Traffic Safety Improvement Program

Applications for
Site Specific
FY 2014

Received August 15, 2012

Site Specific
FY 2014

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
1	City of Urbandale	Reduce median break by adding raised Island and Eliminate left turn lanes at side entrances on US Hwy 6 / Hickman Road @ Stew Hansen & Menards Entrance in Urbandale	$150,000	$30,000
17	Hamilton County	Resurface & Pave 2' shoulders, install safety edge and add Chevrons on curves on a 5 1/2 mi section of R-33 North of Webster City to the County Line	$1,730,000	$265,000
43	City of Fort Dodge	Convert 5th Ave South from a 4 lane to a three lane, including a two-way left turn lane. Replace span wire signals with traffic signals and an offset right turn.	$550,000	$500,000
67	City of Des Moines	Add North-South left turn lanes at the Intersection of East 30th & Dean Avenue	$635,000	$500,000
89	City of Des Moines	Add left turn lanes on all 4- legs of the intersection of South East 30th Street & Scott Ave.	$490,000	$100,000
113	City of Des Moines	Median Island Modification - Traffic Signal Pole relocation at the Intersection of US 69 & US 6 (East 14th St & Euclid Ave)	$195,000	$170,000
137	City of Des Moines	Traffic Signal Upgrade at the Intersection of Us Hwy 6 (East Euclid Ave.) & Dixon Street	$180,000	$150,000
157	District #1	Signal Timing & Functional Geometric Improvements at Ia Hwy 141 & Urbandale Dr. Ramp at I-35/I-80	$500,000	$350,000
173	City of Bondurant	Install Traffic Signals, Install offset left turns on US 65, add left turn lanes on 32nd St SW at the Intersection of US hwy 65 & 32nd Street SW	$716,000	$500,000
201	City of Grinnell	Re-Alignment of the I-80 eastbound exit ramp, dedicated southbound left turn lane, removal of Yield control in the Hwy 146 median and raised island in the east side of intersection at the I-80 East Bound exit ramp at the Intersection with IA Hwy 146	$432,040	$432,040
227	Polk County	Install Yellow Flashing Beacons & Intersection Warning Signs on IA Hwy 163 and Red Flashing Beacons on the NE 112th Street Stop Signs	$38,000	$38,000

Continued on next page

Site Specific
(Continued)

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
243	Black Hawk County	Resurface the roadway, Pave 2' shoulder, Install edgeline rumbles & add turn lane at the Washburn Road intersection From 0.25 mi South of Washburn Rd to Orange Rd South of Waterloo in Black Hawk County	$1,391,740	$500,000
273	District # 2	Install traffic signals @ the intersection of US Hwy 18 & N. Main Street as well as Install 2 railroad crossing gates, cantilevers & prediction circuitry at rail crossing next to intersection in Algona	$415,000	$415,000
291	Black Hawk County	Resurface the PCC roadway, increase sight distance, Pave 2' shoulder, Install edgeline rumbles on Co Rd. V-37 From 0.75 mi North of Schrock Rd. to Eagle Rd South of Waterloo in Black Hawk County	$2,212,265	$450,000
327	District #2	IA Hwy 3 within the City of Clarion 1.2 miles of Four to Three lane conversion	$75,000	$75,000
343	City of Clarion	Upgrade & Replace Traffic Lights & Mast Arm Mounted Traffic Signals at the Intersection of IA Hwy 3 & Co Rd. R-38 in the City of Clarion	$54,900	$45,900
365	City of Algona	Upgrade signals to provide protected left turns for North/South traffic. Improve turning radii, provide full width Right Turns on Minor approach & provide 10' clear zone@ intersection of US Hwy 169 & McGregor Street.	$412,000	$412,000
391	Humboldt County	Add 3' paved shoulders with rumbles and Wider painted Edge lines from 200' before 1st curve thru 200' past 2nd curve at Curves 1.5 mi. East of Livermore on Co Rd. C-20 in Humboldt County	$133,500	$133,500
403	Cerro Gordo County	Reconstruct Horizontal Curve to a 55 MPH design, widen road from 22' to 24' and place 4" rumble stripes in 1' Paved Shoulder on Curves Northwest of Mason City on Co Rd. B-20	$2,100,000	$400,000
429	District #2	Correction of Skew at the Intersection of US-18 & Co Rd X-26 near Monona	$43,600	$43,600
451	City of Waterloo	Install or replace Overhead or near side signals, add Durable pavement markings at Various intersection location along Washington Street (US 218) in Waterloo	$250,000	$250,000

Continued on next page

Site Specific
(Continued)

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
495	Dickinson County	Widen shoulder to 6', Grade fore slope to 3:1 & Correct Horizontal Curve and Vertical Curve on 130th Street in Dickinson County	$325,000	$325,000
507	Plymouth County	Reconstruct Intersection to increase sight distance, widen shoulders to 8' flatten profile and install turn lanes at the Intersection of Co Rd. C-38 & Co Rd. K-42 North of Merrill in Plymouth County	$1,650,000	$200,000
525	Crawford County	Base Widening, Shoulder Paving w/rumble Strips, Safety Edge & Resurfacing on Co Rd. E-16 from the City of Schleswig, west to the intersection with Co Rd. L-51 in Crawford County	$1,297,525	$500,000
551	City of Muscatine	Install new Signals and Equipment at the intersection of Cedar Street & Muscatine High School	$138,000	$138,000
585	Buchanan County	Place Edgeline and Centerline Rumbles on the 6.95 mile stretch of W35 as well as paving 4' shoulders on 2 curves from D22 to Quasqueton in Buchanan County	$90,000	$90,000
605	Clinton County	Realign the intersection by relocating the southern leg of Z-40 18' to the west and of the existing road and continue for 300' at the intersection of Z-40 & E-50	$72,000	$72,000
625	Iowa DOT Office of Traffic & Safety	Install Centerline Rumbles and Edge line Rumbles on various Federal Aid Eligible routes within the RPA #7	$5,000,000	$500,000
629	IDOT Office of Traffic & Safety	Engage an on-call contractor to provide high friction surface treatments for high-crash locations on horizontal curves in the eastern portion of Iowa.	$500,000	$500,000
631	IDOT Office of Traffic & Safety	Engage an on-call contractor to provide high friction surface treatments for high-crash locations on horizontal curves in the western portion of Iowa.	$500,000	$500,000
	Totals	**30 Projects**	**$22,276,570**	**$8,585,040**

Iowa Department of Transportation

Rev. 3/08 A

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: US 6 / HIckman Rd. & Stew Hansen / Menards Entrance Improvements

Applicant: City of Urbandale

Contact Person: Dave McKay Title: City Engineer

Complete Mailing Address: 3600 86th Street
Urbandale, Iowa 50322

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

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 150,000

Safety Funds Requested $ 30,000

Rev. 3/08 **A**

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Urbandale

Signed: _____ May 1, 2012
Signature Date Signed

Robert Andeweg, Mayor City of Urbandale
Typed Name

Attest: Debra Mains May 1, 2012
Signature Date Signed

Debra Mains, City Clerk
Typed Name

Narrative (US 6 / Hickman Rd. & Stew Hansen / Menards Drive)

Existing Conditions:

The project location is the access point on US6/ Hickman Road in Clive that serves as the main east driveway for Stew Hansen auto dealership to the north, and as the west entrance drive to Menard's building supply center to the south. It is the second driveway access point west of the interchange with Interstate 35/80 on Hickman Road. Hickman Road is classified as a principal arterial on the federal highway system and consists of 4 lane divided section with turn lanes.

This access point is unsignalized and the posted speed limit is 45 MPH.

There are high volumes of through and turning traffic, and the volumes are anticipated to grow as further development continues to occur nearby and to the west in Dallas County. The latest 2010 traffic volume is 33,600 AADT on the east leg and 31,100 AADT on the west leg.

The access location immediately to the east of this is the first driveway location west of the interchange and serves as a combined entrance to Loves truck stop and the east entrance to Menards to the south. The north side of the access location is currently undeveloped, but plans are being prepared to improve the north leg as the forth leg at this signalized location. A 40 acre commercial development is occurring to the north, and dual left turns will be added to both directions of Hickman Road. The proposed concept discussed below will be incorporated into these plans so as to be constructed at the same time.

Proposed Concept:

The proposed concept is to restrict the currently full–access driveway location to right-out only turning movements from the driveways. A raised median / island will be placed across the median to restrict traffic coming onto Hickman Road. Turning traffic on Hickman Rd. will continue to have left turn lanes and make the left-turn movements. This will eliminate three conflict points at this location.

To provide for the additional roadway width for the raised island, the north, west –bound lanes will be shifted over and a separate west bound right turn lane will be developed.

Safety Justification:

By eliminating the left-turn movements from the drives, almost half of the accidents that have occurred at this location in the 11 years should be eliminated by removing the conflict points involved in these accidents. Of the 11 crashes involving vehicles at this location from 2001 - 2011, 5 involved vehicles coming from a driveway and turning left, across two lanes of through

traffic to merge into a third lane of through traffic, all in a 45 mph posted sped zone. The other 6 crashes included 2 sideswipes, and 4 rear-ends in connection with stopping traffic approaching the signalized access location to the east.

C

Itemized Cost Breakdown
(US 6 / Hickman Rd. & Stew Hansen / Menards Drive)

US 6 / Hickman Rd. & Stew Hansens /Menards Drive

Engineer's Cost Estimate

	Description	Quantity	Unit	Unit Cost	Extended Cost
1	Pavement Removal	510	SY	$7.50	$3,825.00
2	Excavation, Class 10	250	CY	$10.00	$2,500.00
3	Subgrade Prep	1975	SY	$3.00	$5,925.00
4	PCC pavement, 10.5"	1120	SY	$65.00	$72,800.00
5	PCC pavement, 10.5", Driveway	365	SY	$60.00	$21,900.00
6	PCC median	490	SY	$45.00	$22,050.00
7	Storm Intake	1	EA	$3,000.00	$3,000.00
8	Convert Intake to Manhole	1	EA	2,000.00	$2,000.00
9	Storm Sewer, 15" RCP	10	LF	$40.00	$400.00
10	Paint Markings	31	STA	$100.00	$3,100.00
11	Traffic Control	1	LS	$3,000.00	$3,000.00
12	Silt fence	900	LF	$1.50	$1,350.00
13	Relocate Power Pole	1	EA	$4,000.00	$4,000.00
14	Relocate Light Pole	2	EA	$2,000.00	$4,000.00
	Total				$149,850.00

D

Time Schedule (US 6 / Hickman Rd. & Stew Hansen / Menards Drive)

Preliminary Plans: October 2012

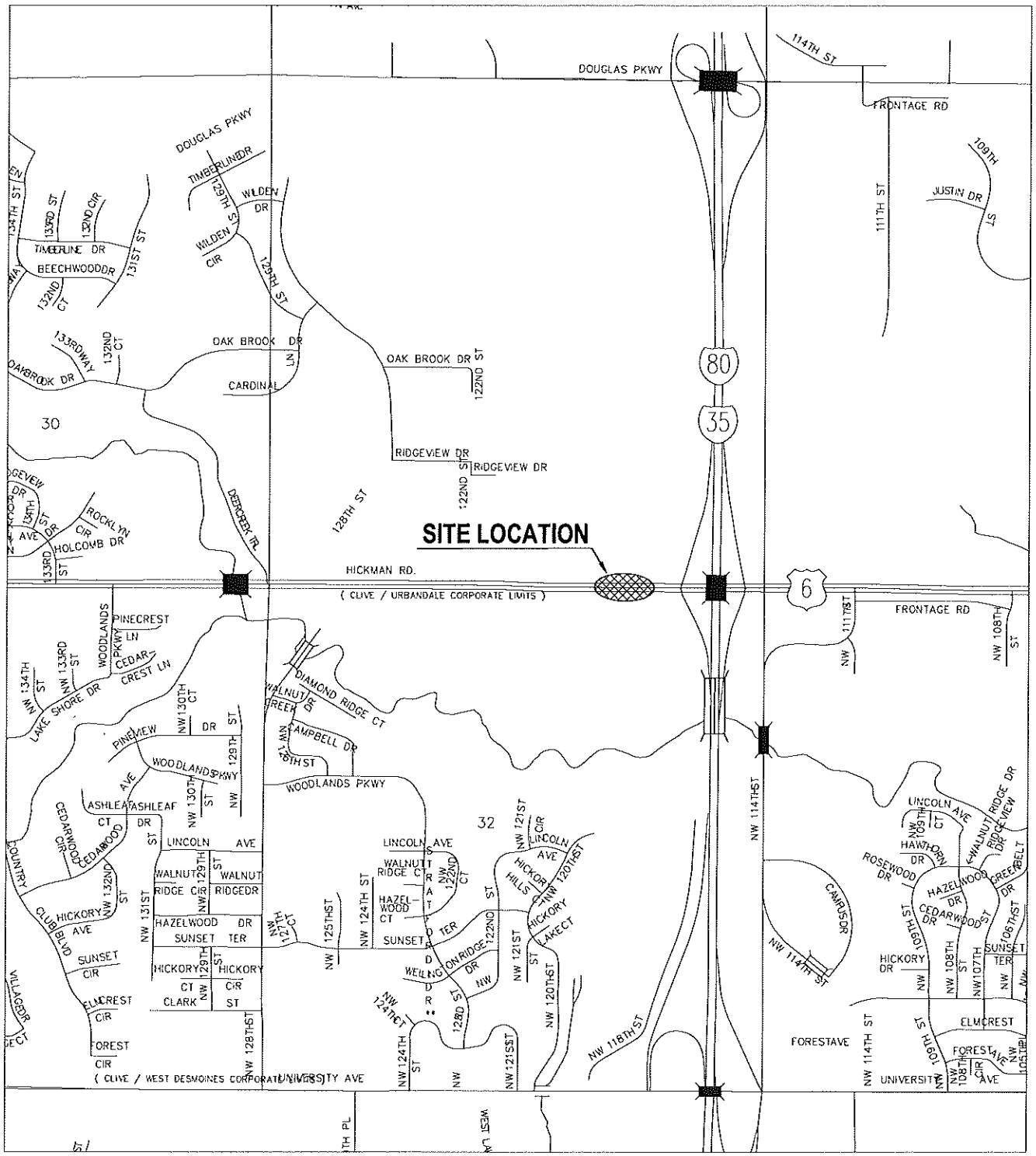
Final Plans: January 2013

Begin Construction: April 2013

Construction Completion: July 2013

Site Map (US 6/ Hickman Rd. & Stew Hansens / Menards Drive

E



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Pictures (US 6 / Hickman Rd. & Stew Hansen / Menards Drive)

Looking West along south side of US 6/ Hickman Rd. at access location.

Looking South to Menard's Drive.

F

Looking East along north side of US 6 / Hickman Rd.

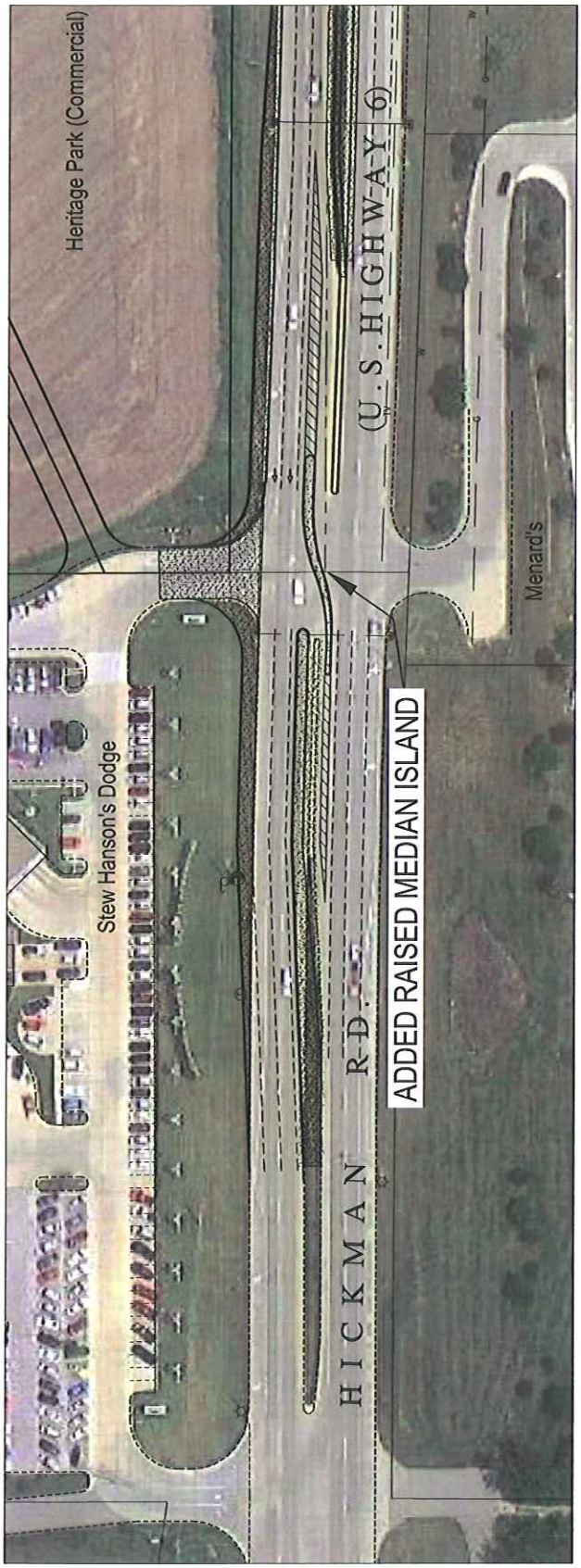
Looking West along north side of Hickman Rd.

F

Looking North to Stew Hansen's Drive.

Plan View (US 6/ Hickman Rd. & Stew Hansens / Menards Drive

G



GRAPHIC SCALE
1 inch = 40ft. (IN FEET)

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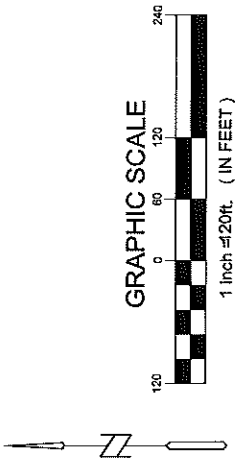
Aerial Photo (US 6/ Hickman Rd. & Stew Hansens / Menards Drive

H



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Accident Reports (US 6 / Hickman Rd. & Stew Hansen / Menards Drive)

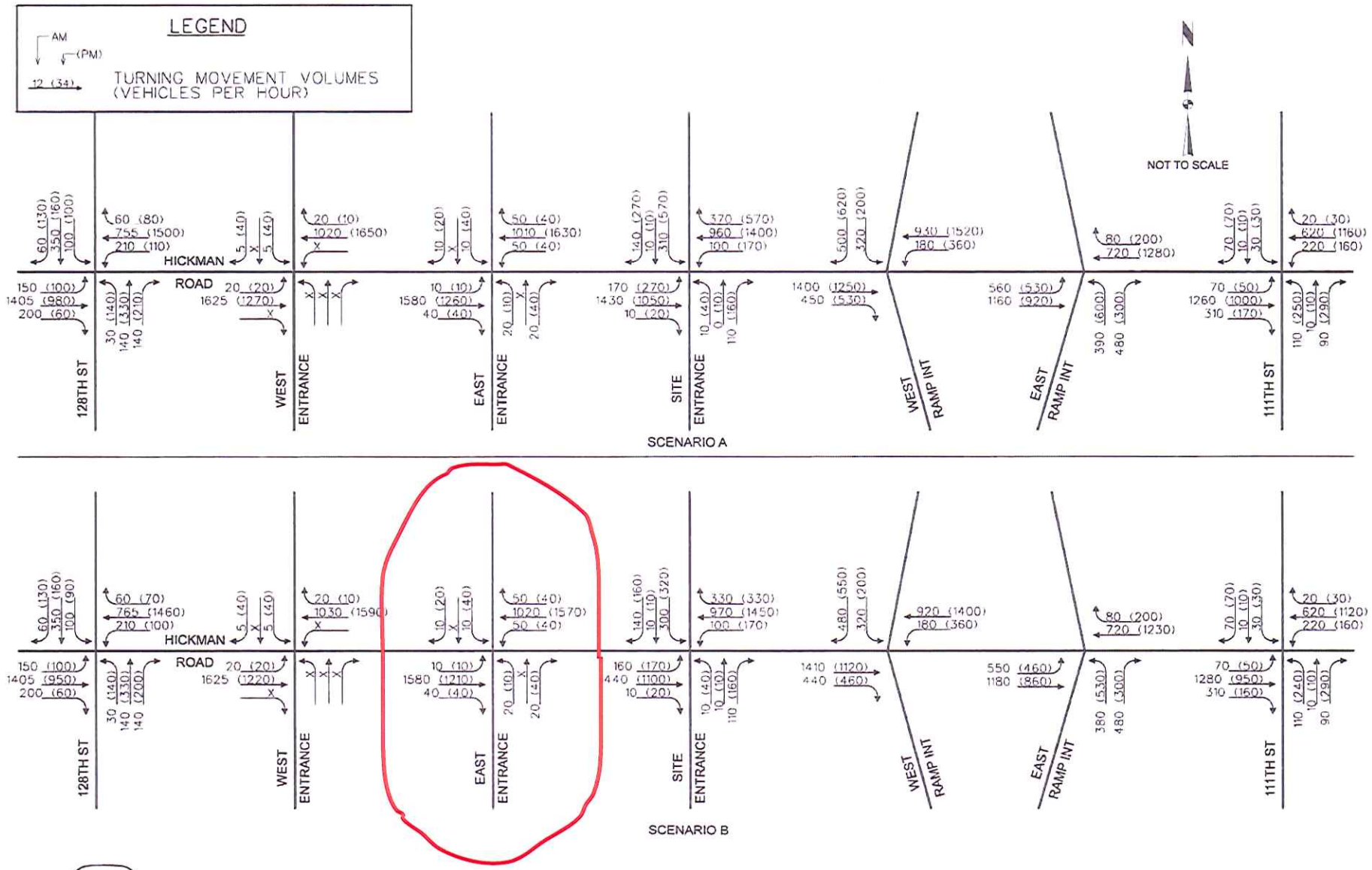
Summary:

2001 - 2011* Reportable Crash History
within 150 feet of the approximate location of west Menards entrance off Hickman
Clive/Urbandale, Iowa
(* 2011 data remains preliminary - downloaded 3/21/2011)

		Crashes						Injuries					
Year	County	Crashes	Fatal	Major	Minor	Poss/Unk	PDO	Injuries	Fatalities	Major	Minor	Possible	Unknown
2001	Polk	1	0	0	0	0	1	0	0	0	0	0	0
2002	Polk	2	0	0	0	1	1	1	0	0	0	1	0
2003	Polk	2	0	0	0	1	1	1	0	0	0	1	0
2004	Polk	0	0	0	0	0	0	0	0	0	0	0	0
2005	Polk	2	0	0	0	0	2	0	0	0	0	0	0
2006	Polk	2	0	0	0	2	0	3	0	0	0	3	0
2007	Polk	0	0	0	0	0	0	0	0	0	0	0	0
2008	Polk	1	0	0	0	0	1	0	0	0	0	0	0
2009	Polk	1	0	0	0	0	1	0	0	0	0	0	0
2010	Polk	2	0	0	0	0	2	0	0	0	0	0	0
2011	Polk	0	0	0	0	0	0	0	0	0	0	0	0
	Totals:	13	0	0	0	4	9	5	0	0	0	5	

meeting the following criteria:
(This feature currently not operational.)

