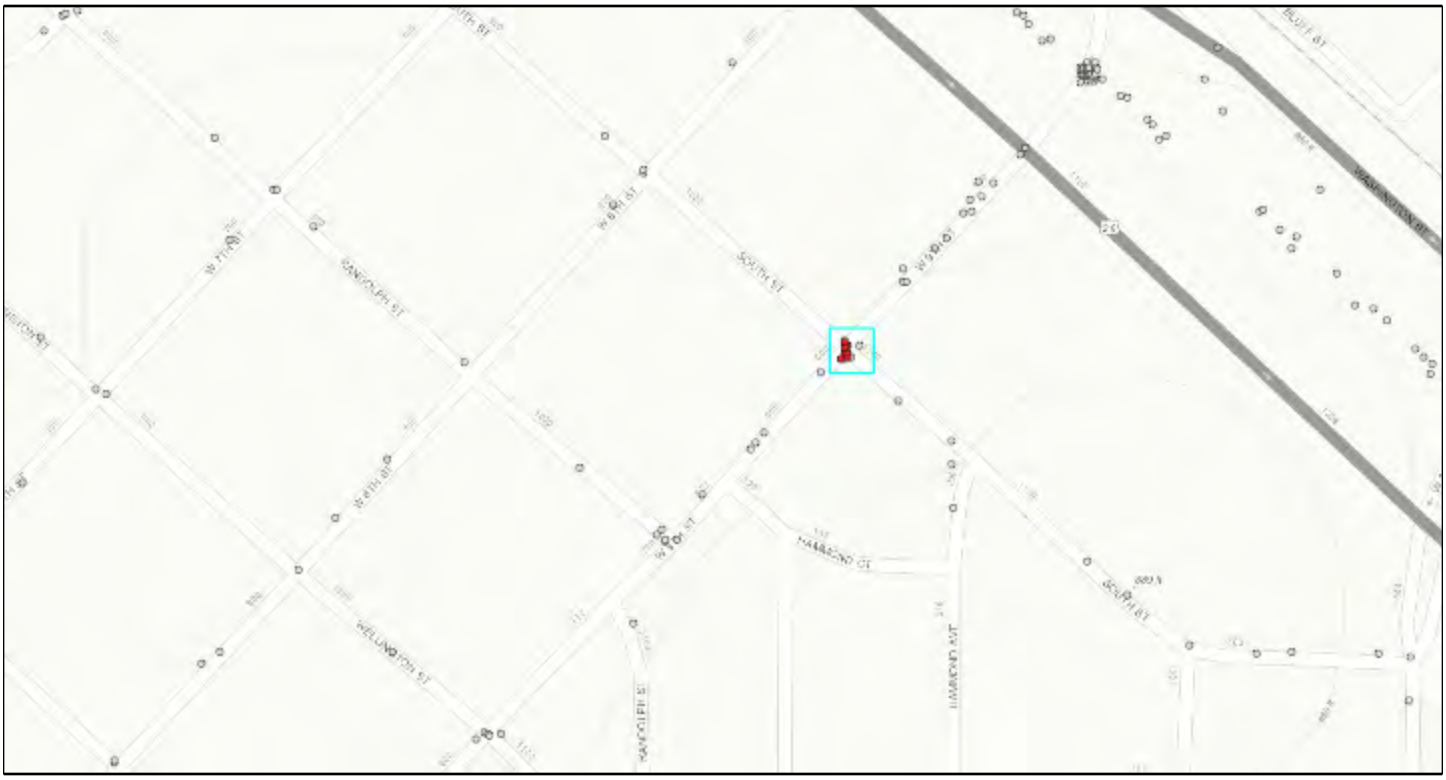
Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	27
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	9
Property Damage Only	17

Injury Status Summary	14
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	1
Possible (complaint of pain/injury)	13
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	144,550.00
Average (per crash dollars):	5,353.70
Total Vehicles:	58.00
Average (per crash):	2.15
Total Occupants:	91.00
Average (per crash):	3.37

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.52
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.04
Possible/Unknown Injuries/Crash:	0.48



Major Cause			27
Animal	0	Ran traffic signal	0
Ran stop sign	6	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	8	FTYROW: From yield sign	0
FTYROW: Making left turn	1	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	1
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	1
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	0
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	1
Passing: Other passing	1	Made improper turn	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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...	1	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	2
Unknown	4	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	1	0	1	0	0	1	0	3
Monday	0	0	0	0	2	0	0	1	1	1	0	1	0	6
Tuesday	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Wednesday	0	0	0	0	0	0	0	0	4	0	0	0	0	4
Thursday	0	0	0	0	0	0	1	3	0	0	0	0	0	4
Friday	0	0	0	0	0	0	1	1	1	1	0	0	0	4
Saturday	1	0	0	0	0	1	0	0	0	1	1	0	0	4
Total	1	0	0	0	2	2	3	6	7	3	1	2	0	27

Manner of Crash Collision	**27**
Non-collision (single vehicle)	0
Head-on (front to front)	0
Rear-end (front to rear)	3
Angle, oncoming left turn	1
Broadside (front to side)	20
Sideswipe, same direction	2
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	1
Unknown	0

Surface Conditions	**27**
Dry	18
Wet	5
Ice/frost	0
Snow	1
Slush	3
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			**58**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	58

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	1	0	0	0	1
= 18	2	0	0	0	2
= 19	0	3	0	0	3
= 20	2	1	0	0	3
>= 21 and <= 24	9	3	0	0	12
>= 25 and <= 29	3	3	0	0	6
>= 30 and <= 34	2	1	0	0	3
>= 35 and <= 39	2	2	0	0	4
>= 40 and <= 44	3	1	0	0	4
>= 45 and <= 49	1	2	0	0	3
>= 50 and <= 54	2	1	0	0	3
>= 55 and <= 59	1	2	0	0	3
>= 60 and <= 64	1	2	0	0	3
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	1	0	0	0	1
>= 80 and <= 84	1	2	0	0	3
>= 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	31	23	0	0	54

Drug/Alcohol Related	**27**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	1
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	26

Alcohol Test Given	**58**
None	53
Blood	0
Urine	0
Breath	1
Vitreous	0
Refused	0
Not reported	4

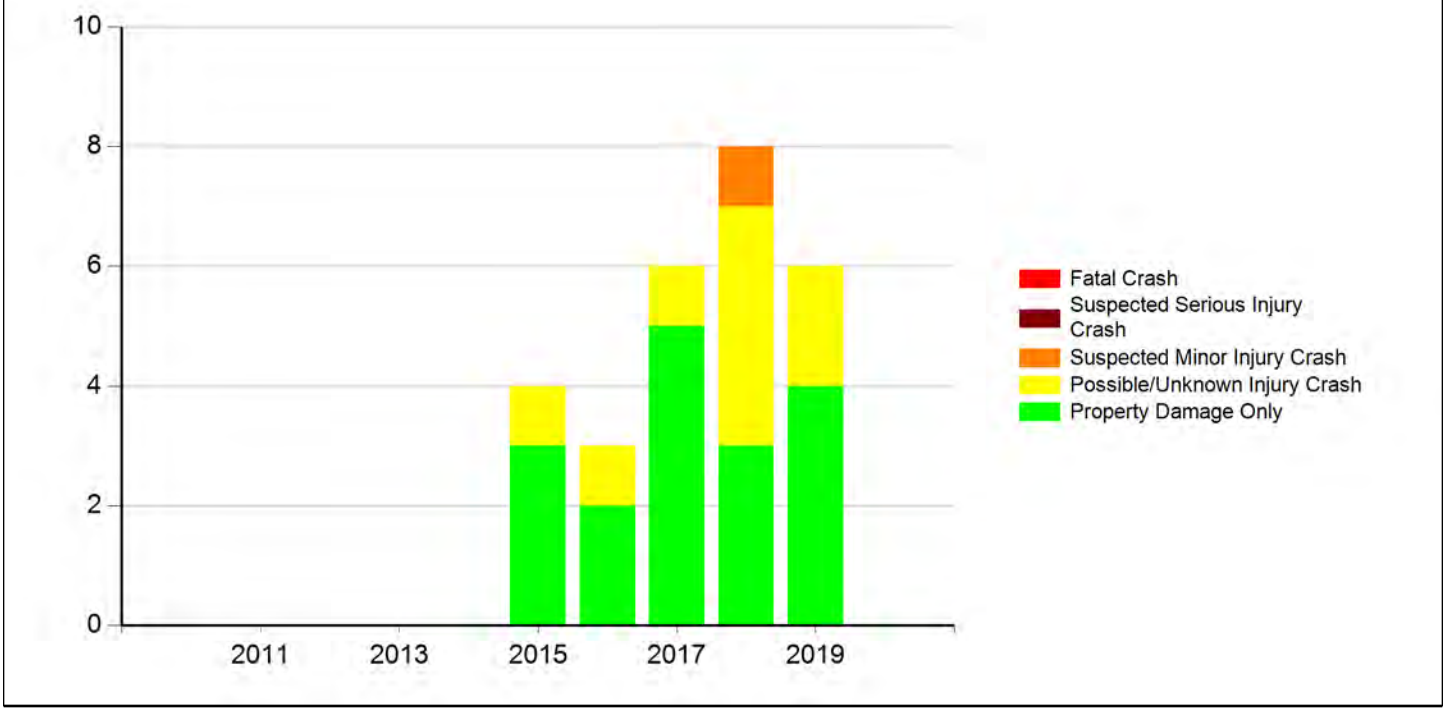
Drug Test Given	**58**
None	54
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	4

Drug Test Result	**58**
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	58
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	3	4
2016	0	0	0	1	2	3
2017	0	0	0	1	5	6
2018	0	0	1	4	3	8
2019	0	0	0	2	4	6
2020	0	0	0	0	0	0
Total	0	0	1	9	17	27

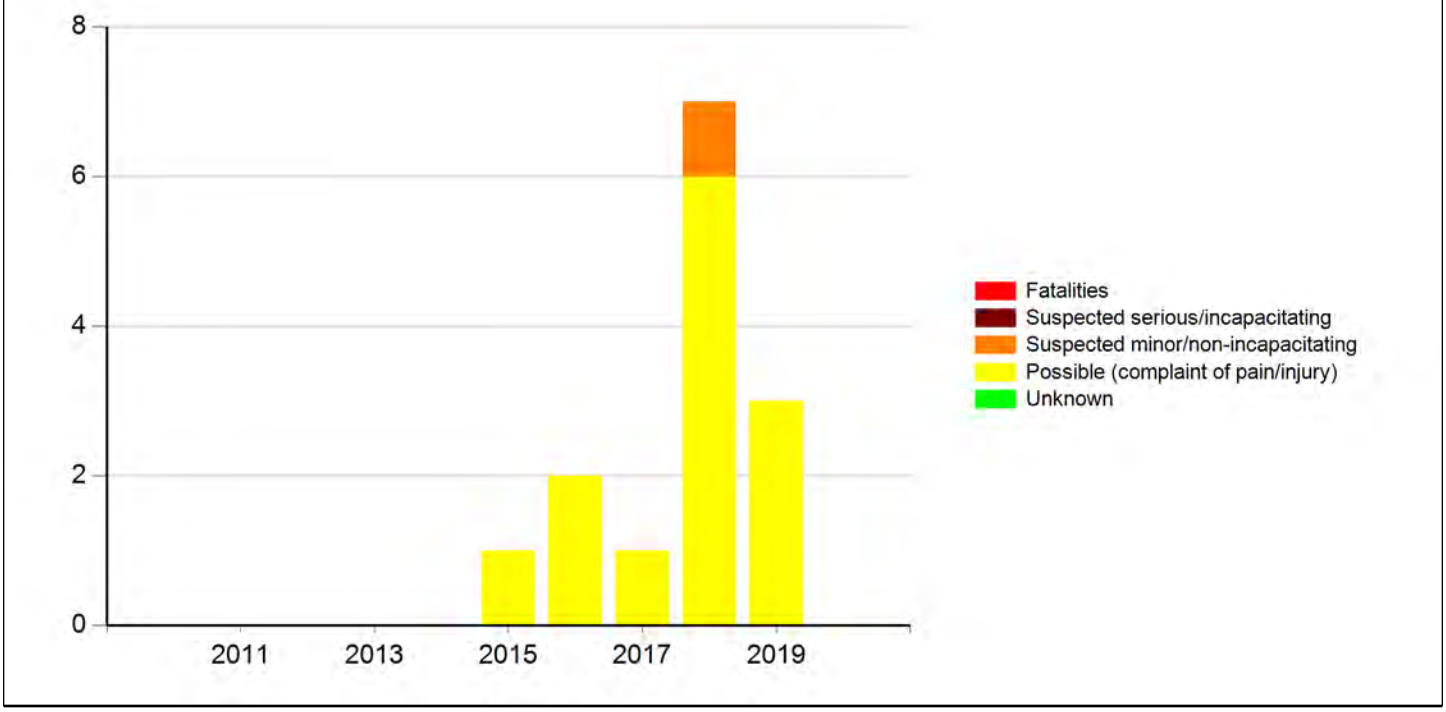
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	1	0	1
2016	0	0	0	2	0	2
2017	0	0	0	1	0	1
2018	0	0	1	6	0	7
2019	0	0	0	3	0	3
2020	0	0	0	0	0	0
Total	0	0	1	13	0	14

Injury Status/Year



Meeting the following criteria

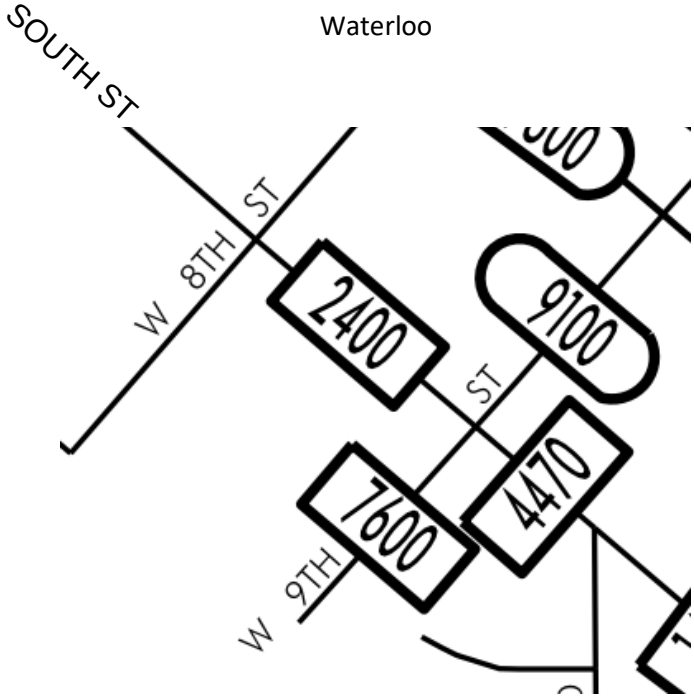
Jurisdiction: Cities (Waterloo)
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

J. 2017 Iowa DOT ADT

W.9th St & South St Intersection

Waterloo



L. Benefit Cost

Iowa Planning-Level CRF for installing a roundabout at an urban unsignalized intersection is used. Crash reduction factor is 45 for all crash severities and 75 for fatal and injuries. In this particular situation, crash reduction might be higher than average CRF since 80% of the crashes are right angle. Computed benefit-cost ratio for all crash severity is 2.53. Benefit-cost ratio for injury crashes is 3.22 as shown in the table below.

CRF #	B/C	Existing Facility Type	Countermeasure Type	Prior Condition	Area Type	Crash Type	Crash Severity	CRF Value
US-61	2.53	Unsignalized Intersection	Roundabouts	Unsignalized	Urban	All	All	45
US-61A	3.22	Unsignalized Intersection	Roundabouts	Unsignalized	Urban	All	Fatal and Injury (K,A,B,C)	75

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Black Hawk Prepared by: ME Date Prepared: 7/13/202

Intersection: W. 9th Street & South Street

Improvement

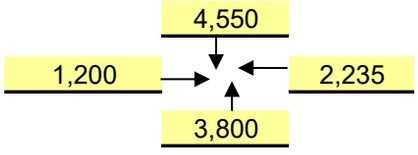
Proposed Improvement(s): Install Roundabout

$ 385,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ 500	Other Annual Cost (after initial year), **AC**	75	Crash Reduction Factor (integer), **CRF**
$ 6,795	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 391,795**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Map 2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,301,525	Current Annual Entering Veh., **AEV** = DEV * 365
13,021	veh / day, Final Year DEV, **FDEV**
90.24	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
0.5%	Projected Traffic Growth (0%-10%), **G**
11,785	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year 5.0 years, Time Period, **T**

Additional months

	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
10	Injury Crashes	1	Minor Injuries @	$65,000	$ 65,000
		13	Possible Injuries @	$35,000	$ 455,000
	Property Damage Only		(assumed cost per crash)	$7,400	$ 74,000
		-OR-	enter all Property Costs of all crashes:		
10	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 594,000

2.00	Current Crashes / Year, **AA** = TA / T	**0.46**	Crashes / MEV, Crash Rate, **CR**
$ 59,400	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
42.0	Total Expected Crashes, **TECR** = CR x TMEV	**$ 1,262,013**	Present Value of Avoided
1.50	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 89,100	Crash Costs Avoided in First Year, AAR x AVC		
31.5	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $1,262,013 : $391,795 = **3.22** : 1

Rev. 5/18

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 6/03/2020

Location / Title of Project W55 (Pearl Street)

Applicant City of Wayland

Contact Person Beverly Conrad Title City Clerk

Complete Mailing Address PO Box 155

Wayland, IA 52654

Phone 319 256-3276 (Area Code) E-Mail bconrad@waylandiowa.com

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	102,730
Total Project Cost	$	216,440
Safety Funds Requested	$	100,000

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 Wayland Iowa

Signed: _____ 6-3-2020
Signature Date Signed

Greg Rich, Mayor
Printed Name

Attest: _____ 6-3-2020
Signature Date Signed

Beverly Conrad, City Clerk
Printed Name

A

RESOLUTION 2020-16

APPROVAL OF TRANSPORTATION SAFETY IMPROVEMENT PROGRAM APPLICATION FOR W55 (PEARL STREET)

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, past traffic data shows the existing W55 (Pearl Street) corridor has an accident history and safety for the traveling public could be improved by incorporating safety improvements; and

WHEREAS, the following safety improvements have been identified for completion:
Widen existing granular shoulders 1' to 3', add 2' paved shoulders.
flattened fore slopes 3:1, install safety edge

WHEREAS, the overlay of W55 (Pearl Street) is included in the City of Wayland and Henry County Five (5) Year Construction Program; and

WHEREAS, the City of Wayland recommends the TSIP application be submitted to the Iowa Department of Transportation for possible safety funding of the above-mentioned project.

IT IS THEREFORE RESOLVED, by the Wayland City Council to endorse the above-mentioned project and authorize the maintenance of the improvement after construction is complete.

NOW THEREFORE BE IT RESOLVED, by the City of Wayland in session this **3rd day of June, 2020,** that the Wayland City Council hereby authorizes the Mayor to execute and submit the application to the Iowa Department of Transportation for Traffic Safety Improvement Program funding.

ATTEST:

Beverly Conrad
Wayland City Clerk

City of Wayland - Council

Chet Fort – Council Member

Melinda Ullery – Council Member

Aaron Barnhart – Council Member

Greg Rich - Mayor

CITY OF WAYLAND
Incorporated
City Hall * P.O. Box 155 * 218 W Main St * Wayland, IA 52654 * Phone: 319-256-3276
Fax: 319-256-3279 Website: www.waylandiowa.com email: bconrad@waylandiowa.com

Date: June 4, 2020

B

Office of Traffic & Safety
Iowa DOT
800 Lincoln Way
Ames, IA 50010

RE: City of Wayland Application for TSIP funds – W55 Pearl St. Safety Improvements

Narrative:

Proposed Project
The City of Wayland is applying for Traffic Safety Improvement Program funding to improve the safety on a section of W55 (Pearl St.) starting at the intersection of HWY 78 then North to corporation Limits of Wayland approximately 0.35 miles.
We are requesting safety TSIP funds for the following safety improvements:

- **widen existing granular shoulders 1' to 3'**
- **flatten fore slopes to 3:1**
- **Add 2 ft paved shoulders**
- **Add safety edge**

This project will be programmed for December 2021 letting. The proposed improvements will not include rumble strips due the residential area and the lower speed limits. It is of note the route leads to one of the larger feed mills in Southeast Iowa - Eichelberger Milling. The heavy truck traffic is a safety concern and with the proximity of WACO High School the need to improve pavement cross-section is extremely important for the 1990 ADT that traverses W55 daily. The City of Wayland is requesting $100,000 to complete this safety improvement. Due to relatively small size of Wayland, Henry County has agreed to oversee the project including design, construction inspection, processing paperwork for design and construction.

Existing Conditions
This is a Farm to Market road connecting Wayland to Washington; running North to the Henry-Washington County line. In 1958, the road was originally paved with a 2.5" HMA surface. In 1976 an additional 3" of HMA was added and again in 1996 a 3" lift was added. Currently, the road is paved 24 feet wide, with 2-foot granular shoulders, and 2:1 fore slopes or steeper. This makes the road unforgiving for vehicles that leave the traveled roadway. The road is posted 25 mph, 45 mph, finally 55 mph at city limits. The average daily traffic count is (1,990 vpd) with a high percentage of those being trucks.

Previous Safety Improvements
The City of Wayland has recently been awarded a USTEP grant from the State of Iowa and will be reconstructing the intersection of W55 (Pearl St.) and HWY 78. Improvements include widening radius for improved turning movements and culvert extension to flattened slopes around intersections.

Proposed Continuity
In coordination with Henry County & Washington County we will be able to complete paved shoulders from HWY 78 to Washington and thus allowing more room for trucks and a safer route for the community of Wayland. With approval of this application the route from Wayland to Washington will have addressed the run-off the road concerns noted on W55.

Crash Reduction Factor
Planning-Level Crash Reduction Factor (CRF) List was utilized. Per recommended list:

"Road Segment" Flatten Fore slope to 3:1
"Road Segment" Add Paved Shoulder
"Road Segment" Add Safety Edge

The City of Wayland recognizes the importance of W55 for connecting the farming community and school to Wayland. The desire for a safer route to accommodate the school and the farming community is of the upmost importance for Wayland. Your consideration and approval for the proposed safety improvements will be greatly appreciated by our City.

Sincerely,

Beverly Conrad
City Clerk

W55 (Pearl St) from HWY 78 to City Corp Limits

ENGINEER'S ESTIMATE

ESTIMATED PROJECT QUANTITIES

C

ITEM NO.	ITEM CODE	ITEM	UNIT	DIVISION I	DIVISION II (Safety)	UNIT PRICES	DIVISION I	DIVISION II (Safety)
1	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED	CY		2500.00	$12.00	$0.00	$30,000.00
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY		500.00	$10.00	$0.00	$5,000.00
3	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY		1000.00	$10.00	$0.00	$10,000.00
4	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON		221.00	$20.00	$0.00	$4,420.00
5	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON		100.00	$23.30	$0.00	$2,330.00
6	2123-7450020	SHOULDER FINISHING, EARTH	STA		36.00	$50.00	$0.00	$1,800.00
7	2212-0475095	CLEAN AND PREPARATION OF BASE	MILE	0.34		$1,500.00	$510.00	$0.00
8	2213-2713300	EXCAVATION, CLASS 13, WIDEN	CY		133.00	$10.00	$0.00	$1,330.00
9	2213-7100400	RELOCATION OF MAILBOX	EACH	10.00		$150.00	$1,500.00	$0.00
10	2214-5145150	PAVEMENT SCARIFICATION	SY	4415.00		$2.00	$8,830.00	$0.00
11	2303-0002380	HMA MIXTURE INTERLAYER BASE COURSE, 3/8 IN. MAX	TON	264.00	48.00	$60.00	$15,840.00	$2,880.00
12	2303-1032500	HMA STANDARD TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	TON	361.00	65.00	$50.00	$18,050.00	$3,250.00
13	2303-1033500	HMA STANDARD TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, NO SPECIAL FRICTION REQUIREMENT	TON	361.00	65.00	$50.00	$18,050.00	$3,250.00
14	2303-1131500	HMA STANDARD TRAFFIC, BASE COURSE, 1/2 IN MIX	SY		803.00	$10.00	$0.00	$8,030.00
15	2303-1258283	ASPHALT BINDER, PG 58-28S, STANDARD TRAFFIC	TON	34.00	5.00	$600.00	$20,400.00	$3,000.00
16	2303-1258346	ASPHALT BINDER, PG 58-34E, EXTREMELY HIGH TRAFFIC	TON	19.00	4.00	$780.00	$14,820.00	$3,120.00
17	2303-6911000	HMA PAVEMENT SAMPLES	LS	0.50	0.50	$3,500.00	$1,750.00	$1,750.00
18	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT	STA	45.00		$17.00	$765.00	$0.00
19	2528-8445110	TRAFFIC CONTROL	LS	0.50	0.50	$7,000.00	$3,500.00	$3,500.00
20	2528-8445113	FLAGGERS	EACH	5.00	5.00	$495.00	$2,475.00	$2,475.00
21	2528-8445115	PILOT CAR	EACH	3.00	3.00	$740.00	$2,220.00	$2,220.00
22	2533-4980005	MOBILIZATION	LS	0.50	0.50	$10,000.00	$5,000.00	$5,000.00
23	2601-2634100	MULCH	ACRE		1.50	$600.00	$0.00	$900.00
24	2601-2636043	SEED & FERTILIZING (RURAL)	ACRE		1.50	$600.00	$0.00	$900.00
25	2602-0000020	SILT FENCE	LF		1500.00	$1.60	$0.00	$2,400.00

W55 (Pearl St) from HWY 78 to City Corp Limits

ENGINEER'S ESTIMATE

ESTIMATED PROJECT QUANTITIES

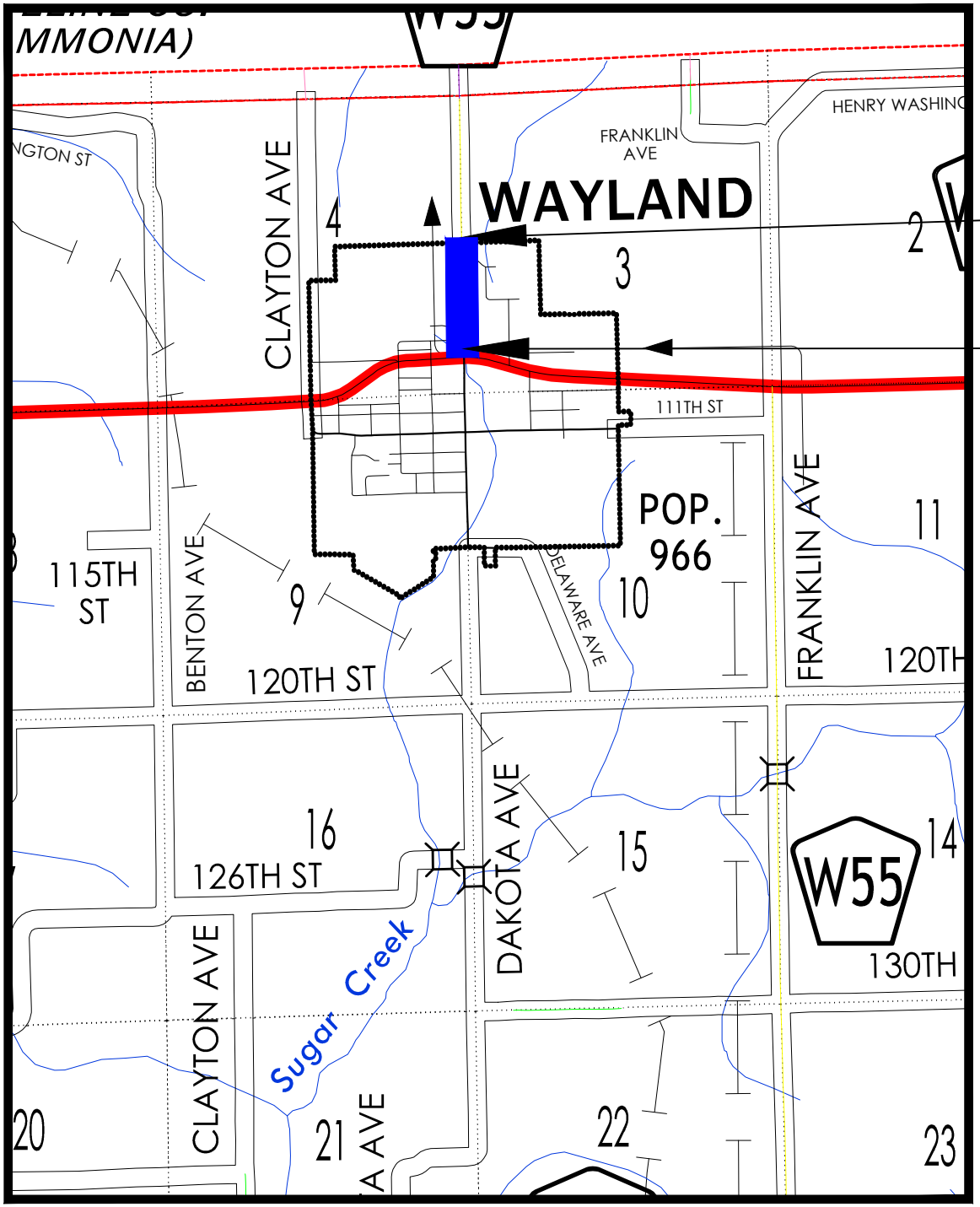
C

ITEM NO.	ITEM CODE	ITEM	UNIT	DIVISION I	DIVISION II (Safety)	UNIT PRICES	DIVISION I	DIVISION II (Safety)
26	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF		1500.00	$1.75	$0.00	$2,625.00
27	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF		1000.00	$0.50	$0.00	$500.00
28	2602-0000312	PERIMETER+SLOPE SEDIMENT CNTL DEVICE, 12 IN.	LF		300.00	$3.50	$0.00	$1,050.00
29	2602-0010010	MOBILIZATION, EROSION CONTROL	EACH		2.00	$500.00	$0.00	$1,000.00
						TOTALS=	**$113,710.00**	**$102,730.00**

TOTAL DIV I & II	**$216,440.00**

FUNDING SOURCE BREAKDOWN	
Funding Sources	Amount
TSIP (DIVISION II SAFETY)	$100,000
CITY FUNDS (DIVISION I)	$116,440
TOTAL	**$216,440**

D & E



E.O.P.
City Limits of Wayland

B.O.P.
Intersection of HWY 78 Dakota Ave

NOT TO SCALE

Length of Project =0.35 Miles

Henry County Projected Time Line:

1. Letting Date: December 2021
2. Late Start Date: May 2022
3. 30 working days
4. Estimated completion: Fall 2022

	HENRY COUNTY	PROJECT NUMBER W55 (DAKOTA AVENUE) TSIP

Y:\MAPS 2008-\COUNTY MAP LOCATION FOR TITLE SHEETS.DWG, 6/12/2020 8:49:16 AM, ANSI FULL BLEED A (8.50 X 11.00 INCHES), 1:1

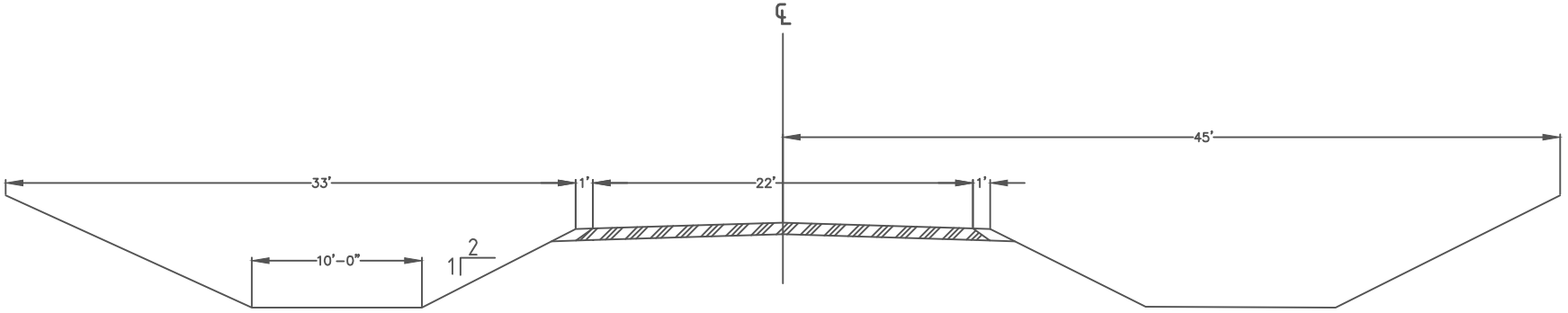
TYPICAL ROAD PICTURES W55(PEARL STREET)

F

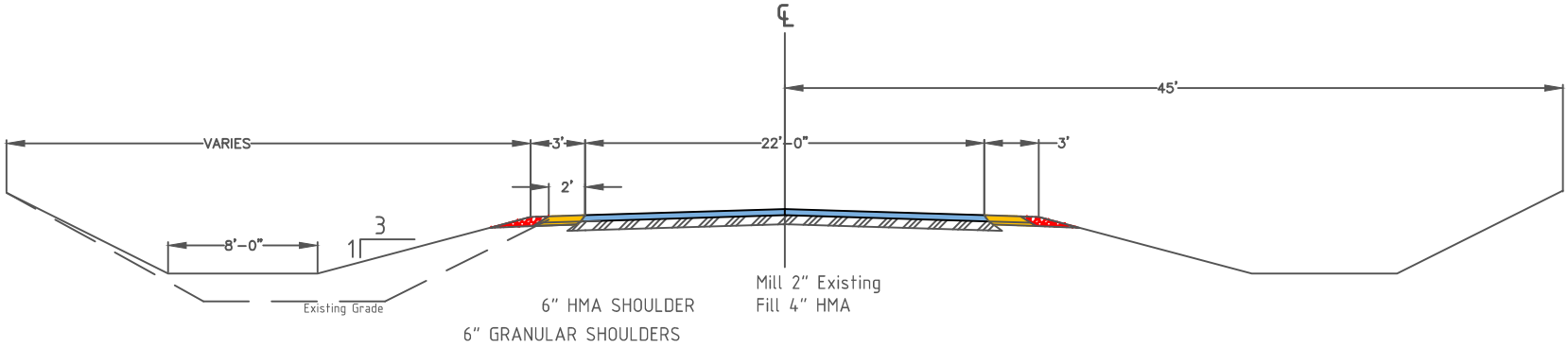
TYPICAL CROSS SECTION VIEWS

NORTH END OF WAYLAND CORP LIMITS – HIGH SCHOOL WEST SIDE

EXISTING TYPICAL SECTION
22' HMA WITH 1' SHOULDERS
2:1 FORE SLOPES



PROPOSED FY22 OVERLAY TYPICAL SECTION
22' HMA WITH 2' PAVED & 1' GRANULAR SHOULDERS
3:1 FLATTENED FORE SLOPES



B.O.P. PAVING PROJECT
STA 7+62

USTEP AWARDED PROJECT
UST-078-4(27)
SCHEDULED LETTING JANUARY 2021

6+40 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

SCALE 1":100'

WAYLAND CORP LIMITS

19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

E.O.P. PAVING PROJECT
STA 25+68 CITY LIMITS

WAYLAND CORP LIMITS

FILE: Y:\2022 Projects\W55 North of HWY 78\TSIP Application.dwg	HENRY COUNTY	PROJECT NUMBER: CITY OF WAYLAND	FISCAL YEAR 2022	SHEET NUMBER H

Y:\2022 PROJECTS\W55 NORTH OF HWY 78\TSIP APPLICATION.DWG, 5/26/2020 1:46:05 PM, ANSI EXPAND B (11.00 X 17.00 INCHES), 1:1

Iowa Crash Analysis Tool
Quick Report
2010-2020

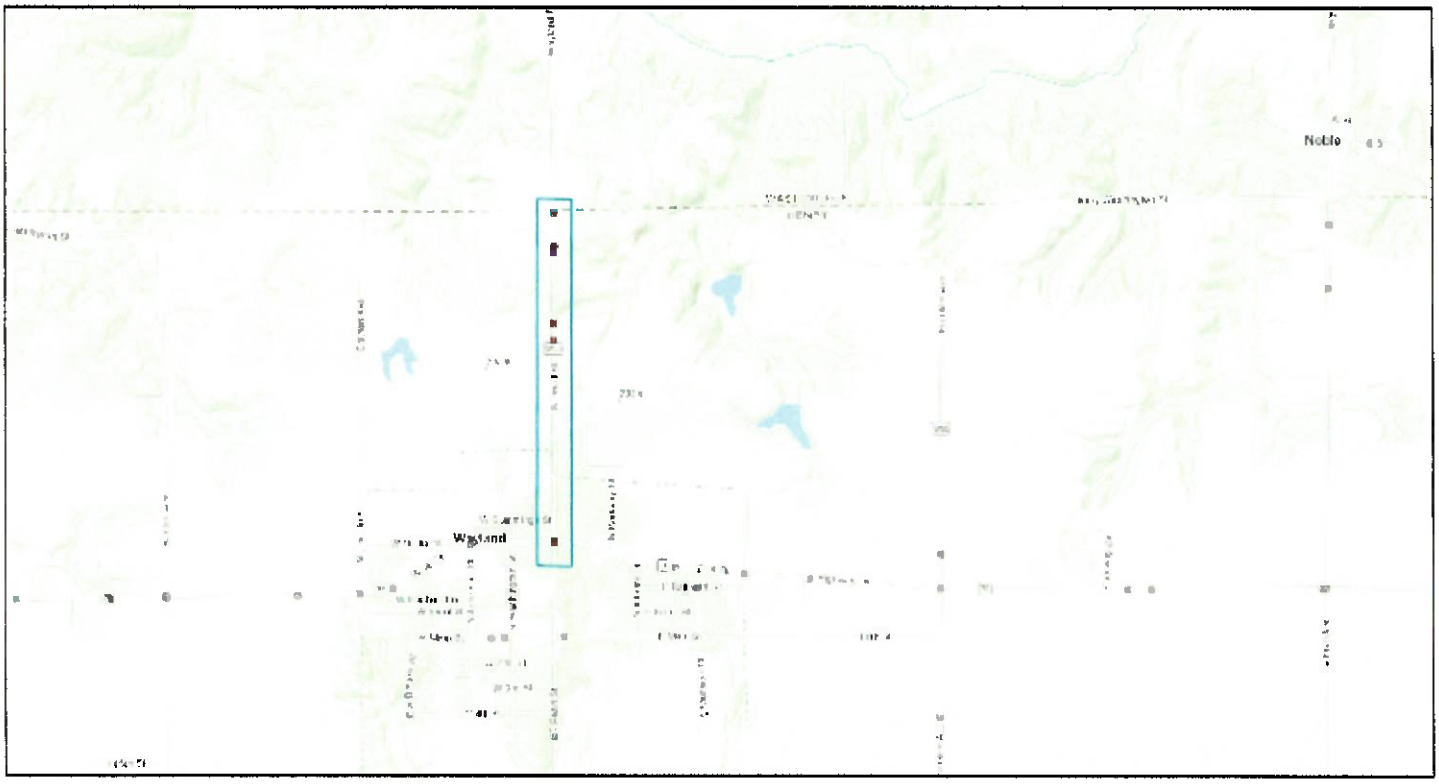
I

Crash Severity	7
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	2
Property Damage Only	4

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	40,000.00
Average (per crash dollars):	5,714.29
Total Vehicles	10.00
Average (per crash):	1.43
Total Occupants:	11.00
Average (per crash):	1.57

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.29
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.14
Possible/Unknown Injuries/Crash:	0.14



1650 AOT

Major Cause			7
Animal	1	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	1	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	1
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	1	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Wednesday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Thursday	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Saturday	0	0	0	1	0	1	0	1	0	0	0	0	0	3
Total	0	0	1	1	0	1	1	3	0	0	0	0	0	7

Manner of Crash Collision	**7**
Non-collision (single vehicle)	3
Head-on (front to front)	1
Rear-end (front to rear)	1
Angle, oncoming left turn	0
Broadside (front to side)	1
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	**7**
Dry	6
Wet	0
Ice/frost	0
Snow	0
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			**10**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	2	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
Traffic signal support	0	Other post/pole/support	1
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	7

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	0	0	0	0	0
= 16	1	1	0	0	2
= 17	0	0	0	0	0
= 18	0	1	0	0	1
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	1	0	0	1
>= 35 and <= 39	0	0	0	0	0
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	2	0	0	0	2
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	1	0	0	1
>= 70 and <= 74	2	1	0	0	3
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	5	5	0	0	10

Drug/Alcohol Related	7
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	7

Alcohol Test Given	10
None	9
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Given	10
None	9
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Result	10
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	10
Other	0

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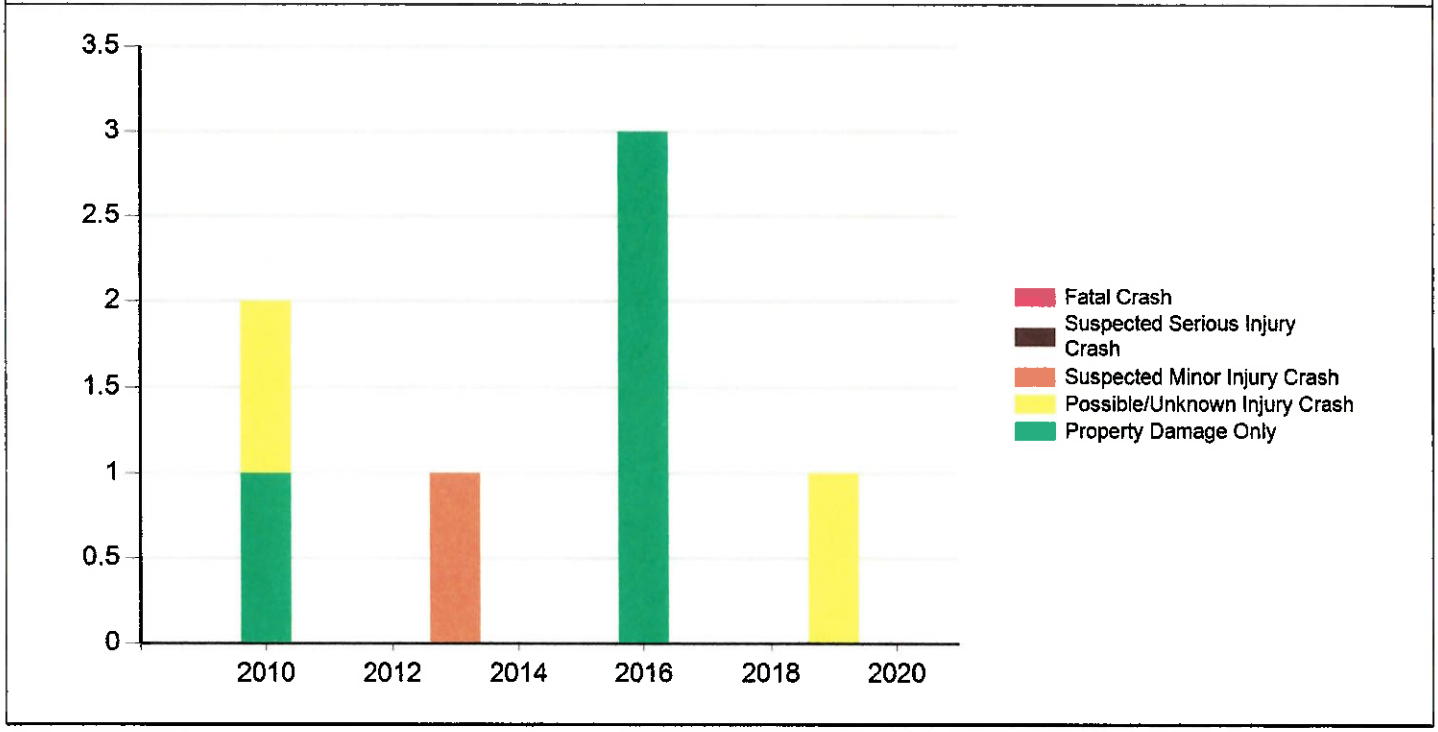
Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2009	0	0	0	0	0	0
2010	0	0	0	1	1	2
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	1	0	0	1
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	3	3
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	1	0	1
2020	0	0	0	0	0	0
Total	0	0	1	2	4	7

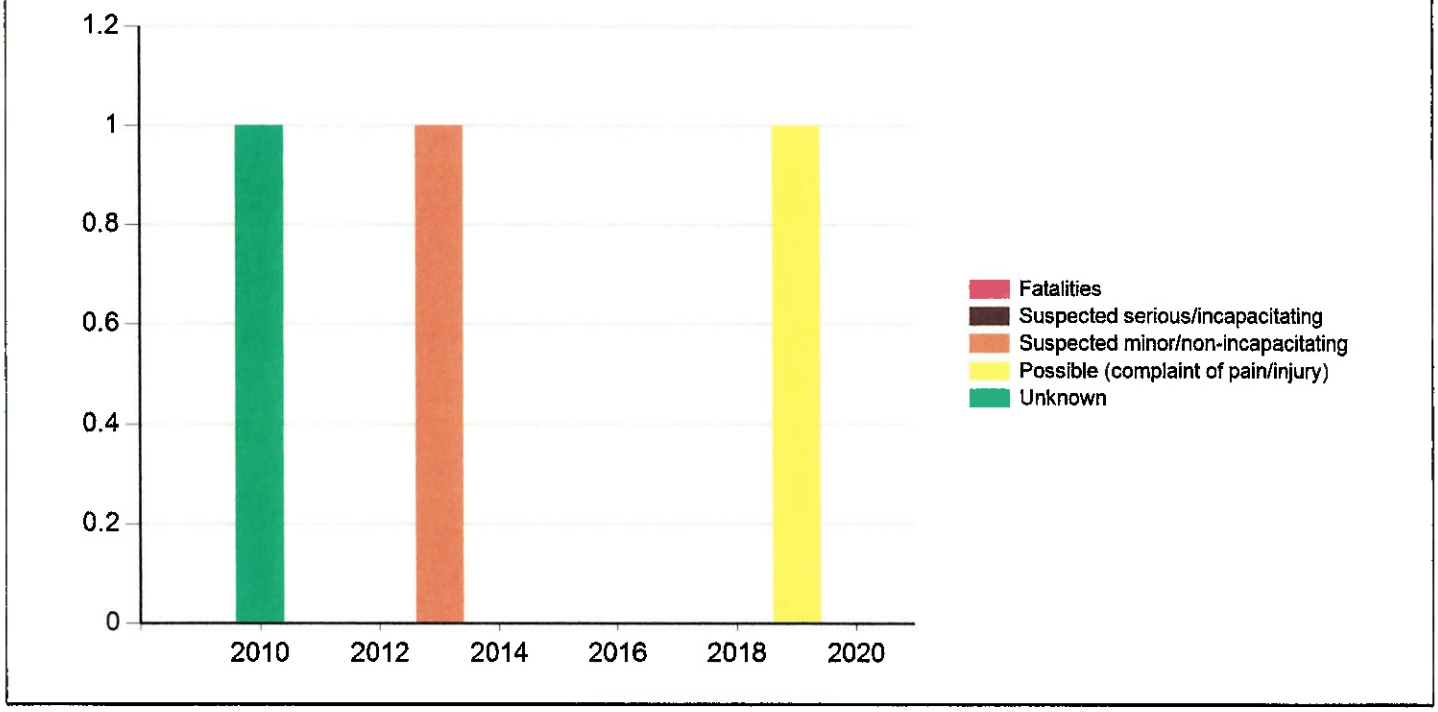
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2009	0	0	0	0	0	0
2010	0	0	0	0	1	1
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	1	0	0	1
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	1	0	1
2020	0	0	0	0	0	0
Total	0	0	1	1	1	3

Injury Status/Year



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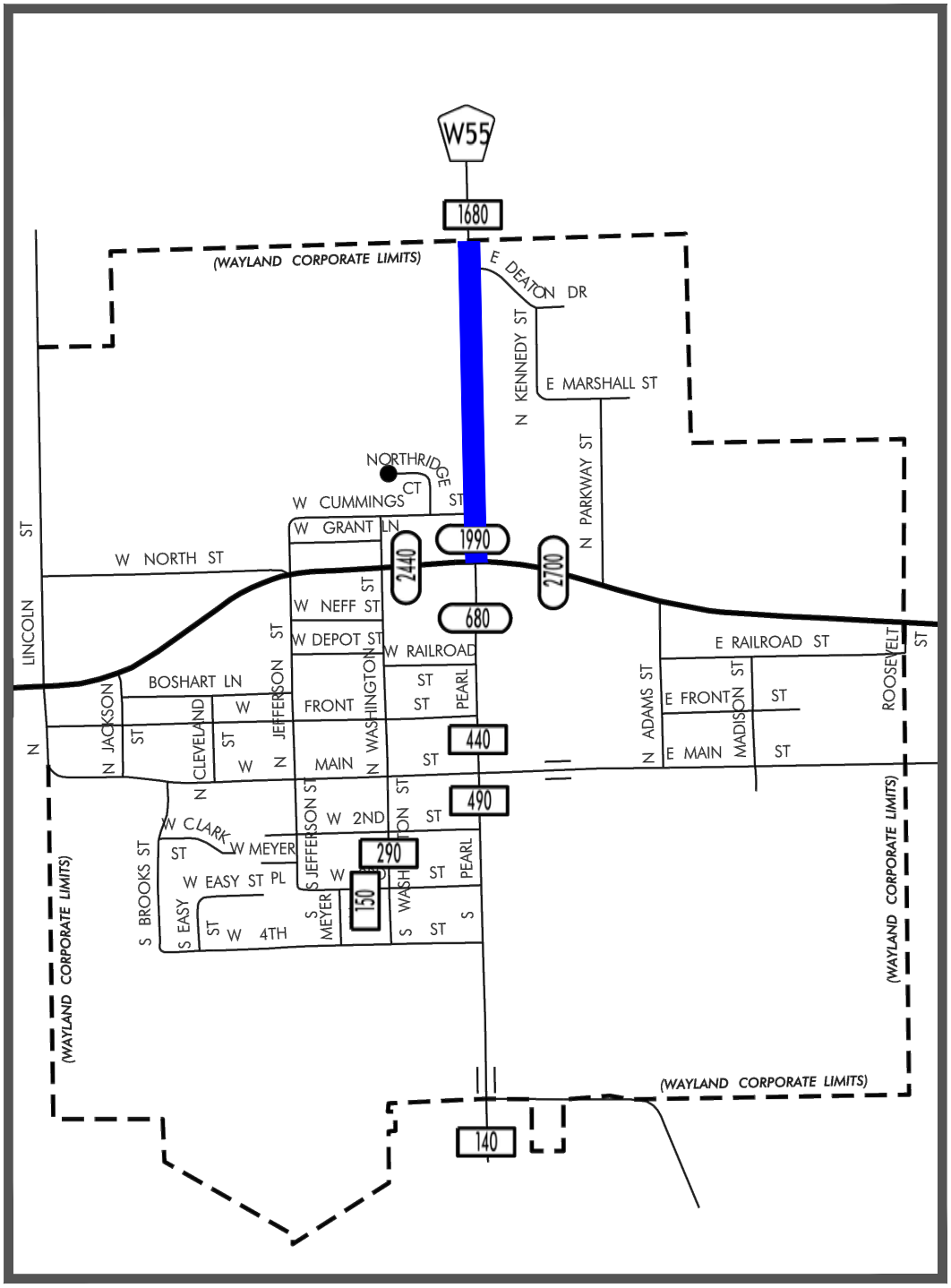
Meeting the following criteria

Jurisdiction: Statewide
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

W55 North 78 to County line

J



TRAFFIC FLOW MAP OF
HENRY COUNTY
IOWA

Prepared By

IOWA DOT

OFFICE OF SYSTEMS PLANNING
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

N

In Cooperation With
United States
Department of Transportation

JANUARY 1, 2018

FILE: Y:\2022 Projects\W55 North of HWY 78\TSIP Application.dwg	HENRY COUNTY	PROJECT NUMBER: CITY OF WAYLAND	SHEET NUMBER J

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

L

County: Henry | Prepared by: Jake Hotchkiss | Date Prepared: May 29, 2020

Location: W55(Pearl St) HWY 78 North to City Limits

Improvement

Proposed Improvement(s): FLATTENED FORESLOPES TO 3:1, WIDEN SHOULDERS, Safety Edge

ADD 2' PAVED SHOULDERS

$ 102,730	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	13	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 102,730**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT Traffic count | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.35	1,990	
0.35	miles total	

697	Current Vehicle Miles / Day, **VM**
1,258	End of Life Veh. Miles / Day
254,223	Current Veh. Miles / Year, **AM**
6,831,054	Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

3.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.4 years, Time Period, **T**

5 Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
3	Injury Crashes	1	Minor Injuries @	$65,000	$ 65,000
		2	Possible Injuries @	$35,000	$ 70,000
4	Property Damage Only		(assumed cost per crash)	$7,400	$ 51,800
			-OR- enter all Property Costs of all crashes:		
7	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 186,800

0.67	Current Crashes / Year, **AA** = TA / T	**264.3**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 26,686	Cost per Crash, **AVCR** = LOSS / TA	**$ 42,224**	Present Value of Avoided Crashes, **BENEFIT**
18.1	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.09	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 2,403	Crash Costs Avoided in First Year, AAR x AVCR		
2.4	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $42,224 : $102,730 = **0.41** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 8/13/2020

Location / Title of Project: Prairie View Drive & Ashworth Road Intersection Improvements

Applicant: City of West Des Moines

Contact Person: Eric Petersen Title: Principal Traffic Engineer

Complete Mailing Address: 4200 Mills Civic Pkwy, Engineering Services Dept.
West Des Moines, IA 50265

Phone: (515) 273-0656 (Area Code) E-Mail: Eric.Petersen@wdm.iowa.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	$ 280,900
Total Project Cost	$ 379,900
Safety Funds Requested	$ 280,000

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 West Des Moines, IA

Signed: _____ 8.13.20
Signature Date Signed

Brian Hemesath, City Engineer
Printed Name

Attest: _____ 8-13-2020
Signature Date Signed

Eric Petersen, Principal Traffic Engineer
Printed Name

CERTIFICATION OF GRANT APPLICATION
FOR TRAFFIC SIGNAL IMPROVEMENT PROGRAM (TSIP) FUNDS

The City of West Des Moines strongly promotes the reduction of traffic congestion and the safe mobility for all users of the transportation system.

Authorization is given to apply for Iowa Department of Transportation Traffic Safety Improvement Program (TSIP) Funds for the planned intersection safety improvements at Prairie View Drive & Ashworth Road.

If the project is funded, the City of West Des Moines will adequately maintain the completed project for its intended public use following project completion.

Tom Hadden, City Manager

Project Narrative

Background

Ashworth Road is an east/west minor arterial street through the western Des Moines suburbs of West Des Moines and Waukee. Ashworth Road is a key gateway for those individuals traveling between the two communities, as well as a way for individuals to cross over Interstate 80 or over Interstate 35. It also serves as a paralleling alternative for drivers when there are crashes or other incidents on Interstate 80/235.

Currently, Ashworth Road is a 4-lane, 35-mph undivided street and Prairie View Drive is a 2-lane, 25-mph undivided street in the area of the proposed project. The intersection of Prairie View Drive & Ashworth Road is located just west of the Interstate 35 bridge, as seen in Part E of this application. A traffic signal is currently installed at this intersection.

Traffic volumes on Ashworth Road are approximately 16,400 vehicles/day to the east of the intersection, according to May 2018 average daily traffic counts, up from 14,200 vehicles/day according to the Iowa DOT's 2016 annual average daily traffic counts. Previous studies have forecasted approximately 20,600 vehicles/day in the future as West Des Moines continues to develop. Prairie View Drive traffic volumes are approximately 2,100 vehicles/day to the north of Ashworth Road and 3,100 vehicles/day to the south. The long-range forecast is comparable at about 3,100-3,300 vehicles per day.

All traffic control devices meet requirements of the *Manual on Uniform Traffic Control Devices (MUTCD).*

Existing Safety Issues

Crashes at the intersection of Prairie View Drive & Ashworth Road have primarily been resulting from a lack of dedicated left-turn lanes on Ashworth Road. Currently, left-turning traffic must stop and wait in the inside through lanes. This results in the following types of crashes:

- Rear-end crashes in the inside through lanes
- Side-swipe crashes as following drivers try to change lanes because of a stopped vehicle in the inside through lane
- Angle crashes as left-turning drivers may have difficulty seeing oncoming traffic and, due to the heavy traffic volumes and the feeling of holding up traffic, may feel pressured to accept shorter gaps or turn despite not being able to see.

Part F of this application shows pictures of the current issues, as observed on a typical weekday.

Proposed Project and Safety Benefits

The proposed project is to widen Ashworth Road to the west of Prairie View Drive so that dedicated left-turn lanes can be installed. East of the intersection, Ashworth Road is already wide enough to accommodate a left-turn lane, but the lanes cannot be restriped until after the opposing side is widened. The lanes would be restriped with this project so that dedicated left-turn lanes would be created for both eastbound and westbound traffic.

Safety benefits of the project include removing turning traffic from the through lanes on Ashworth Road and reducing the number of conflict points on the arterial street. This would reduce the potential for rear-end, sideswipe, and angle collisions at the signalized intersection of Prairie View Drive & Ashworth Road.

Project Costs

The anticipated project costs are detailed in the engineers' opinion of probable costs below:

SNYDER & ASSOCIATES

PRAIRIE VIEW DRIVE & ASHWORTH ROAD
INTERSECTION IMPROVEMENTS
WEST DES MOINES, IOWA
WDM PROJECT #0510-041-2020
120.0764.01
Prepared: August 10, 2020

ITEM #	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENDED PRICE
	EARTHWORK				
2.1	Class 10, Excavation	500	CY	$ 50	$ 25,000
2.2	Special Backfill	200	TON	$ 45	$ 9,000
2.3	Clearing and Grubbing	1	LS	$ 5,000	$ 5,000
	SEWERS AND DRAINS				
4.1	Storm Sewer, Trenched, RCP, 15"	16	LF	$ 400	$ 6,400
	STRUCTURES FOR SANITARY AND STORM				
6.1	Intake, SW-501	1	EA	$ 6,000	$ 6,000
6.2	Removal of Existing Structure (Top-Only)	1	EA	$ 3,000	$ 3,000
	STREETS AND RELATED WORK				
7.1	PCC Pavement, 9 In. Reinforced	625	SY	$ 100	$ 62,500
7.2	Removal of Pavement (2)	1	LS	$ 15,000	$ 15,000
7.3	Sidewalk, PCC, 4"	100	SY	$ 80	$ 8,000
7.4	Sidewalk, PCC, 6"	50	SY	$ 100	$ 5,000
7.5	Detectable Warning	100	SF	$ 50	$ 5,000
	TRAFFIC CONTROL				
8.1	Traffic Signal Modification (3)	1	LS	$ 40,000	$ 40,000
8.2	Painted Markings and Symbols, Durable (4)	1	LS	$ 10,000	$ 10,000
8.4	Temporary Traffic Control	1	LS	$ 15,000	$ 15,000
	SITE WORK AND LANDSCAPING				
9.1	Surface Restoration (5)	1	LS	$ 20,000	$ 20,000
9.2	Erosion Control (6)	1	LS	$ 5,000	$ 5,000
	MISCELLANEOUS				
11.1	Construction Survey	1	LS	$ 5,000	$ 5,000
11.2	Concrete Washout	1	LS	$ 1,000	$ 1,000
11.3	Unquantified Bid Items (7)	1	LS	$ 35,000	$ 35,000
				CONSTRUCTION TOTAL:	$ 280,900
				Other Project Costs	
				Right of Way (8):	$ 25,000
				Engineering and Construction Adminstration:	$ 74,000
				TOTAL PROJECT COST:	**$ 379,900**

Safety related costs

The construction costs associated with the project are related to the safety improvements of adding left-turn lanes. Therefore, the total construction cost (not including right of way, design, and construction administration) are safety-related work costs. This is $280,900 of the total $379,900 project cost.

Funding sources

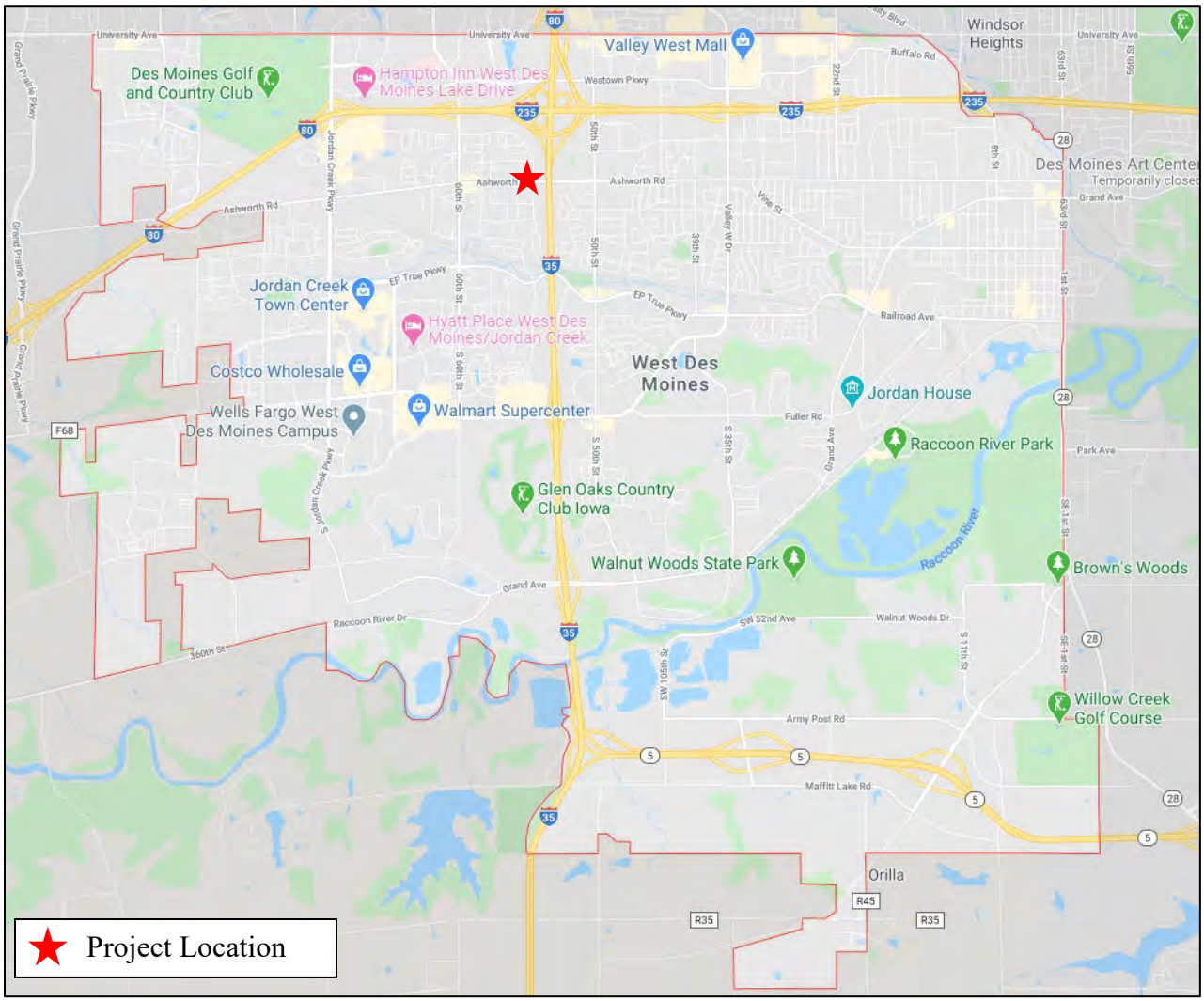
If funded, the TSIP funds would be used to pay the construction costs associated with the project. Local funds would be used to pay for design and right of way costs. The sources and percentages are detailed in the table below.

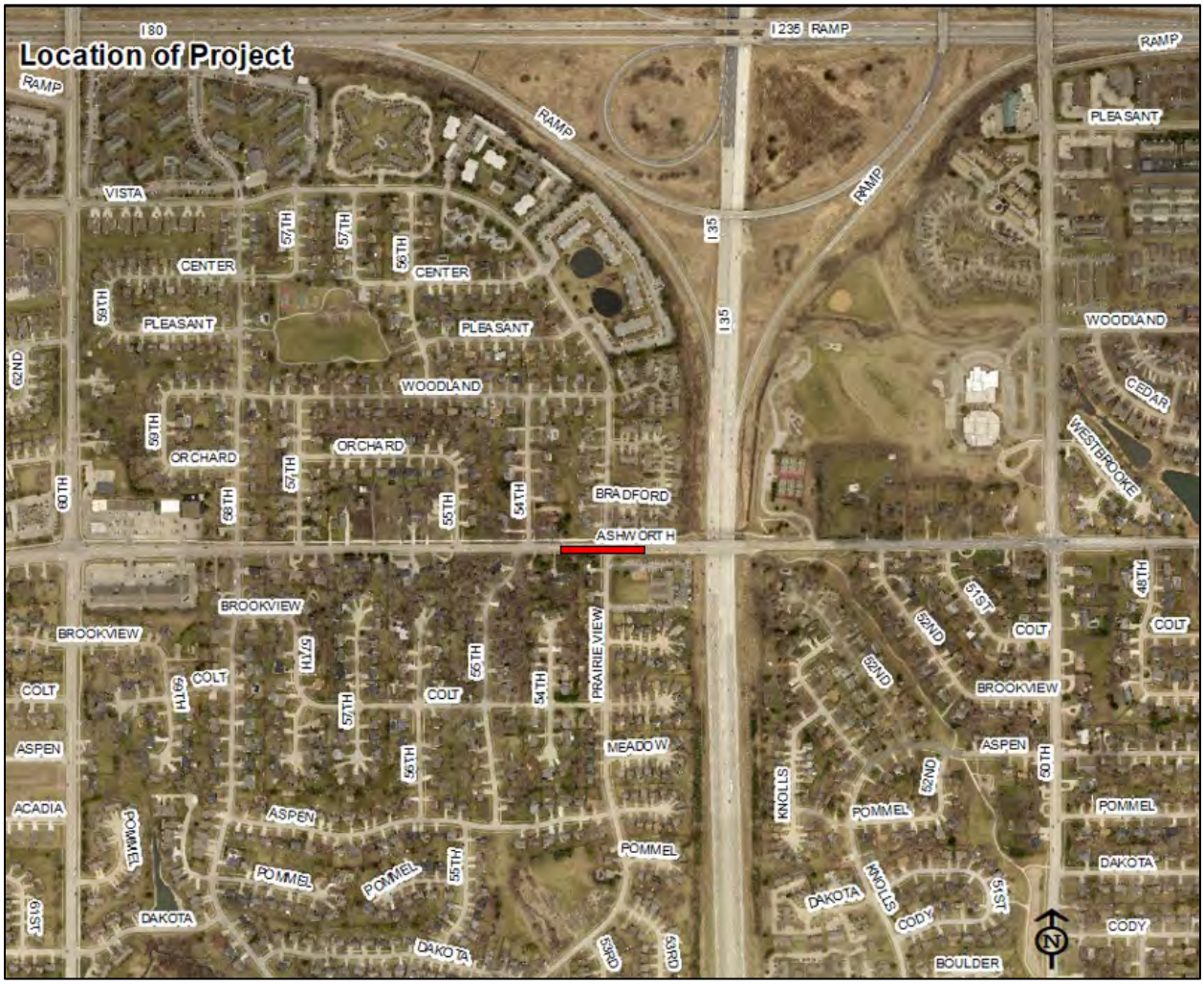
Anticipated Funding Sources			
Source	**Amount**		**Percent**
Traffic Safety Improvement Program Funds (proposed)	$	280,000	74%
Local Funds (Design, ROW, Inspection)	$	99,900	26%
Total	**$**	**379,900**	**100%**

Schedule

- [x] July 2020 .....Project Engineering begins
- [x] August 2020 .....TSIP Application submitted
- [ ] January 2021 .....Iowa DOT Approval
- [ ] Spring 2021 .....TSIP Agreement
- [ ] July 2021 .....Project Letting
- [ ] July 2021 – November 2021 .....Project Construction

Overview Map



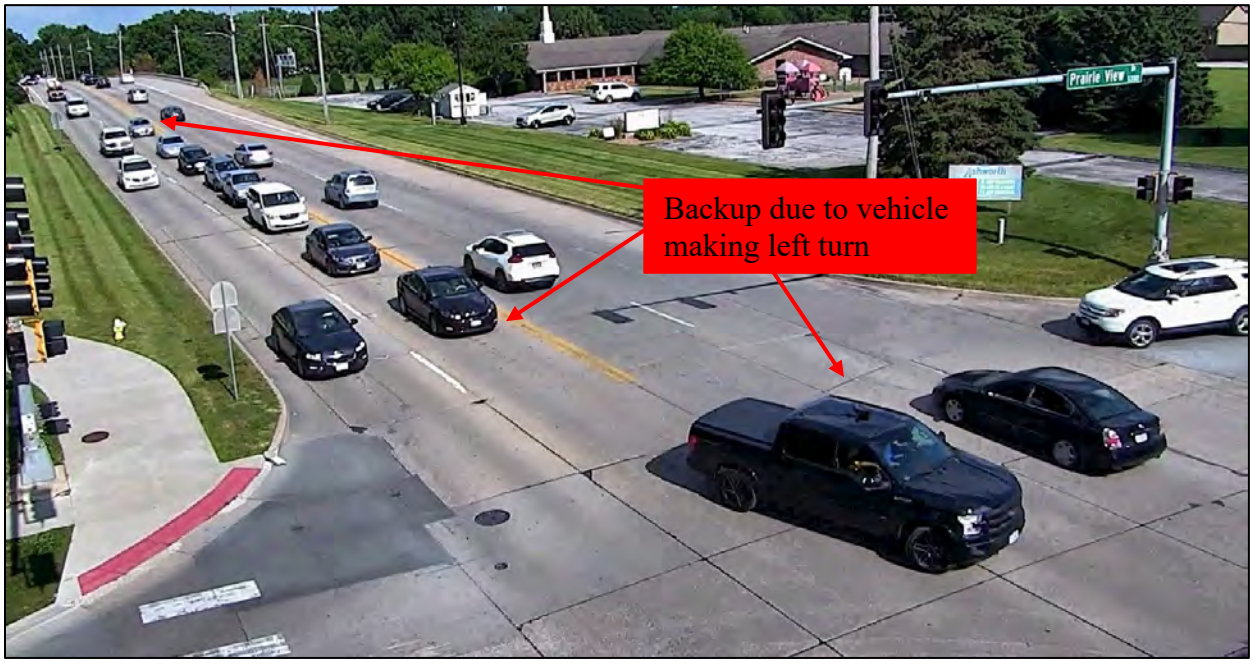

Location of Project
I 80
I 235
RAMP
I 35
VISTA
CENTER
PLEASANT
WOODLAND
ORCHARD
BRADFORD
ASHWORTH
BROOKVIEW
COLT
ASPEN
ACADIA
POMMEL
DAKOTA
MEADOW
PRAIRIE VIEW
KNOLLS
CODY
BOULDER
WESTBROOKE
CEDAR
PLEASANT
57TH
56TH
55TH
54TH
59TH
60TH
62ND
61ST
53RD
52ND
51ST
48TH
N

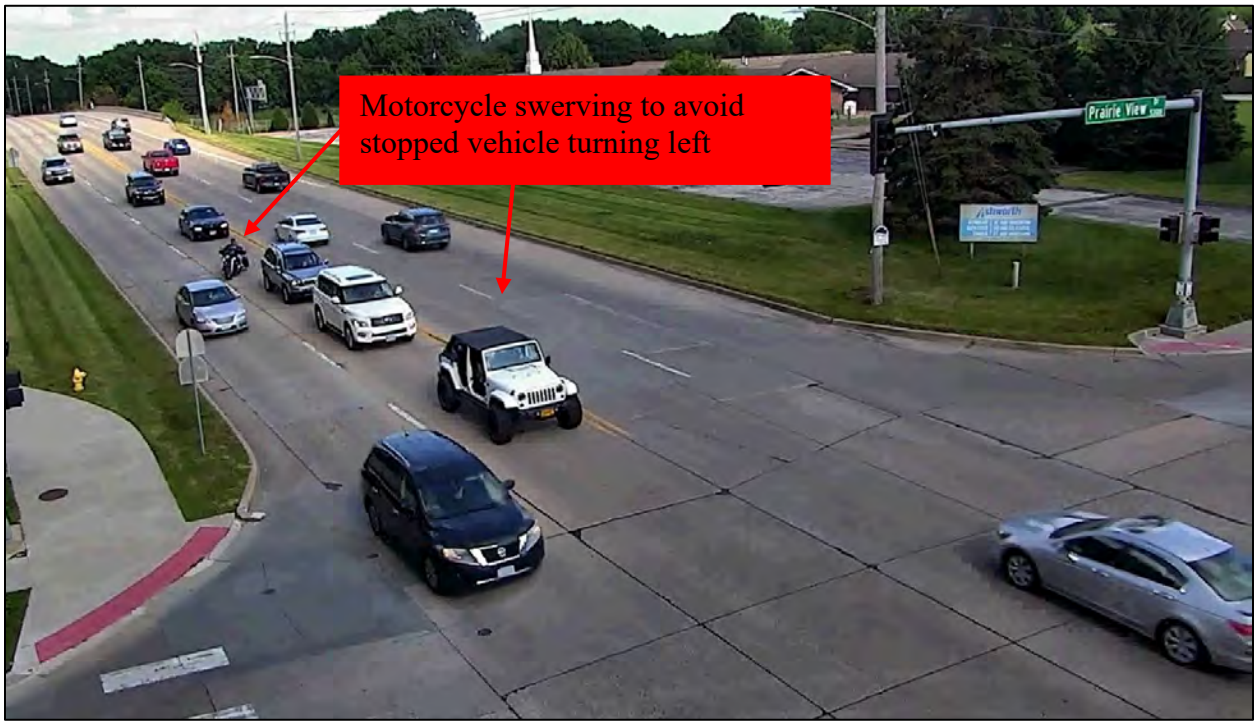
Pictures

Street View, looking east on Ashworth Road

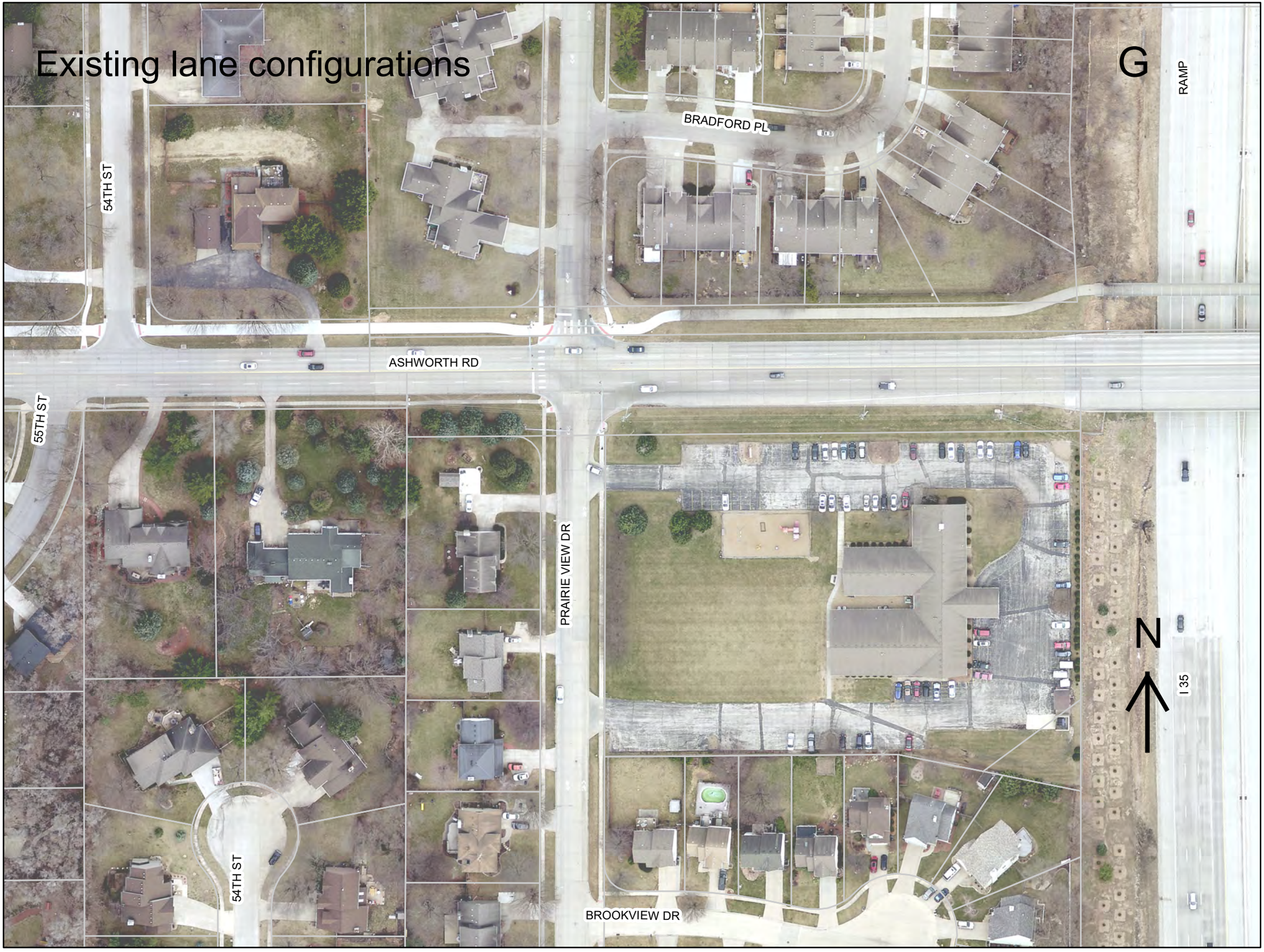
Street View, looking west on Ashworth Road

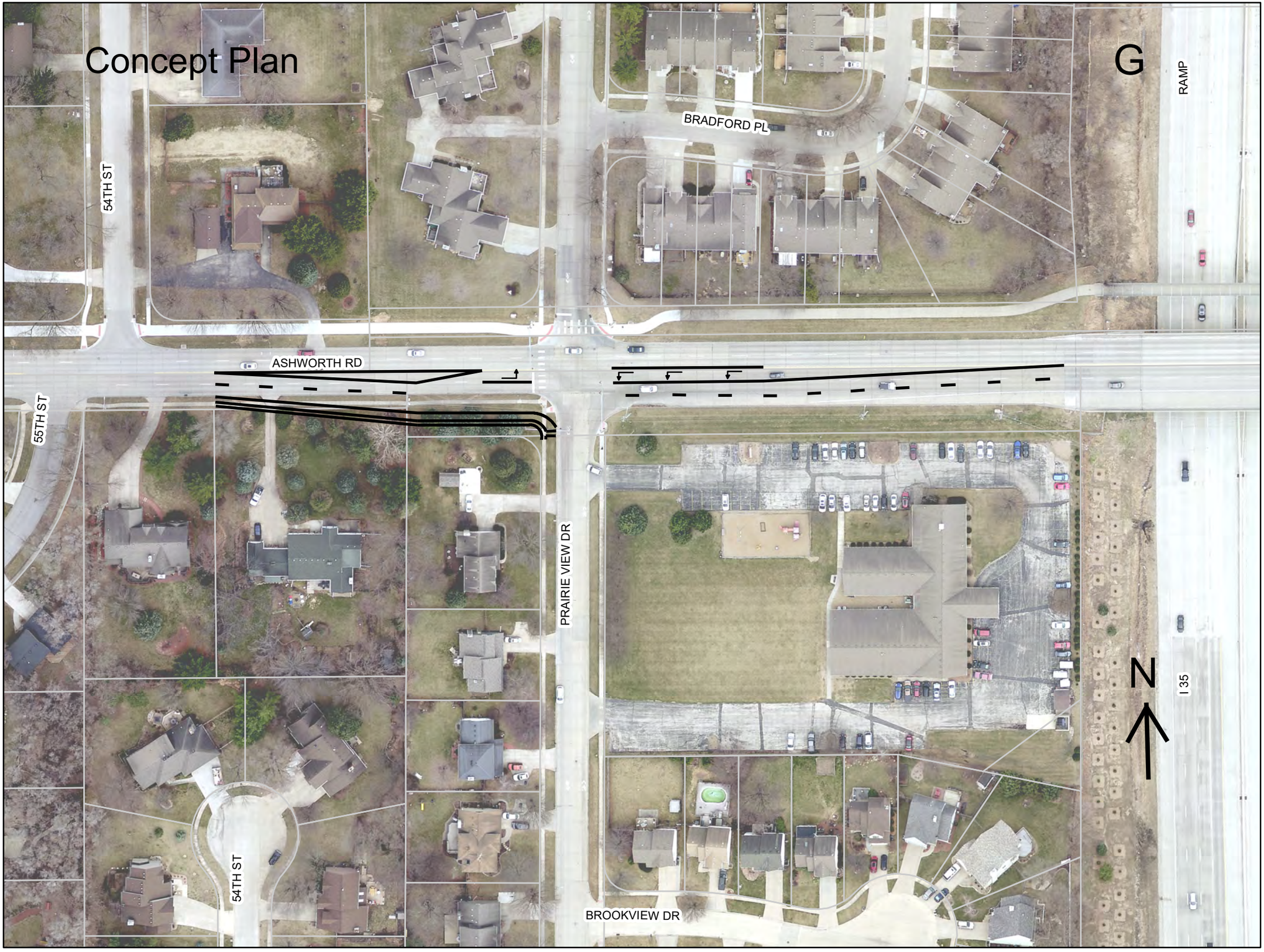
Traffic Camera Views – Looking east on Ashworth Road – 07/02/20



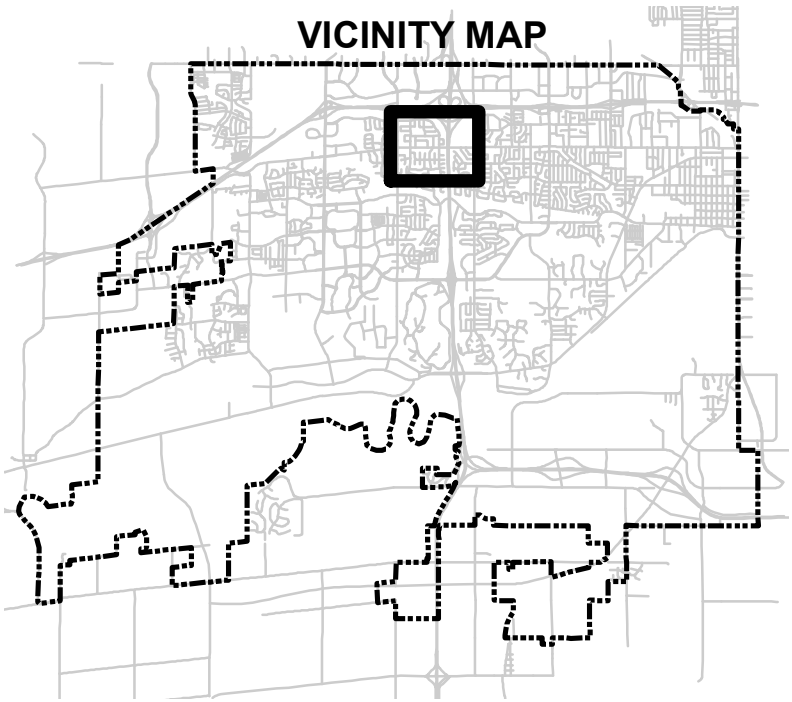


Traffic Camera Views – Looking east on Ashworth Road – 07/02/20


Existing lane configurations
G
RAMP
BRADFORD PL
54TH ST
ASHWORTH RD
55TH ST
PRAIRIE VIEW DR
54TH ST
BROOKVIEW DR
N
I 35


Concept Plan
G
RAMP
BRADFORD PL
54TH ST
ASHWORTH RD
55TH ST
PRAIRIE VIEW DR
54TH ST
BROOKVIEW DR
N
I 35

VICINITY MAP



LEGEND

PROJECT LOCATION

N
W E
S

THE CITY OF WEST DES MOINES

PROJECT:

Intersection Improvements - Prairie View Dr & Ashworth Rd

LOCATION: **Exhibit "A"**

DRAWN BY: TKA	DATE: 7/20/2020	PROJECT NUMBER/NAME: 0510-041-2020	SHT. 1 of 1

Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

Crash Severity	20
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	3
Property Damage Only	16

Injury Status Summary	4
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	3
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	95,750.00
Average (per crash dollars):	4,787.50
Total Vehicles:	39.00
Average (per crash):	1.95
Total Occupants:	72.00
Average (per crash):	3.60

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.20
Major Injuries/Crash:	0.05
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.15

Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

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	0	0	0	0	1	1	0	0	1	0	0	0	0	3
Monday	0	0	0	1	0	0	0	1	3	0	0	0	0	5
Tuesday	0	0	0	0	0	0	1	1	0	1	0	0	0	3
Wednesday	0	0	0	0	0	0	1	0	0	1	0	0	0	2
Thursday	0	0	0	0	1	0	0	0	2	0	0	0	0	3
Friday	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Saturday	0	0	0	0	0	0	1	0	1	1	0	0	0	3
Total	0	0	0	1	2	1	3	2	7	4	0	0	0	20

Month	20
January	3
February	3
March	1
April	1
May	0
June	3
July	1
August	2
September	2
October	3
November	1
December	0
Not reported	0

Lighting	20
Daylight	16
Darkness	4
Morning Twilight (dawn 30 minutes after sunri...	0
Evening Twilight (dusk 30 minutes before suns...	0
Unknown	0

Weather Conditions	20
Clear	14
Cloudy	5
Fog, smoke, smog	0
Freezing rain/drizzle	0
Rain	0
Sleet, hail	1
Snow	0
Blowing snow	0
Severe winds	0
Blowing sand, soil, dirt	0
Not reported	0
Other	0
Unknown	0

Contributing Circumstance - Environment	20
None apparent	18
Weather conditions	1
Visual obstruction	0
Non-motorist action	0
Glare	1
Animal in roadway	0
Severe crosswind	0
Not reported	0
Other	0
Unknown	0

Light Condition	20
Daylight	13
Dusk	3
Dawn	0
Dark - roadway lighted	4
Dark - roadway not lighted	0
Dark - unknown roadway lighting	0
Unknown	0
Not reported	0

Surface Conditions	20
Dry	17
Wet	2
Ice/frost	0
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

Major Cause			20
Animal	0	Ran traffic signal	1
Ran stop sign	0	Failed to yield to emergency vehicle	1
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	8	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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...	3
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	2
Unknown	1	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

Manner of Crash Collision	20
Non-collision (single vehicle)	1
Head-on (front to front)	2
Rear-end (front to rear)	5
Angle, oncoming left turn	5
Broadside (front to side)	3
Sideswipe, same direction	3
Sideswipe, opposite direction	1
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Location of First Harmful Event	20
On roadway	19
Shoulder	0
Median	0
Roadside	0
Gore	0
Outside trafficway	1
In parking lane/zone	0
Continuous left turn lane	0
Separator	0
Not reported	0
Other	0
Unknown	0

Event Summary - Non-Collision **Total Vehicles: 39**

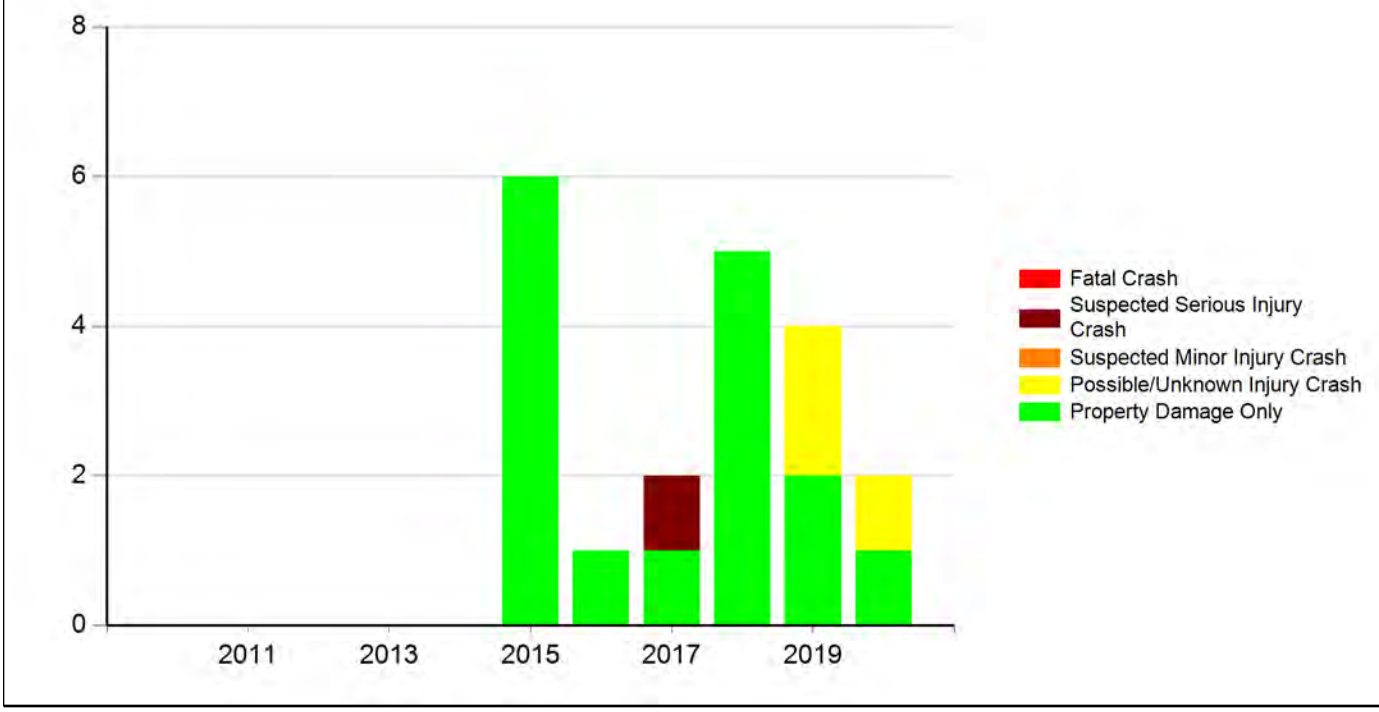
First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Overturn/rollover
0	0	0	0	0	0	Jackknife
0	0	0	0	0	0	Non-contact vehicle (phantom)
0	0	0	0	0	0	Vehicle went airborne
0	0	0	0	0	0	Fell/jumped from vehicle

Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	6	6
2016	0	0	0	0	1	1
2017	0	1	0	0	1	2
2018	0	0	0	0	5	5
2019	0	0	0	2	2	4
2020	0	0	0	1	1	2
Total	0	1	0	3	16	20

Severity/Year



Traffic Volume Data

Iowa DOT Annual Average Daily Traffic (AADT) Counts (Source: Iowa DOT website)

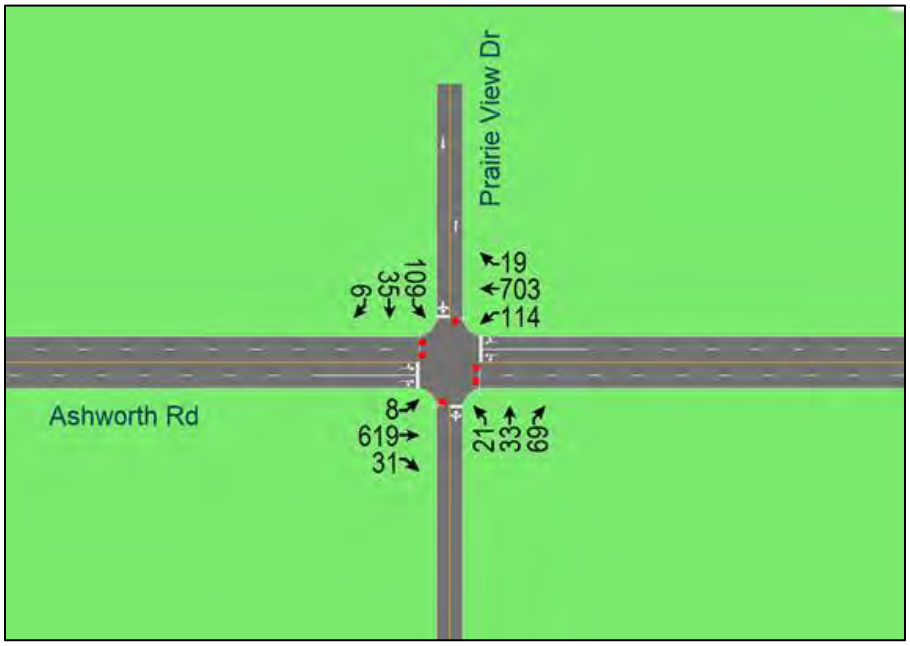
2016 .....14,200 vehicles per day east of Prairie View Dr

Weekday PM peak hour turn counts collected manually, May 2018

PM peak hour
4:30 PM - 5:30 PM
May 8, 2018 - partly sunny, 80 deg.