Feature Count Report (Monday, April 16, 2012 10:43:56 AM Central Daylight Time)
produced using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)
by:
Michael D. Pawlovich, Ph.D., P.E.
Traffic Safety/Crash Data Engineer
Iowa Department of Transportation
Highway Division, Engineering Bureau, Traffic and Safety
800 Lincoln Way
Ames, Iowa 50010



TOTAL TRAFFIC 2007
SITE GENERATED PLUS BACKGROUND
HERITAGE PARK TRAFFIC STUDY
URBANDALE, IOWA

FIGURE 5

SNYDER & ASSOCIATES
Engineers and Planners

J

PEAK HOUR TURNING MOVEMENTS

INTERSECTION: Hickman & Stew Hansen East Drive
CITY: Des Moines COUNT STATION NO.: ———
DATE: 02/21/07 DAY: Wed

	NORTHBOUND ON				SOUTHBOUND ON					EASTBOUND ON				WESTBOUND ON					
AM PEAK				NB				SB	N-S				EB				WB	E-W	PERIOD
TIME PERIOD	L	S	R	TOT.	L	S	R	TOT.	TOT.	L	S	R	TOT.	L	S	R	TOT.	TOT.	TOTAL
7:30-7:45	4	0	5	9	0	0	3	3	12	0	0	7	7	6	0	8	14	21	33
7:45-8:00	2	0	9	11	0	0	1	1	12	2	0	6	8	10	0	16	26	34	46
8:00-8:15	7	0	2	9	4	0	3	7	16	2	0	8	10	13	0	17	30	40	56
8:15-8:30	9	0	3	12	2	0	3	5	17	3	0	16	19	16	0	8	24	43	60
TOTAL VEH	22	0	19	41	6	0	10	16	57	7	0	37	44	45	0	49	94	138	195
% OF APPR	54%	0%	46%		38%	0%	63%			16%	0%	84%		48%	0%	52%			
TOT TRUCKS	1	0	0	1	2	0	0	2	3	1	0	2	3	1	0	2	3	6	9
% TRUCKS	5%	#####!	0%	2%	33%	#####!	0%	13%	5%	14%	#####!	5%	7%	2%	#####!	4%	3%	4%	5%
PHF				0.85				0.57	0.84				0.56				0.78	0.80	0.81

OFF PEAK				NB				SB	N-S				EB				WB	E-W	PERIOD
TIME PERIOD	L	S	R	TOT.	L	S	R	TOT.	TOT.	L	S	R	TOT.	L	S	R	TOT.	TOT.	TOTAL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VEH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% OF APPR	#####!	#####!	#####!		#DIV/0!	#####!	#####!			#####!	#####!	#DIV/0!		#####!	#####!	#####!			
TOT TRUCKS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TRUCKS	#####!	#####!	#####!	#####!	#DIV/0!	#####!	#####!	#####!	#DIV/0!	#####!	#####!	#DIV/0!	#####!	#####!	#####!	#####!	#####!	#####!	#DIV/0!
PHF				#####!				#####!	#DIV/0!				#####!				#####!	#####!	#DIV/0!

PM PEAK				NB				SB	N-S				EB				WB	E-W	PERIOD
TIME PERIOD	L	S	R	TOT.	L	S	R	TOT.	TOT.	L	S	R	TOT.	L	S	R	TOT.	TOT.	TOTAL
5:00-5:15	4	0	4	8	10	0	2	12	20	1	0	5	6	14	0	10	24	30	50
5:15-5:30	3	0	9	12	13	0	7	20	32	3	0	12	15	10	0	9	19	34	66
5:30-5:45	3	0	17	20	10	0	3	13	33	0	0	4	4	9	0	9	18	22	55
5:45-6:00	3	0	7	10	7	0	4	11	21	1	0	13	14	9	0	6	15	29	50
TOTAL VEH	13	0	37	50	40	0	16	56	106	5	0	34	39	42	0	34	76	115	221
% OF APPR	26%	0%	74%		71%	0%	29%			13%	0%	87%		55%	0%	45%			
TOT TRUCKS	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2	2	2	3
% TRUCKS	6%	#####!	0%	2%	0%	#####!	0%	0%	1%	0%	#####!	0%	0%	0%	#####!	6%	3%	2%	1%
PHF				0.63				0.70	0.80				0.65				0.79	0.85	0.84

L

Rev. 8/09

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: RHB Date Prepared: Apr 17, 2012

Intersection: US 6 / Hickman Rd. & Stew Hansen/ Menards Entrance (2nd entr west of I 35/80)

Improvement

Proposed Improvement(s): Reduce median break by adding raised island, eliminating left turns on side entrances.

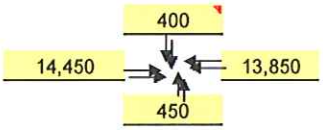
$ 30,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	39	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 30,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Heritage Park Traffic Impact Study 2007 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



10,639,750 Current Annual Entering Veh., **AEV** = DEV * 365

43,315 veh / day, Final Year DEV, **FDEV**

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

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

29,150 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2001 First full year --> 2011 Last full year 11.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes	0	Fatalities @	$3,500,000	$ -
		0	Major Injuries @	$240,000	$ -
2	Injury Crashes	0	Minor Injuries @	$48,000	$ -
		2	Possible Injuries @	$25,000	$ 50,000
3	Property Damage Only		(assumed cost per crash)	$2,700	$ 13,500
		-OR-	enter all Property Costs of all crashes:		
5	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 63,500

0.45	Current Crashes / Year, **AA** = TA / T	0.04	Crashes / MEV, Crash Rate, **CR**
$ 12,700	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
11.0	Total Expected Crashes, **TECR** = CR x TMEV	$ 36,228	Present Value of Avoided Crashes, **BENEFIT**
0.18	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 2,251	Crash Costs Avoided in First Year, AAR x AVC		
4.3	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 = $36,228 : $30,000 = **1.21** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: R-33 HMA RESURFACING AND SHOULDER IMPROVEMENTS

Applicant: Hamilton County Secondary Roads

Contact Person: Danny R. Waid, P.E. Title: Hamilton County Engineer

Complete Mailing Address: 2300 Superior St., Suite #4
Webster City, Iowa 50595

Phone: 515-832-9520 (Area Code) E-Mail: dwaid@hamiltoncounty.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:

Application Type

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

Funding Amount

Total Project Cost $ 1,730,000

Safety Funds Requested $ 265,000

A

RESOLUTION 2012 - 21

BE IT RESOLVED by the Board of Supervisors of Hamilton County that:

1. The Hamilton County Board of Supervisors hereby endorse the proposed application for Transportation Safety Improvement Program funding for the Hot Mix Asphalt Resurfacing Project STP-S-CO40( )—5E-40 located on R-33 from City of Webster City to the Wright County Line.

2. The Hamilton County Board of Supervisors hereby agrees to adequately maintain the completed project for its intended public use for a minimum of 20 years following project completion.

3. The Hamilton County Board of Supervisors hereby authorizes the Hamilton County Engineer to sign the application on our behalf and carry the project to completion if it is approved for State and/or Federal funding.

ATTEST: Lori Kloberdanz
Lori Kloberdanz
Hamilton County Assistant Auditor

DATE: August 14, 2012

David Young
David Young, Chair
Hamilton County Board of Supervisors

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Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Hamilton County

Signed: Danny R Waid 8-14-2012

Signature Date Signed

Danny R. Waid, P.E., Hamilton County Eng

Typed Name

Attest: Lori Kloberdanz 8-14-2012

Signature Date Signed

Lori Kloberdanz, Deputy Auditor

Typed Name

B

PROJECT NARRATIVE

Hamilton County route R-33 is an asphalt-paved major collector route with granular shoulders that connects Webster City to the Wright County Road C-70, which route traffic from the City of Woolstock to U.S. Highway 69 and is also a popular route to R-38 leading to the City of Clarion. This project includes the 5.44 mile segment in Hamilton County from The Wright County line to the City of Webster City.

This project route is utilized to move agricultural commodities between Webster City and Wright County. And also provides access to Grandgeorge Quarry. The traffic counts on this project are 820-1450 vehicles per day based on the 2011 count. There are currently no reduced speed limits on this rural secondary road.

This project was graded in the 1940's. The south 2.5 miles was initially paved in 1956 with 6" PCC Paving over a 4" soil aggregate subbase and resurfaced in 1986 and 1997 with 2 – 2" HMA lifts, and the north 3.5 miles was initially paved with HMA in 1963 and resurfaced with 2" of HMA lifts in 1974, 1986, and 1997, all over a 6" stone rolled base and a 4" soil aggregate subbase. The total existing asphalt pavement thickness is 6" on the south 2.5 miles and 9" on the north 3.5 miles. This project was constructed with 4' shoulders.

The project proposal, as submitted for Regional STP funding includes removal of 2-3" of existing HMA, Cold In-Place Recycling to a depth of 3" and the placement of 3" hot mix asphalt resurfacing on the entire width (22') of the existing pavement and replacing the granular shoulders (4' wide), with the potential of minor shoulder widening. Additional safety features may be incorporated into this project, if safety funds become available.

Safety features that are being considered include paving 2' of the exiting 4' shoulder and adding safety edge along the 2' added pavement width throughout the project. In addition, horizontal curves within the project will be signed with warning signs and chevrons. Hamilton County has targeted these safety improvements as countermeasures to the accident history showing run off the road crashes generally throughout the 5.44 miles and in particular the concentration of swerving, over-steering and runoff the road crashes through the segment with curves. Based on information provided through the Crash Modification Factors Clearinghouse, the countermeasures effecting the Crash Modification Factors (CMF), were selected to reduce crash frequencies by some 30% overall. The design treatments, Crash Reduction Factors (CRF), and their respective contribution to the total overall crash reduction are as follows:

1. Install safety edge: Safety Edge Treatment: CRF=6%
2. Install Warning Signs: Chevron signs on curves: CRF=16%
3. 2' Paved Shoulder: Stabilize shoulder and drop-off: CRF=25%

Using the cumulative crash reduction factor formula as prescribed in the IDOT B/C analysis instructions produces a cumulative crash reduction factor of approximately 40%. A conservative cumulative CRF of 30% has been used in the analysis for this application.

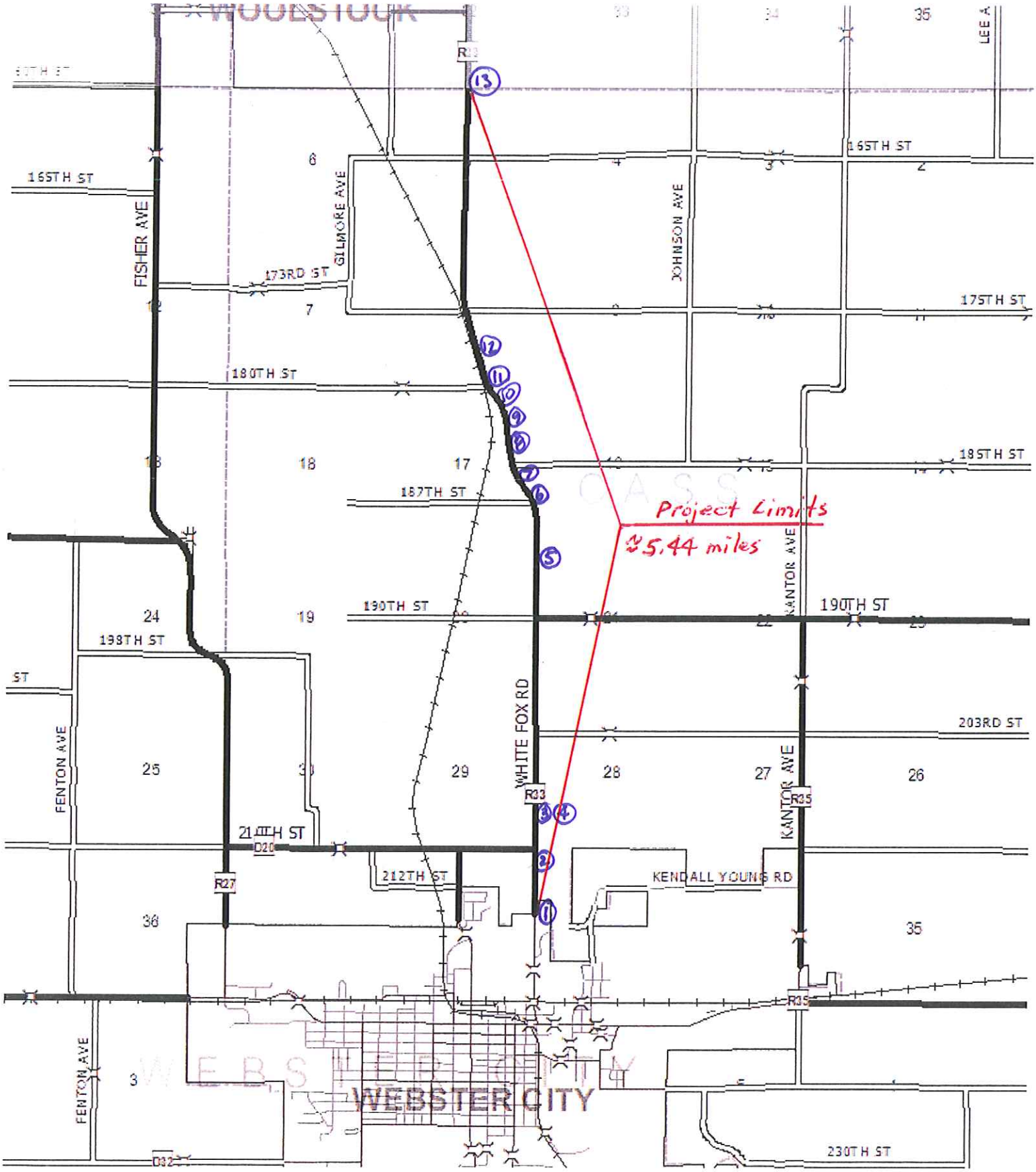
PRELIMINARY COST ESTIMATE
PROJECT STP-S-CO40( )--5E-40
CIP RECYCLING WITH HMA RESURFACING ON ROUTE R-33
Including Safety Improvements

REF #	ITEM #	DESCRIPTION	UNIT	QUANTITY	SAFETY FUNDS QUANTITY	UNIT PRICE	AMOUNT	SAFETY FUND AMOUNT
1	2121-7425020	Shoulders, Granular, Type "B"	Ton	5208		$15.00	$78,120.00	
					1302	$15.00		$19,530.00
2	2212-0475095	Cleaning & Preparation of Base	Mile	5.44		$1,000.00	$5,440.00	
3	2214-5145150	Pavement Scarification	Sq.Yd.	70212		$1.75	$122,871.00	
4	2303-0023500	Hot Mix Asphalt Mixture (1,000,000 ESAL) Intermediate or	Ton	11454		$34.00	$389,436.00	
		Surface Course, 1/2" Mix, No Spcl Fric Req.			2082	$34.00		$70,788.00
5	2303-0245828	Asphalt Binder, PG 58 - 28	Ton	688		$650.00	$447,200.00	
					250	$650.00		$162,500.00
6	2303-6911000	H.M.A. Pavement Samples	L.S.	1		$2,000.00	$2,000.00	
7	2318-1001100	Cold In-Place Recycled Asphalt Pavement	Sq.Yd.	70212		$1.75	$122,871.00	
8	2318-1001223	Asphalt Stabilizing Agent	Ton	305		$700.00	$213,500.00	
9	2527-9263109	Painted Pavement Marking, Waterborne or Solvent-Based	STA	862		$9.00	$7,758.00	
10	2524-9325001	Type A Signs, Sheet Aluminium w/ steel post	Each	0	30	$150.00	$0.00	$4,500.00
10	2528-8445110	Traffic Control	L.S.	1		$2,500.00	$2,500.00	
11	2528-8445112	Flaggers	Day	50		$250.00	$12,500.00	
12	2533-4980005	Mobilization	L.S.	1		$12,000.00	$12,000.00	
			SUBTOTAL				$1,416,196.00	$257,318.00
			Inflation					**3.30%**
							$47,891.00	$8,500.00
			TOTAL				$1,464,087.00	$265,818.00
			TOTAL PROJECT ESTIMATE w/ Safety Improvements					**$1,729,905.00**

D

TIME SCHEDULE

This project will be developed in accordance with the critical path dates established by the Iowa Department of Transportation for minor projects. Hamilton County intends to let the project, through the IDOT letting process, in the early FFY 2016 with construction to follow later in the summer of 2016. This will require the project to be programmed for federal fiscal year 2016, which begins October 1, 2015. Completion of this project is anticipated to be prior to the fall of FY 2016. If funding becomes available through the regional planning agency process prior to the previously approved FFY 2016, Hamilton County would consider an earlier project schedule.



① Indicates Photo reference

1 km
1 mi

Google

F

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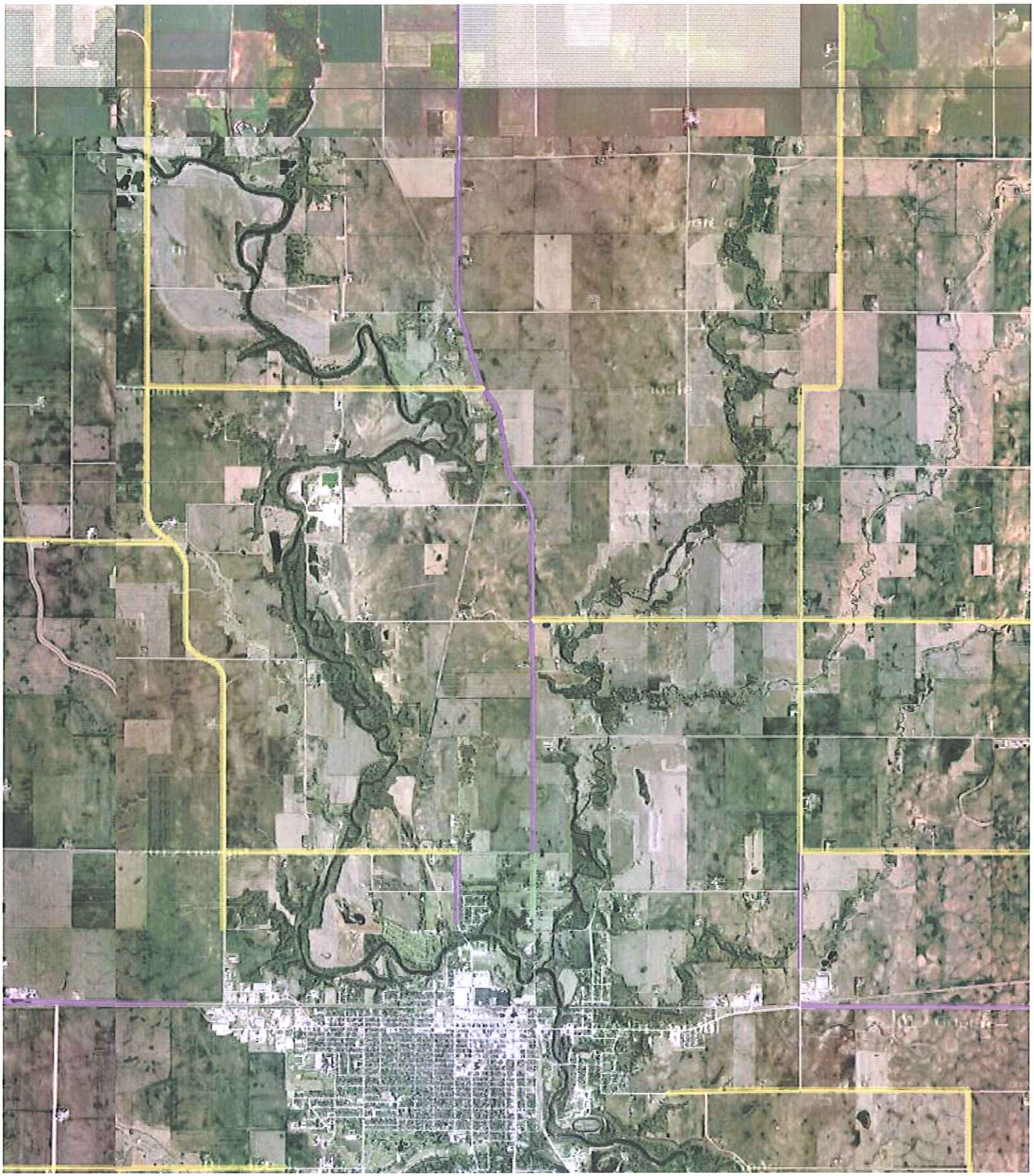

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Imagery ©2012 , DigitalGlobe, GeoEye, Hamilton County, USDA Farm Service Agency

Iowa Department of Transportation

Major Cause Summary

Hamilton Co R33 - WC CL N to CO Line 2007-2011

Report Version 1.1 Jan 2005

Analysis Years: 2007 [4], 2008 [3], 2009 [3], 2010 [1], 2011 [2]

Crash Summary:

Fatal	-
Major Injury	3
Minor Injury	2
Possible/Unknown	2
PDO	6
Total Crashes	13

Injury Summary:

Fatal	-
Major Injury	3
Minor Injury	2
Possible	2
Unknown	-
Total Injuries	7

TOT Property Damage: $54,800

AVG Property Damage: $4,215

Surface Condition Summary:

Dry	6
Wet	4
Ice	2
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	13

Major Cause Summary:

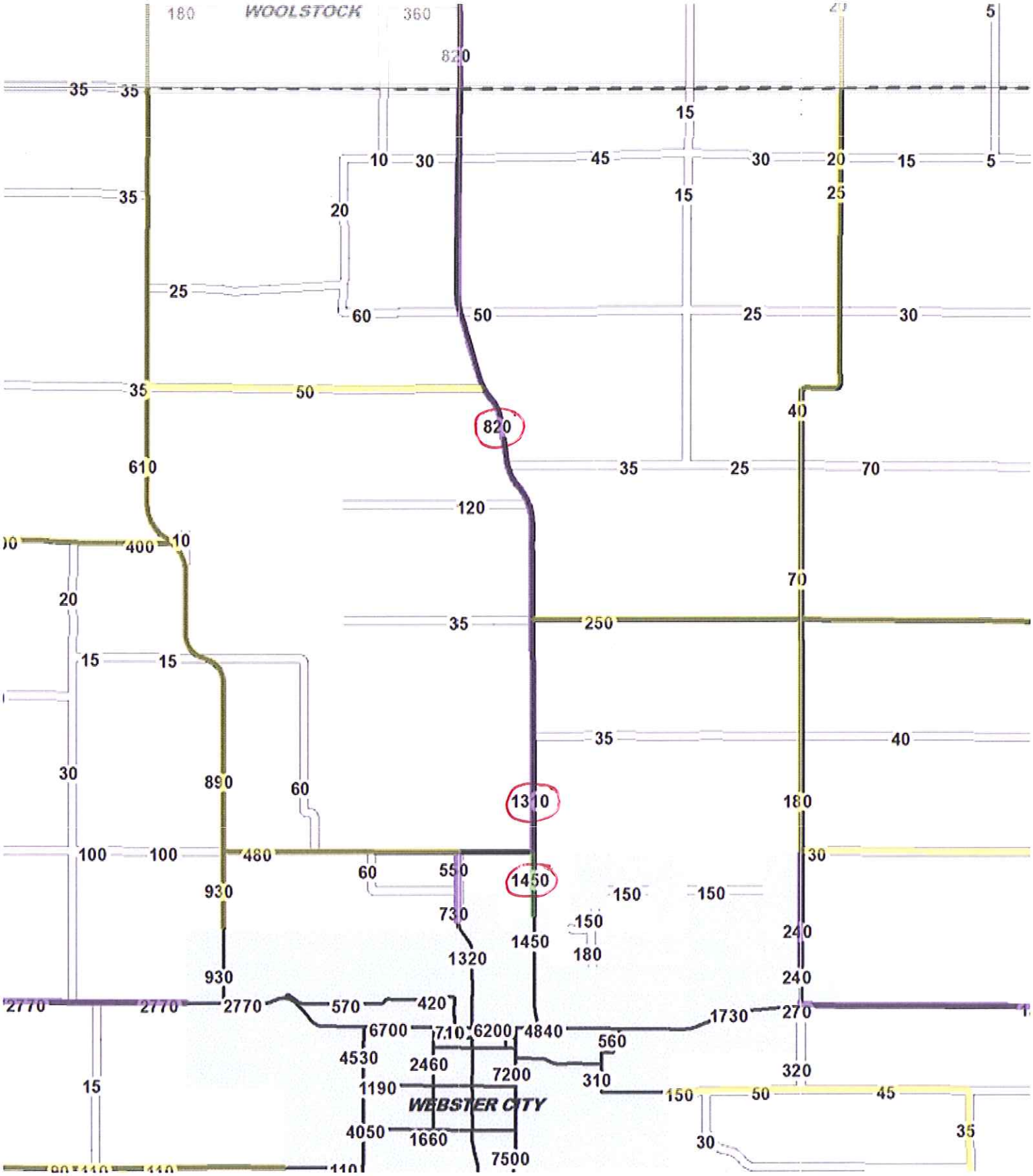
	Animal
	Ran Traffic Signal
	Ran Stop Sign
1	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
1	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
	FTYROW: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

Selection Filter:

((MAJORCAUSE <> 1)) AND ((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: RBS

Notes: All Crashes EXCEPT animals



2011 Annual Average Daily Traffic

L

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Hamilton Prepared by: Danny R. Waid, P.E. Date Prepared: Aug 2, 2012

Location: R-33 from the NCL of Webster City to the Wright County Line

Improvement

Proposed Improvement(s): Pave 2' shoulder & add safety edge throughout project. Add chevrons and curve signing through 2 mile curve segment.