Prairie View & Ashworth

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:30-4:45	6	7	17	21	8	3	2	139	6	32	184	8
4:45-5:00	4	3	11	33	6	1	2	157	4	23	155	1
5:00-5:15	5	14	21	31	15	0	1	169	9	29	178	3
5:15-5:30	6	9	20	24	6	2	3	154	12	30	186	7
Total	21	33	69	109	35	6	8	619	31	114	703	19
PHF	0.88	0.59	0.82	0.83	0.58	0.50	0.67	0.92	0.65	0.89	0.94	0.59



Traffic Signal Modifications

The existing traffic signal at Ashworth and Prairie View Dr currently operates as a 2-phase signal with permissive-only phasing. With the proposed project adding dedicated eastbound and westbound left-turn lanes, the phasing is planned to be updated to protected/permissive phasing with a flashing yellow arrow. The flashing yellow arrow would also give City traffic engineers the ability to run as protected-only during the peak time periods if left-turn crashes become an issue in the future.

Benefit/Cost Ratio

An estimated service life improvement of 15 years was selected for adding turning lanes at intersections, according to the information provided. Based on a review of data on the *Crash Modifications Factors Clearinghouse* website, the following crash reduction factors were applied:

Countermeasure, CRF, and Reference

SI-41 Install Left-Turn Lane on Major Approach when Warranted – Turning north onto Prairie View Dr from Ashworth Rd.

CRF (%) = 25

SI-41 Install Left-Turn Lane on Major Approach when Warranted – Turning South onto Prairie View Dr from Ashworth Rd.

CRF (%) = 25

As calculated in the provided spreadsheet calculator, the Cumulative CRF = 43.75

CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))						
or enter the individual values into this calculator:						
Enter up to 5 CRFs:	25	25				
Cumulative CRF =	43.75					

A projected traffic growth of 2% was used to represent background traffic growth as the western area of West Des Moines develops.

The Benefit/Cost ratio on the following page shows that the safety benefits of the project outweigh the costs.

L

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Eric Petersen Date Prepared:

Intersection: Prairie View Drive & Ashworth Road

Improvement

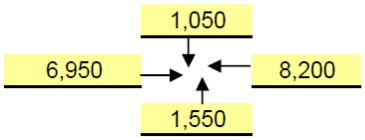
Proposed Improvement(s): Widening Ashworth Road to the South on the west side of Prarie View Dr to accommodate a left-turn lane. Also, adding a left-turn lane to Ashworth on the east side of Prairie View Dr.

$ 280,900	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	44	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 280,900	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: West Des Moines Manual Peak Hour Count May-18 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



6,478,750 Current Annual Entering Veh., **AEV** = DEV * 365

23,889 veh / day, Final Year DEV, **FDEV**

112.04 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$

2.0% Projected Traffic Growth (0%-10%), **G**

17,750 Current Daily Entering Vehicles, **DEV**

Crash Data

2015 First full year --> 2019 Last full year 5.2 years, Time Period, **T**

2 Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
6	Injury Crashes	0	Minor Injuries @	$65,000	$ -
		3	Possible Injuries @	$35,000	$ 105,000
16	Property Damage Only		(assumed cost per crash)	$7,400	$ 162,800
		-OR-	enter all Property Costs of all crashes:		
22	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 592,800

4.26	Current Crashes / Year, **AA** = TA / T	0.66	Crashes / MEV, Crash Rate, **CR**
$ 26,945	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
73.6	Total Expected Crashes, **TECR** = CR x TMEV	$ 634,204	Present Value of Avoided Crashes, **BENEFIT**
1.86	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 50,197	Crash Costs Avoided in First Year, AAR x AVC		
32.2	Total Avoided Crashes, TECR x CRF/ 100		

$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$

Benefit / Cost Ratio

Benefit : Cost = $634,204 : $280,900 = **2.26** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 07/20/2020

Location / Title of Project: John Deere Improvements

Applicant: Dubuque County

Contact Person: Anthony Bardgett Title: County Engineer

Complete Mailing Address: Dubuque County West Campus, 1225 Seippel Rd
Dubuque, IA 52002

Phone: 563-557-7283 (Area Code) E-Mail: Anthony.Bardgett@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	$ 5,236,610
Total Project Cost	$ 6,815,028
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 _A Site Safety Assessment is conducted by Iowa Local Technical Assistance Program (LTAP). The County hire IIW consultant to do an Engineering study. the Assessment Study and Engineering Study are provided in the Appendix.

☐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. 20-177

WHEREAS, the increasing growth of truck traffic, along with operational and safety concerns, along the South John Deere Rd from Peru Rd to John Deere Main entrance and West John Deere Road from South John Deere Rd to US 52 in Dubuque County could be improved by realign and signalize/roundabout W. John Deere Road and the South Parking Lot Drive, adding a southbound lane from W. John Deere Road to south of Peru Road, building turn lane improvements at the Peru Road and making geometric improvements at US 52/ West John Deere road intersection; and

WHEREAS, Dubuque County has determined that improvements recommended by the Traffic Safety Assessment and Engineering Study, will improve traffic flow; and

WHEREAS, Dubuque County is seeking the necessary funding for project implementation, and upon completion, in cooperation with the Iowa Department of Transportation, be responsible for adequately maintaining and operating the project for public use during the project's useful life.

THEREFORE BE IT RESOLVED that the Board of Supervisors of Dubuque County, Iowa hereby files this grant application for funds through the Traffic Safety Improvement Program to fund John Deere improvement.

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

Existing Conditions

Access to the John Deere Dubuque Works is impeded by poorly functioning roadway where workers and tractor trailers must navigate through the inadequate, two-lane S. John Deere Road. From U.S. Highway 52/Iowa Highway 3, W. John Deere Road provides deficient access to the manufacturing facility. The over-capacity W. John Deere Road presents greater difficulty, with dangerous intersections, obstructed sight lines, and risks to pedestrians. The Level of Service (LOS) on S. John Deere Road during the manufacturing plant's three shift changes is commonly at "F." These conditions will worsen as John Deere plans to expand in the near-term with 550 new production and 100 more salaried jobs.

Geometry of the Corridor and Issues

The two corridors South John Deere from Peru Rd to John Deere Main entrance and West John Deere from South John Deere to US 52 can be divided into four locations where improvements are recommended:

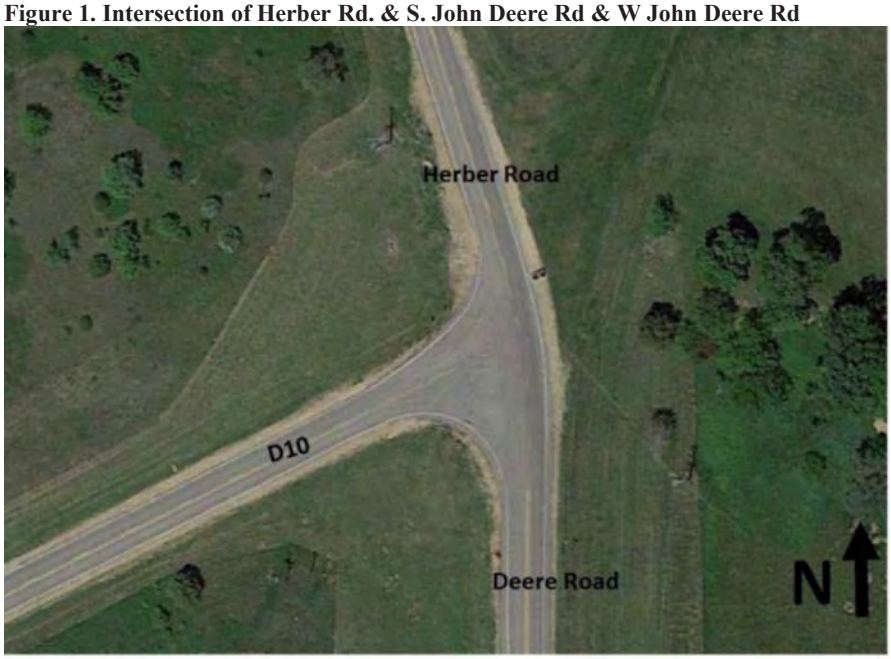
- W. John Deere Road and S. John Deere Road/Herber Road
- S. John Deere Road and South Lot Entrance
- S. John Deere Road and Peru Road
- W. John Deere Road and US 52/IA 3

W. John Deere Road and S. John Deere Road/Herber Road

S. John Deere Road/Herber Road is a north-south roadway, while W. John Deere Road (D10) is a west-directional roadway. Formerly, there was an "east" approach to this intersection, which consisted of a parking lot entrance running northeast from the intersection. This was removed in approximately 2014, and the intersection took on a "T" configuration. The roadways meet at a slight angle, and Herber Road curves slightly north to northwest north of the intersection. The west approach of W. John Deere Road (D10) is stop-controlled. The traffic counts on the west, north, and south approaches of this intersection are approximately 1,227, 4,236, and 4,480 aadt, respectively (2018 data).

The speed limit on Herber Road/Deere Road is 45 mph, while the speed limit on W. John Deere Rd (D10) is 55 mph. The average speeds west, north and south legs of the intersection were 35.5 mph, 41 mph, and 46.5 mph, respectively (2018 data). Figure 1 shows an aerial photo of the intersection.

Figure 1. Intersection of Herber Rd. & S. John Deere Rd & W John Deere Rd



Crash data was collected for the years 2010 through 2019. A total of 13 crashes occurred at this intersection over that time period. Prior to the 2014 reconstruction, six crashes occurred, while seven crashes occurred after the reconstruction. Three crashes were minor injury, seven were property damage only, and one was possible/unknown injury. Ten of the crashes occurred during weekdays, occurring throughout the day. Six crashes involved some form of failure to yield the right of way, one involved an animal, one involved excessive speed, one involved driving too fast for conditions, one involved an improper turn, one was run off the road right, and one was run off the road left. Six crashes involved multiple vehicles. Images from the intersection are shown in Figure 2, Figure 3, and Figure 4.

Figure 2. W. John Deere Rd.

Figure 3. Herber Rd.

Figure 4. S John Deere Rd.

S. John Deere Road and South Lot Entrance

S John Deere Road is a north-south roadway, while the South Lot Entrance is an east-directional roadway. The roadways meet at approximately a right angle. The east approach of the South Lot Entrance is stop-controlled. The traffic counts on the east, north, and south approaches of this intersection are approximately 1,802, 4,369, and 5,682 aadt, respectively (2018 data). The speed limit on S. John Deere Road is 45 mph, while the speed limit for the South Lot Entrance is 25 mph. The average speeds east, north and south legs of the intersection were 30.5 mph, 46.5 mph, and 47

mph, respectively (2018 data). One crash occurred at this intersection between 2010 and 2019. The crash in 2019 and it is a property damage accident. Figure 5 shows an aerial photo of the intersection, while images from the intersection are shown in Figure 6, Figure 7, and Figure 8.

Figure 5. Intersection of S John Deere Rd. & South Lot Entrance

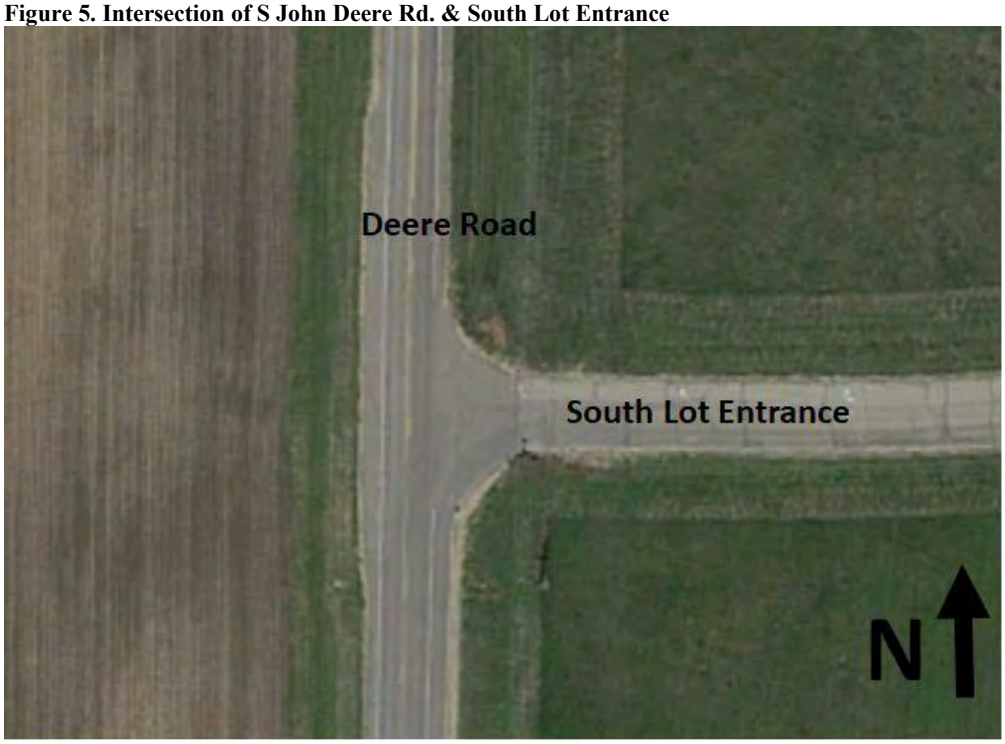


Figure 6. South Lot entrance Westbound

Figure 7. S John Deere Rd. Northbound

Figure 8. S John Deere Rd. Southbound

S. John Deere Road and Peru Road

S. John Deere Road is a north-south roadway, while Peru Road is an east-directional roadway. The roadways meet at a skewed angle, with Peru Road entering the intersection in a southeast to northwest direction. The east approach of Peru Road is stop-controlled. Peru Road is the route taken by trucks when picking up completed machinery for shipment, which translates into a number of heavy loads passing through this intersection. The traffic counts on the east, north, and south approaches of this intersection are approximately 1,863, 5,841, and 5,138 aadt, respectively (2018 data). The speed limit on Deere Road is 50 mph, while the speed limit on Peru Road is 45 mph. The average speeds east, north and south legs of the intersection were 38 mph, 48.5 mph, and 47.5 mph, respectively (2018 data). Figure 9 shows an aerial photo of the intersection.

Figure 9.Intersection of S. John Deere Rd. and Peru Rd.

Crash data was collected for the years 2010 through 2019. Seven crashes occurred at this intersection over that time period. Where three of them occurred in 2019. Four crashes were property damage only, and three were possible/unknown injury. The crashes occurred both during daylight hours under dry conditions. One crash was characterized as run off the road straight, while the other was attributed to following too closely. One crash was single vehicle, while the other involved two vehicles. Interestingly, despite all of the truck traffic that passes through this intersection (including slow turning movements), none of the crashes involved a truck. Images from the intersection are shown in Figure 10, Figure 11, and Figure 12.

Figure 10. Peru Rd. Westbound

Figure 11. S John Deere Rd. Southbound

Figure 12. S. John Deere Rd. Northbound

W. John Deere Rd. and US 52/ IA 3

W. John Deere Road is an east-west roadway, while US 52/IA 3 is a north-south roadway. The intersection is a four-legged intersection. The east and west approach of W. John Deere Rd is stop-controlled. US 52/IA 3 is a national highway route taken by trucks. This corridor carries 429 truck per day. The traffic counts on the east, north, west and south approaches of this intersection are approximately 1,340, 6,400, 70 and 5,700 aadt, respectively (2018 data). The speed limit on Deere Road is 50 mph, while the speed limit on Peru Road is 45 mph. The average speeds east, north and south legs of the intersection were 55 mph, 55 mph, 30 mph and 55 mph, respectively (2018 data).

Crash data was collected for the years 2010 through 2019. Seven crashes occurred at this intersection over that time period. Four crashes were property damage only, and three were minor injury. The crashes occurred both during daylight hours under dry conditions. One crash was characterized as run off the road straight, while the other was attributed to running stop sign, while the other involved two vehicles. Interestingly, despite all of the truck traffic that passes through this intersection (including slow turning movements), none of the crashes involved a truck.

Improvements

Due to rising concerns at the John Deere facility, Dubuque County and the City of Dubuque commissioned an Intersection Site Safety Assessment in 2018 to analyze potential risks. The Intersection Site Safety Assessment is conducted through the Iowa Local Technical Assistance Program (LTAP). The existing traffic volumes, delays, geometrics, and other data were studied to identify improvements in the corridor. The recommendations included:

- Realign and signalize W. John Deere Road and the South Parking Lot Drive to create a four-legged intersection with S. John Deere Road, with consideration to large truck turning movements and pedestrian crossing provisions;
- Add a southbound lane from W. John Deere Road to south of Peru Road to accommodate through traffic and provide a climbing lane for large, slow vehicles heading south from Peru Road toward the Northwest Arterial, U.S. Route 52, and Iowa Highway 3;
- Build turn lane improvements at the Peru Road and S. John Deere Road intersection, with consideration to large truck turning movements and provisions for future signalization; and
- Make geometric improvements, including adding turn lanes and signalization of the intersection of U.S. Route 52/Iowa Highway 3 and W. John Deere Road.

Dubuque County then hired IIW to do an engineering study to address issues listed in Safety Assessment and come up with a cost estimate.

Traffic

With the growth of the John Deere Facility, the daily traffic volume entering the intersection has increased. Dubuque County in partnership with the City of Dubuque conducted special traffic counts at the project location in 2018. Staff also compared these counts with the Iowa DOT Annual Average Daily Traffic (AADT) maps for Dubuque County found. Over all 5,800 vehicles use South John Deere Rd. from Peru Rd to John Deere Main entrance parking and 1,200 vehicles use West John Deere Rd. from South John Deere Rd. to US 52.

Even though the number of vehicles of vehicles using these corridors on daily bases are less but the amount of truck traffic entering these intersections is high. It is estimated that the amount of truck traffic is 10-12% of the overall traffic counts on these corridors. A review of historical AADT data for the intersection is shown in Table 1.

Table 1. Historical Corridor AADT

Corridor	Details		Length in Miles	Traffic		
	From	To		2013	2017	2018
South John Deere Rd	Peru Rd	John Deere Main Parking	0.54	4,770	4,770	5,841
West John Deere Rd	South John Deere Rd	US 52	1	900	1,340	1,227
		TOTAL	**1.54**	**5670**	**6,110**	**7,068**

The increase in traffic volumes over time shown in the above table equates to an approximate 11% on South John Deere corridor, 20 % annual growth West John Deere corridor when traffic volumes from the year 2013 to 2018 are compared. This increase in traffic through the intersections contributes to the overall safety concerns.

Future Traffic Volumes

Staff assumed a 1% annual growth in traffic for the traffic by taking onto consideration future improvements in and around the project area. Table 2 provides future corridor AADT.

Table 2. Intersection AADT

Corridor	Details		Length in Miles	Traffic			
	From	To		2013	2017	2018	2040
South John Deere Rd	Peru Rd	John Deere Main Parking	0.54	4,770	4,770	5,841	7,127
West John Deere Rd	South John Deere Rd	US 52	1	900	1,340	1,227	1,497
		TOTAL	**1.54**	**5,670**	**6,110**	**7,068**	**8,624**

Crashes

Crash data for the intersection was compiled using the Iowa Crash Analysis Tool (ICAT) online data by the Iowa DOT. There has been a total of 33 crashes on these corridors over the last 10 years, an average of 3.3 crashes per year from 2010 through 2019. While none of these crashes have involved fatalities, approximately 36.4% (12 of the 33 crashes) have resulted in personal injuries and 63.6% are property damage.

The major cause of accidents at this location is the curvature South John Deere/West John Deere intersection, turn radius for trucks at South John Deere/Peru Rd. intersection, lack of acceleration lane for traffic coming out of john Deere parking lot during peak time and site distance at West John Deere /US 52 intersection. Table 3 below provides the crash history for these corridors.

Table 3 Corridor Crash History

Corridor	Details		Length in Miles	CRASHES (2010-2019)					
	From	To		Fatalities	Major Injuries	Minor Injuries	Possible / Unknown	Property Damage Only	Total
South John Deere Rd	Peru Rd	John Deere Main Parking	0.54	0	0	3	6	16	25
West John Deere Rd	South John Deere Rd	US 52	1	0	0	3	0	5	8
		TOTAL	**1.54**	**0**	**0**	**6**	**6**	**21**	**33**

C. Itemized Breakdown of All Costs

The overall cost of improvements is estimated to be $6.8 million of which the safety eligible improvements $5.23 million. Dubuque County was able to secure $5.4 million in Better Utilizing Investments to Leverage Development (BUILD) grant. Table below provides cost and funding source for each line item.

Table 4. Cost Breakdowns and Funding Sources

Description	**Cost**	**BUILD Request**	**Non-Federal Match**	**Safety funds eligibility**
FINAL DESIGN	$800,000	$640,000	$160,000	Not eligible
JOHN DEERE & HWY 52 – SIGNAL & TURN LANES	$600,000	$480,000	$120,000	Eligible
JOHN DEERE & HERBER (4-WAY INTERSECTION)– SIGNAL AND TURN LANES	$500,000	$400,000	$100,000	Eligible
PERU AND JOHN DEERE RD CLIMBING LANE-EXCAVATION AND PAVEMENT	$600,000	$480,000	$120,000	Eligible
REALIGNED PORTION OF W. JOHN DEERE ROAD	$700,000	$560,000	$140,000	Eligible
ADDITIONAL SOUTHBOUND LANE ON JOHN DEERE ROAD	$1,300,000	$1,040,000	$260,000	Eligible
PERU ROAD IMPROVEMENTS-(RADIUS IMPROVEMENTS AND RIGHT TURN LANE)	$300,000	$240,000	$60,000	Eligible
PAVING - TRAIL	$556,390	$445,112	$111,278	Not eligible
TRAFFIC AND OPERATIONS'	$500,000	$400,000	$100,000	Eligible
Contingency	$958,638	$766,911	$191,728	Eligible
TOTAL	**$6,815,028**	**$5,452,022**	**$1,363,006**	
	100.00%	**80.00%**	**20.00%**	

Description	**Total Cost**	**Eligible for TSIP**
Total Project Cost	**$6,815,028**	**$5,236,610**
BUILD Grant Funding	**$5,452,022**	**$4,189,288**
Non-BUILD grant Funding	**$1,363,006**	**$1,047,322**

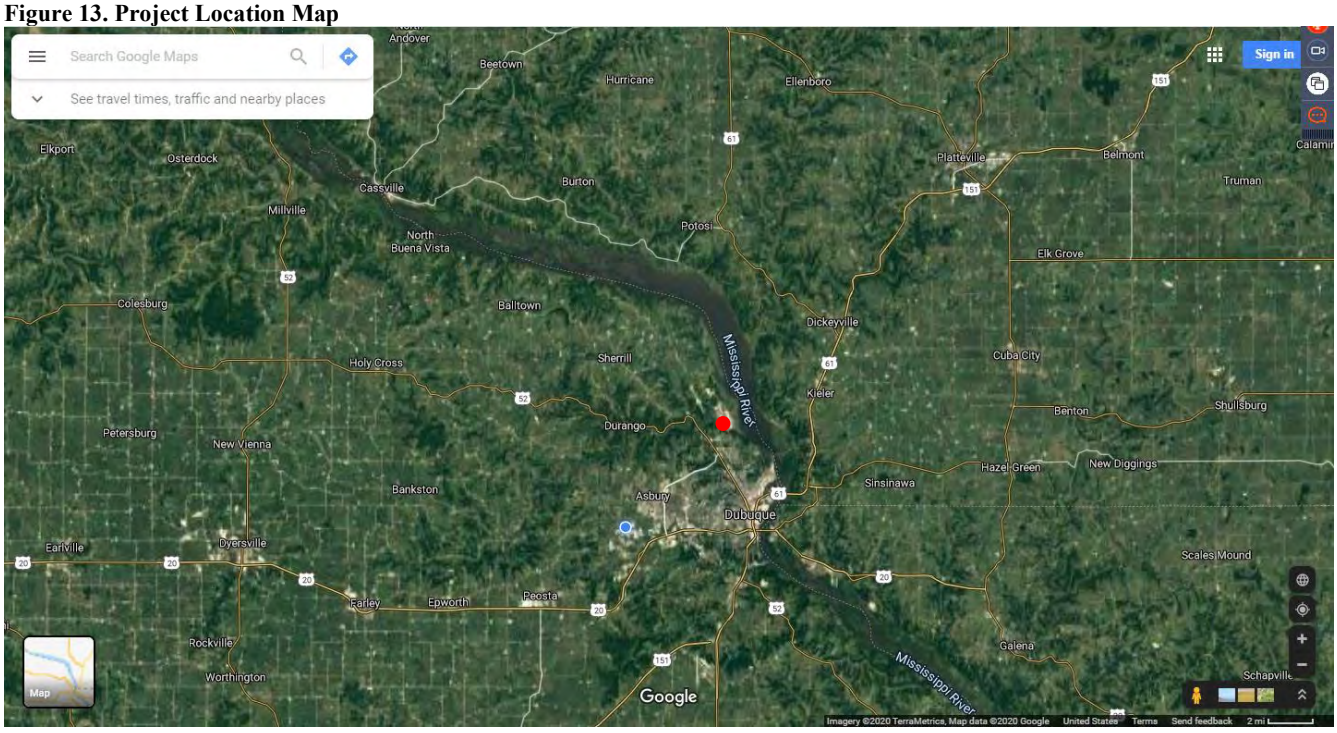
D. TIME SCHEDULE

Description	Date
Grant Application	August 2020
Notice of Funding	December 2020
Approval of Agreement	July 2021
Construction Plan Preparation	December 2020-April 2021
Plans Approval	May 2021
Advertise for Bids	June 2021
Open Bid & Award Contract	August 2021
Notice to Proceed	September 2021
Construction	October 2021 – November 2022
Project Closeout	December 2022

E. MAP

The intersection of US Highway 67 & 7th Avenue is located in the City of Camanche, within Clinton County, Iowa. The intersection location and surrounding area is shown in Figure 13.

Figure 13. Project Location Map



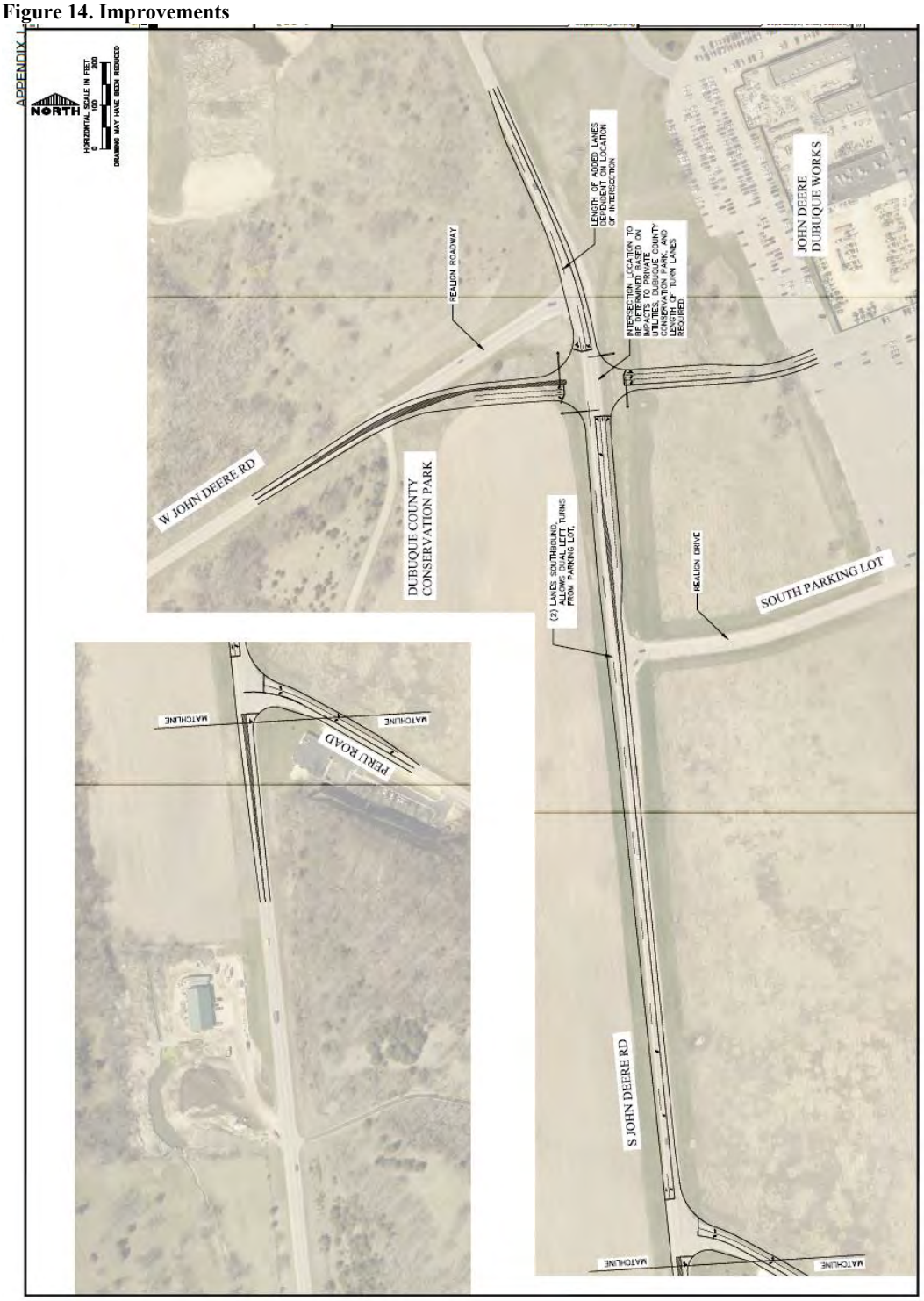
F. COLOR PICTURES

See the narrative section for photos of the project intersections.

G. Plan View

Figure 14 provides recommended improvements at project locations. The County is still assessing to see if a signalized intersection or a roundabout is feasible at S. John Deere/W. John Deere/Herber Rd / South Parking lot.

Figure 14. Improvements



H. AERIAL PHOTOGRAPH

Figure 15. Corridor Aerial Photograph

I. ICAT Crash Summary of Motor Vehicle Accidents

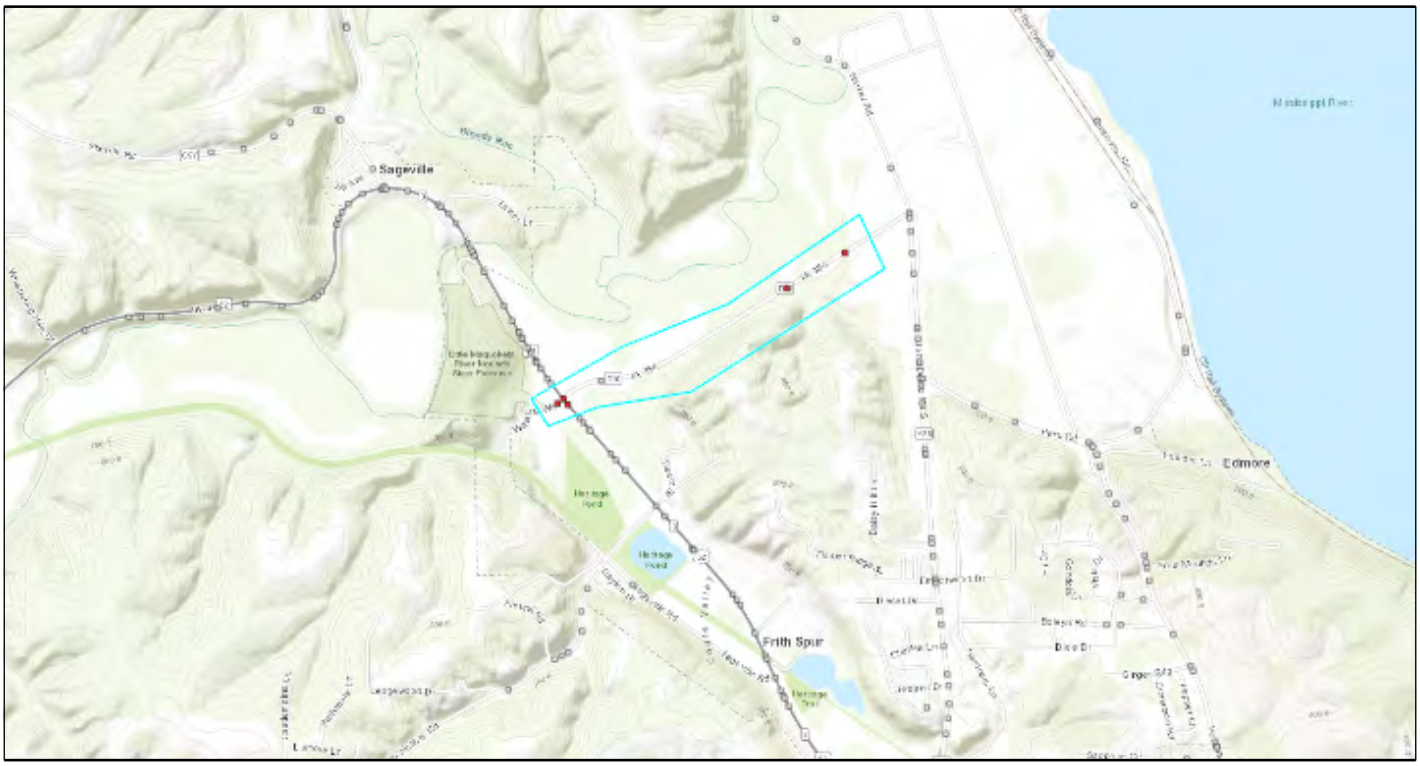
Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Crash Severity	8
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	0
Property Damage Only	7

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	26,500.00
Average (per crash dollars):	3,312.50
Total Vehicles:	9.00
Average (per crash):	1.13
Total Occupants:	11.00
Average (per crash):	1.83

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.38
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.38
Possible/Unknown Injuries/Crash:	0.00



I. ICAT Crash Summary of Motor Vehicle Accidents

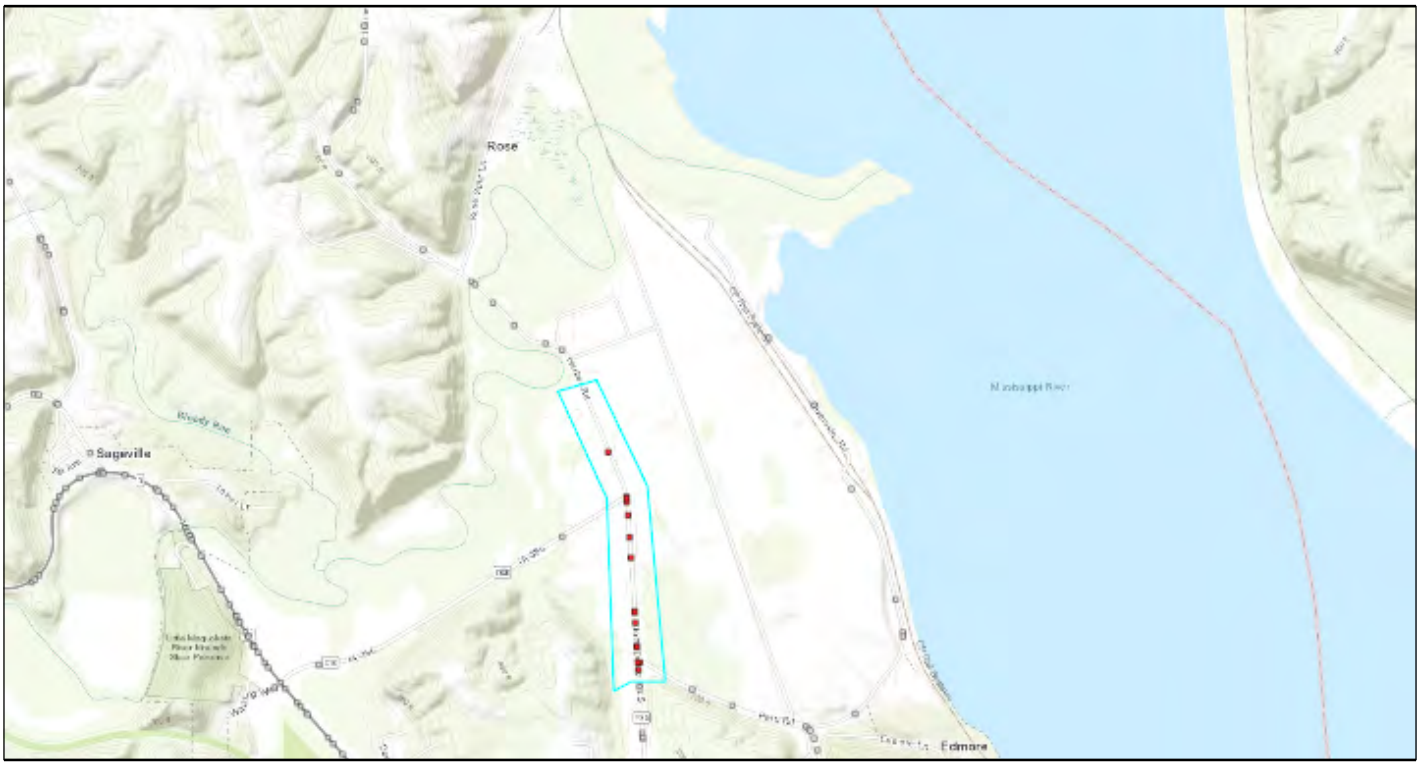
Iowa Crash Analysis Tool
Quick Report
2010-2019

Crash Severity	25
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	6
Property Damage Only	16

Injury Status Summary	10
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	3
Possible (complaint of pain/injury)	7
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	230,650.00
Average (per crash dollars):	9,226.00
Total Vehicles:	37.00
Average (per crash):	1.48
Total Occupants:	41.00
Average (per crash):	1.64

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.40
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.12
Possible/Unknown Injuries/Crash:	0.28



L. Benefit/Cost Ratio

Cmfclearinghouse.org listed several CRFs for adding acceleration lane at Peru Rd. and South John Deere Rd. is 23, converting a non signalized intersection to signalized intersection or a roundabout at South John Deere/West John Deere Rd. is 71.6 and Improving to increase line of site at US 52/West John Deere Rd. is 59. To account for the wide range in values, staff averaged three CRF values that had a quality rating of 3 stars or higher. The cumulative CRF that was use in the Benefit/Cost worksheet came to came to 91.03 and staff used 91.

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Dubuque | Prepared by: ECIA | Date Prepared: Jul 19, 2020

Location: Sotuh John Deere & West John Deere Improvements

Improvement

Proposed Improvement(s): Intersection and road improvements.

$ 500,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	91	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 500,000**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa Department of Transportation | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.54	5,841	
1.00	1,227	
1.54	miles total	

4,381	Current Vehicle Miles / Day, **VM**
5,346	End of Life Veh. Miles / Day
1,599,116	Current Veh. Miles / Year, **AM**
35,210,944	Total Projected Veh. Miles Over Life of Project, **TVMT**

$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
12	Injury Crashes	6	Minor Injuries @	$65,000	$ 390,000
		6	Possible Injuries @	$35,000	$ 210,000
21	Property Damage Only		(assumed cost per crash)	$7,400	$ 244,200
			-OR- enter all Property Costs of all crashes:		
33	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 844,200

3.30	Current Crashes / Year, **AA** = TA / T	**206.4**	Crashes / HMVM, Crash Rate, **CR**
$ 25,582	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
72.7	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 1,134,718**	Present Value of Avoided Crashes, **BENEFIT**
3.00	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 76,822	Crash Costs Avoided in First Year, AAR x AVCR		
66.1	Total Avoided Crashes, TCR x CRF/ 100		

$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$

Benefit / Cost Ratio

Benefit : Cost = $1,134,718 : $500,000 = **2.27** : 1

M. John Deere Letter of Support

Worldwide Construction & Forestry Division
18600 South John Deere Road
Dubuque, IA 52004 USA
Phone: 563.589.6317
Email: StevenJMai@JohnDeere.com

Steven J. Mai
Facility Engineering Supervisor
John Deere Dubuque Works
Construction and Forestry Division

28 July 2020

Re: Strong Support for Traffic Safety Improvement Program for Northwest Arterial/W. John Deere Road BUILD Project

To Whom It May Concern:

I write on behalf of John Deere Dubuque Works to convey our strong support for Dubuque County's Traffic Safety Improvement Program (TSIP) application to the Iowa Department of Transportation (IDOT). Dubuque County seeks matching funds for the already awarded Federal BUILD grant which will rehabilitate the Northwest Arterial (Iowa Highway 32) and reconstruct W. John Deere Road. The project will reduce accidents in the corridor, decrease travel time delays, boost freight mobility, and support the expansion of the John Deere Dubuque Works manufacturing plant. IDOT assistance will help the region to promote economic development and link low-income residents in designated Opportunity Zones (Dubuque County Census Tracts 1 and 5) with one of the largest employers in the area.

John Deere Dubuque Works supports Dubuque County's effort to revitalize the Northwest Arterial/W. John Deere Road corridor because this project is key to enabling capacity, safety, and flow improvements for the population of the area and specifically our business. As the size and quantity of construction and forestry equipment shipped from this facility have increased, the network of roads which support it have not kept pace. The Northwest Arterial/W. John Deere Road corridor is the key roadway for transport of freight and personnel to and from our facility. In addition, John Deere has recently donated 137 acres to create a recreational woodland area located along West John Deere Road and I believe these improvements will be a catalyst for increased recreational traffic to the area.

This project is vital to improve infrastructure condition, address public health and safety, promote connectivity, and facilitate competitiveness. Please give the highest consideration to Dubuque County's application for Traffic Safety Improvements Funding. Thank you very much.

Sincerely,

Steven J. Mai
Facility Engineering Supervisor
John Deere Dubuque Works

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 07/30/2020

Location / Title of Project: US 20 and Thunder Hills Rd Intersection Improvements

Applicant: Dubuque County

Contact Person: Anthony Bardgett Title: County Engineer

Complete Mailing Address: Dubuque County West Campus, 1225 Seippel Rd
Dubuque, IA 52002

Phone: (563) 557-7283 (Area Code) E-Mail: Anthony.Bardgett@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): Iowa DOT District 6

Contact Person: Sam Shea Title: District Planner

Complete Mailing Address: Iowa DOT District 6
5455 Kirkwood Blvd S.W., Cedar Rapids, Iowa 52404

Phone: (319)-364-0235 (Area Code) E-Mail: sam.shea@iowadot.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 327,455
Total Project Cost	$ 327,455
Safety Funds Requested	$ 327,455

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

☒Yes – Explain _Traffic Safety Assessment conducted by Iowa Local Technical Assistance Program (LTAP) Staff .

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. 20-178

WHEREAS, Southbound traffic on Thunder Hills Road coming from the subdivision to the Northwest during the morning commute queuing while waiting to turn left and head East on U.S. 20. This resulted in forming queues and a potential for crashes is risky, crossing and turning movements are attempted due to impatience during the morning peak. Another factor regardless of the time of day is the speeds on U.S. 20 appeared to be higher than the posted 65 mph. The median width at this location is narrow, and no Yield or Stop signs are posted; and

WHEREAS, Dubuque county has determined that improvements recommended by the Traffic Safety Assessment, will improve traffic flow, and reduce the crash risk; and

WHEREAS, Dubuque County in partnership with Iowa Department of Transportation District 6 is seeking the necessary funding for project implementation, and upon completion, the Iowa Department of Transportation District 6 office, will be responsible for adequately maintaining and operating the project for public use during the project's useful life.

THEREFORE BE IT RESOLVED that the Board of Supervisors of Dubuque County, Iowa hereby files this grant application for funds through the Traffic Safety Improvement Program to fund Thunder Hills Road improvement..

Adopted this 10th day of August, 2020.

David J. Baker

David J. Baker, Chair
Dubuque County Board of Supervisors

ATTEST:

Mary J. Habel

Mary J. Habel, Dubuque County Deputy Auditor

July 31, 2020

To: Traffic & Safety Bureau

The Iowa DOT District Six Office supports the addition of the offset right turn lane and acceleration lane at U.S. Hwy 20 and Thunder Hills Road. These improvements are recommended by the June 2020 LTAP review at this intersection.

The District understands that upon completion of construction, maintenance of the new lanes will be the responsibility of the Iowa DOT.

Sincerely,

James. R. Schnoebelen, P. E.
District 6 Engineer

JRS/ss

[319-364-0235] | [jim.schnoebelen@iowadot.us] | www.iowadot.gov

Address:
[5455 Kirkwood Blvd. SW
Cedar Rapids, IA 52404]

B. Narrative

Existing Conditions

Following a request from the East Central Intergovernmental Association (ECIA), on behalf of the Iowa Department of Transportation (DOT) and Dubuque County, the Iowa Local Technical Assistance Program (LTAP) Safety Circuit Rider David Veneziano performed intersection site reviews at this location along U.S. 20. This site is just outside of the city limits of Peosta,

US Highway 20 is a four-lane principal arterial roadway that runs east to west through the study area. To the west, it turns southwest to waterloo, and continues east to the City of Dubuque before crossing east into Illinois. The posted speed limit on this road in the study area is 65 mph for both directions.

Thunder hills is a two-lane local roadway that runs north to south through the study area. The road provides access to residential sub divisions. According to local officials, this region is one of the most growing area in Dubuque county. The posted speed limit on the north leg of the intersection is 50 mph, and the posted speed limit is not know as it is T section.

U.S. 20 and Thunder Hills Road Intersection

The intersection of U.S. 20 and Thunder Hills Road is four-legged, with U.S. 20 as the East-West roadway, and Thunder Hills Road being the North-South roadway. In reality, this is a T-intersection, as the South leg of Thunder Hills Road is a driveway access to two farms located to the East and West. The roadways meet at approximately a 90-degree angle. The approaches on Thunder Hills Road are stop-controlled with Stop signs. The traffic counts on the East, West, and North approaches of this intersection are approximately 19,600, 18,200, and 2,200 vehicles per day (vpd), respectively (2017-2018 count data). Count data for the South leg are not available as this is primarily a driveway access. The speed limit on U.S. 20 is 65 mph, while the North leg of Thunder Hills Road is 50 mph. U.S. 20 is an asphalt pavement, while Thunder Hills Road is concrete. Channelized left turn lanes are on both the East and West legs of U.S. 20. There are also channelized right turn lanes on the East leg of U.S. 20 and the North leg of Thunder Hills Road. Images from the intersection are shown below.

Crash data were collected for the years 2009 through 2020. This data indicated that 23 crashes had occurred at this intersection during that time. This included three minor injury, five possible injury, and 15 PDO crashes. Common crash causes included different forms of failure to yield the right of way (four crashes), animal (eight crashes), crossed centerline (two crashes), driving too fast for conditions (two crashes), followed too close (two crashes), swerving/evasive action (two crashes), lost control (one crash), and unknown (2 crashes). The majority of crashes (21) occurred on a weekday, which again corresponds to commuter traffic from the subdivisions to the northwest of the intersection. Similarly, many crashes (17) occurred between 6:00 a.m. and 8:00 p.m. Five crashes occurred during wet, ice/frost, or snow conditions and, interestingly, the conditions for eight other crashes were not reported. Once again, none of the crashes at this site were related to impairment issues. An overhead image from the intersection is shown below.

ISSUES

The primary concern at this site is Southbound traffic on Thunder Hills Road coming from the subdivision to the Northwest during the morning commute queuing while waiting to turn left and head East on U.S. 20. The drivers either select a gap in Westbound traffic to cross over to the median and stop to wait for a gap in Eastbound traffic to complete a left turn, or wait until a sufficient gap is available from both directions on U.S. 20 before proceeding to make a left turn without stopping in the median. Once again, the result during the morning peak is the formation of queues and the potential for crashes if risky crossing and turning movements are attempted due to impatience. Another factor regardless of the time of day may be that speeds on U.S. 20 appeared to be higher than the posted 65 mph. The median width at this location is narrow, and no Yield or Stop signs are posted.

IMPROVEMENTS

Recommendations from Safety Assessment Study

The traffic safety assessment recommends the following Improvements at this location

- A study could be conducted to determine whether the addition of an acceleration lane for left turning traffic from Southbound Thunder Hills Road to Eastbound U.S. 20 is feasible.
- Long-term, construction of an interchange in combination with a closure of or consolidation with the Cox Springs Road intersection could be pursued.
- The gravel on the pavement of the intersection could be periodically swept off.
- The shoulder in the Northeast quadrant of the intersection (or at least the turning radius) could be paved to reduce gravel bring kicked onto the pavement.
- The runoff erosion East of the crossover in the median could be corrected.
- Intersection warning signs and pennants or flashing beacons could be installed.
- The location of the Do Not Enter signs on the East leg could be reviewed and revised if needed should they present sight distance blockages for vehicles on the South leg.
- The stop bar and edgelines on the North leg could be repainted.
- Stop or Yield signs could be added to the intersection median at the discretion of the DOT.
- Pennants and/or reflective post strips could be added to the Stop signs on the North leg to increase conspicuity. Alternatively, flashing beacons could be added to the signs.
- Speed studies could be conducted to determine whether speeding is an issue at the site. If it is, targeted speed enforcement could be considered.

Proposed Improvements

Dubuque County and Iowa Department of Transportation District 6 are recommending doing the following improvements basing on recommendations provided by safety assessment.

- Extend the existing declaration lane and add six-foot granular shoulder on US 20 west bound lane.

C. ITEMIZED BREAKDOWN OF ALL COSTS

IMPROVEMENTS	PROPOSED	SF
Acceleration	Lane	15,000
	Shoulder	4,800
Deceleration	Lane	5,700
	Shoulder	7,000

ITEMS	Unit	QTY	Unit $$	COST ($$)
Excavation	CY	1955.56	$12	$ 23,466.67
Class 10 Borrow	CY	500.00	$15	$ 7,500.00
10" - PCC Pavement	SY	3200.00	$62	$ 198,400.00
Modified Subbase	CY	1066.67	$40	$ 42,666.67
Granular Shoulder	TON	641.67	$25	$ 16,041.67
Paint Lines	STA	82.74	$57	$ 4,716.18
Pavement Removal	SY	91.11	$10	$ 911.11
Topsoil	CY	524.07	$6	$ 3,144.44
Traffic Control	LS	1.00	$10,000	$ 14,000.00
RCP - 24"	LF	104.00	$82	$ 8,528.00
RCP - 42"	LF	40.00	$202	$ 8,080.00
Excavation	CY	1955.56	$12	$ 23,466.67
Class 10 Borrow	CY	500.00	$15	$ 7,500.00
10" - PCC Pavement	SY	3200.00	$62	$ 198,400.00
Modified Subbase	CY	1066.67	$40	$ 42,666.67
				$ 327,454.74

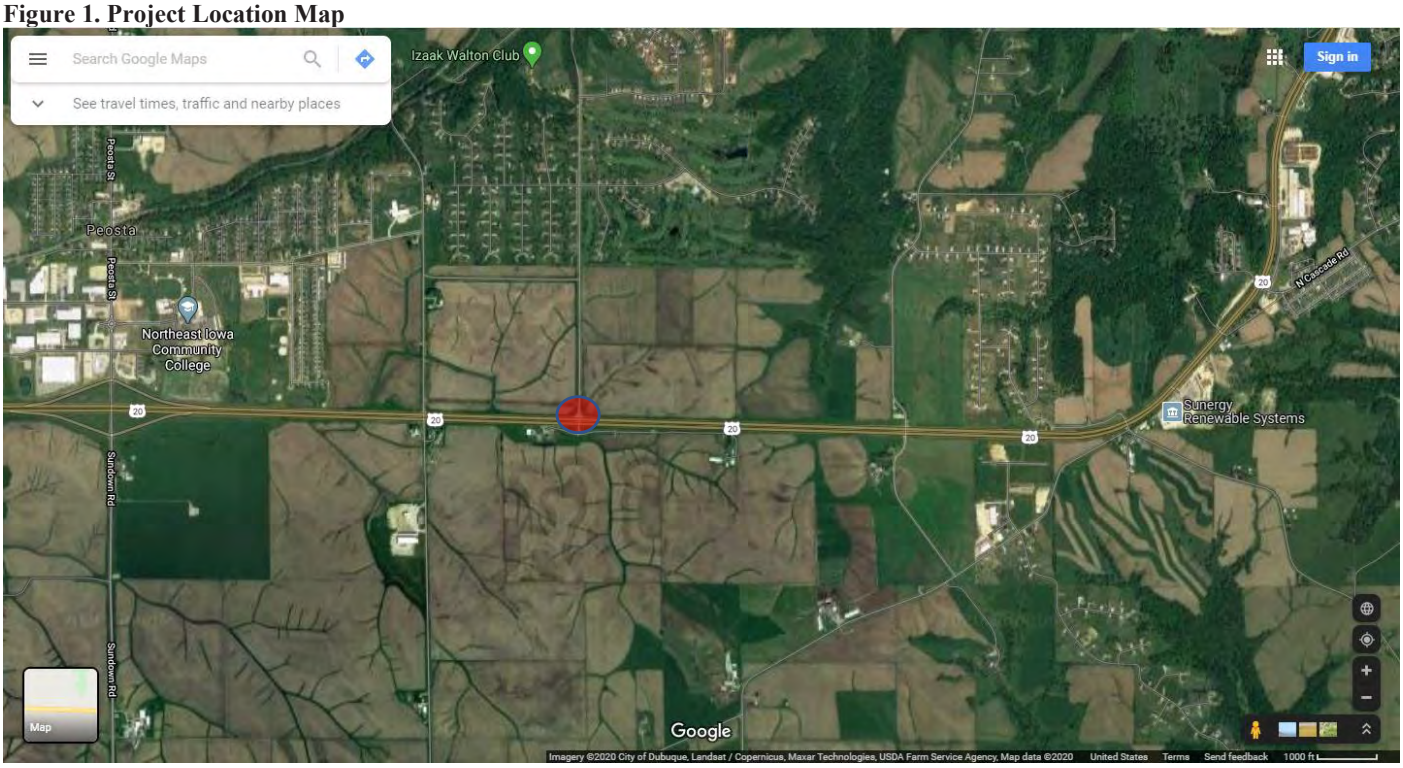
D. TIME SCHEDULE

Description	Date
Grant Application	August 2020
Notice of Funding	December 2020
Approval of Agreement	July 2021
Construction Plan Preparation	December 2020-April 2021
Plans Approval	May 2021
Advertise for Bids	June 2021
Open Bid & Award Contract	August 2021
Notice to Proceed	September 2021
Construction	October 2021 – November 2022
Project Closeout	December 2022

E. MAP

The intersection of US Highway 20 & Thunder hills Road is located in the Dubuque county East of the city of Peosta. The intersection location and surrounding area is shown in Figure 1.

Figure 1. Project Location Map



F. COLOR PICTURES

Figure 2 depicts the study intersection.

Figure 2. U.S. 20 Eastbound Approach

Figure 3. Thunder Hills Rd Northbound Approach

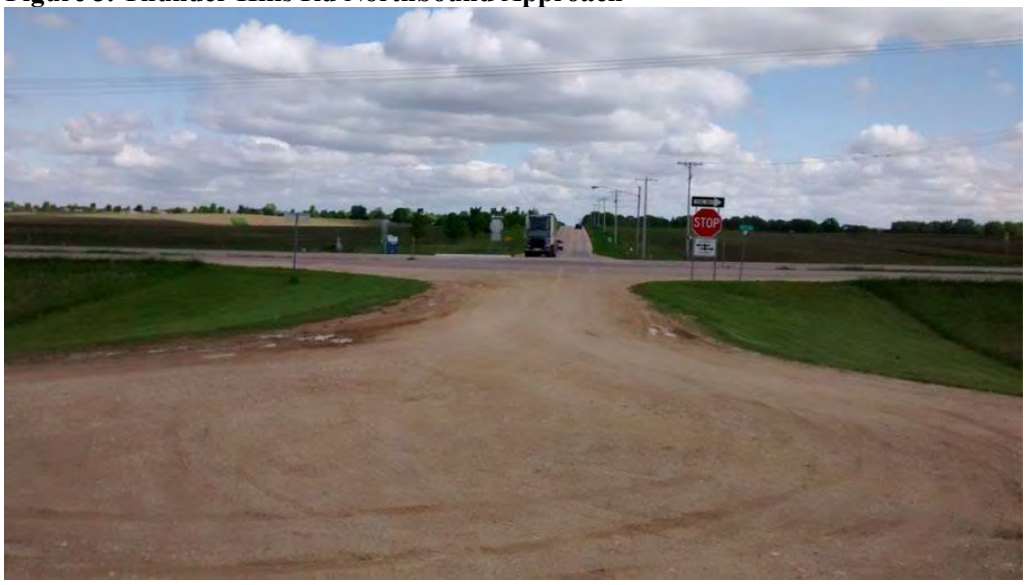
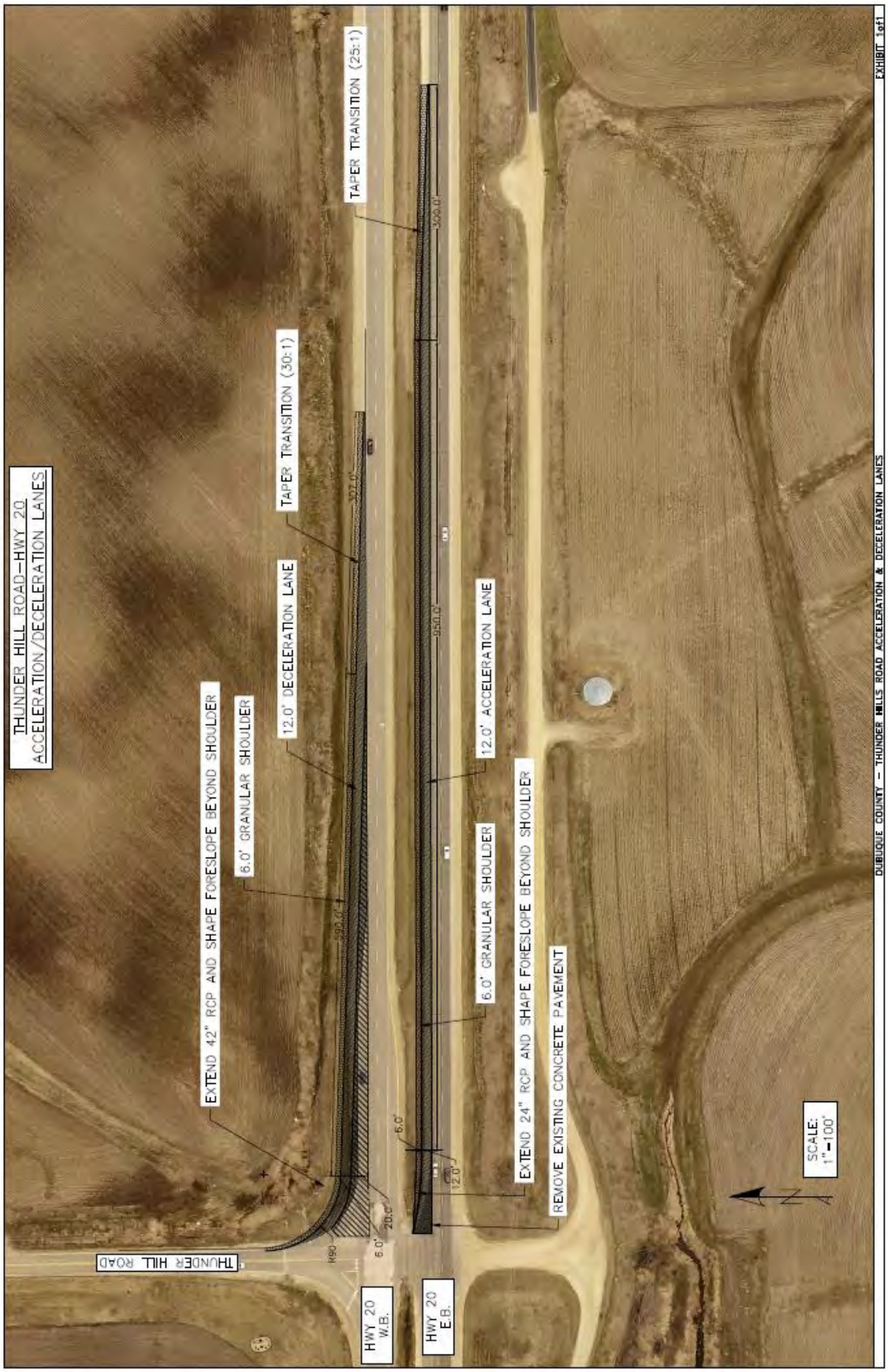


Figure 4. U.S. 20 Westbound Approach

Figure 5. U.S. 20 Westbound Approach

G. PLAN VIEW

Figure 6. Improvements



H. AERIAL PHOTOGRAPH

Figure 3. Intersection Aerial Photograph

I. ICAT Summary of Motor Vehicle Accidents

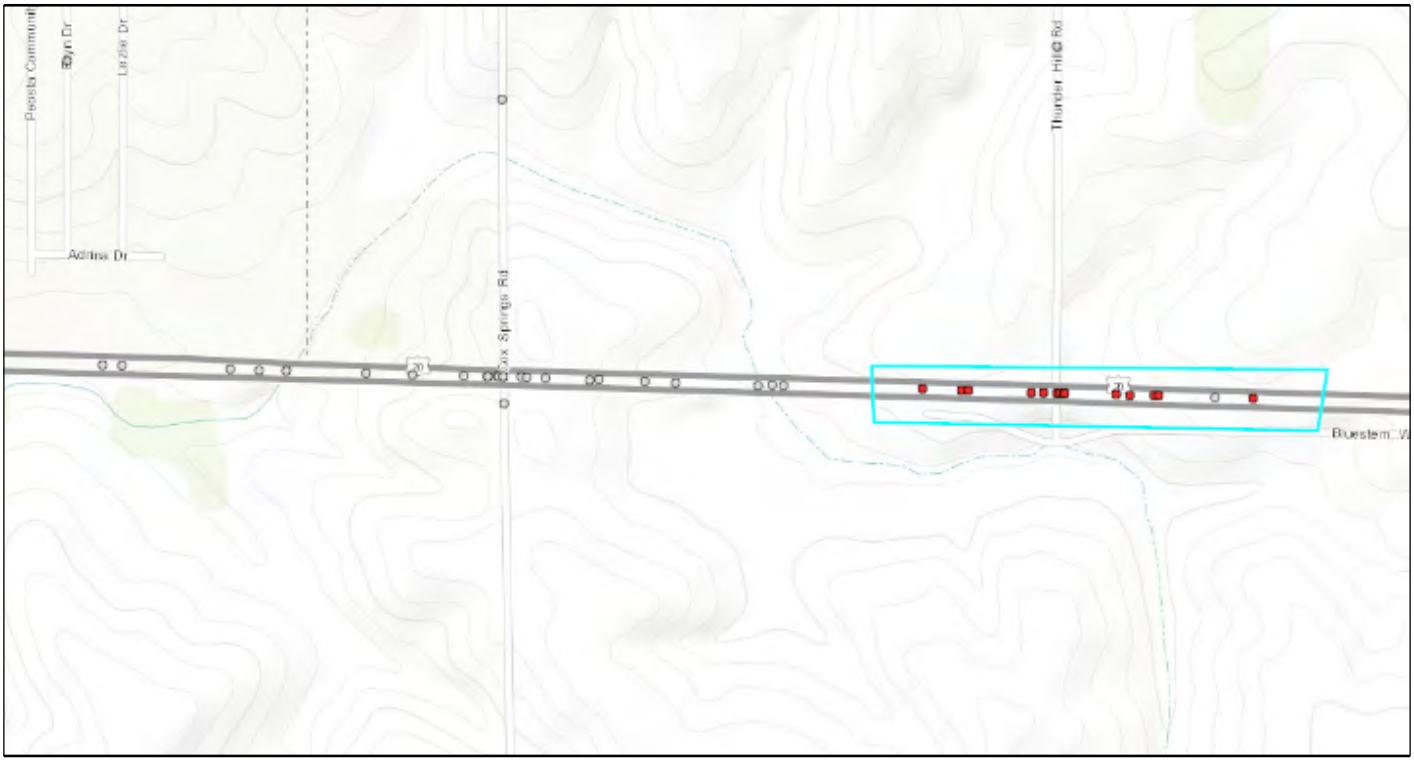
Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Crash Severity	30
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	2
Possible/Unknown Injury Crash	5
Property Damage Only	22

Injury Status Summary	14
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	4
Possible (complaint of pain/injury)	9
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	201,320.00
Average (per crash dollars):	6,710.67
Total Vehicles:	48.00
Average (per crash):	1.60
Total Occupants:	61.00
Average (per crash):	2.10

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.47
Major Injuries/Crash:	0.03
Minor Injuries/Crash:	0.13
Possible/Unknown Injuries/Crash:	0.30



I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

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	0	0	0	0	0	0	0	0	0	0	0	0	1
Monday	0	0	0	0	1	0	0	3	0	1	0	1	0	6
Tuesday	0	0	0	0	0	1	0	1	1	0	0	0	0	3
Wednesday	0	0	0	0	1	1	0	1	2	2	2	0	0	9
Thursday	0	0	0	0	0	0	1	2	0	0	0	0	0	3
Friday	0	0	0	1	0	0	0	2	1	0	1	0	0	5
Saturday	0	0	0	0	0	0	0	0	0	1	1	1	0	3
Total	1	0	0	1	2	2	1	9	4	4	4	2	0	30

Month	**30**
January	1
February	1
March	4
April	1
May	2
June	4
July	2
August	2
September	2
October	3
November	5
December	3
Not reported	0

Lighting	**30**
Daylight	16
Darkness	12
Morning Twilight (dawn 30 minutes after sunri...	0
Evening Twilight (dusk 30 minutes before suns...	2
Unknown	0

Weather Conditions	**30**
Clear	12
Cloudy	4
Fog, smoke, smog	1
Freezing rain/drizzle	1
Rain	2
Sleet, hail	0
Snow	2
Blowing snow	0
Severe winds	0
Blowing sand, soil, dirt	0
Not reported	8
Other	0
Unknown	0

Contributing Circumstance - Environment	**30**
None apparent	17
Weather conditions	3
Visual obstruction	0
Non-motorist action	0
Glare	0
Animal in roadway	5
Severe crosswind	0
Not reported	4
Other	1
Unknown	0

Light Condition	**30**
Daylight	16
Dusk	0
Dawn	1
Dark - roadway lighted	1
Dark - roadway not lighted	4
Dark - unknown roadway lighting	0
Unknown	0
Not reported	8

Surface Conditions	**30**
Dry	16
Wet	3
Ice/frost	1
Snow	2
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	8
Other	0
Unknown	0

I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Major Cause			30
Animal	8	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	3	FTYROW: From yield sign	0
FTYROW: Making left turn	1	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	2	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	1
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	3
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	2
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	1	Swerving/Evasive Action	5
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	2	Not reported	0
Other: No improper action	1		

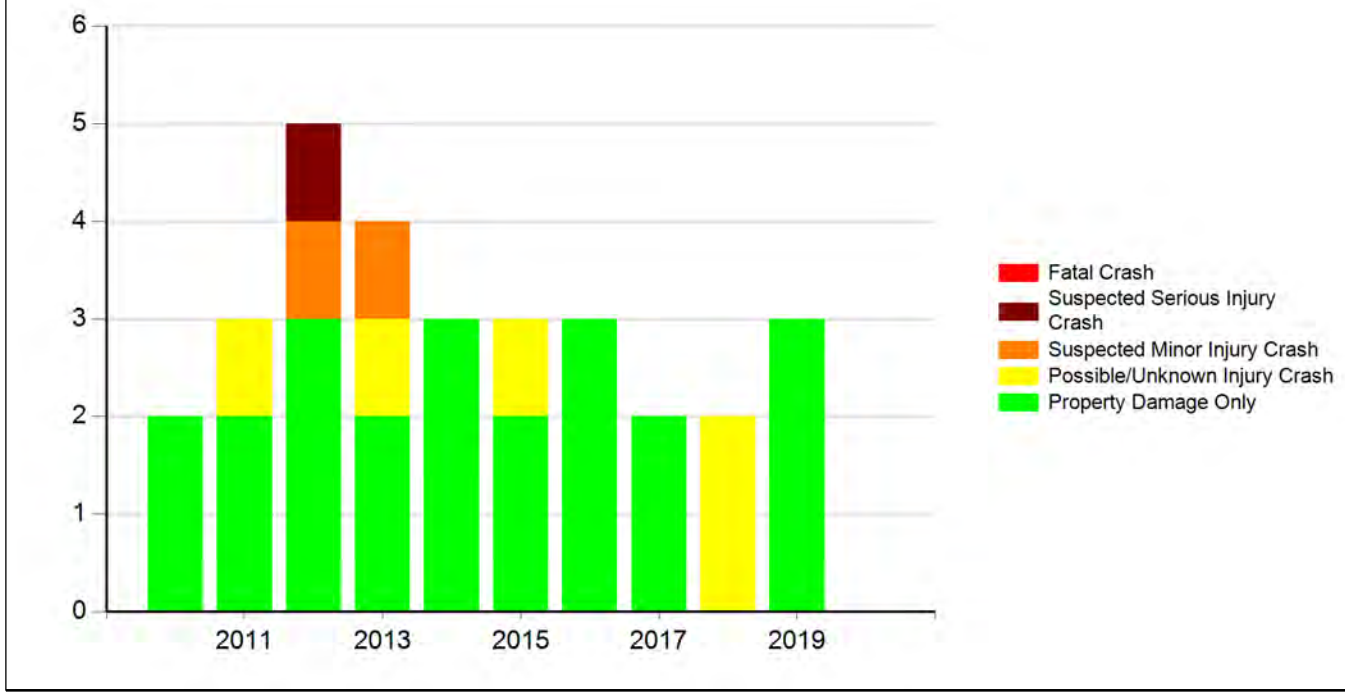
I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	2	2
2011	0	0	0	1	2	3
2012	0	1	1	0	3	5
2013	0	0	1	1	2	4
2014	0	0	0	0	3	3
2015	0	0	0	1	2	3
2016	0	0	0	0	3	3
2017	0	0	0	0	2	2
2018	0	0	0	2	0	2
2019	0	0	0	0	3	3
2020	0	0	0	0	0	0
Total	0	1	2	5	22	30

Severity/Year



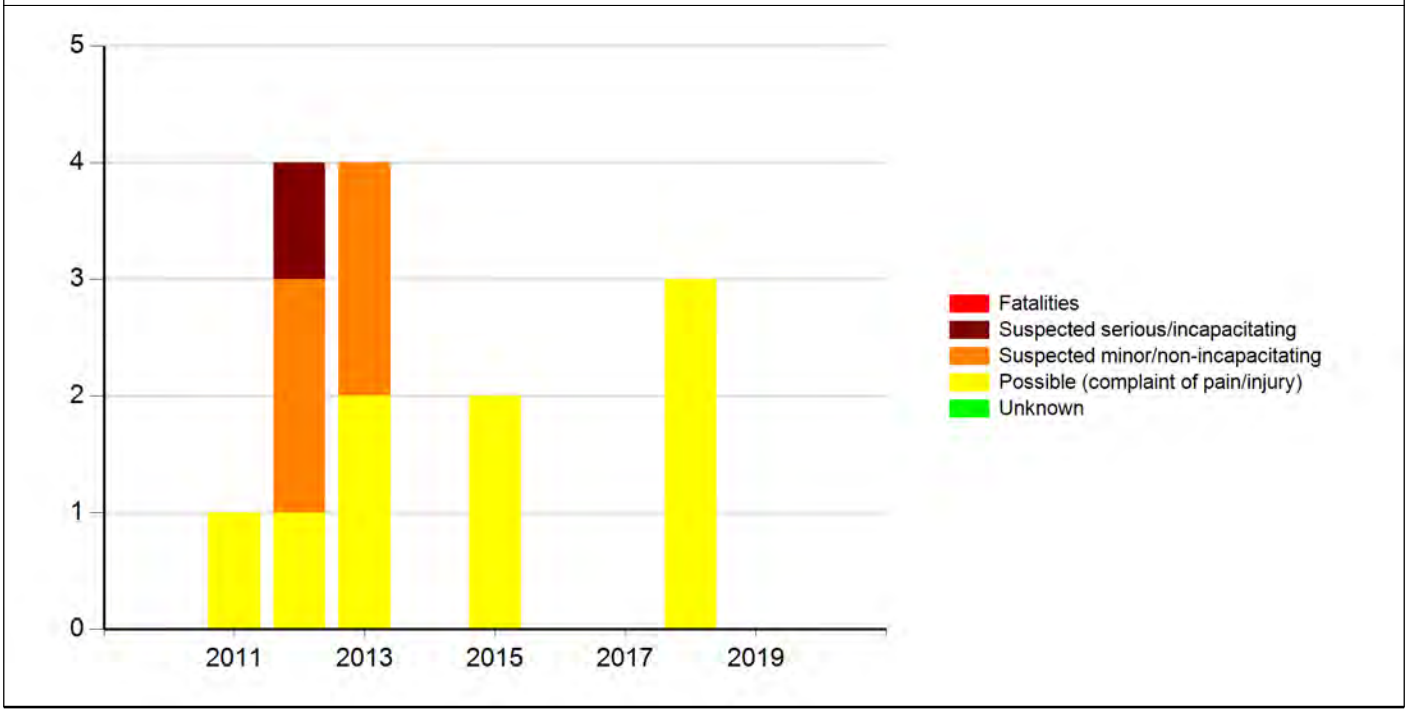
I. ICAT Summary of Motor Vehicle Accidents

Iowa Crash Analysis Tool
Crash Characteristics
2010-2019

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	1	0	1
2012	0	1	2	1	0	4
2013	0	0	2	2	0	4
2014	0	0	0	0	0	0
2015	0	0	0	2	0	2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	3	0	3
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	1	4	9	0	14

Injury Status/Year



L. Benefit/Cost Ratio

Cmfclearinghouse.org listed several CRFs for adding acceleration lane on a rural highway is 79 and increasing deceleration lane to increase line of site is 40. To account for the wide range in values, staff averaged three CRF values that had a quality rating of 3 stars or higher. The cumulative CRF that was use in the Benefit/Cost worksheet came to came to 87.4 and staff used 80.

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Dubuque | Prepared by: Chandra Ravada | Date Prepared: Jul 28, 2020

Intersection: US 20 at Thunder Hills Rd

Improvement

Proposed Improvement(s): Extend the existing declaration lane and add an acceleration lane on US 20

$ 327,455	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	80	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 327,455	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Dubuque County Traffic Map | 2017 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

1,100 (N) | 9,100 (W) | 9,800 (E) | 20 (S)

7,307,300	Current Annual Entering Veh., **AEV** = DEV * 365
23,243	veh / day, Final Year DEV, **FDEV**
117.62	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
20,020	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2010 First full year --> 2019 Last full year | 10.0 years, Time Period, **T**

0 Additional months

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
8	Injury Crashes	2	Minor Injuries @	$65,000	$ 130,000
		5	Possible Injuries @	$35,000	$ 175,000
22	Property Damage Only		(assumed cost per crash)	$7,400	$ 222,000
			-OR- enter all Property Costs of all crashes:		
30	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 852,000

3.00	Current Crashes / Year, **AA** = TA / T	0.41	Crashes / MEV, Crash Rate, **CR**
$ 28,400	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
48.3	Total Expected Crashes, **TECR** = CR x TMEV	$ 807,367	Present Value of Avoided
2.40	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 68,160	Crash Costs Avoided in First Year, AAR x AVC		
38.6	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $807,367 : $327,455 = **2.47** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 20, 2020

Location / Title of Project HWY B55 / Shoulder Paving With Rumble Strip

Applicant Hancock County Road Department

Contact Person Jeremy Purvis, P.E. Title County Engineer

Complete Mailing Address 855 State Street

Garner, Iowa 50438

Phone 641-923-2243 E-Mail jeremy.purvis@hancockcountyia.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	$ 79,100.00
Total Project Cost	$ 109,830.00
Safety Funds Requested	$ 75,000.00

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 Hancock County Road Department

Signed: _____ 8/24/20
Signature Date Signed

Jeremy Purvis
Printed Name

Attest: Lynn Bruggeman 8/24/20
Signature Date Signed

Lynn Bruggeman
Printed Name

RESOLUTION NO. 2020-42

WHEREAS, the TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) OPERATES UNDER THE RULES OF THE Iowa Administrative Code 761- Ch. 164 and TSIP allocates Traffic Safety Funds (TSF), and

WHEREAS, only city and county governments and the Iowa Department of Transportation may apply for the Traffic Safety Funds, and

WHEREAS, Hancock County route B 55 is an eligible route, and

WHEREAS, the TSF awards are limited to a maximum of $500,000 per project and any project costs above the maximum award shall be paid by the local agency, and

WHEREAS, the Sponsoring Agent, Hancock County, shall maintain or cause to be maintained, the complete improvements in a manner acceptable to the Iowa Department of Transportation.

Passed and approved this 24th **day of** August **, 2020.**

Hancock County Board of Supervisors

Jerry Tlach

Gary Rayhons

Florence "Sis" Greiman

ATTEST:

Michelle K. Eisenman, Auditor

HANCOCK COUNTY TSIP PROJECT – NARRATIVE
B55 PAVED SHOULDER & RUMBLE STRIP

EXHIBIT B

Hancock County is applying for Traffic Safety Funds (TSIP) to help fund safety improvements to County Highway B55 from 1,000 feet west of Rake Ave to U.S. HWY 69. TSIP funds are specifically being sought to place a 3-foot paved HMA shoulder with rumble strips and safety edge on the inside of 4 consecutive curves with rolling terrain. The project is approximately 0.5 miles long with 2,500 LF of proposed paved shoulders. The most recent traffic count along B55 is approximately 510 vpd, which ranks #6 on our county highway system.

The existing roadway section is a 22-foot pavement consisting of 11.5" full depth HMA over a 6" stone base. The original 2" HMA surface was completed in 1962, with subsequent overlays in 1973 (3"), 1985 (2"), 1996 (2"), and 2008 (2.5"). 2-foot granular shoulders were added in 1967. The foreslopes very from 2.5:1 to 3:1. Posted speed limit is 55 MPH and the curves are posted with numerous advisory signs and chevrons that currently meet MUTCD standards.

Evaluating the 5-year crash history from 2015 through 2019 indicates 5 crashes with 3 of the crashes having Run-Off-Road listed as the major cause. The severity of the crashes includes 1 major injury, 2 minor injuries, and 1 possible injury as well as 1 property damage accident.

A safety issue exists with the continual development of edge ruts along B55, which is credited to the narrow lanes and curves in the road. Edge rut creates a safety hazard when drivers drop their tires off the pavement and then over correct as they come back onto the pavement out of the rut. This overcorrection sends the vehicle into the other lane and created the possibility of a head-on collision. Paved shoulders and rumble strips will provide for a safer roadway.

Considering the usage of the route, traffic volume, alignment, and narrow shoulders along the curves, this site is a good candidate for safety improvements. The milled rumble strip will serve as a warning for vehicles leaving the roadway, and the paved shoulder will provide some opportunity for vehicles to recover and return to the roadway. Using the Iowa DOT's Planning-Level CRF List, we are predicting that these improvements would provide a crash reduction factor of 27.1. The benefit/cost ratio for this project is 5.11.