$ 265,818	Estimated Improvement Cost, **EC**	20	Est. Improvement 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**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 265,818	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT AADT map 2011 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.38	1,450	WC City Limits N 1/2 mile
1.50	1,310	210th St N to 190th St.
3.56	820	190th St. N to Wright County L
5.44	miles total	

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

5,435 Current Vehicle Miles / Day, **VM**

6,632 End of Life Veh. Miles / Day

1,983,848 Current Veh. Miles / Year, **AM**

43,682,357 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

2007 First full year --> 2011 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

Fatal Crashes →	Fatalities @	$3,500,000	$	-
	3 Major Injuries @	$240,000	$	720,000
7 Injury Crashes →	2 Minor Injuries @	$48,000	$	96,000
	2 Possible Injuries @	$25,000	$	50,000
6 Property Damage Only	(assumed cost per crash)	$2,700	$	35,100
	-OR- enter all Property Costs of all crashes:			
13 Total Crashes, **TA**		Total $ Loss, **LOSS**	$	901,100

2.60	Current Crashes / Year, **AA** = TA / T	131.1	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 69,315	Cost per Crash, **AVCR** = LOSS / TA	$ 798,593	Present Value of Avoided Crashes, **BENEFIT**
57.2	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.78	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 54,066	Crash Costs Avoided in First Year, AAR x AVCR		
17.2	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 = $798,593 : $265,818 = **3.00** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project 5th Ave S Four-Lane to Three-Lane Conversion

Applicant City of Fort Dodge

Contact Person Chad Schaeffer Title City Engineer

Complete Mailing Address 819 1st Ave S

Fort Dodge, IA 50501

Phone (515) 576-3601 (Area Code) E-Mail cschaeffer@fortdodgeiowa.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:

Application Type

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

Funding Amount

Total Project Cost $ 500,000

Safety Funds Requested $ 500,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Fort Dodge

Signed: Matt Bemrich 8/13/2012

Signature Date Signed

Matt Bemrich

Typed Name

Attest: 8/13/2012

Signature Date Signed

Jeff Nemmers

Typed Name

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR THE CONVERSION OF 5TH AVENUE S FROM FOUR LANES TO THREE LANES WITH A CENTER TWO WAY LEFT TURN LANE AND THE INSTALLATION OF PERMANENT TRAFFIC SIGNALS.

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

WHEREAS, 5th Avenue S from east of S 32nd Street to S 42nd Street has been identified as a location where vehicular safety could be improved and funded by TSIP.

WHEREAS, the improvements, including reducing the traffic lanes from four lanes to three lanes with a center two way left turn lane and installation of a permanent traffic signal at the eastern Menards driveway, will help reduce crashes along this corridor and not significantly impact traffic operations.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FORT DODGE, IOWA, that:

1. The City Council supports and approves 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.
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 by the City Council of the City of Fort Dodge this 13th day of August, 2012.

Ayes: Patterson, Wilson, Flattery, Fritz, Taylor
Nays:
Other: Absent: Hill, Alstott

City of Fort Dodge

By: _____
Matt Bemrich, Mayor

Attest:

_____
Jeff Nemmers, City Clerk

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Narrative

Existing Conditions

Fifth Avenue S is located in the southeast portion of Fort Dodge, Iowa and is an east-west corridor connecting the southern portions of downtown Fort Dodge to the commercial region. The corridor from S 32nd Street to S 42nd Street is also designated as County Road P-59 and Business Highway 20. S 42nd Street connects 5th Avenue S to the US Highway 20.

Fifth Avenue S is a four-lane, undivided roadway from a bridge over a drainage way (located approximately 900 feet east of S 32nd Street) east to S 42nd Street. The roadway is 48 feet wide with curbs. It has a concrete pavement that has been overlaid with asphalt. There are numerous driveways along the roadway with few directly across from one another. There are two public street accesses along this corridor (Midway Blvd located 3,000 feet east of S 32nd Street and Kirkberg Blvd located 1,300 feet east of Midway Blvd). Fifth Avenue S has a speed limit of 35 miles per hour (mph) west of Midway Blvd and changes to 45 mph at this point and continues east to S 42nd Street.

There are two (2) traffic signals along the proposed corridor; one located at the eastern driveway into Menards and the other located at the S 42nd St intersection. The traffic signal located at the eastern Menards driveway is a span-wire traffic signal. The other public streets are stop controlled on the intersecting street with 5th Avenue S. All driveways do not have any sign control and act as stop controlled.

According to the Iowa DOT 2011 traffic count data, 5th Avenue S carries 11,000 Average Annual Daily Traffic (AADT) near the bridge east of S 32nd Street to 8,300 AADT near S 42nd Street. These volumes are below counts in similar locations in 2007. This could be partially due to 5th Avenue S was under construction west of S 32nd Street. However, the 2007 volumes were below those taken in 2003. This shows that the corridor is experiencing no traffic growth in the last several years. The City of Fort Dodge is attempting to revitalize the commercial area, partially with the reconstruction of 5th Avenue S.

The existing businesses along 5th Ave S are a mix of commercial and industrial. Several businesses along the corridor send and receive equipment/deliveries via semi truck and trailer. These businesses include a construction equipment dealer/repair, other large machinery dealer/repair, and semi trucking company; all with daily truck traffic.

There are overhead utility lines located on the north side of 5th Avenue S with the wood poles located approximately 10 feet from the back of curb. The span wire traffic signal poles are located closer to the roadway at approximately 5 feet from the back of curb. No other fixed objects are located within 10 feet of the roadway.

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Crash History

From January 1, 2009 through June 30, 2012, the 5th Avenue S corridor from the bridge east of S 32nd Street east to S 42nd Street experienced 50 crashes. Of these crashes, there were two major injury crashes (two major injuries), three minor injury crashes, nine possible/unknown injury crashes, and 36 property damage only crashes. In total, there were 19 injuries, including the two major injuries. The resulting crash rate for this corridor is 431 crashes per hundred million vehicle miles traveled (HMVMT). The average statewide crash rate for a similar primary municipal street is 292 crashes per HMVMT (based on 2007 – 2009 crash data).

Upon reviewing crash summaries and reports, a couple trends stood out. One trend occurred significantly at the western driveway into Menards where a northbound vehicle attempted to turn left out of the driveway and was impacted by an eastbound vehicle. Several reports indicated that an eastbound vehicle was turning right into Menards and blocked the vision of the northbound driver of an oncoming eastbound vehicle either in the outside lane, behind the turning vehicle, or in the inside lane (including one of the major injury crashes). The other trend was east/west left turning traffic. The left turning vehicles (or vehicles behind those turning vehicles) either are hit from behind while waiting to turn or turn in front of an opposing vehicle. One major injury crash occurred in this manner at the span wire signal at the eastern Menards driveway.

There is minimal crash history involving vehicles colliding with fixed objects. One crash occurred between two vehicles (one vehicle made an improper lane change) with one of the vehicles proceeding to collide with a business sign. Another crash involves a vehicle colliding with a fixed object and that was a utility pole. Per the crash detail, two vehicles collided (one made an improper turn) and then impacted the utility pole.

Proposed Improvement

Fifth Avenue S would become a three-lane roadway with a center two-way left turn lane (TWLTL). The restriping of 5th Avenue S to this new configuration would be combined with a pavement rehabilitation to cover the old pavement markings. The TWLTL will be connected to the existing TWLTL west of the bridge and continued to the S 42nd Street intersection. The new pavement markings will follow the 2009 Manual on Uniform Traffic Control Devices (MUTCD) and Iowa DOT Standard Road Plan for Two-Lane Roadway with Two-Way Left Turn Lane. West of the bridge, 5th Avenue S is a five lane roadway with a TWLTL. One lane in each direction will be added/dropped west of the bridge to achieve the necessary roadway width prior to the bridge so no widening work will be done on the bridge. Creating a TWLTL will clear left turning traffic from the through lanes, reducing the likeliness of a rear end collision and aid in improving sight distance around opposing left turning traffic. This will also reduce the likeliness of an entering side vehicle from colliding with an unseen vehicle being blocked by one turning right. Other benefits will include more uniform speeds with the single through lane and improved turning paths for right turning trucks into commercial developments.

The pavement rehabilitation will likely be a slurry seal application over the existing road surface with necessary patching. The primary reason for the slurry seal is to provide a clean surface, free of any previous pavement markings. Other benefits include improved slip resistance, seal cracks, and extend the life of the pavement. Pavement markings and signage will be installed to match the proposed three-lane alignment. Pavement markings will be a durable product based on manufacturer recommendations for installation on a slurry seal.

Also, the span wire traffic signal would be replaced with a permanent mast-arm pole traffic signal. The mast-arm poles would be located further from the intersection at the eastern Menards driveway to improve clear zone. The traffic signal will be designed per the MUTCD. The traffic signal will either have flashing yellow arrows over the left turn lanes or the signal heads will be located over the approaching lane lines. The traffic signal timing will be per national timing standards.

Also included with the improvements is installing an offset right turn lane into the western Menards driveway. Construction of an offset right turn lane (10 foot) will allow better sight visibility for northbound vehicles to see around those eastbound right turning vehicles helping to reduce the likelihood of an eastbound/northbound crash at this high volume driveway.

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Itemized Breakdown of Cost

The total construction cost opinion is $500,000 (with Engineering, the total is $550,000), and the itemized breakdown is shown on the following table.

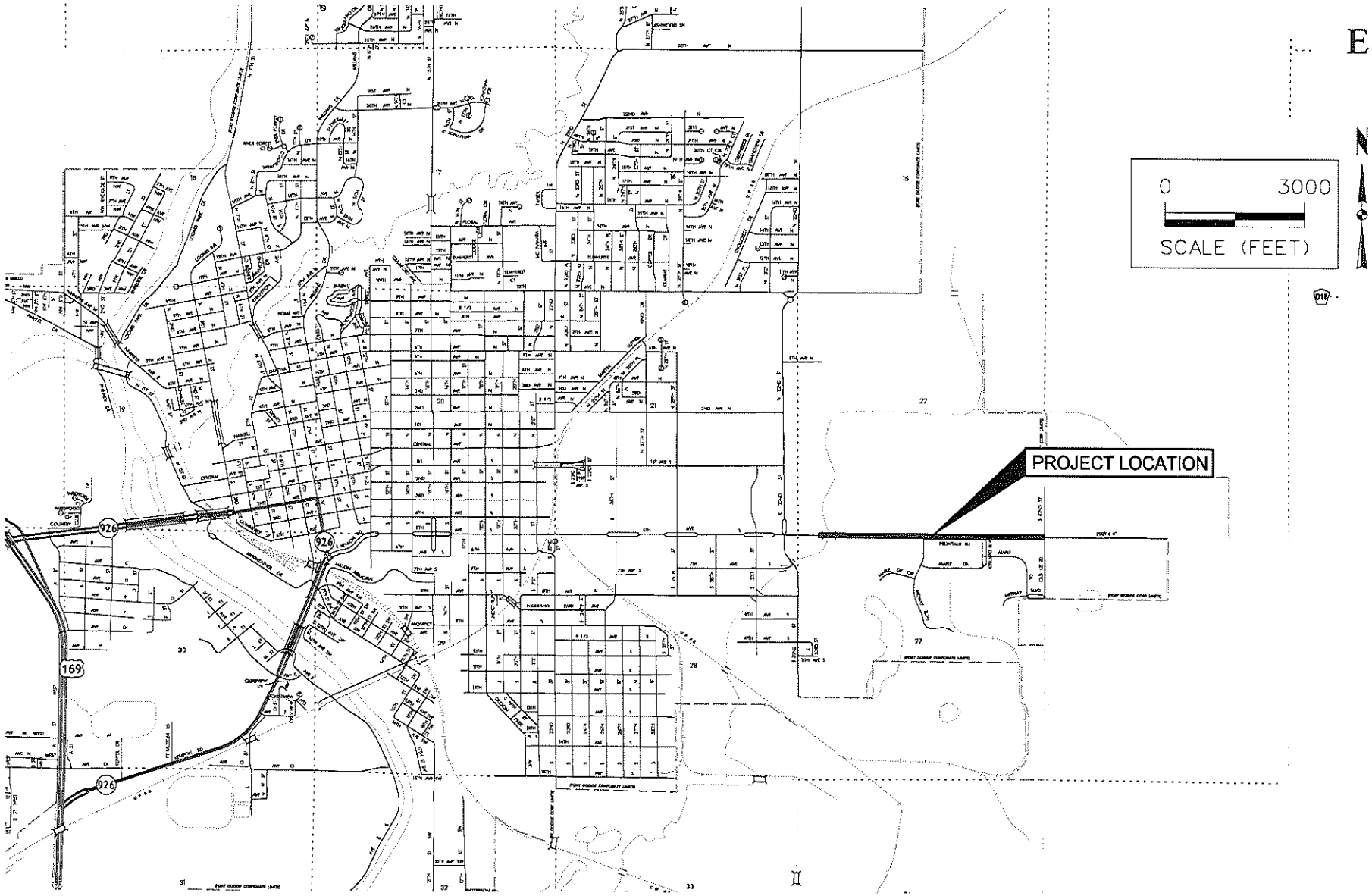
Order of Magnitude
Opinion of Probable Cost
5th Avenue S Corridor
Fort Dodge, IA

ITEM NO.	ITEM	QTY	UNIT	UNIT COST	ITEM TOTAL
1	9" PCC PAVEMENT, RIGHT TURN LANE	600	SY	$100	$60,000
2	PAVEMENT REHABILIATION – SLURRY SEAL	21,500	SY	$1.50	$32,300
3	PAVEMENT FULL DEPTH PATCHING	1,700	SY	$100	$170,000
4	PAVEMENT MARKING LINES	210	STA	$50	$10,500
5	PAVEMENT MARKING SYMBOLS	34	EA	$300	$10,200
6	TRAFFIC SIGNS	10	EA	$300	$3,000
7	TRAFFIC SIGNAL	1	LS	$150,000	$150,000
	CONSTRUCTION SUBTOTAL				$436,000
	CONTINGENCIES		15%		$65,200
	CONSTRUCTION TOTAL				$500,000
	ENGINEERING		10%		$50,000
	TOTAL ESTIMATE				**$550,000**

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Time Schedule

TSIP Application	August 15, 2012
TSIP Funding Award	January 2013
Design	December 2012 – April 2013
Construction	July – September 2013



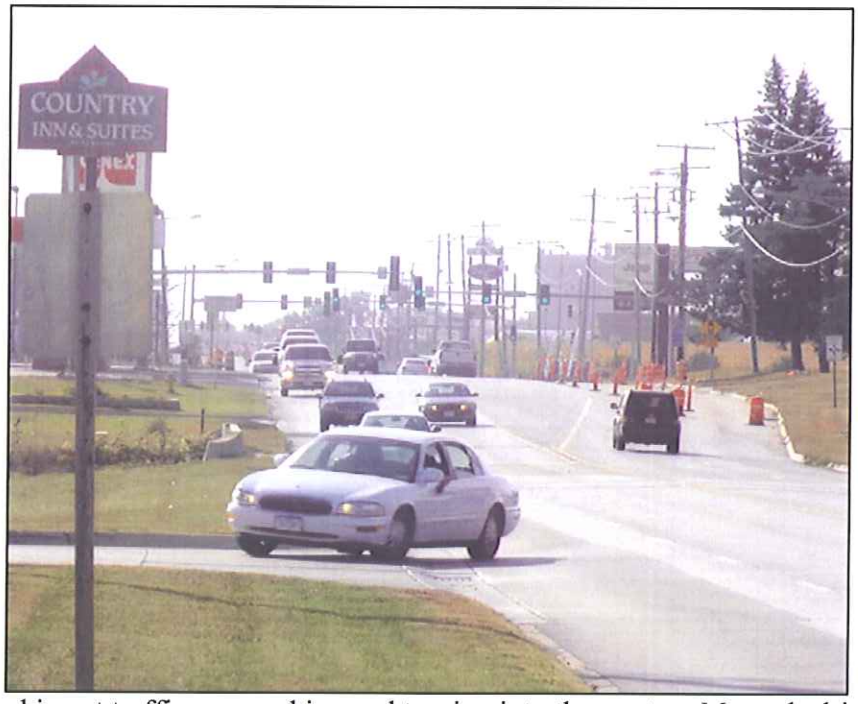
LOCATION MAP
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

SNYDER & ASSOCIATES
Engineers and Planners

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Photos of Project Site

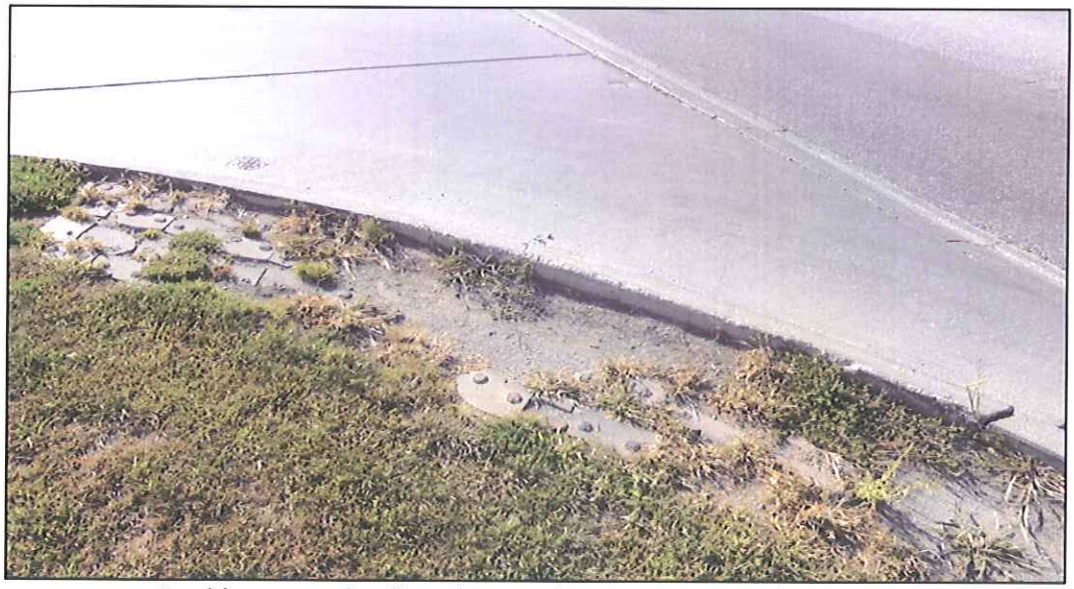
EB looking at the span wire traffic signal and reduced clear zone for poles.



WB looking at traffic approaching and turning into the western Menards driveway

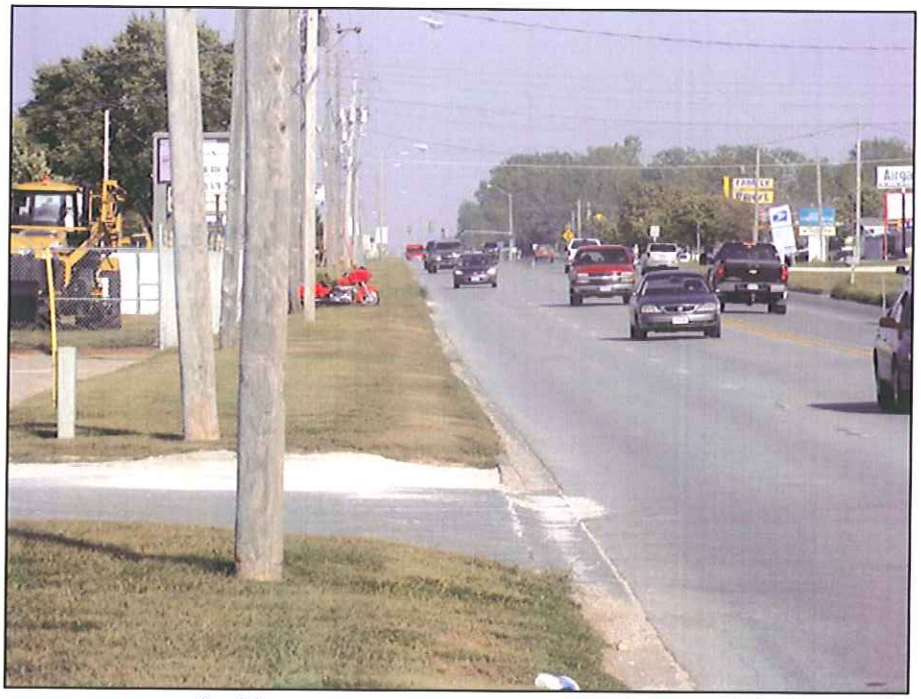
Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

EB looking at the clear zone and truck off tracking over the existing curb at the eastern Menards driveway.

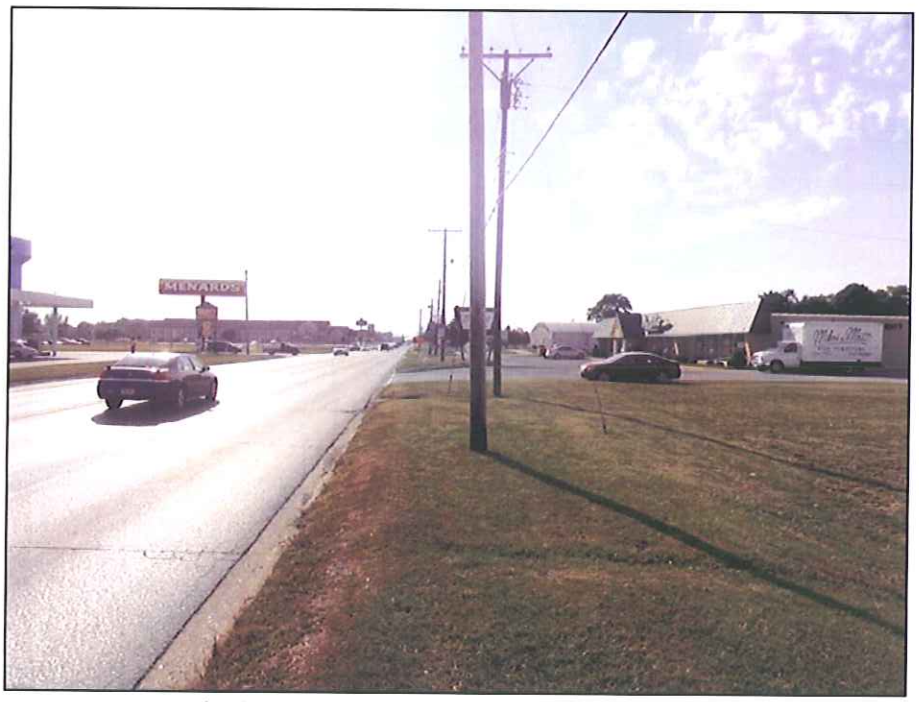


Looking at truck off tracking at the eastern Menards driveway

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

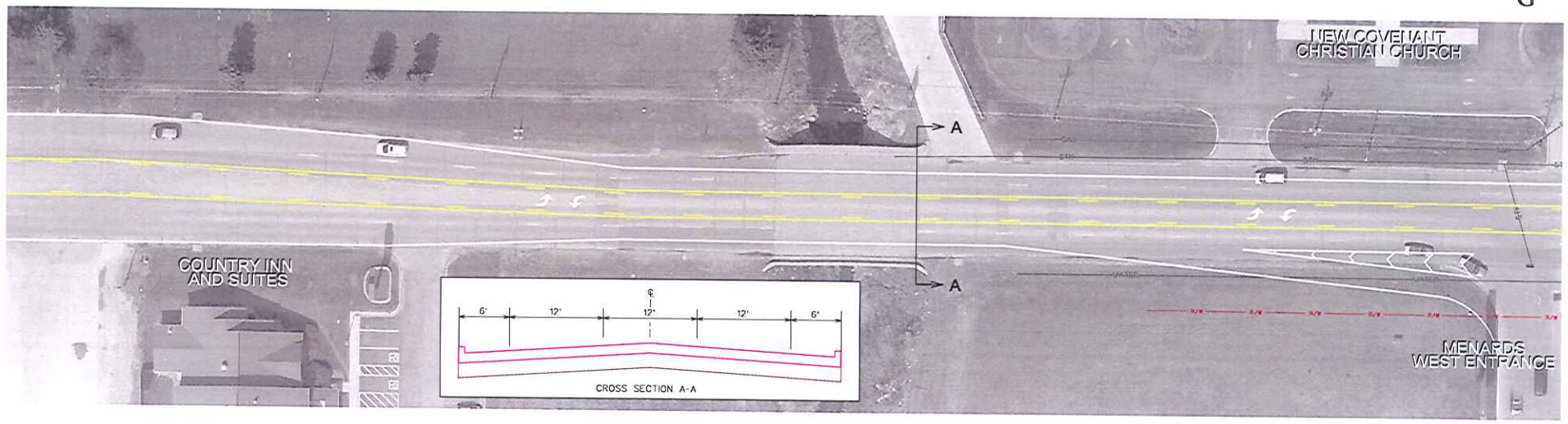


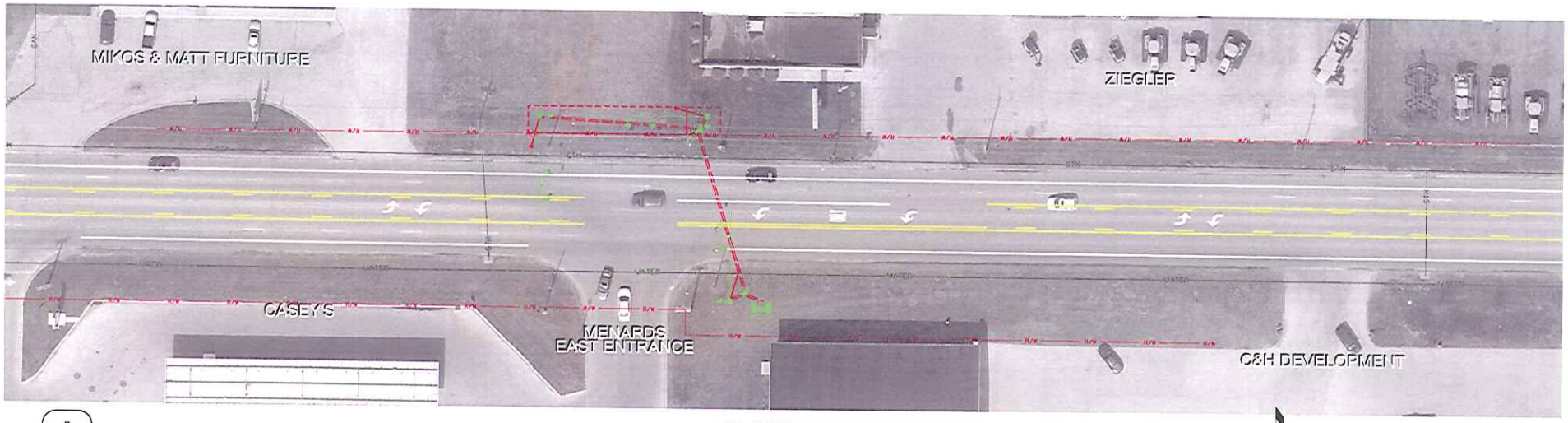
EB looking at clear zone and pavement condition.



WB looking at clear zone and pavement condition.

G





SNYDER & ASSOCIATES
Engineers and Planners

PLAN VIEW
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

0 50
SCALE (FEET)

G

SNYDER & ASSOCIATES
Engineers and Planners

PLAN VIEW
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

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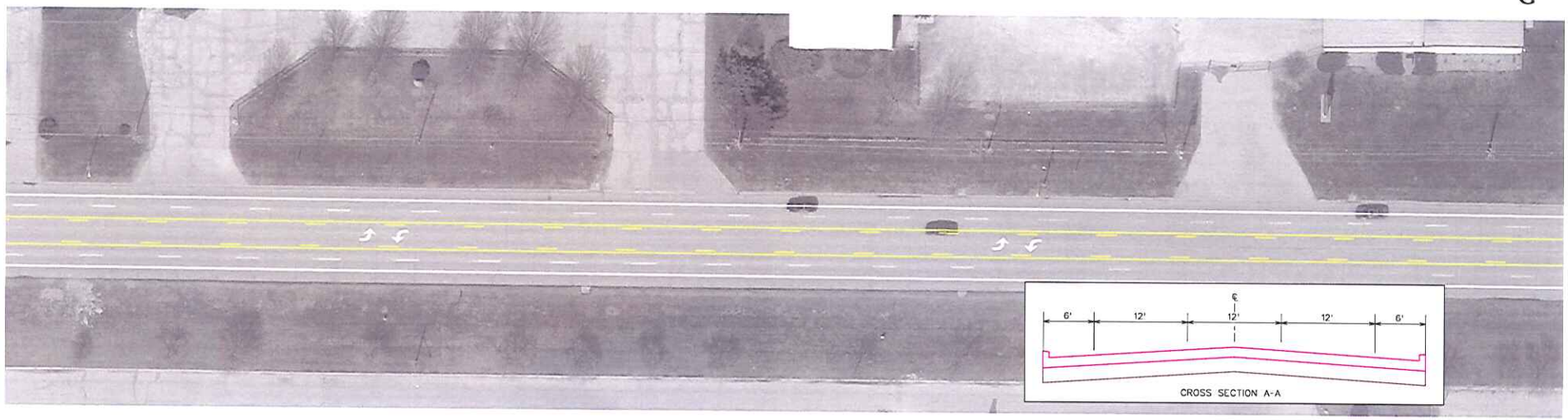

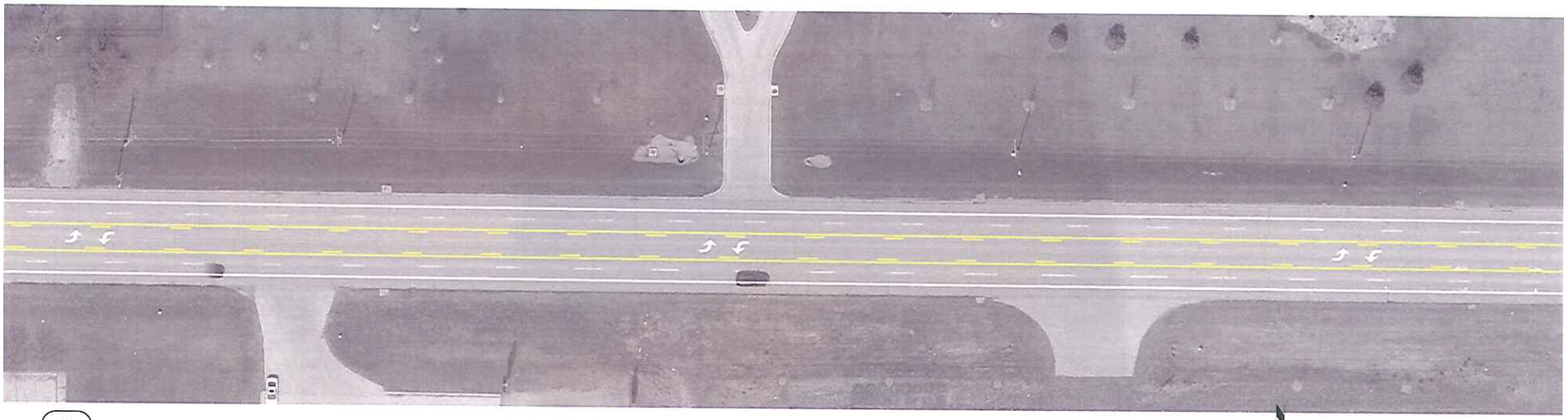

SNYDER & ASSOCIATES
Engineers and Planners

PLAN VIEW
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

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SCALE (FEET)

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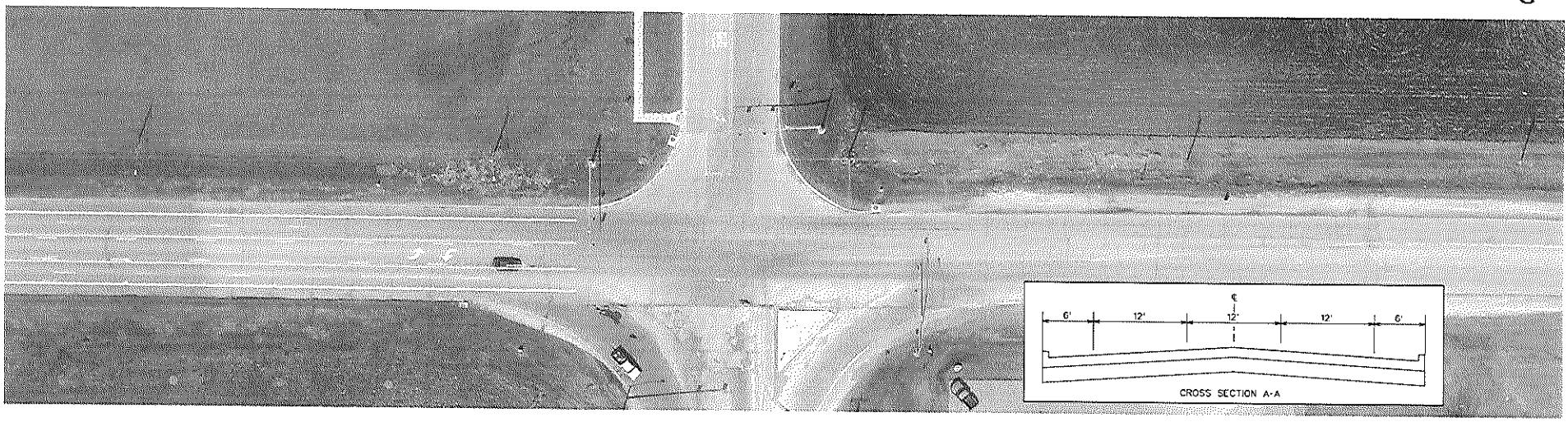

SNYDER & ASSOCIATES
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PLAN VIEW
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

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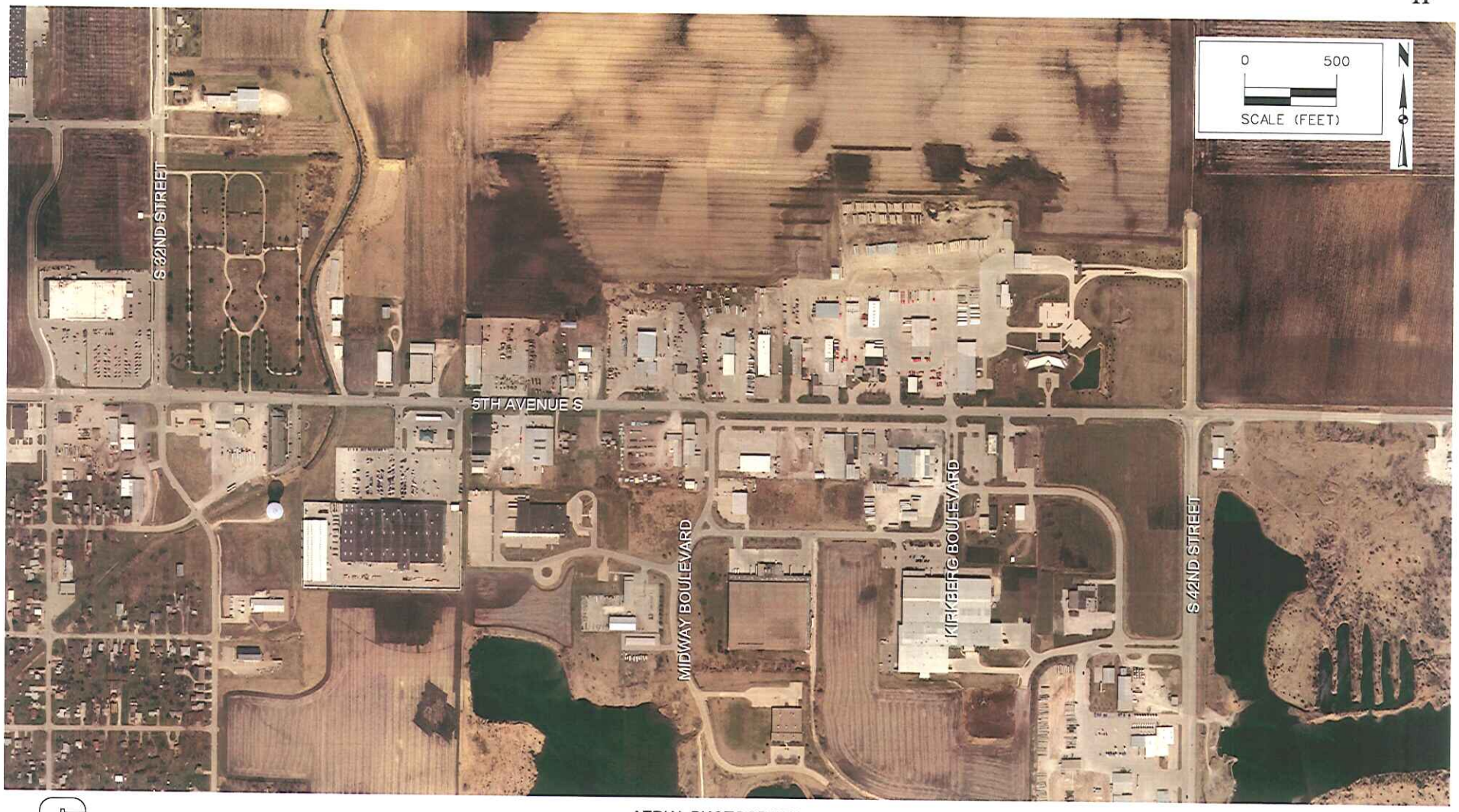

SNYDER & ASSOCIATES
Engineers and Planners

AERIAL PHOTOGRAPH
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

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(FORT DODGE CORP. LI

S 42ND ST

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3,170

8,300 *

3,050

4,970

FRONTAGE RD

MAPLE DR

KIRKBERG BLVD

MAPLE

MAPLE DR CIR

MIDWAY BLVD

MIDWAY BLVD

OLD US 20

ST

S

31ST

S

H AVE S

ST

32ND

S

ST

LEGEND

4,970 DAILY TRAFFIC VOLUMES

* TRAFFIC VOLUMES INCLUDED IN APPLICATION

2011 IOWA DOT TRAFFIC VOLUMES
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

SNYDER & ASSOCIATES
Engineers and Planners

Iowa Department of Transportation

Daily Volume from 04/04/2011 through 04/06/2011

Site Names: 94433348310 City: 2690 FORT DODGE
County: Webster SEC: TWP: RGE:
Location: 5TH AVE S & S 32ND ST
Funct. Class:

Seasonal Factor Type: Muni Streets
Daily Factor Type: Muni Streets
Axle Factor Type: Muni Streets
Growth Factor Type: Muni Streets

	Sun 04/03/2011			Mon 04/04/2011			Tue 04/05/2011			Wed 04/06/2011			Thu 04/07/2011			Fri 04/08/2011			Sat 04/09/2011		
	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E
00:00							49			42											
01:00							44			42											
02:00							36			42											
03:00							47			52											
04:00							80			78											
05:00							206			248											
06:00							489			503											
07:00							864			866											
08:00							668														
09:00							754														
10:00				762			794														
11:00				845			861														
12:00				980			877														
13:00				888			869														
14:00				788			735														
15:00				929			974														
16:00				921			974														
17:00				1,001			972														
18:00				564			562														
19:00				396			389														
20:00				281			281														
21:00				200			191														
22:00				146			145														
23:00				103			110														
Volume				8,804			11,971			1,873											
AM Peak Vol							864														
AM Peak Fct							1.00														
AM Peak Hr							7:00														
PM Peak Vol				1,001			974														
PM Peak Fct				1.00			1.00														
PM Peak Hr				17:00			15:00														
Seasonal Fct				0.960			0.960			0.960											
Daily Fct				0.992			0.956			0.934											
Axle Fct				0.494			0.494			0.494											
Pulse Fct				2.000			2.000			2.000											

Collected by: IDOT
Created 07/11/2012 8:39:10AM

ROAD AADT 11,043 **W AADT 0** **E AADT 0**

Iowa Department of Transportation

Daily Volume from 04/04/2011 through 04/06/2011

Site Names: 94433365710 City: 2690 FORT DODGE
County: Webster SEC: TWP: RGE:
Location: 5TH AVE S, 200TH ST, S 42ND ST & OLD US 20
Funct. Class:

Seasonal Factor Type: Muni Streets
Daily Factor Type: Muni Streets
Axle Factor Type: Muni Streets
Growth Factor Type: Muni Streets

	Sun 04/03/2011			Mon 04/04/2011			Tue 04/05/2011			Wed 04/06/2011			Thu 04/07/2011			Fri 04/08/2011			Sat 04/09/2011		
	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E	ROAD	W	E
00:00							39			37											
01:00							37			37											
02:00							32			43											
03:00							39			52											
04:00							74			31											
05:00							136			74											
06:00							423			202											
07:00							719			249											
08:00							549														
09:00							556														
10:00				532			577														
11:00				646			698														
12:00				723			686														
13:00				646			642														
14:00				613			582														
15:00				716			784														
16:00				699			775														
17:00				786			771														
18:00				445			452														
19:00				333			320														
20:00				226			234														
21:00				185			161														
22:00				132			134														
23:00				93			99														
Volume				6,775			9,519			725											
AM Peak Vol							719														
AM Peak Fct							1.00														
AM Peak Hr							7:00														
PM Peak Vol				786			784														
PM Peak Fct				1.00			1.00														
PM Peak Hr				17:00			15:00														
Seasonal Fct				0.960			0.960			0.960											
Daily Fct				0.992			0.956			0.934											
Axle Fct				0.494			0.494			0.494											
Pulse Fct				2.000			2.000			2.000											

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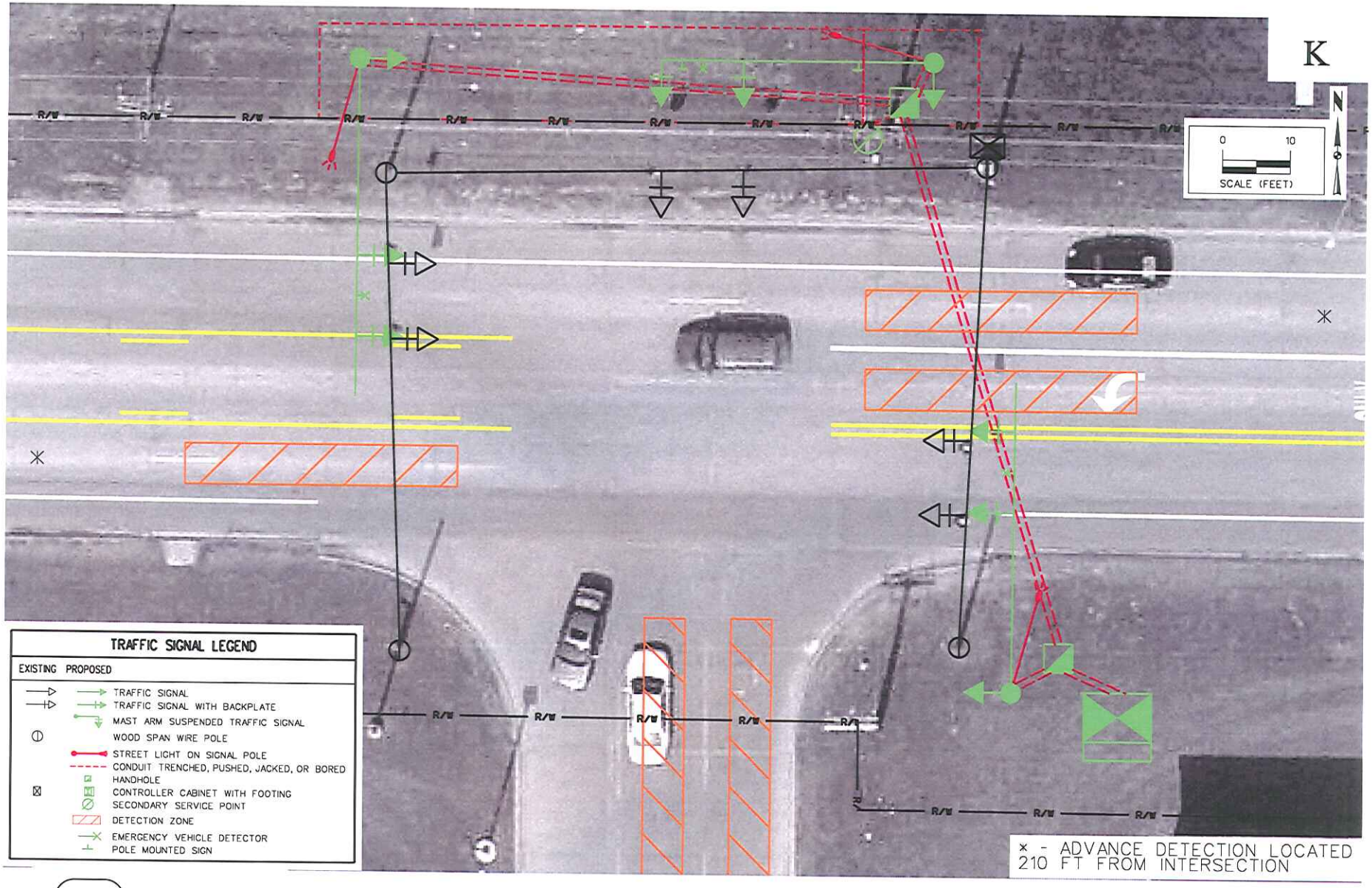


SNYDER & ASSOCIATES
Engineers and Planners

TRAFFIC SIGNAL LAYOUT
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
5TH AVENUE S CORRIDOR
FORT DODGE, IOWA

FIGURE X

Traffic Safety Improvement Program Application
5th Avenue S Corridor
Fort Dodge, Iowa

Benefit/Cost Ratio Calculations

The assumptions applied to the Benefit/Cost Calculations were based on recommended information from the Iowa DOT Office of Traffic and Safety, and the project review meeting conducted on February 23, 2012:

- Service Life: 20 years – based on the four-lane to three-lane conversion
- Crash Reduction Factor: 20% - a conservative percentage for a four-lane to three-lane conversion from data from the http://www.cmfclearinghouse.org/ website (most reduction factors are from 24% to 53% on most crash types).

  This reduction factor may be conservative based on the crash history detailed in Section I and as described in the Narrative. Many of the crashes included vehicles turning left from a through lane and vehicles entering 5th Ave S and colliding with through vehicles either behind or being blocked by right turning vehicles. Many of these crashes will be reduced by the center two-way left turn lane and single through lane.

- Growth: According to the Iowa DOT Traffic Count Data, traffic levels along this corridor have fallen approximately 30% from the highest volumes in 2003 to counts taken in 2011 (counts taken in 2007 were in between the 2003 and 2011 counts). Construction was occurring west of this corridor in 2011, so to account for this construction and potential regrowth of the commercial area, a growth rate of 1% per year was assumed over the service life of the improvements.

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Webster Prepared by: City of Fort Dodge Date Prepared: Aug 14, 2012

Location: 5th Ave S from east of S 32nd St to S 42nd St

Improvement

Proposed Improvement(s): Convert 5th Ave S from four lanes to three lanes, including a two-way left turn lane. Project also includes a traffic signal installation (replacing span wire) and an offset right turn lane into a business.

$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement 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, **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 Recorder Count 2011 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.89	10,000	Average of counts on each end
0.89	miles total	

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

8,900	Current Vehicle Miles / Day, **VM**
10,860	End of Life Veh. Miles / Day
3,248,500	Current Veh. Miles / Year, **AM**
71,528,734	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

2009 First full year --> 2011 Last full year 3.5 years, Time Period, **T**

6 Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$ -
14	Injury Crashes →	2	Major Injuries @	$240,000	$ 480,000
		5	Minor Injuries @	$48,000	$ 240,000
		12	Possible Injuries @	$25,000	$ 300,000
36	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 273,350
50	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,293,350

14.29	Current Crashes / Year, **AA** = TA / T
$ 25,867	Cost per Crash, **AVCR** = LOSS / TA
314.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8
2.86	Crashes Avoided First Year **AAR** = AA x CRF / 100
$ 73,906	Crash Costs Avoided in First Year, AAR x AVCR
62.9	Total Avoided Crashes, TCR x CRF/ 100

439.8	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 1,091,640	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 = $1,091,640 : $500,000 = **2.18** : 1

J:\2011_Projects\111.0740\Correspondence\TSIP Application\TSIP Application B-C Spreadsheet - Fort Dodge - 5th Ave S Corridor - 120814.xlsx

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: East 30th and Dean Avenue Intersection Widening

Applicant: City of Des Moines

Contact Person: Jennifer L. Bohac Title: City Traffic Engineer

Complete Mailing Address: 400 Robert D. Ray Drive
Des Moines, Iowa 50309

Phone: 515-283-4973 (Area Code) E-Mail: jlbohac@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: _____ (Area Code) E-Mail: _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost	$ 635,000
Safety Funds Requested	$ 500,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Des Moines, Iowa

Signed: T.M. Franklin Cownie — AUG 13 2012

Signature — Date Signed

T.M. Franklin Cownie, Mayor

Typed Name

Attest: Diane Rauh — AUG 13 2012

Signature — Date Signed

Diane Rauh, City Clerk

Typed Name

★ **Roll Call Number** 12-1148

Agenda Item Number 6

Date July 23, 2012

APPROVING FY2014 TRAFFIC SAFETY FUND APPLICATIONS TO THE IOWA DEPARTMENT OF TRANSPORTATION

BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF DES MOINES, IOWA:

That the City Manager is hereby directed to submit applications to the Iowa Department of Transportation for Traffic Safety Funds to cover a portion of the construction costs for the following projects:

1. E. 30th Street and Dean Avenue Intersection Widening
2. S.E. 30th Street and Scott Avenue Intersection Widening
3. E. 14th Street and Euclid Avenue Intersection Modification
4. E. Euclid Avenue and Dixon Street Traffic Signal Upgrade

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

(Council Communication Number 12-399 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GRIESS	✓			
HENSLEY	✓			
MAHAFFEY	✓			
MEYER	✓			
MOORE	✓			
TOTAL	7			

MOTION CARRIED APPROVED

T. M. Franklin Cownie Mayor

CERTIFICATE

I, DIANE RAUH, 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.