B-55 HMA SHOULDER PAVING COST ESTIMATE
TSIP APPLICATION

DATE: 8/20/2020

ITEM CODE	ITEM	UNIT	QUANTITY	UNIT PRICE	SUBTOTAL
2102-2713090	CLASS 13 EXCAVATION, WASTE***	CY	180	$ 45.00	$ 8,100.00
2121-7425020	GRANULAR SHOULDER, TYPE B	TON	120	$ 75.00	$ 9,000.00
2122-5500060	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 6 IN.***	SY	825	$ 80.00	$ 66,000.00
2528-8445110	TRAFFIC CONTROL	LS	1	$ 2,500.00	$ 2,500.00
2528-8445113	FLAGGERS	EACH	4	$ 605.00	$ 2,420.00
2528-8445115	PILOT CAR	EACH	2	$ 905.00	$ 1,810.00
2533-4980005	MOBILIZATION	LS	1	$ 15,000.00	$ 15,000.00
2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE***	STA	25	$ 200.00	$ 5,000.00
TOTAL PROJECT COST ESTIMATE					**$ 109,830.00**

BREAK DOWN OF SAFETY ITEMS	
COST OF HIGHLIGHTED SAFETY ITEMS ***	$ 79,100.00
REQUESTED SAFETY FUNDS	$ 75,000.00

BREAK DOWN OF FUNDING SOURCES	
LOCAL FUNDS PROGRAMMED FY 22	$ 35,000.00
PROPOSED TSIP FUNDING	$ 75,000.00

PROJECT TIME LINE	
TSIP APPLICATION SUBMITTAL DEADLINE	AUGUST 2020
TSIP GRANTS AWARDED	JANUARY 2020
START DESIGN	FEBRUARY 2020
FUNDS AVAILIBLE	JULY 2020
BID LETTING	JULY 2020
AWARD CONTRACT	AUGUST 2020
START CONSTRUCTION	SEPTEMBER 2020
FINISH CONSTRUCTION	NOVEMBER 2020

LOCATION MAP

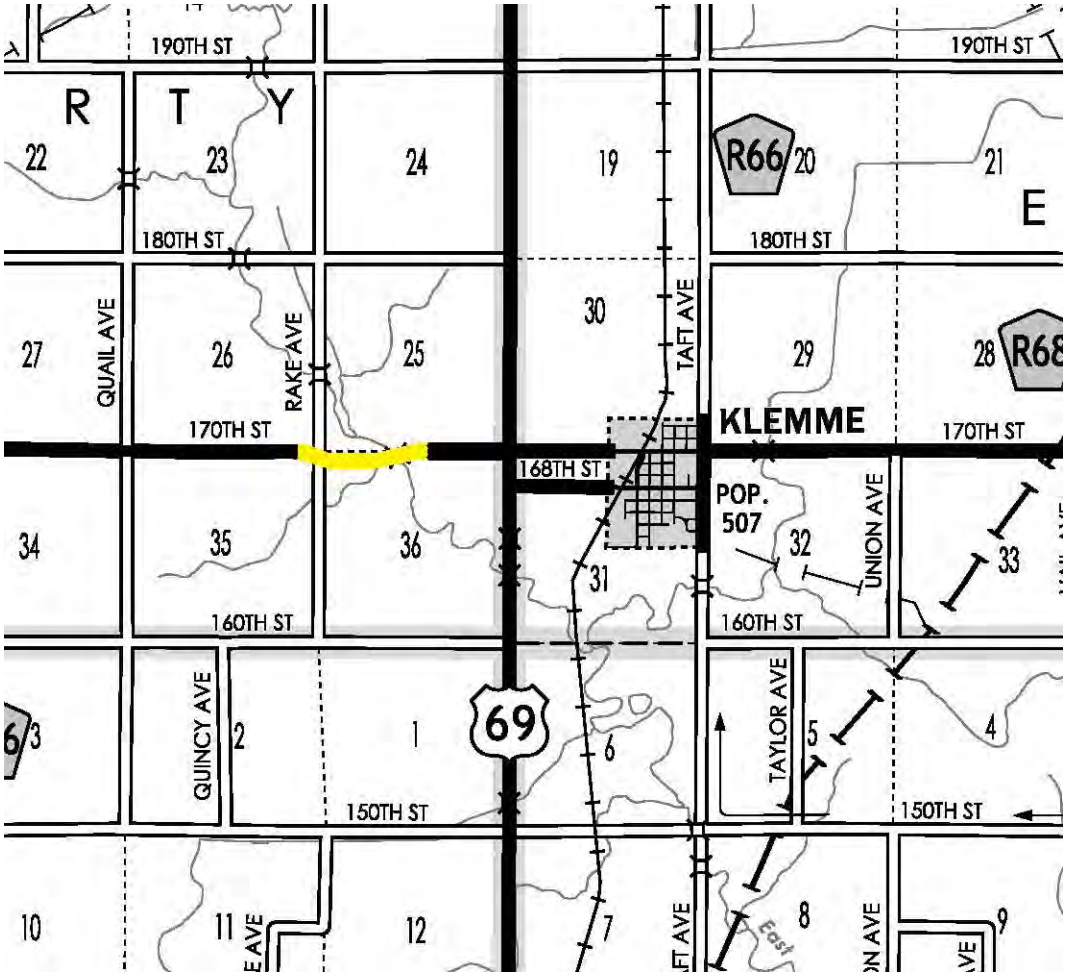
EXHIBIT E

HANCOCK COUNTY TSIP PROJECT

B55 Paved Shoulder with Rumble Strip

Location: From Rake Ave to HWY 69

Approximately 0.5 Miles



HANCOCK COUNTY TSIP PROJECT – SITE CONDITIONS
B55 PAVED SHOULDER & RUMBLE STRIP

EXHIBIT F

East end of project looking west on B55.

EXHIBIT F

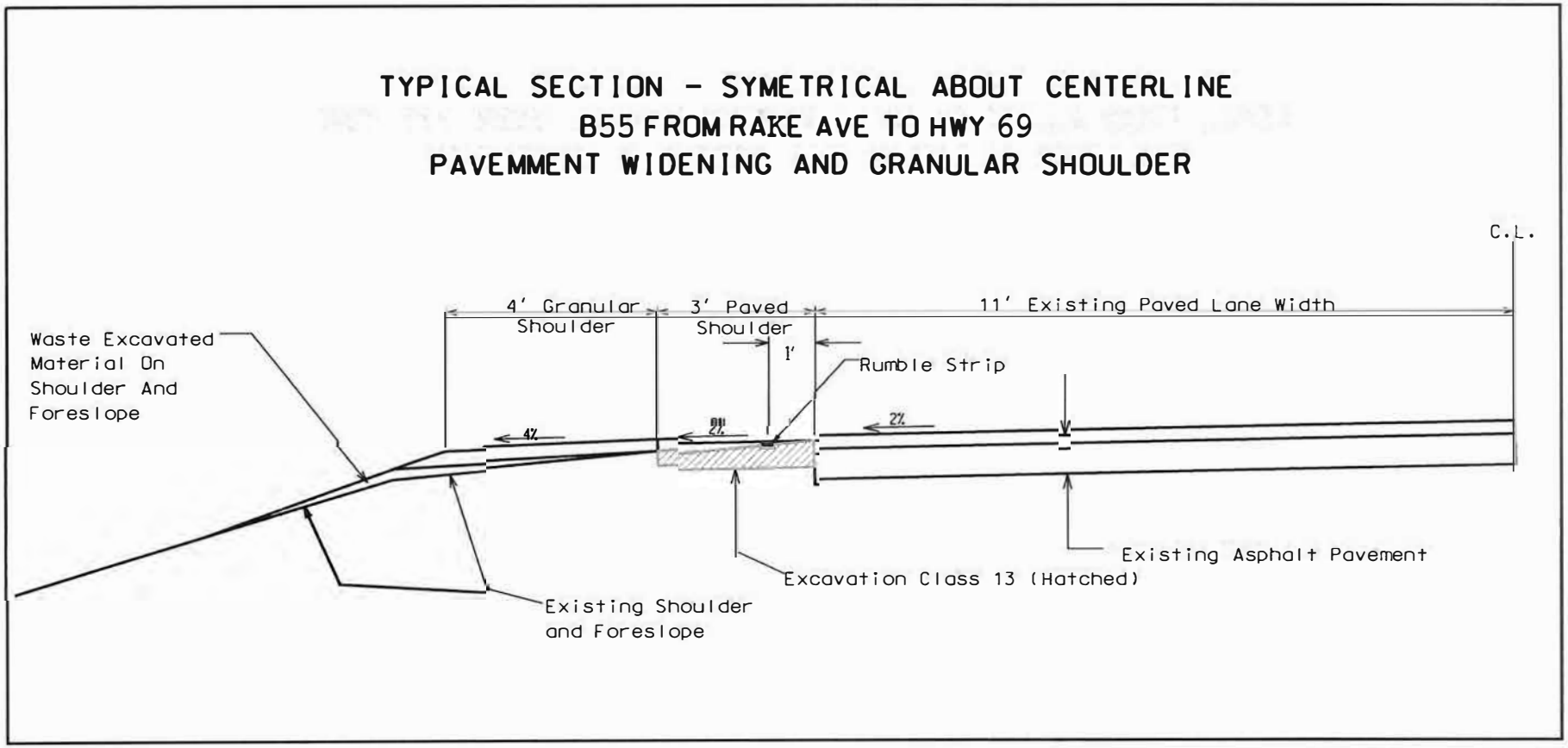
Middle of project looking east on B55.

EXHIBIT F

West end of project looking east on B55

TYPICAL SECTION EXHIBIT G

HANCOCK COUNTY TSIP PROJECT
B55 Paved Shoulder with Rumble Strip



HANCOCK COUNTY TSIP PROJECT – AERIAL VIEW
B55 PAVED SHOULDER & RUMBLE STRIP

EXHIBIT H

N

Iowa Crash Analysis Tool
Quick Report
2015-2020

Crash Severity	5
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	2
Possible/Unknown Injury Crash	1
Property Damage Only	1

Injury Status Summary	4
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	2
Possible (complaint of pain/injury)	1
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	23,000.00
Average (per crash dollars):	4,600.00
Total Vehicles:	5.00
Average (per crash):	1.00
Total Occupants:	5.00
Average (per crash):	1.00

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.80
Major Injuries/Crash:	0.20
Minor Injuries/Crash:	0.40
Possible/Unknown Injuries/Crash:	0.20

Iowa Crash Analysis Tool
Quick Report
2015-2020

Major Cause			5
Animal	1	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	1	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	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Quick Report
2015-2020

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	0	0	0	0	0	0	0	0	0	0	0	0	1
Monday	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Tuesday	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Wednesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saturday	0	1	0	0	0	0	0	0	0	1	0	0	0	2
Total	1	1	0	0	1	0	0	0	0	1	1	0	0	5

Manner of Crash Collision	**5**
Non-collision (single vehicle)	4
Head-on (front to front)	0
Rear-end (front to rear)	0
Angle, oncoming left turn	0
Broadside (front to side)	0
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	1
Other	0
Unknown	0

Surface Conditions	**5**
Dry	4
Wet	0
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	1
Other	0
Unknown	0

Fixed Object Struck	**5**		
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	1	Curb/island/raised median	0
Ditch	2	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	2

Iowa Crash Analysis Tool
Quick Report
2015-2020

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	1	0	0	1
>= 25 and <= 29	0	1	0	0	1
>= 30 and <= 34	0	0	0	0	0
>= 35 and <= 39	1	0	0	0	1
>= 40 and <= 44	0	1	0	0	1
>= 45 and <= 49	1	0	0	0	1
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	2	3	0	0	5

Drug/Alcohol Related	**5**
Drug	0
Alcohol (< Statutory)	1
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	1
None Indicated	3

Alcohol Test Given	**5**
None	4
Blood	1
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	**5**
None	5
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

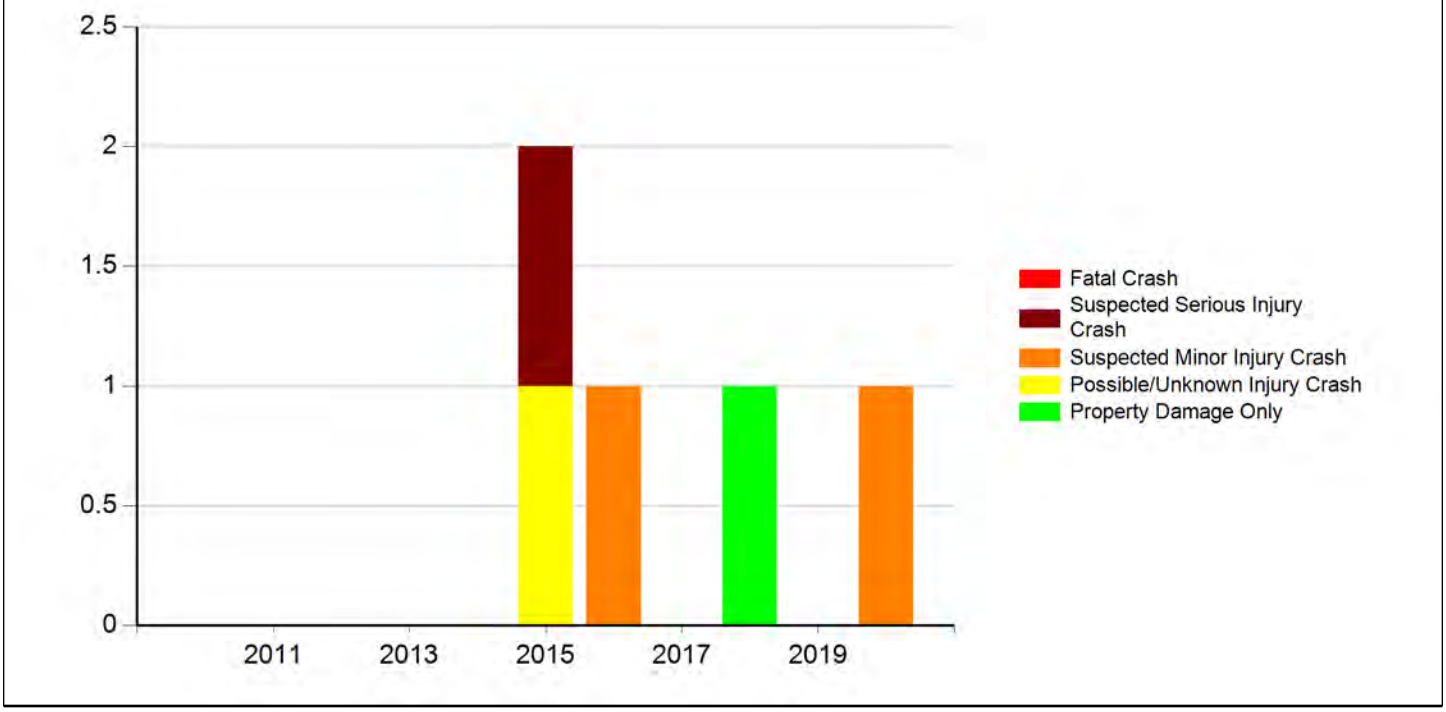
Drug Test Result	**5**
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	5
Other	0

Iowa Crash Analysis Tool
Quick Report
2015-2020

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	1	0	1	0	2
2016	0	0	1	0	0	1
2017	0	0	0	0	0	0
2018	0	0	0	0	1	1
2019	0	0	0	0	0	0
2020	0	0	1	0	0	1
Total	0	1	2	1	1	5

Severity/Year

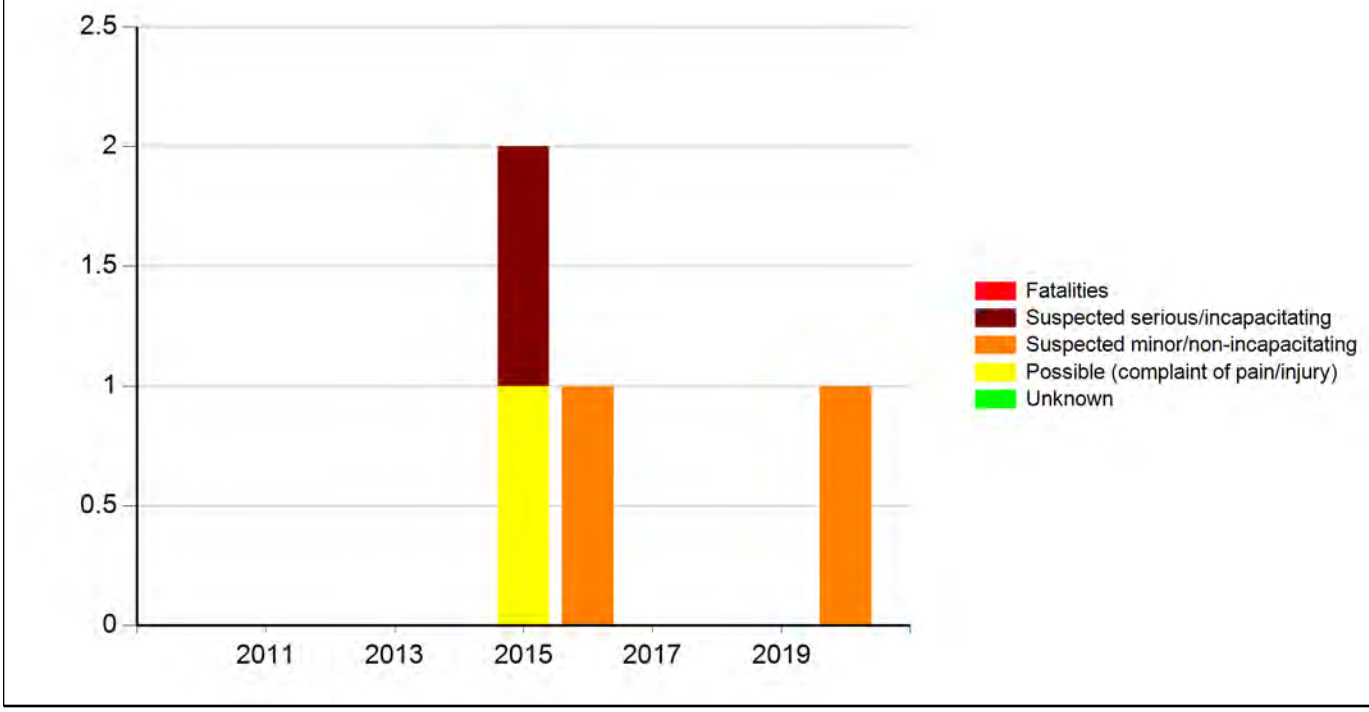


Iowa Crash Analysis Tool
Quick Report
2015-2020

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	1	0	1	0	2
2016	0	0	1	0	0	1
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	1	0	0	1
Total	0	1	2	1	0	4

Injury Status/Year



Iowa Crash Analysis Tool
Quick Report
2015-2020

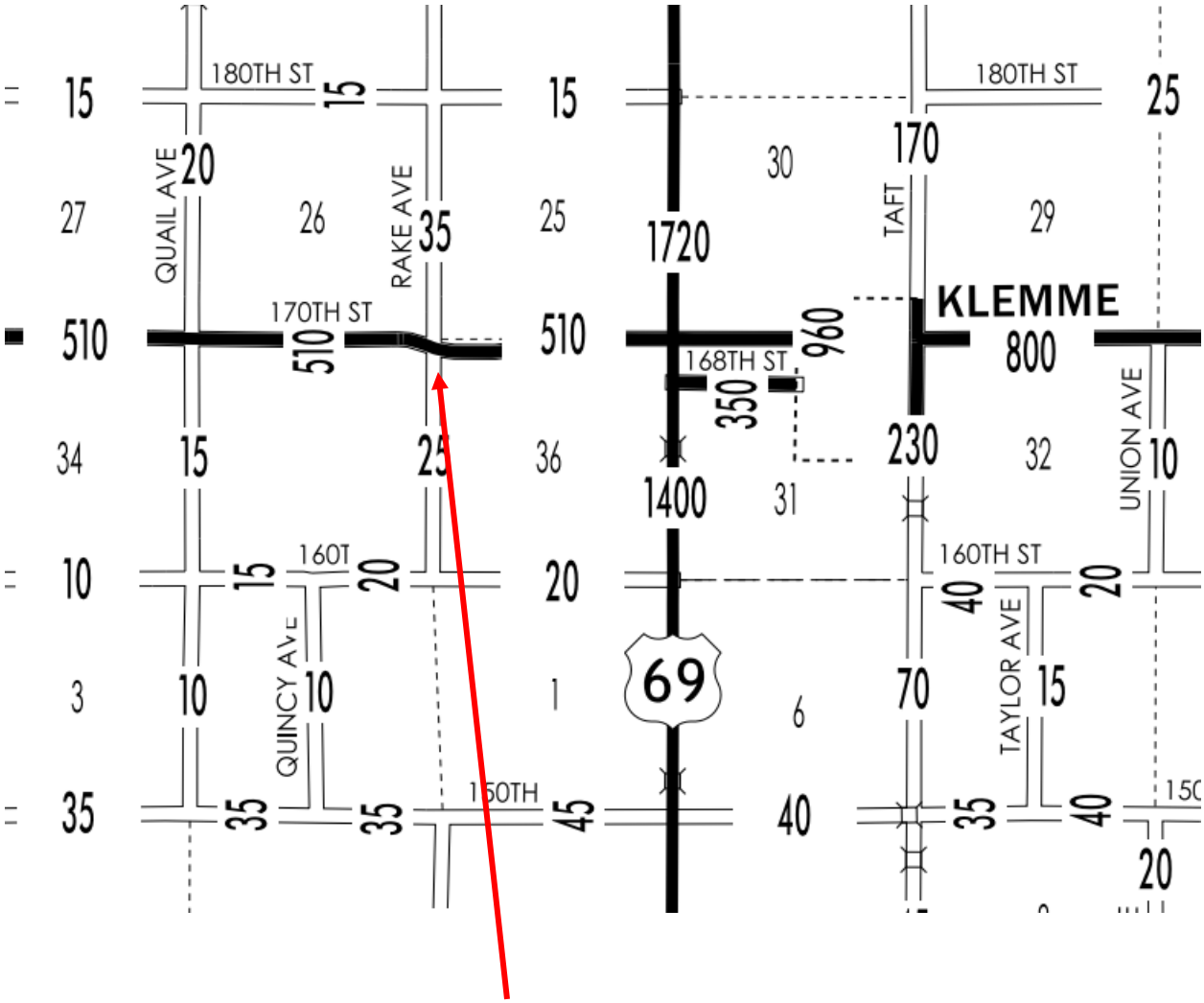
Meeting the following criteria

Jurisdiction: Counties (Hancock)
Year: 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

HANCOCK COUNTY TSIP PROJECT – TRAFFIC COUNT
B55 PAVED SHOULDER & RUMBLE STRIP

EXHIBIT J



PROJECT LOCATION

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: HANCOCK | Prepared by: JEREMY PURVIS, P.E. | Date Prepared: Aug 20, 2020

Location: B55 from Quail Ave to HWY 69

Improvement

Proposed Improvement(s): 3' Paved Shoulder with Rumble Strip

$ 75,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	27	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 75,000**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Count Map for Hancock County | 2015 Date of traffic count

Length (mi.)	Two-way veh/day	Description
2.00	510	Quail Ave to HWY 69
2.00	miles total	

1,020 Current Vehicle Miles / Day, **VM**

1,245 End of Life Veh. Miles / Day

372,300 Current Veh. Miles / Year, **AM**

8,197,675 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2015 First full year --> 2019 Last full year | 5.5 years, Time Period, **T**

6 Additional months

0	Fatal Crashes →		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
4	Injury Crashes →	2	Minor Injuries @	$65,000	$ 130,000
		1	Possible Injuries @	$35,000	$ 35,000
1	Property Damage Only		(assumed cost per crash)	$7,400	$ 37,000
			-OR- enter all Property Costs of all crashes:		
5	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 527,000

0.91 Current Crashes / Year, **AA** = TA / T

$ 105,400 Cost per Crash, **AVCR** = LOSS / TA

20.0 Total Expected Crashes, **TCR** = CR x TVMT/10^8

0.25 Crashes Avoided First Year **AAR** = AA x CRF / 100

$ 25,967 Crash Costs Avoided in First Year, AAR x AVCR

5.4 Total Avoided Crashes, TCR x CRF/ 100

244.2 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 383,547 Present Value of Avoided Crashes, **BENEFIT**

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $383,547 : $75,000 = **5.11** : 1

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project W55 – Franklin Ave (Agency Rd to Fremont Ave)

Applicant Henry County

Contact Person Jake Hotchkiss Title County Engineer

Complete Mailing Address PO Box 655

Mt. Pleasant, IA 52641

Phone 319 385-0762 (Area Code) E-Mail jhotchkiss@henrycountyiowa.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	$	1,376,329 (See C Sheets)
Total Project Cost	$	2,510,394 (See C Sheets)
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__ This Site is identified in our County LRSP Safety Plan_____

☐ 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 Henry County

Signed: _____ 6/4/2020
Signature Date Signed

Jake Hotchkiss, County Engineer
Printed Name

Attest: _____ 6/4/2020
Signature Date Signed

Jelen McCall, Office Manager
Printed Name

A

RESOLUTION
24-2020-20
APPROVAL OF
TRANSPORTATION SAFETY IMPROVEMENT PROGRAM APPLICATION
FOR W55 (FRANKLIN AVENUE)

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, past traffic data shows the existing W55 (Franklin Avenue) corridor has an accident history and safety for the traveling public could be improved by incorporating safety improvements; and

WHEREAS, safety improvements have been identified and need to be completed in two phases:
Phase I: Widen existing shoulders from 2' to 6', flattened fore slopes, extend existing culverts – (Phase I allows Phase II to take place);
Phase II: Add 2' paved shoulders, install rumble strips - center & edge lines, and safety edge; and

WHEREAS, the overlay of W55 (Franklin Avenue) is included in the Henry County Five (5) Year Construction Program; and

WHEREAS, the Henry County Engineer recommends the TSIP application be submitted to the Iowa Department of Transportation for possible safety funding of the above-mentioned projects.

IT IS THEREFORE RESOLVED, by the Henry County Board of Supervisors to endorse the above-mentioned projects and authorize the maintenance of the improvement after construction is complete.

NOW THEREFORE BE IT RESOLVED, by the Henry County Board of Supervisors in session this **4th day of June, 2020,** that the Henry County Board of Supervisors hereby authorizes the County Engineer to execute and submit the application to the Iowa Department of Transportation for Traffic Safety Improvement Program funding.

ATTEST:

Shelly Barber
Henry County Auditor

HENRY COUNTY BOARD OF SUPERVISORS

Marc B. Lindeen, Chairman

Gary K. See, Member

Greg Moeller, Member

HENRY COUNTY, IOWA

Engineering & Road Department

1510 E. Washington Street
P O Box 655
Mt. Pleasant, Iowa 52641

Phone: 319 385-0762
Fax: 319 385-0777
e-mail: engineer@henrycountyiowa.us

B

Date: June 1, 2020

Office of Traffic & Safety
Iowa DOT
800 Lincoln Way
Ames, IA 50010

RE: Henry County Application for TSIP funds – W55 Franklin Avenue Safety Improvements

Narrative:

Proposed Project
Henry County is applying for Traffic Safety Improvement Program funding to improve the safety on a section of Henry County Road W55 (Franklin Avenue) from the intersection of Agency Road to the intersection of Fremont Avenue, approximately 5.0 miles. **We are seeking safety funds to widen existing granular shoulders, flattening fore slopes to 3:1 in Phase I and 2 ft paved shoulders including safety edge with rumble strips for centerline and edge line in Phase II. Projects will be programmed Phase I for December 2021 and Phase II for December 2022 letting**. Henry County is requesting $500,000 for Phase I in order to widen shoulders and prepare for our programmed STBG Overlay Phase II scheduled for FY 23.

Existing Conditions
This is a Farm to Market road connecting Salem to Mount Pleasant; running North and South thru Henry County. In 1960, the road was originally paved with a 3" HMA surface. In 1974 an additional 3" of HMA was added and again in 1996 a 3" lift was added. Currently, the road is paved 22 feet wide with 2 foot granular shoulders and 2:1 fore slopes or steeper, making the road unforgiving for vehicles that leave the traveled roadway. The road is posted 55 mph and has a moderate traffic count of (1,310 vpd).

Previous Safety Improvements
Henry County has worked over the years to keep signage up to date and current with MUTCD standards. As a standard practice current signage for curves & intersections will be reviewed during our development of plans. Henry County works routinely on keeping brush cut back within the right-of-way and sprays brush after it has been removed; along with mowing shoulders 2-3 times a year. We currently reapply our pavement markings every other year, including edge line and centerline, with a county-owned paint truck.

LRSP Safety Plan

To better understand the potential for improvement, we volunteered to have a Local Road Safety Plan developed. This road segment was identified as a candidate for 2ft paved shoulders, rumble strips, clearing and grubbing of right-of-way. Henry County is seeking assistance in funding the widen shoulders and flattening of fore slopes in preparations for our planned STBG HMA overlay which would include 2 ft paved shoulders to be added.

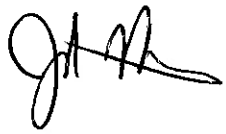
Crash Reduction Factor

Planning-Level Crash Reduction Factor (CRF) List was utilized. Per recommended list:

"Road Segment" Flatten Fore slope to 3:1
"Road Segment" Install Edge line & Centerline Rumble Strips
"Road Segment" Add Paved Shoulder
"Road Segment" Add Safety Edge

As County Engineer, I have had safety concerns about this roadway since becoming the Engineer. It is my sincere hope that we can reduce both the number and severity of accidents on this route with our combined safety efforts. Our request for Traffic Safety Improvement Program funding aligns with the recommendation of the LRSP developed for Henry County and we fully expect that funding this project will make significant impact on the safety of this roadway.

Sincerely,



Jake Hotchkiss, PE
Henry County Engineer

W55 FRANKLIN AVENUE PHASE I & II

ENGINEER'S ESTIMATE

ESTIMATED PROJECT QUANTITIES

C

ITEM NO.	ITEM CODE	ITEM	UNIT	Quantities		UNIT PRICES	PHASE I TOTAL	PHASE II TOTAL	SAFETY ITEMS ONLY	
				PHASE I	PHASE II				QUANTITIES	SAFETY TOTAL
1	2101-0850001	CLEARING AND GRUBBING	ACRE	3.00		$6,000.00	$18,000.00	$0.00	3.00	$18,000.00
2	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED	CY	47,500.00		$10.00	$475,000.00	$0.00	47,500.00	$475,000.00
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	1,100.00		$5.00	$5,500.00	$0.00	1,100.00	$5,500.00
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	12,704.00		$5.00	$63,520.00	$0.00	12,704.00	$63,520.00
5	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	7,318.00		$20.00	$146,360.00	$0.00	7,318.00	$146,360.00
6	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON	250.00		$23.30	$5,825.00	$0.00		$0.00
7	2123-7450020	SHOULDER FINISHING, EARTH	STA		528.00	$50.00	$0.00	$26,400.00	528.00	$26,400.00
8	2212-0475095	CLEAN AND PREPARATION OF BASE	MILE		5.00	$1,500.00	$0.00	$7,500.00		$0.00
9	2213-2713300	EXCAVATION, CLASS 13, WIDEN	CY		1,954.00	$10.00	$0.00	$19,540.00	1,954.00	$19,540.00
10	2213-7100400	RELOCATION OF MAILBOX	EACH	25.00		$150.00	$3,750.00	$0.00		$0.00
11	2214-5145150	PAVEMENT SCARIFICATION	SY		64,533.00	$1.40	$0.00	$90,346.20		$0.00
12	2303-0002380	HMA MIXTURE INTERLAYER BASE COURSE, 3/8 IN. MAX	TON		4,576.00	$45.20	$0.00	$206,835.20	701.00	$31,685.20
13	2303-1032500	HMA STANDARD TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	TON		6,225.00	$43.67	$0.00	$271,845.75	1,301.00	$56,814.67
14	2303-1033500	HMA STANDARD TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, NO SPECIAL FRICTION REQUIREMENT	TON		6,225.00	$43.67	$0.00	$271,845.75	1,301.00	$56,814.67
15	2303-1131500	HMA STANDARD TRAFFIC, BASE COURSE, 1/2 IN MIX	SY		17,600.00	$8.77	$0.00	$154,352.00	17,600.00	$154,352.00
16	2303-1258283	ASPHALT BINDER, PG 58-28S, STANDARD TRAFFIC	TON		498.00	$482.00	$0.00	$240,036.00	104.00	$50,128.00
17	2303-1258346	ASPHALT BINDER, PG 58-34E, EXTREMELY HIGH TRAFFIC	TON		275.00	$601.00	$0.00	$165,275.00	42.00	$25,242.00
18	2303-6911000	HMA PAVEMENT SAMPLES	LS		1.00	$3,500.00	$0.00	$3,500.00	0.50	$1,750.00
19	2303-9091010	RUMBLE STRIP PANEL (HMA SURFACE)	EACH	2.00		$600.00	$1,200.00	$0.00		$0.00
20	2416-0100024	APRON, CONC, 24 IN. DIA.	EACH	20.00		$1,000.00	$20,000.00	$0.00	20.00	$20,000.00
21	2416-0100030	APRON, CONC, 30 IN. DIA.	EACH	4.00		$1,500.00	$6,000.00	$0.00	4.00	$6,000.00
22	2416-0100036	APRON, CONC, 36 IN. DIA.	EACH	2.00		$2,000.00	$4,000.00	$0.00	2.00	$4,000.00
23	2416-0100042	APRON, CONC, 42 IN. DIA.	EACH	2.00		$2,500.00	$5,000.00	$0.00	2.00	$5,000.00
24	2416-1240024	CULV,3000D CONC RDWY PIPE, 24 IN.	LF	176.00		$70.00	$12,320.00	$0.00	176.00	$12,320.00
25	2416-1240030	CULV,3000D CONC RDWY PIPE, 30 IN.	LF	53.00		$90.00	$4,770.00	$0.00	53.00	$4,770.00
26	2416-1240036	CULV,3000D CONC RDWY PIPE, 36 IN.	LF	12.00		$115.00	$1,380.00	$0.00	12.00	$1,380.00
27	2416-1240042	CULV,3000D CONC RDWY PIPE, 42 IN.	LF	16.00		$125.00	$2,000.00	$0.00	16.00	$2,000.00
28	2417-1060030	CULV, CMP RDWY, 30 IN. DIA.	LF	25.00		$70.00	$1,750.00	$0.00	25.00	$1,750.00
29	2417-1060042	CULV, CMP RDWY, 42 IN. DIA.	LF	98.00		$121.00	$11,858.00	$0.00	98.00	$11,858.00

W55 FRANKLIN AVENUE PHASE I & II

ENGINEER'S ESTIMATE

ESTIMATED PROJECT QUANTITIES

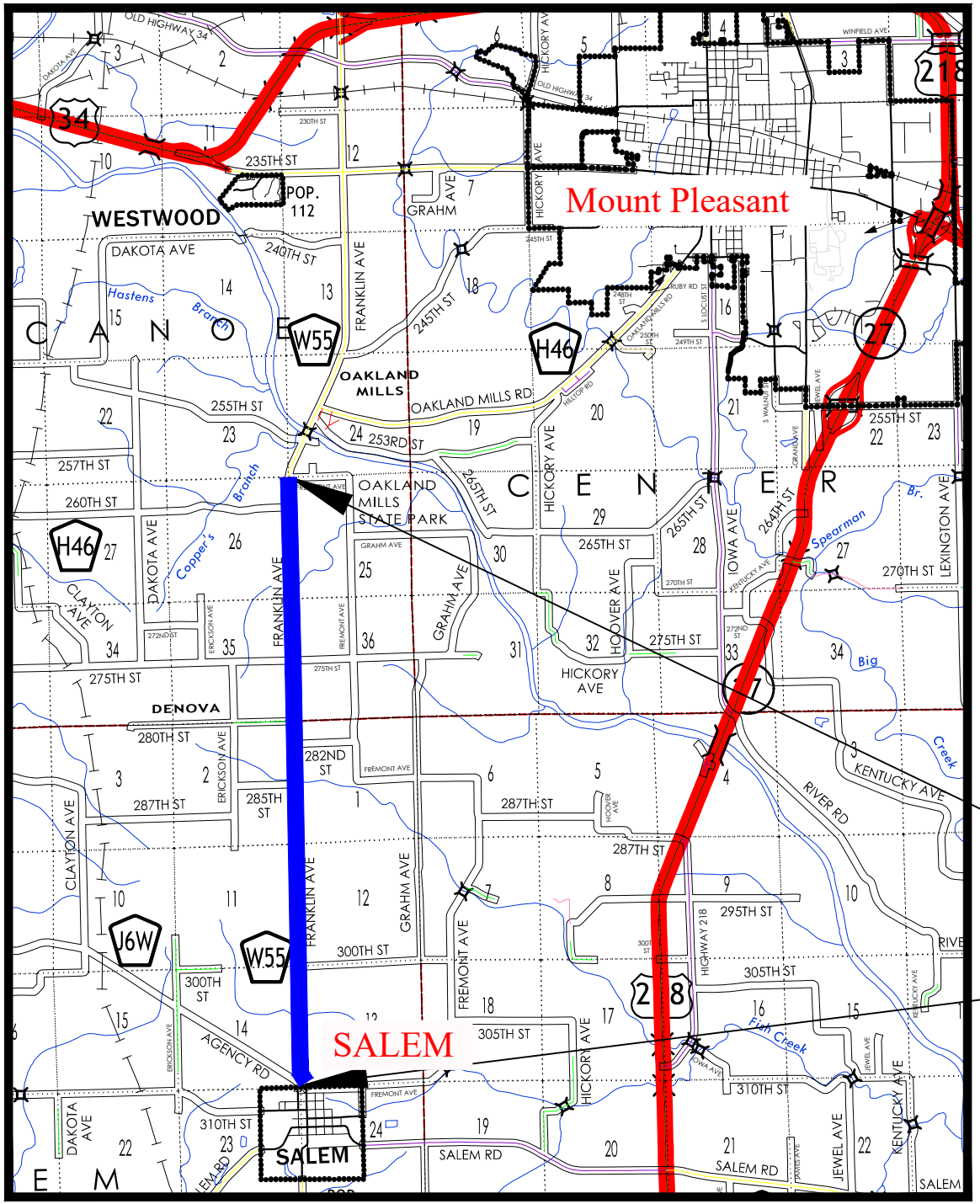
C

ITEM NO.	ITEM CODE	ITEM	UNIT	Quantities		UNIT PRICES	PHASE I TOTAL	PHASE II TOTAL	SAFETY ITEMS ONLY	
				PHASE I	PHASE II				QUANTITIES	SAFETY TOTAL
30	2507-3250005	ENGINEER FABRIC	SY	420.00		$3.00	$1,260.00	$0.00	420.00	$1,260.00
31	2507-6800061	REVETMENT, CLASS 'E'	TON	300.00		$44.00	$13,200.00	$0.00	300.00	$13,200.00
32	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT	STA	528.00	792.00	$17.00	$8,976.00	$13,464.00		$0.00
33	2528-8445110	TRAFFIC CONTROL	LS	1.00	1.00	$7,000.00	$7,000.00	$7,000.00	0.50	$3,500.00
34	2528-8445113	FLAGGERS	EACH	70.00	40.00	$495.00	$34,650.00	$19,800.00	70.00	$34,650.00
35	2528-8445115	PILOT CAR	EACH	30.00	20.00	$740.00	$22,200.00	$14,800.00	30.00	$22,200.00
36	2533-4980005	MOBILIZATION	LS	1.00	1.00	$14,000.00	$14,000.00	$14,000.00	0.50	$7,000.00
37	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA		667.00	$25.00	$0.00	$16,675.00	667.00	$16,675.00
38	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIP)	Gal		962.00	$10.00	$0.00	$9,620.00	962.00	$9,620.00
39	2601-2634100	MULCH	ACRE	36.70		$600.00	$22,020.00	$0.00	36.70	$22,020.00
40	2601-2636043	SEED & FERTILIZING (RURAL)	ACRE	36.70		$600.00	$22,020.00	$0.00	36.70	$22,020.00
41	2602-0000020	SILT FENCE	LF	5,000.00		$1.60	$8,000.00	$0.00	5,000.00	$8,000.00
42	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	5,000.00		$1.75	$8,750.00	$0.00	5,000.00	$8,750.00
43	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	2,500.00		$0.50	$1,250.00	$0.00	2,500.00	$1,250.00
44	2602-0000312	PERIMETER+SLOPE SEDIMENT CNTL DEVICE, 12 IN.	LF	1,000.00		$3.50	$3,500.00	$0.00	1,000.00	$3,500.00
45	2602-0010010	MOBILIZATION, EROSION CONTROL	EACH	5.00		$500.00	$2,500.00	$0.00	5.00	$2,500.00
						TOTALS=	**$957,559.00**	**$1,552,834.90**		**$1,376,329.54**

SAFETY IMPROVEMENT COST USED FOR B/C ANALYSIS	
TOTAL SAFETY IMPROVEMENT COST (PHASE I & PHASE II)	**$1,376,329.54**

FUNDING SOURCE BREAKDOWN	
Funding Sources	**Amount**
LOCAL ROW (3.0acres)	$25,000
Phase II (FM & STBG)	$1,552,835
PHASE I TSIP	$500,000
PHASE I FM FUNDS	$457,559
TOTAL PROJECT COST	**$2,510,394**

D & E



Length of Project =5.0 Miles

Henry County Projected Time Line:

PHASE I

1. Letting Date: December 2021
2. Late Start Date: May 2022
3. 40 working days
4. Estimated completion: Fall 2022

PHASE II (Tied To STBG HMA Overlay)

1. Letting Date: December 2022
2. Late Start Date: June 2023
3. 40 working days
4. Estimated completion: Fall 2023

NOT TO SCALE

E.O.P. INTERSECTION OF FREMONT AVE & W55

B.O.P. INTERSECTION OF AGENCY RD & W55

HENRY COUNTY

PROJECT NUMBER
W55 (FRANKLIN AVENUE) TSIP

TYPICAL ROAD PICTURES W55(FRANKLIN AVE) F

TYPICAL CROSS SECTION VIEWS

CULVERT EXTENSIONS REQUIRED (ALL METAL CULVERTS LINED AND RCP'S TIED AND GROUTED

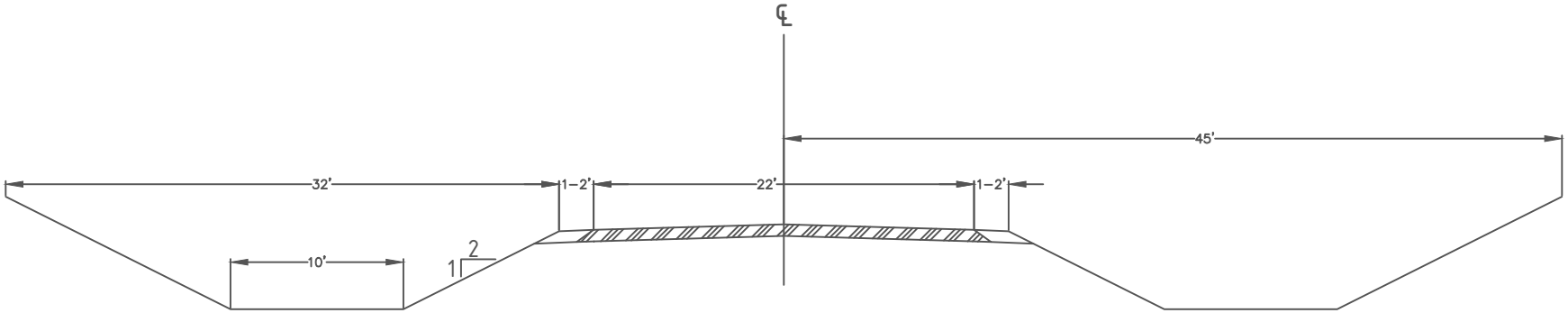
TYPICAL ROAD PICTURES W55(FRANKLIN AVE) F

HEAVY TRUCK TRAFFIC FARM TRAFFIC UTILIZES ROAD CONSISTENTLY YEAR ROUND

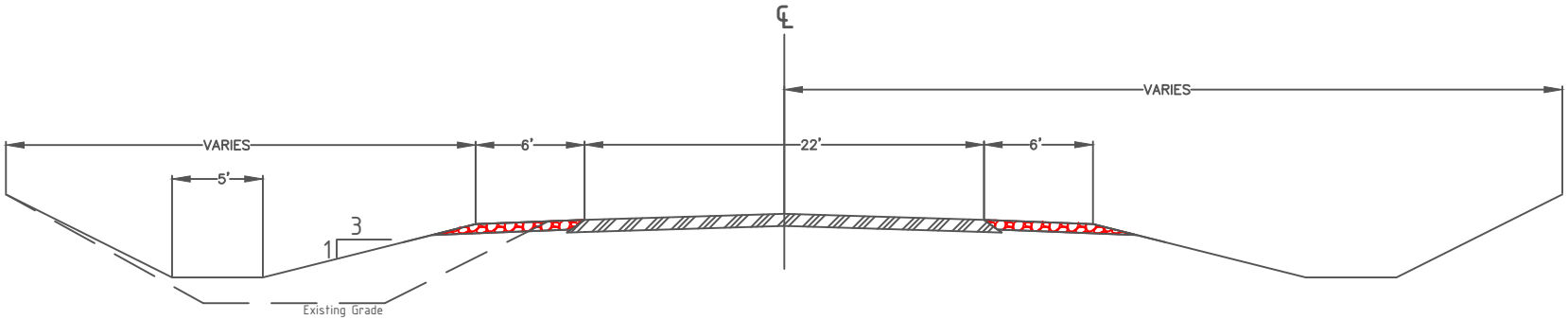
VISUAL SHOULDER WIDTH TYPICAL 2’ AND DRAINAGE ISSUES STREAMS RUNNING ADJACENT TO ROADWAY.

G

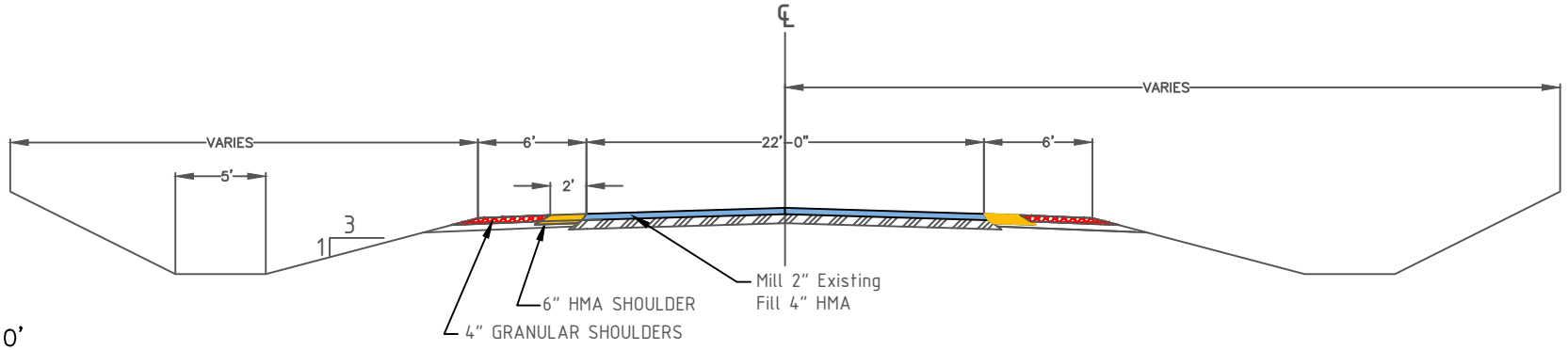
EXISTING TYPICAL SECTION
22' HMA WITH 2' SHOULDERS
2:1 FORE SLOPES



PHASE I FY22 TSIP TYPICAL SECTION
22' HMA WITH 6' SHOULDERS
3:1 FLATTENED FORE SLOPES

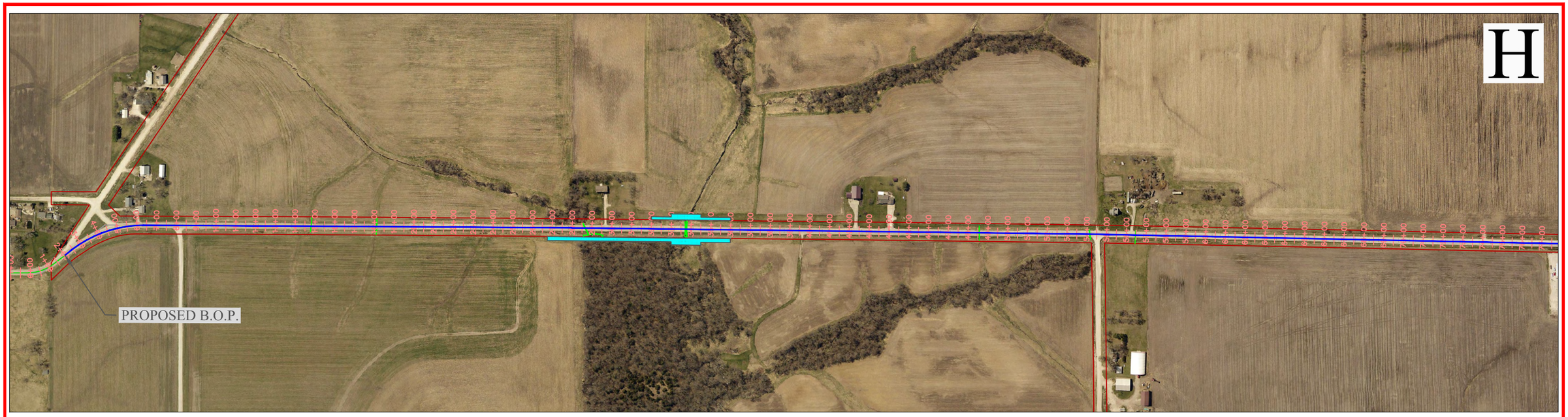


PHASE II FY23 OVERLAY TYPICAL SECTION
22' HMA WITH 2' PAVED & 4' GRANULAR SHOULDERS
3:1 FLATTENED FORE SLOPES



SCALE 1":10'

FILE: Y:\2023 projects\Franklin Avenue- South\DWG\Franklin Ave - SOUTH.dwg	HENRY COUNTY	PROJECT NUMBER: TSIP FRANKLIN AVENUE	SHEET NUMBER G



NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

SCALE 1": 500'

PROPOSED NEW ROW

NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

SCALE 1": 500'

FILE: Y:\2023 projects\Franklin Avenue- South\DWG\Franklin Ave - SOUTH.dwg	HENRY COUNTY	PROJECT NUMBER: STBG-SWAP-CO44(86)--FG-44	FISCAL YEAR 2020	SHEET NUMBER D.01

NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

PROPOSED NEW ROW

SCALE 1": 500'

NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

SCALE 1": 500'

FILE: Y:\2023 projects\Franklin Avenue- South\DWG\Franklin Ave - SOUTH.dwg	HENRY COUNTY	PROJECT NUMBER: STBG-SWAP-CO44(86)--FG-44	FISCAL YEAR 2020	SHEET NUMBER D.02

Y:\2023 PROJECTS\FRANKLIN AVENUE- SOUTH\DWG\FRANKLIN AVE - SOUTH.DWG, 6/11/2020 11:07:44 AM, ANSI FULL BLEED B (11.00 X 17.00 INCHES), 1:1

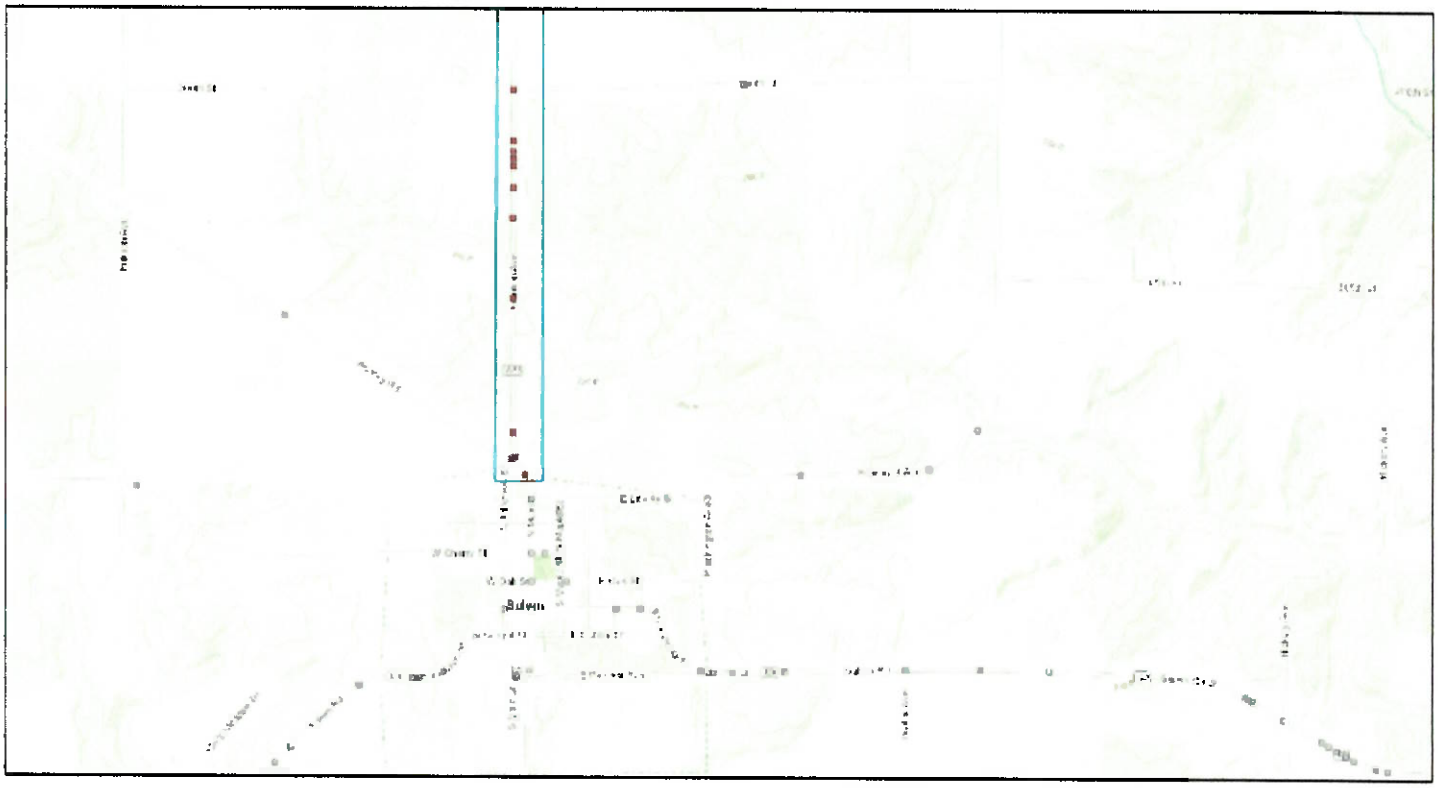
Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity	64
Fatal Crash	1
Suspected Serious Injury Crash	3
Suspected Minor Injury Crash	6
Possible/Unknown Injury Crash	7
Property Damage Only	47

Injury Status Summary	24
Fatalities	1
Suspected serious/incapacitating	4
Suspected minor/non-incapacitating	6
Possible (complaint of pain/injury)	13
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	422,251.00
Average (per crash dollars):	6,597.67
Total Vehicles	72.00
Average (per crash):	1.13
Total Occupants:	105.00
Average (per crash):	1.64

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.02
Injuries/Crash:	0.36
Major Injuries/Crash:	0.06
Minor Injuries/Crash:	0.09
Possible/Unknown Injuries/Crash:	0.20



Major Cause			64
Animal	31	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	1	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	4
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	5
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	1
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...	0
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...	1
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	6
Ran off road - straight	0	Ran off road - left	8
Lost control	2	Swerving/Evasive Action	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	2	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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	2	0	1	0	0	1	1	0	2	0	0	2	0	9
Monday	1	1	0	1	0	0	1	1	1	0	2	1	0	9
Tuesday	1	0	2	0	0	0	1	1	4	1	0	0	0	10
Wednesday	0	2	1	1	0	0	0	1	1	0	1	1	0	8
Thursday	0	0	1	1	0	0	0	0	0	1	0	1	0	4
Friday	0	0	1	2	0	1	0	0	3	0	1	0	0	8
Saturday	1	0	1	0	1	2	2	0	2	5	1	1	0	16
Total	5	3	7	5	1	4	5	3	13	7	5	6	0	64

Manner of Crash Collision	**64**
Non-collision (single vehicle)	41
Head-on (front to front)	2
Rear-end (front to rear)	1
Angle, oncoming left turn	0
Broadside (front to side)	1
Sideswipe, same direction	0
Sideswipe, opposite direction	1
Rear to rear	0
Rear to side	0
Not reported	18
Other	0
Unknown	0

Surface Conditions	**64**
Dry	27
Wet	3
Ice/frost	4
Snow	4
Slush	2
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	24
Other	0
Unknown	0

Fixed Object Struck			**72**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	17	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	1	Traffic sign support	1
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	1
Tree	1	Landscape/shrubbery	0
Snow bank	1	Fence	0
Wall	0	Building	0
Other fixed object	1	None (no fixed object struck)	49

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	2	0	0	2
= 18	2	1	0	0	3
= 19	0	0	0	0	0
= 20	1	0	0	0	1
>= 21 and <= 24	5	2	0	0	7
>= 25 and <= 29	1	5	0	0	6
>= 30 and <= 34	3	5	0	0	8
>= 35 and <= 39	1	2	0	0	3
>= 40 and <= 44	3	3	0	0	6
>= 45 and <= 49	4	5	0	0	9
>= 50 and <= 54	2	2	0	0	4
>= 55 and <= 59	3	0	0	0	3
>= 60 and <= 64	4	5	0	0	9
>= 65 and <= 69	2	2	0	0	4
>= 70 and <= 74	2	3	0	0	5
>= 75 and <= 79	0	1	0	0	1
>= 80 and <= 84	0	1	0	0	1
>= 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	33	39	0	0	72

Alcohol Test Given	72
None	67
Blood	3
Urine	0
Breath	2
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	72
None	72
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

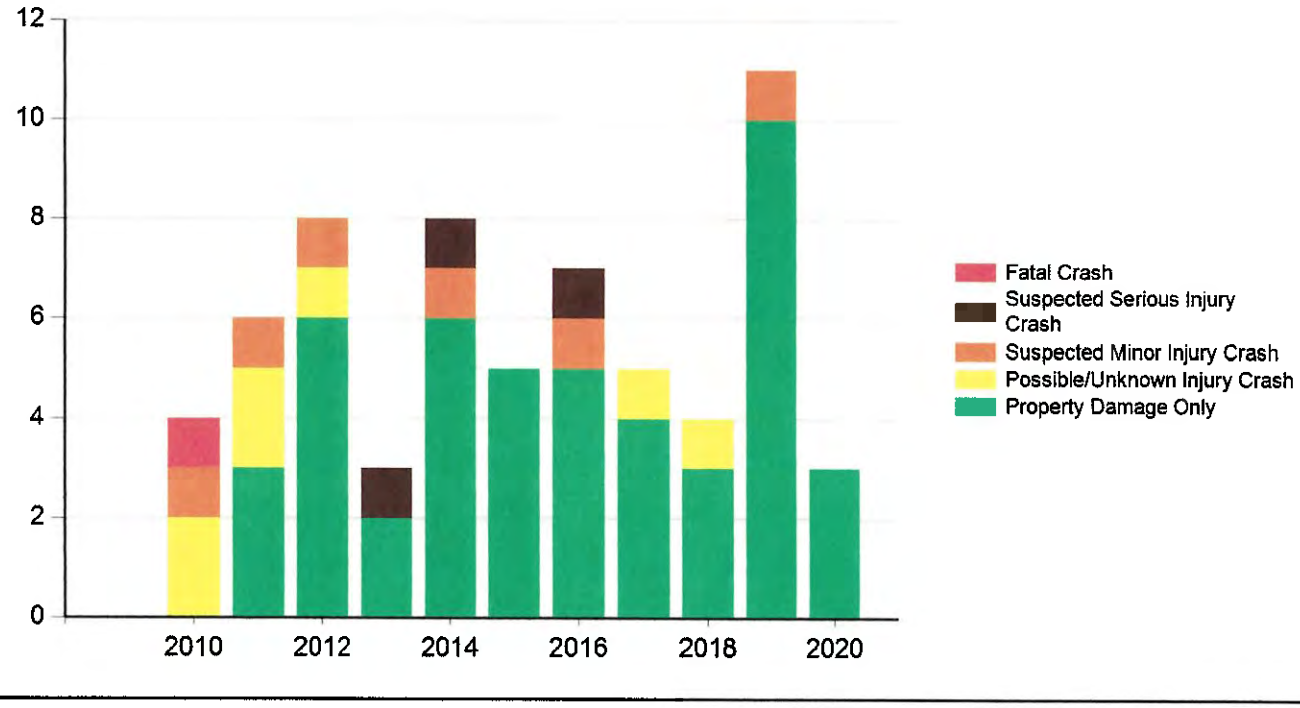
Drug Test Result	72
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	72
Other	0

Drug/Alcohol Related	64
Drug	0
Alcohol (< Statutory)	1
Alcohol (Statutory)	4
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	1
None Indicated	58

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	0	0	0	0
2010	1	0	1	2	0	4
2011	0	0	1	2	3	6
2012	0	0	1	1	6	8
2013	0	1	0	0	2	3
2014	0	1	1	0	6	8
2015	0	0	0	0	5	5
2016	0	1	1	0	5	7
2017	0	0	0	1	4	5
2018	0	0	0	1	3	4
2019	0	0	1	0	10	11
2020	0	0	0	0	3	3
Total	1	3	6	7	47	64

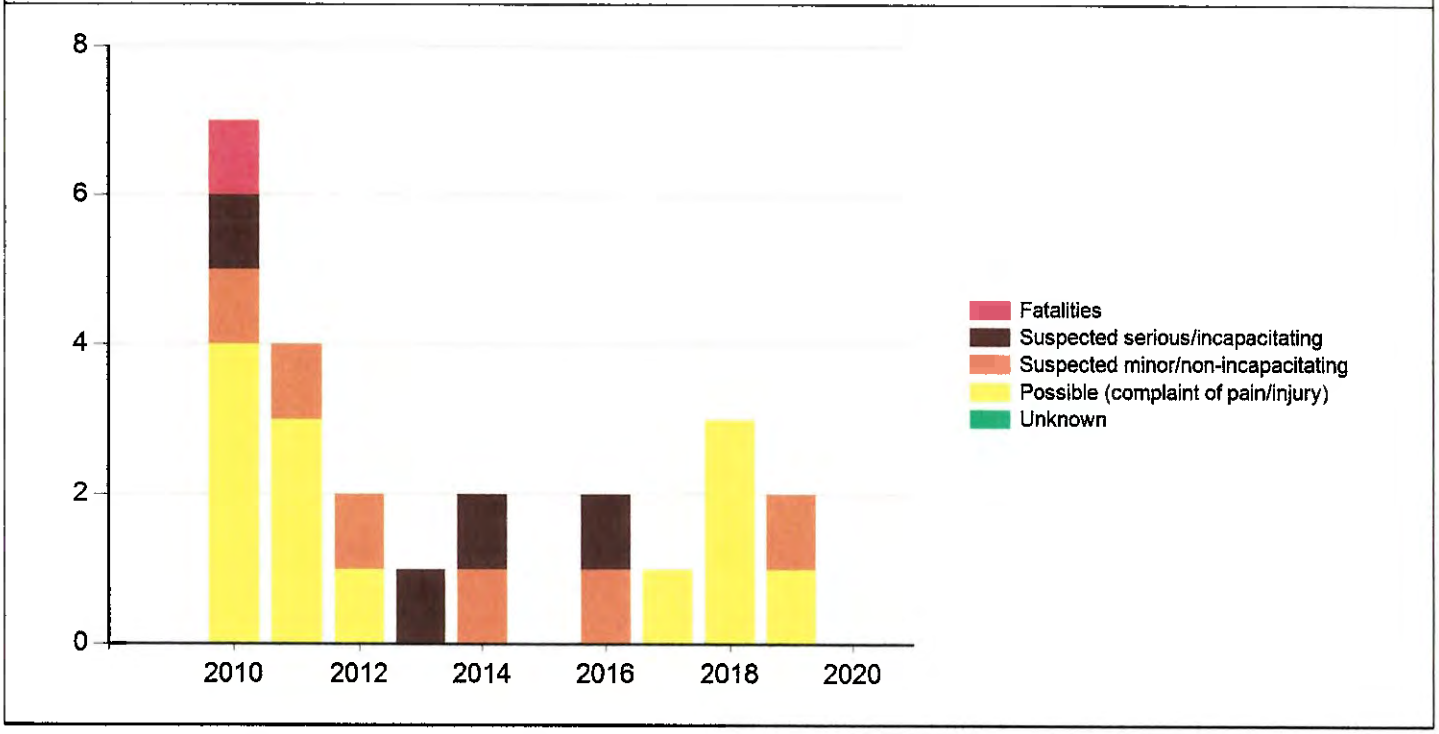
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2009	0	0	0	0	0	0
2010	1	1	1	4	0	7
2011	0	0	1	3	0	4
2012	0	0	1	1	0	2
2013	0	1	0	0	0	1
2014	0	1	1	0	0	2
2015	0	0	0	0	0	0
2016	0	1	1	0	0	2
2017	0	0	0	1	0	1
2018	0	0	0	3	0	3
2019	0	0	1	1	0	2
2020	0	0	0	0	0	0
Total	1	4	6	13	0	24

Injury Status/Year

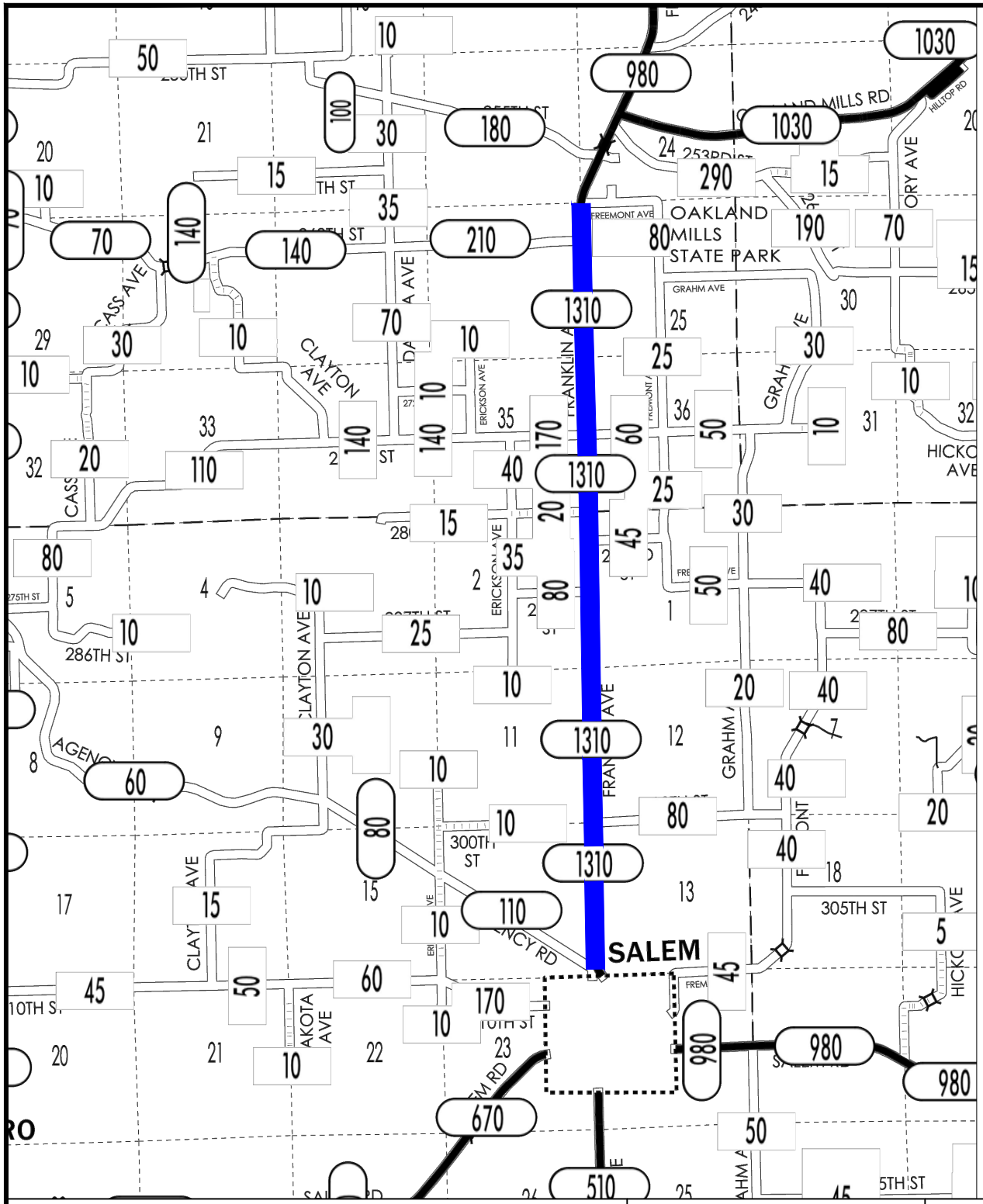


Meeting the following criteria

Jurisdiction: Statewide
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

W55 from Fremont Avenue to Salem



J

TRAFFIC FLOW MAP OF

HENRY COUNTY

IOWA

Prepared By

IOWADOT

OFFICE OF SYSTEMS PLANNING
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

N

In Cooperation With
United States
Department of Transportation

JANUARY 1, 2018

FILE: Y:\2023 projects\Franklin Avenue- South\DWG\Franklin Ave - SOUTH.dwg	HENRY COUNTY	PROJECT NUMBER: TSIP FRANKLIN AVENUE	SHEET NUMBER J

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

L

County: Henry | Prepared by: Jake Hotchkiss | Date Prepared: May 26, 2020

Location: Franklin Avenue W55 From Agency Road to Fremont Avenue

Improvement

Proposed Improvement(s): Flattened fore slopes to 3:1, Add 2 ft paved shoulders, rumble strips

Widen shoulders from 2' to 6'

$1,376,329	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	26	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 1,376,329**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT Traffic count | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
5.00	1,310	W55 (Agency Rd - Fremont)

5.00 miles total

6,550	Current Vehicle Miles / Day, **VM**
9,733	End of Life Veh. Miles / Day
2,390,750	Current Veh. Miles / Year, **AM**
58,088,937	Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

2.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.4 years, Time Period, **T**

5 Additional months

1	Fatal Crashes →	1	Fatalities @	$4,500,000	$ 4,500,000
		3	Major Injuries @	$325,000	$ 975,000
17	Injury Crashes →	6	Minor Injuries @	$65,000	$ 390,000
		7	Possible Injuries @	$35,000	$ 245,000
47	Property Damage Only		(assumed cost per crash)	$7,400	$ 481,000
			-OR- enter all Property Costs of all crashes:		
65	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 6,591,000

6.24	Current Crashes / Year, **AA** = TA / T	**261.0**	Crashes / HMVM, Crash Rate, **CR**
$ 101,400	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
151.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 2,647,259**	Present Value of Avoided Crashes, **BENEFIT**
1.62	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 164,511	Crash Costs Avoided in First Year, AAR x AVCR		
39.4	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $2,647,259 : $1,376,329 = **1.92** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 6/4/2020

Location / Title of Project W55 (Dakota Avenue)

Applicant Henry County

Contact Person Jake Hotchkiss Title County Engineer

Complete Mailing Address PO Box 655

Mt. Pleasant, IA 52641

Phone 319 385-0762 E-Mail jhotchkiss@henrycountyiowa.us
(Area Code)

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	233,340
Total Project Cost	$	428,006
Safety Funds Requested	$	230,000

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

☐ Yes – Explain _____

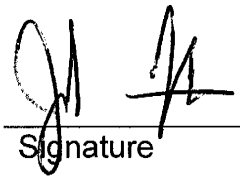
☐ No

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.

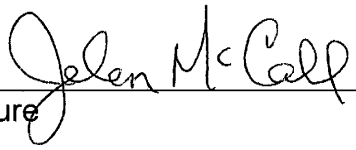
Representing the Henry County

Signed:  6/4/2020

Signature Date Signed

Jake Hotchkiss, County Engineer

Printed Name

Attest:  6/4/2020

Signature Date Signed

Jelen McCall, Office Manager

Printed Name

A

RESOLUTION
25-2020-20
APPROVAL OF
TRANSPORTATION SAFETY IMPROVEMENT PROGRAM APPLICATION
FOR W55 (DAKOTA AVENUE)

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, past traffic data shows the existing W55 (Dakota Avenue) corridor has an accident history and safety for the traveling public could be improved by incorporating safety improvements; and

WHEREAS, the following safety improvements have been identified for completion:
Widen existing shoulders with 2' paved and 4' granular, flattened fore slopes, install safety edge and shoulder rumble strips.

WHEREAS, the overlay of W55 (Dakota Avenue) is included in the Henry County Five (5) Year Construction Program; and

WHEREAS, the Henry County Engineer recommends the TSIP application be submitted to the Iowa Department of Transportation for possible safety funding of the above-mentioned project.

IT IS THEREFORE RESOLVED, by the Henry County Board of Supervisors to endorse the above-mentioned project and authorize the maintenance of the improvement after construction is complete.

NOW THEREFORE BE IT RESOLVED, by the Henry County Board of Supervisors in session this **4th day of June, 2020,** that the Henry County Board of Supervisors hereby authorizes the County Engineer to execute and submit the application to the Iowa Department of Transportation for Traffic Safety Improvement Program funding.

ATTEST:

Shelly Barber
Henry County Auditor

HENRY COUNTY BOARD OF SUPERVISORS

Marc B. Lindeen, Chairman

Gary K. See, Member

Greg Moeller, Member

HENRY COUNTY, IOWA
Engineering & Road Department

1510 E. Washington Street
P O Box 655
Mt. Pleasant, Iowa 52641

Phone: 319 385-0762
Fax: 319 385-0777
e-mail: engineer@henrycountyiowa.us

B

Date: June 1, 2020

Office of Traffic & Safety
Iowa DOT
800 Lincoln Way
Ames, IA 50010

RE: Henry County Application for TSIP funds – W55 Dakota Avenue Safety Improvements

Narrative:

Proposed Project
Henry County is applying for Traffic Safety Improvement Program funding to improve the safety on a section of Henry County Road W55 (Dakota Avenue) starting at the corporation Limits of Wayland then North to Henry-Washington County Line, approximately 0.47 miles.
We are requesting safety TSIP funds for the following safety improvements:

- **widen existing granular shoulders 2' to 6' (requires extending existing culvert)**
- **flatten fore slopes to 3:1**
- **Add 2 ft paved shoulders**
- **Add safety edge**
- **Install shoulder rumble strips.**

This project will be programmed for December 2021 letting. The route leads to one of the larger Feed Mills in Southeast Iowa- Eichelberger Mills. The heavy truck traffic is a safety concern and with the proximity of WACO High School the need to improve pavement cross-section is extremely important for the 1650 ADT that traverses W55 daily. Henry County is requesting $230,000 to complete this safety improvement.

Existing Conditions
This is a Farm to Market road connecting Wayland to Washington; running North to the Henry-Washington County line. In 1958, the road was originally paved with a 2.5" HMA surface. In 1976 an additional 3" of HMA was added and again in 1996 a 3" lift was added. Currently, the road is paved 24 feet wide, with 2-foot granular shoulders, and 2:1 fore slopes or steeper. This makes the road unforgiving for vehicles that leave the traveled roadway. The road is posted 55 mph and has a moderate traffic count of (1,650 vpd) with a high percentage of trucks.

Previous Safety Improvements
Henry County has worked over the years to keep signage up to date and current with MUTCD standards. As a standard practice, current signage for curves & intersections will be reviewed during our development of plans. Henry County works routinely to keep brush cut back within the right-of-way and sprays brush after it has been removed; along with mowing shoulders 2-3 times a year. We currently reapply our pavement markings every other year, including edge line and centerline, with a county-owned paint truck.

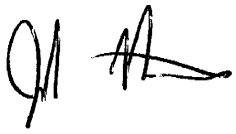
Proposed Continuity
Washington County currently has shoulders in excess of 6-ft and will be applying to add 2-ft paved shoulders to complete previous work on W55. With approval of this application the route from Wayland to Washington will have addressed the run-off the road concerns noted on W55.

Crash Reduction Factor
Planning-Level Crash Reduction Factor (CRF) List was utilized. Per recommended list:

"Road Segment" Flatten Fore slope to 3:1
"Road Segment" Install Edge line & Centerline Rumble Strips
"Road Segment" Add Paved Shoulder
"Road Segment" Add Safety Edge

Since becoming the County Engineer, I have had safety concerns about this roadway. With cooperation between the City of Wayland and Henry County we could make a lasting safety improvement with paved shoulders and flattened slopes. Our request for Traffic Safety Improvement Program funding aligns with projects typically funded by TSIP and we fully expect that the funding of this project will make significant lasting impact on the safety of this roadway.

Sincerely,



Jake Hotchkiss, PE
Henry County Engineer

W55 NORTH OF WAYLAND SHOULDER WIDENING & PAVED SHOULDER

C

ENGINEER'S ESTIMATE

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	DIVISION I	DIVISION II SAFETY	UNIT PRICES	DIVISION I TOTAL	DIVISION II SAFETY
1	2101-0850001	CLEARING AND GRUBBING	ACRE		1.00	$6,000.00	$0.00	$6,000.00
2	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED	CY		6000.00	$12.00	$0.00	$72,000.00
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY		500.00	$10.00	$0.00	$5,000.00
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY		1000.00	$10.00	$0.00	$10,000.00
5	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON		721.00	$20.00	$0.00	$14,420.00
6	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON		100.00	$23.30	$0.00	$2,330.00
7	2123-7450020	SHOULDER FINISHING, EARTH	STA		51.50	$50.00	$0.00	$2,575.00
8	2212-0475095	CLEAN AND PREPARATION OF BASE	MILE	0.50	0.50	$1,500.00	$750.00	$750.00
9	2213-2713300	EXCAVATION, CLASS 13, WIDEN	CY		97.00	$10.00	$0.00	$970.00
10	2213-7100400	RELOCATION OF MAILBOX	EACH	10.00		$150.00	$1,500.00	$0.00
11	2214-5145150	PAVEMENT SCARIFICATION	SY	6874.70		$2.00	$13,749.40	$0.00
12	2303-0002380	HMA MIXTURE INTERLAYER BASE COURSE, 3/8 IN. MAX	TON	412.00	69.00	$60.00	$24,720.00	$4,140.00
13	2303-1032500	HMA STANDARD TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	TON	560.00	72.00	$50.00	$28,000.00	$3,600.00
14	2303-1033500	HMA STANDARD TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, NO SPECIAL FRICTION REQUIREMENT	TON	560.00	72.00	$50.00	$28,000.00	$3,600.00
15	2303-1131500	HMA STANDARD TRAFFIC, BASE COURSE, 1/2 IN MIX	SY	1145.00		$10.00	$11,450.00	$0.00
16	2303-1258283	ASPHALT BINDER, PG 58-28S, STANDARD TRAFFIC	TON	45.00	5.00	$600.00	$27,000.00	$3,000.00
17	2303-1258346	ASPHALT BINDER, PG 58-34E, EXTREMELY HIGH TRAFFIC	TON	25.00	4.00	$780.00	$19,500.00	$3,120.00
18	2303-6911000	HMA PAVEMENT SAMPLES	LS	0.50	0.50	$3,500.00	$1,750.00	$1,750.00
19	2402-2720000	EXCAVATION, CLASS 20	CY		100.00	$15.00	$0.00	$1,500.00
20	2403-0100020	STRUCTURAL CONCRETE (RCB CULV)	CY		28.00	$1,200.00	$0.00	$33,600.00
21	2404-7775000	REINFORCING STEEL	LB		4000.00	$2.00	$0.00	$8,000.00
22	2507-3250005	ENGINEER FABRIC	SY		200.00	$3.00	$0.00	$600.00
23	2507-6800061	REVETMENT, CLASS 'E'	TON		150.00	$44.00	$0.00	$6,600.00
24	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT	STA	64.50		$17.00	$1,096.50	$0.00
25	2528-8445110	TRAFFIC CONTROL	LS	0.50	0.50	$7,000.00	$3,500.00	$3,500.00
26	2528-8445113	FLAGGERS	EACH	10.00	20.00	$495.00	$4,950.00	$9,900.00
27	2528-8445115	PILOT CAR	EACH	5.00	5.00	$740.00	$3,700.00	$3,700.00
28	2533-4980005	MOBILIZATION	LS	0.50	0.50	$30,000.00	$15,000.00	$15,000.00
29	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA		75.00	$50.00		$3,750.00
30	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIP)	GAL		108.00	$20.00		$2,160.00

W55 NORTH OF WAYLAND SHOULDER WIDENING & PAVED SHOULDER

ENGINEER'S ESTIMATE

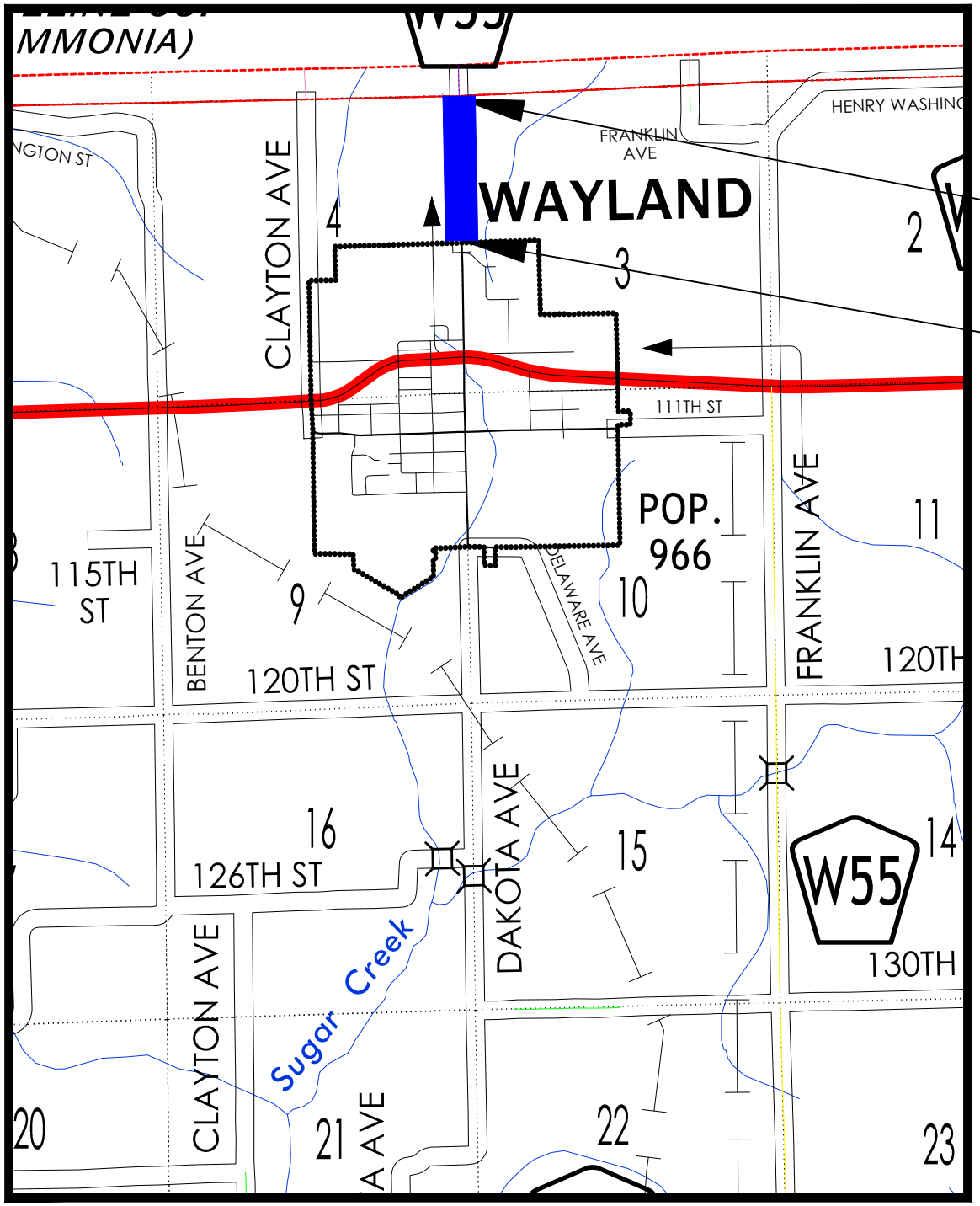
C

31	2601-2634100	MULCH	ACRE		3.50	$600.00	$0.00	$2,100.00
32	2601-2636043	SEED & FERTILIZING (RURAL)	ACRE		3.50	$600.00	$0.00	$2,100.00
33	2602-0000020	SILT FENCE	LF		1500.00	$1.60	$0.00	$2,400.00
34	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF		1500.00	$1.75	$0.00	$2,625.00
35	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF		1000.00	$0.50	$0.00	$500.00
36	2602-0000312	PERIMETER+SLOPE SEDIMENT CNTL DEVICE, 12 IN.	LF		300.00	$3.50	$0.00	$1,050.00
37	2602-0010010	MOBILIZATION, EROSION CONTROL	EACH		2.00	$500.00	$0.00	$1,000.00
						TOTALS=	**$184,665.90**	**$233,340.00**

TOTAL DIV I & II	**$418,005.90**

FUNDING SOURCE BREAKDOWN	
Safety Improvement	
Funding Sources	Amount
ROW (1.0acres) LOCAL	$10,000
TSIP	$230,000
FM Funds	$188,006
TOTAL	**$428,006**

D & E



E.O.P.
Henry-Washington County Line

B.O.P.
City Limits of Wayland

NOT TO SCALE

Length of Project =0.5 Miles

Henry County Projected Time Line:

1. Letting Date: December 2021
2. Late Start Date: May 2022
3. 30 working days
4. Estimated completion: Fall 2022

	HENRY COUNTY	PROJECT NUMBER W55 (DAKOTA AVENUE) TSIP

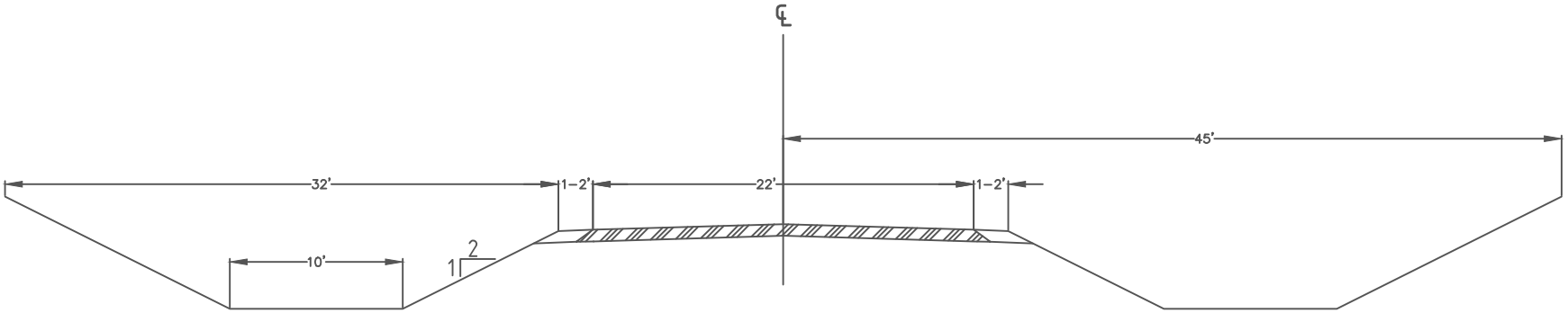
TYPICAL ROAD PICTURES W55(DAKOTA AVENUE) F

TYPICAL CROSS SECTION VIEWS

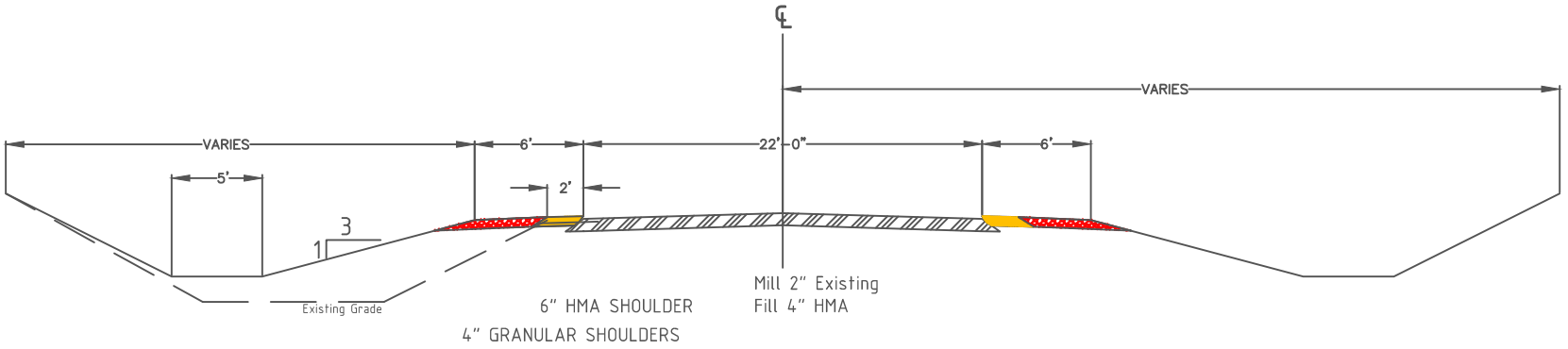
EICHELBERGER MILL OPERATION LOCATED AT COUNTY LINE

G

EXISTING TYPICAL SECTION
22' HMA WITH 2' SHOULDERS
2:1 FORE SLOPES



PROPOSED FY22 OVERLAY TYPICAL SECTION
22' HMA WITH 2' PAVED & 4' GRANULAR SHOULDERS
3:1 FLATTENED FORE SLOPES



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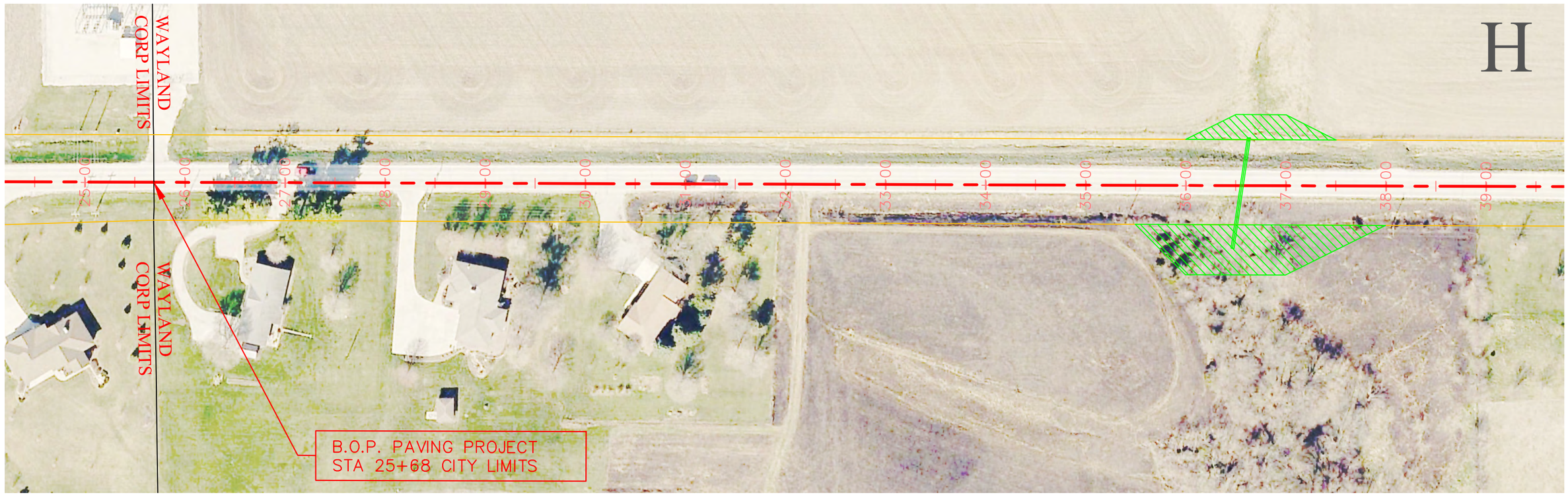


NOTE: ALL COORDINATES ARE EXPRESSED IN FEET AND REFERENCE THE IOWA COORDINATE SYSTEM SOUTH ZONE, NAD83.

PROPOSED ROW

SCALE 1":100'

FILE: Y:\2022 Projects\W55 North of HWY 78\TSIP Application.dwg	HENRY COUNTY	PROJECT NUMBER: FM-CO44(Wayland N.)--55-44	FISCAL YEAR 2022	SHEET NUMBER H

Y:\2022 PROJECTS\W55 NORTH OF HWY 78\TSIP APPLICATION.DWG, 5/26/2020 10:03:36 AM, ANSI EXPAND B (11.00 X 17.00 INCHES), 1:1

Iowa Crash Analysis Tool
Quick Report
2010-2020

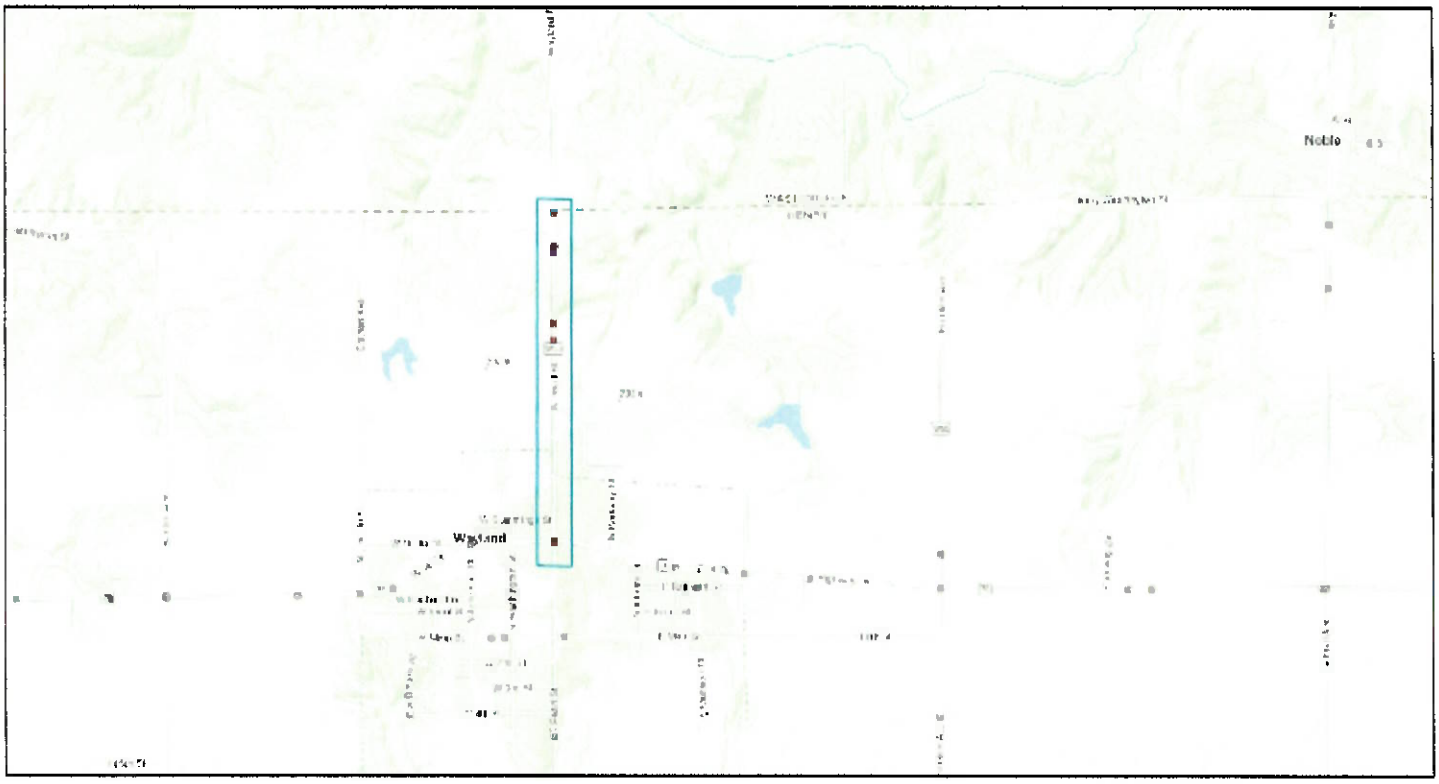
I

Crash Severity	7
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	2
Property Damage Only	4

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	40,000.00
Average (per crash dollars):	5,714.29
Total Vehicles	10.00
Average (per crash):	1.43
Total Occupants:	11.00
Average (per crash):	1.57

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.29
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.14
Possible/Unknown Injuries/Crash:	0.14



1650 AOT

Major Cause			7
Animal	1	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	1	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	1
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	1
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	1	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Wednesday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Thursday	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Saturday	0	0	0	1	0	1	0	1	0	0	0	0	0	3
Total	0	0	1	1	0	1	1	3	0	0	0	0	0	7

Manner of Crash Collision	**7**
Non-collision (single vehicle)	3
Head-on (front to front)	1
Rear-end (front to rear)	1
Angle, oncoming left turn	0
Broadside (front to side)	1
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	**7**
Dry	6
Wet	0
Ice/frost	0
Snow	0
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			**10**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	2	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
Traffic signal support	0	Other post/pole/support	1
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	7

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	0	0	0	0	0
= 16	1	1	0	0	2
= 17	0	0	0	0	0
= 18	0	1	0	0	1
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	1	0	0	1
>= 35 and <= 39	0	0	0	0	0
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	2	0	0	0	2
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	1	0	0	1
>= 70 and <= 74	2	1	0	0	3
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	5	5	0	0	10

Drug/Alcohol Related	7
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	7

Alcohol Test Given	10
None	9
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Given	10
None	9
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Result	10
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	10
Other	0

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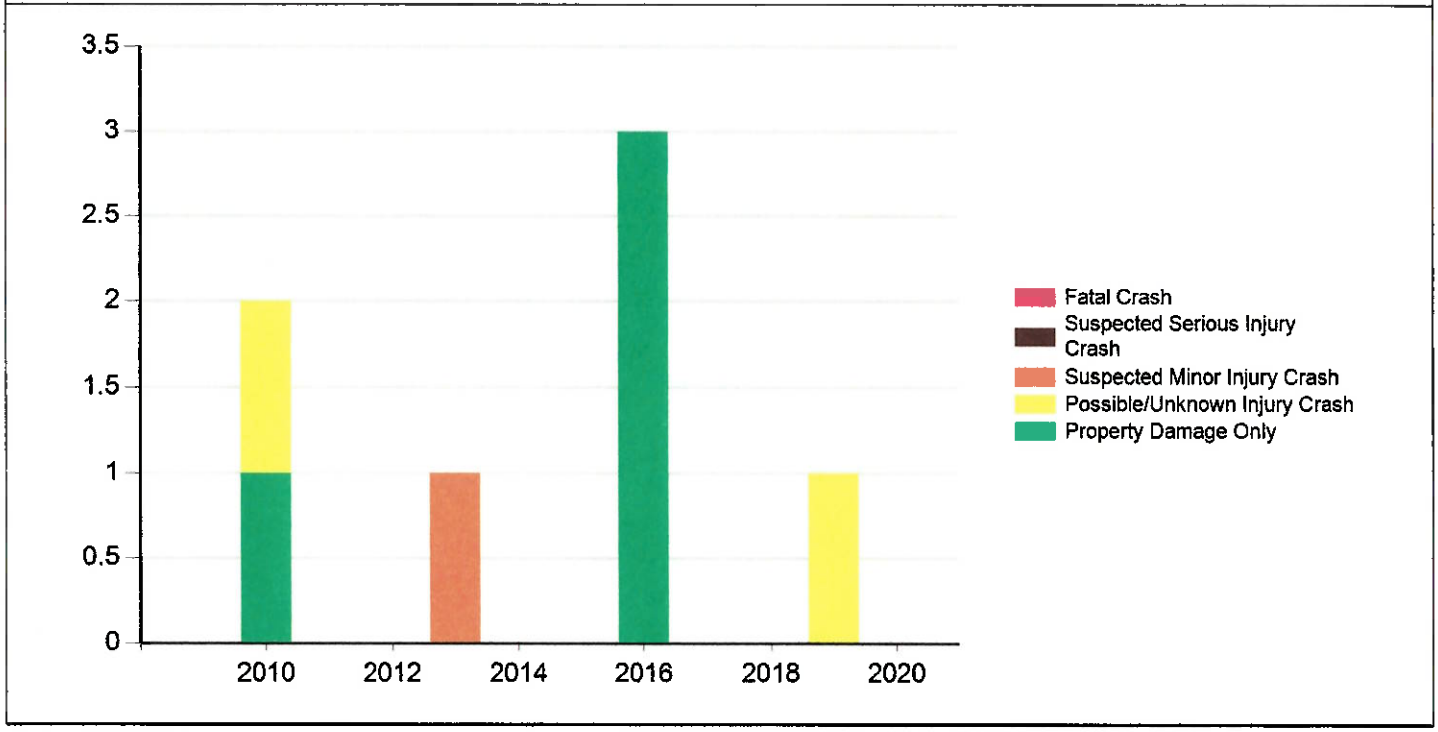
Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2009	0	0	0	0	0	0
2010	0	0	0	1	1	2
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	1	0	0	1
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	3	3
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	1	0	1
2020	0	0	0	0	0	0
Total	0	0	1	2	4	7

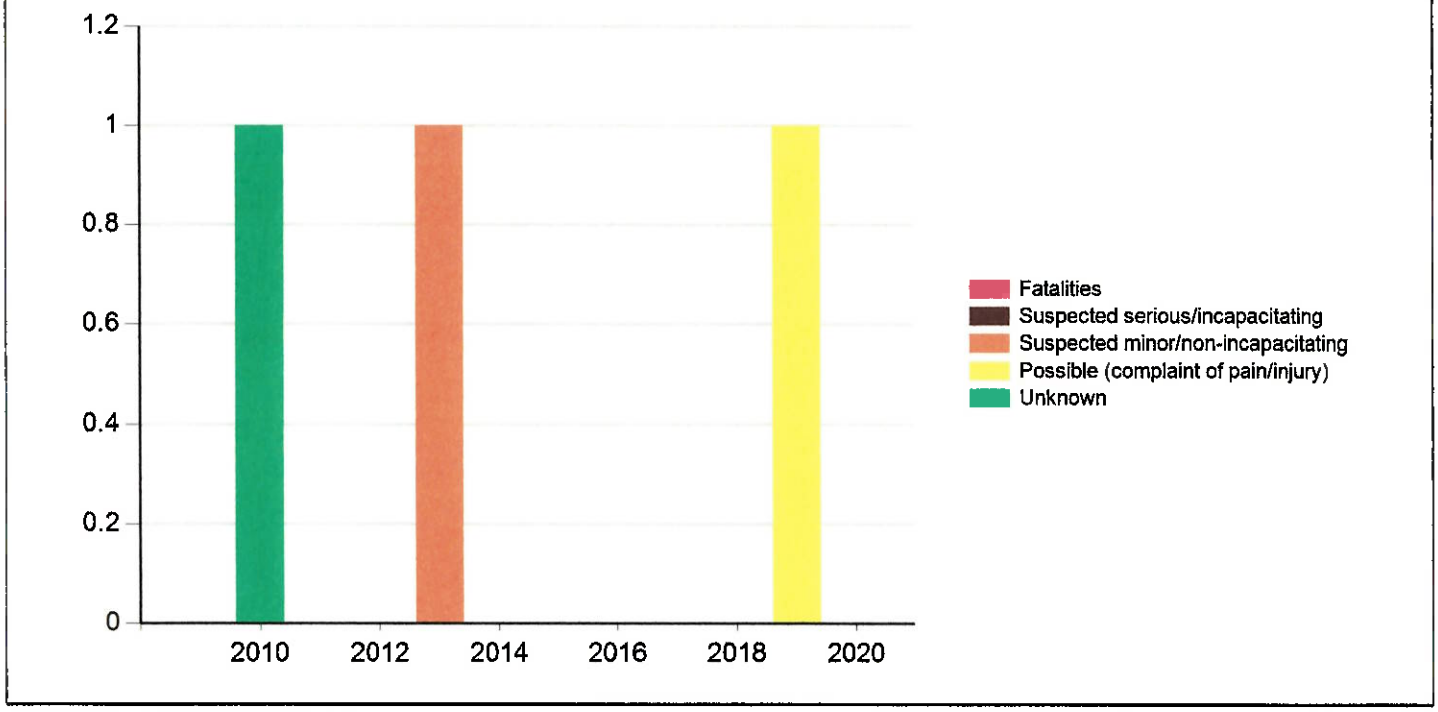
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2009	0	0	0	0	0	0
2010	0	0	0	0	1	1
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	1	0	0	1
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	1	0	1
2020	0	0	0	0	0	0
Total	0	0	1	1	1	3

Injury Status/Year



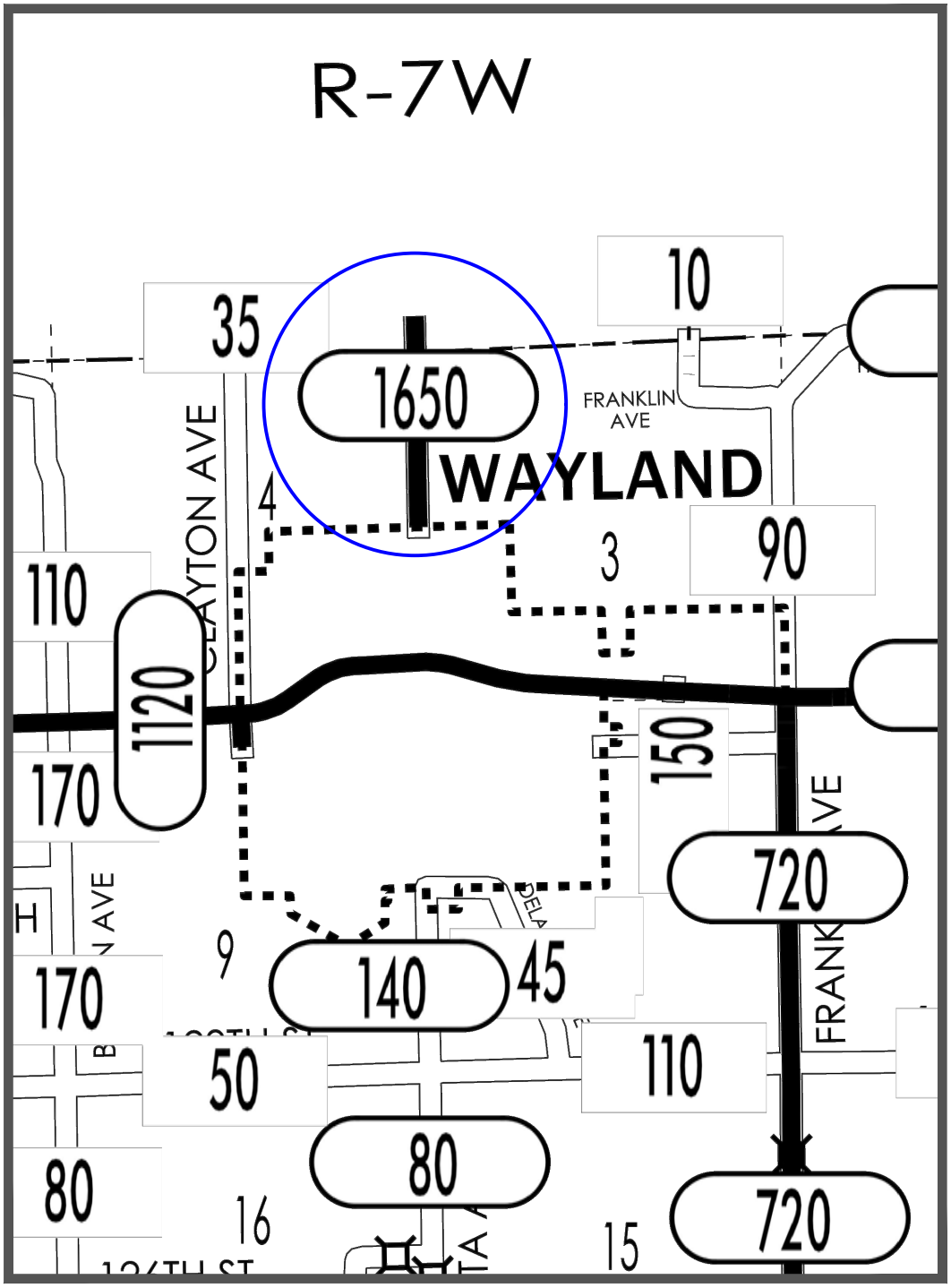
I

Meeting the following criteria

Jurisdiction: Statewide
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

W55 North 78 to County line



J

TRAFFIC FLOW MAP OF

HENRY COUNTY

IOWA

Prepared By

IOWA DOT

OFFICE OF SYSTEMS PLANNING
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

N

In Cooperation With

United States
Department of Transportation

JANUARY 1, 2018

FILE: Y:\2022 Projects\W55 North of HWY 78\TSIP Application.dwg	HENRY COUNTY	PROJECT NUMBER: FM-CO44(Wayland N.)--55-44	SHEET NUMBER J

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

L

County: Henry | Prepared by: Jake Hotchkiss | Date Prepared: May 8, 2020

Location: W55 starting at city limits then North to County line

Improvement

Proposed Improvement(s): FLATTENED FORESLOPES TO 3:1, WIDEN SHOULDERS, MILLED RUMBLE STRIPS ADD 2' PAVED SHOULDERS

$ 240,000 Estimated Improvement Cost, **EC**	20 Estimated Service Life, years, **Y**
$ - Other Annual Cost (after initial year), **AC**	26 Crash Reduction Factor (integer), **CRF**
$ - Present Value Other Annual Costs, **OC**	4.0% Discount Rate, **INT**
$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^{Y}}\right)$$	**$ 240,000** Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT Traffic count | 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.50	1,650	
0.50	miles total	

825 Current Vehicle Miles / Day, **VM**

1,490 End of Life Veh. Miles / Day

301,125 Current Veh. Miles / Year, **AM**

8,091,342 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^{Y}\right)$$

3.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.4 years, Time Period, **T**

5 Additional months

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
3	Injury Crashes →	1	Minor Injuries @	$65,000	$ 65,000
		2	Possible Injuries @	$35,000	$ 70,000
4	Property Damage Only		(assumed cost per crash)	$7,400	$ 51,800
			-OR- enter all Property Costs of all crashes:		
7	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 186,800

0.67 Current Crashes / Year, **AA** = TA / T

$ 26,686 Cost per Crash, **AVCR** = LOSS / TA

18.1 Total Expected Crashes, **TCR** = CR x TVMT/10^8

0.17 Crashes Avoided First Year **AAR** = AA x CRF / 100

$ 4,663 Crash Costs Avoided in First Year, AAR x AVCR

4.7 Total Avoided Crashes, TCR x CRF/ 100

223.2 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 81,927 Present Value of Avoided Crashes, **BENEFIT**

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^{Y}\right)$$

Benefit / Cost Ratio

Benefit : Cost = $81,927 : $240,000 = **0.34** : 1

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 6/29/20

Location / Title of Project IA 146 and County Road F-62 near Searsboro

Applicant District 1

Contact Person Gary Kretlow Title Traffic Tech

Complete Mailing Address 1020 S. 4th St.

Ames, IA 50010

Phone 515-239-1199 (Area Code) E-Mail Gary.kretlowjr@iowadot.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	$ 500,000
Total Project Cost	$ 698,100
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 _In the DRSP above 50% risk factor

☐ No

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Poweshiek | Prepared by: Gary Kretlow | Date Prepared: Jun 24, 2020

Intersection: IA 146 and County Road F62 near Searsboro

Improvement

Proposed Improvement(s): Realign southbound IA 146 at F62 to give better sight distance for the stop condition.

$ 500,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ 5,000	Other Annual Cost (after initial year), **AC**	34	Crash Reduction Factor (integer), **CRF**
$ 67,952	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 567,952	Present Value Cost, **COST** = EC + OC

$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^{Y}}\right)$$

Traffic Volume Data

Source: Iowa DOT | 2018 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

994 (N) | 526 (W) | 1,179 (E) | 0 (S)

985,135 Current Annual Entering Veh., **AEV** = DEV * 365

3,293 veh / day, Final Year DEV, **FDEV**

21.69 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

1.0% Projected Traffic Growth (0%-10%), **G**

2,699 Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^{Y}\right) \Big/ 10^{6}$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
1	Injury Crashes	0	Minor Injuries @	$65,000	$ -
		1	Possible Injuries @	$35,000	$ 35,000
3	Property Damage Only		(assumed cost per crash)	$7,400	$ 29,600
			-OR- enter all Property Costs of all crashes:		
4	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 64,600

0.80	Current Crashes / Year, **AA** = TA / T	**0.81**	Crashes / MEV, Crash Rate, **CR**
$ 16,150	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
17.6	Total Expected Crashes, **TECR** = CR x TMEV	**$ 63,931**	Present Value of Avoided
0.27	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 4,328	Crash Costs Avoided in First Year, AAR x AVC		
5.9	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^{Y}\right)$$

Benefit / Cost Ratio

Benefit : Cost = $63,931 : $567,952 = **0.11** : 1

IA 146 & County Road F62

1. Existing Conditions

IA 146 is a 2-lane roadway with a 55mph speed limit. IA 146 currently has a stop condition for southbound traffic and northbound is free flow. County Road F62 is a 2-lane county road with a free flow condition eastbound and westbound.

2. Proposed Concept

Based on the review of existing conditions and accidents, we are proposing to bring IA 146 in at 90 degrees to line it up better with County Road F62. This will allow better sight distance from the stop sign. In order to improve the stopping sight distance the vertical profile correction on existing County Road F-62 requires 840 feet of reconstruction. This is the primary expense involved with this proposed TSIP project application.

3. Justification

This intersection currently has a risk percentage of 50 in the District 1 DRSP. The DOT has also received comments from the county sheriff and truck drivers who use this intersection about the number of close calls. The current stop condition for southbound IA 146 makes it hard for a truck driver to see traffic coming eastbound on County Road F62.

4. Cost Estimate and Proposed Funding Sources

The cost of the proposed improvements is estimated at $699,100. It is proposed to fund the cost of the project with TSIP funds and 3R funds. The project will be constructed within current right of way and use a lot of the current pavement.

5. Proposed Schedule

The project is proposed for letting in fiscal year 2022 with construction to be completed by end of 2023.

Project Quantities

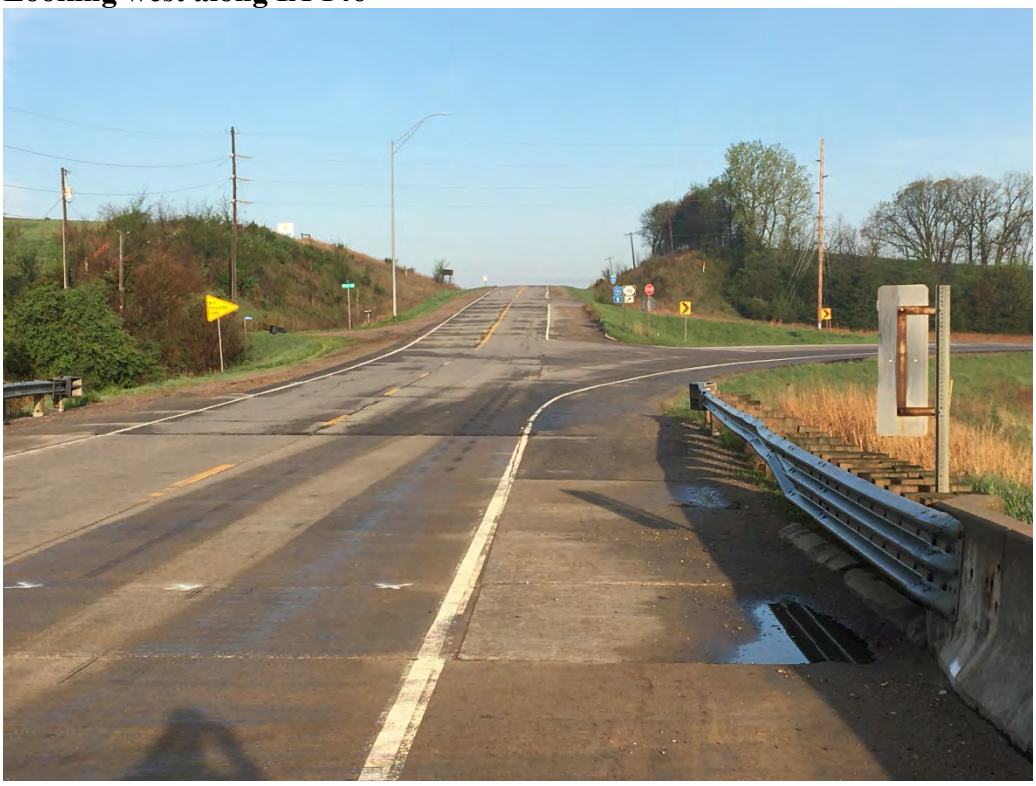
ITEM#	ITEM DESCRIPTION		UNITS	QUANTITY	UNIT PRICE	TOTAL
1	9.0" PCC PAVEMENT (24' Wide)		SY	3,500	$ 50.00	$ 175,000.00
2	12" MODIFIED SUBBASE		CY	1,500	$ 50.00	$ 75,000.00
3	EXCAVATION, CLASS 10		CY	22,000	$ 12.00	$ 264,000.00
4	GRANULAR SHOULDERS, TYPE A		TON	1,100	$ 25.00	$ 27,500.00
5	MILLED RUMBLE STRIPS, PCC		STA	30	$ 50.00	$ 1,500.00
6	CENTERLINE RUMBLE STRIPS, PCC		STA	20	$ 50.00	$ 1,000.00
7	LONGITUDINAL SUBDRAINS		LF	1,300	$ 12.00	$ 15,600.00
8	PAINTED PAVEMENT MARKINGS		STA	100	$ 11.00	$ 1,100.00
9	PAVEMENT REMOVAL		SY	3,500	$ 6.00	$ 21,000.00
					SUBTOTAL	$ 581,700.00
10	RIGHT OF WAY		LS	N/A		$ -
11	TRAFFIC CONTROL				5%	$ 29,100.00
12	MOBILIZATION				5%	$ 29,100.00
	Contingency				10%	$ 58,200.00
					TOTAL	**$ 698,100.00**

Looking south towards F-62

Looking South

Looking East along F-62 towards IA 146

Looking west along IA 146




IA 146 & F62
146
F62
Google Earth
© 2020 Google
N
200 ft

HIGHWAY AND TRANSPORTATION MAP

POWESHIEK COUNTY
IOWA

Prepared By

IOWA DOT

SYSTEMS PLANNING BUREAU
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

In Cooperation With
United States
Department of Transportation

JANUARY 1, 2019

MILES 0 1 2 3 4
KILOMETERS 0 1 2 3 4 5 6

12 - 20 - 19

LEGEND

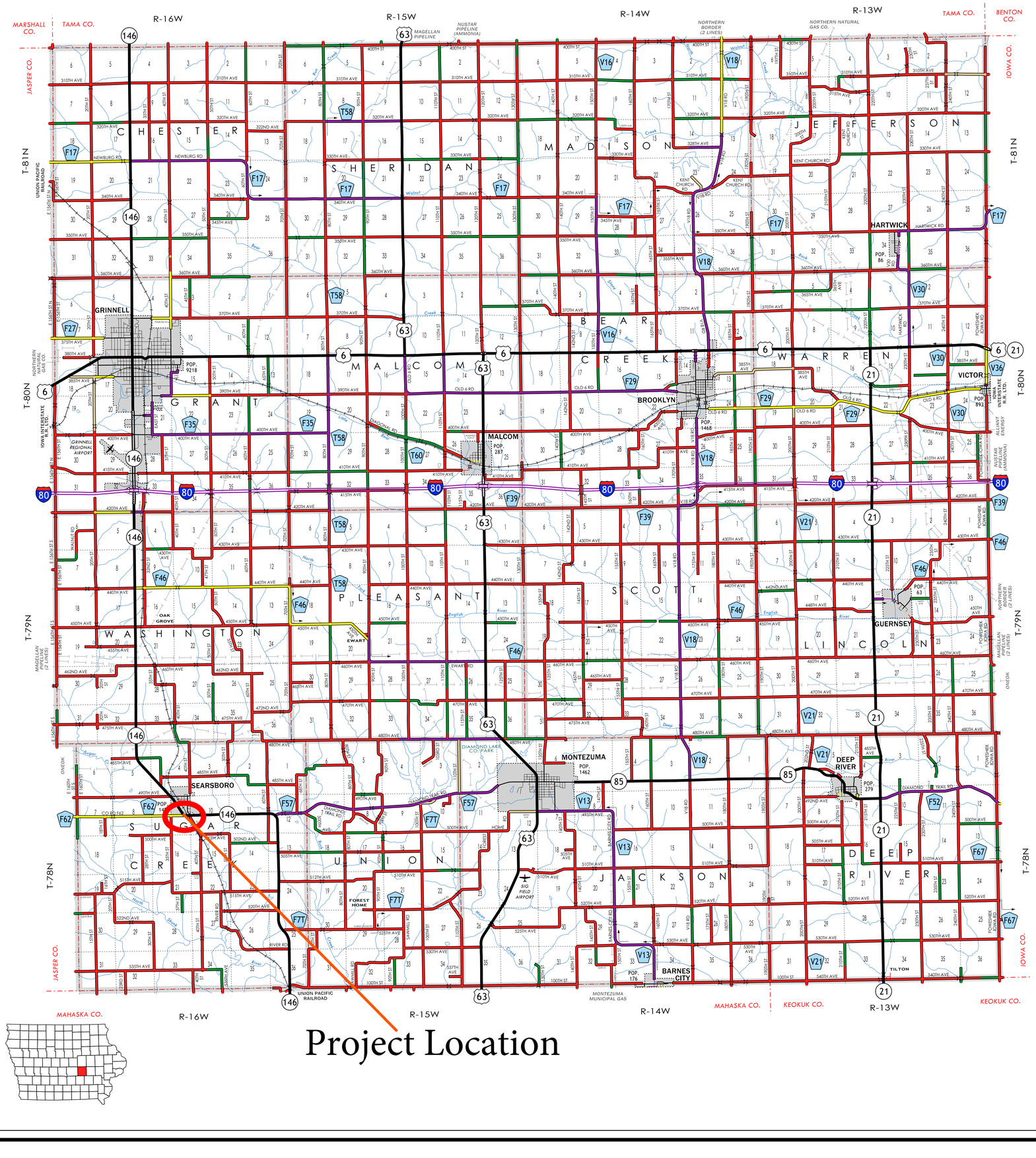
- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD

- INTERSTATE HIGHWAY 80
- UNITED STATES HIGHWAY 65
- STATE HIGHWAY 237
- COUNTY HIGHWAY S27

- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE

- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES ABBEY ROAD
- UNINCORPORATED PLACE ELWOOD

- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND



79

(For Information Only)

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
		010		18	213

SUGAR CREEK TWP.
T 78 N. R 16 W.

CHARLES HASLEY

HARRY C. & GERTIE VAN GORP

MEADOW

PASTURE

Sec. 12

Sec. 11

Prop. Intercepting Ditch

Prop. Ditch

Sta. 2382+78 3'X3'X42.0' Conc. Box Culv. D.A.= 3 Ac. H Extension to extend pres. structure 40' Lt. Lt. 28.8 @ Rt 92.6°

Sta. 2392+76.84 2'X2'X54.6' Conc. Box Culv. D.A.= 5 Ac. H Relocate to remove pres. structure. Furnish and place 24"ø (.564"(8) and 5(.6"(1) round rdwy. pipe culv. at Sta. 2392+76.84 Class 80 conc. → Reinforced

Sta. 2398+25 83.6 Rt 2'X2'X54.6' Conc. Box Culv. D.A.= 5 Ac. H Relocate to remove pres. structure. Furnish and place 24"ø (.564"(8) and 5(.6"(1) round rdwy. pipe culv. at Sta. 2398+25 Class 80 conc. → Reinforced

C.M.P.A.S.T. conc. pipe D.A.= 7 Ac. Use as constructed

Sta. 2405+10.8 5'X5'X28.0 Conc. Box Culv. D.A.= 33 Ac. Extension to extend pres. structure (Southbound) 89.7 Lt. & 102.1 Rt. Relocate to ditch min. limits.

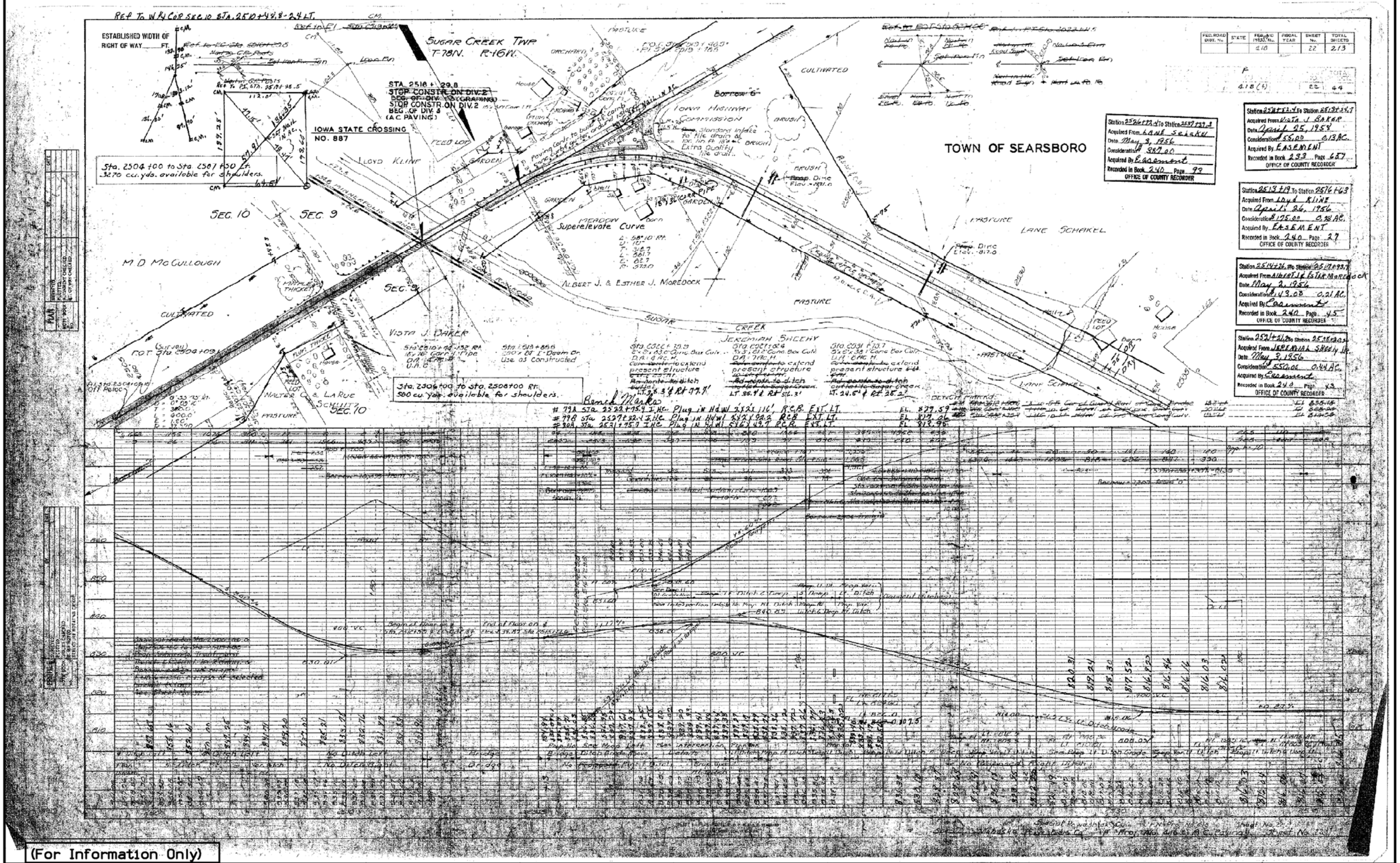
Bench Marks: #6A Sta. 2389+99 1 Hc. Plug in Hdwl 38' X 100' Rt. & Est Lt. EL. 855.06
#7A Sta. 2405+10.8 1 Hc. Plug in Hdwl 35' X 100' Lt. EL. 845.65

Station 2399+25.3 To Station 2414+91.
Acquired From Charles Hasley
Date April 15, 1936
Consideration $ 1323.75 4.01 AC.
Acquired By EASEMENT
Recorded in Book 231 Page 223
OFFICE OF COUNTY RECORDER

(For Information Only)

ENGLISH	IOWA DOT	DESIGN TEAM Gustafson\North	MAHASKA/POWESHIEK COUNTY	PROJECT NUMBER STP-146-1(6)--2C-62/MB-146-1(500)3--77-79 & STP-63-3(91)--2C-62	SHEET NUMBER D.5

(For Information Only)



FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
		418		22	213
	F			418(4)	22 44

(For Information Only)

ENGLISH	IOWA DOT	DESIGN TEAM Gustafson\North	MAHASKA/POWESHIEK COUNTY	PROJECT NUMBER STP-146-1(6)--2C-62/MB-146-1(500)3--77-79 & STP-63-3(91)--2C-62	SHEET NUMBER D.6

9:04:51 AM 7/28/2011 rinorth W:\Projects\6214601003\DistrictDesign\62146006D00.sht

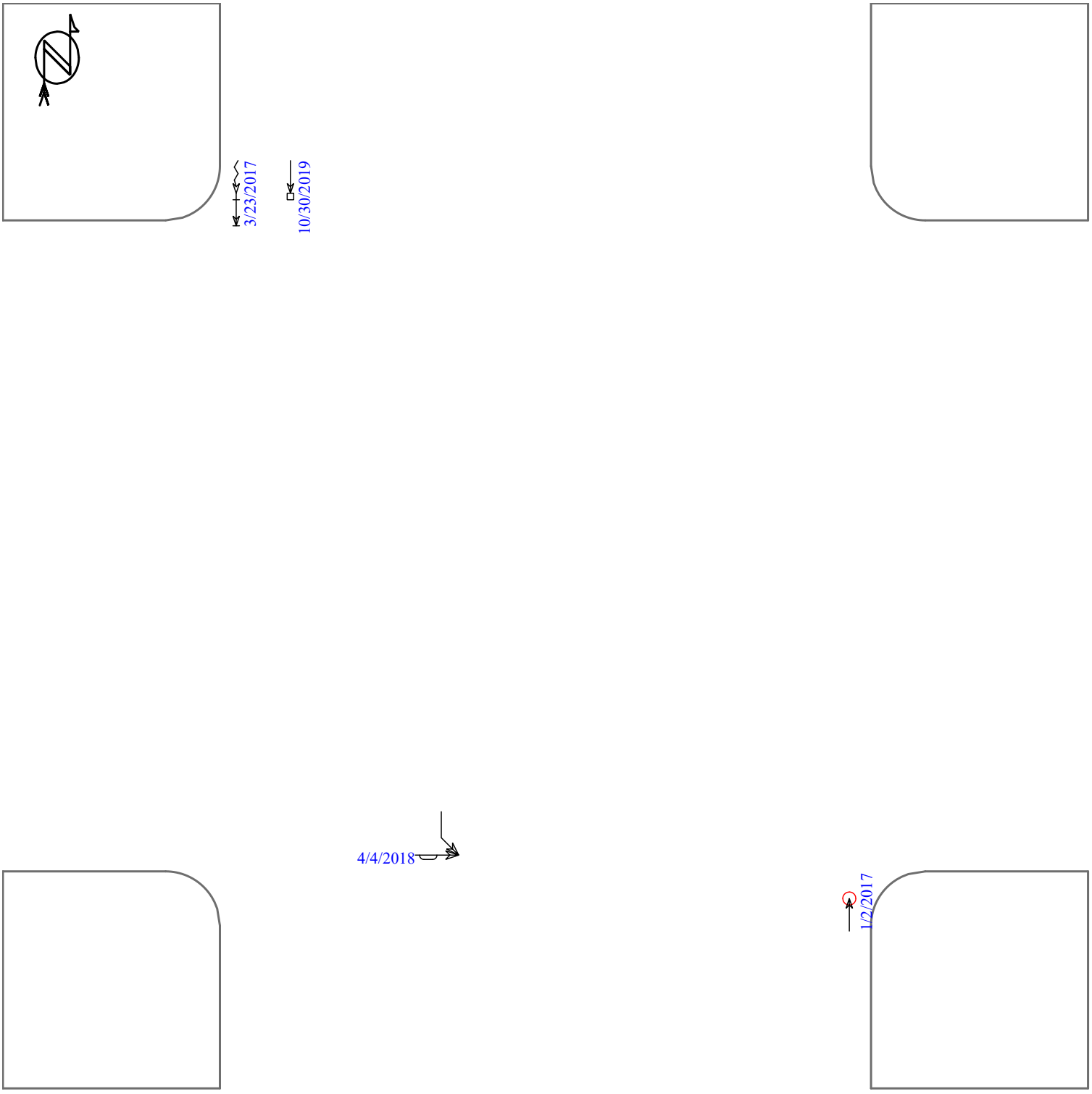
FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER U.1

2:17:50 PM 6/17/2020 gkretl2 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Highway\District1\Design\Projects\Future Projects\Poweshiek IA 146 & F62\plansheet_U01.sht

Collision Diagram
6/29/2020 - 6/29/2020

4 Crashes

Clear



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

79117346099

Count Date:

Monday, July 30, 2018

County:

Poweshiek

Location Description:

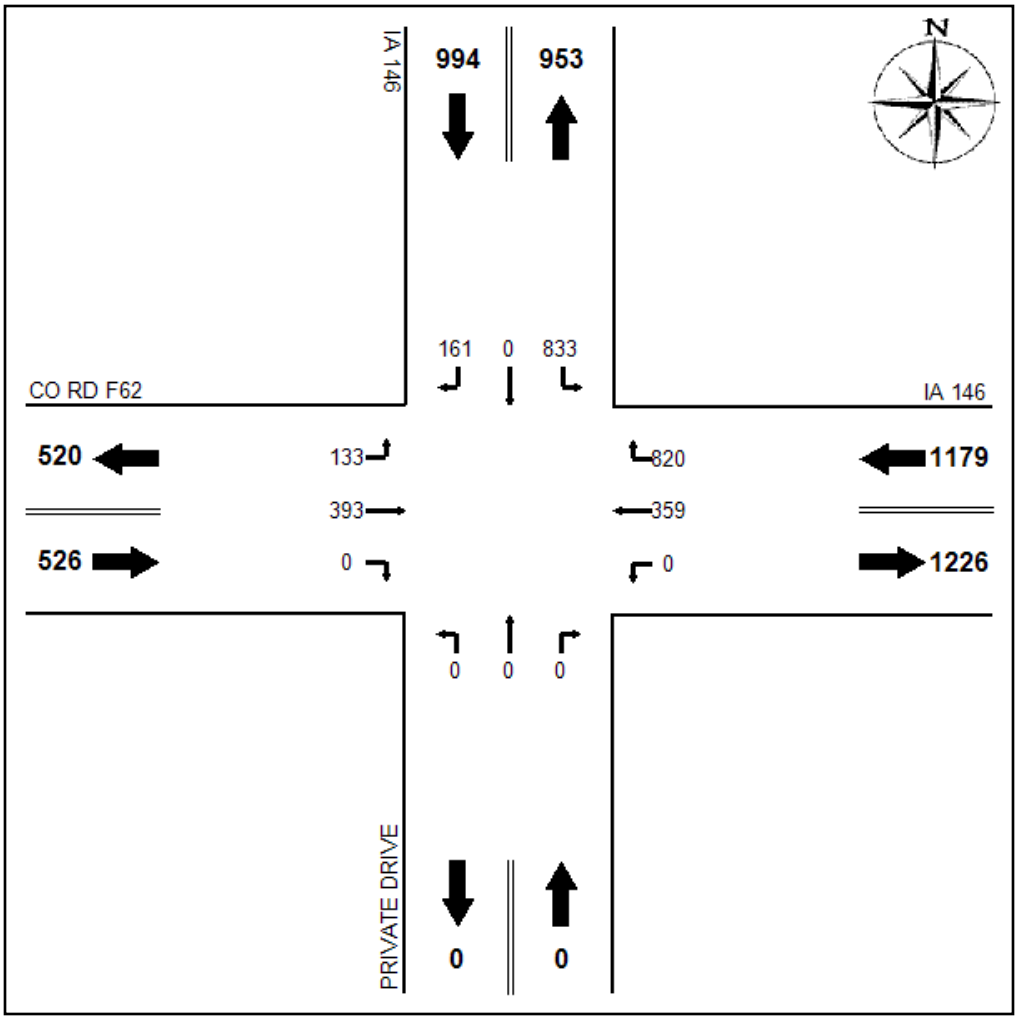
IA 146 & CO RD f62

Volume Factor: 1.918

Pass Class Factor: 2.045

SU Class Factor: 1.772

Combo Class Factor: 1.660



Raw Data-All Vehicles:

	N Leg		E Leg		W Leg	
	L	*R*	*T*	*R*	*L*	*T*
07:00	35	4	23	95	15	29
08:00	19	11	17	55	3	18
11:00	41	6	26	42	11	24
12:00	52	11	22	49	7	27
15:00	103	11	26	56	11	34
16:00	96	27	25	55	10	40
17:00	65	11	41	55	10	24

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

Station Number:

79117346099

Count Date:

Monday, July 30, 2018

County:

Poweshiek

Location Description:

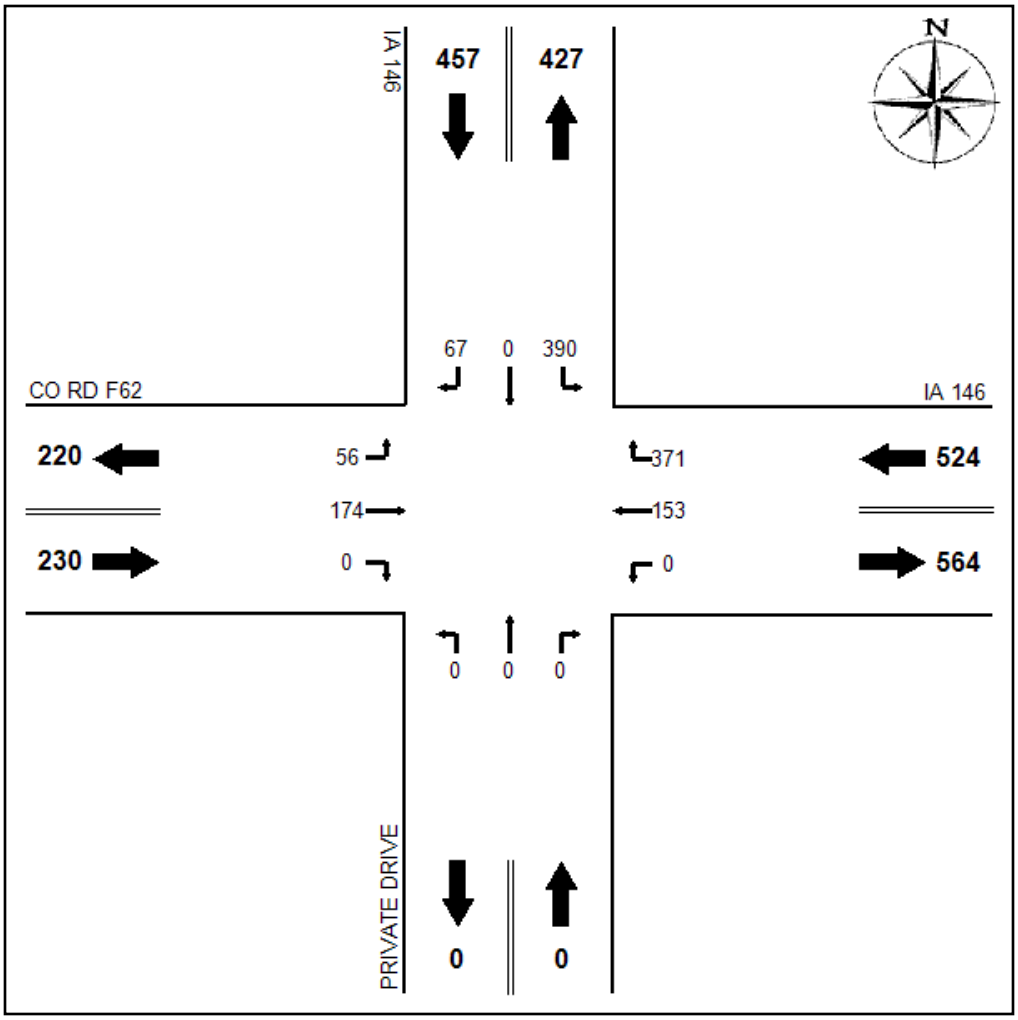
IA 146 & CO RD f62

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

Combo Class Factor: N/A



Raw Data-Passenger Vehicles:

	N Leg		E Leg		W Leg	
	L	*R*	*T*	*R*	*L*	*T*
07:00	33	3	19	88	14	28
08:00	17	8	15	48	2	14
11:00	33	3	24	37	8	21
12:00	50	8	13	43	4	20
15:00	97	10	23	52	10	31
16:00	95	24	23	49	9	36
17:00	65	11	36	54	9	24

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

Station Number:

79117346099

Count Date:

Monday, July 30, 2018

County:

Poweshiek

Location Description:

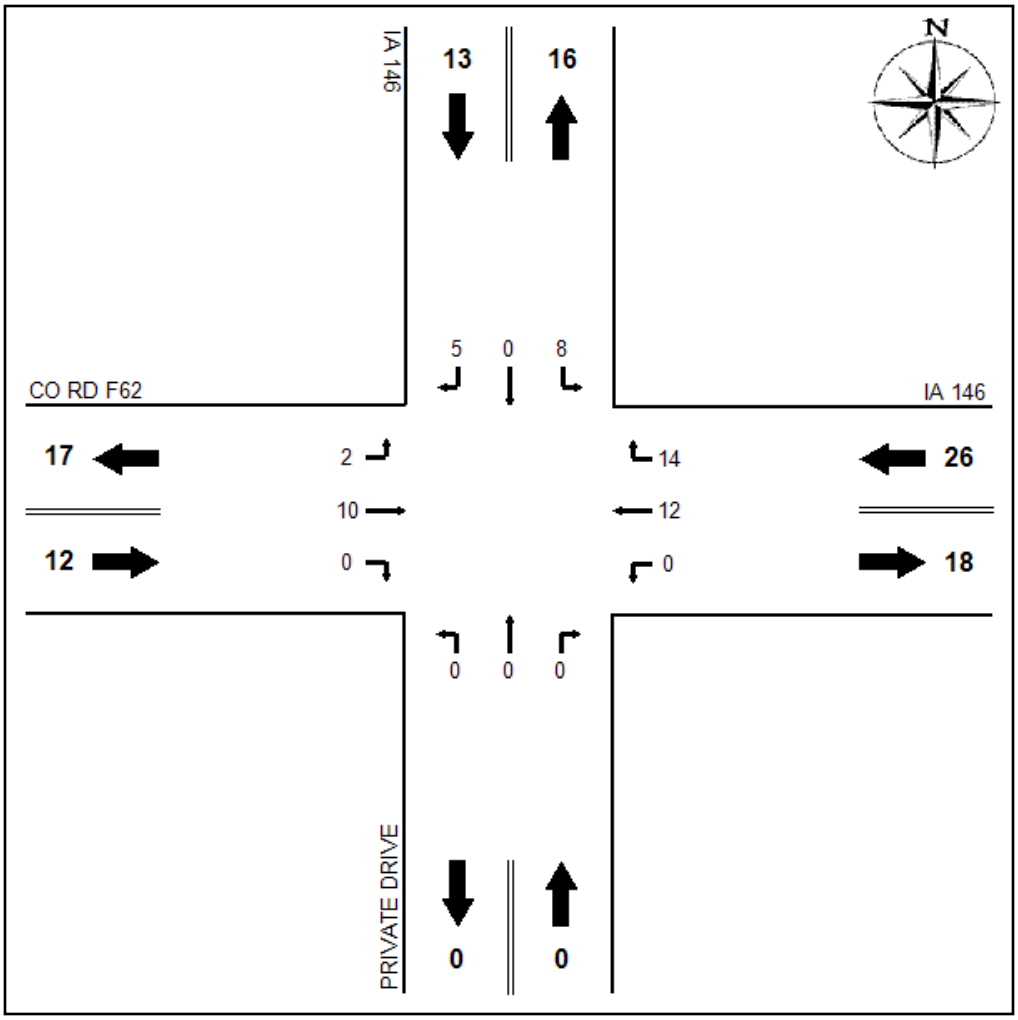
IA 146 & CO RD f62

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

Combo Class Factor: N/A



Raw Data-Single-Unit Trucks:

	N Leg		E Leg		W Leg	
	L	*R*	*T*	*R*	*L*	*T*
07:00	1	1	1	3	1	1
08:00	0	1	0	2	0	2
11:00	3	1	2	1	1	1
12:00	0	1	5	3	0	3
15:00	3	0	2	2	0	1
16:00	1	1	0	3	0	2
17:00	0	0	2	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

Station Number:

79117346099

Count Date:

Monday, July 30, 2018

County:

Poweshiek

Location Description:

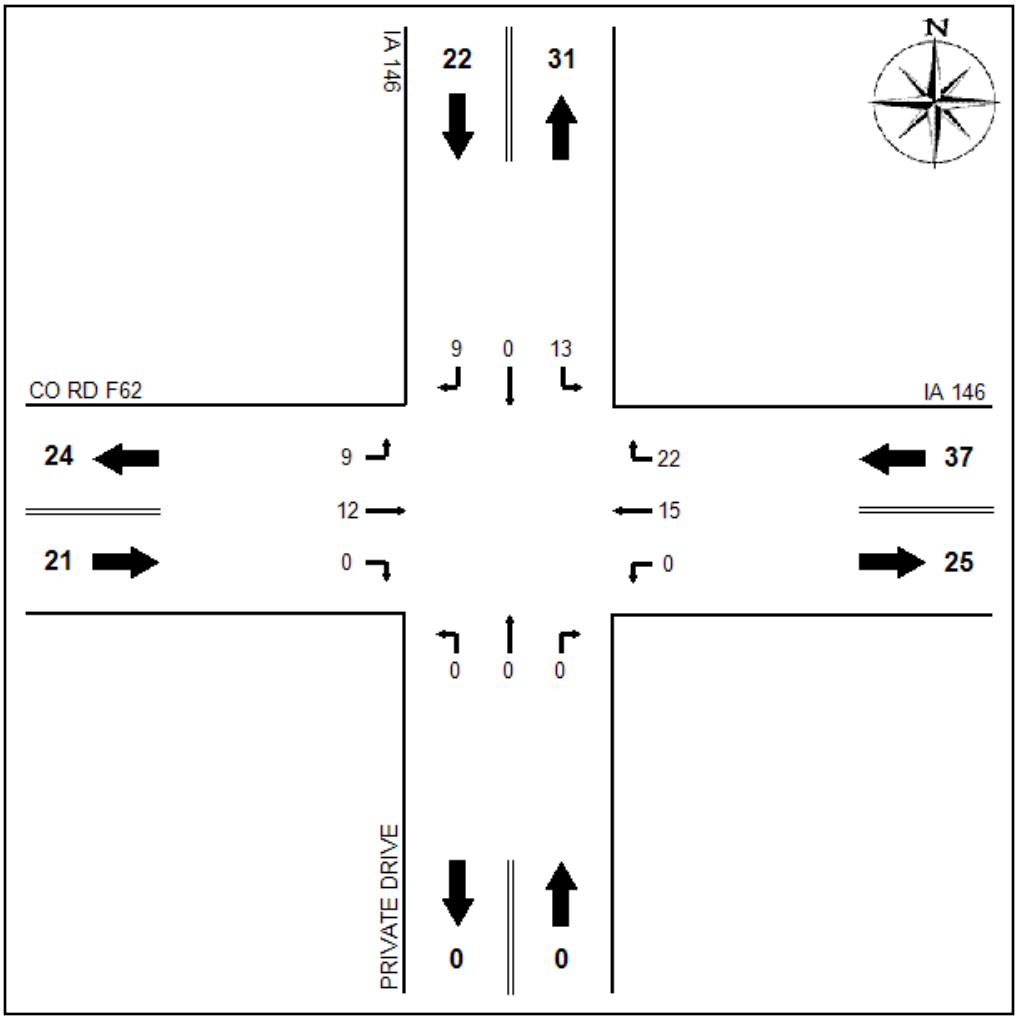
IA 146 & CO RD f62

Volume Factor: N/A

Pass Class Factor: N/A

SU Class Factor: N/A

Combo Class Factor: N/A



Raw Data-Combination Trucks:

	N Leg		E Leg		W Leg	
	L	*R*	*T*	*R*	*L*	*T*
07:00	1	0	3	4	0	0
08:00	2	2	2	5	1	2
11:00	5	2	0	4	2	2
12:00	2	2	4	3	3	4
15:00	3	1	1	2	1	2
16:00	0	2	2	3	1	2
17:00	0	0	3	1	1	0

Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	4
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	1
Property Damage Only	3

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	75,500.00
Average (per crash dollars):	18,875.00
Total Vehicles:	6.00
Average (per crash):	1.50
Total Occupants:	6.00
Average (per crash):	1.50

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

Major Cause			4
Animal	0	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	2	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	0	0	0	1	0	0	0	1	0	2
Thursday	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	0	1	0	0	0	1	0	4

Manner of Crash Collision	**4**
Non-collision (single vehicle)	2
Head-on (front to front)	0
Rear-end (front to rear)	1
Angle, oncoming left turn	0
Broadside (front to side)	0
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	**4**
Dry	2
Wet	0
Ice/frost	1
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			**6**
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	1	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	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	1	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	4

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	1	0	0	1
= 19	0	0	0	0	0
= 20	0	1	0	0	1
>= 21 and <= 24	1	0	0	0	1
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	1	1	0	0	2
>= 35 and <= 39	0	0	0	0	0
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	1	0	0	1
>= 80 and <= 84	0	0	0	0	0
>= 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	2	4	0	0	6

Drug/Alcohol Related	**4**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	4

Alcohol Test Given	**6**
None	6
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

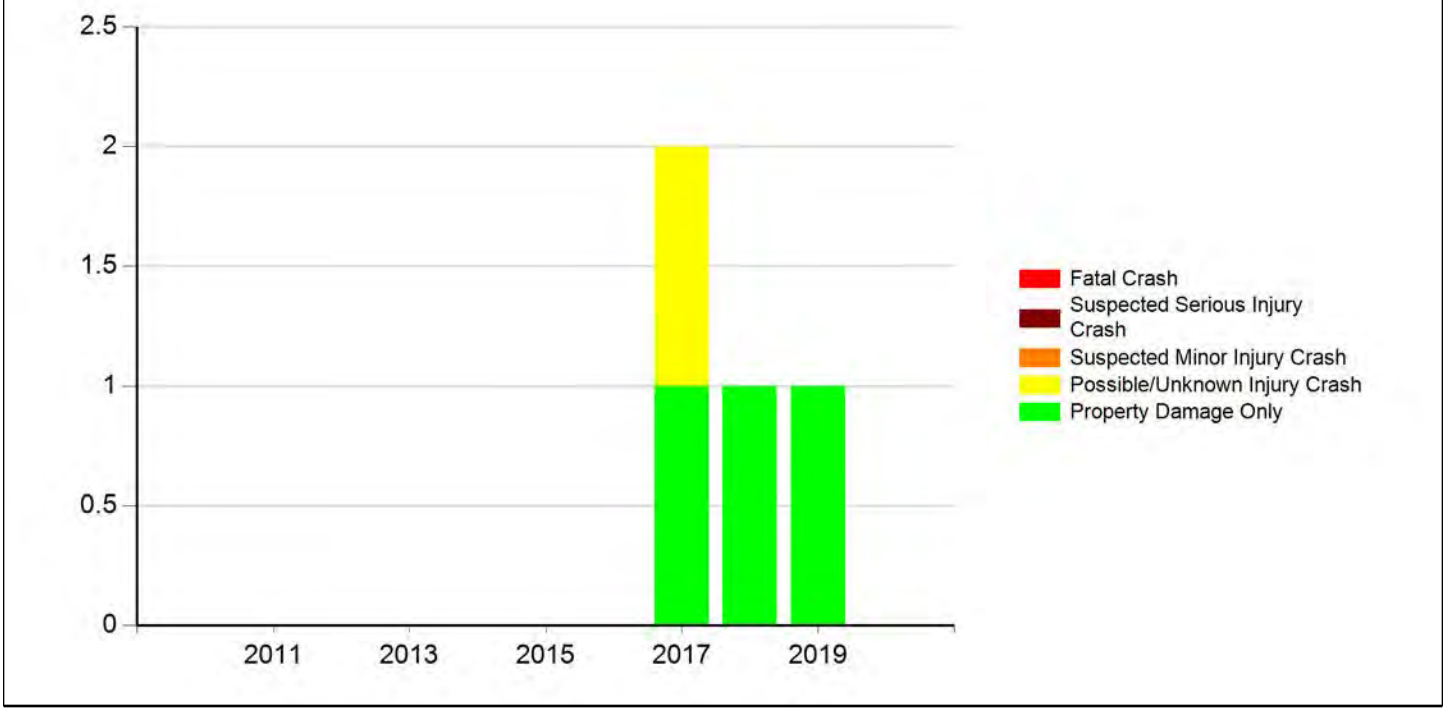
Drug Test Given	**6**
None	6
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	**6**
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	6
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	1	1	2
2018	0	0	0	0	1	1
2019	0	0	0	0	1	1
2020	0	0	0	0	0	0
Total	0	0	0	1	3	4

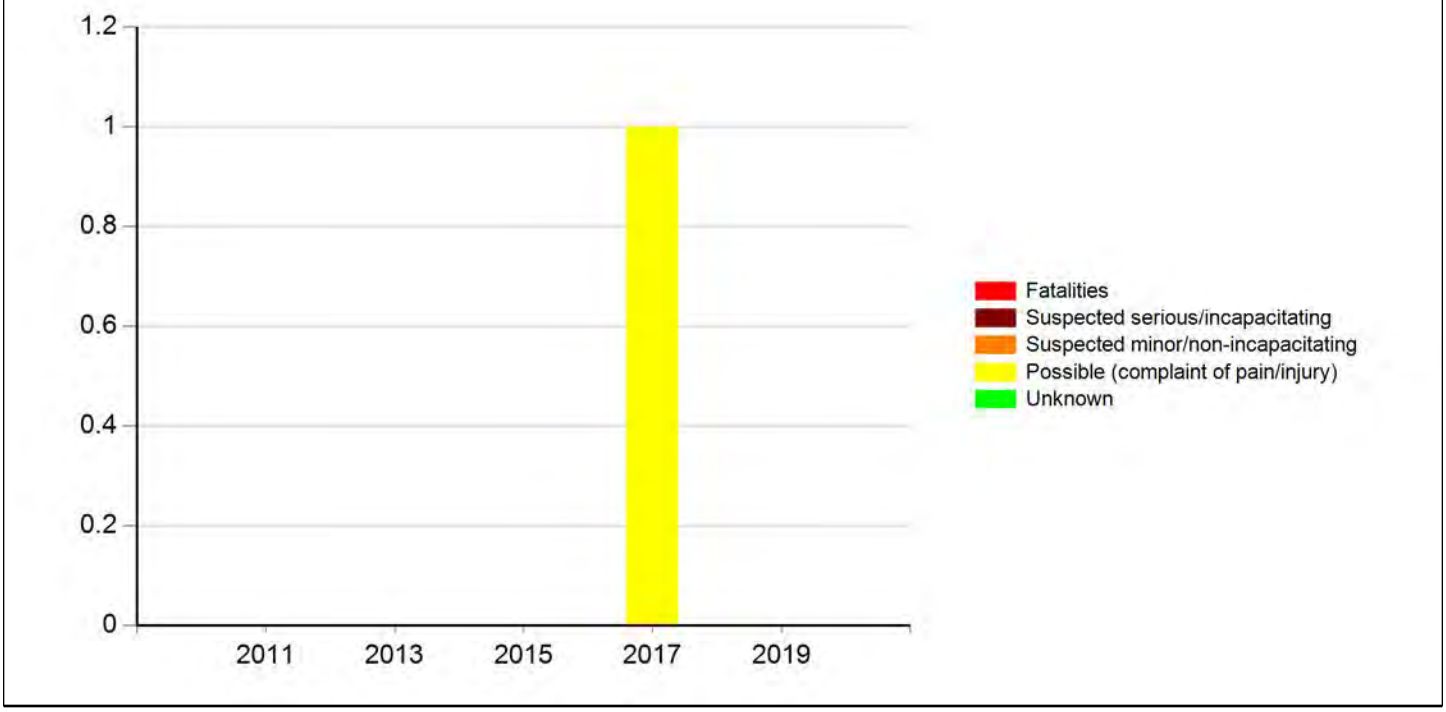
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	1	0	1
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	0	1	0	1

Injury Status/Year



Meeting the following criteria

Jurisdiction: Counties (Poweshiek)
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 7/10/20

Location / Title of Project IA 163 westbound and Prairie Ave. Prairie City

Applicant District 1

Contact Person Gary Kretlow Title Traffic Tech

Complete Mailing Address 1020 S. 4th St.

Ames, IA 50010

Phone 515-239-1199 (Area Code) E-Mail Gary.kretlowjr@iowadot.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	$ 500,000
Total Project Cost	$ 500,000
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 _In the DRSP above 50% risk factor

☐ No

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Jasper | Prepared by: Gary Kretlow | Date Prepared: Jul 10, 2020

Intersection: IA 163 & Prairie Ave. south side of Prairie City

Improvement

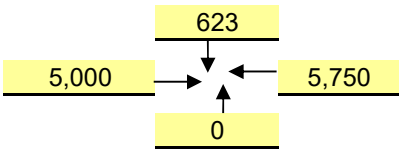
Proposed Improvement(s): Build an offset right turn lane from westbound IA 163 to Prairie Ave

$ 500,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ 5,000	Other Annual Cost (after initial year), **AC**	20	Crash Reduction Factor (integer), **CRF**
$ 67,952	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 567,952**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT | 2018 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,151,145	Current Annual Entering Veh., **AEV** = DEV * 365
13,877	veh / day, Final Year DEV, **FDEV**
91.40	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
11,373	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2015 First full year --> 2019 Last full year | 5.0 years, Time Period, **T**

Additional months

2	Fatal Crashes	2	Fatalities @	$4,500,000	$ 9,000,000
		1	Major Injuries @	$325,000	$ 325,000
4	Injury Crashes	2	Minor Injuries @	$65,000	$ 130,000
		3	Possible Injuries @	$35,000	$ 105,000
10	Property Damage Only		(assumed cost per crash)	$7,400	$ 118,400
		-OR-	enter all Property Costs of all crashes:		
16	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 9,678,400

3.20	Current Crashes / Year, **AA** = TA / T	**0.77**	Crashes / MEV, Crash Rate, **CR**
$ 604,900	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
70.5	Total Expected Crashes, **TECR** = CR x TMEV	**$ 5,718,272**	Present Value of Avoided
0.64	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 387,136	Crash Costs Avoided in First Year, AAR x AVC		
14.1	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $5,718,272 : $567,952 = **10.07** : 1

IA 163 and Prairie Ave. on the south side of Prairie City

1. Existing Conditions

IA 163 is a 4-lane rural expressway with a 65mph speed limit. IA 163 currently has a parallel right turn lane onto Prairie Ave. Prairie Ave. is a 2-lane county road with a stop condition at IA 163.

2. Proposed Concept

Based on the review of existing conditions and accidents, we are proposing to construct an offset right turn lane from westbound IA 163 onto Prairie Ave. This allows better sight distance from the stop bar on Prairie Ave. to the south.

3. Justification

This segment currently has a risk percentage of 52 in the District 1 DRSP. The DOT has also received comments from the public in the past about this intersection. In the last 5 years, there has been 2 fatal crashes resulting in 2 fatalities at this intersection.

4. Cost Estimate and Proposed Funding Sources

The cost of the proposed improvements is estimated at $500,000. It is proposed to fund the cost of the project with TSIP funds. The project will be constructed within current right of way.

5. Proposed Schedule

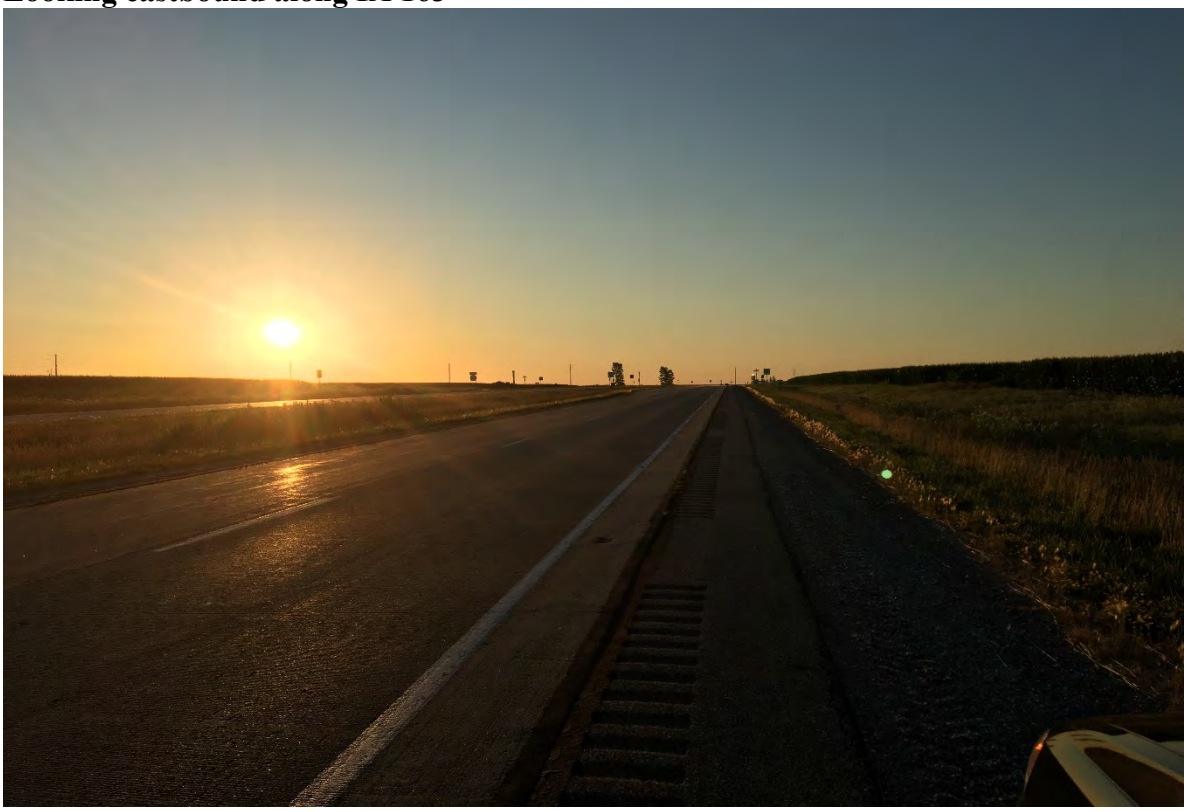
The project is proposed for letting in fiscal year 2022 with construction to be completed by end of 2023.

Project Quantities

9" PCC Reconstruction of Intersection						
ITEM#	ITEM DESCRIPTION		UNITS	QUANTITY	UNIT PRICE	TOTAL
1	9.0" PCC PAVEMENT		SY	1,700	$ 50.00	$ 85,000.00
2	12" MODIFIED SUBBASE		CY	700	$ 50.00	$ 35,000.00
3	EXCAVATION, CLASS 10		CY	22,000	$ 12.00	$ 264,000.00
4	GRANULAR SHOULDERS, TYPE A		TON	500	$ 25.00	$ 12,500.00
5	MILLED RUMBLE STRIPS, PCC		STA	20	$ 50.00	$ 1,000.00
6	CENTERLINE RUMBLE STRIPS, PCC		STA	10	$ 50.00	$ 500.00
7	LONGITUDINAL SUBDRAINS		LF	800	$ 12.00	$ 9,600.00
8	PAINTED PAVEMENT MARKINGS		STA	100	$ 11.00	$ 1,100.00
9	PAVEMENT REMOVAL		SY	1,000	$ 6.00	$ 6,000.00
					SUBTOTAL	$ 414,700.00
10	RIGHT OF WAY		LS	1		$ 1,000.00
11	TRAFFIC CONTROL				5%	$ 20,800.00
12	MOBILIZATION				5%	$ 20,800.00
	Contingency				10%	$ 41,500.00
					TOTAL	**$ 498,800.00**

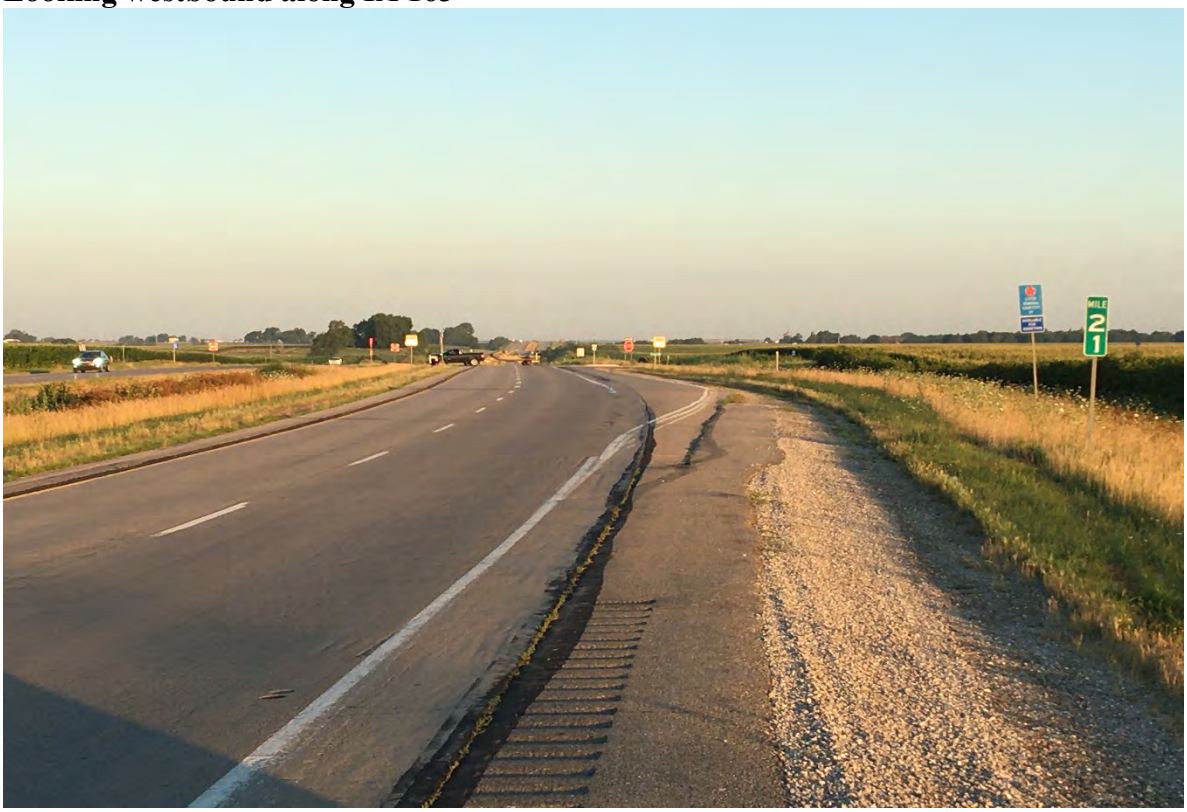
IA 163 and Prairie Ave. on the south side of Prairie City

Looking eastbound along IA 163



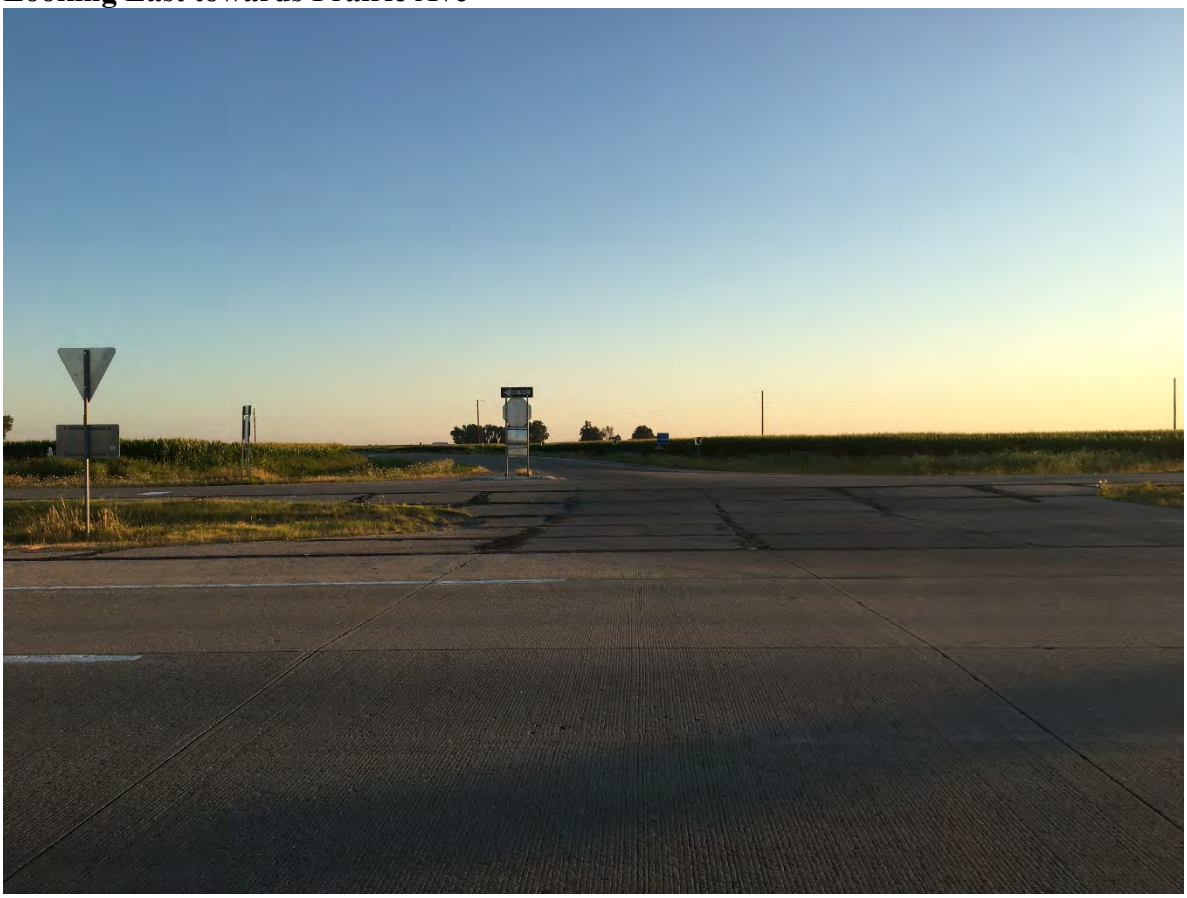
IA 163 and Prairie Ave. on the south side of Prairie City

Looking westbound along IA 163



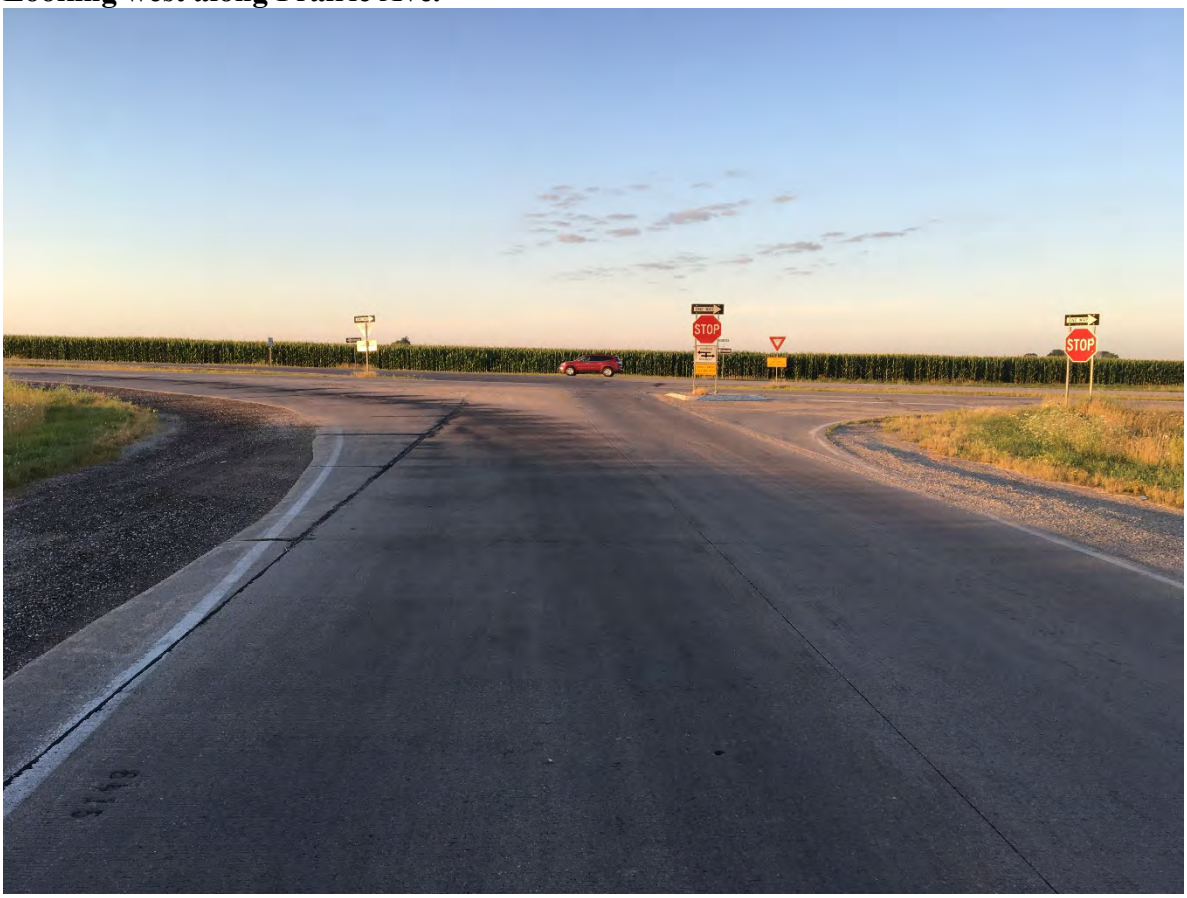
IA 163 and Prairie Ave. on the south side of Prairie City

Looking East towards Prairie Ave



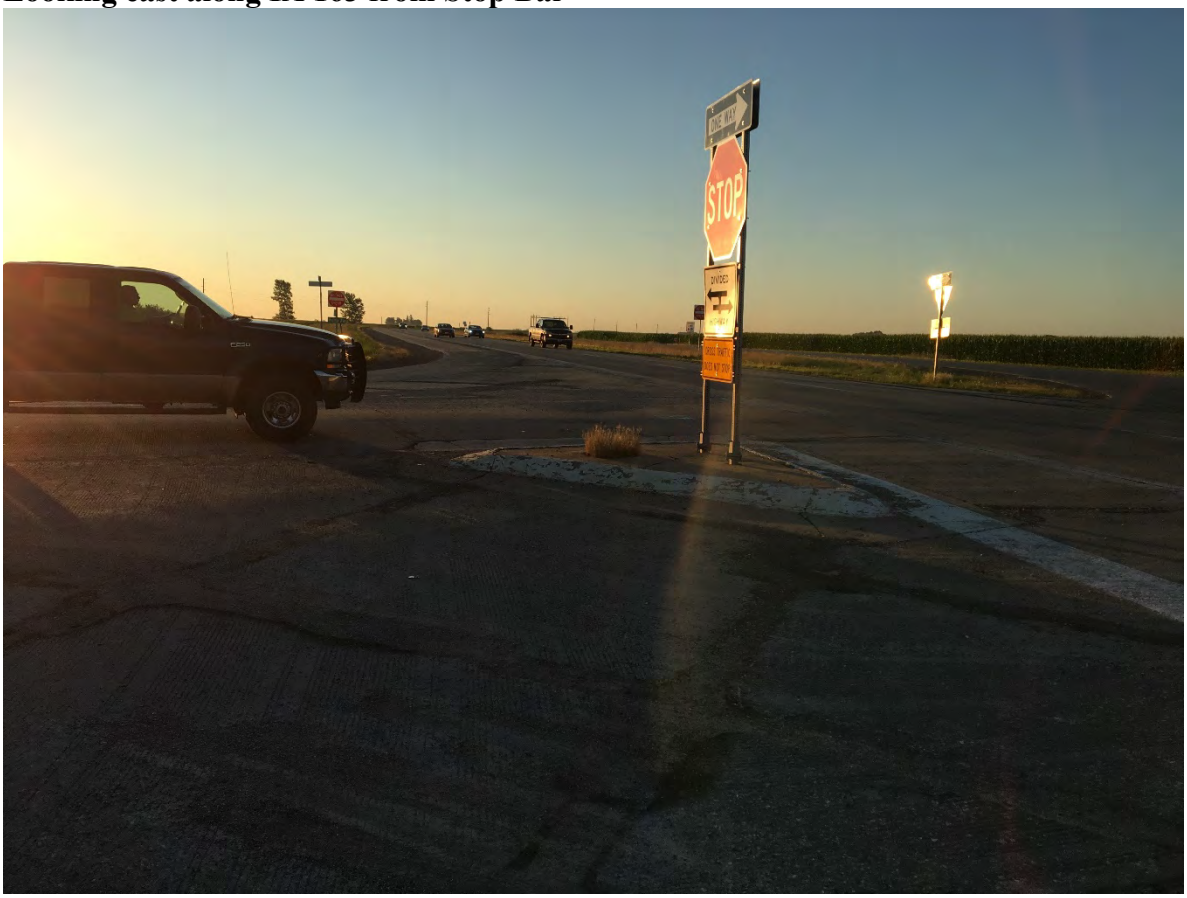
IA 163 and Prairie Ave. on the south side of Prairie City

Looking west along Prairie Ave.