Diane Rauh City Clerk

PROJECT DESCRIPTION

EAST 30TH STREET AND DEAN AVENUE INTERSECTION WIDENING AND TRAFFIC SIGNAL UPGRADE

Project Description:

The proposed intersection improvement will provide left-turning lanes in all four directions and upgraded traffic signals. A westbound right turn lane would also be included. Widening will be required on the east and west approaches on Dean Avenue. For north-south traffic, no widening would be needed, with the existing pavement being restriped to provide for the left-turn lanes. The intersection radii would be improved to accommodate larger turning vehicles that occur during all times of the year, but especially during the Iowa State Fair. Additional right-of-way would be required on the northeast, northwest, and southwest quadrants. An existing school service driveway in the southwest quadrant would be removed, and an alternate access to the school service area would be provided. A 10' clear zone is proposed.

New traffic signals with overhead indications for all directions would be installed, including north-south and westbound left-turn phasing. Backplates would be included. Pedestrian signals with count-down timers would be added. Detection for fully-actuated operation would be installed. The signals would remain interconnected to the city's current traffic signal network.

The total project cost is estimated to be $635,000, of which $500,000 is requested from State Traffic Safety Improvement Program Funding.

Existing Conditions:

East 30th Street is a north-south minor arterial roadway that services traffic in the east and southeast area of Des Moines. The section of East 30th Street near Dean Avenue is a 4-lane, undivided roadway. Approximately 100 feet south of the intersection with Dean Avenue, the SE 30th Street Viaduct begins, which provides a grade-separated bridge over the Iowa Interstate / Union Pacific railroad facilities, including their "Shortline" switching yard. This bridge is currently marked as a 4-lane roadway, but will be restriped as a 3-lane facility when the bridge is rehabilitated in 2016.

The most prominent landmark in this vicinity is the Iowa State Fairgrounds, which lies in the northeast quadrant of this intersection, extending north along the east side of East 30th Street to E. University Avenue and east along the north side of Dean Avenue. The west side of E. 30th is generally commercial in nature. Willard Elementary School is located in the southwest quadrant of the intersection of E. 30th and Dean. The speed limit on E. 30th Street is 35 miles per hour (mph), except during school arrival and dismissal times, where the speed limit is reduced to 25 mph with flashing beacons.

Dean Avenue is a 2-lane collector roadway, with a speed limit of 30 mph. School flashers lower the speed limit to 25 mph during school arrival and dismissal times. It serves a small industrial / residential area. During the Iowa State Fair, Dean Avenue becomes the primary service roadway for employees, vendor deliveries, and livestock arrivals, along with a large amount of parking for visitors.

The intersection currently has no left turning lanes, and is controlled with a two-phase, semi-actuated traffic signal. It is interconnected via fiberoptic cable to the city's "citywide" traffic signal system.

Traffic count information from IDOT in 2008 indicates volumes on East 30th Street of approximately 12,800 vehicles per day (vpd) and volumes on Dean Avenue of 5,800 vehicles per day. These numbers do not reflect the significant increases that occur during the 10 days of the Iowa State Fair.

Traffic signals are warranted at this location based on Warrant No. 1B (Interruption of Continuous Traffic).

Project Justification

A review of the crash history for the 5-year period between January 2006 and December 2010 indicated a total of 37 crashes at the intersection of East 30th Street and Dean Avenue. The analysis of the crash information indicates the following:

Crash Type	Total no. of Crashes
Right-Angle	12
Rear End	4
Left turning	13
Sideswipe	2
Fixed Object	3
Head-on	2
Unknown	1
Total	**37**
Average per year:	**7.4**

Of the 37 reported crashes, there were 16 personal injury crashes involving 22 injuries. Right angle crashes accounted for 12 crashes (32%), rear-end accounted for 4 crashes (11%), and left-turning accounted for 13 crashes (35%). All of these types, which account for 78% of the total crashes, would generally be considered correctible by the improvements planned as part of this project.

Based on current IDOT value factors, the monetary benefit (present value of the avoided crashes) is $1,028,639 (See Exhibit "L-1"). Assuming an overall accident reduction of 30 percent and an estimated project life of 20 years. The request for $500,000 of Traffic Safety Funds relates to a benefit-cost factor of **1.82:1.**

Exhibit "C"

DEPARTMENT OF ENGINEERING

CONSTRUCTION ESTIMATE

CITY OF DES MOINES, IA.

W.O. NO. 0306-00-000

DATE: 8/6/2012

PROJECT: Intersection Approach Widening - E. 30th St. and Dean Ave. (East/West Combined & Extended 20' Widening to E. 30th Ct. with 15:1 taper east)

ITEM NO.	DESCRIPTION	ESTIMATED UNITS	UNIT PRICE	TOTAL AMOUNT
1	18" Curb Removal with sawcut, tie bars	1,000 LF	$20.00	$20,000.00
2	8" PCC Widening with 2" HMA	1,450 SY	$75.00	$108,750.00
3	Subgrade Preparation	1,650 SY	$10.00	$16,500.00
4	Drive, P.C. Concrete, 7 IN	125 SY	$50.00	$6,250.00
5	Removal of Paved Drive	125 SY	$20.00	$2,500.00
6	Sidewalk Removal	450 SY	$15.00	$6,750.00
7	6" PCC Sidewalk, 5' wide	500 SY	$30.00	$15,000.00
8	Intake Removal	4 EA	$500.00	$2,000.00
9	Intake, SW-505	4 EA	$4,500.00	$18,000.00
10	Sewer, Storm, 15 IN. Dia.	80 LF	$100.00	$8,000.00
11	Adjustment of Manhole	2 EA	$500.00	$1,000.00
12	Sodding	100 SQ	$50.00	$5,000.00
13	Traffic Signal Modifications,R & R	1 LS	$200,000.00	$200,000.00
	20% CONTINGENCIES	1 LS	$85,000.00	$85,000.00
	20% ENGINEERING, INCIDENTALS	1 LS	$85,000.00	$85,000.00
	TOTAL CONSTRUCTION COST			$579,750.00
	RIGHT OF WAY (150 SF Fair Grounds)			$4,050.00
	Drive connection to Willard School from E. 29th Ct. school lot.			$50,000.00
Notes:	1) 20' PCC Widening, north side, east of E. 30th St. to E. 30th Ct.			
	2) 15 to 1 taper east of E. 30th Ct.			
	3) Existing Dean Ave. has HMA overlay			
	4) Relocation of 4 intakes.			
	5) Existing north sidewalk is in poor condition, remove & replace, 5' wide to 30th Ct.			
	6) Recommend 7:1, 10' x 70' taper at NE & SE Radius for WB-50 semitrailer, 15' parking NE, 25' parking SE.			
	7) Moving of power poles along north side Dean required			
	8) DMWW feeder main south side Dean, west of E. 30th St.?			
			TOTAL PROJECT COST	$633,800.00

PREPARED BY: _____RRJ_____

CHECKED BY: _____

Exhibit D

TIME SCHEDULE

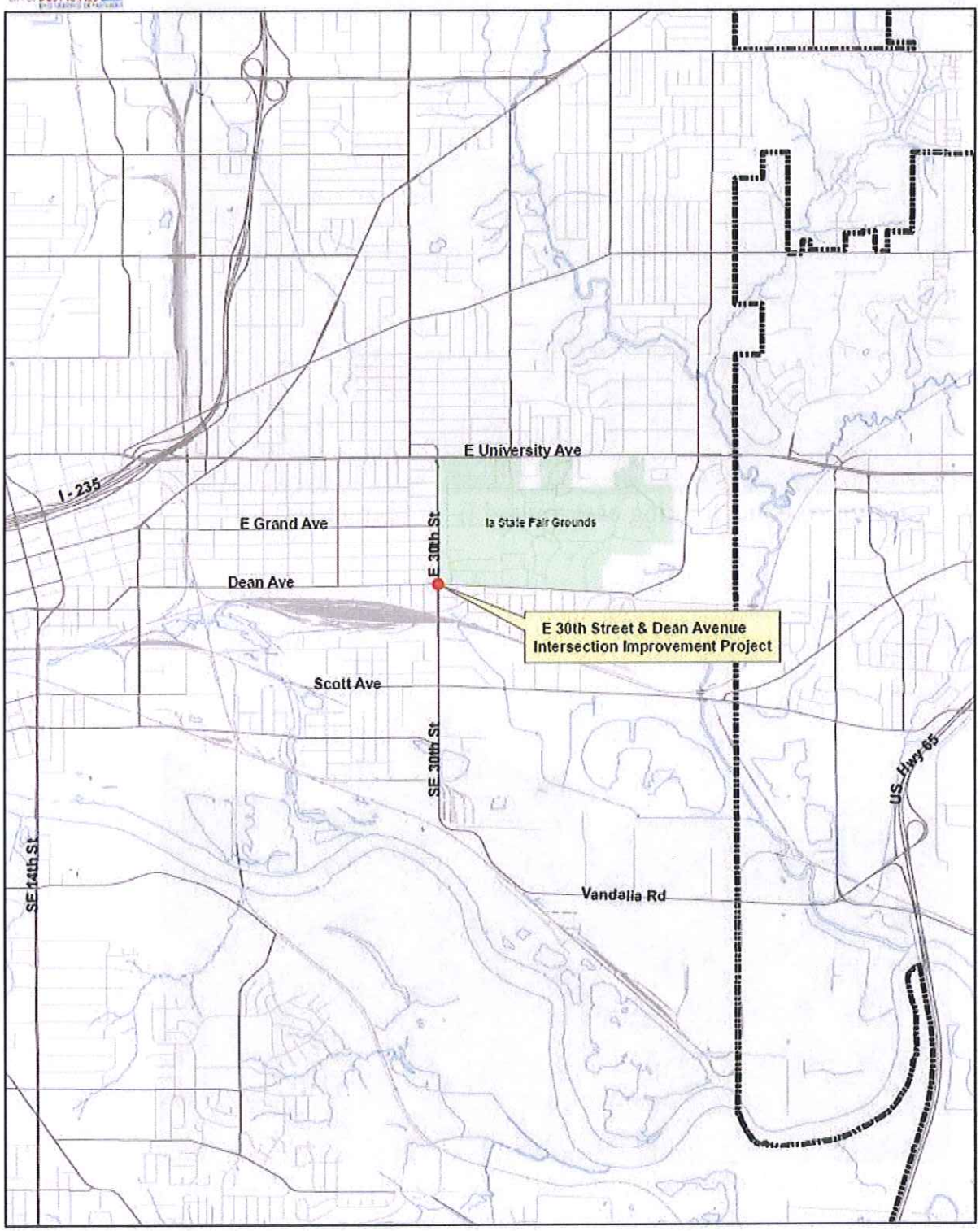
E 30TH STREET AND DEAN AVENUE INTERSECTION WIDENING AND TRAFFIC SIGNAL UPGRADING

Project Approval:	**December 2012**
Agreement Signed:	**February 2013**
Project bid:	**May 2013**
Construction completed:	**August 2013**
Project Closeout:	**December 2013**

Exhibit "E"

Vicinity Map

E 30th Street & Dean Avenue
Intersection Improvement Project



Dean Avenue, looking east toward E 30th Street 200 feet

Dean Avenue, looking east toward E 30th Street, near intersection

Exhibit F-2

E 30th Street, looking north toward Dean Avenue 200 feet

E 30th Street, looking north toward Dean Avenue, near intersection

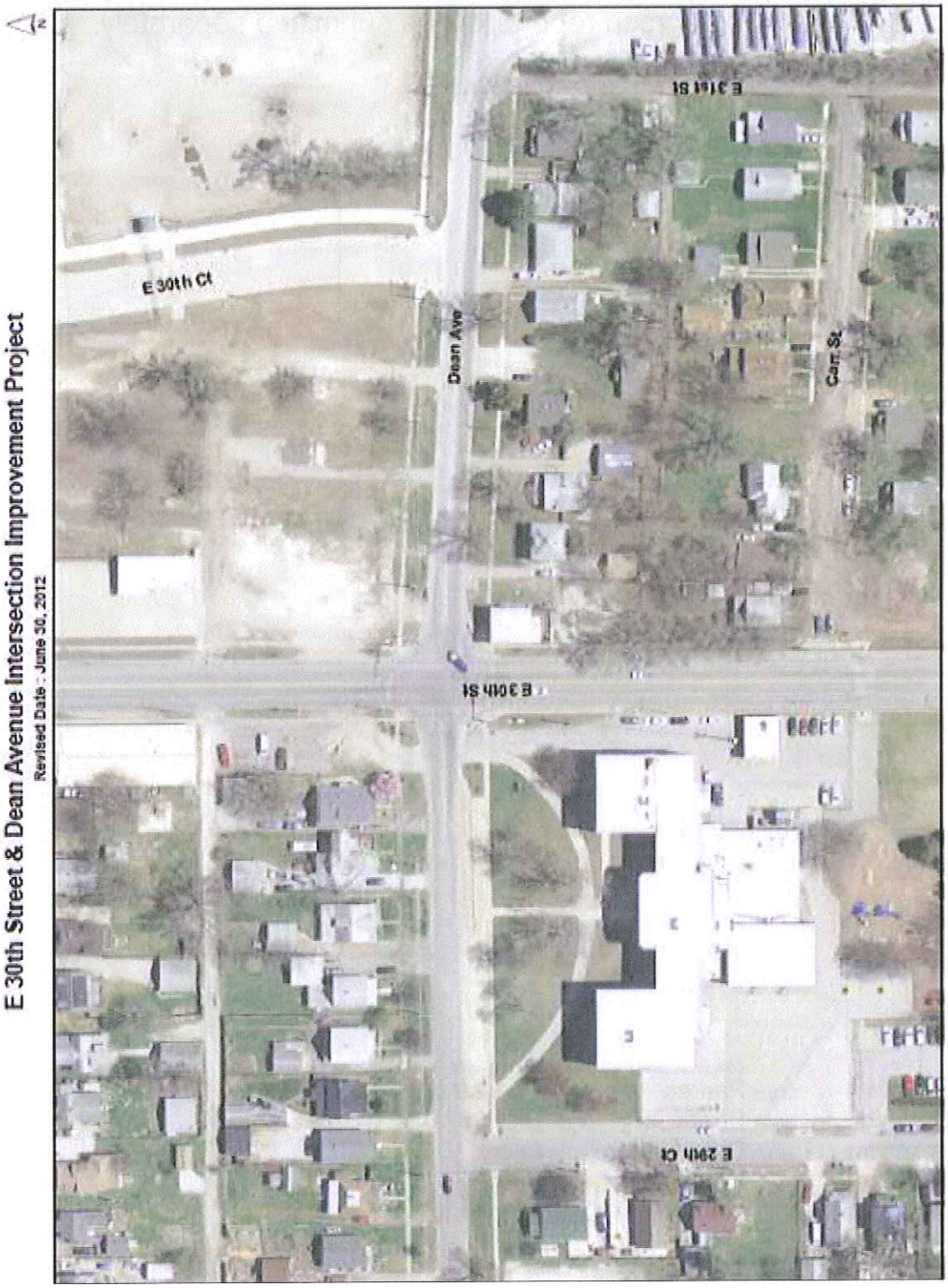
Dean Avenue, looking west toward E 30th Street, near intersection

Dean Avenue, looking west toward E 30th Street 200 feet

Dean Avenue, looking west toward E 30th Street 420 feet

E 30th Street, looking south toward Dean Avenue 200 feet

E 30th Street, looking south toward Dean Avenue, near intersection



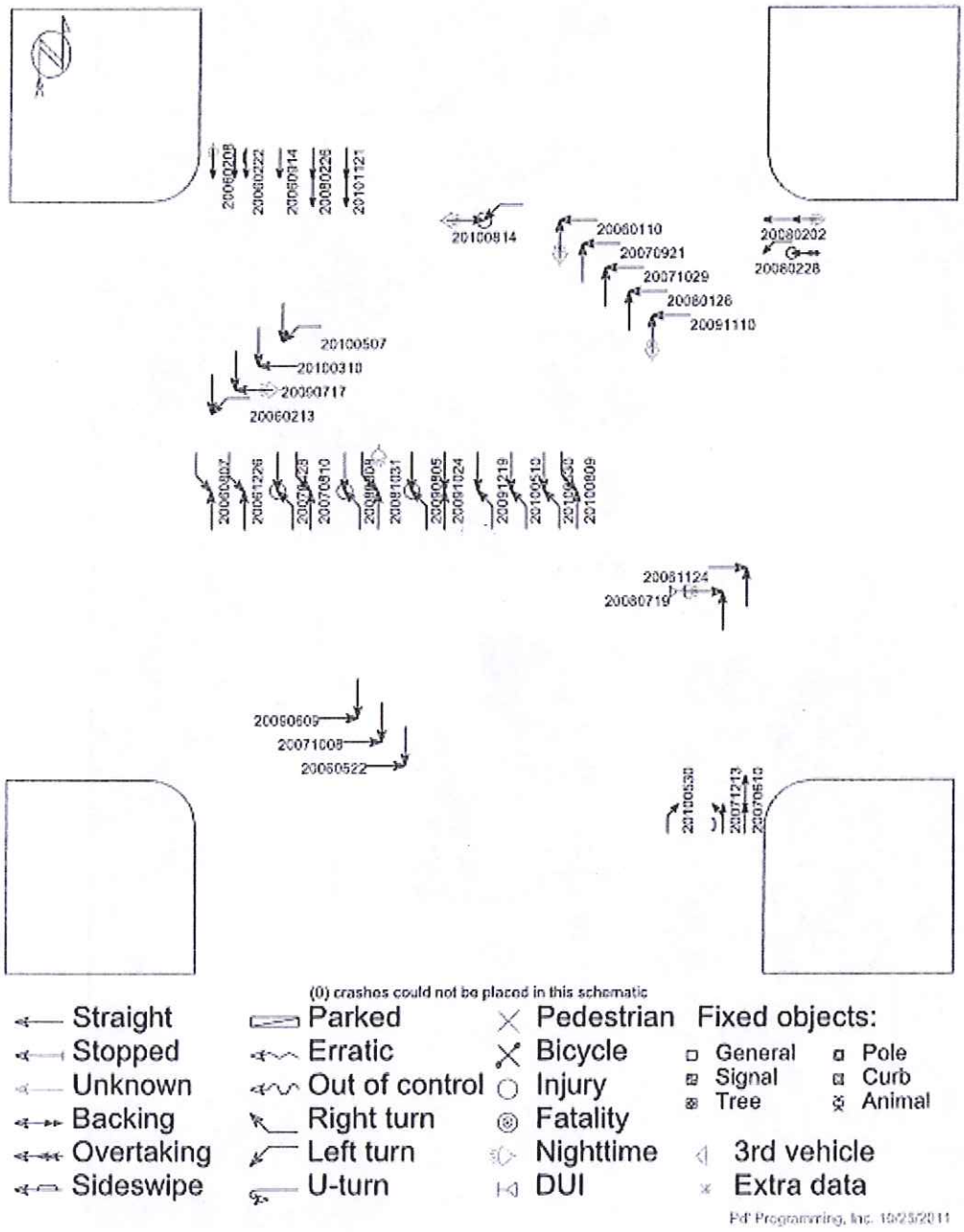
E 30th Street & Dean Avenue Intersection Improvement Project

Revised Date : June 30, 2012

Note: Copies of Injury/Fatal crash reports will be submitted separately.

E 30th and Dean

2006-2010 crash history (5 yrs)



City of Des Moines
600 E Court, Suite 200A
Des Moines, IA 50309
Turning Movement Count

File Name : E 30th & Dean_TM 2012
Site Code : 00000000
Start Date : 7/25/2012
Page No : 1

Groups Printed- Cars & Pickups - Trucks

	E30TH From North				DEAN From East				E30TH From South				DEAN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	5	49	8	0	21	19	8	0	6	77	8	0	3	6	3	0	214
07:15 AM	8	43	6	0	21	24	4	0	7	72	7	0	3	1	8	0	204
07:30 AM	13	50	10	0	35	38	8	0	7	62	9	0	1	7	4	0	244
07:45 AM	12	67	15	0	16	34	3	0	4	66	8	0	4	9	9	0	247
Total	38	209	39	0	93	115	23	0	24	277	32	0	11	23	24	0	909
08:00 AM	4	30	11	0	14	14	8	0	4	65	3	0	4	9	1	0	167
Total	4	30	11	0	14	14	8	0	4	65	3	0	4	9	1	0	167
11:45 AM	10	56	36	0	28	8	4	0	5	42	4	0	10	9	10	0	222
Total	10	56	36	0	28	8	4	0	5	42	4	0	10	9	10	0	222
12:00 PM	11	51	23	0	14	7	3	0	7	75	2	0	4	10	9	0	216
12:15 PM	6	46	19	0	17	4	11	0	6	41	3	0	5	11	6	0	175
12:30 PM	10	56	10	0	21	6	5	2	8	51	8	1	3	13	3	0	197
12:45 PM	6	49	12	0	20	14	11	0	7	45	6	0	4	9	8	0	191
Total	33	202	64	0	72	31	30	2	28	212	19	1	16	43	26	0	779
01:00 PM	11	71	14	0	12	6	5	0	3	54	3	0	3	9	15	0	206
Total	11	71	14	0	12	6	5	0	3	54	3	0	3	9	15	0	206
03:45 PM	7	66	29	0	25	9	4	0	6	60	5	0	7	38	12	0	268
Total	7	66	29	0	25	9	4	0	6	60	5	0	7	38	12	0	268
04:00 PM	9	54	19	0	20	10	6	0	8	62	3	0	9	37	15	2	254
04:15 PM	13	65	23	0	19	5	7	0	6	71	5	0	8	39	19	0	280
04:30 PM	4	55	29	0	15	6	6	0	13	67	1	1	12	19	17	1	246
04:45 PM	5	66	37	0	21	12	4	0	17	65	2	0	8	46	16	0	299
Total	31	240	108	0	75	33	23	0	44	265	11	1	37	141	67	3	1079
Grand Total	135	874	301	0	319	216	97	2	114	975	77	2	88	272	155	3	3630
Apprch %	10.3	66.7	23.0	0.0	50.3	34.1	15.3	0.3	9.8	83.9	6.6	0.2	17.0	52.5	29.9	0.6	
Total %	3.7	24.1	8.3	0.0	8.8	6.0	2.7	0.1	3.1	26.9	2.1	0.1	2.4	7.5	4.3	0.1	

Exhibit J-1

PORTABLE RECORDER TRAFFIC COUNT

CURRENT DATE 08-08-2012

STATION NUMBER: COUNTY 77 POLK
TWP 13 CITY: DES MOINES
NODE 8805
N LOC 3101

LOCATION: DEAN AVE & E 32ND ST

LEGAL DESC: SEC TWP RGE

RECORDER LEG E

2008 AADT 005645

D1530974 VIEW HOURLY COUNTS PAGE 0001

STATION: COUNTY 77 TOWNSHIP 12 MODE 8805 LOCATION 3101 PRINTER ID: TPRT003W

BEGINNING TIME AND DATE TIME 0600 PM MONTH 07 DAY 28 YEAR 2008 DOW 2
ENDING TIME AND DATE TIME 0600 PM MONTH 07 DAY 29 YEAR 2008 DOW 3

D O W	DATE	MID TO 1AM	1AM TO 2AM	2AM TO 3AM	3AM TO 4AM	4AM TO 5AM	5AM TO 6AM	6AM TO 7AM	7AM TO 8AM	8AM TO 9AM	9AM TO 10AM	10AM TO 11AM	11AM TO NOON	NOON TO 1PM	1PM TO 2PM	2PM TO 3PM	3PM TO 4PM	4PM TO 5PM	5PM TO 6PM	6PM TO 7PM	7PM TO 8PM	8PM TO 9PM	9PM TO 10PM	10PM TO 11PM	11PM TO MID	TOTAL
2	07 28																									
																				0287	0225	0208	0181	0104	0066	001071
3	07 29																									
		0036	0030	0023	0026	0023	0053	0324	0496	0323	0251	0280	0305	0383	0366	0412	0507	0734	0618							005210

PF7 BKWD PF6 FWD PF9 SELECT DIFFERENT CONTROLS PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

PORTABLE RECORDER TRAFFIC COUNT

CURRENT DATE 08-08-2012

STATION NUMBER: COUNTY 77 POLK
TWP 13 CITY: DES MOINES
NODE 9201
N LOC 5101

LOCATION: E GRAND AVE & E 30TH ST

LEGAL DESC: SEC TWP RGE

RECORDER LEG S

2008 AADT 012780

D1530974 VIEW HOURLY COUNTS PAGE 0001

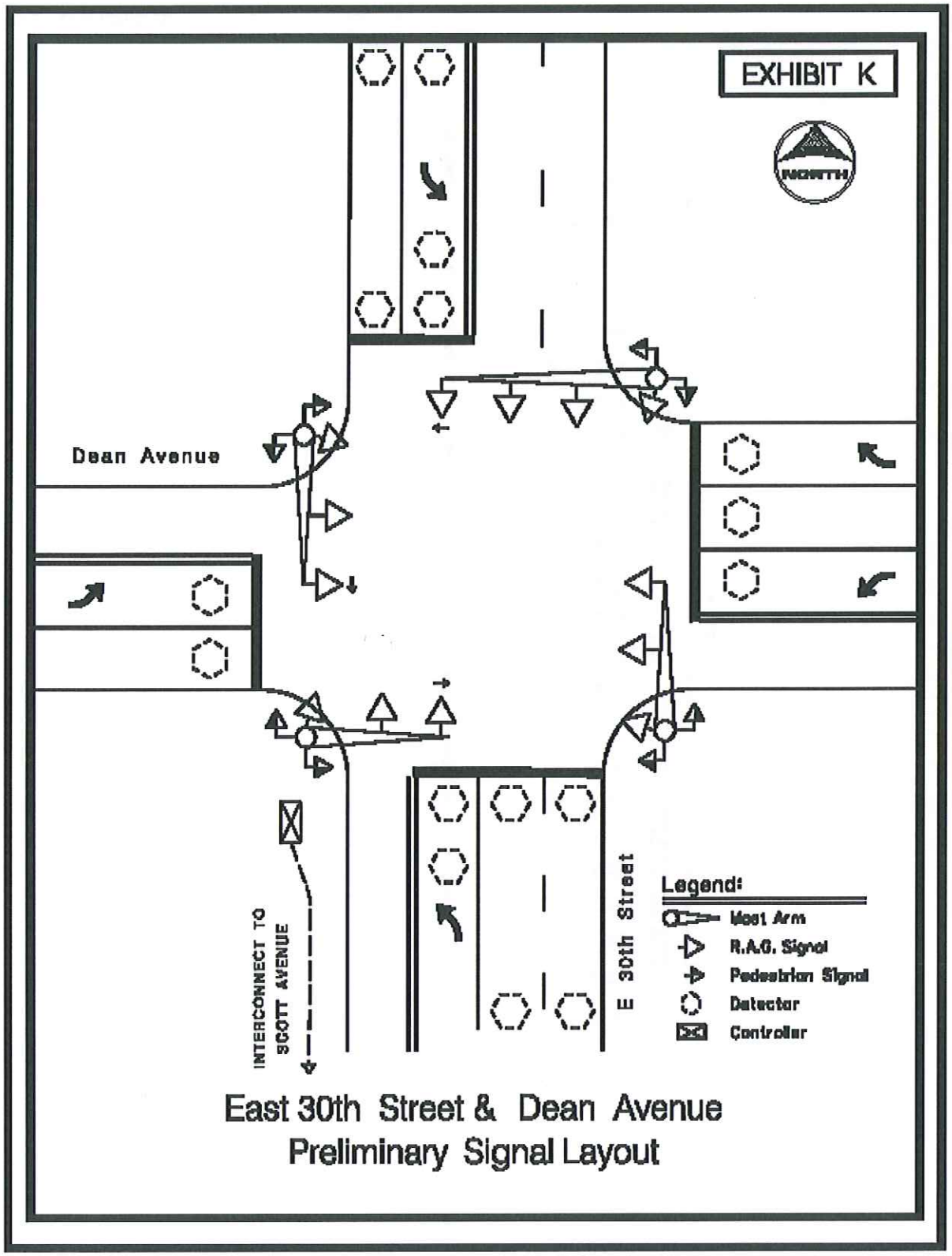
STATION: COUNTY 77 TOWNSHIP 13 NODE 9201 LOCATION 5101 PRINTER ID: TPRT003W

BEGINNING TIME AND DATE TIME 0600 PM MONTH 07 DAY 28 YEAR 2008 DOW 2
ENDING TIME AND DATE TIME 0600 PM MONTH 07 DAY 29 YEAR 2008 DOW 3

DOW	DATE	MID TO 1AM	1AM TO 2AM	2AM TO 3AM	3AM TO 4AM	4AM TO 5AM	5AM TO 6AM	6AM TO 7AM	7AM TO 8AM	8AM TO 9AM	9AM TO 10AM	10AM TO 11AM	11AM TO NOON	NOON TO 1PM	1PM TO 2PM	2PM TO 3PM	3PM TO 4PM	4PM TO 5PM	5PM TO 6PM	6PM TO 7PM	7PM TO 8PM	8PM TO 9PM	9PM TO 10PM	10PM TO 11PM	11PM TO MID	TOTAL
2	07 28																		0650	0548	0481	0438	0278	0225		002620
3	07 29	0109	0086	0063	0061	0108	0277	0771	0892	0674	0703	0721	0871	0936	0869	0884	1074	1047	0969							011115

PF7 BKWD PF8 FWD PF9 SELECT DIFFERENT CONTROLS PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Exhibit J-5



East 30th Street & Dean Avenue
Preliminary Signal Layout

Exhibit L-1

Rev. 8/09

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County:	Polk	Prepared by:	Mike Ring	Date Prepared:	Oct 25, 2011
Intersection:	E 30th and Dean				

Improvement

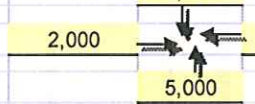
Proposed Improvement(s): Add north-south left turn lanes

$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement 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 (time value of $), **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 500,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: City traffic counts — 2009 — Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



		5,110,000	Current Annual Entering Veh., **AEV** = DEV * 365
		17,083	veh / day, Final Year DEV, **FDEV**
		112.52	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**		
14,000	Current Daily Entering Vehicles, **DEV**		

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

Crash Data

2006	First full year -->	2010	Last full year		5.0	years, Time Period, **T**	
	Additional months					values as of Dec. 2007	
0	Fatal Crashes	0	Fatalities @		$3,500,000	$	-
		1	Major Injuries @		$240,000	$	240,000
16	Injury Crashes	4	Minor Injuries @		$48,000	$	192,000
		17	Possible Injuries @		$25,000	$	425,000
21	Property Damage Only		(assumed cost per crash)		$2,700	$	-
		-OR-	enter all Property Costs of all crashes:			$	171,639
37	Total Crashes, **TA**				Total $ Loss, **LOSS**	$	1,028,639

7.40	Current Crashes / Year, **AA** = TA / T	1.45	Crashes / MEV, Crash Rate, **CR**
$ 27,801	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
162.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 911,623	Present Value of Avoided
2.22	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 61,718	Crash Costs Avoided in First Year, AAR x AVC		
48.9	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 = $911,623 : $500,000 = **1.82** : 1

Exhibit A-1

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Southeast 30th and Scott Avenue Intersection Widening

Applicant: City of Des Moines

Contact Person: Jennifer L. Bohac Title: City Traffic Engineer

Complete Mailing Address: 400 Robert D. Ray Drive
Des Moines, Iowa 50309

Phone: 515-283-4973 (Area Code) E-Mail: jlbohac@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: _____ (Area Code) E-Mail: _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost	$ 490,000
Safety Funds Requested	$ 100,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Des Moines, Iowa

Signed: T.M. Franklin Cownie — AUG 13 2012
Signature — Date Signed

T.M. Franklin Cownie, Mayor
Typed Name

Attest: Diane Rauh — AUG 13 2012
Signature — Date Signed

Diane Rauh, City Clerk
Typed Name

★ **Roll Call Number** 12-1148

Agenda Item Number 6

Date July 23, 2012

APPROVING FY2014 TRAFFIC SAFETY FUND APPLICATIONS TO THE IOWA DEPARTMENT OF TRANSPORTATION

BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF DES MOINES, IOWA:

That the City Manager is hereby directed to submit applications to the Iowa Department of Transportation for Traffic Safety Funds to cover a portion of the construction costs for the following projects:

1. E. 30th Street and Dean Avenue Intersection Widening
2. S.E. 30th Street and Scott Avenue Intersection Widening
3. E. 14th Street and Euclid Avenue Intersection Modification
4. E. Euclid Avenue and Dixon Street Traffic Signal Upgrade

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

(Council Communication Number 12-399 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GRIESS	✓			
HENSLEY	✓			
MAHAFFEY	✓			
MEYER	✓			
MOORE	✓			
TOTAL	7			

MOTION CARRIED APPROVED

T. M. Franklin Cownie Mayor

CERTIFICATE

I, DIANE RAUH, 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.

Diane Rauh City Clerk

PROJECT DESCRIPTION

SE 30TH STREET AND SCOTT AVENUE INTERSECTION WIDENING AND TRAFFIC SIGNAL UPGRADE

Project Description:

The proposed intersection improvement will provide left-turning lanes on the north-south legs of Southeast 30th Street, along with upgrading the traffic signals. Pavement widening will be required on the south approach. The intersection radii would be improved to accommodate larger turning vehicles. Additional right-of-way would be required in all four quadrants. A 10' clear zone is proposed.

New traffic signals with overhead indications for all directions would be installed, including north-south left-turn phasing. Backplates would be included. Detection for fully-actuated operation would be installed. The signals would be interconnected to the city's traffic signal system when the SE 30th Street Viaduct is reconstructed, which is currently scheduled for 2016.

The total project cost is estimated to be $490,000, of which $100,000 is requested from State Traffic Safety Improvement Program Funding.

Existing Conditions:

Southeast 30th Street is a north-south minor arterial roadway that services traffic in the east and southeast area of Des Moines. The section of SE 30th Street near Scott Avenue is a 2-lane roadway with a speed limit of 35 miles per hour (mph). The street has an urban cross-section north of Scott Avenue, transitioning to a rural cross-section to the south of Scott Avenue.

Dean Avenue is a 2-lane collector roadway, with a speed limit of 25 mph. To the west of the project intersection it connects into the Chesterfield residential area of Des Moines. East of SE 30th Street, Dean Avenue provides a good connection to the City of Pleasant Hill and eastern Polk County.

There are no existing left-turn lanes on any of the approaches to the intersection. It is controlled by a two-phase, semi-actuated traffic signal with span-wire mounting. It is not currently connected to the city's "citywide" traffic signal system.

Traffic count information from IDOT in 2004 indicates volumes on SE 30th Street of approximately 6,900 vehicles per day (vpd) and volumes on Scott Avenue of 2,430 vehicles per day. This intersection is located in close proximity to the Iowa State Fairgrounds, and these traffic volumes do not reflect the significant increases that occur during the 10 days of the Iowa State Fair.

Additional traffic will travel through this location once the Southeast Connector roadway project is completed to SE 30th, which will make a direct connection from downtown Des Moines to this section of the City. This project is expected to be completed in 2016.

Traffic signals are warranted at this location based on Warrant No. 1B (Interruption of Continuous Traffic).

Project Justification

A review of the crash history for the 5-year period between January 2006 and December 2010 indicated a total of 8 crashes at the intersection of SE 30th Street and Scott Avenue. The analysis of the crash information indicates the following:

Crash Type	Total no. of Crashes
Right-Angle	4
Left turning	1
Sideswipe	1
Fixed Object	2
Total	**8**
Average per year:	**1.6**

Of the 8 reported crashes, there were 3 personal injury crashes involving 4 injuries. Right angle crashes accounted for 4 crashes (50%) and left-turning accounted for 1 crash (13%). Both of these types would generally be considered correctible by the improvements planned as part of this project.

Based on current IDOT value factors, the monetary benefit (present value of the avoided crashes) is $181,700 (See Exhibit "L-1"). Assuming an overall accident reduction of 30 percent and an estimated project life of 20 years, the request for $100,000 of Traffic Safety Funds relates to a benefit-cost factor of **1.61:1.**

Exhibit "C"

DEPARTMENT OF ENGINEERING

CONSTRUCTION ESTIMATE

CITY OF DES MOINES, IA

W.O. NO. 0306-00-000
DATE: 12/13/2011

PROJECT: Intersection Approach Widening - E. 30th St. and Scott Ave.

ITEM NO.	DESCRIPTION	ESTIMATED UNITS	UNIT PRICE	TOTAL AMOUNT
1	Sawcut, tie bars	1,250 LF	$20.00	$25,000.00
2	8" PCC Widening	490 SY	$55.00	$26,950.00
3	8" PCC Widening with 2" HMA	400 SY	$75.00	$30,000.00
4	Subgrade Preparation	1,250 SY	$10.00	$12,500.00
5	Drive, P.C. Concrete, 7 IN	200 SY	$50.00	$10,000.00
6	Removal of Paved Drive	200 SY	$20.00	$4,000.00
7	Sidewalk Removal	150 SY	$15.00	$2,250.00
8	6" PCC Sidewalk, 5' wide	200 SY	$30.00	$6,000.00
9	Intake Removal	4 EA	$500.00	$2,000.00
10	Intake, SW-505	4 EA	$4,500.00	$18,000.00
11	Sewer, Storm, 15 IN. Dia.	40 LF	$100.00	$4,000.00
12	Sodding	35 SQ	$50.00	$1,750.00
13	Traffic Signal Modifications, R & R	1 LS	$200,000.00	$200,000.00
	20% CONTINGENCIES	1 LS	$70,000.00	$70,000.00
	20% ENGINEERING, INCIDENTALS	1 LS	$70,000.00	$70,000.00
	TOTAL CONSTRUCTION COST			$482,450.00
	RIGHT OF WAY			$3,606.00
Notes:	1) Project involves removal of 500 LF existing curb.			
	2) Remove and replace traffic signals			
	3) Rural section on E. 30th south of Scott Ave.			
	4) Relocation of 4 intakes.			

PREPARED BY: __________RRJ____________________

CHECKED BY: ______________________________

TOTAL PROJECT COST $486,056.00

Exhibit D

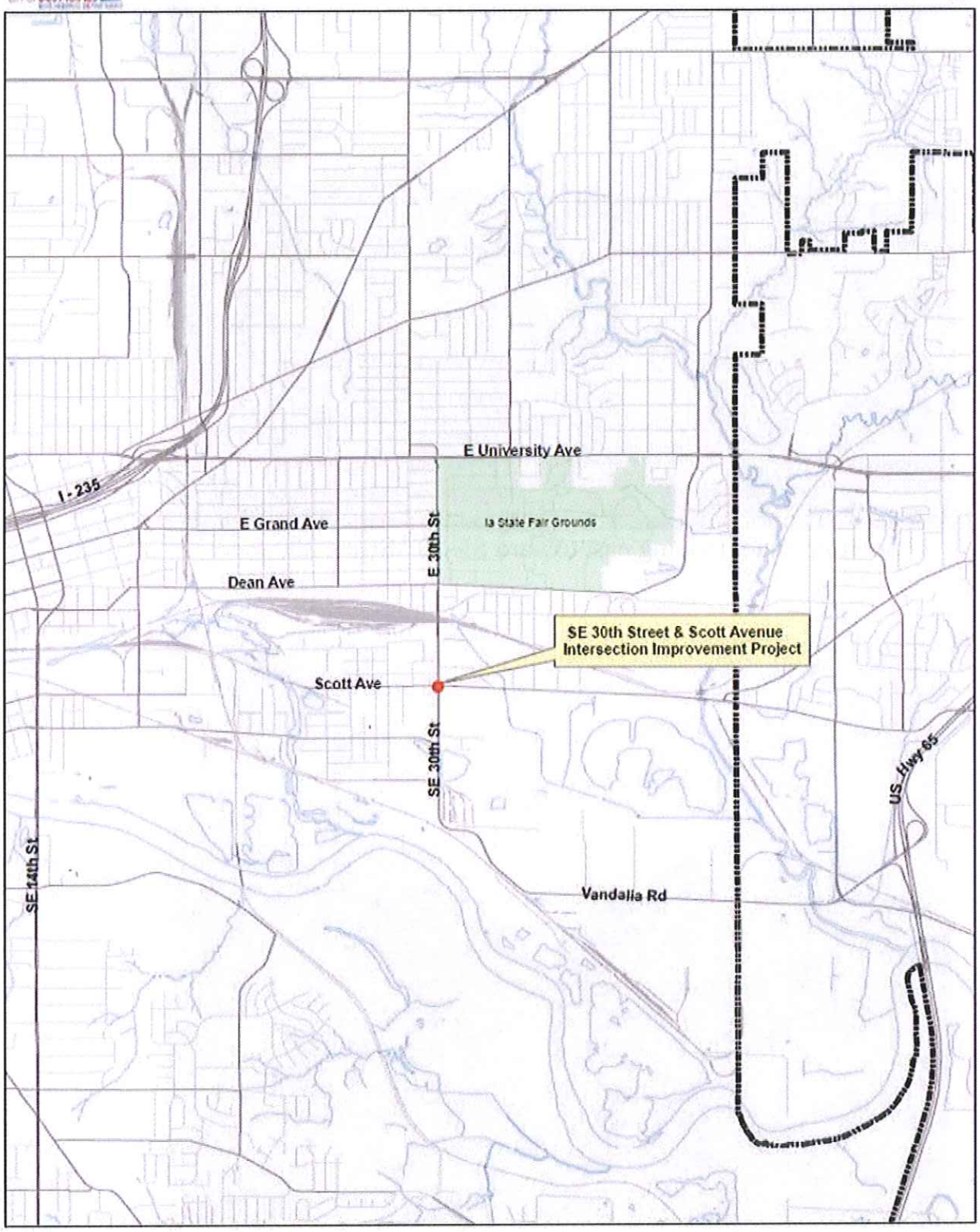
TIME SCHEDULE

SE 30TH STREET AND SCOTT AVENUE INTERSECTION WIDENING AND TRAFFIC SIGNAL UPGRADING

Project Approval:	**December 2012**
Agreement Signed:	**March 2013**
Project bid:	**May 2013**
Construction completed:	**August 2013**
Project Closeout:	**December 2013**

Vicinity Map

SE 30th Street & Scott Avenue Intersection Improvement Project



Scott Avenue, looking east toward SE 30th Street 200 feet

Scott Avenue, looking east toward SE 30th Street, near intersection

SE 30th Street, looking north toward Scott Avenue 200 feet

SE 30th Street, looking north toward Scott Avenue, near intersection

Scott Avenue, looking west toward SE 30th Street, near intersection

Scott Avenue, looking west toward SE 30th Street 200 feet

SE 30th Street, looking south toward Scott Avenue, near intersection

SE 30th Street, looking south toward Scott Avenue 200 feet

Exhibit G

SE 30th Street & Scott Avenue
Proposed Intersection Improvement
Date Prepared : June 28, 2012

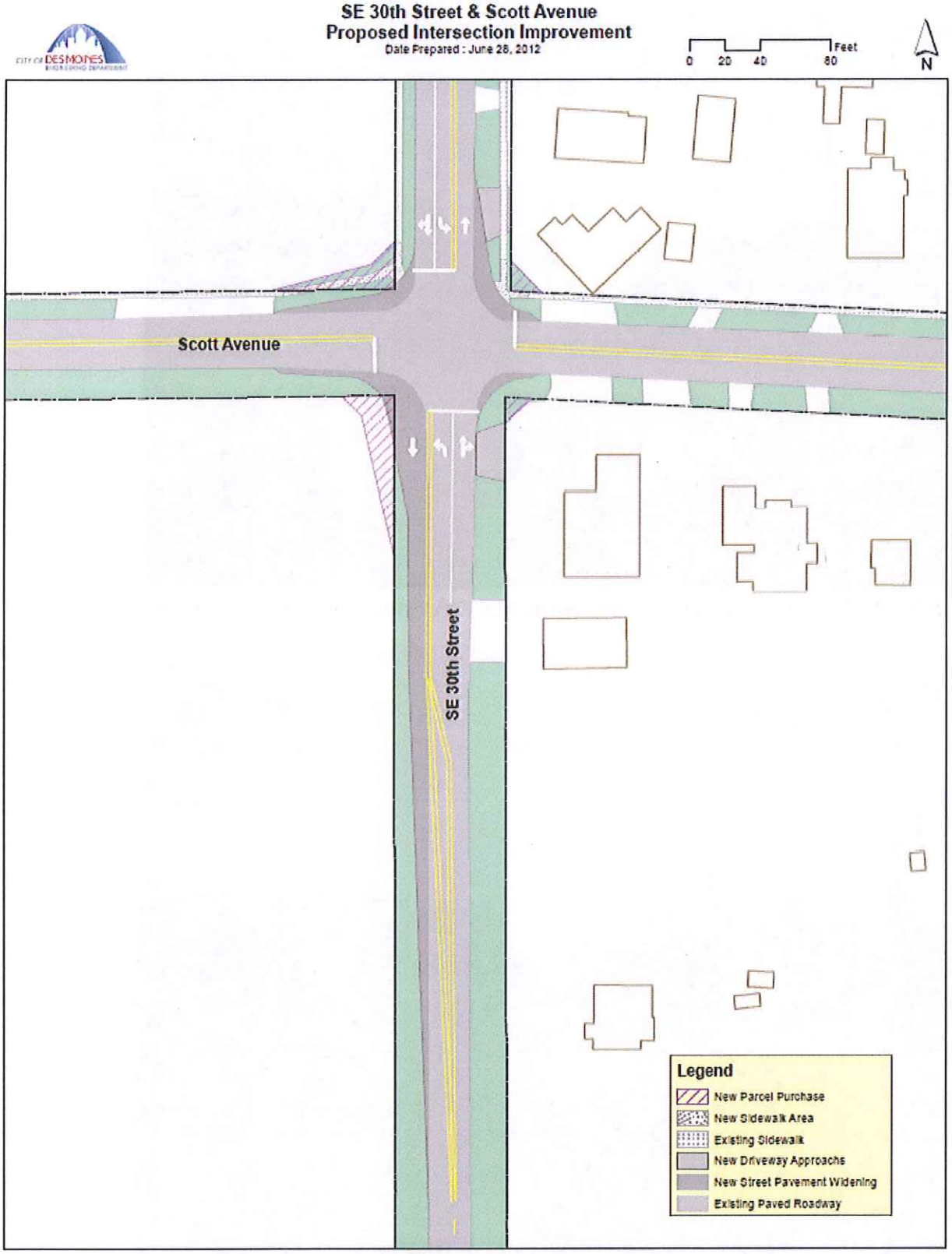


Exhibit H

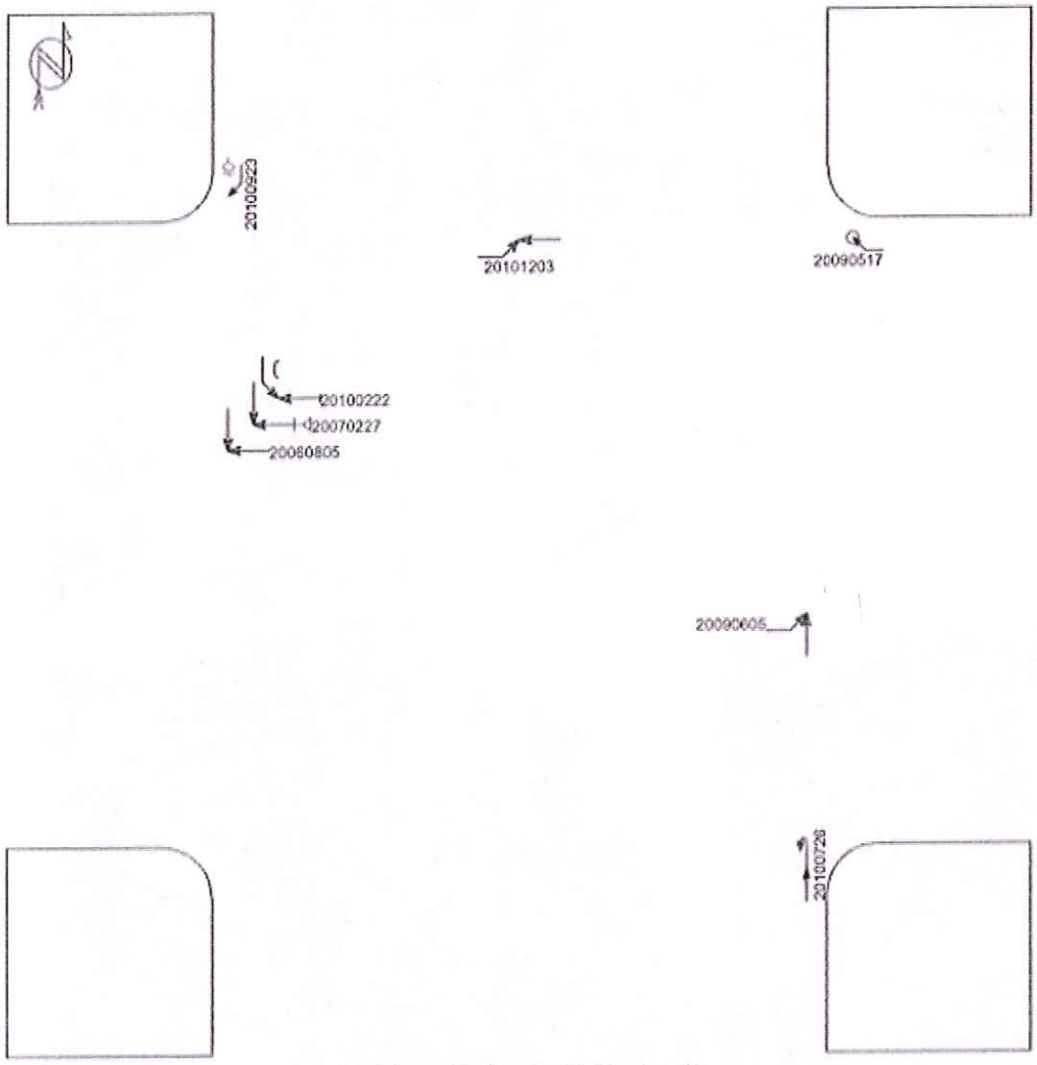
SE 30th Street & Scott Avenue Intersection Improvement Project

Revised Date : June 30, 2012

Note: Copies of Injury/Fatal crash reports are attached under separate cover.