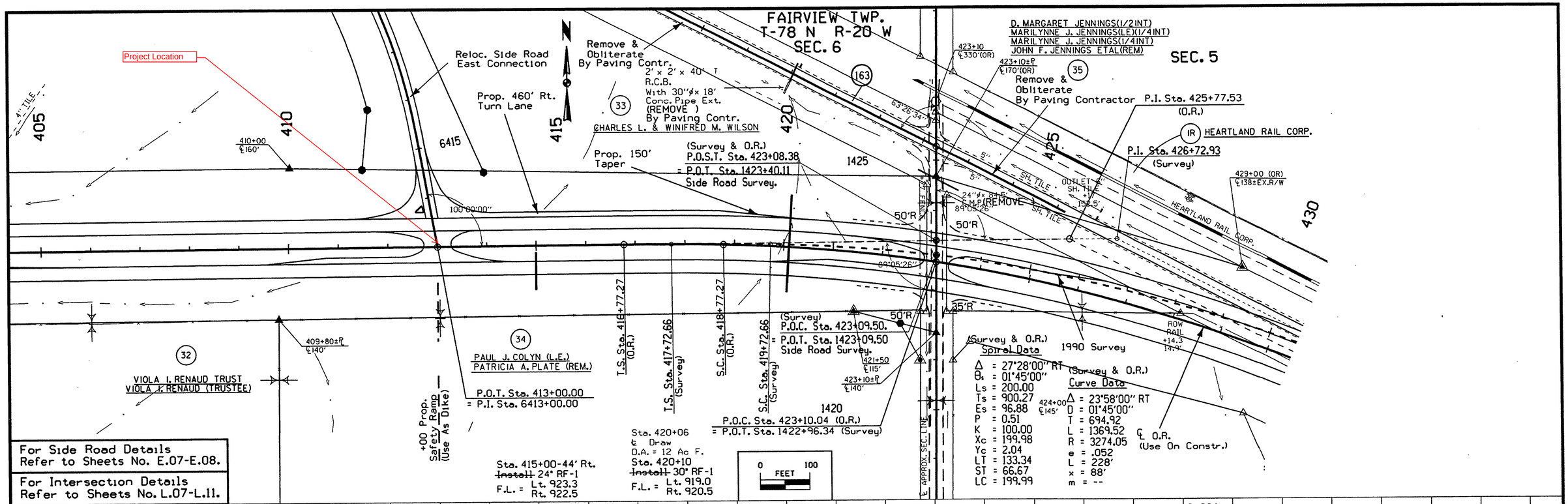


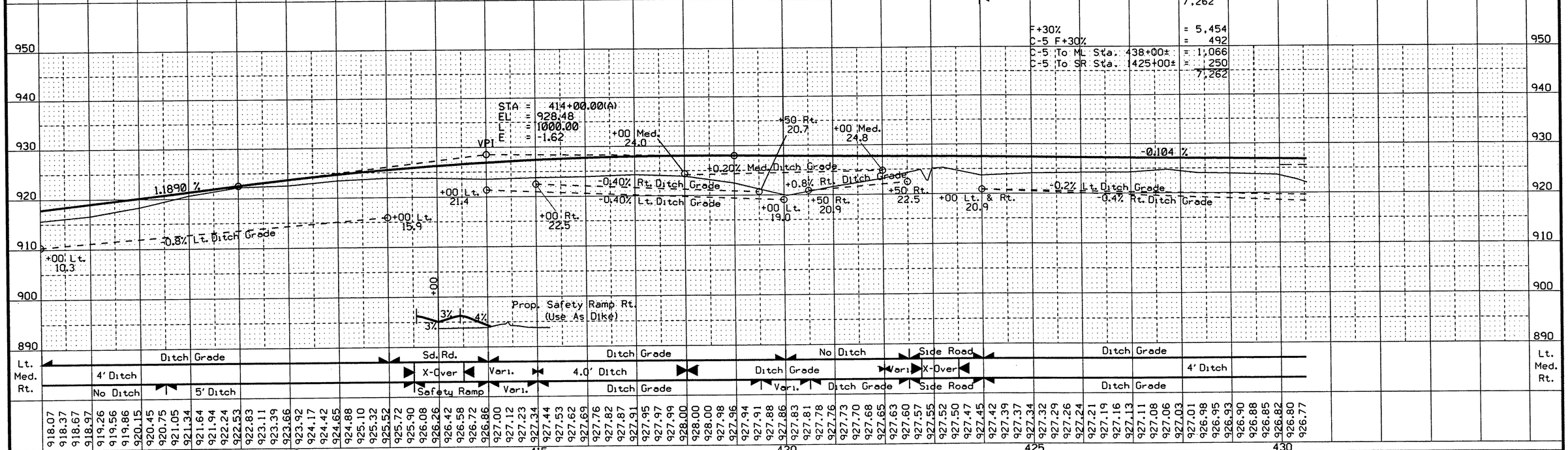
IA 163 and Prairie Ave. on the south side of Prairie City

Looking east along IA 163 from Stop Bar




Prairie Ave
656 ft Deceleration Lane
15:1 Taper
163





ROAD DESIGN • CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	JASPER COUNTY	PROJECT NUMBER NHSN-163-2(15)--2R-50	SHEET NUMBER D.08

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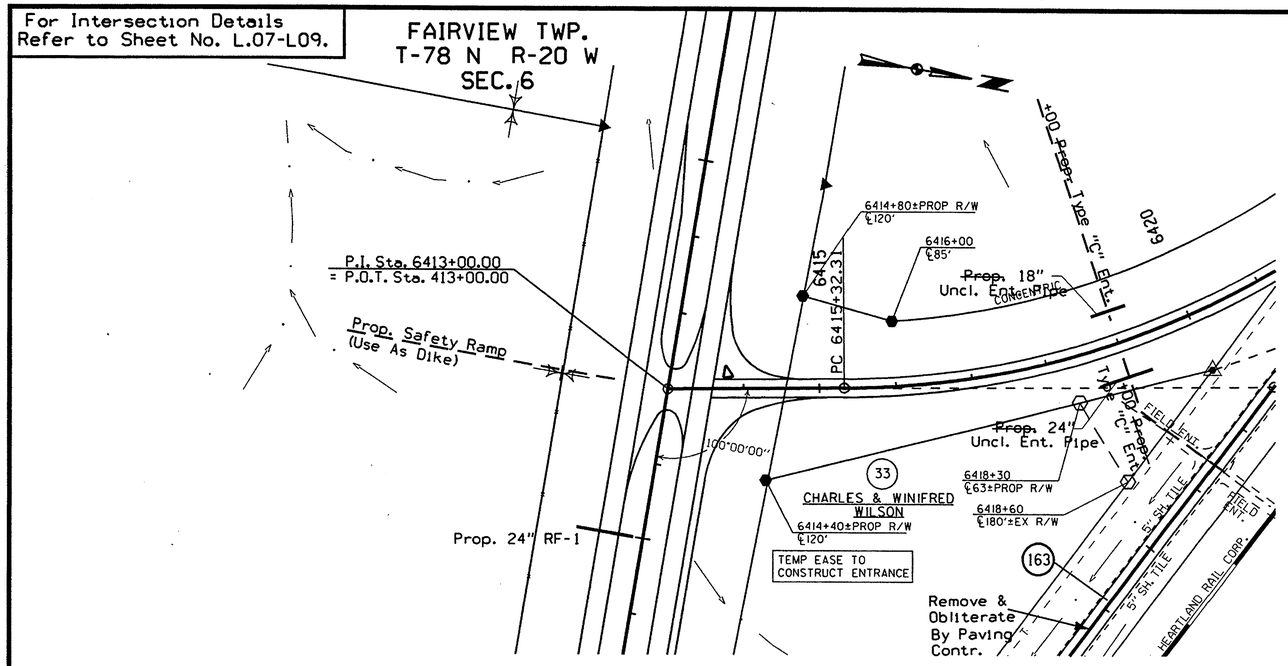
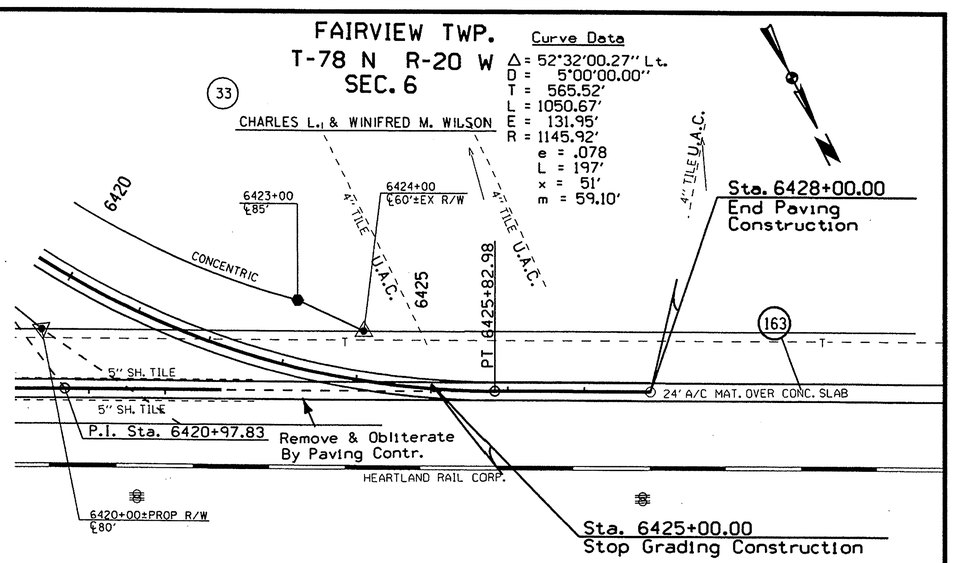
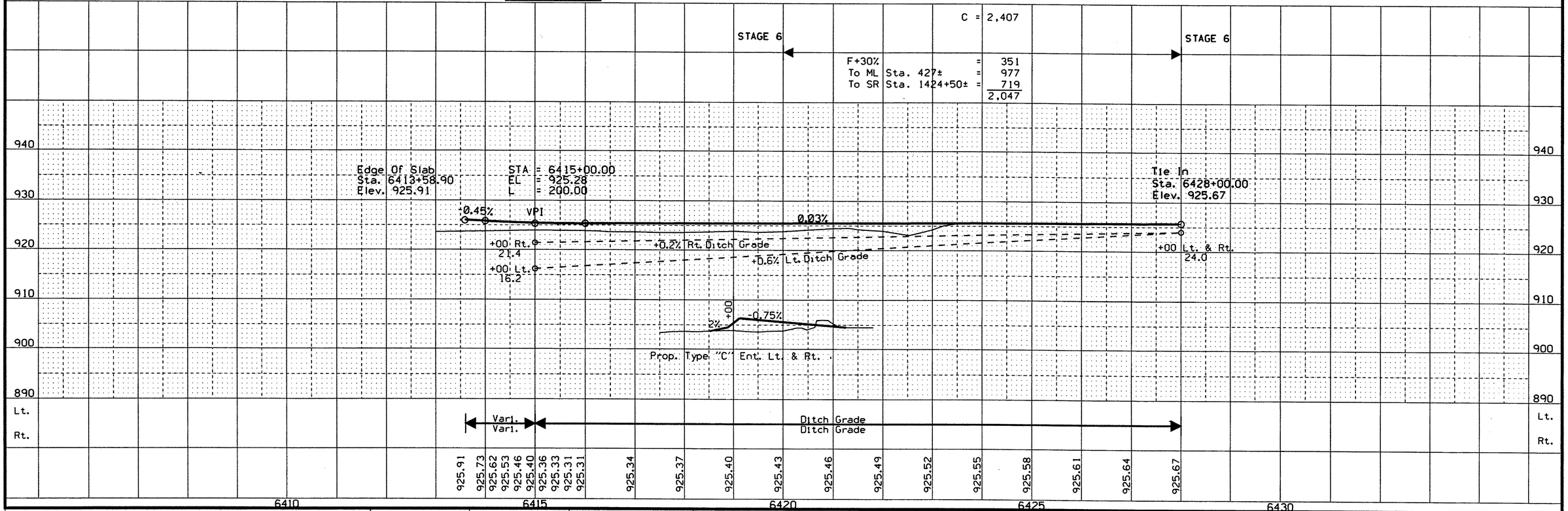
For Intersection Details
Refer to Sheet No. L.07-L09.





Side Road Connection
Lt. Sta. 413+00.00
(East Connection Existing Ia. 163)



ROAD DESIGN • CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	JASPER	COUNTY	PROJECT NUMBER	NHSN-163-2(15)--2R-50	SHEET NUMBER	E.07

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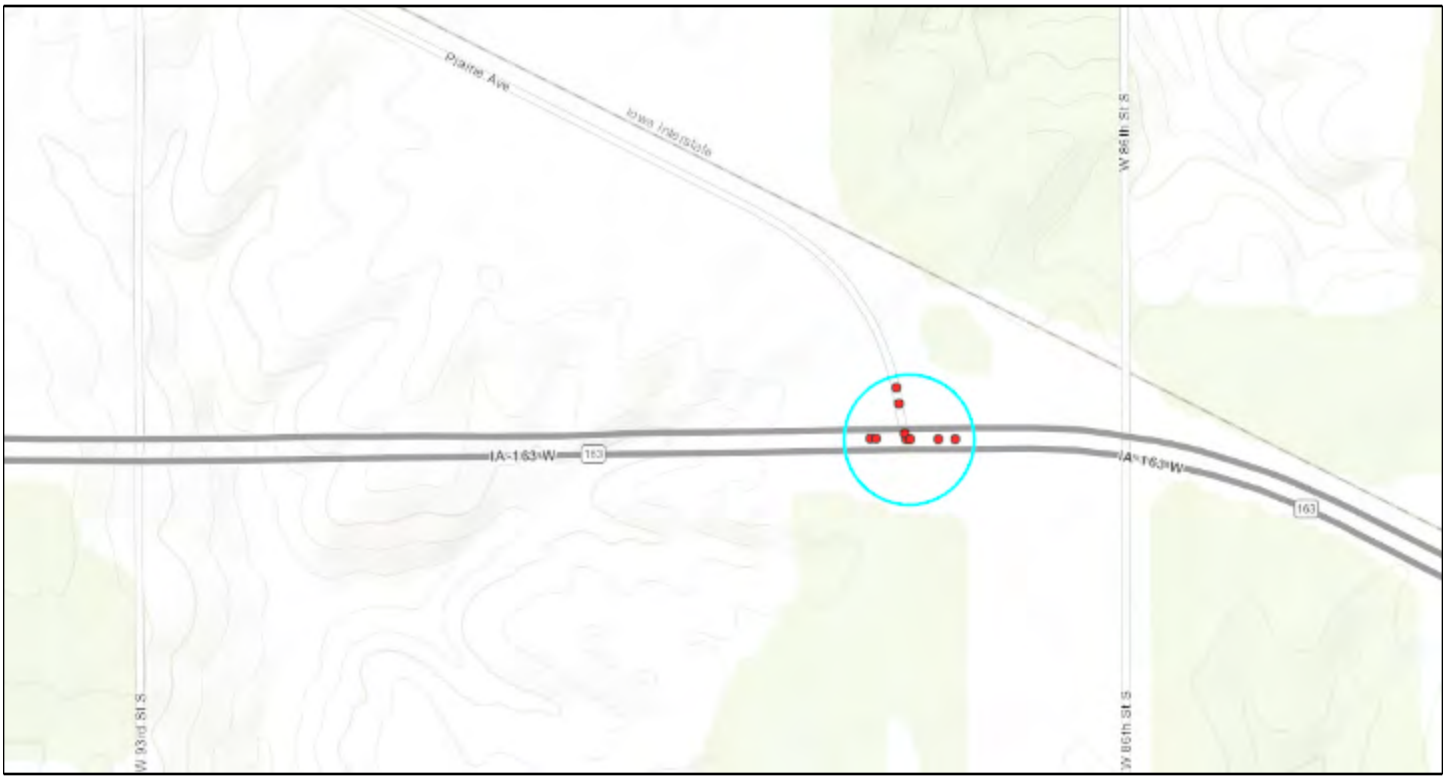
Iowa Crash Analysis Tool
Quick Report
2015-2019

Crash Severity	16
Fatal Crash	2
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	3
Property Damage Only	10

Injury Status Summary	8
Fatalities	2
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	2
Possible (complaint of pain/injury)	3
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	160,800.00
Average (per crash dollars):	10,050.00
Total Vehicles:	30.00
Average (per crash):	1.88
Total Occupants:	37.00
Average (per crash):	2.31

Average Severity	
Fatalities/Fatal Crash:	1.00
Fatalities/Crash:	0.13
Injuries/Crash:	0.38
Major Injuries/Crash:	0.06
Minor Injuries/Crash:	0.13
Possible/Unknown Injuries/Crash:	0.19



Major Cause			16
Animal	0	Ran traffic signal	0
Ran stop sign	2	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	7	FTYROW: From yield sign	0
FTYROW: Making left turn	2	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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...	0
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	1
Ran off road - straight	0	Ran off road - left	1
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Monday	0	0	0	1	0	0	0	0	1	0	0	0	0	2
Tuesday	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Wednesday	0	0	0	1	0	1	0	0	1	1	0	0	0	4
Thursday	1	0	0	2	0	0	0	0	0	1	0	0	0	4
Friday	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Saturday	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	1	0	1	5	1	3	0	1	2	2	0	0	0	16

Manner of Crash Collision	16
Non-collision (single vehicle)	4
Head-on (front to front)	0
Rear-end (front to rear)	3
Angle, oncoming left turn	0
Broadside (front to side)	9
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	16
Dry	10
Wet	2
Ice/frost	2
Snow	0
Slush	1
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	1
Unknown	0

Fixed Object Struck			30
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	1	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	29

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	1	0	0	1
= 17	1	0	0	0	1
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	1	0	0	1
>= 21 and <= 24	1	1	0	0	2
>= 25 and <= 29	0	2	0	0	2
>= 30 and <= 34	0	0	0	0	0
>= 35 and <= 39	1	0	0	0	1
>= 40 and <= 44	1	1	0	0	2
>= 45 and <= 49	2	3	0	0	5
>= 50 and <= 54	0	3	0	0	3
>= 55 and <= 59	0	1	0	0	1
>= 60 and <= 64	0	1	0	0	1
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	2	1	0	0	3
>= 75 and <= 79	0	0	1	0	1
>= 80 and <= 84	3	1	0	0	4
>= 85 and <= 89	1	0	0	0	1
>= 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	13	16	1	0	30

Drug/Alcohol Related	**16**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	16

Alcohol Test Given	**30**
None	30
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

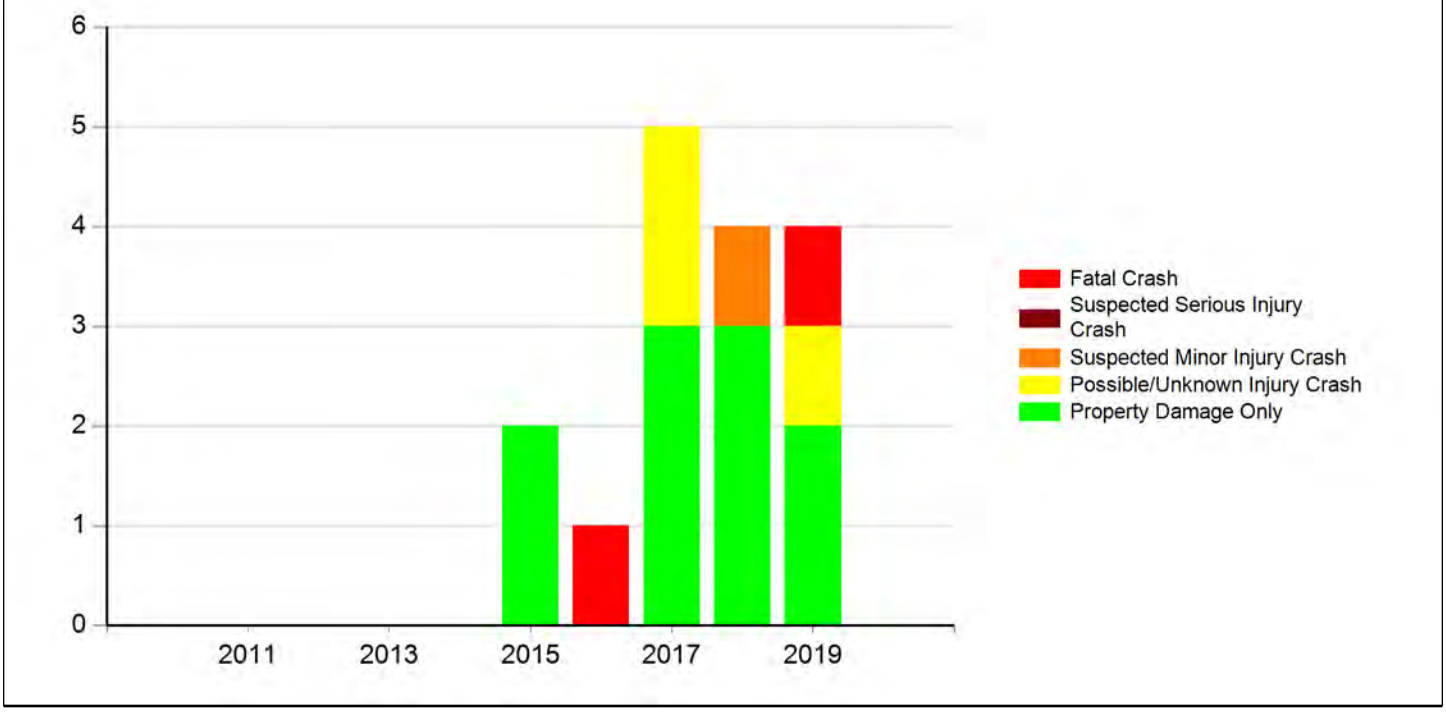
Drug Test Given	**30**
None	30
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	**30**
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	30
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**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	2	2
2016	1	0	0	0	0	1
2017	0	0	0	2	3	5
2018	0	0	1	0	3	4
2019	1	0	0	1	2	4
2020	0	0	0	0	0	0
Total	2	0	1	3	10	16

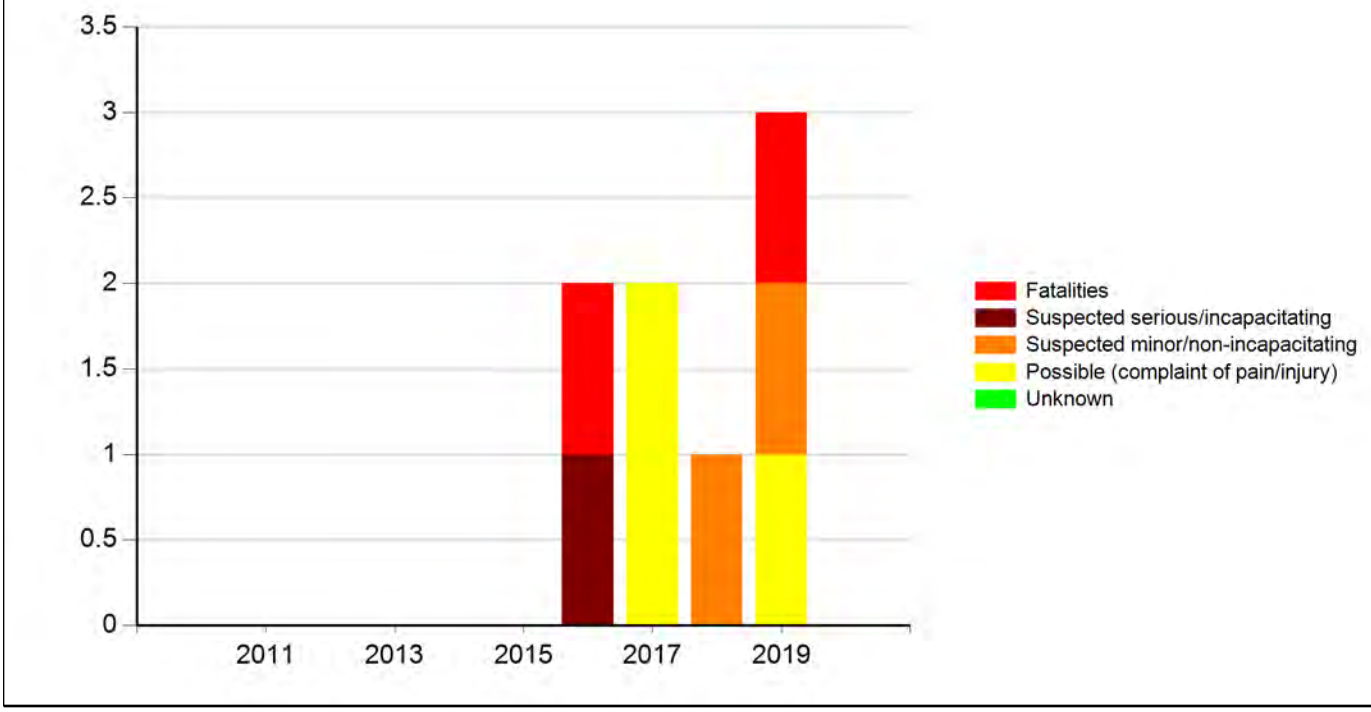
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	1	1	0	0	0	2
2017	0	0	0	2	0	2
2018	0	0	1	0	0	1
2019	1	0	1	1	0	3
2020	0	0	0	0	0	0
Total	2	1	2	3	0	8

Injury Status/Year



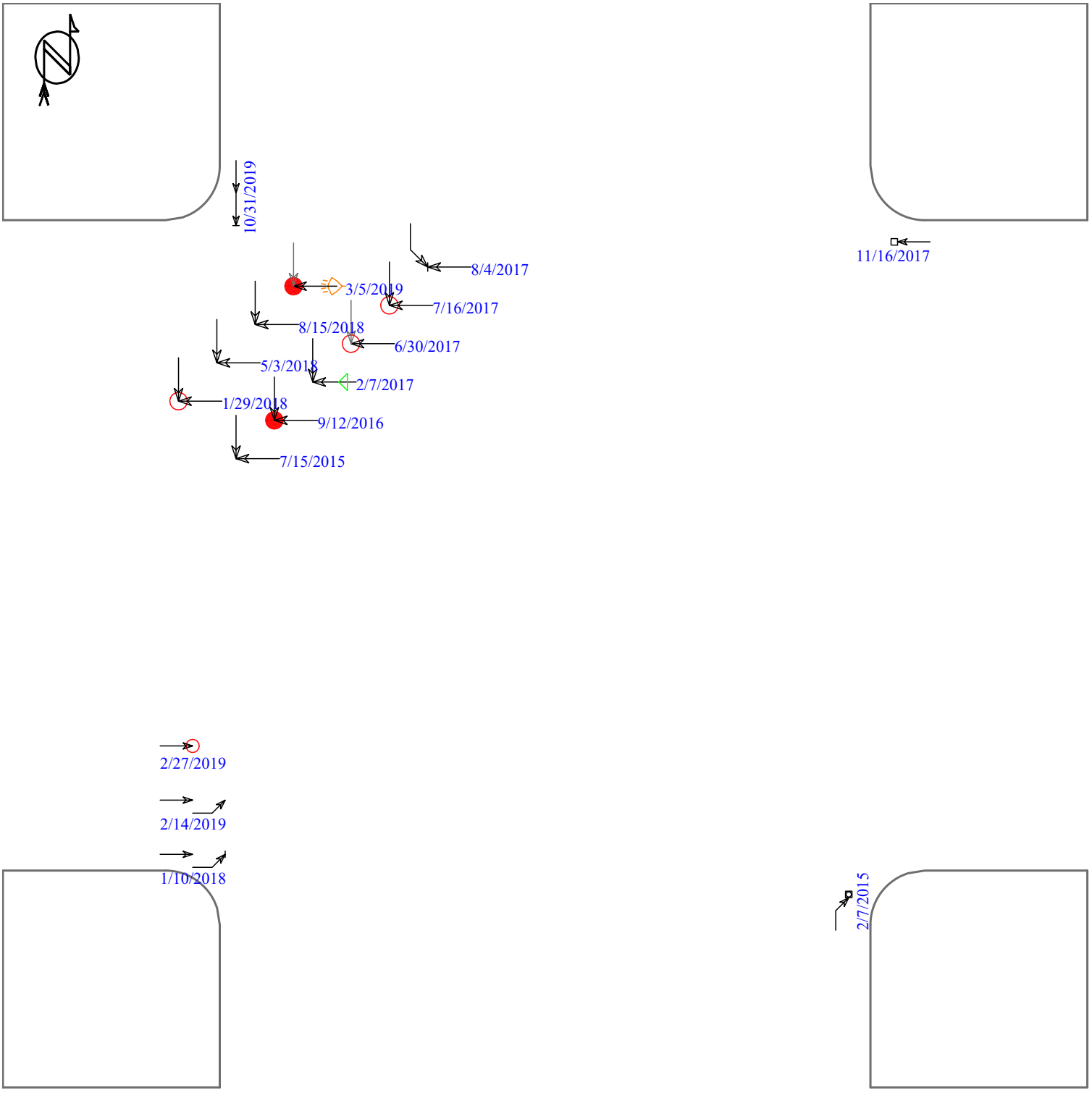
Meeting the following criteria

Jurisdiction: Counties (Jasper)
Year: 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

16 Crashes

Clear



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project CO RD E34 – HMA OVERLAY

Applicant Jones County

Contact Person Eric Grove Title Engineer-in-Training

Complete Mailing Address 19501 Highway 64, P.O. Box 368

Anamosa, Iowa 52205

Phone (319) 462-3785 E-Mail eric-grove@co.jones.ia.us
(Area Code)

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____
(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 515,000
Total Project Cost	$ 1,850,000
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 _____

☒ 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 COUNTY OF JONES

Signed: Derek Snead 8/14/2020

Signature Date Signed

Derek Snead, P.E., Jones County Engineer

Printed Name

Attest: 8/14/20

Signature Date Signed

Janine Sulzner, Jones County Auditor

Printed Name

Application for Traffic Safety Funds (TSF)

Date: August 10, 2020

County Name: Jones

Contact Person: Eric Grove, Jones County Engineer-in-Training

PROJECT LOCATION
On County Road E34, from Highway 151 northeast 3.02 miles to City of Anamosa Corporate Limits.
(See page 'E' identifying the location of the project.)

PROJECT NARRATIVE

B1. Existing Conditions
County Road E34 is a portion of Iowa's first "military' road. It's Iowa's first official territorial road that ran from Dubuque to Missouri. It was originally paved in 1928 and has since been resurfaced multiple times and widened. It was last resurfaced in 1997 and currently has a 24' wide HMA surface with 3' paved shoulders and 2' of granular shoulders beyond the paving. The 1997 paving has cracking, rutting and shoulder deterioration. Existing foreslopes range along the project length but generally are between 2:1 and 2.5:1.

The roadway is signed for 50 mph and contains several horizontal curves requiring warning signs. All signs are currently installed according to MUTCD requirements.

B2. Proposed Concept
Based on the review of existing conditions and accidents, the following improvements have been recommended to enhance safety.

- Milled edgeline rumble strips will provide drivers with tactile and auditory warnings as they are about to leave their lane of travel, providing a quicker reaction time in which to correct their errant direction.
- Regrade sharp horizontal curve near the Fish House Road intersection to more safely and comfortably traverse the curved roadway and add recoverable slopes on which a motorist may, to a greater extent, retain or regain control of a vehicle.
- Access cross slopes throughout the corridor shall be flattened which currently are not safely traversable or may pose a hazard to an errant vehicle.

B3. Justification
Motorists are involved in a high number of accidents on this route. When vehicles run off the roadway, the steep foreslopes do not provide errant vehicles a safe recovery area to regain control. A large number of these accidents are occurring near the Fish House Road intersection with County Road E34. This particular curve is posted with warning signs but it is a tight corner with a history of multiple fatalities.

A crash analysis and benefit/cost calculation has been performed for the proposed safety improvements. Using the last decade of crash data, calculations show a benefit/cost ratio of over **4**. The situation as presented and the predicted savings indicate that this would be an extremely worthwhile appropriation of funding. Consideration for funding for these improvements is greatly appreciated.

ESTIMATED ROADWAY QUANTITIES **Run Date: 8.10.2020**

Project Number: STBG-SWAP-C053(C-928)--FG-53

Item No.	Item Code	Item	Unit	Total	Saftey Total	Unit Cost	Safety Total Cost	Total Cost
1	2101-0850002	CLEARING AND GRUBBING	UNIT	80.00	20.00	$ 28.08	561.60	2,246.40
2	2102-2625001	EMBANKMENT-IN-PLACE, CONTACTOR FURNISHED	CY	25000.00	25000.00	$ 10.47	261,750.00	261,750.00
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	13000.00	8000.00	$ 5.10	40,800.00	66,300.00
4	2115-0100000	MODIFIED SUBBASE	CY	1550.00	1000.00	$ 38.82	38,820.00	60,171.00
5	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	2200.00	200.00	$ 22.29	4,458.00	49,038.00
6	2123-7450020	SHOULDER FINISHING, EARTH	STA	2.50		$ 174.97	-	437.43
7	2212-0475095	CLEANING AND PREPARATION OF BASE	MILE	1.88		$ 1,229.72	-	2,311.87
8	2214-5145150	PAVEMENT SCARIFICATION	SY	33000.00		$ 1.68	-	55,440.00
9	2303-0001000	HOT MIX ASPHALT MIXTURE, WEDGE, LEVELING OR STRENGTHENING COURSE	TON	825.00	525.00	$ 41.62	21,850.50	34,336.50
10	2303-1042500	HOT MIX ASPHALT HIGH TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	TON	5500.00	525.00	$ 38.73	20,333.25	213,015.00
11	2303-1043503	HOT MIX ASPHALT HIGH TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, FRICTION L-3	TON	5700.00	545.00	$ 47.64	25,963.80	271,548.00
12	2303-1258284	ASPHALT BINDER, PG 58-28H, HIGH TRAFFIC	TON	721.50	95.70	$ 521.13	49,872.14	375,995.30
13	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON	1100.00		$ 27.02	-	29,722.00
14	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	525.00	525.00	$ 11.37	5,969.25	5,969.25
15	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	130.00	130.00	$ 81.17	10,552.10	10,552.10
16	2435-0250700	INTAKE, SW-507	EACH	18.00		$ 4,439.67	-	79,914.06
17	2512-1725356	CURB AND GUTTER, P.C. CONCRETE, P.C. CONCRETE, 3.5 FT	LF	2500.00		$ 33.67	-	84,175.00
18	2515-2475005	DRIVEEWAY, P.C. CONCRETE, 5 IN.	SY	1250.00		$ 57.28	-	71,600.00
19	2515-6745600	REMOVAL OF PAVED DRIVEWAY	SY	1250.00		$ 8.97	-	11,212.50
20	2518-6910000	SAFETY CLOSURE	EACH	2.00	2.00	$ 137.98	275.96	275.96
21	2519-3280000	FENCE, FIELD	LF	1250.00	1250.00	$ 3.17	3,962.50	3,962.50
22	2519-3300400	FIELD FENCE BRACE PANELS	EACH	10.00	10.00	$ 153.84	1,538.40	1,538.40
23	2519-4200140	REMOVAL OF FENCE, FIELD	LF	1250.00	1250.00	$ 1.44	1,800.00	1,800.00
24	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNED OR SOLVENT-BASED	STA	159.25		$ 13.47	-	2,145.10
25	2528-8445110	TRAFFIC CONTROL	LS	1.00		$ 13,362.70	-	13,362.70
26	2528-8445113	FLAGGERS	EACH	5.00		$ 509.98	-	2,549.90
27	2528-8445115	PILOT CARS	EACH	5.00		$ 749.24	-	3,746.20
28	2533-4980005	MOBILIZATION	LS	1.00		$ 68,684.34	-	68,684.34
29	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA	148.00	148.00	$ 20.09	2,973.32	2,973.32
30	2548-0000310	MILLED CENTERLINE RUMBLE STRIPS, HMA SURFACE	STA	148.00	148.00	$ 18.48	2,735.04	2,735.04
31	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	10.00	3.25	$ 3,800.00	12,350.00	38,000.00
32	2602-0000020	SILT FENCE	LF	1500.00	1000.00	$ 1.68	1,680.00	2,520.00
33	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	1500.00	1000.00	$ 0.23	230.00	345.00
34	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	5000.00	2000.00	$ 3.17	6,340.00	15,850.00
35	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	1000.00		$ 0.55	-	550.00
36	2602-0010010	MOBILIZATION, EROSION CONTROL	EACH	1.00		$ 500.00	-	500.00
							-	-
							514,815.86	*1,847,272.86*

Source	Funding
TSIP	$500,000
STBG	$1,080,000
FM	$270,000
Total	$1,850,000

Time Schedule

The schedule proposed for the project is as follows:

D1.	Submittal of TSIP Application	August 2020
D2.	Preliminary Project Design	November 2020
D3.	Anticipated Approval of TSIP Funds	December 2020
D4.	Final Project Design	April 2021
D5.	Safety Funds become Available	July 2021
D6.	Project Letting	December 2021
D7.	Construction	April 2022
D8.	Project Completion	October 2022

LETTING DATE: 12/21/2021

PROJECT NO. STBG-SWAP-CO53(C-928)--FG-53

JONES COUNTY

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

SECONDARY ROAD SYSTEM

JONES COUNTY

PROJECT NO. L-C-928--73-53

HMA RESURFACING WITH MILLING

On E34, from US HWY 151 to S LINN ST

Revisions		Total Sheets
Project Number: STBG-SWAP-CO53(C-928)--FG-53		

Refer to the Proposal Form for list of applicable specifications.

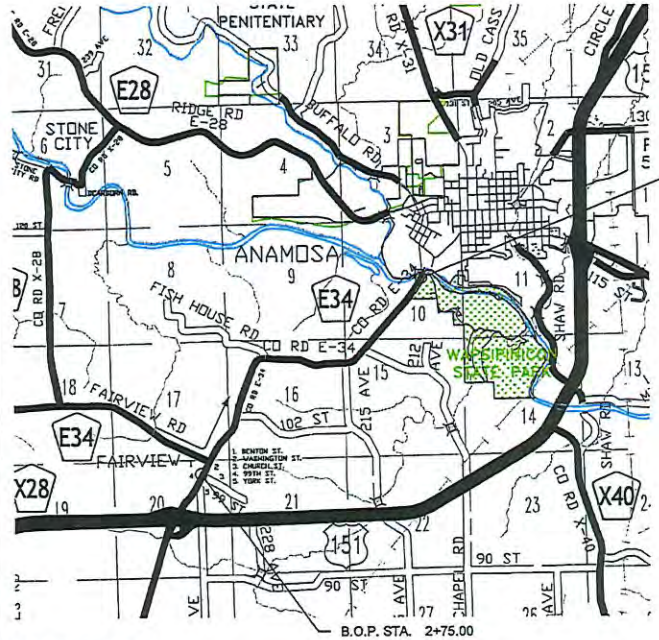
Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

MILEAGE SUMMARY

Div.	Description	Lin. Ft.	Miles
1	Sta. 2+75.00 to Sta. 162+00.00	15,925.00	3.016
	Total Net Length of Project	15,925.00	3.016

E.O.P. STA. 162+00.00

B.O.P. STA. 2+75.00



LOCATION MAP SCALE

1 MI 0 1 MI 2 MI

N

UTILITY CONTACTS

Facility	Company	Phone Number

IOWA ONE CALL 811

1-800-292-8989

www.iowaonecall.com

DESIGN DATA RURAL

2017 AADT	3290	VPD
2047 AADT	3290	VPD
Trucks	10	%

INDEX OF SHEETS

Sheet Number	Description

Approved by the Jones County Board of Supervisors

Signature	Date

LICENSED PROFESSIONAL ENGINEER — DEREK G SNEAD 20862 — IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

(signature) (date)

Derek G. Snead, P.E.

License number 20862

My license renewal date is December 31, 2019.

Pages or sheets covered by this seal:

JONES COUNTY ENGINEER'S OFFICE
ANAMOSA, IOWA (319) 462-3785

DESIGNED BY: GROVE
CHECKED BY:

JONES COUNTY

PROJECT NO. STBG-SWAP-CO53(C-928)--FG-53

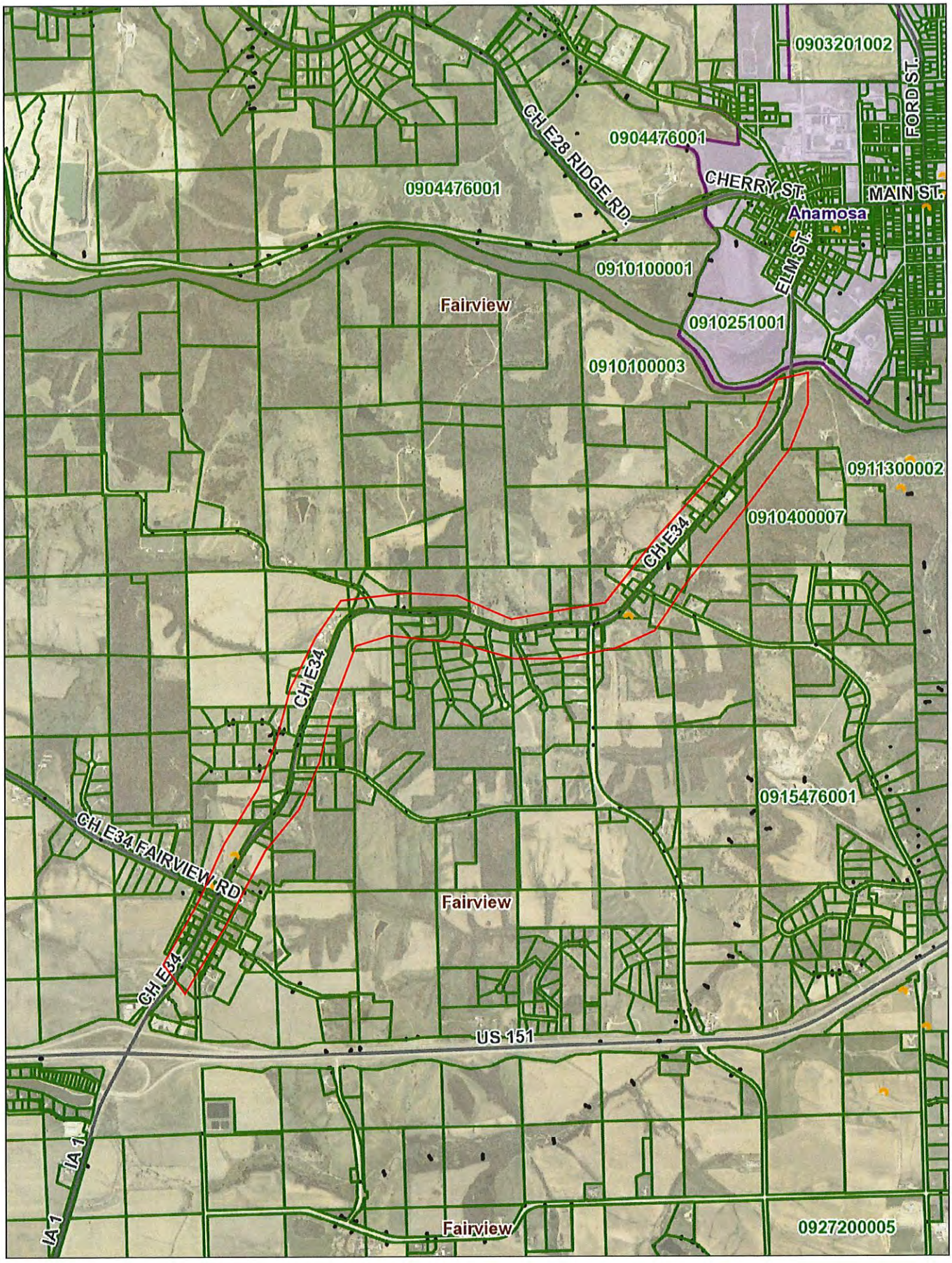
SHEET NUMBER A.01

Color Pictures of the Project Site




The top two pictures shown above are of the sharp horizontal curve that we are proposing to bring up to current standards. The bottom two pictures shown above show the deteriorating shoulders.

Fish House Road VPD: 80
75+00
EXISTING ROW
PROPOSED ROW
County Road E34 VPD: 3290
Δ = 73°46'08"
T = 798.17
L = 1368.05
R = 1061.00'
70+00
EXISTING ROW
County Road E34 VPD: 3290
65+00
PROPOSED ROW
EXISTING ROW
92+93.78
JONES COUNTY ENGINEER'S OFFICE
ANAMOSA, IOWA (319) 462-3785
DESIGNED BY:
CHECKED BY:
GROUP
JONES COUNTY
PROJECT NO. STBG-SWAP-C053(C-928)--FG-53
SHEET NUMBER D.01


0903201002
FORD ST.
CH E28 RIDGE RD.
0904476001
0904476001
CHERRY ST.
MAIN ST.
Anamosa
ELM ST.
0910100001
Fairview
0910251001
0910100003
0911300002
0910400007
CH E34
CH E34
0915476001
CH E34 FAIRVIEW RD
Fairview
CH E34
US 151
IA 1
IA 1
Fairview
0927200005

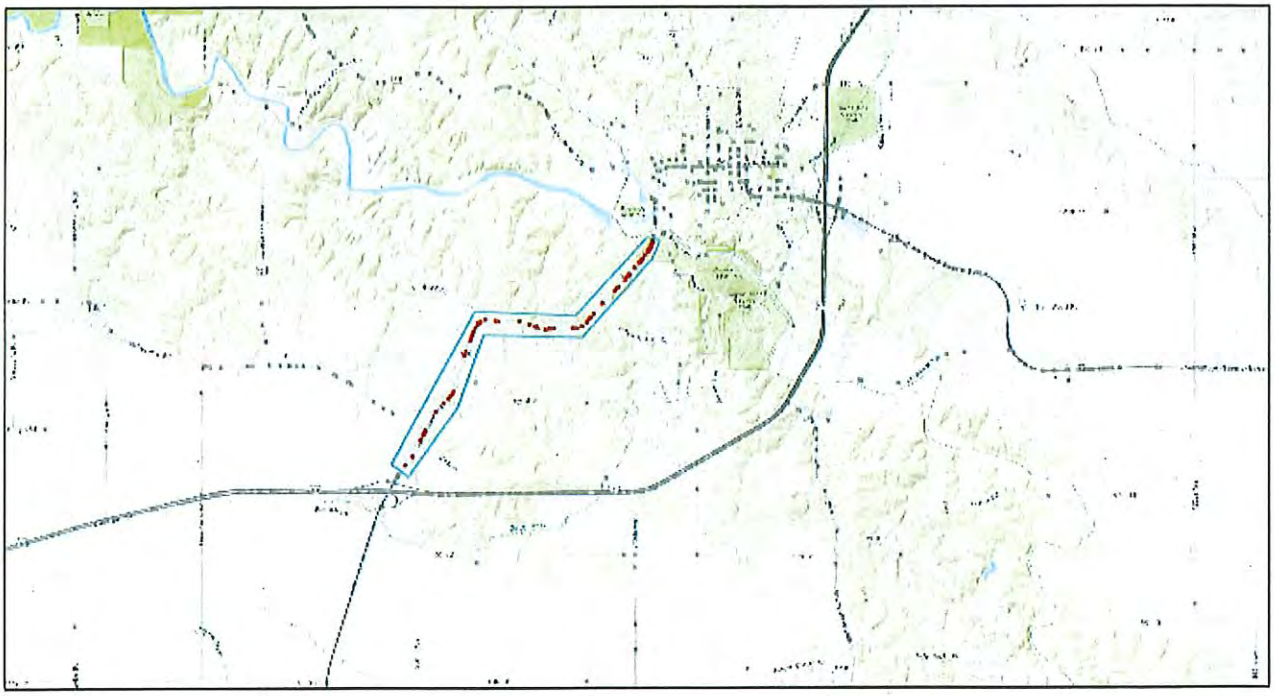
Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity	91
Fatal Crash	0
Suspected Serious Injury Crash	5
Suspected Minor Injury Crash	4
Possible/Unknown Injury Crash	13
Property Damage Only	69

Injury Status Summary	32
Fatalities	0
Suspected serious/incapacitating	6
Suspected minor/non-incapacitating	9
Possible (complaint of pain/injury)	15
Unknown	2

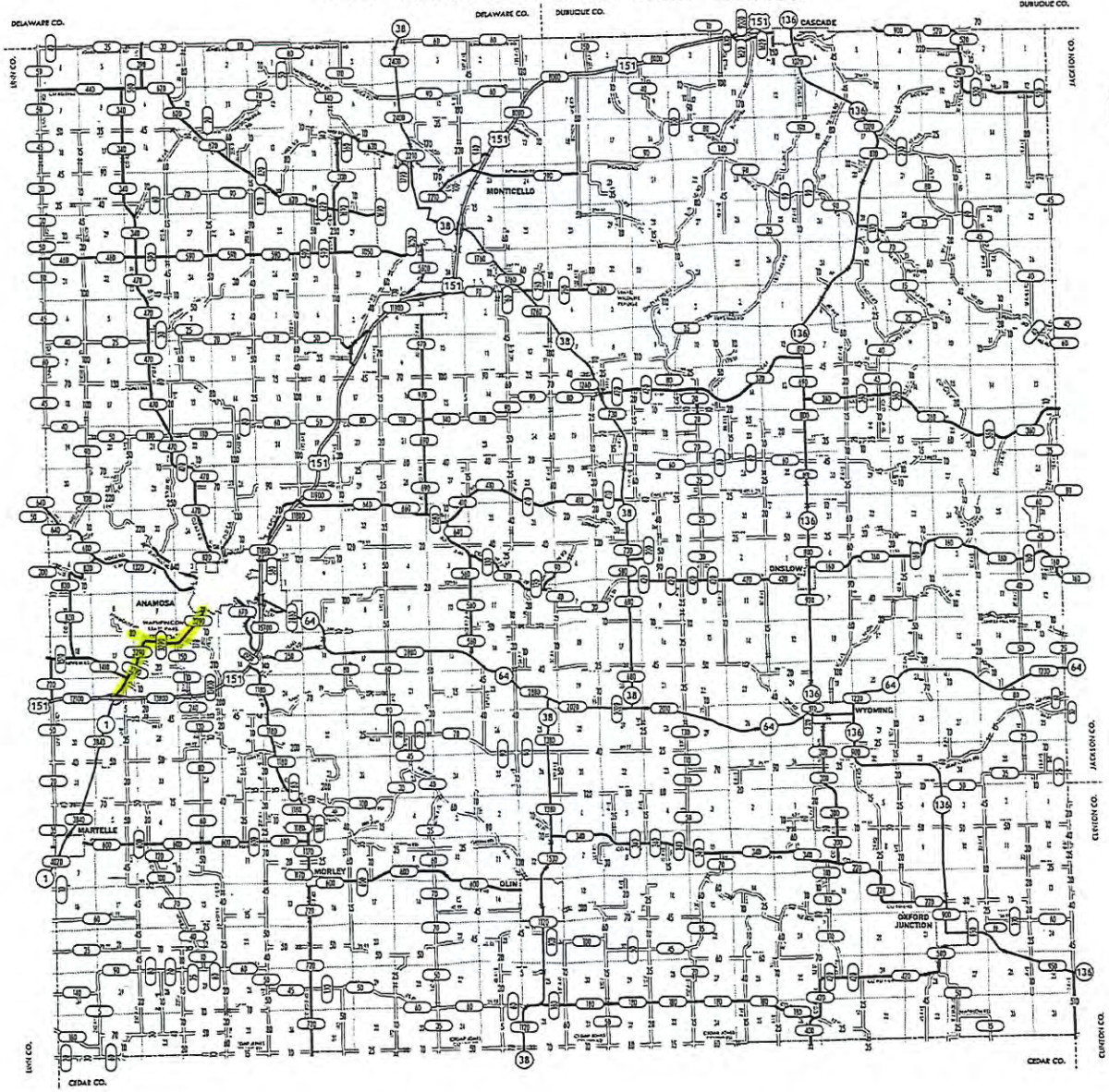
Property/Vehicles/Occupants	
Property Damage Total (dollars):	538,800.00
Average (per crash dollars):	5,920.88
Total Vehicles:	118.00
Average (per crash):	1.30
Total Occupants:	135.00
Average (per crash):	1.57

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.33
Major Injuries/Crash:	0.07
Minor Injuries/Crash:	0.10
Possible/Unknown Injuries/Crash:	0.16



(2017) ANNUAL AVERAGE DAILY TRAFFIC

2013 ANNUAL AVERAGE DAILY TRAFFIC



TRAFFIC FLOW MAP OF
JONES COUNTY
IOWA

Prepared By

IOWADOT

OFFICE OF SYSTEMS PLANNING
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

In Cooperation With
United States
Department of Transportation

JANUARY 1, 2018

MILES
0 1 2 3 4
KILOMETERS
0 1 2 3 4 5 6
7-1-18

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD
LEGAL NOT OPEN ROAD

2017

53

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Jones | Prepared by: Eric Grove | Date Prepared: Aug 6, 2020

Location: On CO RD E34

Improvement

Proposed Improvement(s): Milled Shoulder and Ceneterline Rumble Strips, Regrade Sharp Horizontal Curves to Improve Radius, and Flatten Foreslopes, Barnroof Foreslope Deep Ditches, Access Improvements (Flatten Slopes)

$ 500,000	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	50	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 500,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT | 2017 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.02	3,290	
3.02	miles total	

9,936	Current Vehicle Miles / Day, **VM**
14,764	End of Life Veh. Miles / Day
3,626,567	Current Veh. Miles / Year, **AM**
88,116,039	Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

2.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.6 years, Time Period, **T**

7 Additional months

0	Fatal Crashes →		Fatalities @	$4,500,000	$ -
		5	Major Injuries @	$325,000	$ 1,625,000
22	Injury Crashes →	4	Minor Injuries @	$65,000	$ 260,000
		13	Possible Injuries @	$35,000	$ 455,000
69	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 538,800
91	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 2,878,800

8.60	Current Crashes / Year, **AA** = TA / T	237.1	Crashes / HMVM, Crash Rate, **CR**
$ 31,635	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
208.9	Total Expected Crashes, **TCR** = CR x TVMT/10^8	$ 2,188,566	Present Value of Avoided Crashes, **BENEFIT**
4.30	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 136,006	Crash Costs Avoided in First Year, AAR x AVCR		
104.5	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $2,188,566 : $500,000 = **4.38** : 1

TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP)

SITE-SPECIFIC APPLICATION

FY 2022

Table of Contents

A. Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** July 30, 2020

Location / Title of Project Lee County

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 E-Mail bhull@leecounty.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	$ 497,558.00
Total Project Cost	$ 497,558.00
Safety Funds Requested	$ 497,558.00

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

RESOLUTION 2020-89

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 County has determined that flattening the crest of a vertical curve on a section of J62 (255th Street) will improve the roadway characteristics and help reduce the likelihood of vehicular crashes, thus improving safety for drivers; and

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

NOW THEREFORE, BE IT RESOLVED, that the Board of Supervisors supports and approves the attached application for Iowa Department of Transportation Traffic Safety Improvement Program funding on 255th St and hereby commits to accepting and maintaining these improvements.

LEE COUNTY BOARD OF SUPERVISORS

Ron Fedler, Chair

Matt Pflug, Vice Chair

Gary Folluo, Supervisor

Rich Harlow, Supervisor

Rick Larkin, Supervisor

Attest: Denise Fraise
Denise Fraise, County Auditor

B. NARRATIVE

Lee County is submitting an application herewith for TSIP site specific funding for a 0.53 mile section of roadway on 255 Street (1,200 feet east of to 1,500 feet west of 160 Ave). The road segment on 255 Street is a gravel-surfaced road with an AADT of 255 (Average of 220 and 290) and has not had any major alterations since the original construction in 1933.

Existing Conditions

The existing ground surrounding 255 Street is a series of rolling hills, with multiple vertical and sag crests that have severely affected the sight distance of one particular section of roadway near 160 Ave. This 0.53-mile section of roadway has K values or length of vertical curve per grade change that are below the minimum rate of vertical curvature deemed safe for a 55 mile per hour roadway (Crest K value of 53, Sag K values of 31 and 79).

Design Controls for Crest Vertical Curves

U.S. Customary			
Design Speed (mph)	Stopping Sight Distance (ft)	Rate of Vertical Curvature, Ka	
		Calculated	Design
15	80	3.0	3
20	115	6.1	7
25	155	11.1	12
30	200	18.5	19
35	250	29.0	29
40	305	43.1	44
45	360	60.1	61
50	425	83.7	84
55	495	113.5	114
60	570	150.6	151
65	645	192.8	193
70	730	246.9	247
75	820	311.6	312
80	910	383.7	384

Design Controls for Sag Vertical Curves

U.S. Customary			
Design Speed (mph)	Stopping Sight Dis-tance (ft)	Rate of Vertical Curvature, K^a	
		Calculated	Design
15	80	9.4	10
20	115	16.5	17
25	155	25.5	26
30	200	36.4	37
35	250	49.0	49
40	305	63.4	64
45	360	78.1	79
50	425	95.7	96
55	495	114.9	115
60	570	135.7	136
65	645	156.5	157
70	730	180.3	181
75	820	205.6	206
80	910	231.0	231

(Source: AASHTO A Policy on Geometric Design of Highways and Streets 2018 7th Edition)

Decreased K values also decrease sight distance making the roadway more hazardous to travel. Unfortunately, this not a theoretical concept, it has already resulted in five crashes with two fatalities.

Proposed Improvements

Though vertical curves maybe unavoidable, they can be mitigated by flattening the crest of the vertical curve. Crash Modification Factors Clearinghouse has determined that “Flattening a Crest Vertical Curve” (CMF ID 721) has a crash reduction factor of 51, a significant reduction in injury and fatalities. By removing part of the crests and filling in a portion of the sag sections of the vertical curves, the crest K value will change from 53 to 151.5, and Sag K values will change from 31 and 79 to 130.9 and 115.6 respectively. The flattening of the adjacent sag curves would be a byproduct of reducing the grade in/ grade out of the crest curve vertical tangents.

A crash analysis and Benefit/Cost calculation has been performed for the proposed safety improvements. Over a service life of 20 years, calculations show a B/C ratio of **16.56:1**. The situation as presented and the predicted savings indicate that this would be a worthwhile appropriation of funding. Consideration for funding for these improvements is greatly appreciated.

C. COST

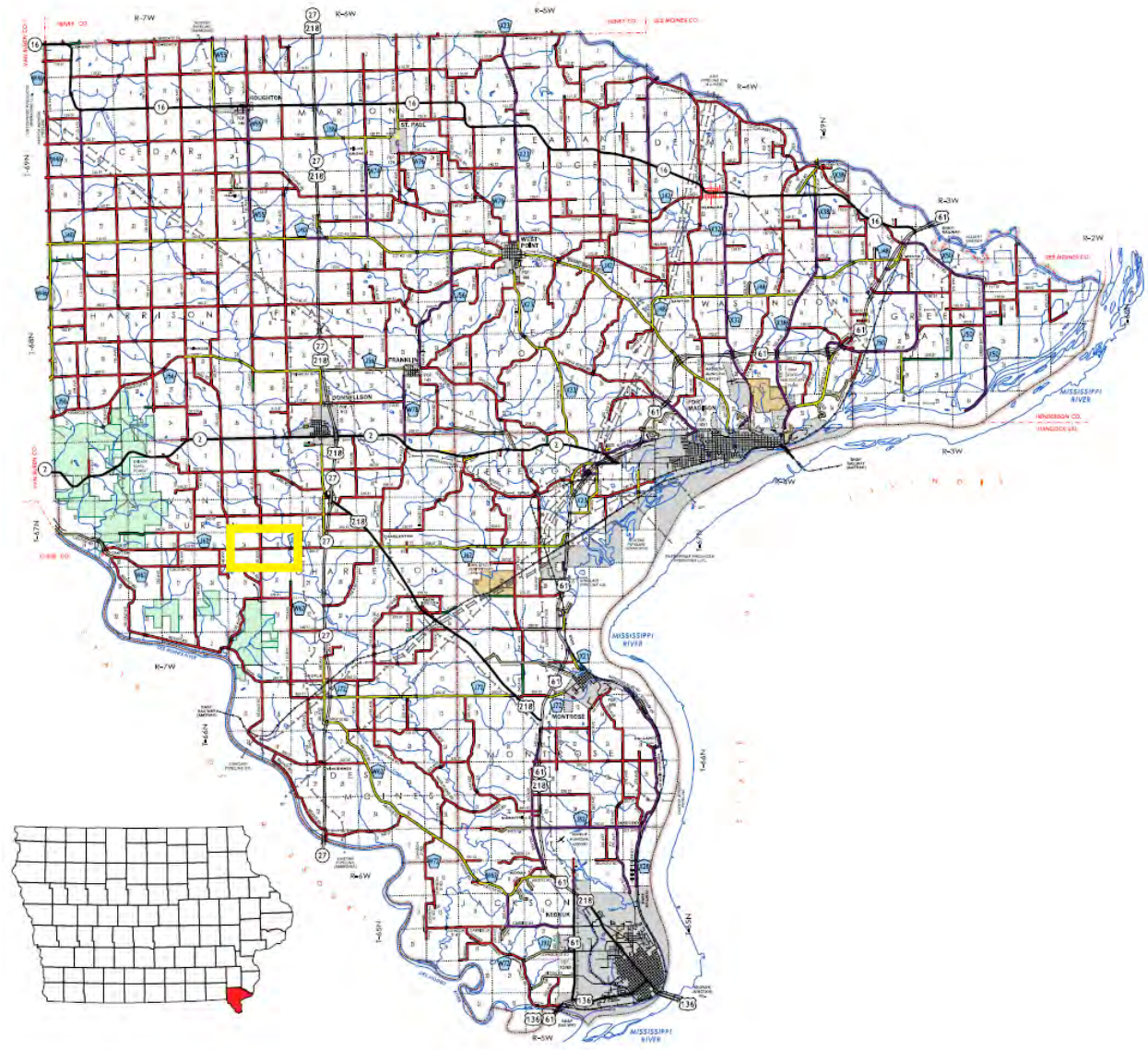
ESTIMATED ROADWAY QUANTITIES

Item No.	Item Code	Item	Unit	Total	Unit Price		
1	2101-0850001	CLEARING AND GRUBBING	ACRE	0.94	15,000	$	14,100.00
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	12,117.00	10	$	121,170.00
3	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED	CY	1,320.00	20	$	26,400.00
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	3,258.00	6	$	19,548.00
5	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	2,170.00	25	$	54,250.00
6	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	2.00	5,000	$	10,000.00
7	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	800.00	40	$	32,000.00
8	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEAOUS) (HEADWALL)	LS	1.00	10,000	$	10,000.00
9	2417-1060024	CULVERT, CORRUGATED METAL ROADWAY PIPE, 24 IN. DIA.	LF	62.00	55	$	3,410.00
10	2417-1060060	CULVERT, CORRUGATED METAL ROADWAY PIPE, 60 IN. DIA.	LF	94.00	220	$	20,680.00
11	2507-6800061	REVETMENT, CLASS E	TON	100.00	50	$	5,000.00
12	2507-8029000	EROSION STONE	TON	300.00	40	$	12,000.00
13	2601-2634100	MULCHING	ACRE	4.00	1,000	$	4,000.00
14	2601-2636015	NATIVE GRASS SEEDING	ACRE	4.00	3,500	$	14,000.00
15		EROSION CONTROLS	0	15,000.00	1	$	15,000.00
16		MOBILIZATION	LUMP SUM	1.00	40,000	$	40,000.00
		Traffic control	LUMP SUM	1.00	10,000	$	10,000.00
		Relocation of water main	0	1.00	35,000	$	35,000.00
		RIGHT OF WAY NEEDED	ACRES	3.40	15,000	$	51,000.00
					Total estimate	**$**	**497,558.00**

D. TIME SCHEDULE

TSIP APPLICATION DUE	August 15, 2020
TSIP Award Notification	Mid-January 2021
Project Development	Spring – Summer 2021
Project Letting	Fall – Winter 2021
Project Construction	2022 Construction Season

E. MAP


MISSISSIPPI RIVER
MISSISSIPPI RIVER
MISSISSIPPI RIVER
MONTROSE
KEOKUK
WEST POINT
DONNELLSON
FRANKLIN
ST. PAUL
HOUGHTON

F. PHOTOS OF PROJECT SITE

At intersection of 255th and 160th Avenue

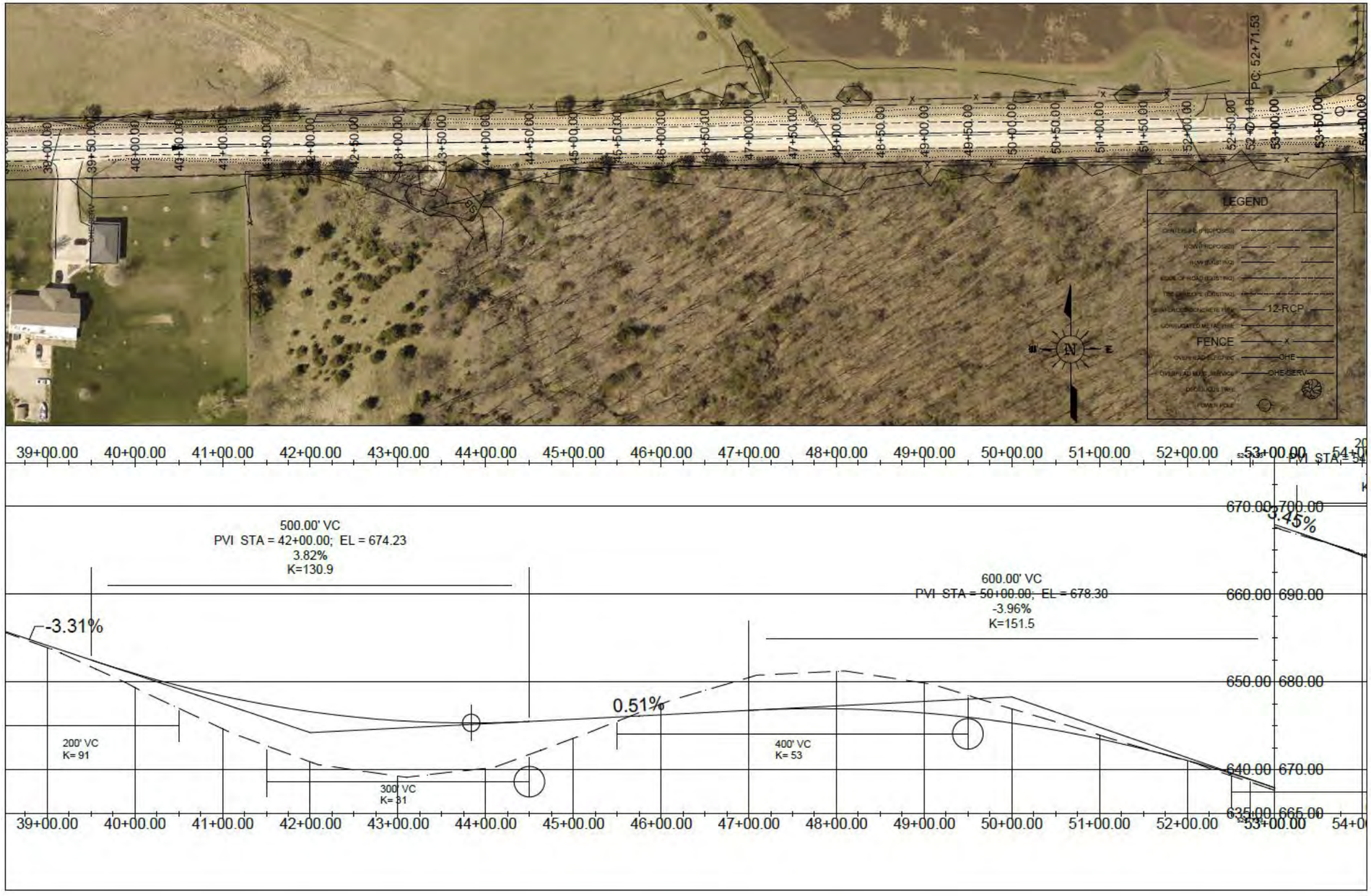
Looking North

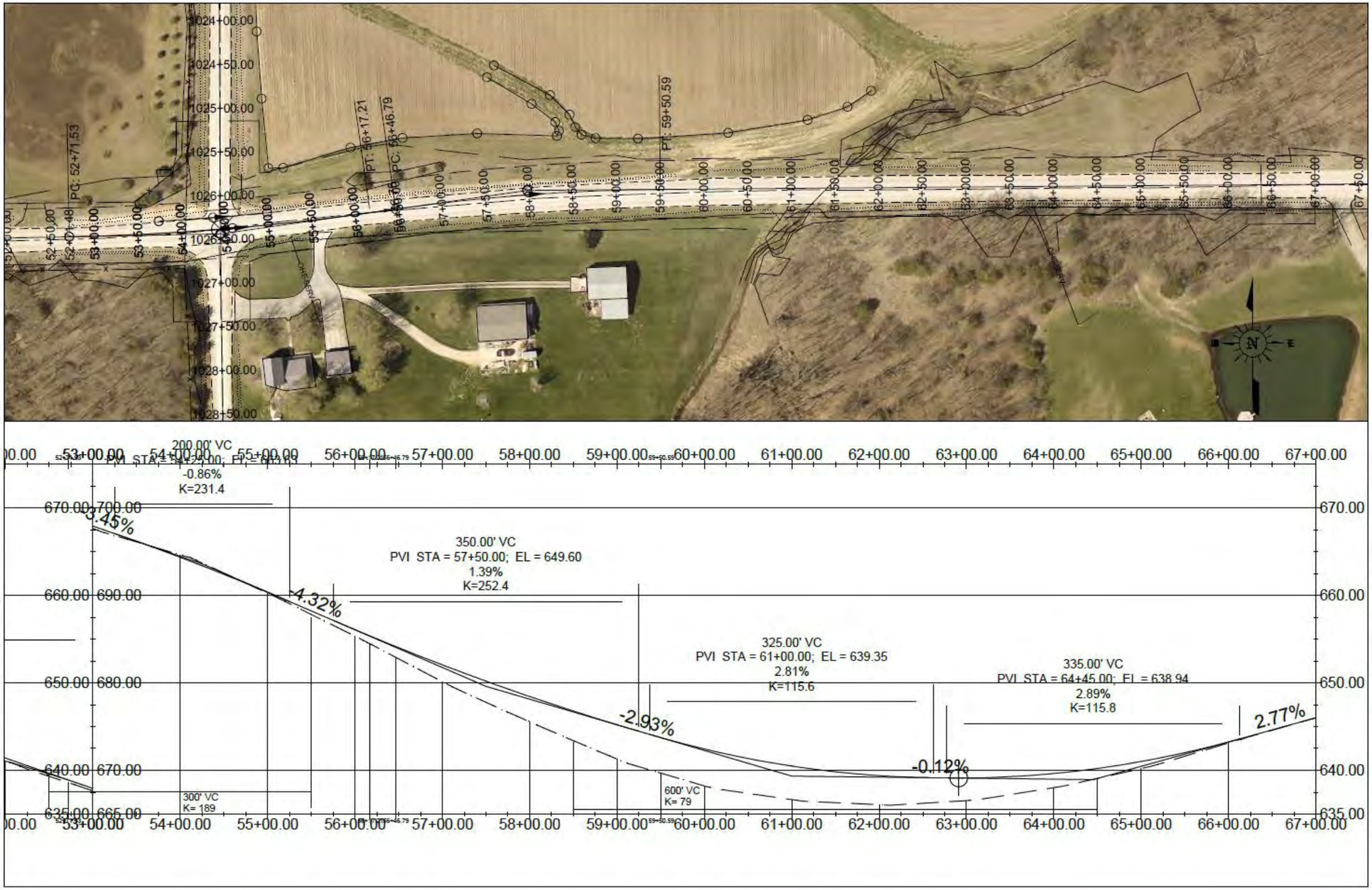
Looking East

Looking South

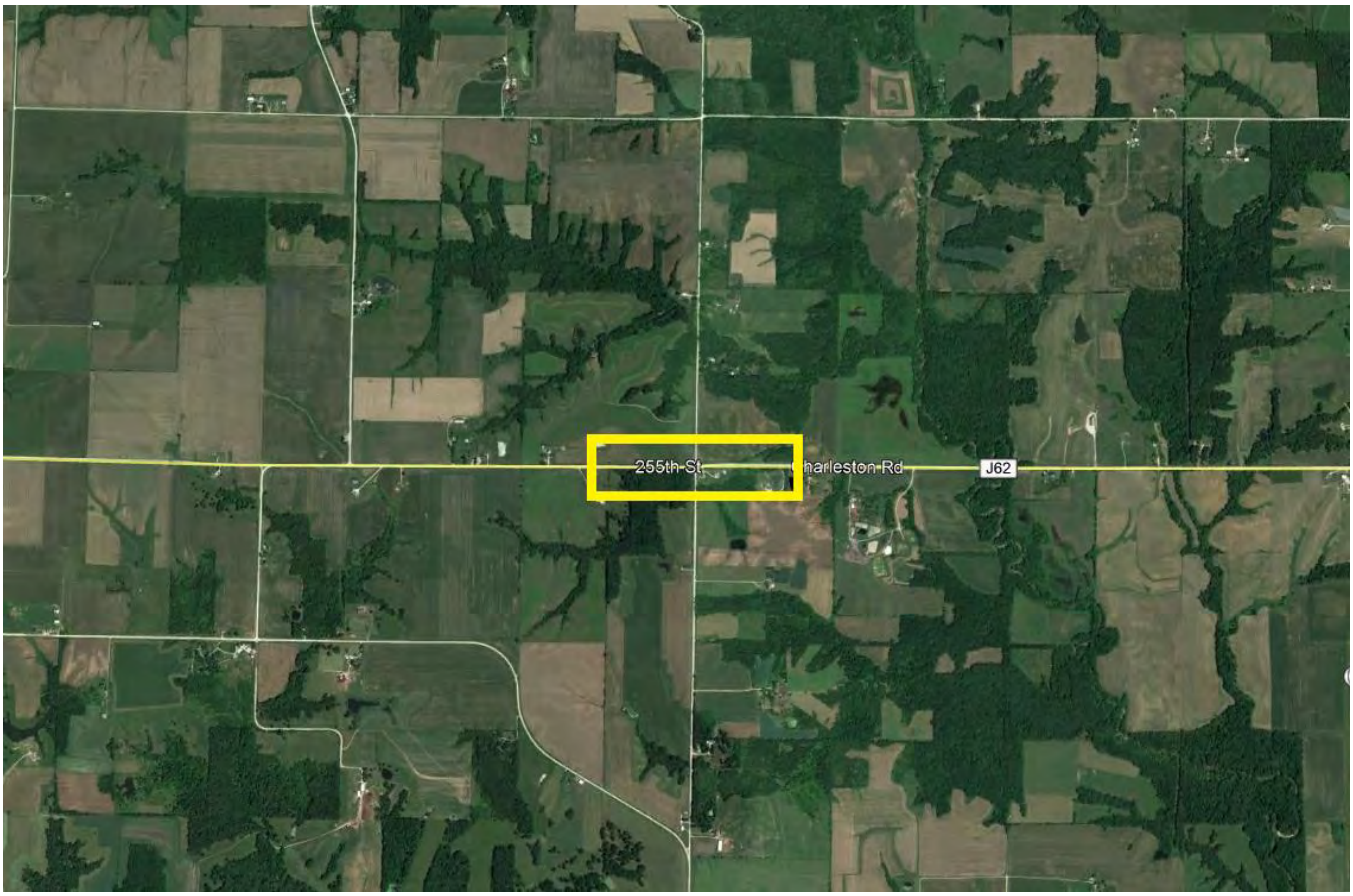
Looking West

G. PLAN VIEW


LEGEND
12-RCP
FENCE
OHE
OHE SERV
PC: 52+71.53
500.00' VC
PVI STA = 42+00.00; EL = 674.23
3.82%
K=130.9
600.00' VC
PVI STA = 50+00.00; EL = 678.30
-3.96%
K=151.5
-3.31%
0.51%
3.45%
200' VC
K= 91
300' VC
K= 31
400' VC
K= 53
39+00.00
40+00.00
41+00.00
42+00.00
43+00.00
44+00.00
45+00.00
46+00.00
47+00.00
48+00.00
49+00.00
50+00.00
51+00.00
52+00.00
53+00.00
670.00
700.00
660.00
690.00
650.00
680.00
640.00
670.00
635.00
665.00


PC: 52+71.53
PT: 56+17.21
PC: 58+46.79
PT: 59+50.59
200.00' VC
PVI STA = 54+00.00; EL = 667.18
-0.86%
K=231.4
-3.45%
350.00' VC
PVI STA = 57+50.00; EL = 649.60
1.39%
K=252.4
-4.32%
325.00' VC
PVI STA = 61+00.00; EL = 639.35
2.81%
K=115.6
-2.93%
335.00' VC
PVI STA = 64+45.00; EL = 638.94
2.89%
K=115.8
-0.12%
2.77%
300' VC
K= 189
600' VC
K= 79
53+00.00
54+00.00
55+00.00
56+00.00
57+00.00
58+00.00
59+00.00
60+00.00
61+00.00
62+00.00
63+00.00
64+00.00
65+00.00
66+00.00
67+00.00
670.00
660.00
650.00
640.00
635.00

H. AERIAL PHOTOGRAPH



I. ICAT CRASH SUMMARY OF MOTOR VEHICLE ACCIDENTS SUMMARY

IOWA CRASH ANALYSIS TOOL QUICK REPORT 2011-2019

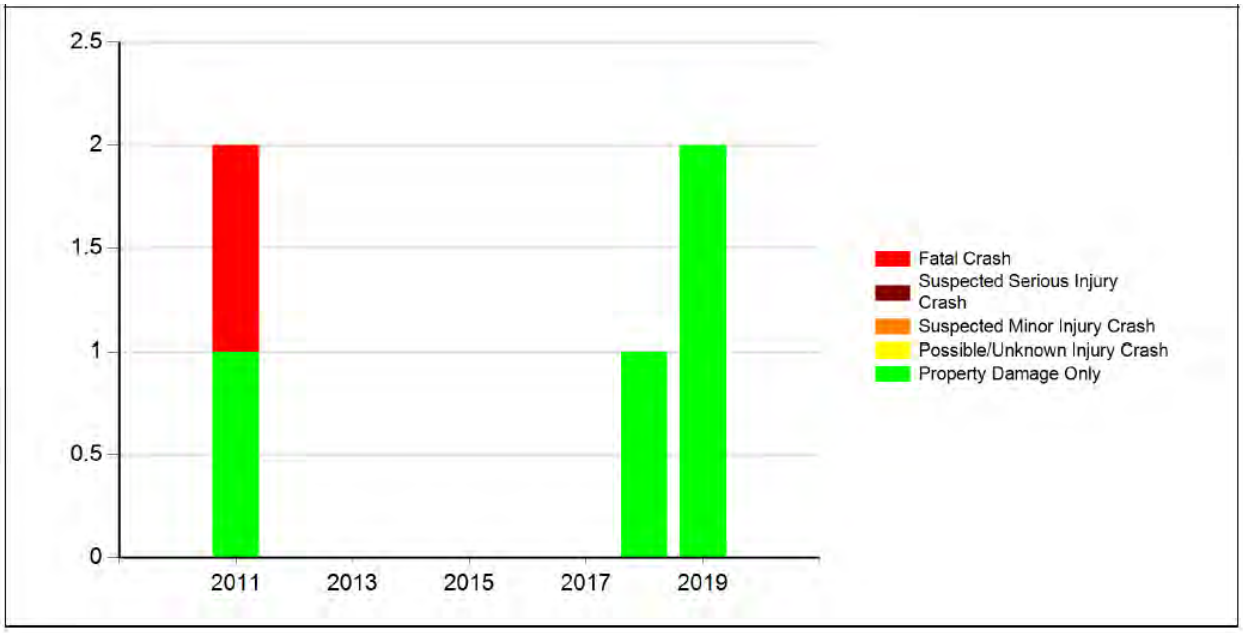
Crash Severity	5
Fatal Crash	1
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	0
Property Damage Only	4

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	33,500.00
Average (per crash dollars):	6,700.00
Total Vehicles:	7.00
Average (per crash):	1.40
Total Occupants:	9.00
Average (per crash):	1.80

Average Severity	
Fatalities/Fatal Crash:	2.00
Fatalities/Crash:	0.40
Injuries/Crash:	0.00
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.00

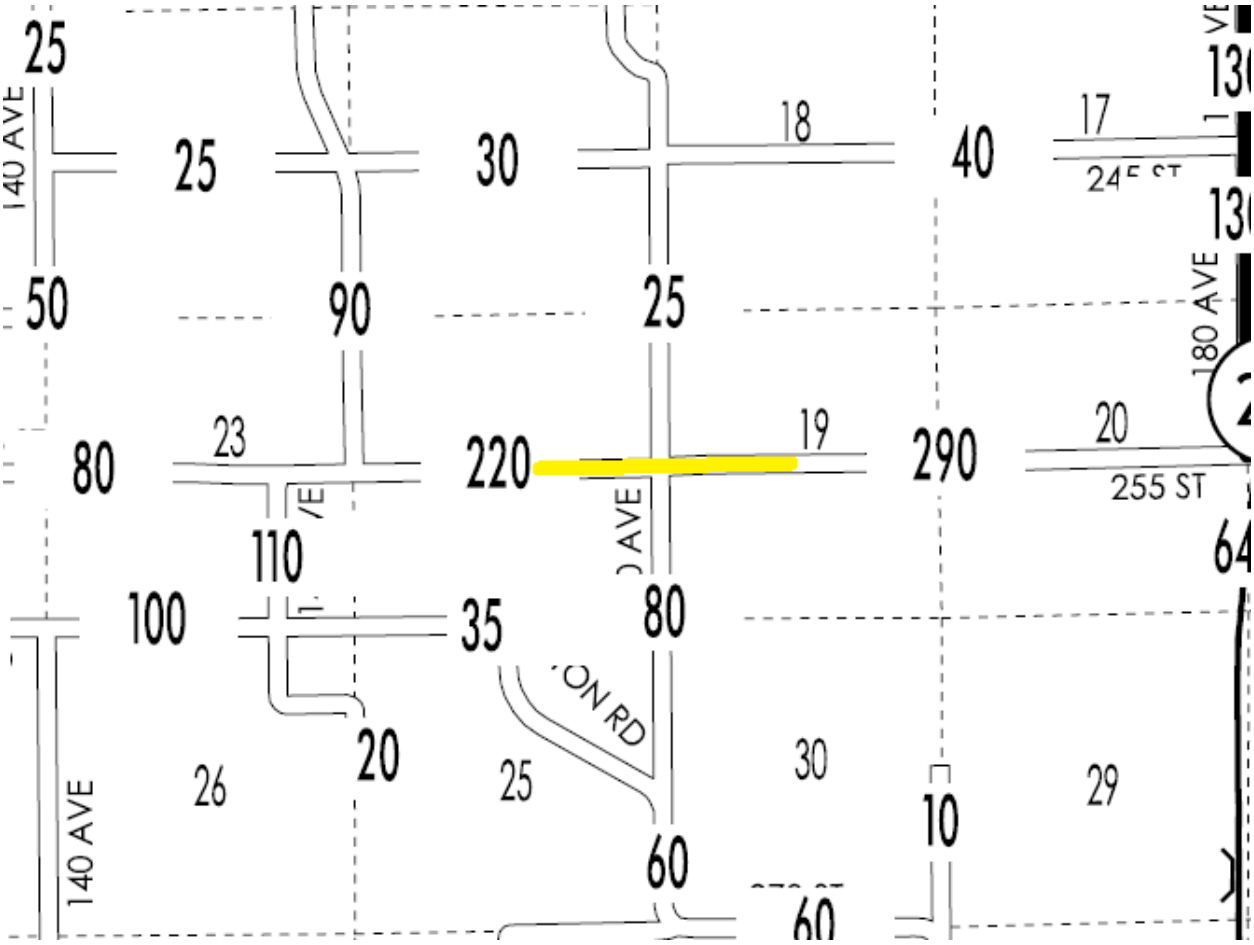
Severity/Year



Full report found in the Appendix.

J. TRAFFIC VOLUMES

255 Street AADT



Source: 2018 AADT Traffic Flow Map of Lee County, prepared by Iowa DOT.

K. TRAFFIC SIGNAL LAYOUT

Not Applicable for this project

L. BENEFIT/COST ratio

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Lee Prepared by: Benjamin J. Hull, P.E. Date Prepared:

Location: 255 Street

Improvement

Proposed Improvement(s):

$ 497,558	Estimated Improvement Cost, EC	20	Estimated Service Life, years, Y
$ -	Other Annual Cost (after initial year), AC	51	Crash Reduction Factor (integer), CRF
$ -	Present Value Other Annual Costs, OC	4.0%	Discount Rate, INT
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 497,558	Present Value All Costs, COST = EC + OC

Traffic Volume Data

Source: 2018 Iowa DOT AADT Map of Lee County 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.53	255	
0.53	miles total	

135 Current Vehicle Miles / Day, **VM**

201 End of Life Veh. Miles / Day

49,330 Current Veh. Miles / Year, **AM**

1,198,583 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

2.0% Projected Traffic Growth (0%-10%), G

Crash Data

2011 First full year --> 2019 Last full year 9.0 years, Time Period, T

Additional months

1	Fatal Crashes	2	Fatalities @	$4,500,000	$ 9,000,000
		0	Major Injuries @	$325,000	$ -
0	Injury Crashes	0	Minor Injuries @	$65,000	$ -
			Possible Injuries @	$35,000	$ -
4	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 33,500
5	Total Crashes, TA			Total $ Loss, LOSS	$ 9,033,500

0.56	Current Crashes / Year, AA = TA / T	1,126.2	Crashes / HMVM, Crash Rate, CR
$1,806,700	Cost per Crash, AVCR = LOSS / TA		CR = TA x 10^8 / (AM x T)
13.5	Total Expected Crashes, TCR = CR x TVMT/10^8	$ 8,237,289	Present Value of Avoided
0.28	Crashes Avoided First Year AAR = AA x CRF / 100		Crashes, BENEFIT
$ 511,898	Crash Costs Avoided in First Year, AAR x AVCR		
6.9	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $8,237,289 : $497,558 = **16.56** : 1

APPENDIX

IOWA CRASH ANALYSIS TOOL QUICK REPORT 2011-2019 FULL REPORT

Iowa Crash Analysis Tool
Quick Report
2011-2019

Crash Severity	5
Fatal Crash	1
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	0
Property Damage Only	4

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

Property/Vehicles/Occupants	
Property Damage Total (dollars):	33,500.00
Average (per crash dollars):	6,700.00
Total Vehicles:	7.00
Average (per crash):	1.40
Total Occupants:	9.00
Average (per crash):	1.80

Average Severity	
Fatalities/Fatal Crash:	2.00
Fatalities/Crash:	0.40
Injuries/Crash:	0.00
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.00

Major Cause			5
Animal	1	Ran traffic signal	0
Ran stop sign	1	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	1
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	1	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	1
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	1	3	0	0	0	5

Manner of Crash Collision	5
Non-collision (single vehicle)	2
Head-on (front to front)	1
Rear-end (front to rear)	0
Angle, oncoming left turn	0
Broadside (front to side)	1
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	1
Other	0
Unknown	0

Surface Conditions	5
Dry	2
Wet	0
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	1
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	1
Not reported	1
Other	0
Unknown	0

Fixed Object Struck			7
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	2	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	5

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	Total
< 14	0	0	0	0	0
= 14	1	0	0	0	1
= 15	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	1	0	0	1
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	2	0	0	2
>= 35 and <= 39	0	1	0	0	1
>= 40 and <= 44	0	1	0	0	1
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	0	1	0	0	1
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	1	6	0	0	7

Drug/Alcohol Related	5
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	5

Alcohol Test Given	7
None	6
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

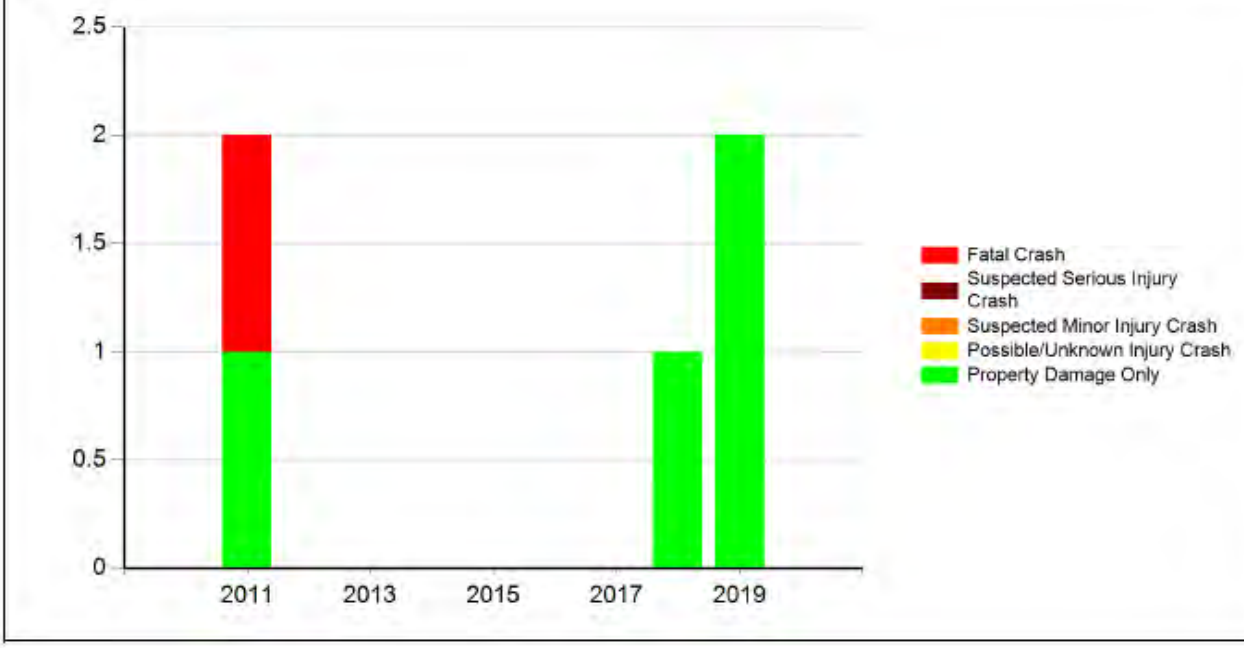
Drug Test Given	7
None	6
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	1

Drug Test Result	7
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	7
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
2010	0	0	0	0	0	0
2011	1	0	0	0	1	2
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	1	1
2019	0	0	0	0	2	2
2020	0	0	0	0	0	0
Total	1	0	0	0	4	5

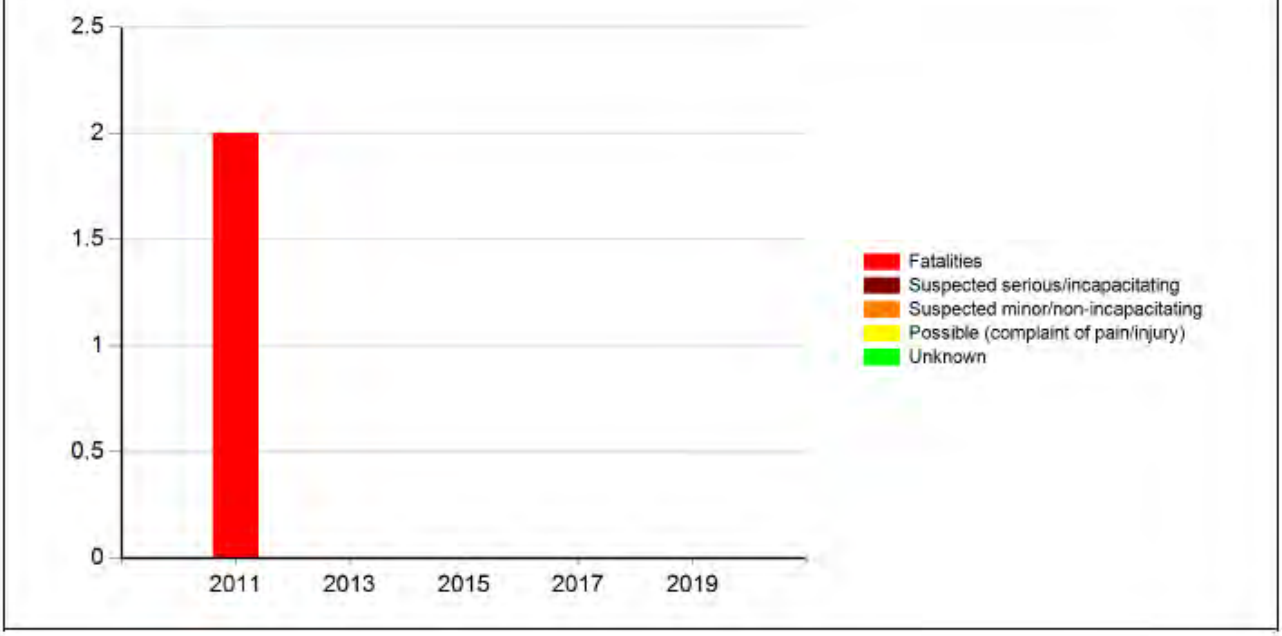
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	2	0	0	0	0	2
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	2	0	0	0	0	2

Injury Status/Year



Meeting the following criteria

Jurisdiction: Counties (Lee)
Year: 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019
Map Selection: Yes
Filter: None

Analyst Information

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 721

Flatten crest vertical curve

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Alignment

Study: ***Development of Crash Reduction Factors*****, Hovey and Chowdhury, 2005**

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.49
Adjusted Standard Error:	
Unadjusted Standard Error:	0.19

Crash Reduction Factor (CRF)	
Value:	51 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	19

Applicability	
Crash Type:	All
Crash Severity:	K (fatal),A (serious injury),B (minor injury),C (possible injury)
Roadway Types:	All
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	OH
Country:	

Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Sites
Before Sample Size Used:	3 Sites
After Sample Size Used:	3 Sites

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 07/15/2020

Location / Title of Project X-17 Resurfacing Project

Applicant Louisa County Secondary Roads

Contact Person Adam Shutt Title County Engineer

Complete Mailing Address 8313 K Avenue

Wapello, IA 52653

Phone 319-523-5271 E-Mail Ashutt.locoe@louisacomm.net

(Area Code)

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ E-Mail _____

(Area Code)

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	~~432,850~~ $337,258
Total Project Cost	$	1,900,000
Safety Funds Requested	$	~~432,580~~ $337,258

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

☐ Yes – Explain _____

☒ No

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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 Louisa County Board of Supervisors

Signed: Chris E Ball 7-28-2020

Signature Date Signed

Chris E Ball

Printed Name

Attest: _____

Signature Date Signed

_____

Printed Name

LOUISA COUNTY SECONDARY ROADS

TSIP APPLICATION NARRATIVE – X17

Purpose

Louisa County is submitting an application for a TSIP site specific funding for County Road X17 from G62 north to Philadelphia Street in Columbus City. This project will seek to add safety measures to a larger mill and overlay project funded through Louisa County's FY 2022 STBG allocation.

Existing Conditions

X17 is a typical 2 lane road consisting of a 22' HMA surface. The road was first paved in the 1950's with 6" HMA pavement rock base. The road received a cold in place treatment and overlay in the 1990's. Currently the road is 22' wide with 9" HMA pavement over a rock base. The pavement is distressed and in need of rehabilitation. Existing granular shoulders vary between 3 and 5 feet. Beyond the travelled way, grading varies from 3/1 at the north and south to 2/1 through the middle of the route.

The road is signed for 55 mph with several curves with warning signs to reduce speeds. All signs are installed to current MUTCD standards.

X17 is a busy north-south haul route for construction materials out of the River Products Quarry south west of Columbus City.

Available Crash Data

Motorists are involved in a relatively high number of accidents in this route. The route has fairly steep slopes through wooded areas with steep side slopes. The existing granular shoulders are as narrow as 3' in some places. The granular shoulders are difficult to maintain and prone to rutting which creates a safety hazard.

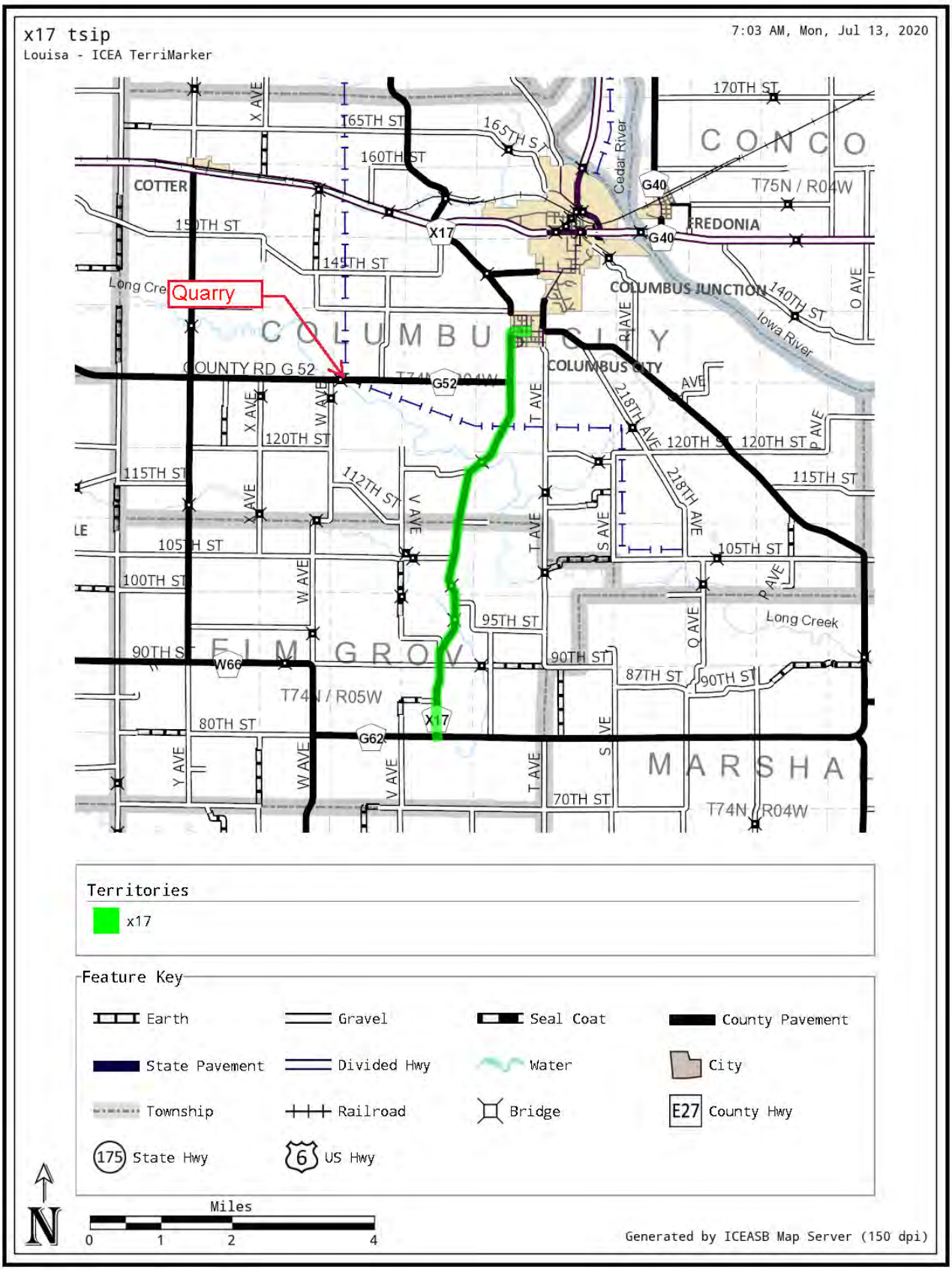
Crash data was gathered using ICAT. The data for X17 lists 3 accidents on the roadway in 2019: 1 major injury, 2 minor injuries and 1 possible injury. Estimated loss of property and productivity resulting from these accidents is approximately $532,000 in 2019. A B/C analysis is shown below using five years of data as requested in the TSIP Site-Specification Application Requirements.

Proposed Project

Louisa County plans a 1-1/2" Mill with 3" inch overlay of X17. The road top will be widened using TSIP funding to 25' to allow for additional lane width, wider striping and safety edge. This project will be combined with County Highway 305 in an effort to improve efficiencies. The proposed TSIP project will only be used for X17. All improvements will be included within the larger X17-305 project in an attempt to maximize efficiencies.

X17 has a right of way width of 100’ for approximately 5.8 miles of the project. The remaining 0.5 miles has a ROW width of 82’. This project will have no requirement for additional right of way.

Project Map



Proposed Safety Improvements

To reduce the number of accidents, multiple safety measures are being proposed:

- 1.5 ft paved shoulder (CRF Value 2) will provide drivers a wider surface, without a drop off to make corrections before leaving the road. A widened paved shoulder will be required to incorporate the remaining measures. Depth of pavement widening will be 6" over existing compacted base.
- A wider (6") edge line (CRF Value 7) will heighten driver awareness of the edge of the travelled way, thereby reducing roadway departures
- Install safety edge (CRF Value 6) to reduce edge line rutting and allow for safe corrections

CRF Values taken from Iowa DOT Planning-Level Crash Reduction Factor (CRF) List Version 1.0 July 22, 2019

Preliminary Construction Estimate

X17 TSIP SHOULDER PAVING PROJECT - ADDITIONS TO BASE PROJECT

REF No	Item Number	Description	Units	Quantity	Engineer's Estimate	Extended Amount
1	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	1,100.0	$ 30.00	$ 33,000.00
2	2303-1032500	HOT MIX ASPHALT STANDARD TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	Ton	2,243.0	64.00	143,552.00
3	2303-1033500	HOT MIX ASPHALT STANDARD TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, NO SPECIAL FRICTION REQUIREMENT	Ton	668.0	64.00	42,752.00
4	2303-1258283	ASPHALT BINDER, PG 58-28S, STANDARD TRAFFIC	Ton	175.0	600.00	105,000.00
5	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	664	15.00	9,954.00
6	2528-8445113	FLAGGERS	EACH	6.0	500.00	3,000.00
		Construction Estimate				**$ 337,258.00**

Figures reflect addition of paved shoulders, safety edge and striping to proposed mill and overlay of X17.

Funding Sources

TOTAL ESTIMATE: $1,807,772 (X17 Portion only)

STBG-SWAP: $1,400,000 (est)

FM-SWAP: $ 70,514

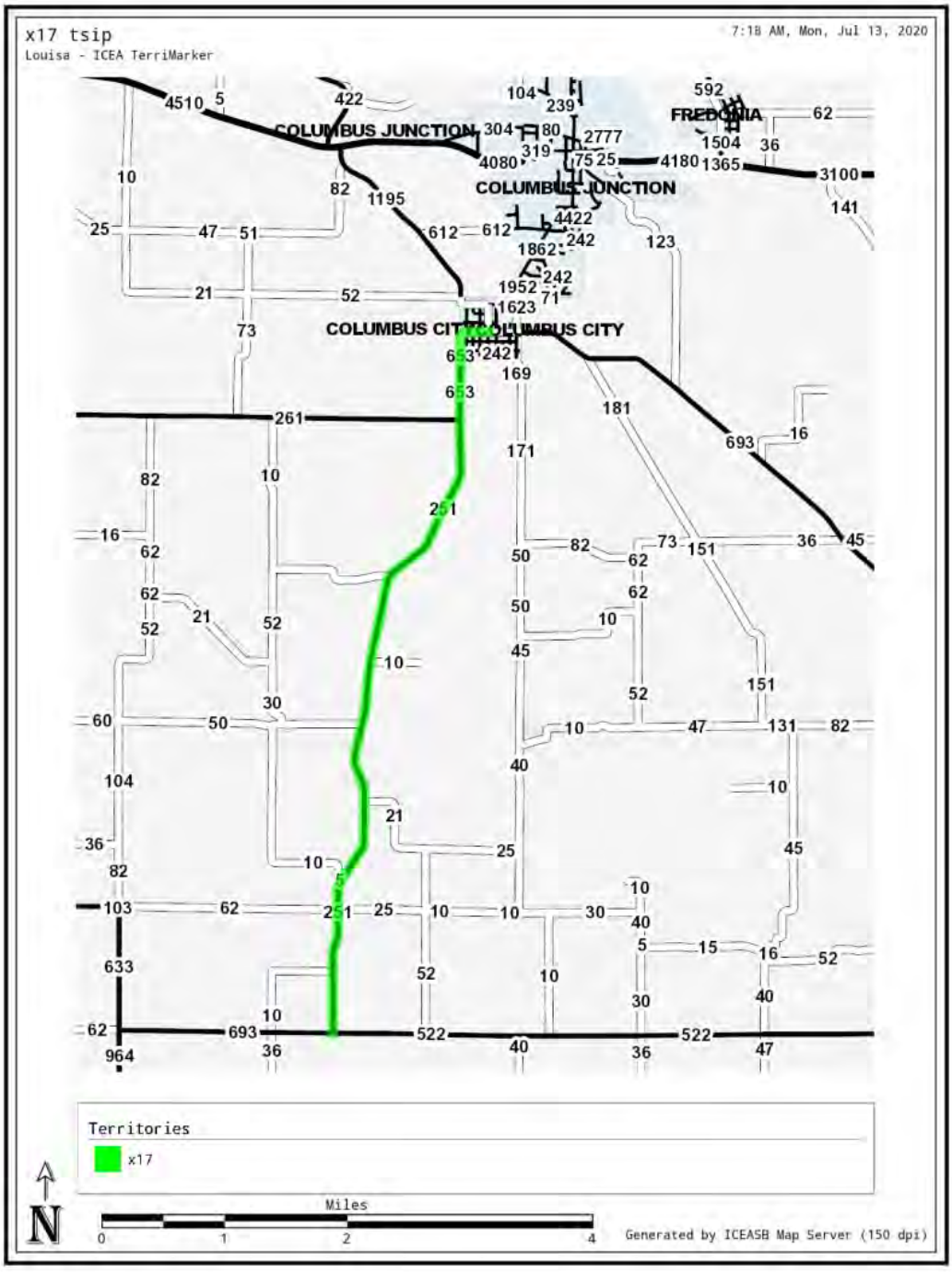
TSIP: $337,258 (Requested)

*Note that the project will be combined with another 1.7 miles of HMA Overlay for an estimated total of $2.31M. The remainder of the funding for Hwy 305 portion will come from FM-SWAP.

Timing and Schedule

August 2020	TSIP Application
January 2020- January 2021	Project Development
January 2021	Anticipated Approval of Funds
July 2021	Project Letting
Summer 2022	Completion

Project AADT



B/C Analysis information:

B/C ANALYSIS INSTRUCTIONS					revised May 2018	
					Office of Traffic & Safety, Iowa DOT	
Document all values and assumptions and include with application.						
Use either the "Road Segment" or "Intersections" worksheet and only enter values in the YELLOW cells.						
Crashes used in the B/C worksheet should be mitigated by the proposed countermeasure(s).						
Crash Reduction Factors						
Select crash reduction factors from the Iowa CRF List (link to be provided). For strategies not found in the CRF List, refer to the CMF Clearinghouse.						
http://www.cmfclearinghouse.org/						
Be sure to use the CRF (not the CMF) in these spreadsheets. A CRF of 10 means a 10% reduction in crashes is expected with that improvement. Note that a CRF of 10 equals a CMF of 0.90 (CRF = 1 - CMF).						
If more than one safety improvement will be made, the cumulative crash reduction factor must be calculated using the following formula:						
CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))						
or enter the individual values into this calculator:						
Enter up to 5 CRFs:	12	7	6			
Cumulative CRF =	23.0704					
If the improvements have different service lives, enter the shortest service life into the spreadsheet.						
Yearly Worksheet						
The "Yearly" worksheet is not part of the analysis, but can be used to check and better understand the results.						
Discount Rate						
The discount rate of 4% excludes inflation and comes from the St. Louis Federal Reserve Bank. It should not be changed without proper justification and documentation.						
Societal crash cost values were last updated in May 2014.						
Report any errors or problems to:						
DOT-TSIP@iowadot.us						

B/C Analysis Results:

Road Segment Benefit / Cost Safety Analysis

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Iowa DOT Office of Traffic & Safety

County:	Louisa	Prepared by:	Adam Shutt	Date Prepared:	Feb 7, 2020
Location:	X17 South of Columbus City				

Improvement

Proposed Improvement(s): County to mill & Overlay 22' Wide HMA Road

Widen pavement to 24'. Add 6" Striping and Safety Edge

$ 337,258	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	23	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 337,258**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT — 2018 — Date of traffic count

Length (mi.)	Two-way veh/day	Description
5.30	250	G56 South to G62
1.00	650	G56 North to Mulberry St

1,975	Current Vehicle Miles / Day, **VM**
2,410	End of Life Veh. Miles / Day
720,875	Current Veh. Miles / Year, **AM**
15,872,950	Total Projected Veh. Miles Over Life of Project, **TVMT**

6.30 miles total

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2015 First full year --> 2019 Last full year — 5.0 years, Time Period, **T**

0 Additional months

0	Fatal Crashes →		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
3	Injury Crashes →	2	Minor Injuries @	$65,000	$ 130,000
		1	Possible Injuries @	$35,000	$ 35,000
	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 42,000
3	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 532,000

0.60	Current Crashes / Year, **AA** = TA / T	**83.2**	Crashes / HMVM, Crash Rate, **CR**
$ 177,333	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
13.2	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 361,469**	Present Value of Avoided Crashes, **BENEFIT**
0.14	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 24,472	Crash Costs Avoided in First Year, AAR x AVCR		
3.0	Total Avoided Crashes, TCR x CRF/ 100	$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$	

Benefit / Cost Ratio

Benefit : Cost = $361,469 : $337,258 = **1.07** : 1

Site Photos:

Southern 1/3 of project

Middle 1/3 of Project

Northern 1/3 of project

Approach into Columbus City

ICAT Analysis Information:

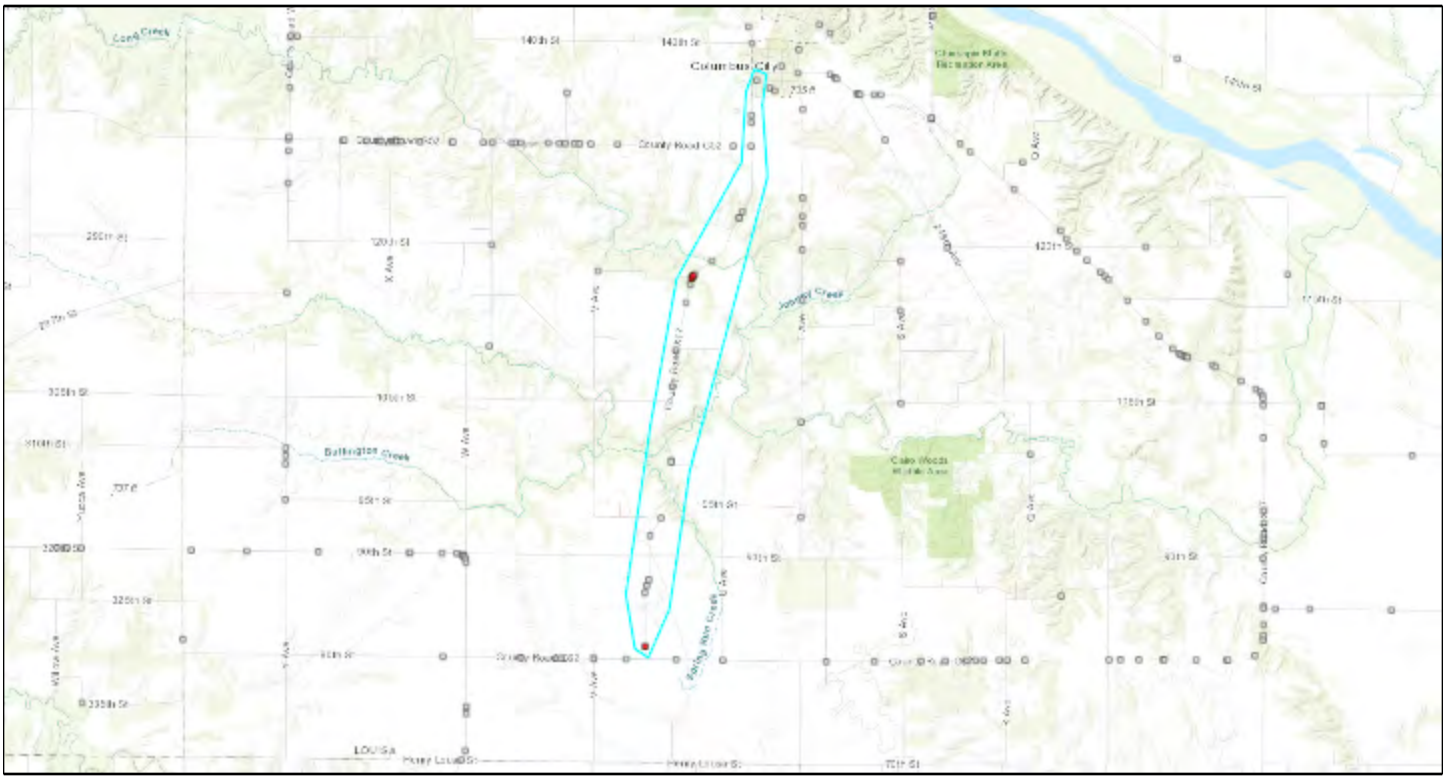
Iowa Crash Analysis Tool
Crash Characteristics
2015-2020

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

Injury Status Summary	4
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	2
Possible (complaint of pain/injury)	1
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	42,000.00
Average (per crash dollars):	14,000.00
Total Vehicles:	3.00
Average (per crash):	1.00
Total Occupants:	4.00
Average (per crash):	1.33

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	1.33
Major Injuries/Crash:	0.33
Minor Injuries/Crash:	0.67
Possible/Unknown Injuries/Crash:	0.33



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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	0	1	0	0	0	1	0	0	0	0	0	2
Wednesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thursday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	2	0	0	0	0	0	3

Month	3
January	0
February	0
March	0
April	0
May	0
June	0
July	1
August	1
September	0
October	0
November	0
December	1
Not reported	0

Lighting	3
Daylight	2
Darkness	1
Morning Twilight (dawn 30 minutes after sunri...	0
Evening Twilight (dusk 30 minutes before suns...	0
Unknown	0

Weather Conditions	3
Clear	3
Cloudy	0
Fog, smoke, smog	0
Freezing rain/drizzle	0
Rain	0
Sleet, hail	0
Snow	0
Blowing snow	0
Severe winds	0
Blowing sand, soil, dirt	0
Not reported	0
Other	0
Unknown	0

Contributing Circumstance - Environment	3
None apparent	3
Weather conditions	0
Visual obstruction	0
Non-motorist action	0
Glare	0
Animal in roadway	0
Severe crosswind	0
Not reported	0
Other	0
Unknown	0

Light Condition	3
Daylight	2
Dusk	0
Dawn	0
Dark - roadway lighted	1
Dark - roadway not lighted	0
Dark - unknown roadway lighting	0
Unknown	0
Not reported	0

Surface Conditions	3
Dry	2
Wet	1
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Major Cause			3
Animal	0	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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

Location of First Harmful Event	3
On roadway	3
Shoulder	0
Median	0
Roadside	0
Gore	0
Outside trafficway	0
In parking lane/zone	0
Continuous left turn lane	0
Separator	0
Not reported	0
Other	0
Unknown	0

Event Summary - Non-Collision **Total Vehicles: 3**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
2	2	0	0	2	1	Overturn/rollover
0	0	0	0	0	0	Jackknife
0	0	0	0	0	0	Non-contact vehicle (phantom)
0	0	0	0	0	0	Vehicle went airborne
0	0	0	0	0	0	Fell/jumped from vehicle

Event Summary - Collision With **Total Vehicles: 3**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Thrown or falling object
0	0	0	0	0	0	Animal
0	0	0	0	0	0	Non-motorist (see non-motorist section - NOT ...
0	0	0	0	0	0	Vehicle in traffic
0	0	0	0	0	0	Re-entering roadway
0	0	0	0	0	0	Parked motor vehicle
0	0	0	0	0	0	Work zone maintenance equipment
0	0	0	0	0	0	Railway vehicle/train
0	0	0	0	0	0	Struck/struck by object/cargo/person from oth...
0	0	0	0	0	0	Other non-fixed object

Event Summary - Collision With Fixed Object **Total Vehicles: 3**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Bridge overhead structure
0	0	0	0	0	0	Bridge pier or support
0	0	0	0	0	0	Bridge/bridge rail parapet
0	0	0	0	0	0	Curb/island/raised median
1	1	0	1	1	1	Ditch
0	0	0	0	0	0	Embankment
0	0	0	0	0	0	Ground
0	0	0	0	0	0	Culvert/pipe opening
0	0	0	0	0	0	Guardrail - face
0	0	0	0	0	0	Guardrail - end
0	0	0	0	0	0	Concrete traffic barrier (median or right sid...
0	0	0	0	0	0	Other traffic barrier
0	0	0	0	0	0	Cable barrier
0	0	0	0	0	0	Impact attenuator/crash cushion
0	0	0	0	0	0	Utility pole/light support
0	0	0	0	0	0	Traffic sign support
0	0	0	0	0	0	Traffic signal support
0	0	0	0	0	0	Other post/pole/support
0	0	0	0	0	0	Fire hydrant
0	0	0	0	0	0	Mailbox
0	0	0	0	0	0	Tree
0	0	0	0	0	0	Landscape/shrubbery
0	0	0	0	0	0	Snow bank
0	0	0	0	0	0	Fence
0	0	0	0	0	0	Wall
0	0	0	0	0	0	Building
0	0	0	0	0	0	Other fixed object

Event Summary - Miscellaneous Events						Total Vehicles: 3
		Sequence				
First Harmful	Most Harmful	1st	2nd	3rd	4th	
0	0	0	0	0	0	Fire/explosion
0	0	0	0	0	0	Immersion
0	0	0	0	0	0	Hit and run
0	0	0	0	0	0	Eluding law enforcement
0	0	0	0	0	0	Gas inhalation/asphyxiation
0	0	0	0	0	0	Vehicle out of gear/rolled

Fixed Object Struck	3		
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	3	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	0

Drug/Alcohol Related	3
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	3

Non-Motorist Type	0
Pedestrian	0
Pedalcyclist (bicycle/tricycle/unicycle/pedal...	0
Pedalcycle passenger	0
In or on building	0
Horse and buggy	0
Skater, personal conveyance, wheelchair	0
Not reported	0
Other non-motorist	0
Unknown	0

Road Classifiction	3
Interstate	0
US Route	0
Iowa Route	0
Secondary Road	3
Municipal Road	0
Institutional Road	0
Other	0
Unknown	0

Work Zone Type	0
Lane closure	0
Lane switch/crossover	0
Work on shoulder or median	0
Intermittent or moving work	0
Not reported	0
Other	0
Unknown	0

Work Zone Location	0
Before work zone warning sign	0
Advance warning area	0
Transition area	0
Within or adjacent to work activity	0
Termination area	0
Not reported	0
Other	0
Unknown	0

Work Zone Activity	0
Construction	0
Maintenance	0
Utility	0
Not reported	0
Other	0
Unknown	0

Workers Present	0
Workers only	0
No workers present	0
Workers and officer present	0
Law enforcement only	0
No one present	0
Not reported	0
Other	0
Unknown	0

Intersection Classification	3
Interstate - Interstate	0
Interstate - US Route	0
Interstate - IA Route	0
Interstate - Secondary	0
Interstate - Municipal	0
Interstate - Institutions	0
US Route - US Route	0
US Route - IA Route	0
US Route - Secondary	0
US Route - Municipal	0
US Route - Institutions	0
IA Route - IA Route	0
IA Route - Secondary	0
IA Route - Municipal	0
IA Route - Institutions	0
Secondary - Secondary	0
Secondary - Municipal	0
Secondary - Institutions	0
Municipal - Municipal	0
Municipal - Institutions	0
Institutions - Institutions	0
Not Indicated as an Intersection	3
Unlocated or Unknown	0

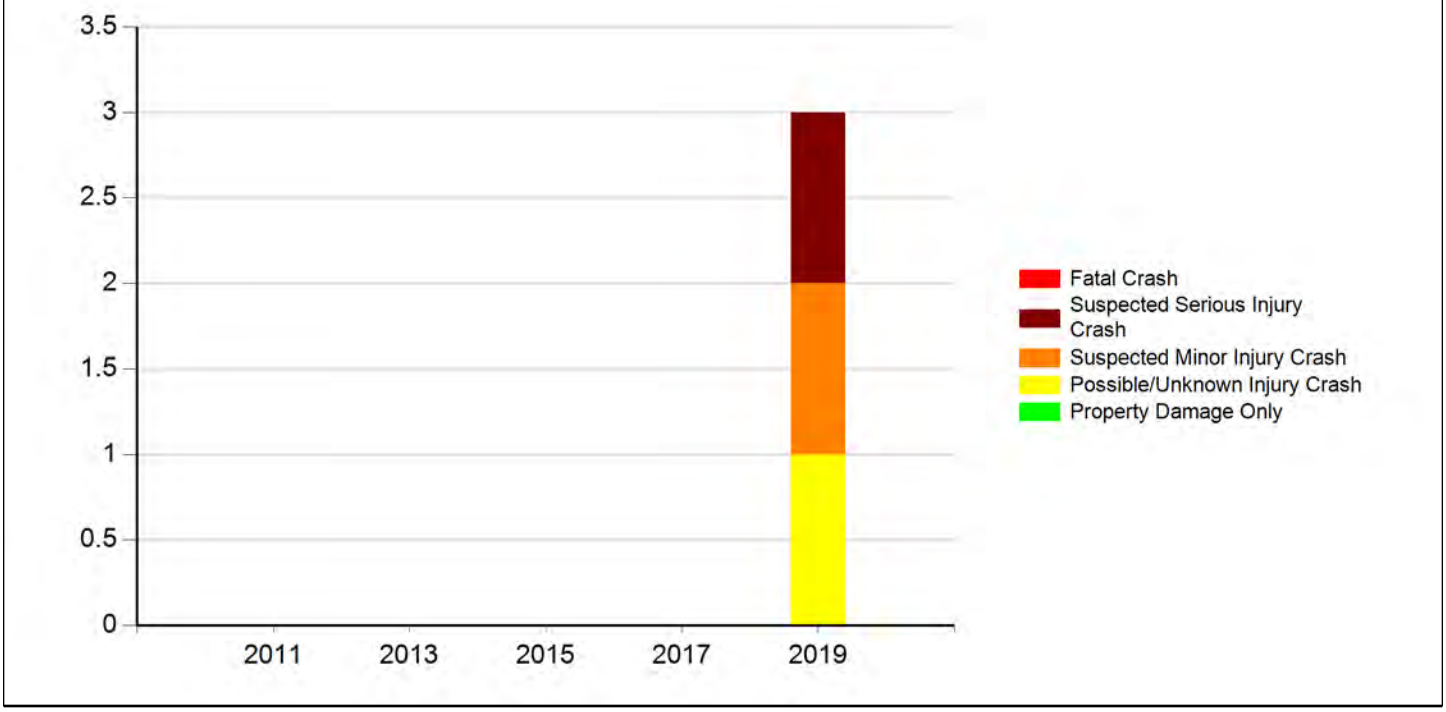
Contributing Circumstance - Road	3
None apparent	2
Surface condition (e.g., wet, icy)	1
Debris	0
Ruts/holes/bumps	0
Work Zone (roadway-related)	0
Slippery, loose, or worn surface	0
Obstruction in roadway	0
Traffic control obscured	0
Shoulders (none, low, soft, high)	0
Non-highway work	0
Traffic backup, prior crash	0
Traffic backup, regular congestion	0
Traffic backup, prior non-recurring incident	0
Disabled vehicle	0
Not reported	0
Other	0
Unknown	0

Work Zone Related	0
Yes	0
No	0
Unknown	0
Not reported	0

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	1	1	1	0	3
2020	0	0	0	0	0	0
Total	0	1	1	1	0	3

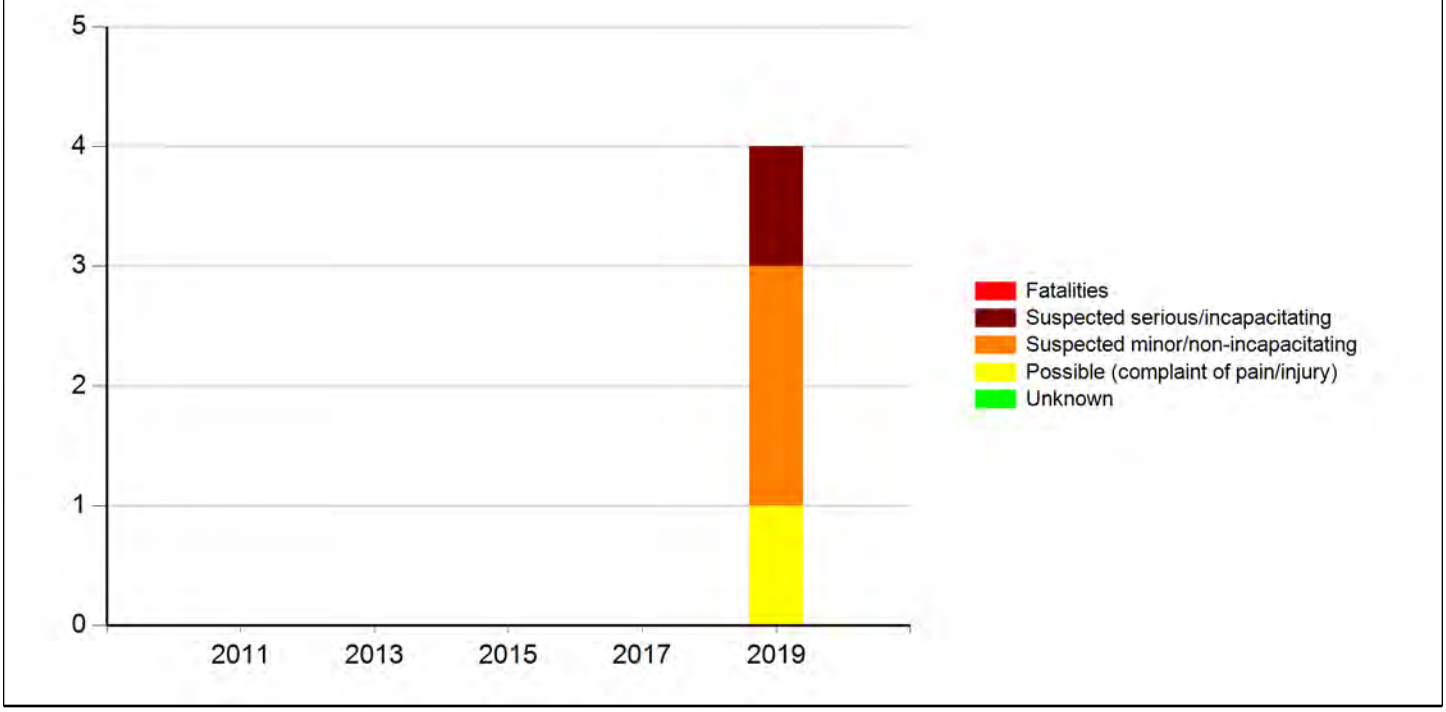
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	1	2	1	0	4
2020	0	0	0	0	0	0
Total	0	1	2	1	0	4

Injury Status/Year



Meeting the following criteria

Jurisdiction: Counties (Louisa)
Year: 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: Major Cause - Derived (Driving too fast for conditions, Ran off road - right, Ran off road - straight, Ran off road - left, Lost control, Over correcting/over steering)

Analyst Information

X17 CRASH REPORT

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** August 5, 2020

Location / Title of Project: Ocheyedan /A22 Improvements

Applicant: Osceola County

Contact Person: Sara Howard Title: Engineer Office Manager

Complete Mailing Address: 300 7th Street
Sibley IA 51249

Phone: 712-754-2303 (Area Code) E-Mail: showard@osceolacoia.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): n/a

Contact Person: Title:

Complete Mailing Address:

Phone: (Area Code) E-Mail:

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 669,284.00
Total Project Cost	$ 772,082.70
Safety Funds Requested	$ 500,000.00

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 Osceola County Engineer's Office

Signed: Dan Eckert 8/12/20

Signature Date Signed

Dan Eckert
Printed Name

Attest: Sara Howard 8/12/20

Signature Date Signed

Sara Howard
Printed Name

A

RESOLUTION # 40 - 19/20

BE IT RESOLVED by the Board of Supervisors of Osceola County, Iowa, that Dan Eckert, the County Engineer of Osceola County, as recited in the Osceola-Dickinson Shared County Engineer 28E Agreement be and is hereby designated, authorized, and empowered on behalf of the Board of Supervisors of said county to execute the certification of completion of work and final acceptance thereof in accordance with plans and specifications in connection with all Farm-to-Market and Federal or State aid construction projects in this county.

Board of Supervisors

Osceola County, Iowa

LeRoy Schulte

Jayson VanderHoef

Mike Schulte

Ed Jones

Passed and adopted this 30th day of June 2020 in Sibley, Iowa.

Ed Jones, Chairman

Osceola County Board of Supervisors

Rochelle VanTilburg

Attest: Rochelle Van Tilburg

Osceola County Auditor

TSIP Narrative by Dan Eckert, Osceola County Engineer

County Road A22 is a major east-west Farm-to-Market road in Osceola County. It is a direct route between Sibley, Iowa and Ocheyedan, Iowa, the two largest communities in Osceola County. On the east side of Sibley is the newly constructed 4-lane US Highway #60 with an interchange onto County Road A22. Traffic near this intersection is 1000 vehicle per day (2015 count) with a significant amount of trucks hauling to the newly constructed Feed Mill Operation in Ocheyedan Iowa, nine (9) miles to the east. According to Cooperative Farmers Elevator (CFE) in Ocheyedan, the feed mill takes up to 285 trucks per day.

The existing two-lane road has 3.5 – 4 foot shoulders with 2:1 fore slopes which do not meet clear zone requirements. Since a significant number of vehicle crashes have involved "single vehicle crashes leaving the roadway", the 4:1 fore slopes would have a dramatic effect on improving the clear zone for these errant vehicles. The intent of this safety improvement project would be to widen the existing shoulders, and flatten the existing fore slopes. This will provide operators with a much safer "escape to the right" without concern for rollovers or other out-of-control crashes with embankments, driveways, utility poles or other objects within the right of way.

Other factors to consider for this safety improvement include;

The existing right of way is 100 feet in most locations so additional right of way should not be required.

Osceola County currently has a large stockpile of suitable embankment material which was attained from another project in close proximity to this project.

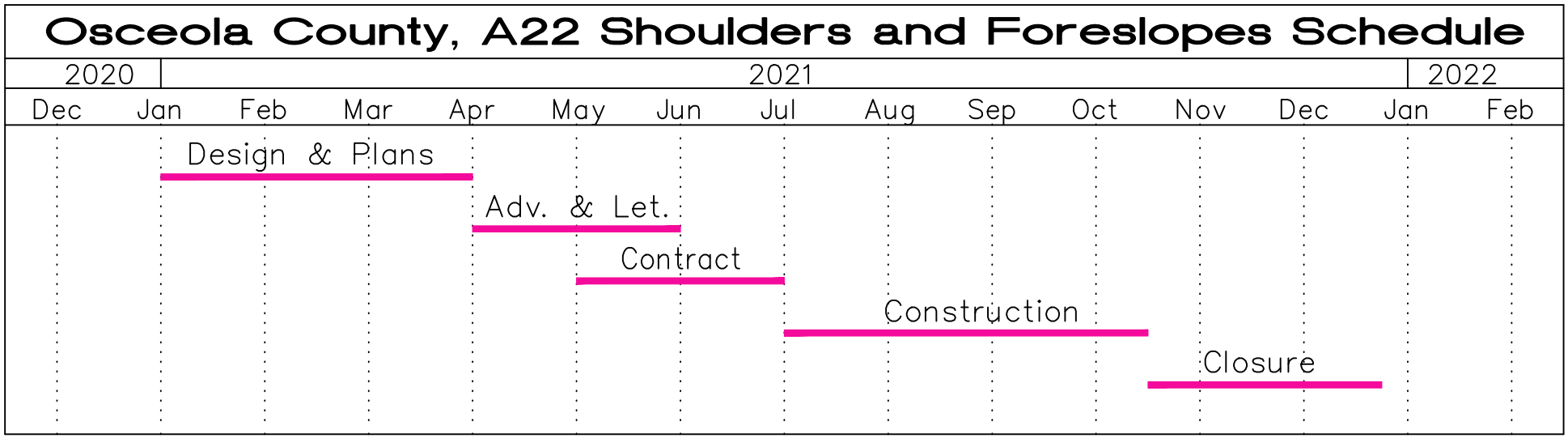
Osceola County has not received any TSIP funds in recent history.

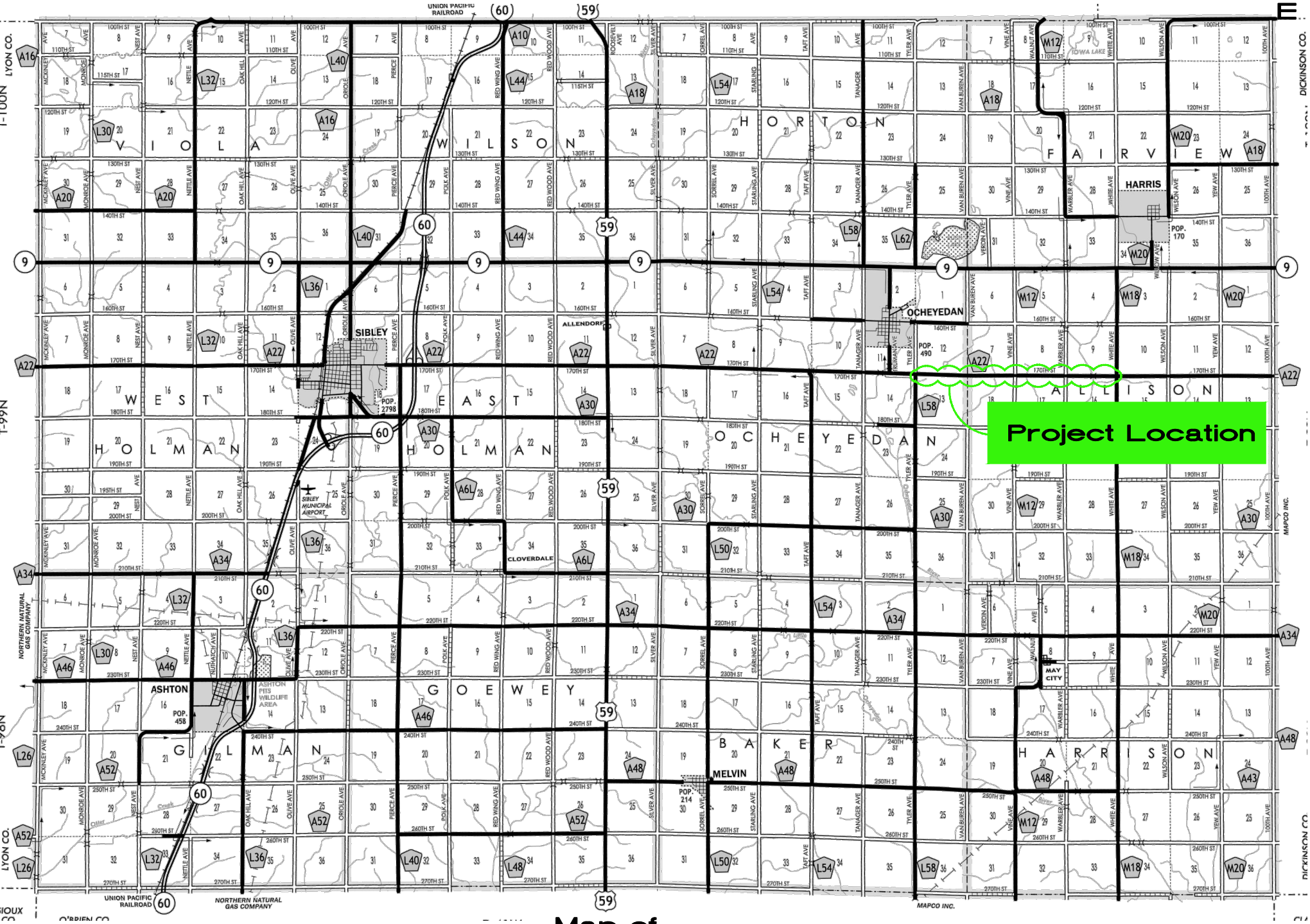
Osceola County A22 Shoulders and Foreslope Improvements Cost Estimate

Item No.	Iten Code	Item description	Quantity	Units	Unit Cost	Total Cost
001	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FURNISH	51660	CY	$11.00	$568,260.00
002	2105-8425015	TOPSOIL, STRIP, SALVAGE+SPREAD	23000	CY	$4.31	$99,130.00
003	2214-7450050	BLADING+SHAPING SHLD MAT'L	100	STA	$18.94	$1,894.00
004	2416-1000000	RIGID PIPE CULV, _____	96	LF	$150.00	$14,400.00
005	2416-0100000	RIGID PIPE APRON, _____	16	EACH	$700.00	$11,200.00
006	2533-4980005	MOBILIZATION	1	LS	$35,000.00	$35,000.00
007	2601-2633100	MOW	30	ACRE	$35.73	$1,071.90
008	2601-2636043	SEED+FERTILIZE (RURAL)	30	ACRE	$965.56	$28,966.80
009	2602-0000030	SILT FENCE-DITCH CHECKS	8000	LF	$1.52	$12,160.00
		Total				**$772,082.70**

D

Osceola County, A22 Shoulders and Foreslopes Schedule





Map of Osceola County, Iowa

Site Location One
South Side Looking East

Site Location One
North Side Looking East

Site Location One
South Side Looking West

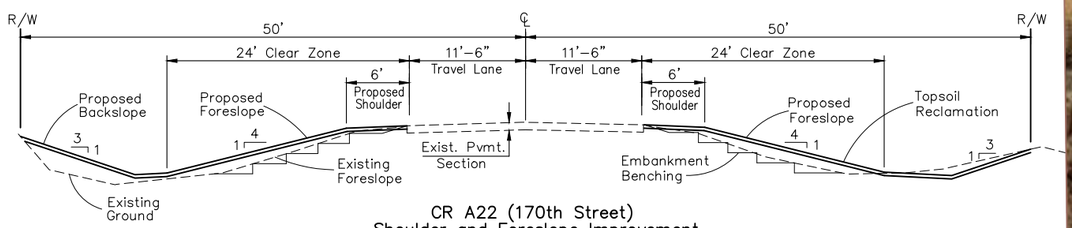
Site Location One
North Side Looking West

Site Location Two
South Side Looking East

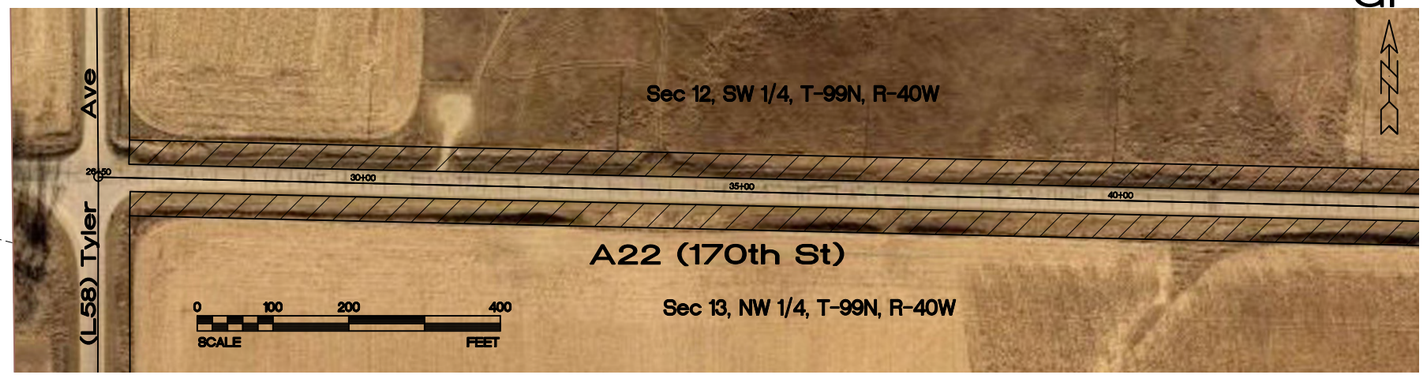
Site Location Two
North Side Looking East

Site Location Two
South Side Looking West

Site Location Two
North Side Looking West



CR A22 (170th Street)
Shoulder and Foreslope Improvement
Typical Section (1" = 15')



Osceola County CR A22 Shoulder and Foreslope Improvement Plan (Sheet 2 of 2)

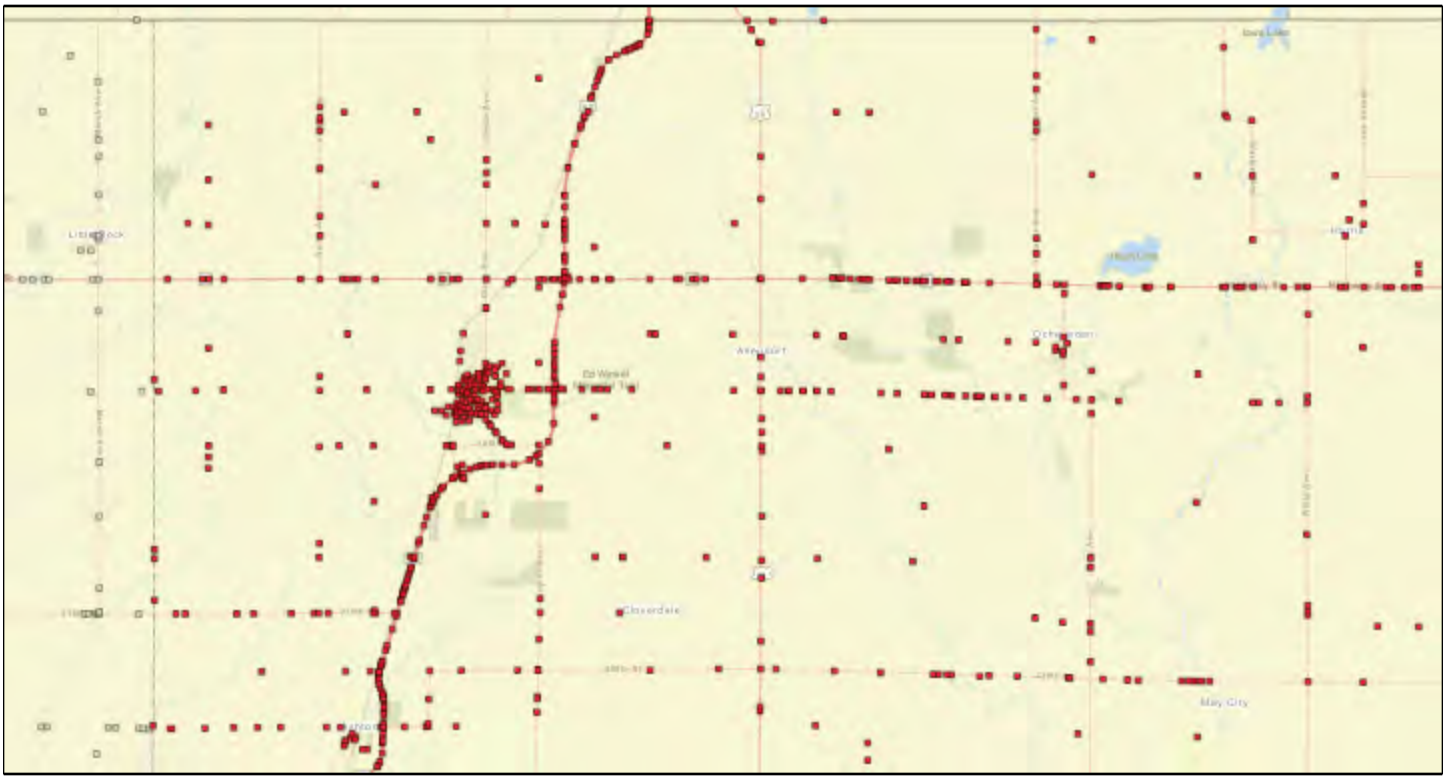
Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity	998
Fatal Crash	16
Suspected Serious Injury Crash	45
Suspected Minor Injury Crash	109
Possible/Unknown Injury Crash	130
Property Damage Only	698

Injury Status Summary	414
Fatalities	17
Suspected serious/incapacitating	55
Suspected minor/non-incapacitating	151
Possible (complaint of pain/injury)	167
Unknown	24

Property/Vehicles/Occupants	
Property Damage Total (dollars):	8,441,352.00
Average (per crash dollars):	8,458.27
Total Vehicles:	1,399.00
Average (per crash):	1.40
Total Occupants:	1,773.00
Average (per crash):	1.84

Average Severity	
Fatalities/Fatal Crash:	1.06
Fatalities/Crash:	0.02
Injuries/Crash:	0.37
Major Injuries/Crash:	0.06
Minor Injuries/Crash:	0.15
Possible/Unknown Injuries/Crash:	0.17



Major Cause			996
Animal	281	Ran traffic signal	0
Ran stop sign	28	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	52	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	66	FTYROW: From yield sign	5
FTYROW: Making left turn	12	FTYROW: From driveway	19
FTYROW: From parked position	3	FTYROW: To pedestrian	4
FTYROW: Other	16	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	26
Crossed median (divided)	1	Traveling wrong way or on wrong side of road	4
Aggressive driving/road rage	0	Driving too fast for conditions	76
Exceeded authorized speed	10	Improper or erratic lane changing	1
Operating vehicle in an reckless, erratic, ca...	17	Followed too close	28
Passing: On wrong side	1	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	2	Made improper turn	10
Driver Distraction: Manual operation of an e...	3	Driver Distraction: Talking on a hand-held d...	0
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	1	Driver Distraction: Reaching for object(s)/f...	3
Driver Distraction: Inattentive/lost in thou...	10	Driver Distraction: Other interior distracti...	9
Driver Distraction: Exterior distraction	6	Ran off road - right	80
Ran off road - straight	8	Ran off road - left	54
Lost control	30	Swerving/Evasive Action	51
Over correcting/over steering	5	Failed to keep in proper lane	1
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	12
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	2
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	5	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	19	Improper starting	0
Illegally parked/unattended	4	Driving less than the posted speed limit	0
Operator inexperience	1	Other	18
Unknown	4	Not reported	0
Other: No improper action	8		

Iowa Crash Analysis Tool
Quick Report
2010-2020

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	6	4	8	8	8	11	9	5	14	17	14	12	0	116
Monday	6	2	9	26	11	9	13	17	20	23	14	4	0	154
Tuesday	4	4	7	16	14	7	10	18	12	14	12	9	0	127
Wednesday	9	2	4	14	17	9	15	14	17	12	12	9	0	134
Thursday	4	5	6	18	15	11	8	14	23	18	11	17	0	150
Friday	4	4	3	10	14	19	12	25	20	21	17	12	0	161
Saturday	6	10	4	12	11	12	14	15	11	23	27	11	0	156
Total	39	31	41	104	90	78	81	108	117	128	107	74	0	998

Manner of Crash Collision	**998**
Non-collision (single vehicle)	459
Head-on (front to front)	10
Rear-end (front to rear)	86
Angle, oncoming left turn	23
Broadside (front to side)	183
Sideswipe, same direction	36
Sideswipe, opposite direction	21
Rear to rear	3
Rear to side	15
Not reported	150
Other	8
Unknown	4

Surface Conditions	**998**
Dry	445
Wet	46
Ice/frost	106
Snow	89
Slush	19
Mud, dirt	31
Water (standing or moving)	0
Sand	2
Oil	0
Gravel	23
Not reported	220
Other	7
Unknown	10

Fixed Object Struck			**1,399**
Bridge overhead structure	7	Bridge pier or support	0
Bridge/bridge rail parapet	3	Curb/island/raised median	4
Ditch	117	Embankment	10
Ground	3	Culvert/pipe opening	10
Guardrail - face	22	Guardrail - end	0
Concrete traffic barrier (median or right sid...	1	Other traffic barrier	2
Cable barrier	1	Impact attenuator/crash cushion	0
Utility pole/light support	8	Traffic sign support	6
Traffic signal support	0	Other post/pole/support	5
Fire hydrant	2	Mailbox	1
Tree	8	Landscape/shrubbery	0
Snow bank	1	Fence	0
Wall	0	Building	2
Other fixed object	7	None (no fixed object struck)	1,179

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	**Total**
< 14	0	0	0	0	0
= 14	2	2	0	0	4
= 15	6	4	0	0	10
= 16	21	14	0	0	35
= 17	11	16	3	0	30
= 18	18	20	1	0	39
= 19	10	18	2	0	30
= 20	11	15	1	0	27
>= 21 and <= 24	34	92	3	0	129
>= 25 and <= 29	49	72	5	0	126
>= 30 and <= 34	36	79	5	0	120
>= 35 and <= 39	40	54	5	0	99
>= 40 and <= 44	34	68	8	0	110
>= 45 and <= 49	42	63	4	0	109
>= 50 and <= 54	38	54	1	1	94
>= 55 and <= 59	30	59	5	0	94
>= 60 and <= 64	22	67	2	0	91
>= 65 and <= 69	14	28	0	0	42
>= 70 and <= 74	21	34	1	0	56
>= 75 and <= 79	13	22	0	0	35
>= 80 and <= 84	4	15	0	0	19
>= 85 and <= 89	5	9	0	0	14
>= 90 and <= 94	6	4	0	0	10
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	1	46	0	47
Total	467	810	92	1	1,370

Drug/Alcohol Related	**998**
Drug	1
Alcohol (< Statutory)	7
Alcohol (Statutory)	23
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	1
Refused	8
Under Influence of Alcohol/Drugs/Medications	8
None Indicated	950

Alcohol Test Given	**1,399**
None	1,253
Blood	18
Urine	2
Breath	35
Vitreous	0
Refused	8
Not reported	83

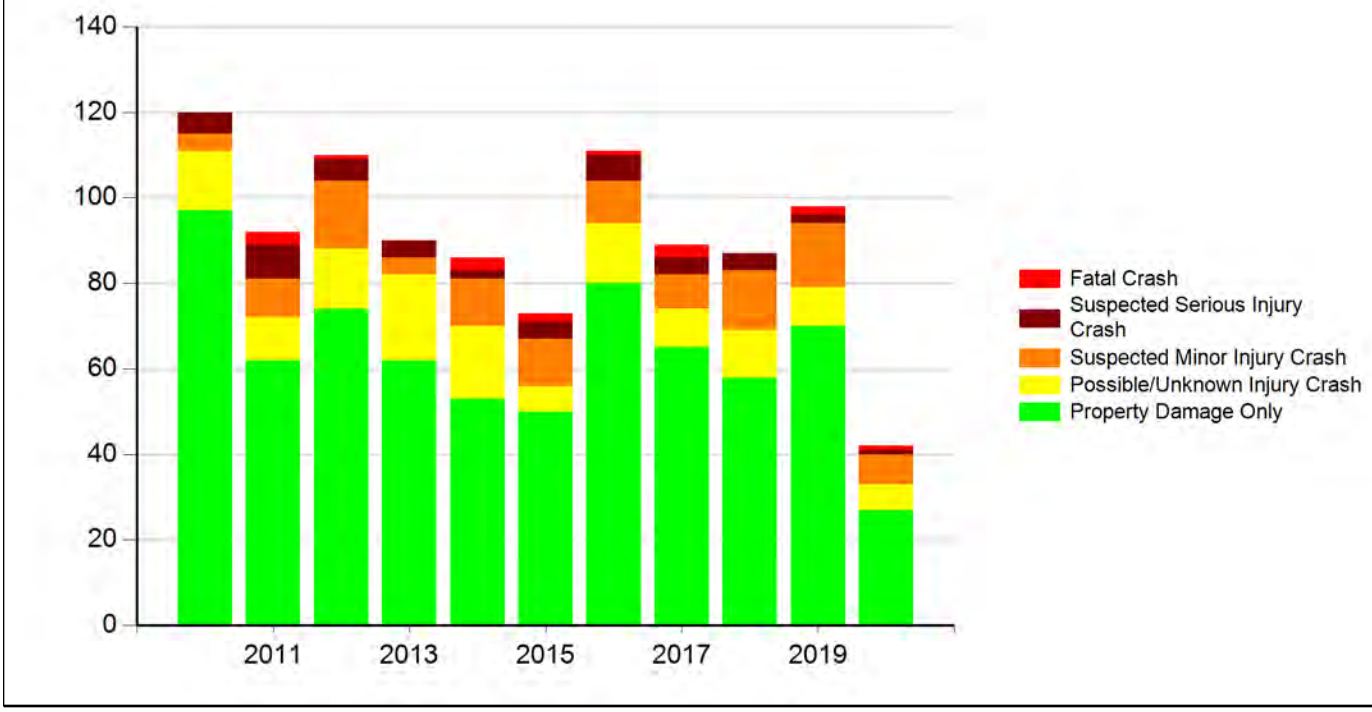
Drug Test Given	**1,399**
None	1,295
Blood	11
Urine	6
Breath	0
Vitreous	0
Refused	2
Not reported	85

Drug Test Result	**1,399**
Negative	2
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	1,396
Other	1

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2010	0	5	4	14	97	120
2011	3	8	9	10	62	92
2012	1	5	16	14	74	110
2013	0	4	4	20	62	90
2014	3	2	11	17	53	86
2015	2	4	11	6	50	73
2016	1	6	10	14	80	111
2017	3	4	8	9	65	89
2018	0	4	14	11	58	87
2019	2	2	15	9	70	98
2020	1	1	7	6	27	42
Total	16	45	109	130	698	998

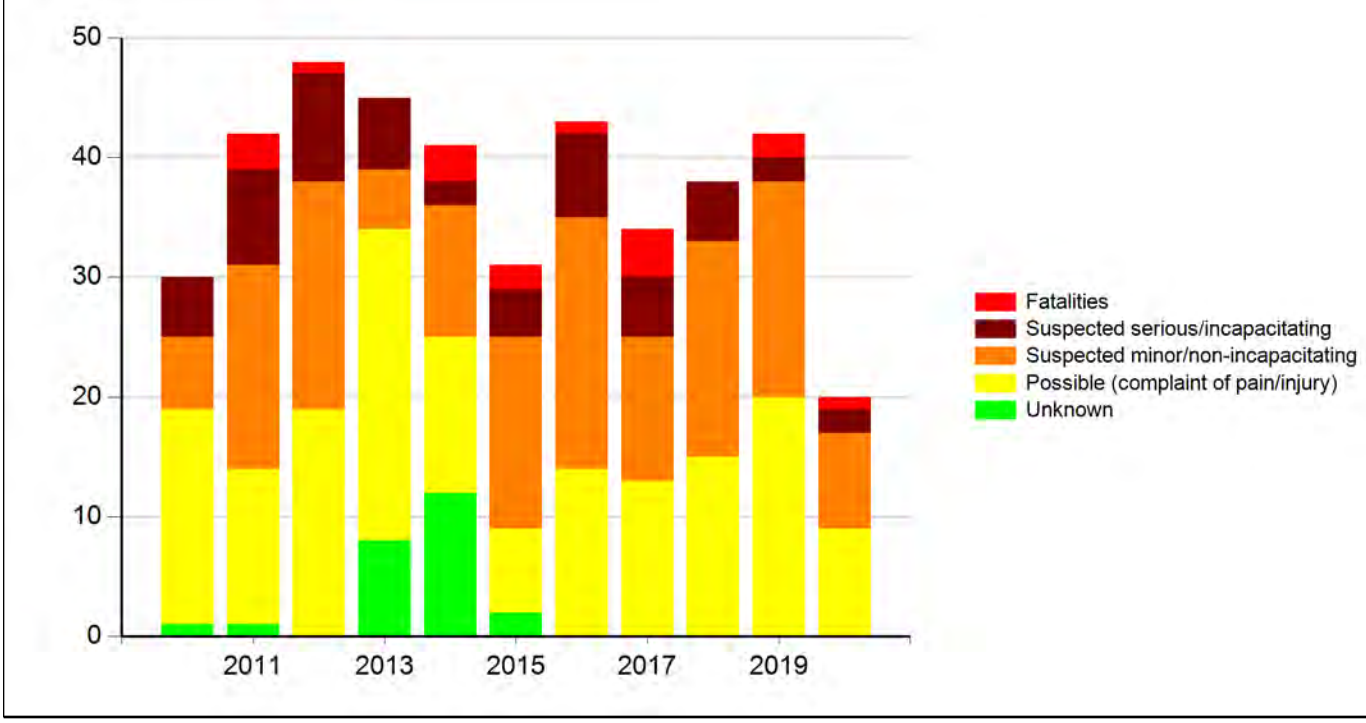
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	5	6	18	1	30
2011	3	8	17	13	1	42
2012	1	9	19	19	0	48
2013	0	6	5	26	8	45
2014	3	2	11	13	12	41
2015	2	4	16	7	2	31
2016	1	7	21	14	0	43
2017	4	5	12	13	0	34
2018	0	5	18	15	0	38
2019	2	2	18	20	0	42
2020	1	2	8	9	0	20
Total	17	55	151	167	24	414

Injury Status/Year



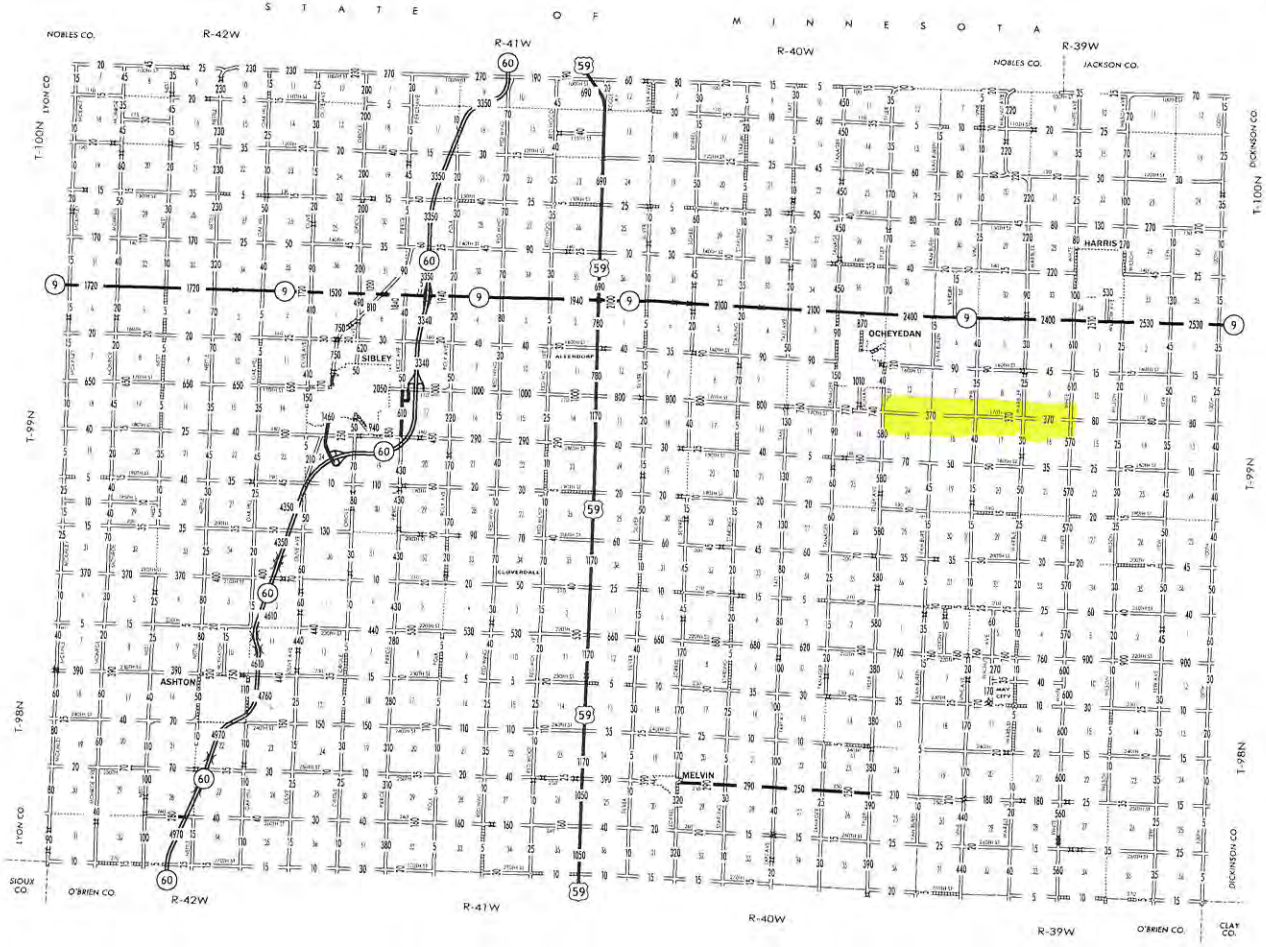
Meeting the following criteria

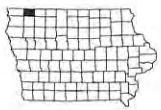
Jurisdiction: Counties (Osceola)
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: No
Filter: None

Analyst Information

TRAFFIC FLOW MAP OF
OSCEOLA COUNTY
IOWA

2015 ANNUAL AVERAGE DAILY TRAFFIC





Prepared By
IOWADOT
OFFICE OF SYSTEMS PLANNING
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS

In Cooperation With
United States
Department of Transportation

JANUARY 1, 2015

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD
LEGAL NOT OPEN ROAD

2015

L

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Osceola | Prepared by: Roger Mouw | Date Prepared: Aug 12, 2020

Location: CR A22 from CR L58 to CR M18, 170th Street from Tyler Avenue to White Avenue

Improvement

Proposed Improvement(s): Provide 6' shoulder with 4:1 foreslopes and 3:1 backslopes adjacent to each side of roadway, typical right-of-way width is 100' therefore additional right-of-way is not being considered.

$ 772,083	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	11	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 772,083**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Flow Map of Osceola County (2015) | 2015 Date of traffic count

Length (mi.)	Two-way veh/day	Description
4.00	370	Paved Route CR A22

4.00 miles total

1,480 Current Vehicle Miles / Day, **VM**

1,806 End of Life Veh. Miles / Day

540,200 Current Veh. Miles / Year, **AM**

11,894,666 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2019 Last full year | 10.6 years, Time Period, **T**

7 Additional months

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
4	Injury Crashes →	3	Minor Injuries @	$65,000	$ 195,000
		0	Possible Injuries @	$35,000	$ -
2	Property Damage Only		(assumed cost per crash)	$7,400	$ 44,400
			-OR- enter all Property Costs of all crashes:		
6	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 564,400

0.57	Current Crashes / Year, **AA** = TA / T	**104.9**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 94,067	Cost per Crash, **AVCR** = LOSS / TA	**$ 86,648**	Present Value of Avoided Crashes, **BENEFIT**
12.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.06	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 5,866	Crash Costs Avoided in First Year, AAR x AVCR		
1.4	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $86,648 : $772,083 = **0.11** : 1

IOWA DOT

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project C-30/K-64 Intersection

Applicant Plymouth County

Contact Person Thomas Rohe Title County Engineer

Complete Mailing Address P.O. Box 1227

Le Mars, Iowa 51031

Phone 712-546-4559 (Area Code) E-Mail trohe@co.plymouth.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) NA

Contact Person -- Title --

Complete Mailing Address --

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	315,660
Total Project Cost	$	486,710
Safety Funds Requested	$	315,660

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

☒ Yes – Explain Listed in our Road Safety Plan with Risk Factor Points of 8

☐ 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 Board of Supervisors

Signed: Don Kass 8/18/20

Signature Date Signed

Don Kass

Printed Name

Attest: Stacey Feldman 8/18/20

Signature Date Signed

Stacey Feldman

Printed Name

B: Narrative

C-30/K-64 Intersection at the NE Corner Sec 20-92-44

This section of roadway was graded in 1952 with a 28 ft. top and 2:1foreslopes. The roadway was then paved in 1954 as an asphalt road. The grade line of this roadway follows the existing topography and vertical curve designs are essentially at 30-45 mph.

The intersection in question has four legs with the north/south legs being K-64 and the west leg being C-30 which is also paved. The easterly leg of 190th St. is gravel. The east/west traffic is in a stop condition and K-64 is the thru road. The sight distance to the north is very short, approximately 350-400 ft.. This can be seen on the aerial photo's "F" and the centerline profile "G". The traffic count is shown on exhibit "J" which is 890 VPD to the west, 750 VPD to the north, 560 VPD to the south and 80 VPD to the east. C-30 is a direct access to Le Mars. There is a substantial amount of turning traffic at this intersection because of the access to Le Mars.

Both C-30 and K-64 are scheduled for resurfacing during the 2021 construction season. An improvement in the sight distance at the intersection is the goal of the county . The proposed project will reconstruct approximately 1200 ft. of the north leg of this intersection to improve sight distance from 350-400 ft. to 850 ft.. The shoulders will be widened from 3 ft. to 8 ft., the roadway profile will be flattened from 6% to 4% maximum, and the foreslopes will be flattened from 2:1 to 3:1.

The traffic accident data does not support this type of reconstruction based on accidents alone. There was a fatality at this intersection approximately 15-20 years ago that does not show up on the ICAT Crash Summary. However the risk that we have with traffic movements would certainly warrant taking a good look at this project. This intersection is listed in our Road Safety Program with a risk factor of 8 which I believe is low for the geometrics that we have. We would like to make this improvement and get out ahead of any accidents that we might have in the future. We are fortunate that we have not had any more serious accidents at this location. We believe that since we are going to be working on the roadway as scheduled now would be the time to make these improvements and provide a much safer intersection.

C: Cost

The estimated cost of this project is $ 486,710 of which $ 315,660 is the safety work associated with the project. A breakdown can be seen on the spread sheet on exhibit "C".

D: Time Schedule

This project is scheduled to be let in January or February of 2021 with the construction to be completed during the 2021 construction season. We would need to schedule this intersection reconstruction ahead of the resurfacing work.

E: Map

See enclosed map showing the intersection location.

F: Color Pictures

Enclosed

G: Plan View

Plan profile sheet is enclosed. Additional right of way of will need to be acquired for the construction of this project. See Exhibit "G".

H: Aerial Photo of the site as per Exhibit "H".

I: Crash Summary Report – Exhibit "I".

J: Recent Traffic Volumes – Exhibit "J".

A map showing the traffic count of this roadway by IDOT for 2015 is enclosed.