SE 30th and Scott

5 yr crash history 2006-2010



(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

Pd Programming, Inc. 07/11/2012

City of Des Moines
600 E Court, Suite 200A
Des Moines, IA 50309
Turning Movement Count

File Name : E 30th & Scott_TM 2012
Site Code : 00000000
Start Date : 7/26/2012
Page No : 1

Groups Printed- Cars & Pickups - Trucks

	30TH From North				SCOTT From East				30TH From South				SCOTT From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	9	22	6	0	17	7	12	0	1	39	1	0	0	1	12	0	127
07:15 AM	5	24	3	0	19	6	13	0	2	30	3	0	2	0	6	0	113
07:30 AM	7	45	6	0	18	10	13	0	1	26	1	0	2	0	7	0	136
07:45 AM	12	55	3	0	18	3	7	0	4	45	2	0	2	1	3	0	155
Total	33	146	18	0	72	26	45	0	8	140	7	0	6	2	28	0	531
08:00 AM	6	24	5	0	12	4	6	0	3	28	3	0	0	2	14	0	111
Total	6	24	5	0	12	4	6	0	3	28	3	0	0	2	14	0	111
11:45 AM	6	48	5	0	4	2	5	0	6	48	1	0	0	2	8	0	135
Total	6	48	5	0	4	2	5	0	6	48	1	0	0	2	8	0	135
12:00 PM	6	41	11	0	4	3	2	0	4	42	1	0	2	2	4	0	124
12:15 PM	6	45	6	0	7	3	5	0	7	42	0	0	1	2	4	0	132
12:30 PM	11	30	14	0	9	3	11	0	11	29	1	0	0	0	3	0	122
12:45 PM	8	30	3	0	7	3	3	0	1	36	0	0	0	4	10	0	105
Total	35	146	36	0	27	12	21	0	23	149	2	0	3	8	21	0	483
03:45 PM	9	48	10	0	10	2	11	1	11	50	1	0	2	2	10	0	167
Total	9	48	10	0	10	2	11	1	11	50	1	0	2	2	10	0	167
04:00 PM	11	53	6	0	8	4	2	0	5	57	3	0	2	5	10	0	175
04:15 PM	9	47	17	0	3	1	6	0	15	51	0	0	0	2	12	0	163
04:30 PM	9	46	14	0	11	3	3	0	16	68	1	0	3	4	10	0	188
04:45 PM	9	49	23	0	7	2	5	0	21	50	1	0	1	9	14	0	191
Total	38	205	60	0	29	10	16	0	57	226	5	0	6	20	46	0	718
Grand Total	129	617	134	0	154	56	106	1	108	641	19	0	17	36	127	0	2145
Apprch %	14.7	70.1	15.2	0.0	48.6	17.7	33.4	0.3	14.1	83.5	2.5	0.0	9.4	20.0	70.6	0.0	
Total %	6.0	28.8	6.2	0.0	7.2	2.6	4.9	0.0	5.0	29.9	0.9	0.0	0.8	1.7	5.9	0.0	

Exhibit J-1

PORTABLE RECORDER TRAFFIC COUNT

CURRENT DATE 08-08-2012

STATION NUMBER: COUNTY 77 POLK
TWP 13 CITY: DES MOINES
NODE 8101
N LOC 5101

LOCATION: SCOTT AVE & SE 30TH ST

LEGAL DESC: SEC TWP RGE

RECORDER LEG S

2004 AADT 006856

City of Des Moines
600 E Court, Suite 200A
Des Moines, IA 50309
Turning Movement Count

File Name : E 30th & Scott_TM 2012
Site Code : 00000000
Start Date : 7/26/2012
Page No : 1

Groups Printed- Cars & Pickups - Trucks

	30TH From North				SCOTT From East				30TH From South				SCOTT From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	9	22	6	0	17	7	12	0	1	39	1	0	0	1	12	0	127
07:15 AM	5	24	3	0	19	6	13	0	2	30	3	0	2	0	6	0	113
07:30 AM	7	45	6	0	18	10	13	0	1	26	1	0	2	0	7	0	136
07:45 AM	12	55	3	0	18	3	7	0	4	45	2	0	2	1	3	0	155
Total	33	146	18	0	72	26	45	0	8	140	7	0	6	2	28	0	531
08:00 AM	6	24	5	0	12	4	8	0	3	28	3	0	0	2	14	0	111
Total	6	24	5	0	12	4	8	0	3	28	3	0	0	2	14	0	111
11:45 AM	6	48	5	0	4	2	5	0	6	48	1	0	0	2	8	0	135
Total	6	48	5	0	4	2	5	0	6	48	1	0	0	2	8	0	135
12:00 PM	6	41	11	0	4	3	2	0	4	42	1	0	2	2	4	0	124
12:15 PM	8	45	8	0	7	3	5	0	7	42	0	0	1	2	4	0	132
12:30 PM	11	30	14	0	9	3	11	0	11	29	1	0	0	0	3	0	122
12:45 PM	8	30	3	0	7	3	3	0	1	36	0	0	0	4	10	0	105
Total	35	146	36	0	27	12	21	0	23	149	2	0	3	8	21	0	483
03:45 PM	9	48	10	0	10	2	11	1	11	50	1	0	2	2	10	0	167
Total	9	48	10	0	10	2	11	1	11	50	1	0	2	2	10	0	167
04:00 PM	11	53	6	0	8	4	2	0	5	57	3	0	2	5	10	0	175
04:15 PM	9	47	17	0	3	1	6	0	15	51	0	0	0	2	12	0	163
04:30 PM	9	46	14	0	11	3	3	0	16	68	1	0	3	4	10	0	188
04:45 PM	9	49	23	0	7	2	5	0	21	50	1	0	1	9	14	0	191
Total	38	205	60	0	29	10	16	0	57	226	5	0	6	20	46	0	718
Grand Total	129	617	134	0	154	56	106	1	108	641	19	0	17	36	127	0	2145
Apprch %	14.7	70.1	15.2	0.0	48.6	17.7	33.4	0.3	14.1	83.5	2.5	0.0	9.4	20.0	70.6	0.0	
Total %	6.0	28.8	6.2	0.0	7.2	2.6	4.9	0.0	5.0	29.9	0.9	0.0	0.8	1.7	5.9	0.0	

Exhibit J-1

PORTABLE RECORDER TRAFFIC COUNT

CURRENT DATE 08-08-2012

STATION NUMBER: COUNTY 77 POLK
TWP 13 CITY: DES MOINES
NODE 8101
N LOC 5101

LOCATION: SCOTT AVE & SE 30TH ST

LEGAL DESC: SEC TWP RGE

RECORDER LEG S

2004 AADT 006856

D1530974 VIEW HOURLY COUNTS PAGE 0001

STATION: COUNTY 77 TOWNSHIP 13 NODE 8101 LOCATION 5101 PRINTER ID: TPETO63W

BEGINNING TIME AND DATE TIME 0900 PM MONTH 06 DAY 20 YEAR 2004 DOW 1
ENDING TIME AND DATE TIME 0500 AM MONTH 06 DAY 22 YEAR 2004 DOW 3

DOW	DATE	MID TO 1AM	1AM TO 2AM	2AM TO 3AM	3AM TO 4AM	4AM TO 5AM	5AM TO 6AM	6AM TO 7AM	7AM TO 8AM	8AM TO 9AM	9AM TO 10AM	10AM TO 11AM	11AM TO NOON	NOON TO 1PM	1PM TO 2PM	2PM TO 3PM	3PM TO 4PM	4PM TO 5PM	5PM TO 6PM	6PM TO 7PM	7PM TO 8PM	8PM TO 9PM	9PM TO 10PM	10PM TO 11PM	11PM TO MID	TOTAL
1	06 20																							0173	0111	0067	000351
2	06 21	0044	0034	0030	0029	0039	0146	0367	0416	0343	0364	0437	0410	0533	0424	0547	0685	0576	0519	0325	0247	0214	0164	0136	0076	007113
3	06 22	0058	0037	0028	0019	0035																				000169

PF7 BKWD PF8 FWD PF9 SELECT DIFFERENT CONTROLS PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Exhibit J-3

PORTABLE RECORDER TRAFFIC COUNT

CURRENT DATE 08-08-2012

STATION NUMBER: COUNTY 77 POLK
TWP 13 CITY: DES MOINES
NODE 8101
N LOC 3101

LOCATION: SCOTT AVE & SE 30TH ST

LEGAL DESC: SEC TWP RGE

RECORDER LEG E

2004 AADT 002425

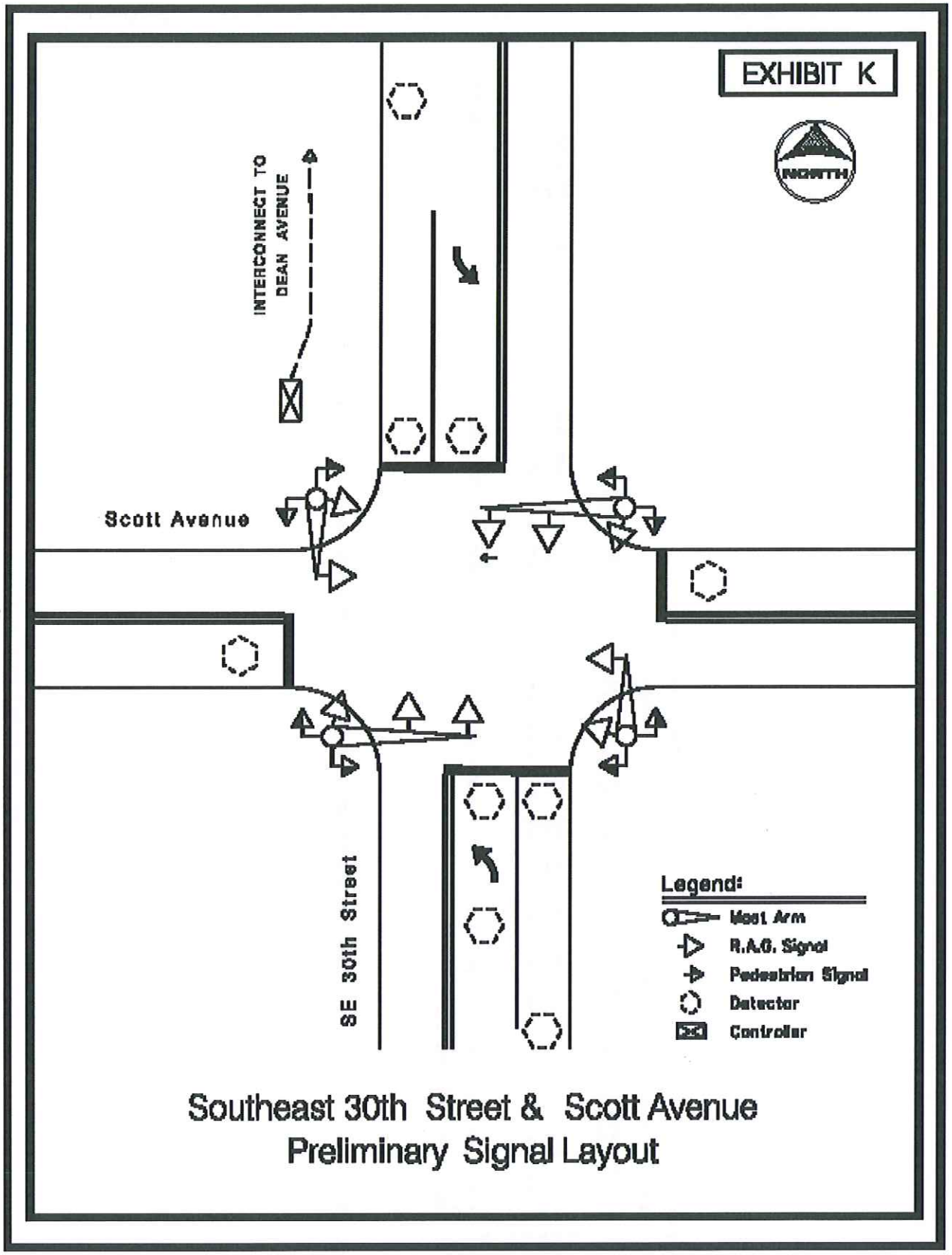
D1530974 VIEW HOURLY COUNTS PAGE 0001

STATION: COUNTY 77 TOWNSHIP 13 NODE 8101 LOCATION 3101 PRINTER ID: TPRT003W

BEGINNING TIME AND DATE TIME 1000 PM MONTH 06 DAY 20 YEAR 2004 DOW 1
ENDING TIME AND DATE TIME 0500 AM MONTH 06 DAY 22 YEAR 2004 DOW 3

DOW	DATE	MID TO 1AM	1AM TO 2AM	2AM TO 3AM	3AM TO 4AM	4AM TO 5AM	5AM TO 6AM	6AM TO 7AM	7AM TO 8AM	8AM TO 9AM	9AM TO 10AM	10AM TO 11AM	11AM TO NOON	NOON TO 1PM	1PM TO 2PM	2PM TO 3PM	3PM TO 4PM	4PM TO 5PM	5PM TO 6PM	6PM TO 7PM	7PM TO 8PM	8PM TO 9PM	9PM TO 10PM	10PM TO 11PM	11PM TO MID	TOTAL
1	06 20																								0032	0020	000052
2	06 21	0005	0009	0012	0015	0011	0050	0125	0175	0114	0102	0125	0132	0152	0133	0150	0208	0229	0238	0140	0155	0103	0075	0046	0029	002523
3	06 22	0024	0016	0016	0012	0008																				000074

PF7 BKWD PF8 FWD PF9 SELECT DIFFERENT CONTROLS PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT



Southeast 30th Street & Scott Avenue
Preliminary Signal Layout

Rev. 8/09

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: Mike Ring | Date Prepared: Oct 25, 2011

Intersection: E 30th and Scott

Improvement

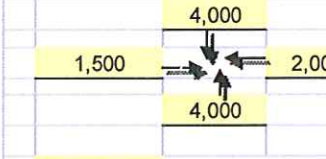
Proposed Improvement(s): Add left turn lanes all directions

$ 100,000	Estimated Improvement Cost, **EC**	20	Est. Improvement 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 (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 100,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: City traffic counts | 2009 | Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



		4,197,500	Current Annual Entering Veh., **AEV** = DEV * 365
		14,032	veh / day, Final Year DEV, **FDEV**
		92.42	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**		$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$
11,500	Current Daily Entering Vehicles, **DEV**		

Crash Data

2006	First full year -->	2010	Last full year		5.0	years, Time Period, **T**	
	Additional months					values as of Dec. 2007	
0	Fatal Crashes	0	Fatalities @		$3,500,000	$	-
		0	Major Injuries @		$240,000	$	-
3	Injury Crashes	1	Minor Injuries @		$48,000	$	48,000
		3	Possible Injuries @		$25,000	$	75,000
5	Property Damage Only		(assumed cost per crash)		$2,700	$	-
		-OR-	enter all Property Costs of all crashes:			$	58,700
8	Total Crashes, **TA**				Total $ Loss, **LOSS**	$	181,700

1.60	Current Crashes / Year, **AA** = TA / T	0.38	Crashes / MEV, Crash Rate, **CR**
$ 22,713	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
35.2	Total Expected Crashes, **TECR** = CR x TMEV	$ 161,030	Present Value of Avoided Crashes, **BENEFIT**
0.48	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 10,902	Crash Costs Avoided in First Year, AAR x AVC		
10.6	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 = $161,030 : $100,000 = **1.61** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: E 14th Street and Euclid Avenue Intersection Modification

Applicant: City of Des Moines

Contact Person: Jennifer L. Bohac Title: City Traffic Engineer

Complete Mailing Address: 400 Robert D. Ray Drive
Des Moines, Iowa 50309

Phone: 515-283-4973 (Area Code) E-Mail: jlbohac@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: _____ (Area Code) E-Mail: _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost	$ 195,000
Safety Funds Requested	$ 170,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Des Moines, Iowa

Signed: T.M. Franklin Cownie — AUG 13 2012
Signature — Date Signed

T.M. Franklin Cownie, Mayor
Typed Name

Attest: Diane Rauh — AUG 13 2012
Signature — Date Signed

Diane Rauh, City Clerk
Typed Name

★ Roll Call Number
12-1148

Agenda Item Number
6

Date July 23, 2012

APPROVING FY2014 TRAFFIC SAFETY FUND APPLICATIONS TO THE IOWA DEPARTMENT OF TRANSPORTATION

BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF DES MOINES, IOWA:

That the City Manager is hereby directed to submit applications to the Iowa Department of Transportation for Traffic Safety Funds to cover a portion of the construction costs for the following projects:

1. E. 30th Street and Dean Avenue Intersection Widening
2. S.E. 30th Street and Scott Avenue Intersection Widening
3. E. 14th Street and Euclid Avenue Intersection Modification
4. E. Euclid Avenue and Dixon Street Traffic Signal Upgrade

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

(Council Communication Number 12-399 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GRIESS	✓			
HENSLEY	✓			
MAHAFFEY	✓			
MEYER	✓			
MOORE	✓			
TOTAL	7			

MOTION CARRIED APPROVED

T. M. Franklin Cownie Mayor

CERTIFICATE

I, DIANE RAUH, 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.

Diane Rauh City Clerk

PROJECT DESCRIPTION

E. 14TH STREET (U.S. 69) AND EUCLID AVE. (U.S. 6) INTERSECTION MODIFICATION

Project Description:

The proposed improvement consists of modifying the northeast quadrant of the East 14th Street / Euclid Avenue intersection. The existing island would be removed, and the existing 60' radius in the northeast quadrant would be reduced to a 40' radius in order to provide a more standard urban-type intersection. The traffic signal pole, previously located within this island, would be relocated to behind the new curb line. Additional signing and pavement marking would be added for the northbound right-turn lane. All four left-turn signal indications would be modified to the new "flashing yellow" protected/permissive operation. New pedestrian signals with "countdown" timers would be included. The remaining signal supports and indications in the other three quadrants of the intersection would not be affected. The upgraded traffic signal would continue to be interconnected to the city's traffic signal control system via fiberoptic cable.

The total project cost is estimated to be $195,000. Traffic Safety Funds in the amount of $170,000 are being requested, which will cover the construction portion of the project.

Existing Conditions:

The intersection of East 14th Street and Euclid Avenue is a standard 4-legged design located in the northeast area of Des Moines. Both roadways are 4-lane, divided facilities with left-turning lanes, and are both on the State Primary Highway System, designated as U.S. 69 and U.S. 6 respectively. They are also both identified as a Principal Arterials on the Metropolitan Planning Agency's Federal Functional Classification Network, and each has a speed limit of 35 mph. The surrounding area is generally commercial in nature.

The intersection is currently signalized, and operates as a fully-actuated, eight-phase signal with protected/permissive left turn phases. These phases use the previous signal head arrangement which provided a circular green indication and "Left Turn Yield on Green Ball" sign for the "permissive" left turn portion of the signal phase.

The primary purpose for the project is to eliminate crashes that have occurred involving the existing island and associated traffic signal pole in the northeast quadrant of the intersection. This island was originally installed approximately 30-35 years ago to provide a protected area for westbound right-turning traffic approaching on E. Euclid Avenue. As they turned north onto East 14th Street, they can currently turn into a "shadowed" third northbound lane protected by this island.

Over the past 10 years, a number of crashes have occurred that have involved damage to and/or knockdown of the existing signal pole. This pole was not of a "break-away" design, so when it was struck, there was also significant damage to the vehicle and increased risk of injury to the motorist. The primary type of crash appeared to be northbound vehicles in the existing right-turn lane that continued to travel straight north through the intersection, where the island and signal pole are directly in line with.

Below is a picture of the pole and island as they existed prior to the existing pole being knocked down in April 2012.

East 14th St. and Euclid – looking NE toward signal pole and island

Traffic counts taken by the Iowa DOT in 2008 show 18,400 vehicles per day (vpd) on Euclid Avenue and 18,400 vpd on East 14th Street.

Traffic signals are warranted based on Warrant No. 1A – Eight-Hour Vehicular Volume.

Project Justification:

In reviewing the crash history for the 3-year period between January 2008 and December 2010, there were a total of 41 crashes at this location. Below is a table that summarizes these crashes:

Accident Type	Number
Right-Angle	9
Rear End	17
Left turning	7
Fixed Object	8
Total	41
Average per year:	**13.7**

Of the 41 reported crashes, there were 22 personal injury crashes involving 32 injuries, 3 of which were incapacitating. Right angle crashes accounted for 9 crashes (22%), rear-end accounted for 17 crashes (41%), and left-turning accounted for 7 crashes (17%). All of these types, which account for 80% of the total crashes, would generally be considered correctible by the improvements planned as part of this project.

During the 3-year crash analysis period, three incidents were specifically identified where vehicles struck the signal pole in the northeast quadrant. These were on February 20, 2008; August 8, 2010; and August 19, 2010. All of these crashes involved injuries. More recently, a crash on April 27, 2012 also struck and knocked down this pole.

Our maintenance records were also reviewed to provide additional information related to this pole. The previous signal pole in this quadrant was knocked down by the August 8, 2010 crash. The pole transformer base had to be replaced, and the traffic observation camera was also destroyed. The total cost of the repair was approximately $12,000. Below is a picture of the damaged transformer base.

Northbound pole damage (August 2010)

More recently, in the April 27, 2012 crash, the pole was again hit, at which time the entire pole was knocked down, destroying the pole, signals, camera, and damaging the concrete pole base. As an interim measure, and in order to provide overhead traffic signal indications for northbound traffic, a temporary span-wire mounted signal was installed until such time as the permanent improvement in the northeast quadrant can be funded.

Northbound signal pole knockdown (April 2012)

For the Traffic Safety Funds analysis, we used an overall intersection crash reduction factor (CRF) of 20%. The improvement will have a primary benefit for the northbound direction, although it will also have a benefit for the westbound right-turn direction as well, by removing the signal pole obstacle directly in line with the right-turning traffic. Assuming the proposed improvement will conservatively benefit ¼ of the approaching traffic, the overall CRF was reduced to 5%.