K: Signals - NA

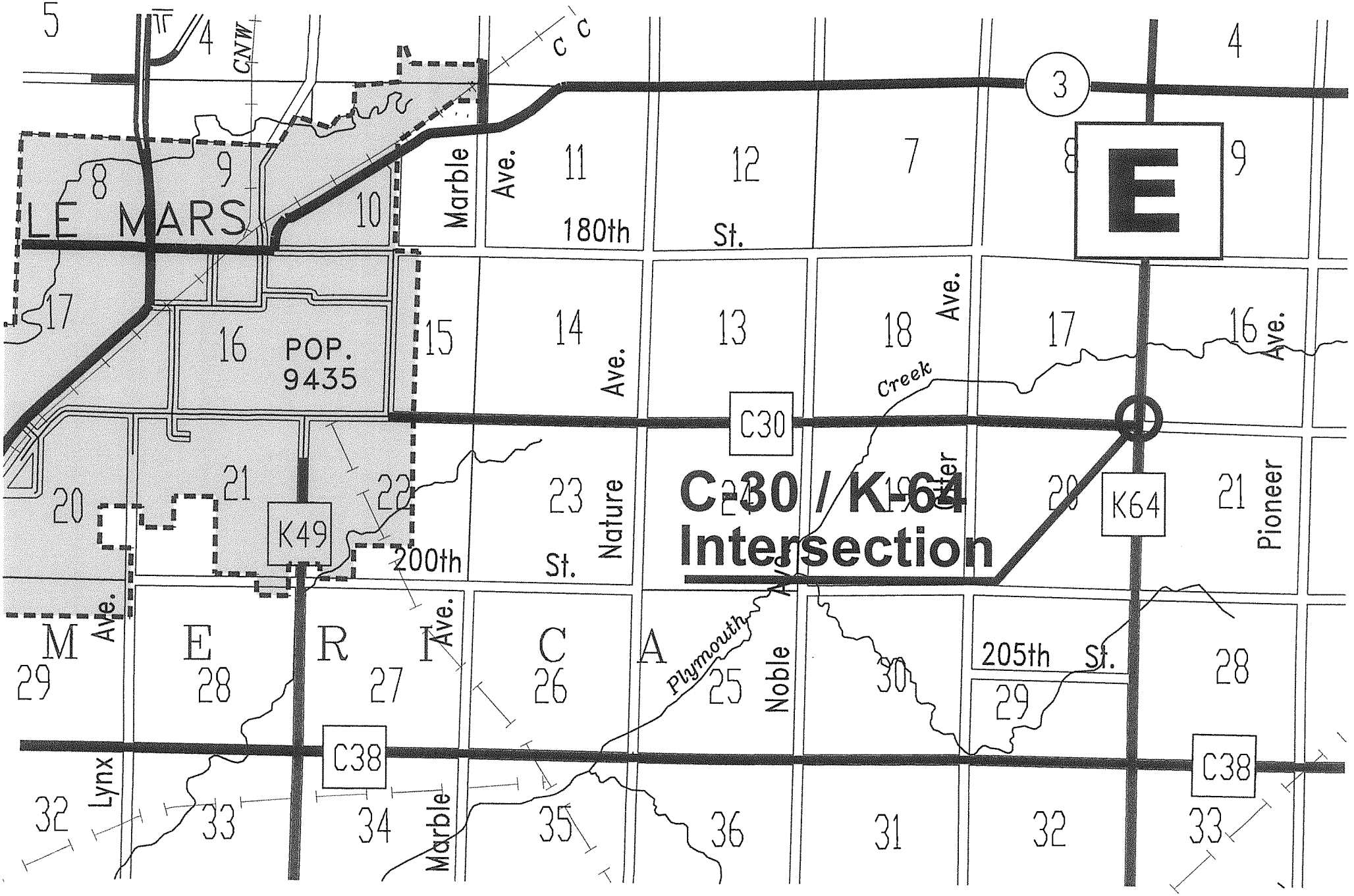
L: B/C Worksheet – Exhibit "L"

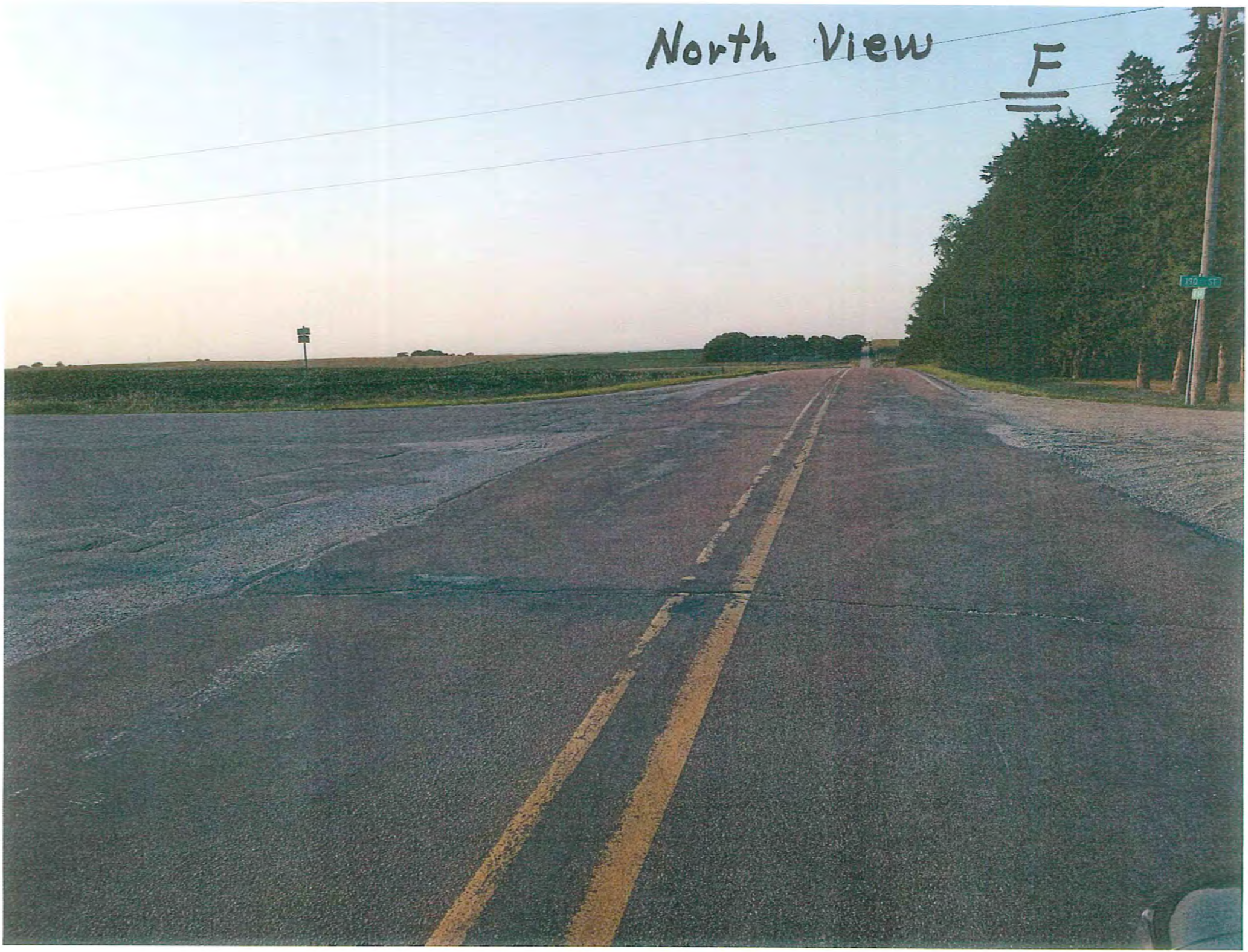
PLYMOUTH COUNTY

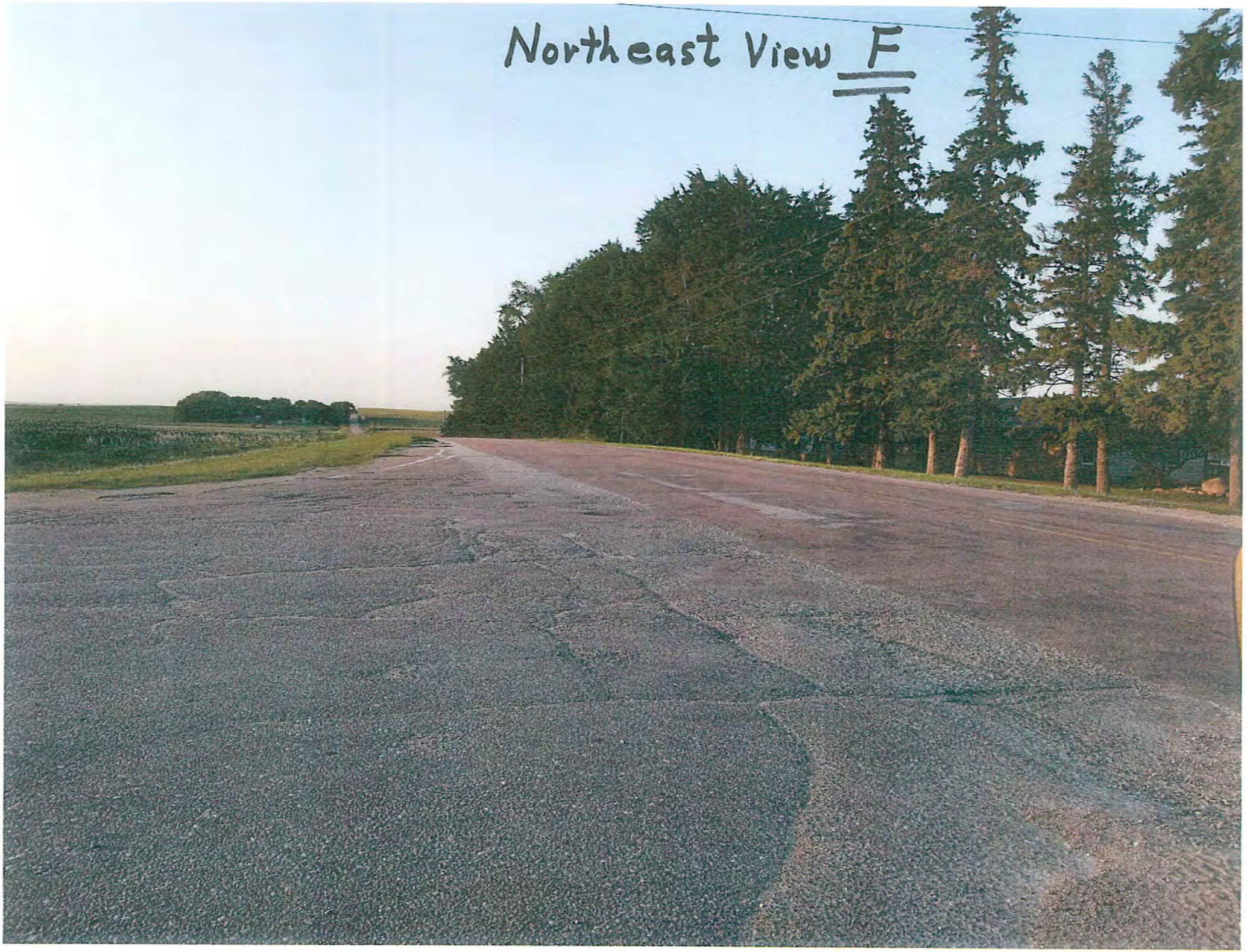
ENGINEER'S ESTIMATE

Kind of Work	CULVERT REPLACEMENT ON K-64		County	PLYMOUTH			
Project No.	C-30/K-64 Intersection		Date	8/14/2020			
						Safety Work	

Item No.	Item	Quantity	Units	Unit Price	Amount	Quantity	Amount
1	EXCAV. CL. 10, RDWY & BORROW	20930	C.Y.	$12.00	$ 251,160.00	20930	251,160.00
2	REMOVAL OF PAVEMENT	2950	SY	$6.00	$ 17,700.00	2950	17,700.00
3	MODIFIED SUBBASE	800.0	CY	$50.00	$ 40,000.00	800	40,000.00
4	HMA, WEDGE/LEVEL/STRENGTH	1280.0	TONS	$95.00	$ 121,600.00		
5	AC BINDER, PG 58-28S, STANDARD TRAFFIC	75.0	TONS	$550.00	$ 41,250.00		
6	TRAFFIC CONTROL	1	L.S.	$700.00	$ 700.00		
7	MOBILIZATION	1	LS	$7,000.00	$ 7,000.00		
8	(LUMP SUM ITEM) DELIVER AND STOCKPILE SALVAGED MATERIAL	1	LS	$2,000.00	$ 2,000.00	LS	2,000.00
9	Silt Fence	1200	LF	$4.00	$ 4,800.00	1200	4,800.00
10	Mobilization -Erosion Control	1	Each	$500.00	$ 500.00		
11							
12							
13				TOTAL	$ 486,710.00		$ 315,660.00
14					Project Total		Safety Widening
15							
16							
17							


C30 / K64
Intersection
LE MARS
POP. 9435
MERICA
C30
C38
K49
K64
E
Marble Ave.
180th St.
Ave.
Creek
200th St.
Nature Ave.
Plymouth Ave.
Noble Ave.
205th St.
Pioneer Ave.
Lynx Ave.
Marble Ave.
CNW


North View
F
190 ST

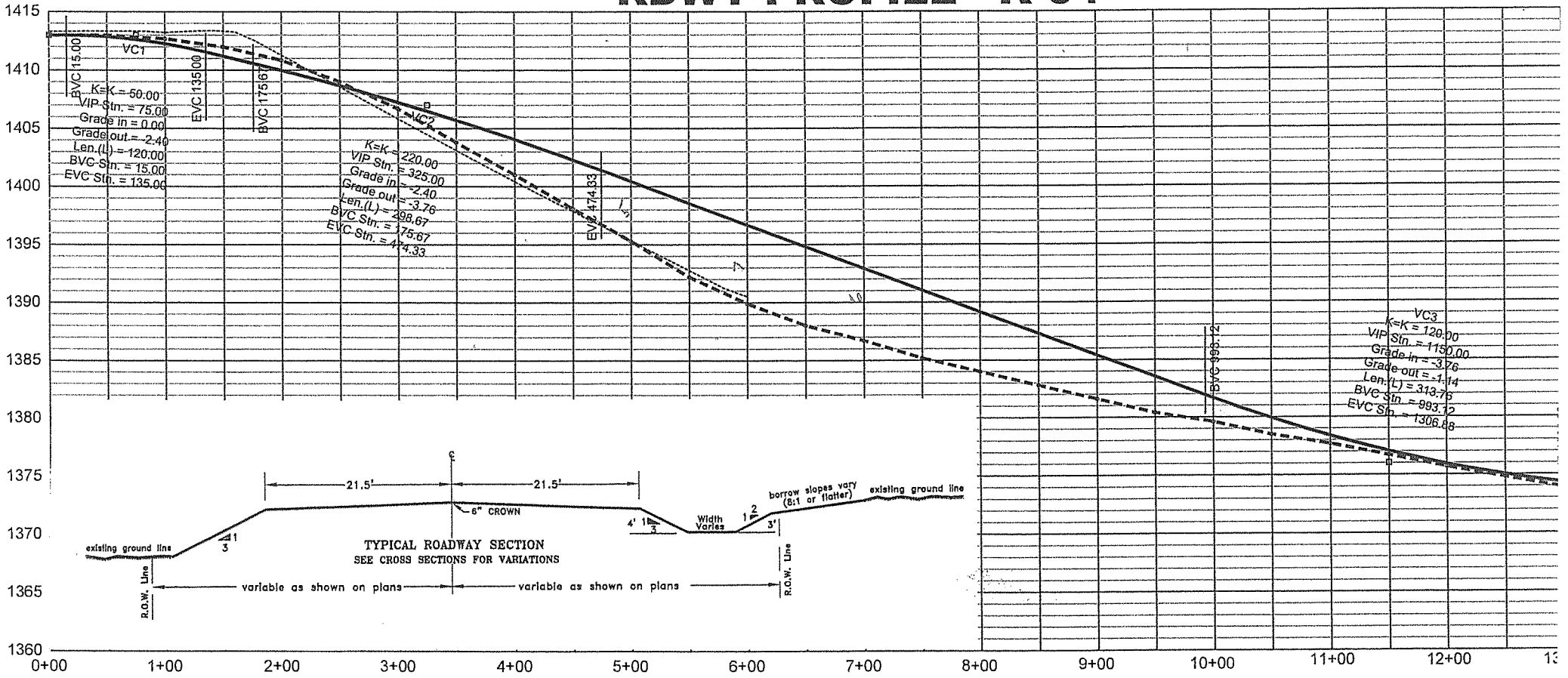

Northeast View F


South View F


G
PROPOSED ROW
+50'
0+00
EXISTING ROW
5+00
10+00
K 64
PROPOSED ROW
+00
60'
PROPOSED ROW
EXISTING ROW
75'
+90
PROPOSED ROW
60'
+00

G

RDWY PROFILE K-64




H
K 64

C-30/K-64 Intersection

I

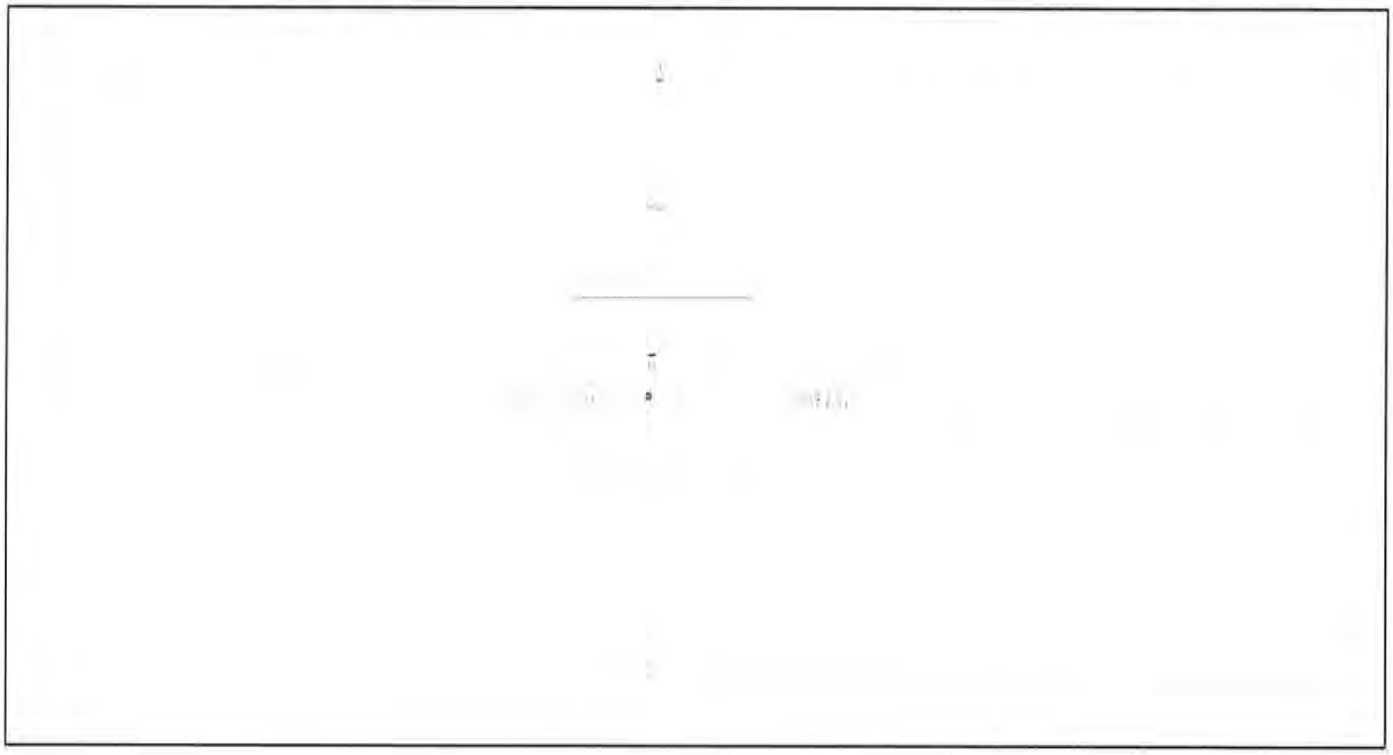
Iowa Crash Analysis Tool
Quick Report
2010-2020

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

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):	9,150.00
Average (per crash dollars):	9,150.00
Total Vehicles:	1.00
Average (per crash):	1.00
Total Occupants:	1.00
Average (per crash):	1.00

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



Major Cause			1
Animal	0	Ran traffic signal	0
Ran stop sign	1	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saturday	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	1

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

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

Fixed Object Struck			1
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	1	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	0

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	0	0	0	0
>= 35 and <= 39	0	0	0	0	0
>= 40 and <= 44	1	0	0	0	1
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	1	0	0	0	1

Drug/Alcohol Related	1
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	1
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	0

Alcohol Test Given	1
None	0
Blood	0
Urine	0
Breath	1
Vitreous	0
Refused	0
Not reported	0

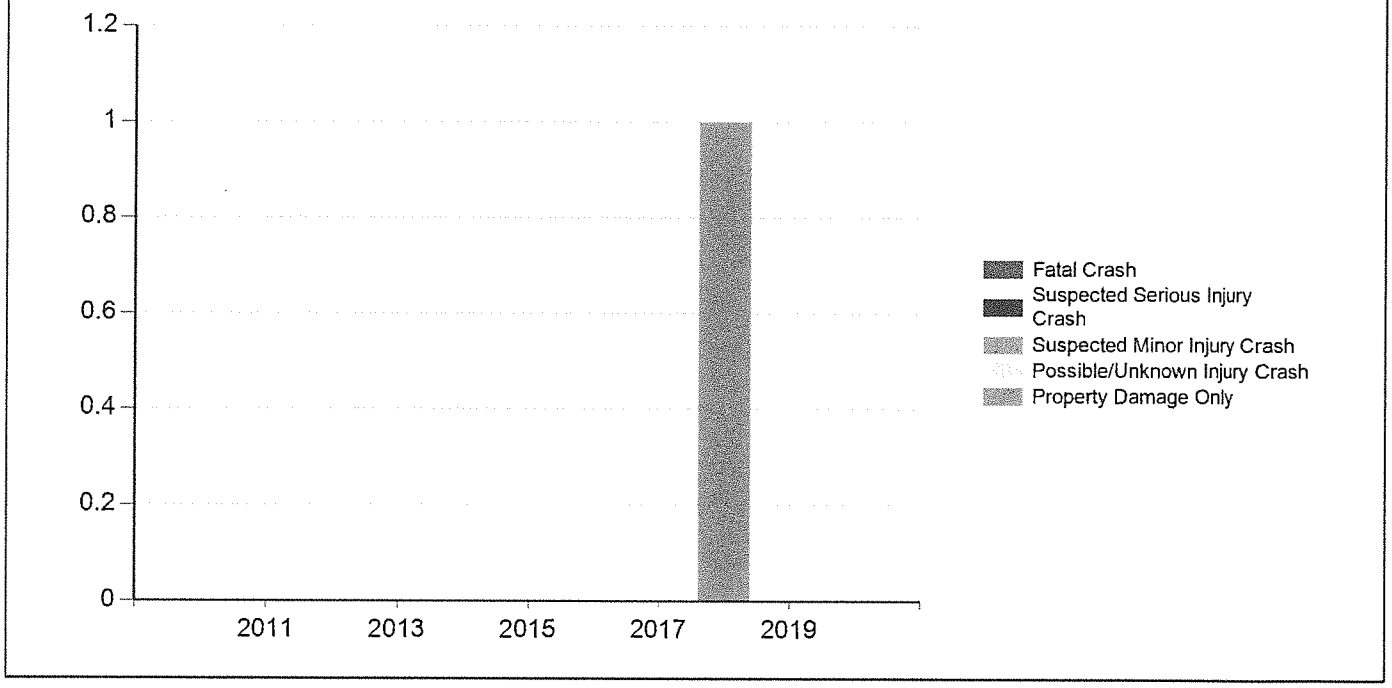
Drug Test Given	1
None	1
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Result	1
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	1
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
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	1	1
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	0	0	1	1

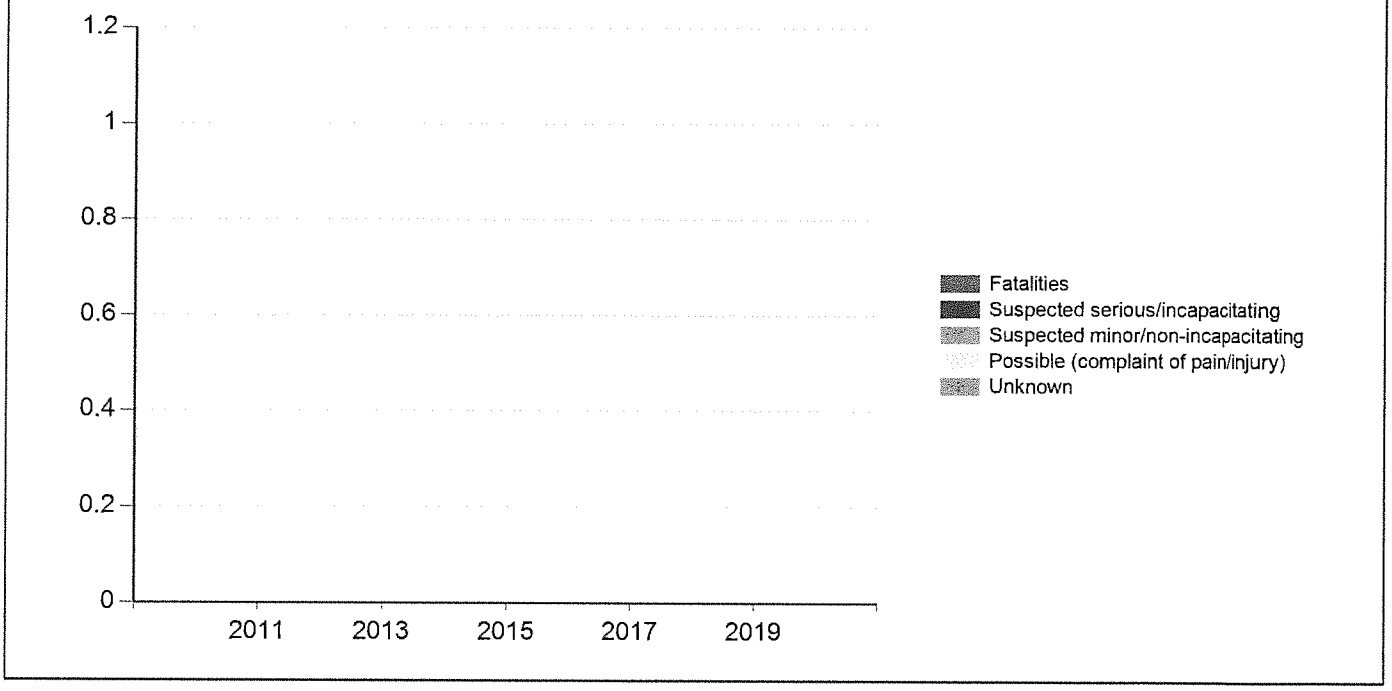
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	0	0	0	0

Injury Status/Year



Meeting the following criteria

Jurisdiction: Counties (Plymouth)
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

Intersection of K-64 and C-30
2010 - 2020

C-30/K-64 Intersection

I

Crash Detail Report

20181084608	12/08/2018 00:06	190TH ST AND C030/190TH ST AND K064/OYENS AVE
County: Plymouth	City:	

Major Cause: Ran stop sign

Roadway Type: Intersection: Four-way intersection

Severity:: Property Damage Only

Manner of Crash: Non-collision (single vehicle)

Fatalities: 0

Surface Conditions: Unknown

Major Injuries: 0

Light Conditions: Dark - roadway not lighted

Minor Injuries: 0

Weather Conditions: Fog, smoke, smog

Possible Injuries: 0

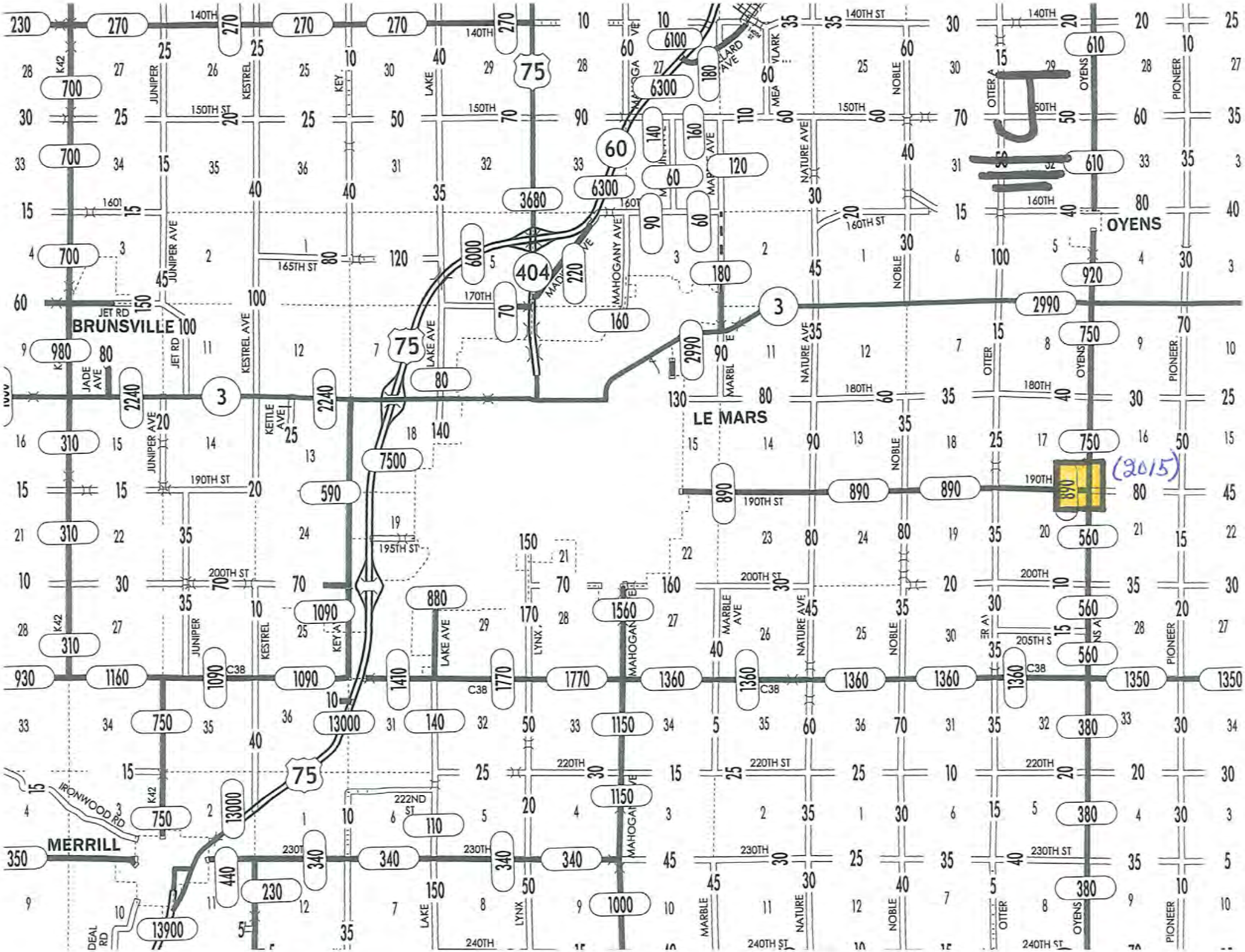
Drug/Alc Involved: Alcohol (Statutory)

Severity:: Property Damage Only

Property Damage: $9,150

Number of Vehicles: 1

	Unit 1	Unit	Unit
Init Trav Dir:	East		
Veh Action:	Movement essentially straight		
Configuration:	Sport utility vehicle		
Driver Age:	43		
Driver Gender:	F		
Driver Cond:	Under the influence of alcohol		
Driver Contr 1:	Ran stop sign		
Driver Contr 2:	Lost control		
Fixed Object:	Snow bank		


BRUNSVILLE
LE MARS
OYENS
MERRILL
(2015)
140TH
150TH
160TH
165TH ST
170TH
180TH
190TH ST
195TH ST
200TH ST
205TH S
220TH ST
222ND ST
230TH ST
240TH ST
JET RD
JUNIPER AVE
KESTREL AVE
KETTLE AVE
LAKE AVE
MAHOGANY AVE
MARBLE AVE
NATURE AVE
NOBLE
OTTER
OYENS
PIONEER
JADE AVE
IRONWOOD RD
DEAL RD
K42
KEY
LYNX
MAPLE AVE
75
60
3
404
3680
6000
6100
6300
7500
13000
13900

B/C ANALYSIS INSTRUCTIONS

revised May 2018
Office of Traffic & Safety, Iowa DOT

Document all values and assumptions and include with application.

Use either the "Road Segment" or "Intersections" worksheet and only enter values in the YELLOW cells.

Crashes used in the B/C worksheet should be mitigated by the proposed countermeasure(s).

Crash Reduction Factors
Select crash reduction factors from the Iowa CRF List (link to be provided). For strategies not found in the CRF List, refer to the CMF Clearinghouse.

http://www.cmfclearinghouse.org/

Be sure to use the CRF (not the CMF) in these spreadsheets. A CRF of 10 means a 10% reduction in crashes is expected with that improvement. Note that a CRF of 10 equals a CMF of 0.90 (CRF = 1 - CMF).

If more than one safety improvement will be made, the cumulative crash reduction factor must be calculated using the following formula:

CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))

or enter the individual values into this calculator:

Enter up to 5 CRFs:	30	5			
Cumulative CRF =	33.5				

If the improvements have different service lives, enter the shortest service life into the spreadsheet.

Yearly Worksheet
The "Yearly" worksheet is not part of the analysis, but can be used to check and better understand the results.

Discount Rate
The discount rate of 4% excludes inflation and comes from the St. Louis Federal Reserve Bank. It should not be changed without proper justification and documentation.

Societal crash cost values were last updated in May 2014.

Report any errors or problems to:
DOT-TSIP@iowadot.us

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Plymouth Prepared by: Thomas Rohe Date Prepared: Aug 14, 2020

Intersection: Plymouth County Road C-30 / K-64

Improvement

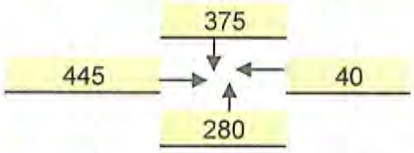
Proposed Improvement(s): The proposed improvement will improve site distance at the intersection and widen the sholder of the paved roadway.

$ 315,660	Estimated Improvement Cost, **EC**	15	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	34	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 315,660	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: IDOT Traffic County 2015 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



416,100 Current Annual Entering Veh., **AEV** = DEV * 365

1,534 veh / day, Final Year DEV, **FDEV**

7.20 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

2.0% Projected Traffic Growth (0%-10%), **G**

1,140 Current Daily Entering Vehicles, **DEV**

Crash Data

2010 First full year --> 2020 Last full year 11.0 years, Time Period, **T**

Additional months

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
0	Injury Crashes		Minor Injuries @	$65,000	$ -
			Possible Injuries @	$35,000	$ -
1	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 9,150
1	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 9,150

0.09	Current Crashes / Year, **AA** = TA / T	0.22	Crashes / MEV, Crash Rate, **CR**
$ 9,150	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
1.6	Total Expected Crashes, **TECR** = CR x TMEV	$ 3,521	Present Value of Avoided
0.03	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 279	Crash Costs Avoided in First Year, AAR x AVC		
0.5	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $3,521 : $315,660 = **0.01** : 1

For Information Only -- Not Required for B/C
All values imported from Road Segment worksheet

ROAD SEGMENT YEARLY DETAILS

Factors from Road Segment Tab

1.0% Traffic Growth Factor
4.0% Discount Rate
$0 Cost Per Crash
$0 Present Value of All Crashes Avoided

0.00 Crash Rate, Per HMVM
0 Crash Reduction Factor
0 Project Life in Years

	Traffic - Veh. Miles		Crashes		Savings	
Year	Daily	Annual	Annual	Avoided	$ Saved	PV $ saved
	TOTALS	**0**	**0.00**	**0.00**	**$ -**	**$ -**
1	0	0				
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

For Information Only -- Not Required for B/C
All values imported from Intersection worksheet

INTERSECTION YEARLY DETAILS

Factors from Intersection Tab

2.0% Traffic Growth Factor
4.0% Discount Rate
$9,150 Cost Per Crash
$3,521 Present Value of All Crashes Avoided
0.22 Crash Rate, Per MEV
34 Crash Reduction Factor
15 Project Life in Years

	Traffic - Entering Veh.		Crashes		Savings	
Year	Daily	Ann MEV	Annual	Avoided	$ Saved	PV $ saved
	TOTALS	**7.196**	**1.57**	**0.53**	**$ 4,819**	**$ 3,521**
1	1,140	0.416	0.09	0.03	$ 279	$ 268
2	1,163	0.424	0.09	0.03	$ 284	$ 263
3	1,186	0.433	0.09	0.03	$ 290	$ 258
4	1,210	0.442	0.10	0.03	$ 296	$ 253
5	1,234	0.450	0.10	0.03	$ 302	$ 248
6	1,259	0.459	0.10	0.03	$ 308	$ 243
7	1,284	0.469	0.10	0.03	$ 314	$ 238
8	1,310	0.478	0.10	0.03	$ 320	$ 234
9	1,336	0.488	0.11	0.04	$ 326	$ 229
10	1,362	0.497	0.11	0.04	$ 333	$ 225
11	1,390	0.507	0.11	0.04	$ 340	$ 221
12	1,417	0.517	0.11	0.04	$ 346	$ 216
13	1,446	0.528	0.12	0.04	$ 353	$ 212
14	1,475	0.538	0.12	0.04	$ 360	$ 208
15	1,504	0.549	0.12	0.04	$ 368	$ 204
16						
17						

IOWA DOT

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** Augu14, 2020

Location / Title of Project K-64 Culvert Replacement – Sec 28/20 T-92N, R-44W

Applicant Plymouth County

Contact Person Thomas Rohe Title County Engineer

Complete Mailing Address P.O. Box 1227

Le Mars, Iowa 51031

Phone 712-546-4559 E-Mail trohe@co.plymouth.ia.us
(Area Code)

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

Co-Applicant(s) NA

Contact Person -- Title --

Complete Mailing Address --

--

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$	55,310
Total Project Cost	$	223,570
Safety Funds Requested	$	55,310

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 Board of Supervisors

Signed: Don Kass 8/18/20

Signature Date Signed

Don Kass

Printed Name

Attest: Stacy Feldman 8/18/20

Signature Date Signed

Stacey Feldman

Printed Name

B: Narrative

K-64 Culvert Replacement Between Sec 28/29 T-92N, R-44W

This section of roadway was graded in 1952 with a 28 ft. top and 2:1foreslopes. The roadway was then paved in 1954 as an asphalt road. The grade line of this roadway follows the existing topography and vertical curve designs are essentially at 30-45 mph.

The culvert that we are proposing is a 14 ft. x 6 ft. x 73 ft. precast box and will replace a 12 ft. x 5 ft. x 28 ft. box. The existing culvert is too short to allow for adequate shoulder width and meet clear zone requirements. The guardrail causes some width restrictions when large oversize loads are moved and the guardrails themselves are obstructions which require maintenance and cause additional drifting of snow. The goal of the county is to provide adequate width for the traveling public and provide a structure that meets clear zone requirements.

K-64 is scheduled for resurfacing during the 2021 construction season. An improvement at this site would be timely. The proposed project will replace the existing structure, widen the shoulders to current standards, and provide a recoverable slope over the culvert

The traffic accident data does not support this type of reconstruction based on accidents alone. However because of the roadway geometrics and the improvement that can be made at a reasonable cost, I would hope that this project would be considered. We are fortunate that we have not had many accidents at this location. We believe that since we are going to be working on the roadway as scheduled now would be the time to make this improvement and provide a safer roadway in the culvert area.

C: Cost

The estimated cost of this project is $ 223,570 of which $ 55,310 is the safety improvement associated with the project. A breakdown can be seen on the spread sheet on exhibit "C".

D: Time Schedule

This project is scheduled to be let in January or February of 2021 with the construction to be completed during the 2021 construction season. We would need to schedule this intersection reconstruction ahead of the resurfacing work.

E: Map

See enclosed transportation map showing the culvert location.

F: Color Pictures

Enclosed

G: Plan View

Plan sheet is enclosed. Additional right of way of will need to be acquired for the construction of this project. See Exhibit "G".

H: Aerial Photo of the site as per Exhibit "H".

I: Crash Summary Report – Exhibit "I".

J: Recent Traffic Volumes – Exhibit "J".

A map showing the traffic count of this roadway by IDOT for 2015 is enclosed.

K: Signals - NA

L: B/C Worksheet – Exhibit "L"

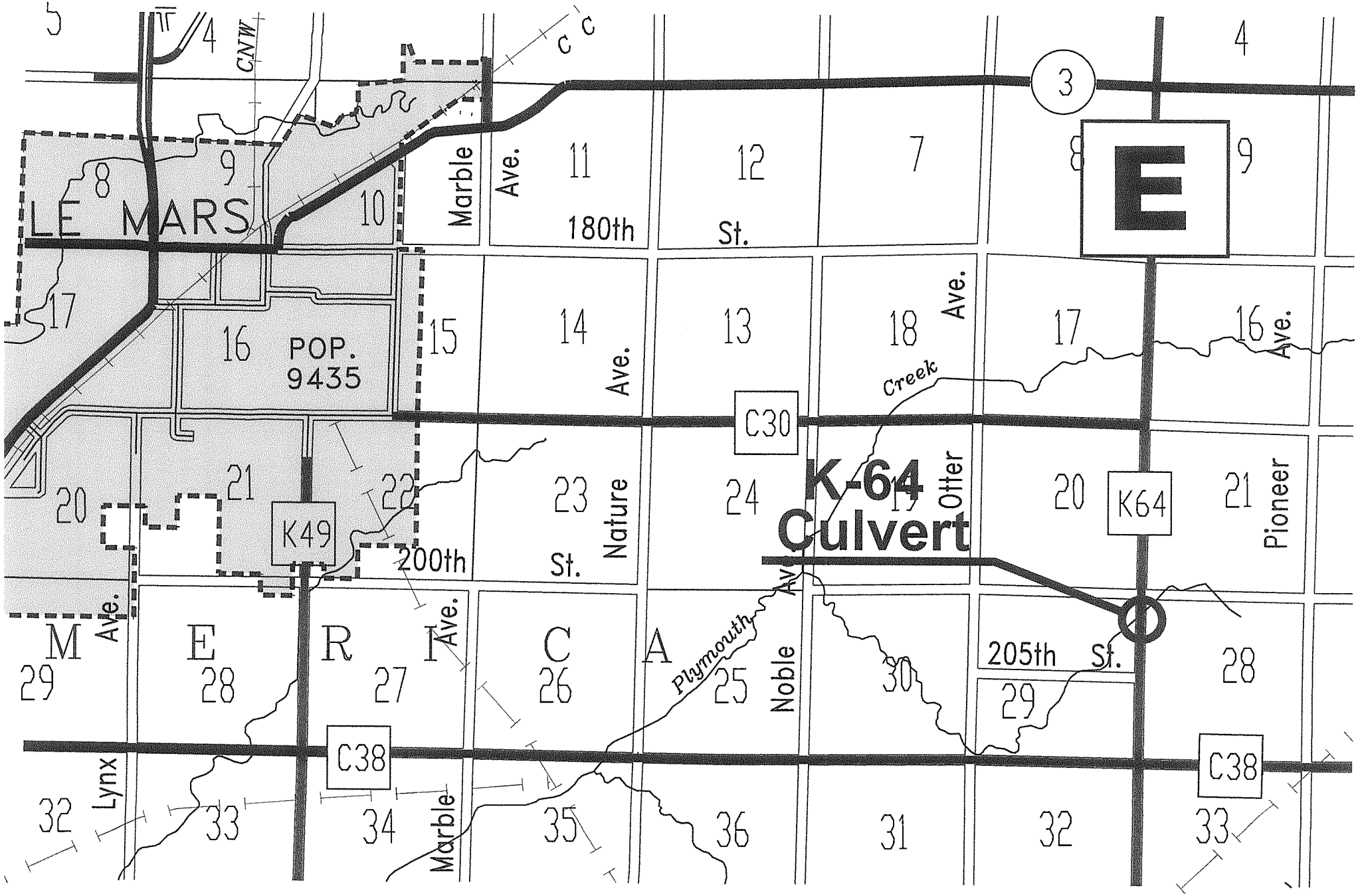
C

PLYMOUTH COUNTY

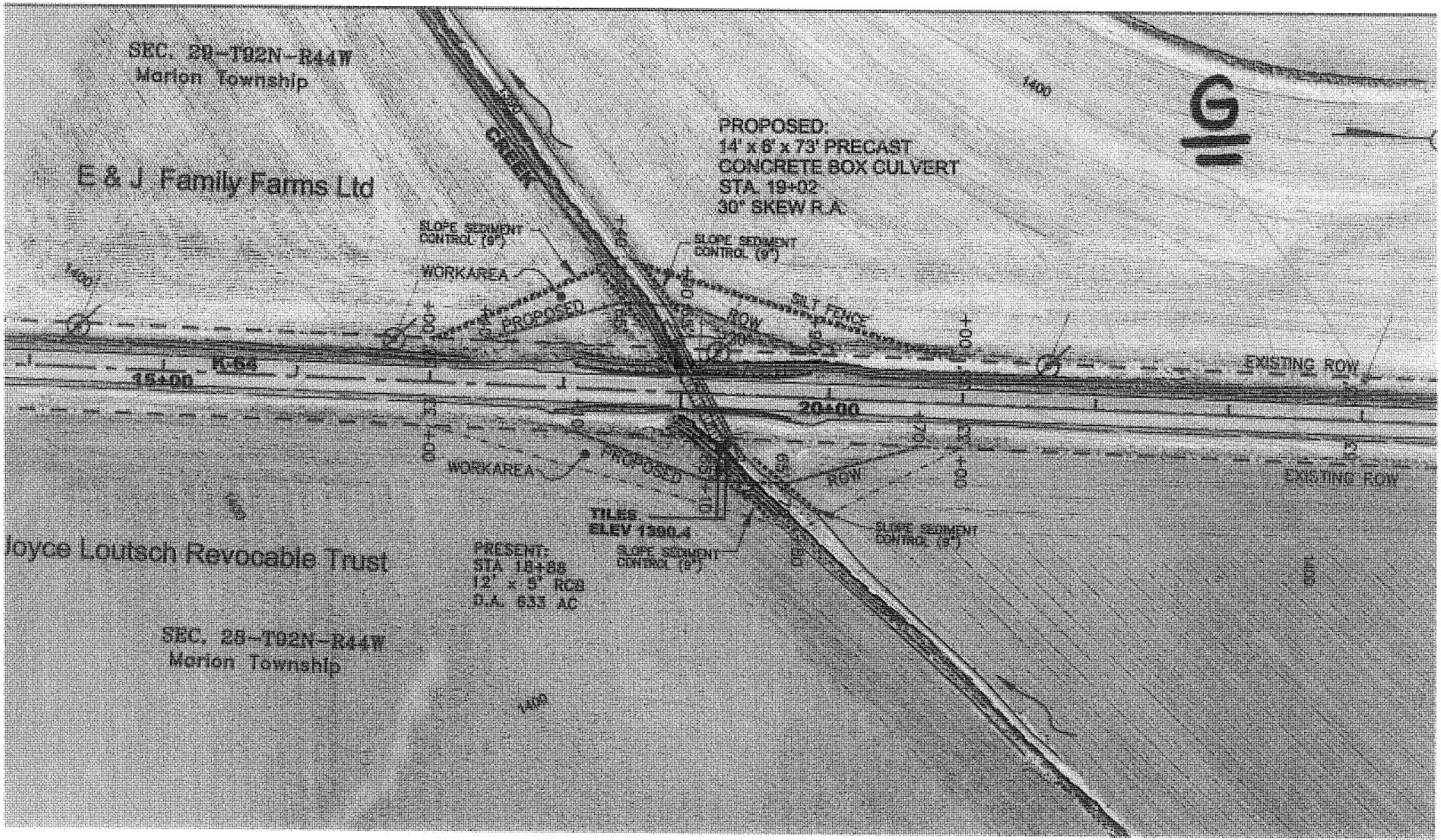
ENGINEER'S ESTIMATE

Kind of Work	CULVERT REPLACEMENT ON K-64	County	PLYMOUTH		
Project No.	LFM-242802--73-75	Date	7/10/2020		

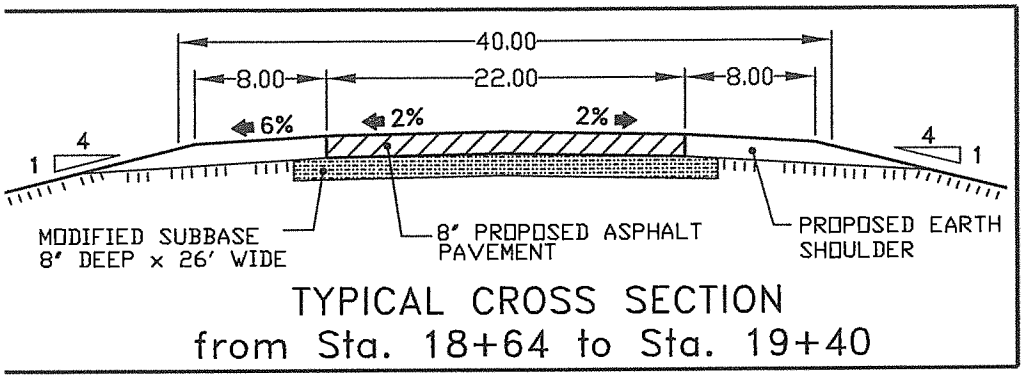
Item No.	Item	Quantity	Units	Unit Price	Amount	Extension	Amount
1	EXCAV. CL. 10, RDWY & BORROW	490	C.Y.	$10.00	$ 4,900.00	350	3,500.00
2	EXCAVATION, CLASS 10 CHANNEL	409	C.Y.	$6.60	$ 2,699.40		
3	MODIFIED SUBBASE	50.0	CY	$75.00	$ 3,750.00		
4	HMA, WEDGE/LEVEL/STRENGTH	84.0	TONS	$140.00	$ 11,760.00		
5	AC BINDER, PG 58-28S, STANDARD TRAFFIC	5.1	TONS	$670.00	$ 3,417.00		
6	REMOVAL OF EXISTING STRUCTURE	1	L.S.	$8,700.00	$ 8,700.00		
7	GRANULAR BACKFILL	391	TONS	$23.00	$ 8,993.00	170	3,910.00
8	EXCAVATION, CLASS 20	1,031	CY	$5.00	$ 5,155.00		
9	STRUCTUEAL CONCRETE (MISCELLANEOUS)	4.6	CY	$1,100.00	$ 5,060.00		
10	REINFORCING STEEL	548	LB	$3.50	$ 1,918.00		
11	PRECAST CONCRETE BOX CULVERT, 14' X 6"	73	LF	$1,400.00	$ 102,200.00	32	44,800.00
12	PRE CONC. BOX CULV. 30 DEG SKEW END SEC 14'X6' (3:1 SLOPE)	2	EACH	$12,000.00	$ 24,000.00		
13	PILE, STEEL SHEET	288	SF	$23.00	$ 6,624.00		
14	FLOWABE MORTAR	40	CY	$145.00	$ 5,800.00	16	2,320.00
15	ENGINEERING FABRIC	375	SY	$3.00	$ 1,125.00		
16	REVETMENT, CLASS E	67	TONS	$70.00	$ 4,690.00		
17	REMOVAL OF PAVEMENT	190	SY	$35.00	$ 6,650.00		
18	SAFTY CLOSURE	2	EACH	$450.00	$ 900.00		
19	TRAFFIC CONTROL	1	L.S.	$700.00	$ 700.00		
20	MOBILIZATION	1	LS	$7,000.00	$ 7,000.00		
21	(EACH ITEM) EXTEND TILE OUTLET	2	EACH	$1,000.00	$ 2,000.00		
22	(LUMP SUM ITEM) DELIVER AND STOCKPILE SALVAGED MATERIAL	1	LS	$700.00	$ 700.00		
23	(TONS ITEM) GRANULAR MATERIAL FOR BEDDING (PLACE ONLY)	149	TONS	$13.00	$ 1,937.00	60	780.00
24	PERIMETER & SLOPE SEDIMENT CONTROL DEVICE, 9 IN.	598	LF	$4.00	$ 2,392.00		
25	MOBILIZATION, EROSION CONTROL	1	EACH	$500.00	$ 500.00		
26					$ -		
27					$ -		
28				TOTAL	$ 223,570.40		$ 55,310.00
29					Project Total		Safety Widening
30					$ -		


LE MARS
POP. 9435
K-64
Culvert
C30
C38
K49
K64
180th St.
200th St.
205th St.
Marble Ave.
Nature Ave.
Otter Ave.
Pioneer Ave.
Noble Ave.
Lynx Ave.
Plymouth Av
Creek
CNW
3
E

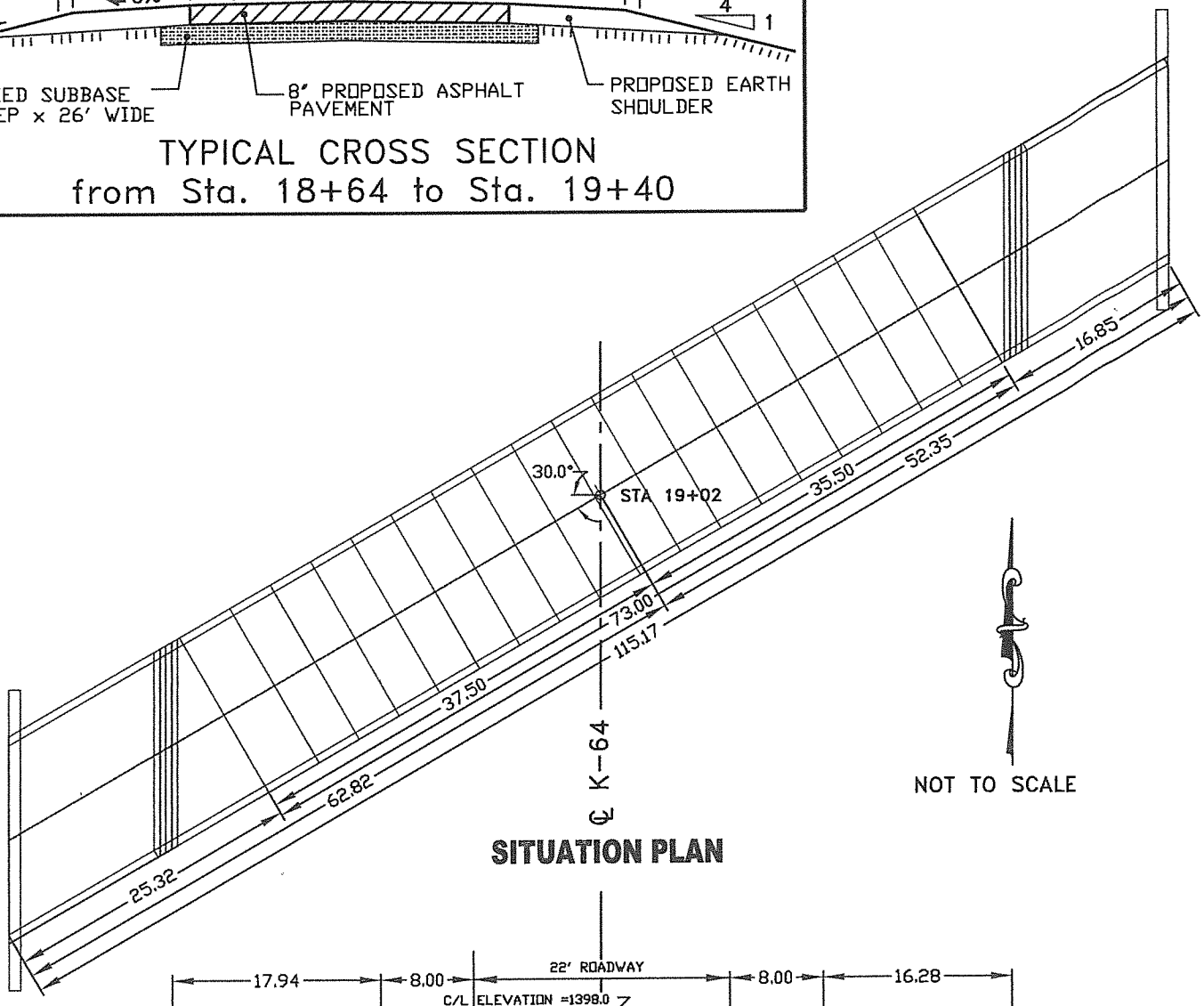

F
SING


SEC. 28-T92N-R44W
Marion Township
E & J Family Farms Ltd
PROPOSED:
14' x 6' x 73' PRECAST
CONCRETE BOX CULVERT
STA. 19+02
30° SKEW R.A.
SLOPE SEDIMENT CONTROL (9")
WORKAREA
PROPOSED
ROW
SILT FENCE
EXISTING ROW
35+00
20+00
TILES
ELEV 1390.4
PRESENT:
STA 18+88
12' x 5' RCB
D.A. 633 AC
Joyce Loutsch Revocable Trust
SEC. 28-T92N-R44W
Marion Township

G1

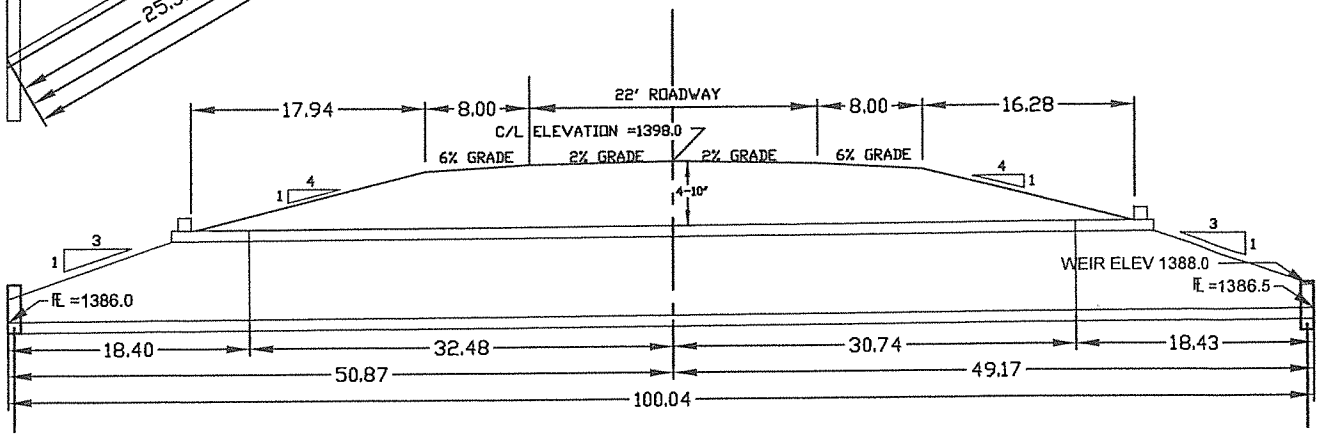


TYPICAL CROSS SECTION
from Sta. 18+64 to Sta. 19+40



NOT TO SCALE

SITUATION PLAN



LONGITUDINAL SECTION


K 64

K-64 Culvert Replacement

I

Iowa Crash Analysis Tool
Quick Report
2010-2020

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

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):	2,500.00
Average (per crash dollars):	2,500.00
Total Vehicles:	1.00
Average (per crash):	1.00
Total Occupants:	2.00
Average (per crash):	2.00

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

Major Cause			1
Animal	0	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	0
Ran off road - straight	0	Ran off road - left	1
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	0	0	0	0	1

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

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

Fixed Object Struck			1
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	1

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	0	0	0	0
>= 35 and <= 39	0	1	0	0	1
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 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	0	1	0	0	1

Alcohol Test Given	1
None	1
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

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

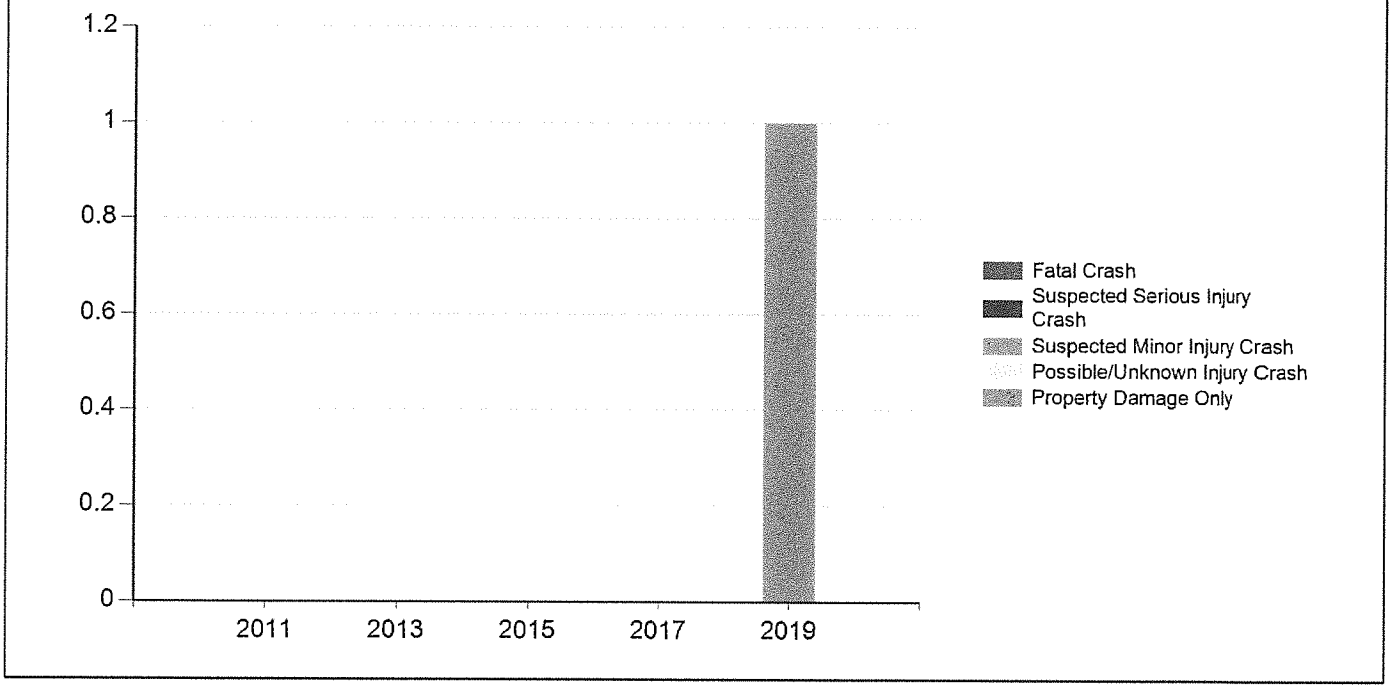
Drug Test Result	1
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	1
Other	0

Drug/Alcohol Related	1
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	1

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	1	1
2020	0	0	0	0	0	0
Total	0	0	0	0	1	1

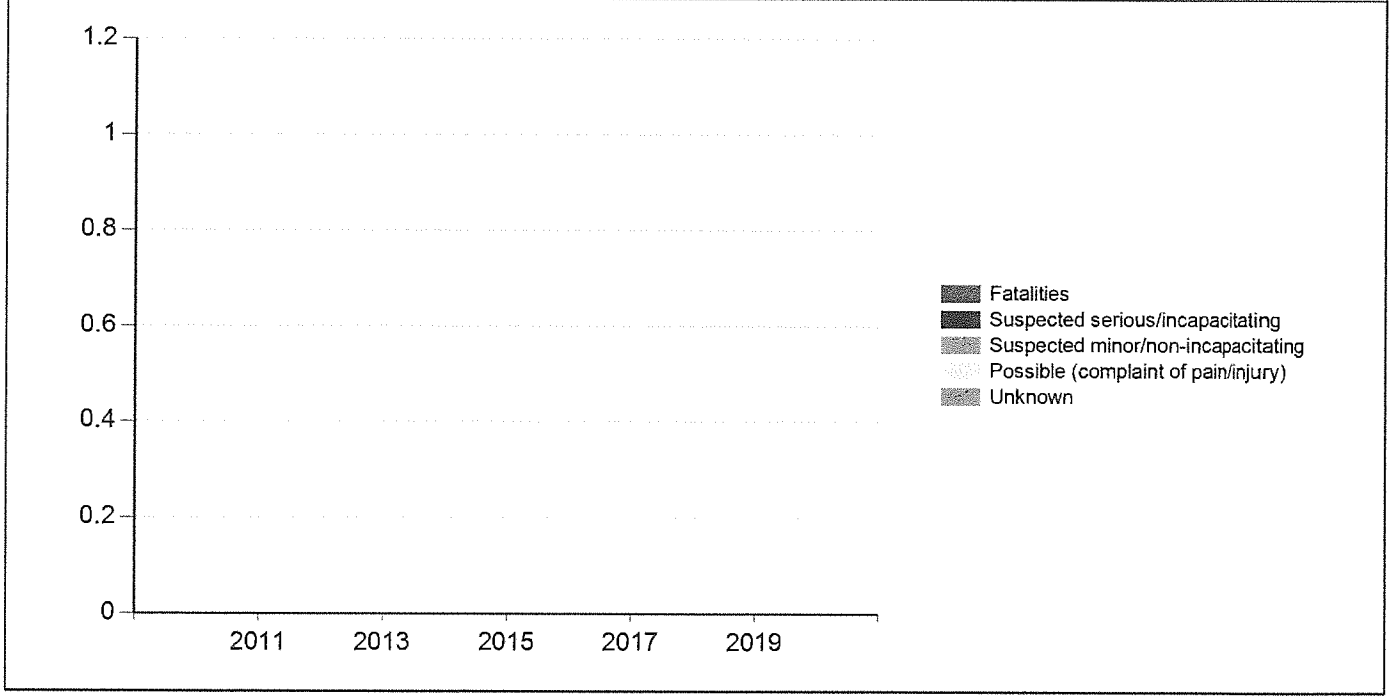
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	0	0	0	0	0

Injury Status/Year



Meeting the following criteria

Jurisdiction: Counties (Plymouth)
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

K64 segment South of 200th Street
2010-2020

K-64 Culvert Replacement

I

Crash Detail Report

20191115076	05/24/2019 09:40	K064/OYENS AVE MEASURING 1617 FEET SOUTH FROM K064/OYENS AVE AND 200TH ST
County: Plymouth	City:	

Major Cause: Ran off road - left

Roadway Type: Feature: Non-junction/no special feature

Severity:: Property Damage Only

Manner of Crash: Non-collision (single vehicle)

Fatalities: 0

Surface Conditions: Dry

Major Injuries: 0

Light Conditions: Daylight

Minor Injuries: 0

Weather Conditions: Cloudy

Possible Injuries: 0

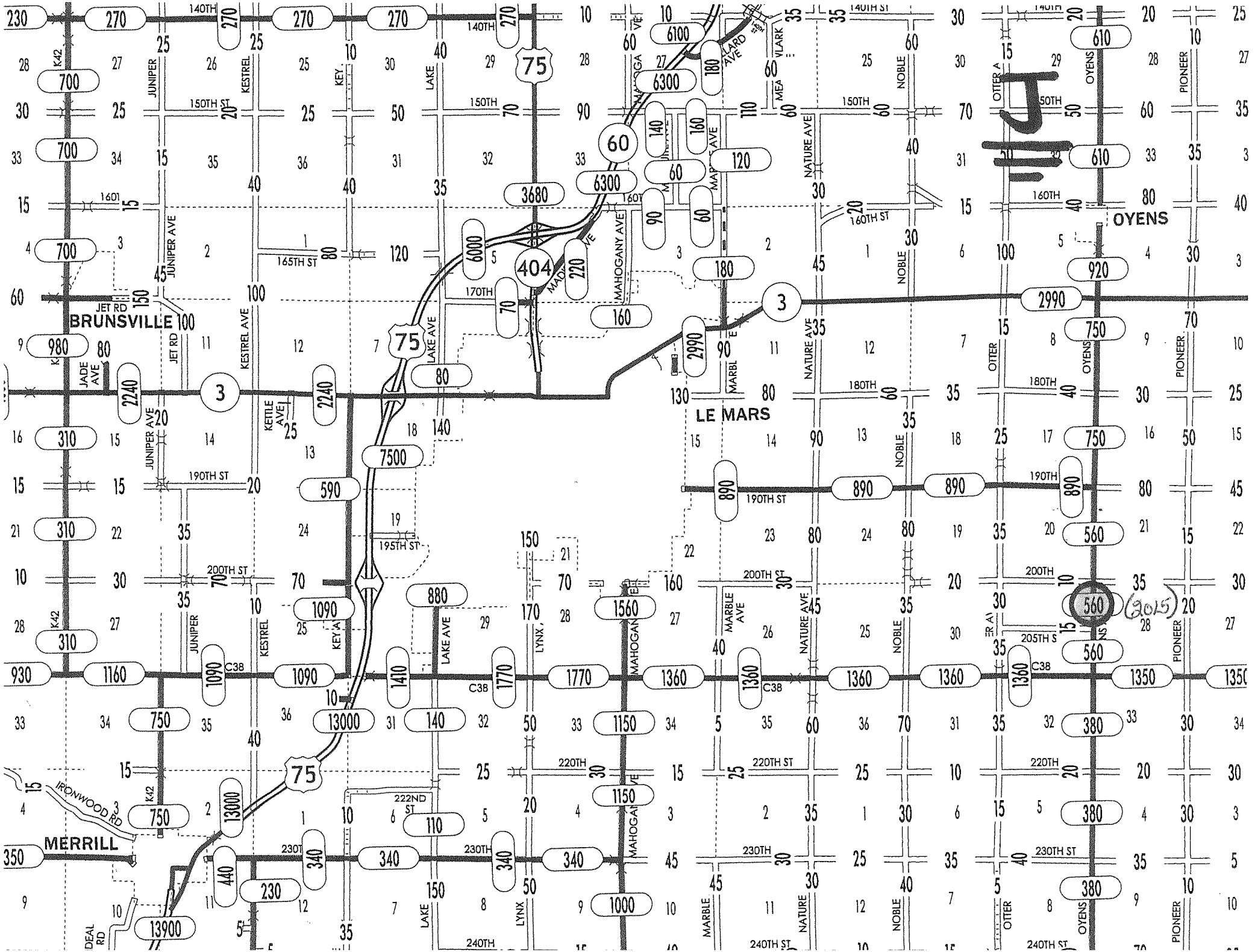
Drug/Alc Involved: None Indicated

Severity:: Property Damage Only

Property Damage: $2,500

Number of Vehicles: 1

	Unit 1	Unit	Unit
Init Trav Dir:	North		
Veh Action:	Other		
Configuration:	Passenger car		
Driver Age:	36		
Driver Gender:	M		
Driver Cond:	Apparently normal		
Driver Contr 1:	Failed to keep in proper lane		
Driver Contr 2:	Other		
Fixed Object:	None (no fixed object struck)		


BRUNSVILLE
LE MARS
OYENS
MERRILL
JET RD
JUNIPER AVE
KESTREL AVE
KETTLE AVE
LAKE AVE
MAHOGANY AVE
MARBLE AVE
NATURE AVE
NOBLE
OTTER
OYENS
PIONEER
JADE AVE
IRONWOOD RD
DEAL RD
140TH
150TH ST
160TH ST
165TH ST
170TH
180TH
190TH ST
195TH ST
200TH ST
205TH S
220TH ST
222ND ST
230TH ST
240TH ST
75
3
60
404
K42
C38
(2015)

B/C ANALYSIS INSTRUCTIONS

revised May 2018
Office of Traffic & Safety, Iowa DOT

Document all values and assumptions and include with application.

Use either the "Road Segment" or "Intersections" worksheet and only enter values in the YELLOW cells.

Crashes used in the B/C worksheet should be mitigated by the proposed countermeasure(s).

Crash Reduction Factors

Select crash reduction factors from the Iowa CRF List (link to be provided). For strategies not found in the CRF List, refer to the CMF Clearinghouse.

http://www.cmfclearinghouse.org/

Be sure to use the CRF (not the CMF) in these spreadsheets. A CRF of 10 means a 10% reduction in crashes is expected with that improvement. Note that a CRF of 10 equals a CMF of 0.90 (CRF = 1 - CMF).

If more than one safety improvement will be made, the cumulative crash reduction factor must be calculated using the following formula:

CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))

or enter the individual values into this calculator:

Enter up to 5 CRFs:	5	6			
Cumulative CRF =	10.7				

If the improvements have different service lives, enter the shortest service life into the spreadsheet.

Yearly Worksheet

The "Yearly" worksheet is not part of the analysis, but can be used to check and better understand the results.

Discount Rate

The discount rate of 4% excludes inflation and comes from the St. Louis Federal Reserve Bank. It should not be changed without proper justification and documentation.

Societal crash cost values were last updated in May 2014.

Report any errors or problems to:
DOT-TSIP@iowadot.us

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

Rev. 5/18

County: Plymouth | Prepared by: Thomas Rohe | Date Prepared: Aug 14, 2020

Location: On County Road K-64 between Sec 28/29 T-92N, R-44W

Improvement

Proposed Improvement(s): Extend a culvert during replacement in order to remove existing guardrail and provide adequate clear zone to make the roadway wider and safer.

$ 55,310	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	11	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 55,310	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Count | 2015 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.10	560	22 ft. wide asphalt roadway
0.10	miles total	

56 Current Vehicle Miles / Day, **VM**

68 End of Life Veh. Miles / Day

20,440 Current Veh. Miles / Year, **AM**

450,068 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

1.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year --> 2020 Last full year | 11.0 years, Time Period, **T**

Additional months

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
0	Injury Crashes		Minor Injuries @	$65,000	$ -
			Possible Injuries @	$35,000	$ -
1	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 2,500
1	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 2,500

0.09 Current Crashes / Year, **AA** = TA / T

$ 2,500 Cost per Crash, **AVCR** = LOSS / TA

2.0 Total Expected Crashes, **TCR** = CR x TVMT/10^8

0.01 Crashes Avoided First Year **AAR** = AA x CRF / 100

$ 24 Crash Costs Avoided in First Year, AAR x AVCR

0.2 Total Avoided Crashes, TCR x CRF/ 100

444.8 Crashes / HMVM, Crash Rate, **CR**
CR = TA x 10^8 / (AM x T)

$ 359 Present Value of Avoided Crashes, **BENEFIT**

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $359 : $55,310 = **0.01** : 1

L

For Information Only -- Not Required for B/C
All values imported from Road Segment worksheet

ROAD SEGMENT YEARLY DETAILS

Factors from Road Segment Tab

1.0% Traffic Growth Factor
4.0% Discount Rate
$2,500 Cost Per Crash
$0 Present Value of All Crashes Avoided
44.48 Crash Rate, Per HMVM
0 Crash Reduction Factor
20 Project Life in Years

	Traffic - Veh. Miles		Crashes		Savings	
Year	Daily	Annual	Annual	Avoided	$ Saved	PV $ saved
	TOTALS	**4,500,684**	**2.00**	**0.00**	**$ -**	**$ -**
1	560	204,400	0.09	0.00	$ -	$ -
2	566	206,444	0.09	0.00	$ -	$ -
3	571	208,508	0.09	0.00	$ -	$ -
4	577	210,594	0.09	0.00	$ -	$ -
5	583	212,699	0.09	0.00	$ -	$ -
6	589	214,826	0.10	0.00	$ -	$ -
7	594	216,975	0.10	0.00	$ -	$ -
8	600	219,144	0.10	0.00	$ -	$ -
9	606	221,336	0.10	0.00	$ -	$ -
10	612	223,549	0.10	0.00	$ -	$ -
11	619	225,785	0.10	0.00	$ -	$ -
12	625	228,043	0.10	0.00	$ -	$ -
13	631	230,323	0.10	0.00	$ -	$ -
14	637	232,626	0.10	0.00	$ -	$ -
15	644	234,953	0.10	0.00	$ -	$ -
16	650	237,302	0.11	0.00	$ -	$ -
17	657	239,675	0.11	0.00	$ -	$ -
18	663	242,072	0.11	0.00	$ -	$ -
19	670	244,493	0.11	0.00	$ -	$ -
20	677	246,937	0.11	0.00	$ -	$ -
21						
22						
23						

For Information Only -- Not Required for B/C
All values imported from Intersection worksheet

INTERSECTION YEARLY DETAILS

Factors from Intersection Tab

0.0% Traffic Growth Factor
4.0% Discount Rate
$0 Cost Per Crash
$0 Present Value of All Crashes Avoided
0.00 Crash Rate, Per MEV
0 Crash Reduction Factor
0 Project Life in Years

	Traffic - Entering Veh.		Crashes		Savings	
Year	Daily	Ann MEV	Annual	Avoided	$ Saved	PV $ saved
	TOTALS	**0.000**	**0.00**	**0.00**	**$ -**	**$ -**
1	0	0.000				
2						
3						
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Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project: Flashing Beacons at NE 56th St. and NE 94th Ave.

Applicant: Polk County Public Works

Contact Person: Kurt D. Bailey, P.E. Title: County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: (515) 286-3705 (Area Code) E-Mail: Kurt.bailey@polkcountyiowa.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	$ 40,000
Total Project Cost	$ 40,000
Safety Funds Requested	$ 40,000

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 Polk County

Signed: Kurt D Bailey 8/13/20

Signature Date Signed

Kurt D. Bailey, P.E.

Printed Name

Attest: [signature] 8/13/2020

Signature Date Signed

Kyle Riley

Printed Name

Res. No. 110-20
August 4, 2020

RESOLUTION

Moved by Connolly, Seconded by Brownell that the following Resolution be adopted:

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

WHEREAS, the Polk County Public Works Department regularly monitors traffic safety on roadways within its jurisdiction; and

WHEREAS, an engineering study has been completed which shows that the number of accidents could potentially be reduced if flashing beacons were installed at the following locations:

- At intersection of NE 56th Street and NE 94th Avenue
- At intersection of NW 44th Street and NW 118th Avenue
- At intersection of NE 108th Street and IA Hwy 163; and

WHEREAS, the Polk County Public Works Department recommends that an application for each location be submitted to the Iowa Department of Transportation for possible Traffic Safety Funding.

NOW, THEREFORE, BE IT RESOLVED that the Polk County Board of Supervisors hereby endorse these intersection improvement projects and authorize the Polk County Public Works Department to maintain the improvements within the County's jurisdiction after construction is completed should funding be awarded; and

BE IT FURTHER RESOLVED that the Polk County Board of Supervisors authorized the Polk County Engineer to sign said funding application certifications and direct the Polk County Public Works Department to submit the applications to the Iowa Department of Transportation for possible Traffic Safety Improvement Program funding.

POLK COUNTY, IOWA

Matt McCoy

Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice

Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Requests:
NE 108 St/Hwy 163 $50,000
NE 56 St/NE 94 Ave. $40,000
NW 44 St/NW 118 Ave. $40,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

AUG - 4 2020

ALLOWED BY VOTE OF BOARD

Matt McCoy
CHAIRPERSON

Steve Van Oort	~~Yea~~	~~Nay~~ a
Robert Brownell	~~Yea~~	Nay
Tom Hockensmith	~~Yea~~	Nay
Angela Connolly	~~Yea~~	Nay
Matt McCoy	~~Yea~~	Nay
Yea 4	Nay 1 - ABSENT	

Above tabulation made by BS

#11

B

NARRATIVE

The Polk County Secondary Road system continues to experience increasing traffic volumes due to the population growth and economic expansion occurring in the Des Moines metropolitan area. Due to this growth, the Public Works Department annually performs traffic safety reviews of over fifty (50) intersections that have experienced a history of accidents over the last 10 years. One of the intersections we reviewed was the intersection of NE 56th Street and NE 94th Avenue.

While we added oversized Stop signs with red flags, and double Stop Ahead signs with flags in 2012, we continue to see accidents involving a driver on NE 56th Street failing to yield to through traffic on NE 94th Avenue. Traffic volume or accident rates do not warrant an all-way stop condition at this time.

This intersection is located 2 miles east of Ankeny, and 2 miles west of Bondurant city limits. NE 94th Avenue is a two-lane roadway with a Minor Arterial federal functional classification with a posted speed limit of 55 mph. This roadway serves as the primary route for commercial and commuter traffic from Hwy 65 to I-35 and the Ankeny area north of the I-80 corridor.

NE 56th Street is a two-lane HMA roadway and is classified as a Major Collector. This roadway serves as a north/south commuter route, south to Altoona and eastern Des Moines, including retail areas of the Bass Pro and the Facebook complex.

Even though there seems to be ample sight distance from the stop condition, motorists are still failing to either see on-coming traffic and not yielding to on-coming traffic. Based on the 5-year accident history, we believe this intersection warrants traffic safety improvements.

As you can see in Section G, we propose to install yellow post mounted flashing beacons and intersection warning signs on NE 94th Avenue on approach to NE 56th Street, and red post mounted flashing beacons with oversized Stop signs on NE 56th Street to give additional warning to motorists, especially those on NE 94th Avenue that traffic may be entering unexpectedly. We believe the addition of these beacons will not only reduce the number of accidents, but also reduce the severity of the accidents. A detailed cost estimate for these improvements can be found in Section C. The relatively low cost of these improvements results in a high Benefit/Cost ratio over 11:1.

C

ENGINEER'S ESTIMATE NE 56th Street and NE 94th Avenue Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 100.00	$ 200.00
2	REMOVAL OF TYPE A SIGN ASSEMBLY	EA	2.00	$ 100.00	$ 200.00
3	TYPE A SIGNS, SHEET ALLUMINUM	SF	24.00	$ 22.50	$ 540.00
4	TRAFFIC CONTROL	LS	1.00	$ 1,500.00	$ 1,500.00
5	FLAGGERS	EA	3.00	$ 520.00	$ 1,560.00
6	MOBILIZATION	LS	1.00	$ 6,000.00	$ 6,000.00
7	PEDESTAL POLES W/CONCRETE FOUNDATIONS	EA	4.00	$ 1,500.00	$ 6,000.00
8	SOLAR POWERED 12-INCH FLASHING BEACONS	EA	4.00	$ 6,000.00	$ 24,000.00
	TOTAL ESTIMATED CONSTRUCTION COST				**$ 40,000.00**

D

PROJECT TIME SCHEDULE

Proposed N.E. 56th Street and NE 94th Avenue Advanced Signing with Solar Powered Beacons

IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

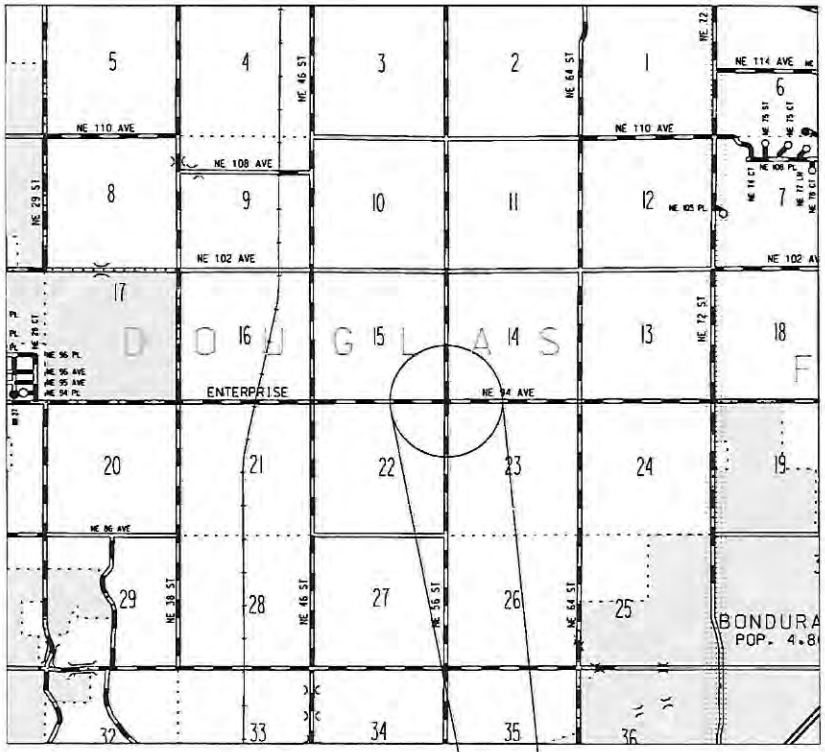
Polk County, Iowa

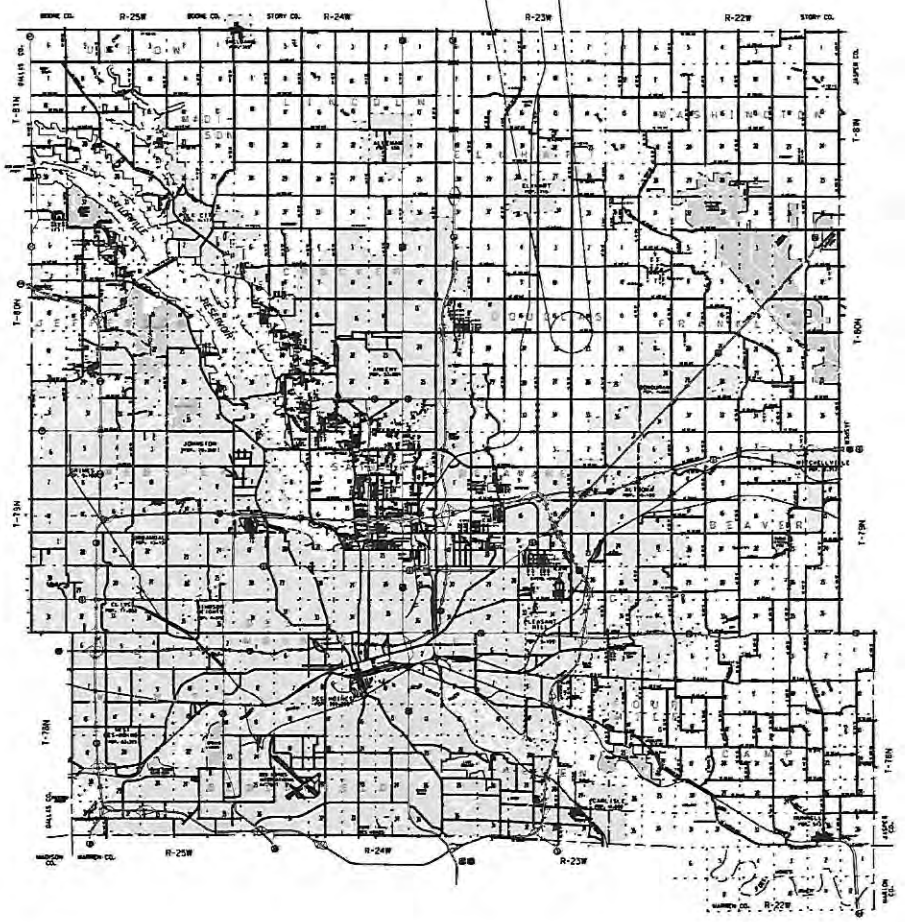
PROJECT PHASE	2021											
(YEAR 2021)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement	■	■	■									
Project Design and Project Plan Approvals			■	■	■							
Iowa DOT Bid Letting						■						
Project Construction/Pole Manufacture time							■	■	■			
Project Closeout										■	■	

E

NORTH

NO SCALE





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Plotted by KLB

F

Figure 1 Eastbound NE 94 Avenue Approaching Intersection.

Figure 2 Westbound NE 94 Avenue Approaching Intersection.

Figure 3 Looking West from Northbound Stop Condition- NE 56 Street.

Figure 4 Looking East from Northbound Stop Condition- NE 56 Street

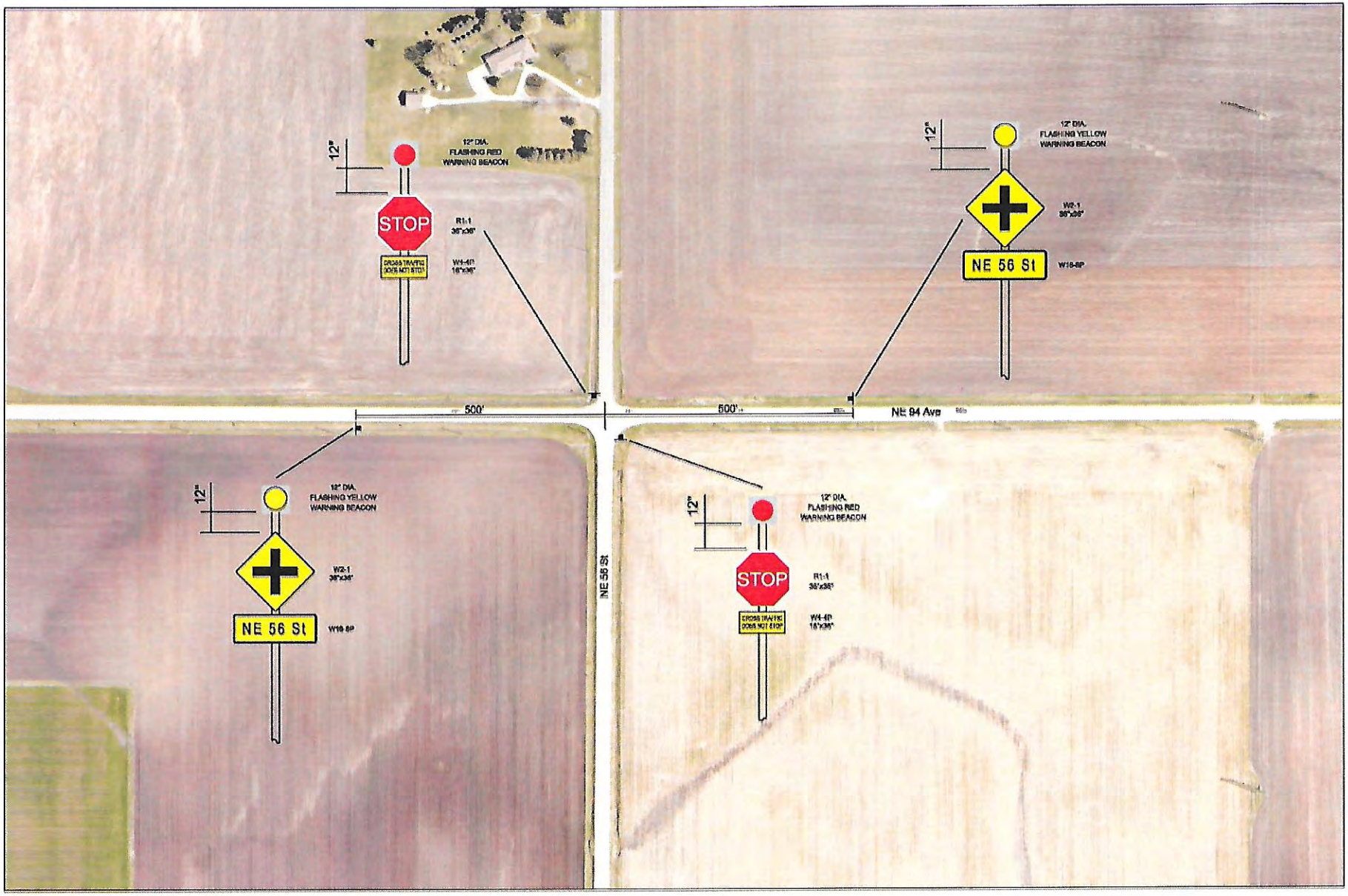
Figure 5 Looking West from Southbound Stop Condition- NE 56 Street

Figure 6 Looking East from Southbound Stop Condition- NE 56 Street

G

NORTH

NO SCALE



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Plotted by: KLB

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Plotted by KLB

NORTH

NO SCALE

H

I

ACCIDENT HISTORY

NE 56 STREET AT NE 94 AVENUE

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	33-4965	8/29/2015	PI	1-MINOR	$ 7,000	REAR-END - NB
2	33-4965	1/14/2016	PDO		$ 20,000	FAIL TO CONTROL - PASSING - WB
3	33-4965	8/3/2016	PI	1-MINOR	$ 30,000	FTY FROM STOP - NB
4	33-4965	3/8/2017	PDO		$ 14,000	FTY FROM STOP - SB
5	33-4965	4/23/2017	PI	1-FATAL 1-MAJOR 1-MINOR	$ ~~30,000~~	FTY FROM STOP - NB (METH FOUND ON DRIVER)
6	33-4965	9/25/2017	PI	2-MINOR	$ 20,000	FTY FROM STOP - NB
7	33-4965	12/29/2017	PDO		$ 11,000	FTY FROM STOP - NB TO WB
8	33-4965	6/17/2018	PI	1-POSS.	$ 28,200	RAN STOP SIGN (NB)
9	33-4965	11/12/2018	PDO		$ 4,500	FTYROW:From Stop Sign (NB)
10	33-4965	4/28/2019	PDO		$ 3,500	FAILURE TO STOP IN ASSURED CLEAR DISTANCE (NB)
11	33-4965	7/2/2019	PDO		$ 3,000	FTY FROM STOP - NB
12	33-4965	1/23/2020	PI	3-MINOR	$ ~~50,000~~	FTY FROM STOP - NB - Alcohol involved
10		**Total Accidents Last 5 Years Only Not including Impaired Drivers**		**0 fatality 0 major 4 minor 1 possible**	**$ 141,200**	**Total Property Damage**

SUMMARY

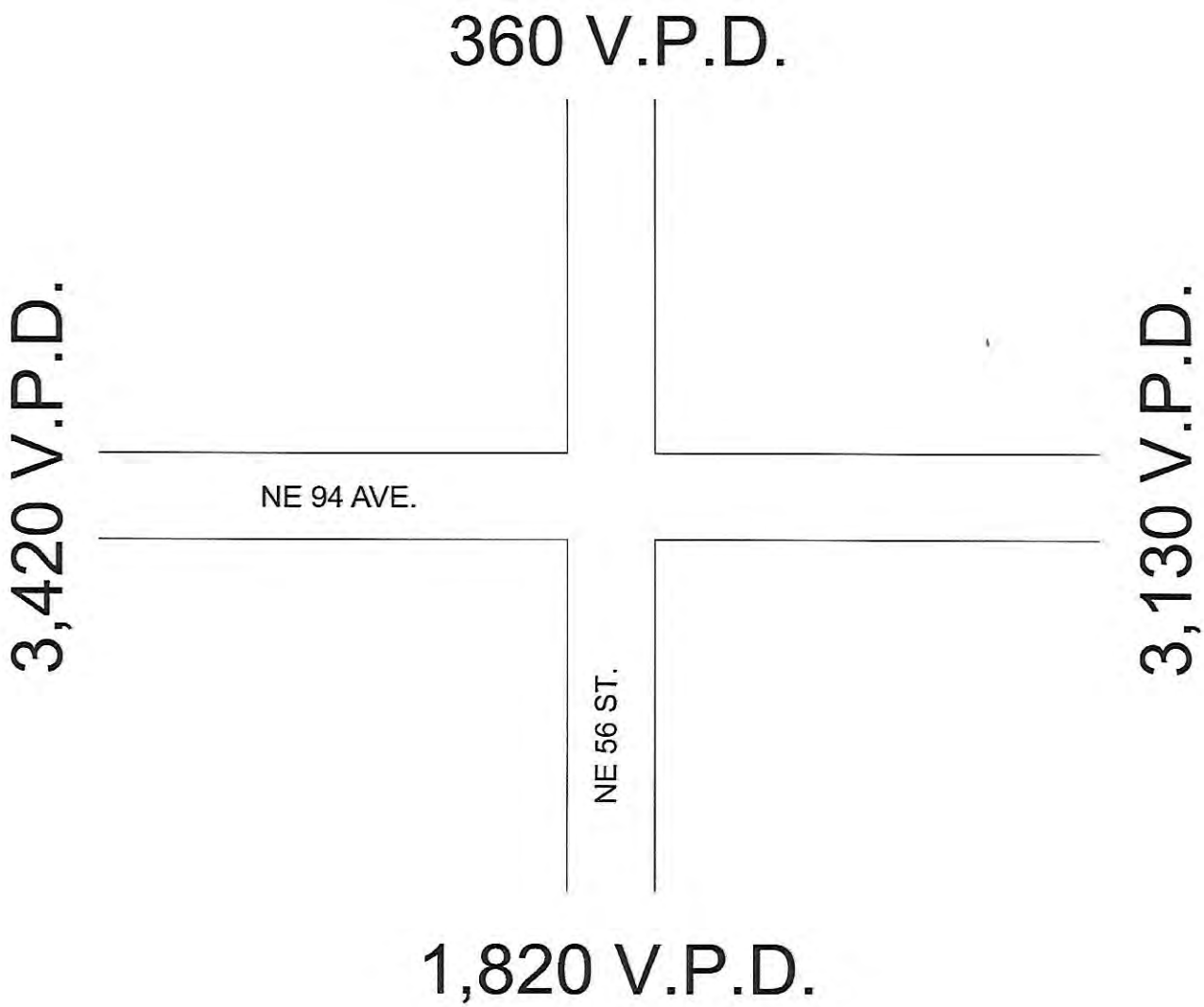
0	Fatalities @	$ 4,500,000		$ -
0	Major @	$ 325,000		$ -
4	Minor @	$ 65,000		$ 260,000
1	Possible @	$ 35,000		$ 35,000
	Property Damage			$ 141,200

TOTAL DAMAGE $ 436,200

TRAFFIC VOLUME INFORMATION
NE 56 ST. AT NE 94 AVE.

J

NO SCALE



ALL TRAFFIC COUNTS
I.D.O.T. 2016 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

TRAFFIC COUNTS AT INTERSECTION OF NE 56 ST. AT NE 94 AVE.

File Name: S:\Engineering\Bentley Design\Intersections\PROPOSED TSF\NE 56 ST_NE 94 AVE\NE 56 ST_NE 94 AVE TSF APP MAPS.dgn ModelName: Default Date: 8/4/2020 11:08AM
Plotted by KLB

Section K

Not Applicable

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Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: KDB Date Prepared: Jul 27, 2020

Intersection: NE 56 St. at NE 94 Ave

Improvement

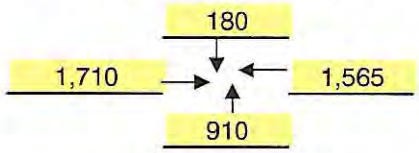
Proposed Improvement(s): Add Red solar powered LED Flashing beacons on NE 56 St. Stop signs, and add Yellow solar powered LED flasing beacons on NE 94 Ave. on approach to NE 56 St.

$ 40,000	Estimated Improvement Cost, **EC**	10	Estimated Service Life, years, **Y**
$ 200	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 1,622	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 41,622	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: DOT 2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,593,225 Current Annual Entering Veh., **AEV** = DEV * 365

5,321 veh / day, Final Year DEV, **FDEV**

17.45 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

2.0% Projected Traffic Growth (0%-10%), **G**

4,365 Current Daily Entering Vehicles, **DEV**

Crash Data

2016 First full year --> 2020 Last full year 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$	-
		0	Major Injuries @	$325,000	$	-
4	Injury Crashes	4	Minor Injuries @	$65,000	$	260,000
		1	Possible Injuries @	$35,000	$	35,000
6	Property Damage Only		(assumed cost per crash)	$7,400	$	-
		-OR-	enter all Property Costs of all crashes:		$	141,200
10	Total Crashes, **TA**		Total $ Loss, **LOSS**		$	436,200

2.00	Current Crashes / Year, **AA** = TA / T	**1.26**	Crashes / MEV, Crash Rate, **CR**
$ 43,620	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
21.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 477,309	Present Value of Avoided Crashes, **BENEFIT**
1.24	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 54,089	Crash Costs Avoided in First Year, AAR x AVC		
13.6	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $477,309 : $41,622 = **11.47** : 1

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project: Flashing Beacons at NE 108 St. and IA Hwy 163.

Applicant: Polk County Public Works

Contact Person: Kurt D. Bailey, P.E. Title: County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: (515) 286-3705 (Area Code) E-Mail: Kurt.bailey@polkcountyiowa.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	$ 50,000
Total Project Cost	$ 50,000
Safety Funds Requested	$ 50,000

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 Polk County

Signed: Kurt D Bailey — August 13, 2020

Signature — Date Signed

Kurt D. Bailey, P.E.

Printed Name

Attest: [signature] — 8/13/2020

Signature — Date Signed

Kyle Riley

Printed Name

Res. No. 110-20
August 4, 2020

RESOLUTION

Moved by Connolly, Seconded by Brownell that the following Resolution be adopted:

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

WHEREAS, the Polk County Public Works Department regularly monitors traffic safety on roadways within its jurisdiction; and

WHEREAS, an engineering study has been completed which shows that the number of accidents could potentially be reduced if flashing beacons were installed at the following locations:

- At intersection of NE 56th Street and NE 94th Avenue
- At intersection of NW 44th Street and NW 118th Avenue
- At intersection of NE 108th Street and IA Hwy 163; and

WHEREAS, the Polk County Public Works Department recommends that an application for each location be submitted to the Iowa Department of Transportation for possible Traffic Safety Funding.

NOW, THEREFORE, BE IT RESOLVED that the Polk County Board of Supervisors hereby endorse these intersection improvement projects and authorize the Polk County Public Works Department to maintain the improvements within the County's jurisdiction after construction is completed should funding be awarded; and

BE IT FURTHER RESOLVED that the Polk County Board of Supervisors authorized the Polk County Engineer to sign said funding application certifications and direct the Polk County Public Works Department to submit the applications to the Iowa Department of Transportation for possible Traffic Safety Improvement Program funding.

POLK COUNTY, IOWA

Matt McCoy

Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice

Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Requests:
NE 108 St/Hwy 163 $50,000
NE 56 St/NE 94 Ave. $40,000
NW 44 St/NW 118 Ave. $40,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

AUG - 4 2020

ALLOWED BY VOTE OF BOARD

Matt McCoy
CHAIRPERSON

Steve Van Oort	~~Yea~~	~~Nay~~ a.
Robert Brownell	~~Yea~~	Nay
Tom Hockensmith	~~Yea~~	Nay
Angela Connolly	~~Yea~~	Nay
Matt McCoy	~~Yea~~	Nay
Yea 4	Nay 1 - ABSENT	

Above tabulation made by RD

#11

B

NARRATIVE

The Polk County Secondary Road system continues to experience increasing traffic volumes due to the population growth and economic expansion occurring in the Des Moines metropolitan area. Due to this growth, the Public Works Department annually performs traffic safety reviews of over fifty (50) intersections that have experienced a history of accidents over the last 10 years. One of the intersections we reviewed was the intersection of NE 108th Street and IA Hwy 163.

It has only been in the last 3 years that we have seen in increase in the accidents at this intersection, and while the number of accidents in the last 5 years has not been high, the severity has high. This is likely due to the 65 mph speed limit on Hwy 163, but all the fact that 3 of the 5 accidents involved drivers on NE 108 St. running the Stop signs. This has resulted in 1 Fatality, 1 Major Injury, 4 Minor injuries, and 5 Possible injuries on just six (6) accidents.

This intersection is located 2.5 miles east of the Pleasant Hill city limits, and 3.3 miles east of the SE Polk Community School District Complex. NE 108th Street is a two-lane roadway with a Minor Collector federal functional classification with a posted speed limit of 45 mph.

IA Hwy 163 is a four-lane divided highway with at grade intersections and is classified as an Other Principal Arterial with a posted speed limit of 65 mph. This roadway serves as major commuter and freight route from SE Iowa into the Des Moines metro area, and is the route to the Metro Waste Authority's complex near the Polk County line.

As you can in the roadway photos in Section F, the grade of both NE 108 St. and Hwy 163 are very rolling in nature, so while there appears to be ample sight distance from the stop conditions, motorists are still failing to stop or failing to see on-coming traffic. Based on the 5-year accident history and severity, we believe this intersection warrants traffic safety improvements.

As you can see in Section G, we propose to install yellow post mounted flashing beacons and intersection warning signs on Hwy 163 on approach to NE 108th Street, and red post mounted flashing beacons on the NE 108th St. stop signs to give additional warning to motorists, especially those on NE 108 St. that the stop condition exists. This same improvement was added just one half mile east of this intersection at NE 112th St. after fatality accidents occurred and has thus far very effective. A detailed cost estimate for these improvements can be found in Section C. The relatively low cost of these improvements results in a very high Benefit/Cost ratio.

C

ENGINEER'S ESTIMATE NE 108th Street and IA Hwy 163 Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 100.00	$ 200.00
2	REMOVAL OF TYPE A SIGN ASSEMBLY	EA	2.00	$ 100.00	$ 200.00
3	TYPE A SIGNS, SHEET ALLUMINUM	SF	38.00	$ 22.50	$ 855.00
4	TRAFFIC CONTROL	LS	1.00	$ 1,500.00	$ 1,500.00
5	FLAGGERS	EA	3.00	$ 515.00	$ 1,545.00
6	MOBILIZATION	LS	1.00	$ 5,500.00	$ 5,500.00
7	PEDESTAL POLES W/CONCRETE FOUNDATIONS	EA	6.00	$ 1,200.00	$ 7,200.00
8	SOLAR POWERED 12-INCH FLASHING BEACONS	EA	6.00	$ 5,500.00	$ 33,000.00
	TOTAL ESTIMATED CONSTRUCTION COST				**$ 50,000.00**

D

PROJECT TIME SCHEDULE

Proposed NE 108th Street and IA Hwy 163 Advanced Signing with Solar Powered Beacons

IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

Polk County, Iowa

PROJECT PHASE	2021											
(YEAR 2021)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement	■	■	■									
Project Design and Project Plan Approvals			■	■	■							
Iowa DOT Bid Letting						■						
Project Construction/Pole Manufacture time							■	■	■			
Project Closeout										■	■	

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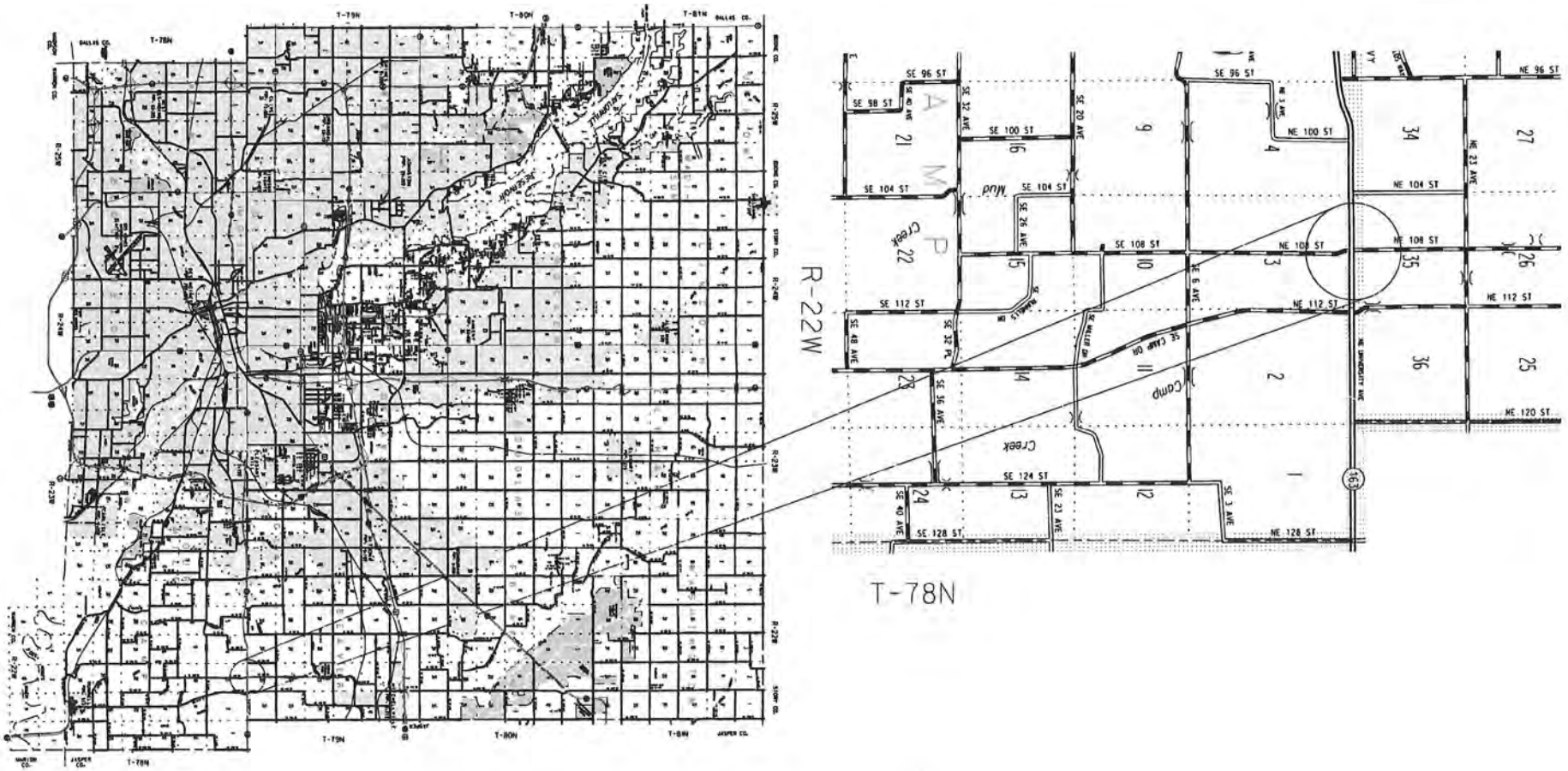
Plotted by KLB

NO SCALE

NORTH



E

F

Figure 1 Eastbound Hwy 163 approaching Intersection.

Figure 2 Westbound Hwy 163 approaching Intersection.

Figure 3 Northbound NE 108 St. approaching Intersection.

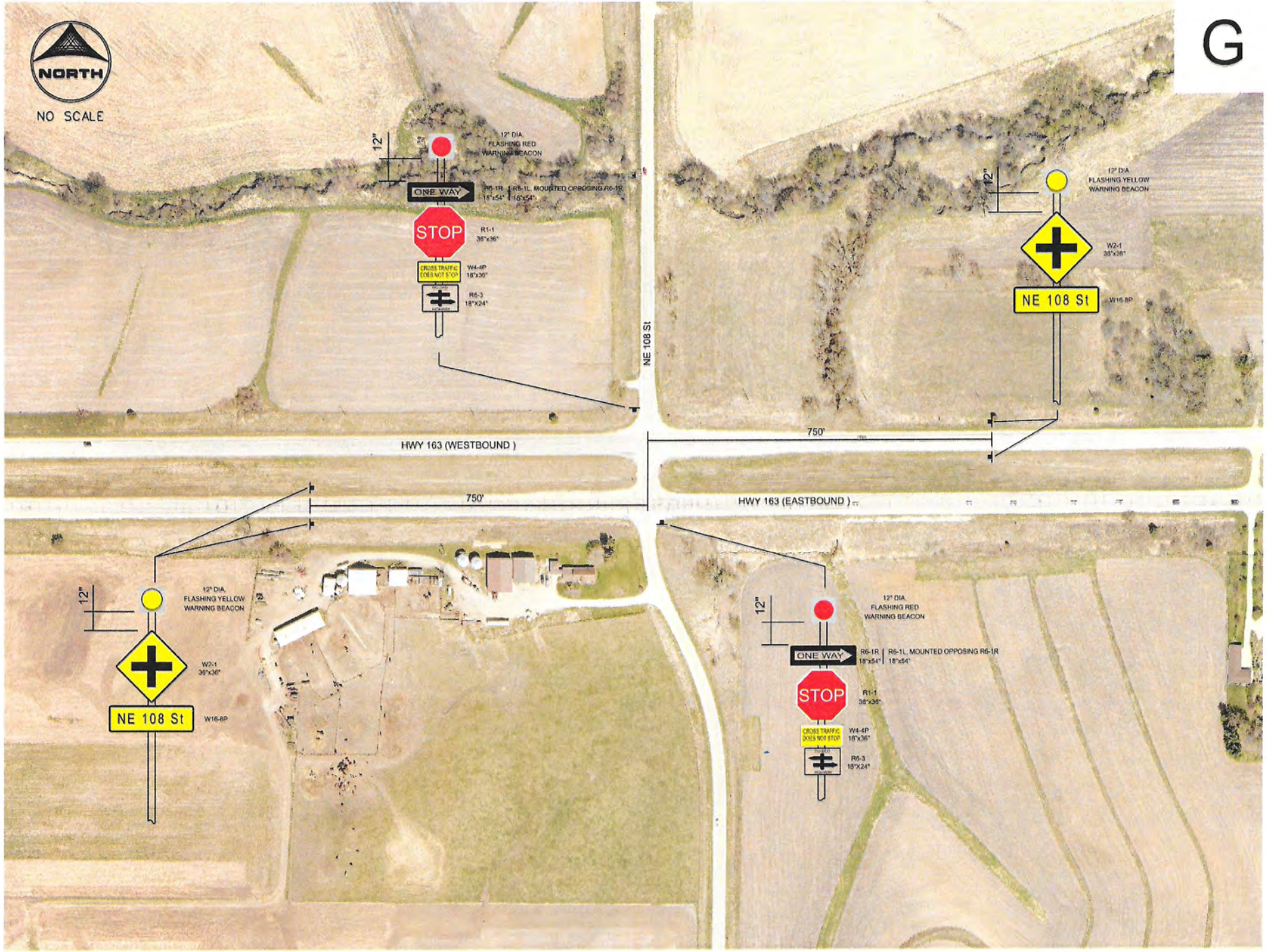
Figure 4 Southbound NE 108 St approaching Intersection.

Figure 5 Looking West from Northbound Stop Condition- NE 108 Street.

Figure 6 Looking East from Northbound Median Stop Condition- NE 108 Street

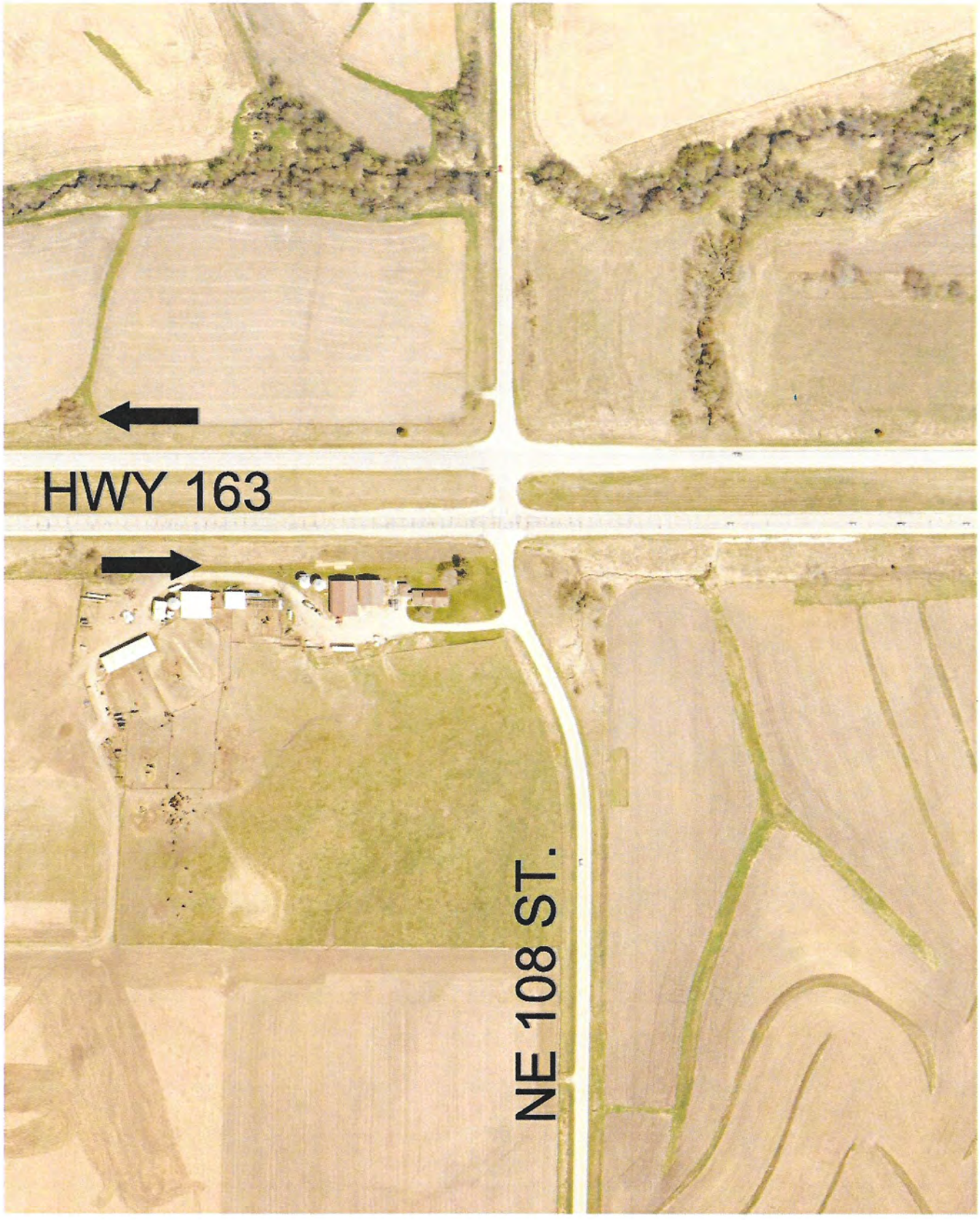
Figure 7 Looking East from Southbound Stop Condition- NE 108 Street

Figure 8 Looking West from Southbound Median Stop Condition- NE 108 Street


NORTH
NO SCALE
G
12"
12" DIA
FLASHING RED
WARNING BEACON
ONE WAY
R6-1R | R6-1L MOUNTED OPPOSING R6-1R
18"x54" | 18"x54"
STOP
R1-1
36"x36"
CROSS TRAFFIC
DOES NOT STOP
W4-4P
18"x36"
R6-3
18"X24"
NE 108 St
12" DIA
FLASHING YELLOW
WARNING BEACON
W2-1
36"x36"
NE 108 St
W16-8P
750'
HWY 163 (WESTBOUND)
HWY 163 (EASTBOUND)
750'
12"
12" DIA
FLASHING YELLOW
WARNING BEACON
W2-1
36"x36"
NE 108 St
W16-8P
12"
12" DIA
FLASHING RED
WARNING BEACON
ONE WAY
R6-1R | R6-1L MOUNTED OPPOSING R6-1R
18"x54" | 18"x54"
STOP
R1-1
36"x36"
CROSS TRAFFIC
DOES NOT STOP
W4-4P
18"x36"
R6-3
18"X24"

NORTH

NO SCALE



I

ACCIDENT HISTORY

NE 56 STREET AT NE 94 AVENUE

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	33-4965	8/29/2015	PI	1-MINOR	$ 7,000	REAR-END - NB
2	33-4965	1/14/2016	PDO		$ 20,000	FAIL TO CONTROL - PASSING - WB
3	33-4965	8/3/2016	PI	1-MINOR	$ 30,000	FTY FROM STOP - NB
4	33-4965	3/8/2017	PDO		$ 14,000	FTY FROM STOP - SB
5	33-4965	4/23/2017	PI	1-FATAL 1-MAJOR 1-MINOR	~~$ 30,000~~	FTY FROM STOP - NB (METH FOUND ON DRIVER)
6	33-4965	9/25/2017	PI	2-MINOR	$ 20,000	FTY FROM STOP - NB
7	33-4965	12/29/2017	PDO		$ 11,000	FTY FROM STOP - NB TO WB
8	33-4965	6/17/2018	PI	1-POSS.	$ 28,200	RAN STOP SIGN (NB)
9	33-4965	11/12/2018	PDO		$ 4,500	FTYROW:From Stop Sign (NB)
10	33-4965	4/28/2019	PDO		$ 3,500	FAILURE TO STOP IN ASSURED CLEAR DISTANCE (NB)
11	33-4965	7/2/2019	PDO		$ 3,000	FTY FROM STOP - NB
12	33-4965	1/23/2020	PI	3-MINOR	~~$ 50,000~~	FTY FROM STOP - NB - Alcohol involved
10		**Total Accidents Last 5 Years Only Not including Impaired Drivers**		**0 fatality 0 major 4 minor 1 possible**	**$ 141,200**	**Total Property Damage**

SUMMARY

0	Fatalities @	$ 4,500,000		$ -
0	Major @	$ 325,000		$ -
4	Minor @	$ 65,000		$ 260,000
1	Possible @	$ 35,000		$ 35,000
	Property Damage			$ 141,200

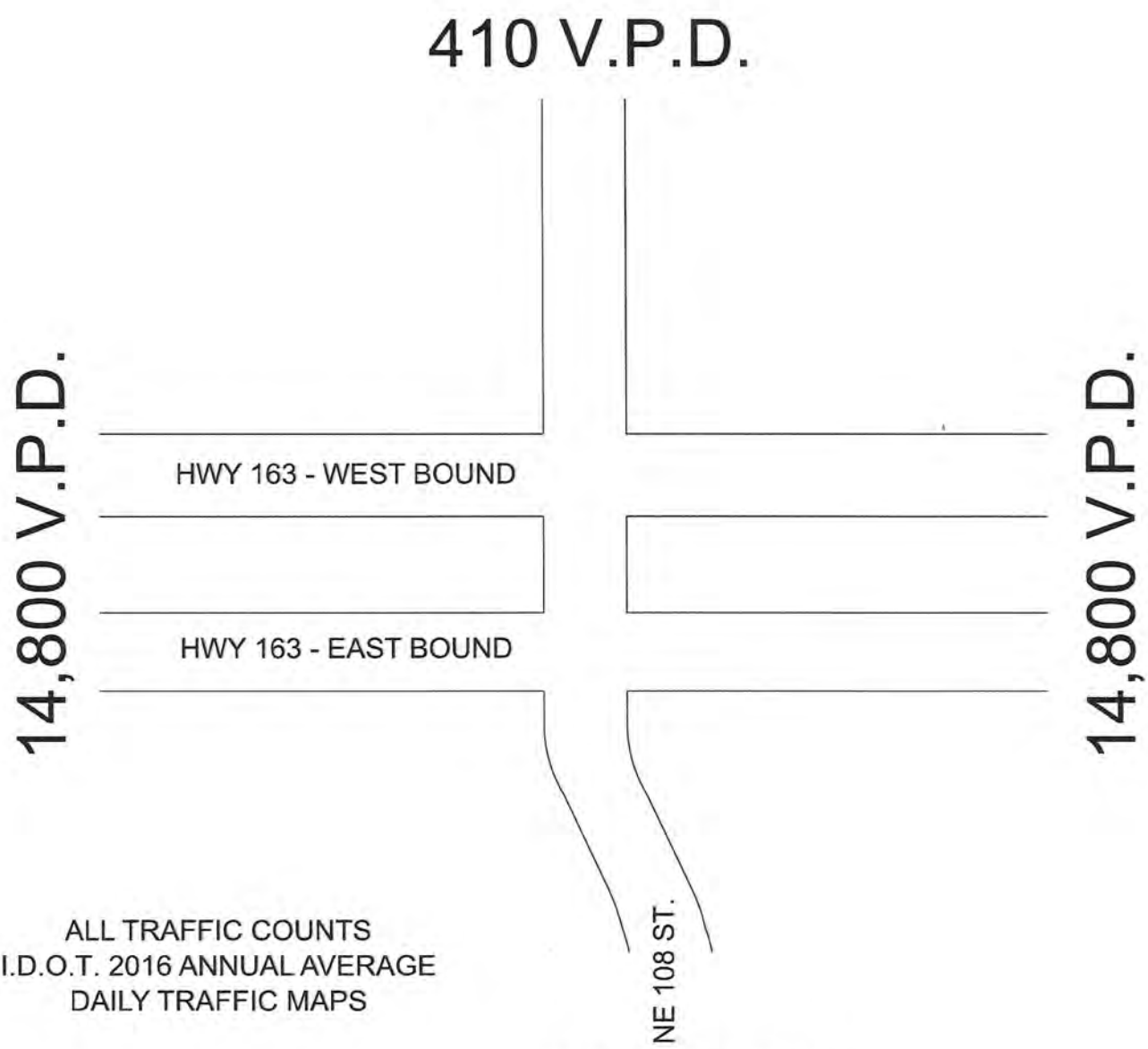
TOTAL DAMAGE $ 436,200

TRAFFIC VOLUME INFORMATION
NE 108 ST. AT HWY 163

J

NORTH

NO SCALE



ALL TRAFFIC COUNTS
I.D.O.T. 2016 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

TRAFFIC COUNTS AT INTERSECTION OF NE 108 ST. AND HWY 163

File Name: S:\Engineering\Bentley Design\Intersections\PROPOSED TSF\NE 108 ST_HWY 163\NE 108 ST_HWY 163 TSF APP MAPS.dgn Model Name: Default Date: 8/3/2020 3:22PM
Plotted by KLB

Section K

Not Applicable

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Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: KDB Date Prepared: Jul 27, 2020

Intersection: NE 108 St. at IA HWY 163

Improvement

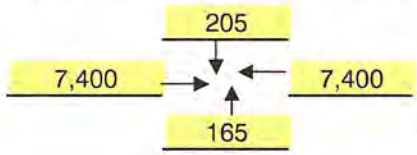
Proposed Improvement(s): Add Red solar powered LED Flashing beacons on NE 108 St. Stop signs, and add Dual Yellow solar powered LED flasing beacons on Hwy 163 on approach to NE 108 St.

$ 50,000	Estimated Improvement Cost, **EC**	10	Estimated Service Life, years, **Y**
$ 200	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 1,622	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 51,622**	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: DOT 2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



5,537,050	Current Annual Entering Veh., **AEV** = DEV * 365
18,492	veh / day, Final Year DEV, **FDEV**
60.63	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
15,170	Current Daily Entering Vehicles, **DEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

Crash Data

2016 First full year --> 2020 Last full year 5.0 years, Time Period, **T**

Additional months

1	Fatal Crashes	1	Fatalities @	$4,500,000	$ 4,500,000
		1	Major Injuries @	$325,000	$ 325,000
5	Injury Crashes	4	Minor Injuries @	$65,000	$ 260,000
		5	Possible Injuries @	$35,000	$ 175,000
0	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 142,000
6	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 5,402,000

1.20	Current Crashes / Year, **AA** = TA / T	0.22	Crashes / MEV, Crash Rate, **CR**
$ 900,333	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
13.1	Total Expected Crashes, **TECR** = CR x TMEV	**$ 5,911,109**	Present Value of Avoided
0.74	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 669,848	Crash Costs Avoided in First Year, AAR x AVC		
8.1	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $5,911,109 : $51,622 = **114.51** : 1

Application for SITE-SPECIFIC TSIP FUNDS

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

Location / Title of Project: Flashing Beacons at NW 44th St. and NW 118th Ave.

Applicant: Polk County Public Works

Contact Person: Kurt D. Bailey, P.E. Title: County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: (515) 286-3705 (Area Code) E-Mail: Kurt.bailey@polkcountyiowa.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	$ 40,000
Total Project Cost	$ 40,000
Safety Funds Requested	$ 40,000

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 Polk County

Signed: Kurt D Bailey — Signature

August 13, 2020 — Date Signed

Kurt D. Bailey, P.E. — Printed Name

Attest: JSK Riley — Signature

8/13/2020 — Date Signed

Kyle Riley — Printed Name

Res. No. 110-20
August 4, 2020

RESOLUTION

Moved by Connolly, Seconded by Brownell that the following Resolution be adopted:

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

WHEREAS, the Polk County Public Works Department regularly monitors traffic safety on roadways within its jurisdiction; and

WHEREAS, an engineering study has been completed which shows that the number of accidents could potentially be reduced if flashing beacons were installed at the following locations:

- At intersection of NE 56th Street and NE 94th Avenue
- At intersection of NW 44th Street and NW 118th Avenue
- At intersection of NE 108th Street and IA Hwy 163; and

WHEREAS, the Polk County Public Works Department recommends that an application for each location be submitted to the Iowa Department of Transportation for possible Traffic Safety Funding.

NOW, THEREFORE, BE IT RESOLVED that the Polk County Board of Supervisors hereby endorse these intersection improvement projects and authorize the Polk County Public Works Department to maintain the improvements within the County's jurisdiction after construction is completed should funding be awarded; and

BE IT FURTHER RESOLVED that the Polk County Board of Supervisors authorized the Polk County Engineer to sign said funding application certifications and direct the Polk County Public Works Department to submit the applications to the Iowa Department of Transportation for possible Traffic Safety Improvement Program funding.

POLK COUNTY, IOWA

Matt McCoy

Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice

Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Requests:
NE 108 St/Hwy 163 $50,000
NE 56 St/NE 94 Ave. $40,000
NW 44 St/NW 118 Ave. $40,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

AUG - 4 2020

ALLOWED BY VOTE OF BOARD

Matt McCoy
CHAIRPERSON

Steve Van Oort	~~Yea~~	~~Nay~~ a
Robert Brownell	~~Yea~~	Nay
Tom Hockensmith	~~Yea~~	Nay
Angela Connolly	~~Yea~~	Nay
Matt McCoy	~~Yea~~	Nay
Yea 4	Nay 1 - ABSENT	

Above tabulation made by BD

#11

B

NARRATIVE

The Polk County Secondary Road system continues to experience increasing traffic volumes due to the population growth and economic expansion occurring in the Des Moines metropolitan area. Due to this growth, the Public Works Department annually performs traffic safety reviews of over fifty (50) intersections that have experienced a history of accidents over the last 10 years. One of the intersections we reviewed was the intersection of NW 44th Street and NW 118th Avenue.

While we added oversized Stop signs with red flags, and double Stop Ahead signs with flags in 2016, we continue to see accidents involving a driver on NW 44th Street failing to yield to through traffic on NW 118th Avenue. Traffic volumes or accident rates do not warrant an all-way stop condition at this time.

This intersection is located 0.25 miles east of Polk City and 1.75 miles NW of the Ankeny city limits. NW 44th Street is a two-lane roadway with a Minor Collector federal functional classification south of NW 118 Ave. with a posted a posted speed limit of 55 mph. This roadway serves as a north/south commuter route between the west side of Ames and the Ankeny/Metro area and has seen significant growth in traffic volume from 410 VPD in 2008, to 1620 VPD in 2016 south of NW 118 Ave.

NW 118th Ave. is a 24' wide HMA roadway and is classified as a Major Collector with a posted speed limit of 55 mph. This roadway serves as commuter route for residents in Polk City and northern Ankeny, as well as the main connector to the Mile Long Bridge through Polk City, and is the only continuous east/west corridor on the north side of Ankeny.

Even though there is ample sight distance from the stop condition, motorists are still failing to either see on-coming traffic, especially northbound traffic, and not yielding to on-coming traffic. Based on the 5-year accident history in Section I, we believe this intersection warrants traffic safety improvements.

As you can see in Section G, we propose to install yellow flashing beacons and intersection warning signs on NW 118th Avenue and red flashing beacons on the NW 44th Street stop signs to give additional warning to motorists, especially those on NW 118th Avenue that traffic may be entering unexpectedly. We believe the addition of these beacons will not only reduce the number of accidents, but also reduce the severity of the accidents. A detailed cost estimate for these improvements is shown in Section C. The relatively low cost of these improvements results in a high Benefit/Cost ratio over 15:1.

C

ENGINEER'S ESTIMATE NW 44th Street and NW 118th Avenue Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 100.00	$ 200.00
2	REMOVAL OF TYPE A SIGN ASSEMBLY	EA	2.00	$ 100.00	$ 200.00
3	TYPE A SIGNS, SHEET ALLUMINUM	SF	24.00	$ 22.50	$ 540.00
4	TRAFFIC CONTROL	LS	1.00	$ 1,500.00	$ 1,500.00
5	FLAGGERS	EA	3.00	$ 520.00	$ 1,560.00
6	MOBILIZATION	LS	1.00	$ 6,000.00	$ 6,000.00
7	PEDESTAL POLES W/CONCRETE FOUNDATIONS	EA	4.00	$ 1,500.00	$ 6,000.00
8	SOLAR POWERED 12-INCH FLASHING BEACONS	EA	4.00	$ 6,000.00	$ 24,000.00
	TOTAL ESTIMATED CONSTRUCTION COST				**$ 40,000.00**

D

PROJECT TIME SCHEDULE

Proposed NW 44th Street and NW 118th Avenue Advanced Signing with Solar Powered Beacons

IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

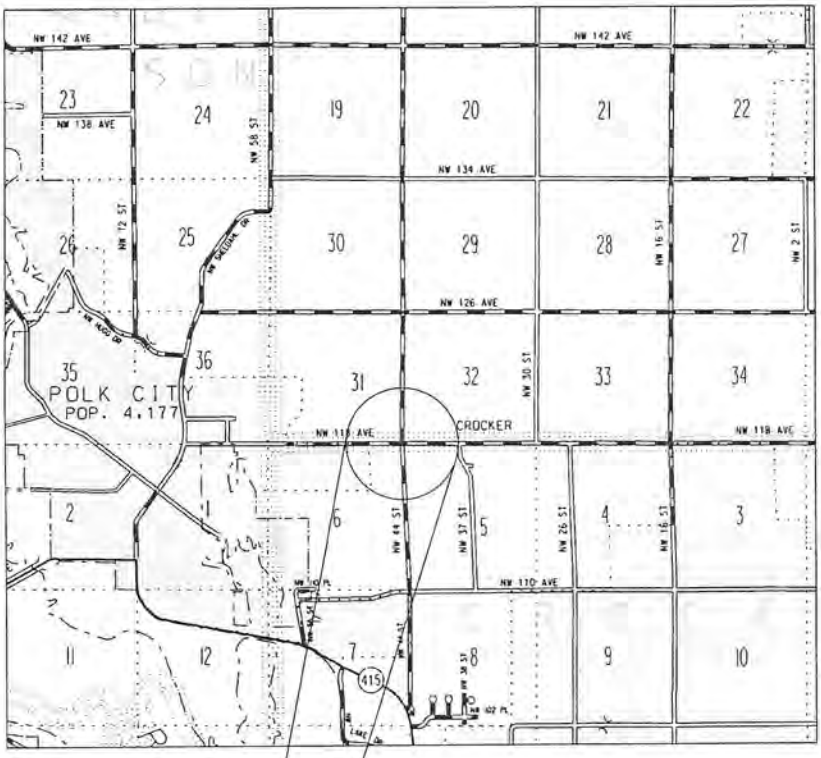
Polk County, Iowa

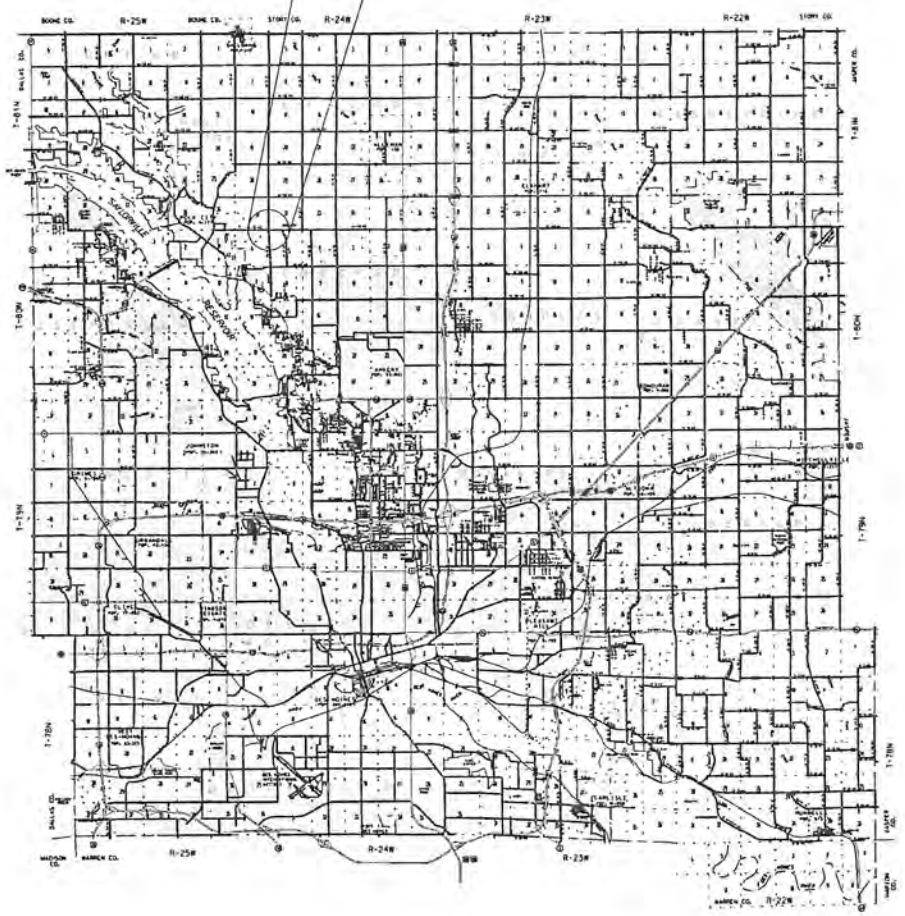
PROJECT PHASE	2021											
(YEAR 2021)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement	■	■	■									
Project Design and Project Plan Approvals			■	■	■							
Iowa DOT Bid Letting						■						
Project Construction/Pole Manufacture time							■	■	■			
Project Closeout										■	■	

E

NORTH

NO SCALE





F

Figure 1 Eastbound NW 118 Avenue Approaching Intersection.

Figure 2 Westbound NW 118 Avenue Approaching Intersection.

Figure 3 Looking West from Northbound Stop Condition- NW 44 Street.

Figure 4 Looking East from Northbound Stop Condition- NW 44 Street

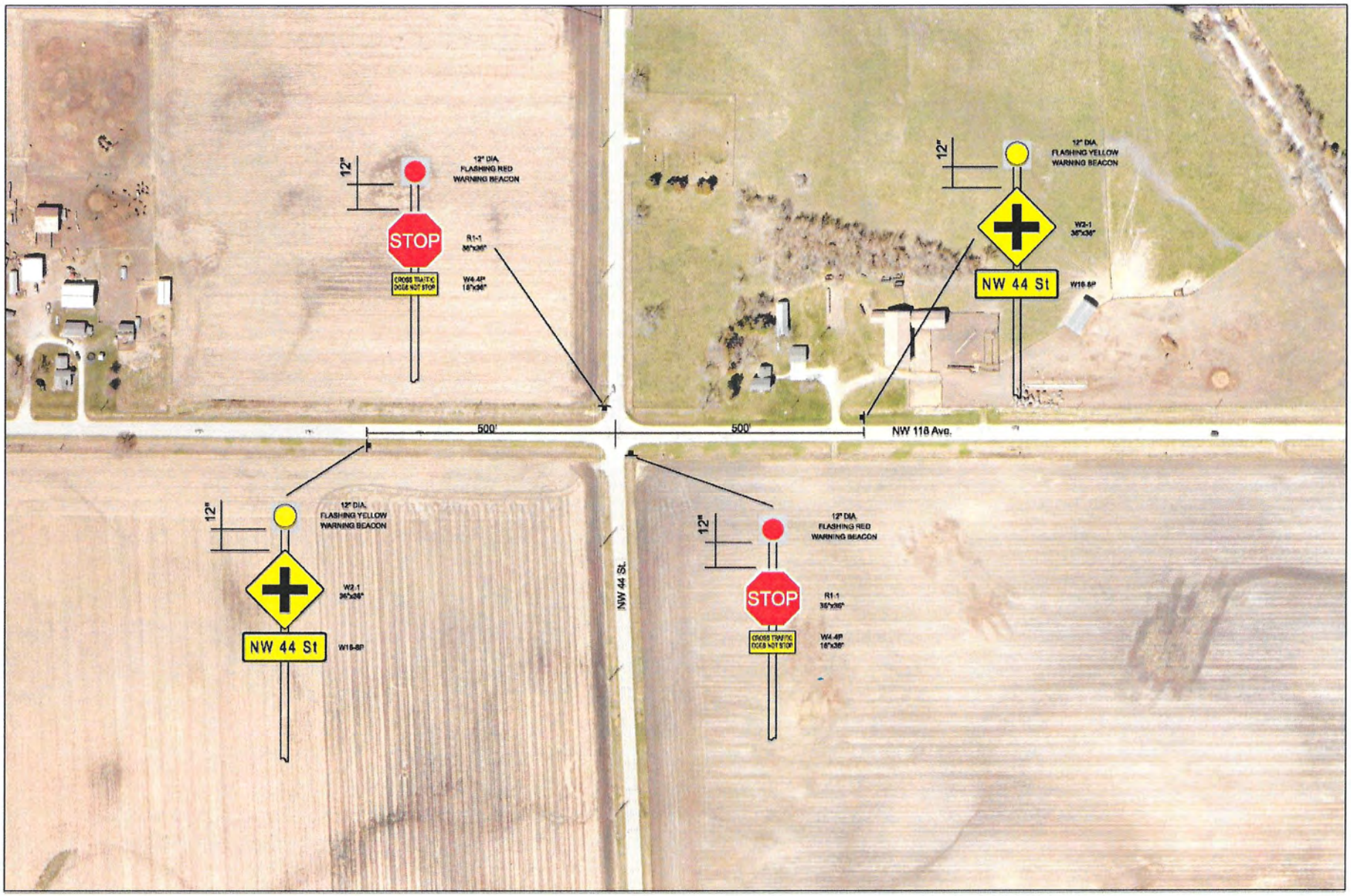
Figure 5 Looking West from Southbound Stop Condition- NW 44 Street

Figure 6 Looking East from Southbound Stop Condition- NW 44 Street

G

NORTH

NO SCALE



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Plotted by KLB

NO SCALE

H

NW 118 AVE.

NW 44 ST.

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I

ACCIDENT HISTORY

NW 44 Street and NW 118 Avenue

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	42-0117	10/27/2015	PI	1 POSS	$ 5,000	FOLLOWING TOO CLOSE - REAR END - WB
2	42-0117	1/19/2016	PDO		$ 1,300	RAN STOP SIGN - FAIL TO CONTROL - NB
3	42-0117	5/5/2016	PDO		$ 1,700	FOLLOWING TOO CLOSE - REAR END - WB
4	42-0117	6/22/2016	PDO		$ 12,000	RAN STOP SIGN - FAIL TO CONTROL - NB
5	42-0117	9/13/2016	PI	2 MINOR	$ 17,000	FTY - FROM STOP - NB
6	42-0117	11/15/2016	PDO		$ 4,500	FAILURE TO STOP SAFELY - REAR END - EB
7	42-0117	6/10/2017	PDO		$ 5,500	FTY - FROM STOP - SB
8	42-0117	3/25/2018	PDO		$ 4,000	FOLLOWING TOO CLOSE - REAR END - SB
9	42-0117	6/9/2018	PI	2 - Minor	~~$ 30,450~~	Ran Stop Sign - SB - Alcohol Involved
10	42-0117	10/26/2018	PI	1 - POSS	$ 6,000	FTYROW: SB
11	42-0117	12/18/2018	PI	1 - POSS 1 - Minor	$ 35,000	Failure to stop in clear assured dist NB
12	42-0117	3/26/2019	PDO		$ 9,000	Failure to stop in clear assured dist - Distracted Driver WB
13	42-0117	3/27/2019	PDO		$ 30,000	FTYROW: From stop sign NB
14	42-0117	6/5/2019	PDO		$ 2,600	Failure to stop in assured clear distance - WB
15	42-0117	8/12/2019	PDO		$ 4,000	Failure to stop in assured clear distance - SB
16	42-0117	9/15/2019	PDO		$ 10,000	FTYROW: From stop sign SB
17	42-0117	2/25/2020	PI	2 - Minor	$ 20,000	FTYROW: From stop sign SB
16		**Accidents Last 5 Years that Beacons would impact**		**0 fatality 0 major 5 minor 3 possible**	**$ 167,600**	**Total Property Damage**

SUMMARY

0	Fatalities @	$ 4,500,000		$ -
0	Major @	$ 325,000		$ -
5	Minor @	$ 65,000		$ 325,000
3	Possible @	$ 35,000		$ 105,000
	Property Damage			$ 167,600

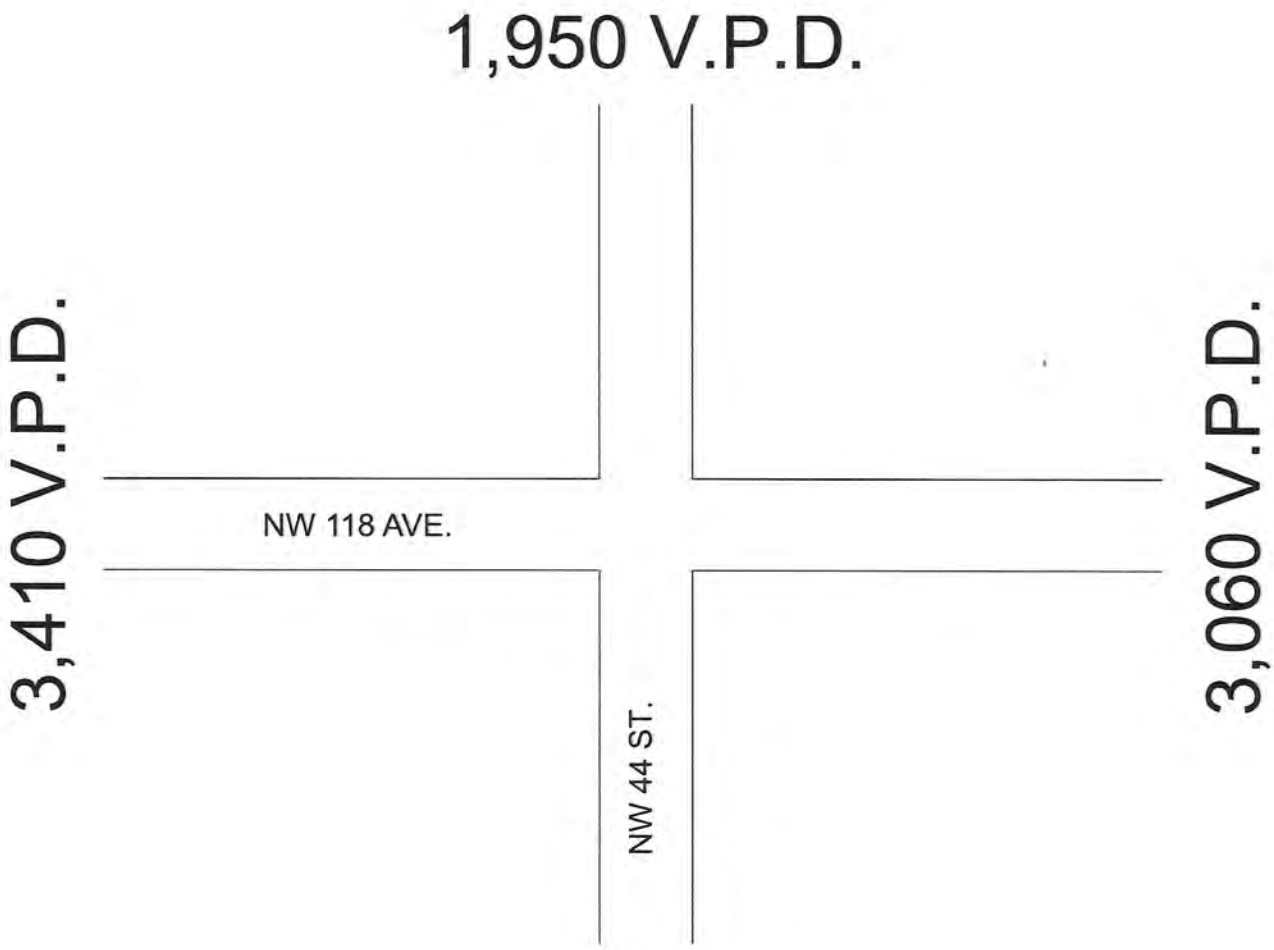
TOTAL DAMAGE $ 597,600

TRAFFIC VOLUME INFORMATION
NW 44 ST. AT NW 118 AVE.

J

NORTH

NO SCALE



ALL TRAFFIC COUNTS
I.D.O.T. 2016 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

TRAFFIC COUNTS AT INTERSECTION OF NW 44 ST. AT NW 118 AVE.

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Plotted by: KLB

Section K

Not Applicable

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Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/18

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: KDB Date Prepared: Jul 27, 2020

Intersection: NW 44 St. at NW 118 Ave

Improvement

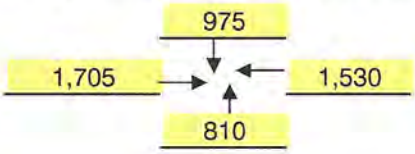
Proposed Improvement(s): Add Red solar powered LED Flashing beacons on NE 56 St. Stop signs, and add Yellow solar powered LED flasing beacons on NW 118 Ave. on approach to NW 44 St.

$ 40,000	Estimated Improvement Cost, **EC**	10	Estimated Service Life, years, **Y**
$ 200	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 1,622	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 41,622	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: DOT 2016 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,832,300 Current Annual Entering Veh., **AEV** = DEV * 365

6,119 veh / day, Final Year DEV, **FDEV**

20.06 MEV, Total Million Entering Veh. Over life of Project, **TMEV**

$$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$$

2.0% Projected Traffic Growth (0%-10%), **G**

5,020 Current Daily Entering Vehicles, **DEV**

Crash Data

2016 First full year --> 2020 Last full year 5.0 years, Time Period, **T**

Additional months

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
5	Injury Crashes	5	Minor Injuries @	$65,000	$ 325,000
		3	Possible Injuries @	$35,000	$ 105,000
11	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 167,600
16	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 597,600

3.20	Current Crashes / Year, **AA** = TA / T	**1.75**	Crashes / MEV, Crash Rate, **CR**
$ 37,350	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
35.0	Total Expected Crashes, **TECR** = CR x TMEV	$ 653,921	Present Value of Avoided
1.98	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 74,102	Crash Costs Avoided in First Year, AAR x AVC		
21.7	Total Avoided Crashes, TECR x CRF/ 100		

$$BEN. = \frac{AVC \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $653,921 : $41,622 = **15.71** : 1

WASHINGTON COUNTY, IOWA

Transportation Safety Improvement Program

2020 Grant Application – Site Specific

Prepared by:
Washington County Engineer's Office
210 West Main Street, Washington, IA 52353

INDEX

GRANT APPLICATION

Application for SITE-SPECIFIC TSIP FUNDS

GENERAL INFORMATION **DATE:** 07/13/2020

Location / Title of Project W-55 (Wayland Road)

Applicant Washington County

Contact Person Jacob Thorius Title County Engineer

Complete Mailing Address 210 West Main St

Washington, IA 52353

Phone 319-653-7731 (Area Code) E-Mail thorius@co.washington.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) N/A

Contact Person _____ Title _____

Complete Mailing Address N/A

_____

Phone N/A (Area Code) E-Mail N/A

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Funding Amount

Total Safety Cost	$ 245,832
Total Project Cost	$ 398,745
Safety Funds Requested	$ 245,832

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

☒Yes – Explain Local Road Safety Plan (2017) recommended adding paved shoulders.

☐No

GRANT APPLICATION

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 Washington County Board of Supervisors

Signed: _____ 7/21/2020
Signature Date Signed

Jacob Thorius, P.E.
Printed Name

Attest: _____ 7/21/2020
Signature Date Signed

Kathy Dolan
Printed Name

A. RESOLUTION

RESOLUTION 20-45

APPROVAL OF APPLICATION FOR TRANSPORTATION SAFETY IMPROVEMENT PROGRAM FUNDING FOR PAVED SHOULDERS ON W-55 (WAYLAND RD.)

WHEREAS, the Washington County Board of Supervisors recognizes the need to incorporate safety features in Secondary Roads projects, and

WHEREAS, Transportation Safety Improvement Program Funds are made available annually to qualifying local projects in amounts not to exceed $500,000 to facilitate the incorporation of said safety features, and

WHEREAS, application for said funds must be submitted to the Iowa Department of Transportation for review and approval, and

WHEREAS, as a part of the application procedure, a commitment of funds and a commitment to maintain the facility for the useful life of the improvement must be made by the applicant, and

THEREFORE, BE IT RESOLVED, that the Board of Supervisors of Washington County, Iowa, as a part of the application for Transportation Safety Improvement Program Funding, resolves to commit to the additional funds needed above and beyond those granted to Washington County by the Transportation Safety Improvement Program and to supply the Construction and Engineering cost for the County Road W-55 (Wayland Road) Paved Shoulder Project (beginning at the Washington/Henry County Line and extending north 2.0 miles to 320th Street) from existing county funding and also resolve to maintain the facility for the useful life of the improvements;

BE IT FURTHER RESOLVED by the Washington County Board of Supervisors that the Washington County Engineer be authorized to execute and submit the application to the Iowa Department of Transportation for Traffic Safety Improvement Program funding.

Adopted this 21st day of July, 2020.

The vote on the resolution:
Aye Seward Young Miller Stoops Yoder
Nay —
Abstain —
Absent —

JACK SEWARD, JR.
Chairperson, Board of Supervisors

Attest:
DANIEL L. WIDMER
County Auditor

B. PROJECT NARRATIVE

Summary

Washington County is applying for TSIP Funds to improve the safety of a 2.0-mile section of County Road W-55 by adding paved shoulders with a safety edge and edge line rumble strips.

Existing Conditions

The alignment of this road follows an old trail from the 1800's that was subsequently re-graded in the 1930's, asphalted in the 1950's and later paved with concrete in 1978. Currently, the road is paved 22' wide with 6' gravel shoulders. Because of the built-up geometry, the foreslopes are 2:1 or worse in many places making the road unforgiving for vehicles that leave the traveled roadway. The road is a commuter route to Washington and also carries area farm traffic. It has a traffic count of 1650 VPD and is the only road heading from the City of Washington to Wayland.

Safety Problem

The poor, outdated geometry and narrowness of the road contributes to accidents. Specifically, the majority of accidents are single-vehicle run off the road accidents. The narrowness of the roadway leads to edge ruts which is a common contributor to the accidents. Whether caused by a distraction, heavy wind, icy conditions, animals, or simple inattentiveness, once the tires of a vehicle are off the road, the driver is confronted with navigating their vehicle on gravel at high speed. Drivers often over correct or get caught in the edge rut along the pavement, leading to accidents.

Roadway Safety Research

- A Road Safety Audit (RSA) was completed in 2009 for this roadway. The audit recommended adding paved shoulders and rumble strips as well as flattening foreslopes, eliminating brush, and upgrading curve signage.
- A Local Road Safety Plan (LRSP) for Washington County was completed in 2017. That plan also adding paved shoulders would be helpful in reducing accidents.

Proposed Project

Washington County is proposing to add 4' paved shoulders with a safety edge and rumble strips. TSIP funds will pay for 2' of the paved shoulder and the rumble strips. This improvement has proven effective in reducing accidents and eliminating the edge rut.

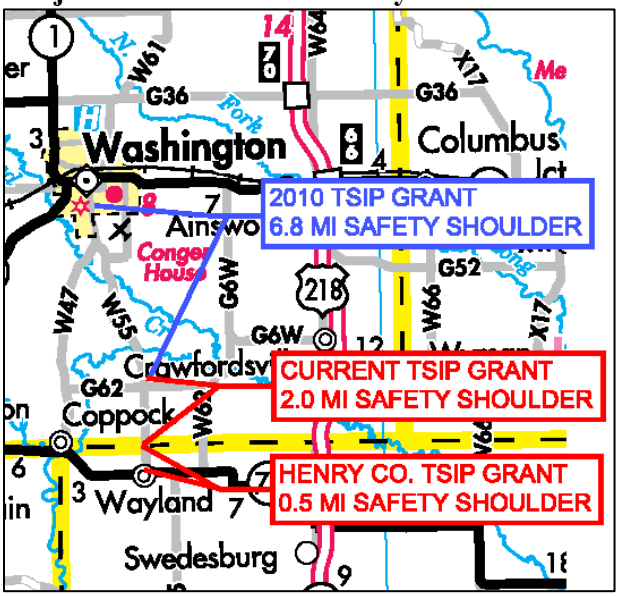
Proven Results

Washington County previously applied for and received 2010 TSIP funding for the northern portion of this roadway. The same paved shoulder improvements proposed in this application were added in 2011. The reduction of accident frequency and severity was significant. **As shown below, accidents were reduced on that segment by 2/3!**

	2002-09		2012-19
Fatality	2		0
Major Injury	9		4
Minor Injury	23	(Safety Shoulders	4
Property Damage Only	46	Installed in 2011)	18
TOTAL	**80**		**26**

B. PROJECT NARRATIVE (cont.)

Project and Route Continuity



Henry County plans to make a similar improvement to their section of this route. The approval of this application will ensure route continuity from the City of Washington to Wayland.

As County Engineer, I have witnessed the effectiveness of these safety improvements first hand. It is my sincere belief that we can reduce both the number and severity of accidents on the rest of this route with our combined safety efforts. We fully expect that funding this project will make a significant impact on the safety of this roadway as it has on the original segment.

C. ITEMIZED BREAKDOWN OF ALL COSTS

ITEM	BID ITEM	DESCRIPTION	UNIT	QTY	ITEM PRICE [1]	DIV 1 - SAFETY PROJECT [2]	DIV 2 - EXTRA 2' OF SHOULDER	TOTAL
1	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	1478.4	22.25	32,894	0	32,894
2	2122-5500060	PAVED SHOULDER, HMA 6"	SY	10560	25.50	134,640	134,640	269,280
3	2122-55000XX	PAVED SHOULDER, INSTALLATION OF SA	STA	211.2	100.00	21,120	0	21,120
4	2213-2713300	EXCAVATION CLASS 13, FOR WIDENING	CY	1955.56	17.00	16,622	16,622	33,244
5	2303-6911000	HOT MIX ASPHALT PAVEMENT SAMPLES	LS	1	3,300.00	1,650	1,650	3,300
6	2303-9091021	MILLED SHOULDER RUMBLE STRIPS, HMA	STA	211.2	6.55	1,383	0	1,383
7	2308-1000000	ASPHALT EMULSION FOR FOG SEAL (SHO	GAL	432.647	3.75	1,622	0	1,622
8	2528-8445110	TRAFFIC CONTROL	LS	1	11,100.00	11,100	0	11,100
9	2528-8445112	FLAGGERS	DAY	14	400.00	5,600	0	5,600
10	2528-8445144	PILOT CAR	DAY	7	600.00	4,200	0	4,200
11	2533-4980005	MOBILIZATION	LS	1	15,000.00	15,000	0	15,000
		TOTAL				245,832	152,912	398,745

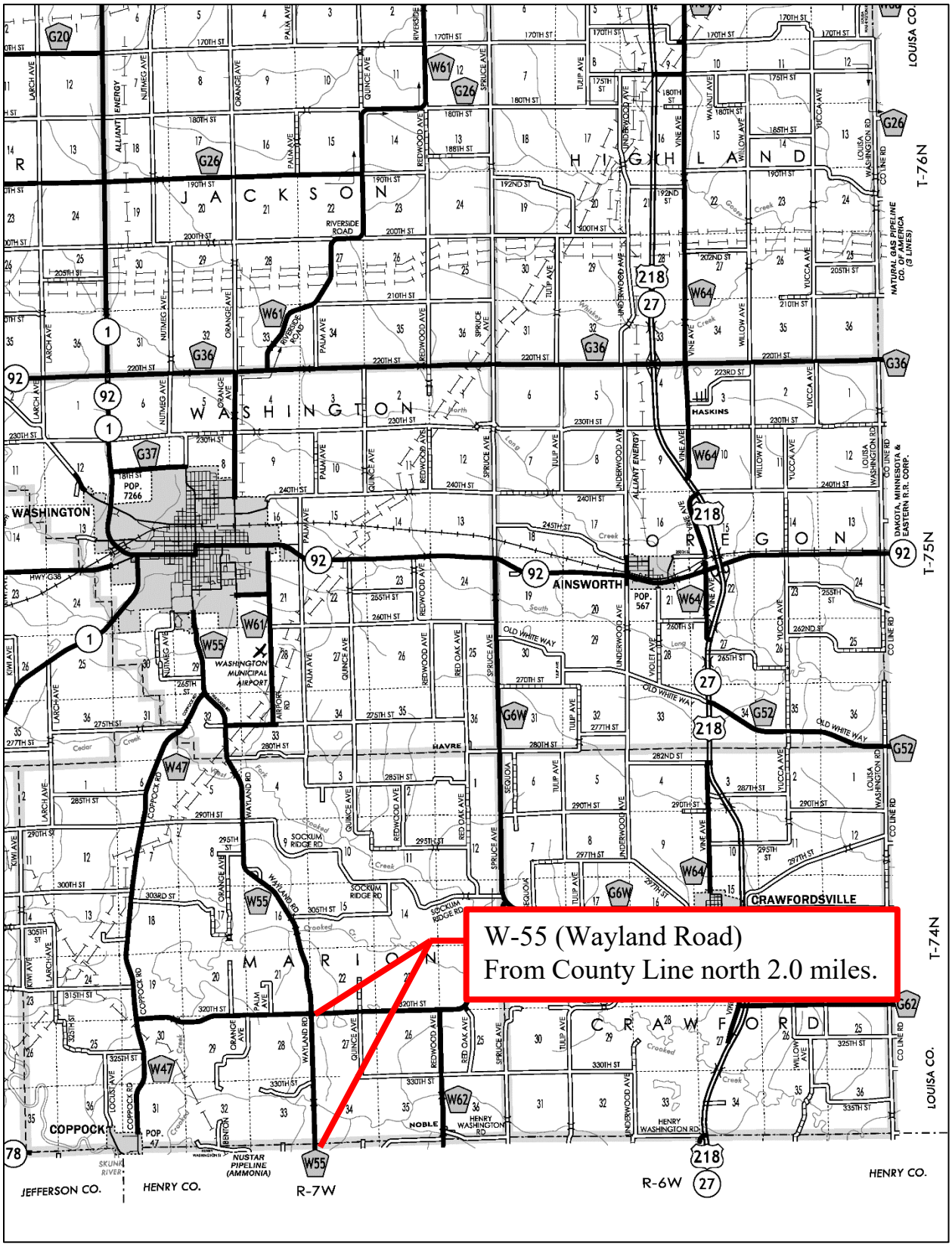
[1] Engineer Estimate bases on mix of the DOT Average prices and similar past projectS.

[2] Safety Funds account for 59% of the total costs.

D. TIME SCHEDULE

	2020					2021										
Phase	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Application Phase	→	→	→	→	→	→										
Design Phase						→	→	→	→	→	→	→				
Bid and Award												→	→	→		
Construction Phase														→	→	→

E. PROJECT LOCATION



F. COLOR PICTURES

Photo 1: Beginning of project taken at the county line looking north. Note large silo operation generating truck traffic.

Photo 2: End of project taken at 320th street looking north. Note previously completed safety shoulder project beyond 320th street.

F. COLOR PICTURES

Photo 3: Typical shoulder showing developing edge rut.

Photo 4: Typical steep foreslope (west side).

Photo 5: Typical steep foreslope (east side).

G. PLAN VIEW (NOTE: All work to be completed within existing ROW.)

G. PLAN VIEW (cont.)

H. AERIAL PHOTOGRAPH

Project begins at the Washington/Henry County line and goes north 2.0 miles to 320th St.

I. ICAT CRASH SUMMARY

IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity	11
Fatal Crash	0
Suspected Serious Injury Crash	1
Suspected Minor Injury Crash	1
Possible/Unknown Injury Crash	2
Property Damage Only	7

Injury Status Summary	6
Fatalities	0
Suspected serious/incapacitating	1
Suspected minor/non-incapacitating	2
Possible (complaint of pain/injury)	2
Unknown	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	133,863.00
Average (per crash dollars):	12,169.36
Total Vehicles:	13.00
Average (per crash):	1.18
Total Occupants:	15.00
Average (per crash):	1.36

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.45
Major Injuries/Crash:	0.09
Minor Injuries/Crash:	0.18
Possible/Unknown Injuries/Crash:	0.18

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I. ICAT CRASH SUMMARY (cont.)

IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

Major Cause			11
Animal	7	Ran traffic signal	1
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	1	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	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	1
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	0
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	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
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	1
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
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	0
Towing improperly	0	Cargo/equipment loss or shift	0
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	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

07/13/2020 2 of 7

I. ICAT CRASH SUMMARY (cont.)

IOWA DOT

Iowa Crash Analysis Tool
Quick Report
2010-2020

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	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Monday	0	0	1	0	0	0	0	1	0	1	0	0	0	3
Tuesday	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Wednesday	0	0	0	0	0	1	0	0	0	0	1	0	0	2
Thursday	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Friday	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Saturday	0	0	0	0	0	0	0	0	1	0	1	0	0	2
Total	0	0	2	1	0	2	0	1	1	2	2	0	0	11

Manner of Crash Collision	11
Non-collision (single vehicle)	8
Head-on (front to front)	1
Rear-end (front to rear)	0
Angle, oncoming left turn	0
Broadside (front to side)	2
Sideswipe, same direction	0
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	11
Dry	10
Wet	0
Ice/frost	0
Snow	1
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			13
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	1	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	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	0
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	0	None (no fixed object struck)	12

07/13/2020 3 of 7

I. ICAT CRASH SUMMARY (cont.)

Iowa Crash Analysis Tool
Quick Report
2010-2020

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	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	2	0	0	0	2
>= 30 and <= 34	1	0	0	0	1
>= 35 and <= 39	2	0	0	0	2
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	1	1	0	0	2
>= 50 and <= 54	2	1	0	0	3
>= 55 and <= 59	1	0	0	0	1
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	1	0	0	0	1
>= 85 and <= 89	0	1	0	0	1
>= 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	10	3	0	0	13

Alcohol Test Given	13
None	6
Blood	0
Urine	0
Breath	1
Vitreous	0
Refused	0
Not reported	6

Drug Test Given	13
None	7
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	6

Drug Test Result	13
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	13
Other	0

Drug/Alcohol Related	11
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug/Alcohol (< Statutory)	0
Drug/Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	11

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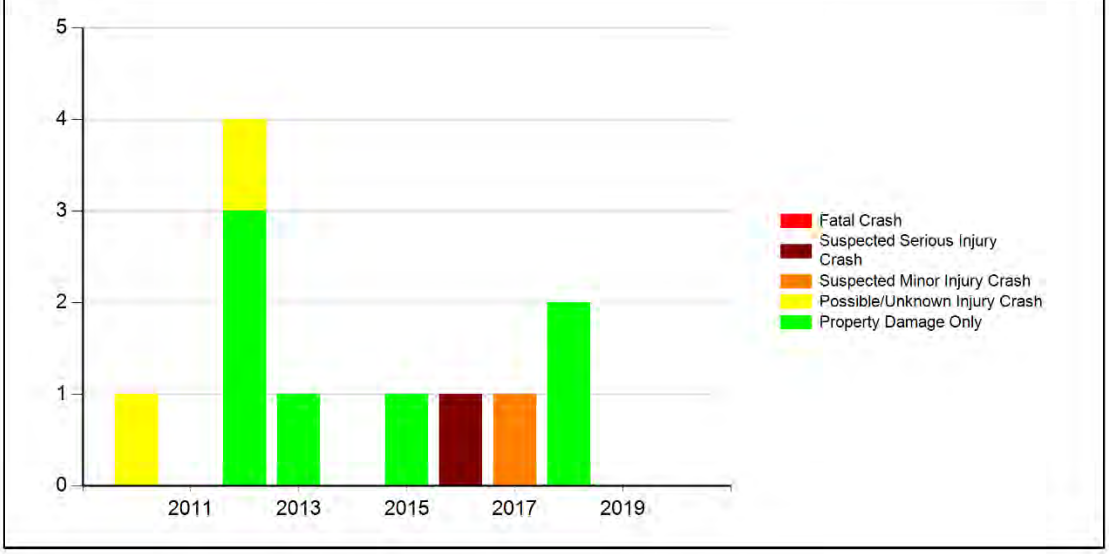
I. ICAT CRASH SUMMARY (cont.)

Iowa Crash Analysis Tool
Quick Report
2010-2020

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2010	0	0	0	1	0	1
2011	0	0	0	0	0	0
2012	0	0	0	1	3	4
2013	0	0	0	0	1	1
2014	0	0	0	0	0	0
2015	0	0	0	0	1	1
2016	0	1	0	0	0	1
2017	0	0	1	0	0	1
2018	0	0	0	0	2	2
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	1	1	2	7	11

Severity/Year



07/13/2020 5 of 7

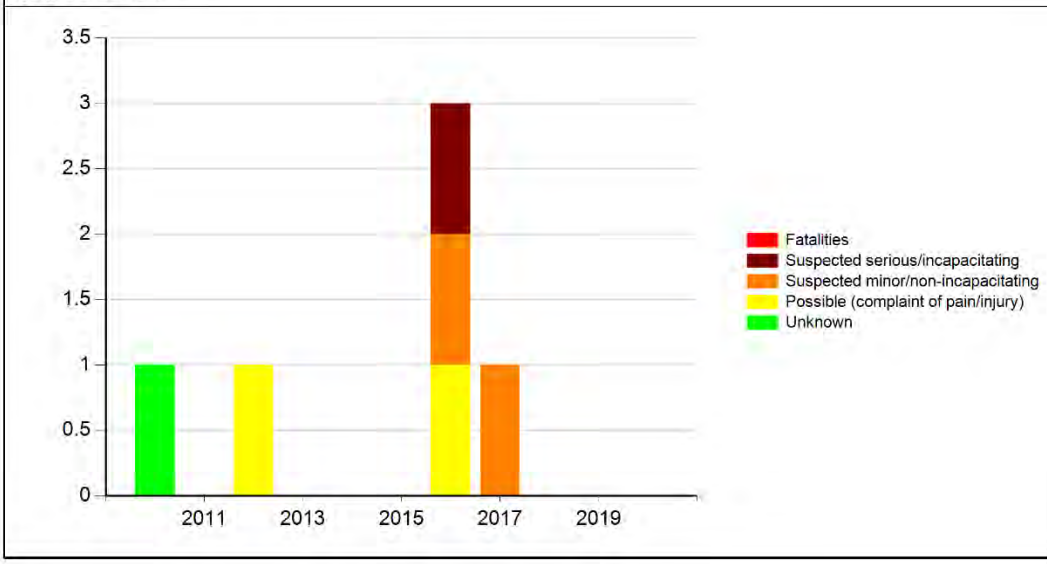
I. ICAT CRASH SUMMARY (cont.)

Iowa Crash Analysis Tool
Quick Report
2010-2020

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2010	0	0	0	0	1	1
2011	0	0	0	0	0	0
2012	0	0	0	1	0	1
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	1	1	1	0	3
2017	0	0	1	0	0	1
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
Total	0	1	2	2	1	6

Injury Status/Year



07/13/2020 6 of 7

I. ICAT CRASH SUMMARY (cont.)

Iowa Crash Analysis Tool
Quick Report
2010-2020

Meeting the following criteria

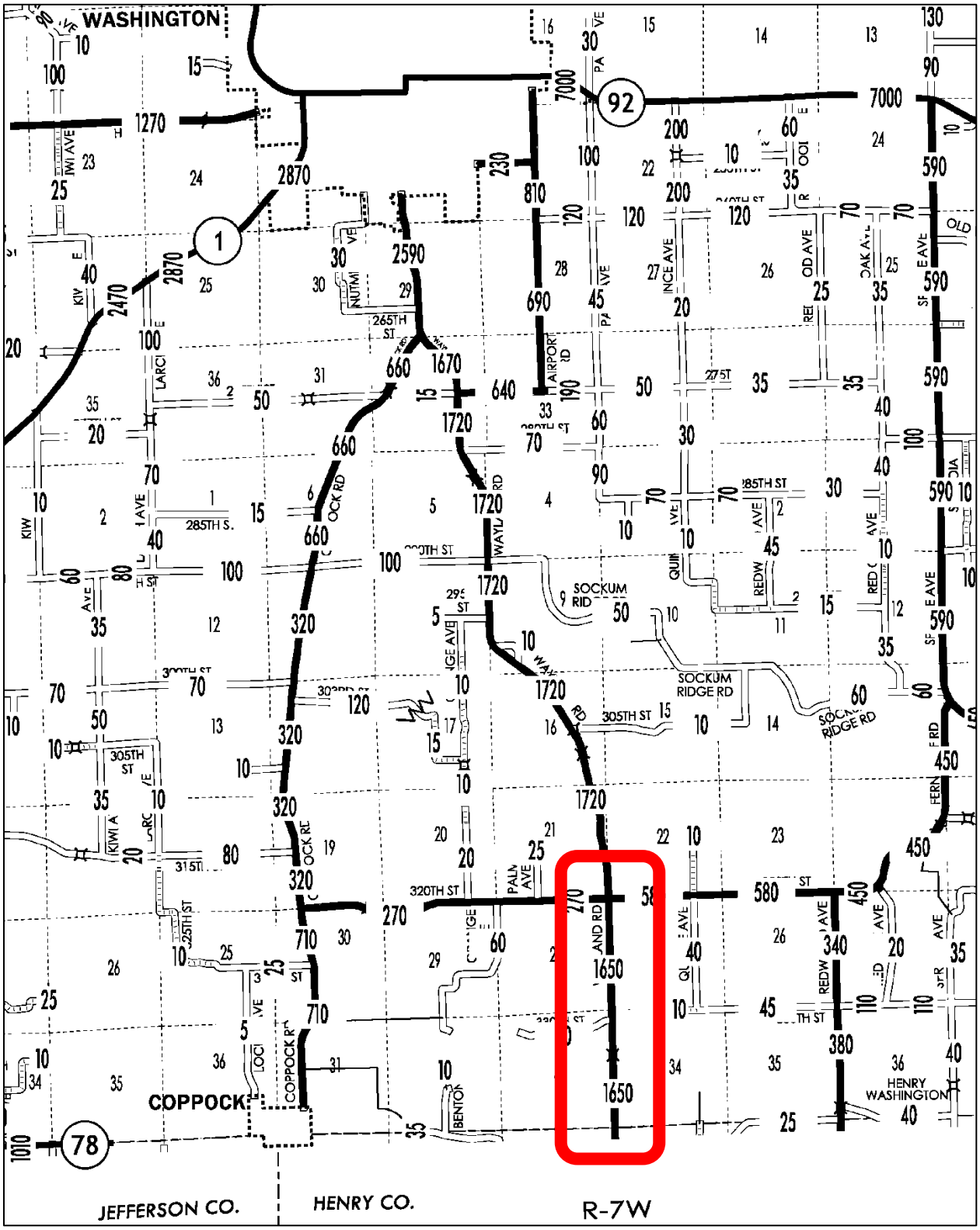
Jurisdiction: Counties (Washington)
Year: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Map Selection: Yes
Filter: None

Analyst Information

W-55 - Wayland Road
Preparred by DRP on 07/13/2020 for TSIP Application

07/13/2020 7 of 7

J. RECENT TRAFFIC VOLUME (2018 AADT from the Iowa DOT)



K. SIGNALS (NO Signals Proposed)

L. BENEFIT/COST RATIO WORKSHEET

Rev. 5/18

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: WASHINGTON Prepared by: DAVID PATTERSON Date Prepared: Jul 10, 2020

Location: W-55 FROM THE WASHINGTON/HENRY COUNTY LINE NORTH 2.0 MILES TO 320TH ST

Improvement

Proposed Improvement(s): WIDENED/PAVED SHOULDERS, MILLED RUMBLE STRIPS, AND SAFETY EDGE

$ 245,832	Estimated Improvement Cost, **EC**	20	Estimated Service Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	23	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 245,832	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT TRAFFIC COUNT 2018 Date of traffic count

Length (mi.)	Two-way veh/day	Description
2.00	1,650	
2.00	miles total	

3,300 Current Vehicle Miles / Day, **VM**

5,960 End of Life Veh. Miles / Day

1,204,500 Current Veh. Miles / Year, **AM**

32,365,366 Total Projected Veh. Miles Over Life of Project, **TVMT**

$$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$$

3.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2010 First full year –> 2019 Last full year 10.3 years, Time Period, **T**

4 Additional months

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
4	Injury Crashes	1	Minor Injuries @	$65,000	$ 65,000
		2	Possible Injuries @	$35,000	$ 70,000
7	Property Damage Only		(assumed cost per crash)	$7,400	$ 81,400
			-OR- enter all Property Costs of all crashes:		
11	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 541,400

1.06	Current Crashes / Year, **AA** = TA / T	88.4	Crashes / HMVM, Crash Rate, **CR**
$ 49,218	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
28.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8	$ 211,745	Present Value of Avoided Crashes, **BENEFIT**
0.24	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 12,051	Crash Costs Avoided in First Year, AAR x AVCR		
6.6	Total Avoided Crashes, TCR x CRF/ 100		

$$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$$

Benefit / Cost Ratio

Benefit : Cost = $211,745 : $245,832 = 0.86 : 1