Based on current IDOT value factors, the monetary benefit (present value of the avoided crashes) is $1,744,049 (See Exhibit "L-1"). Assuming an overall accident reduction of 5 percent (see paragraph above) and an estimated project life of 15 years, the request for $170,000 of Traffic Safety Funds relates to a benefit-cost factor of **2.03:1.**

Exhibit "C"

DEPARTMENT OF ENGINEERING

CONSTRUCTION ESTIMATE

CITY OF DES MOINES, IA.

W.O. NO. 06-2013-000

DATE: 8/10/2012

PROJECT: E. 14th St.at Euclid Northeast Radius Reconstruction

ITEM NO.	DESCRIPTION	ESTIMATED UNITS	UNIT PRICE	TOTAL AMOUNT
1	PCC Pavement Removal	150 SY	$100.00	$15,000.00
2	PCC Median Removal	80 SY	$25.00	$2,000.00
3	1.5' PCC Curb and Gutter	150 LF	$40.00	$6,000.00
4	10" PCC Base Replacement	100 SY	$100.00	$10,000.00
5	Traffic Signals	1 LS	$100,000.00	$100,000.00
6	Pavement markings	1 LS	$10,000.00	$10,000.00
6	Traffic Control	1 LS	$5,000.00	$5,000.00
	20% CONTINGENCIES	1 LS		$22,500.00
	20% ENGINEERING, INCIDENTALS	1 LS		$22,500.00
	TOTAL CONSTRUCTION COST			$193,000.00
	RIGHT OF WAY			$0.00
Notes:	1) See project "redline sketch"			
	2) Possible base repair at median removal.			
			TOTAL PROJECT COST	$193,000.00

PREPARED BY: _____RRJ, MPR_____

CHECKED BY: _____

East 14th Street and Euclid Avenue Intersection Modification

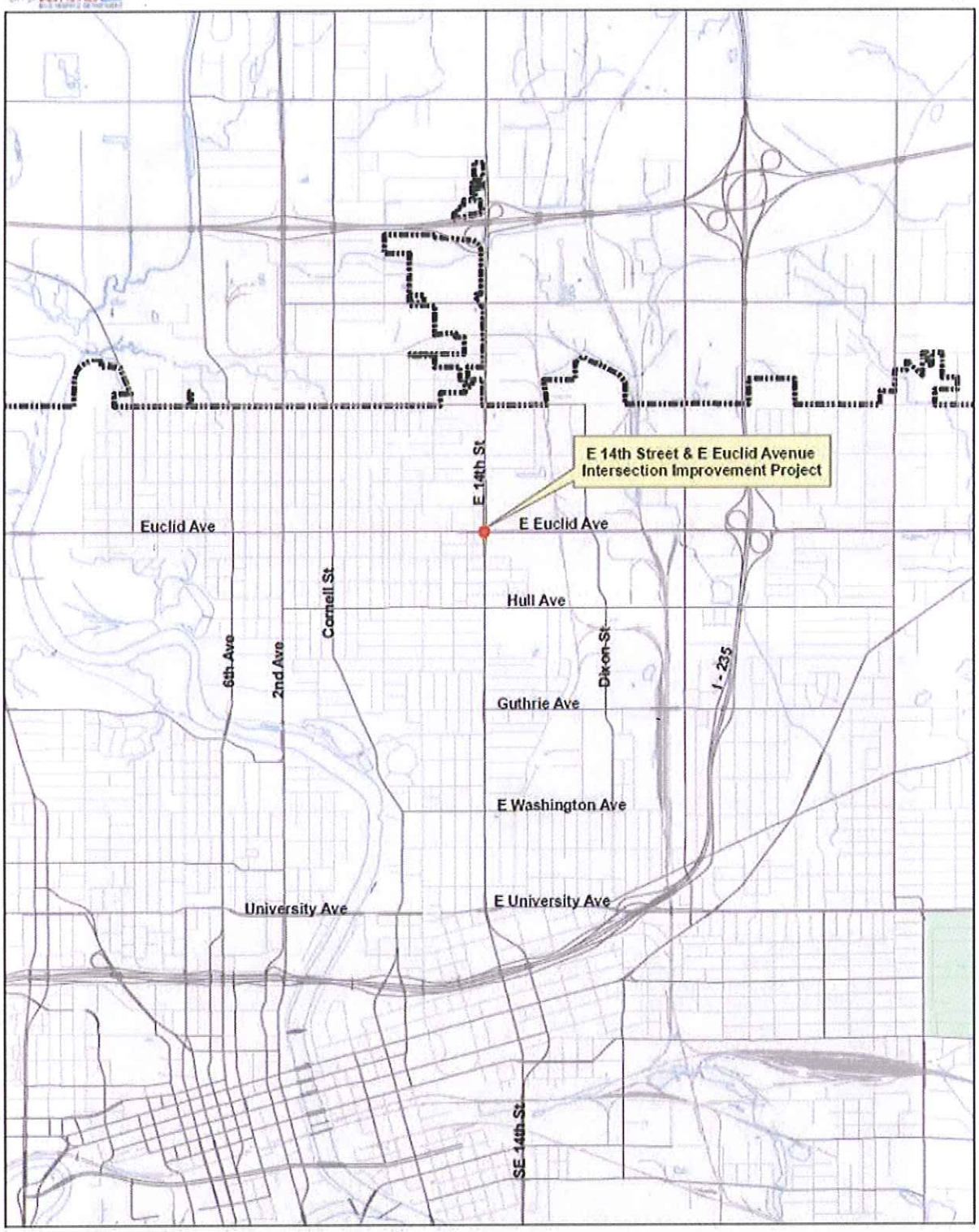
TIME SCHEDULE

Project Approval:	**December 2012**
Agreement Signed:	**May 2013**
Project bid:	**August 2013**
Construction completed:	**November 2013**
Project Closeout:	**June 2014**

Exhibit B

Exhibit E

E 14th Street & E Euclid Avenue Intersection Improvement Project



E Euclid Avenue, looking east toward E 14th Street 200 feet

E Euclid Avenue, looking east toward E 14th Street, near intersection

E 14th Street, looking north toward E Euclid Avenue 200 feet

E 14th Street, looking north toward E Euclid Avenue, near intersection

Exhibit F-3

E Euclid Avenue, looking west toward E 14th Street, near intersection

E Euclid Avenue, looking west toward E 14th Street 200 feet

E 14th Street, looking south toward E Euclid Avenue, near intersection

E 14th Street, looking south toward E Euclid Avenue 200 feet

Exhibit B

Exhibit G

Sketch of proposed modification in northeast quadrant of intersection

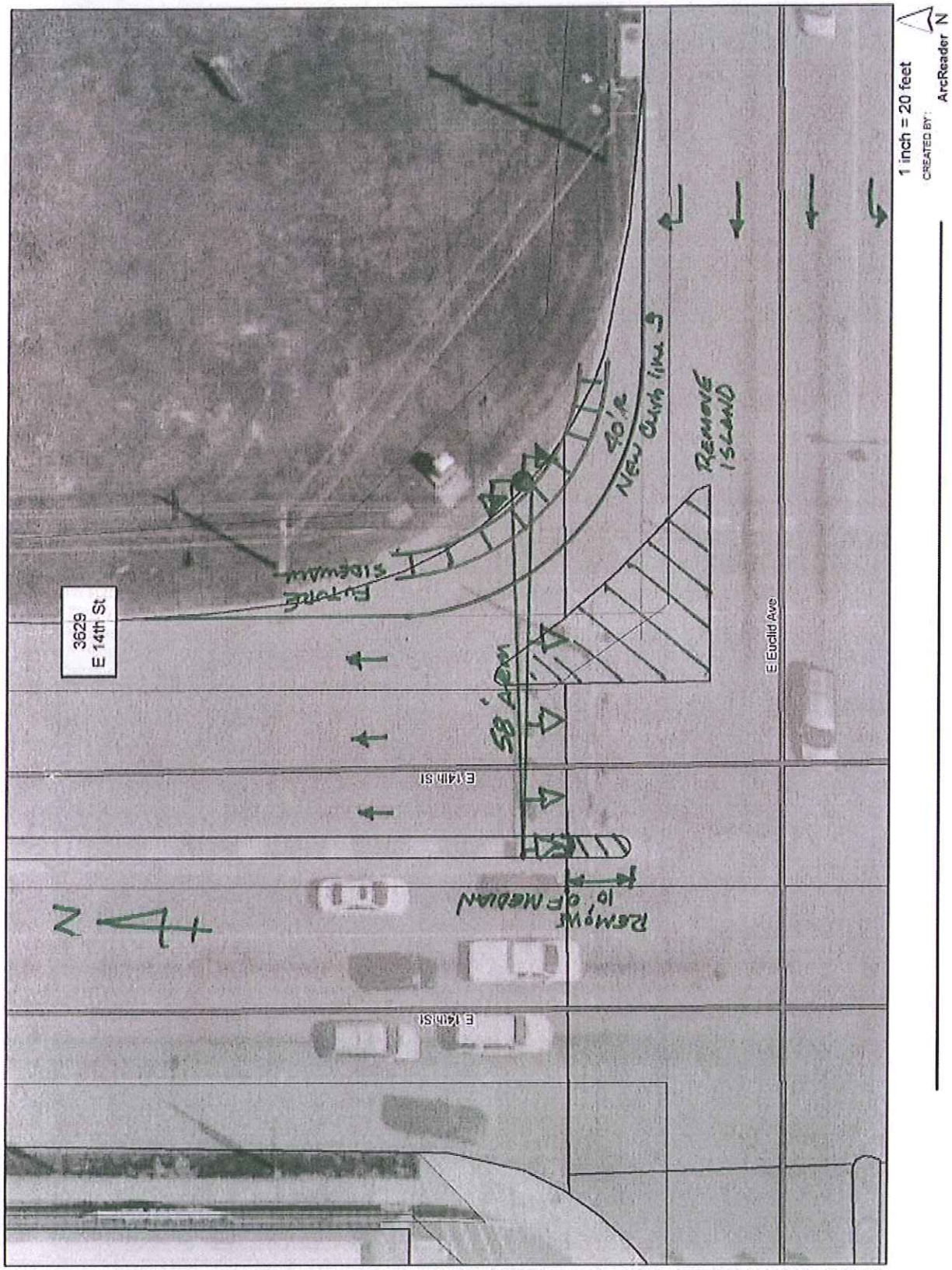
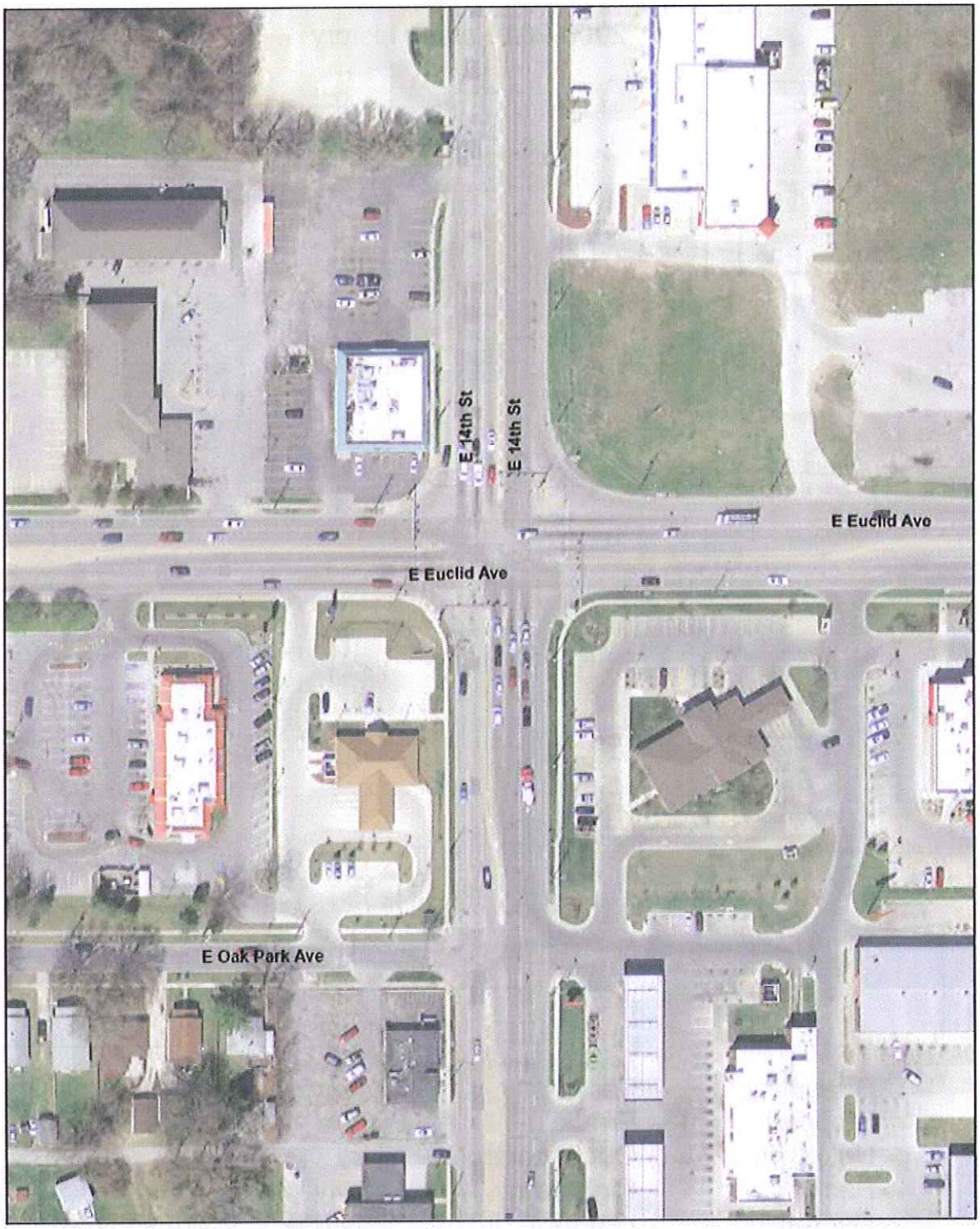


Exhibit B
Exhibit H

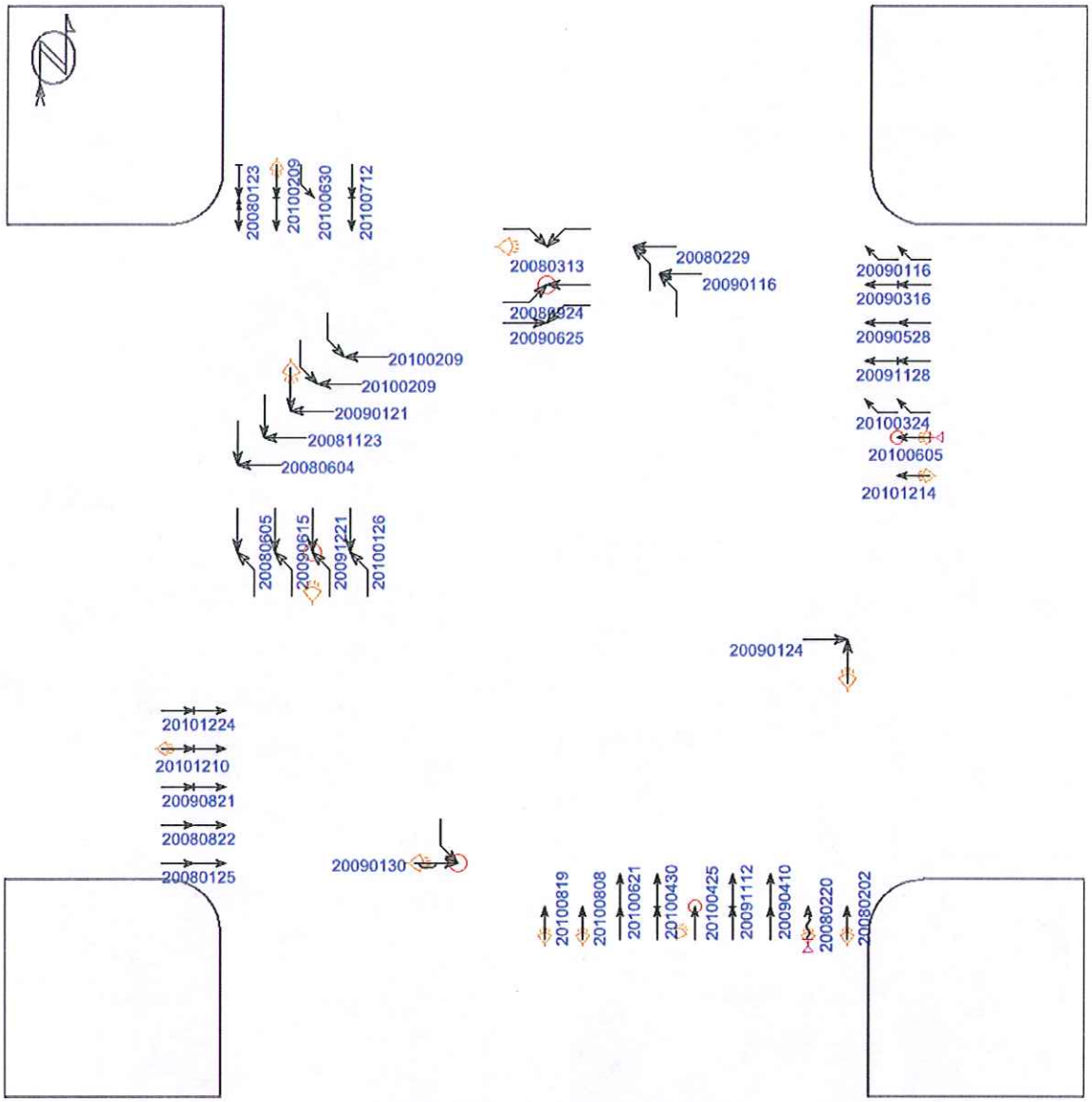
E 14th Street & E Euclid Avenue Intersection Improvement Project

Revised Date : June 30, 2012



E 14th and Euclidd

2008-2010 crash history



(0) crashes could not be placed in this schematic

Straight	Parked	Pedestrian	Fixed objects:
Stopped	Erratic	Bicycle	General / Pole
Unknown	Out of control	Injury	Signal / Curb
Backing	Right turn	Fatality	Tree / Animal
Overtaking	Left turn	Nighttime	3rd vehicle
Sideswipe	U-turn	DUI	Extra data

Pd' Programming, Inc. 07/02/2012

(Note: Crash reports involving injury will be forwarded to IDOT under separate cover)

DATE: 08-17-2010

IOWA DEPARTMENT OF TRANSPORTATION
VEHICULAR TURNING MOVEMENTS
ANNUAL AVERAGE DAILY TRAFFIC - YEAR 2008
IN DES MOINES

COUNTY:POLK
US 6 & US 69

STATION NO. 77 22 3181 0991

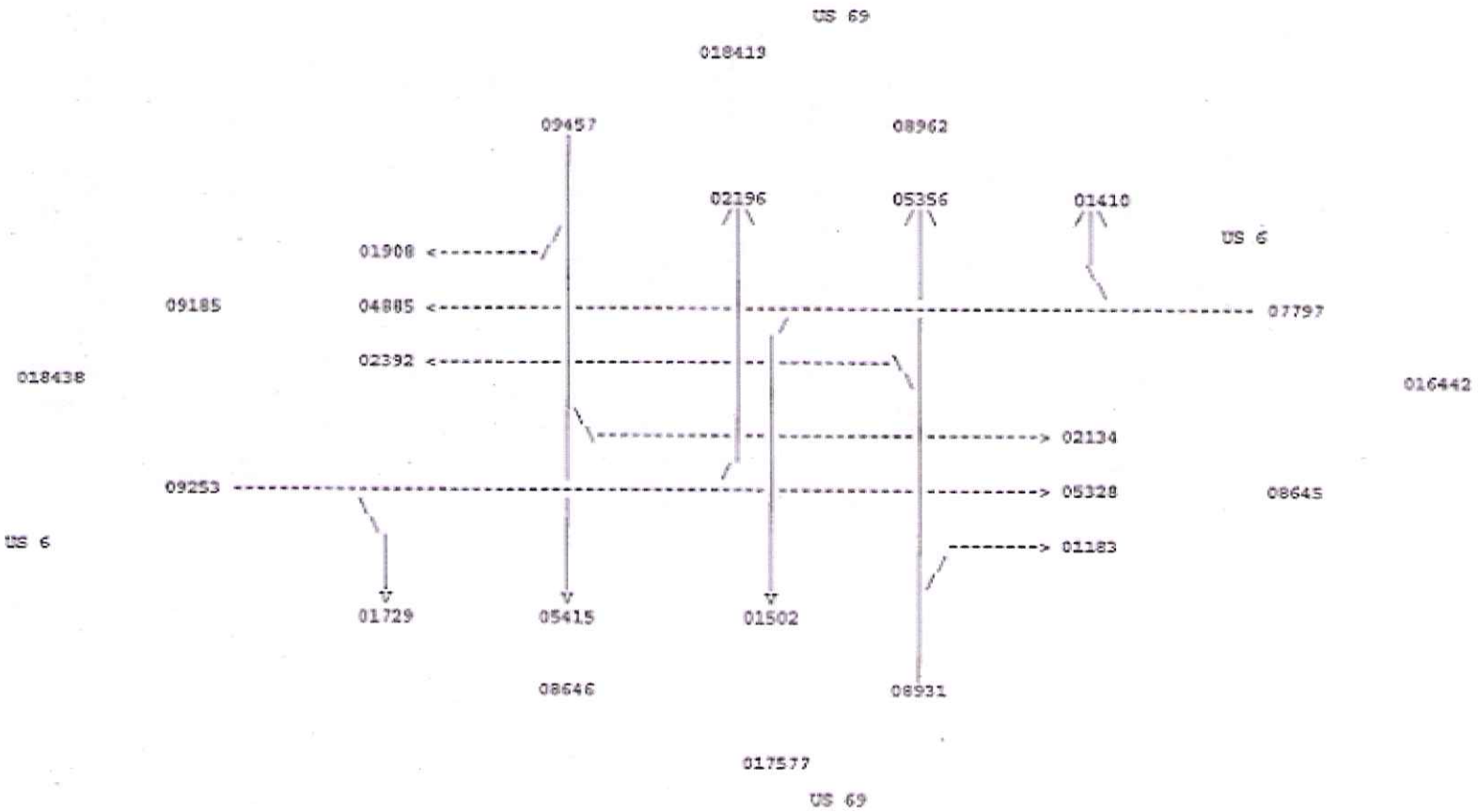


Exhibit B
Exhibit J-1

D1530926
COUNTY TOWNSHIP NODE LOCATION YEAR
77 22 3181 0991 2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
ALL VEHICLES

PRINTER ID: TPRT003W PAGE 0001
CITY: DES MOINES
COUNTY: POLK

HOUR	******* NORTH LEG *******				******* EAST LEG *******				******* SOUTH LEG *******				******* WEST LEG *******			
	US 69 RT	ST	LT	TOTAL	US 6 RT	ST	LT	TOTAL	US 69 LT	ST	RT	TOTAL	US 6 LT	ST	RT	TOTAL
12-1 AM	12	31	15	58	10	43	10	63	25	49	18	92	16	54	37	107
01- 2AM	13	33	12	58	7	28	9	44	8	32	7	47	15	28	16	59
02- 3AM	4	29	13	46	3	19	4	26	17	24	2	43	3	14	14	31
03- 4AM	6	21	12	39	5	18	0	23	13	30	5	48	13	15	13	41
04- 5AM	10	24	13	47	9	35	7	51	21	36	10	67	11	26	14	51
05- 6AM	20	61	27	108	21	59	8	88	24	134	17	175	40	78	32	150
06- 7AM	35	246	97	378	18	162	23	203	62	323	61	446	98	203	76	377
07- 8AM	49	399	101	549	62	307	48	417	76	413	61	550	150	228	106	494
08- 9AM	96	352	126	574	88	256	84	428	112	272	71	455	87	251	85	423
09-10AM	123	330	105	558	103	258	81	442	127	272	61	460	137	278	95	510
10-11AM	119	340	118	577	98	292	106	496	169	296	68	533	156	355	119	630
11-12PM	149	309	152	610	145	347	102	594	180	342	94	616	199	413	130	742
12-1 PM	185	357	191	733	179	390	139	708	170	354	109	633	229	455	133	817
1- 2PM	152	347	141	640	136	348	133	617	163	346	95	604	161	433	145	739
2- 3PM	140	347	156	643	153	361	129	643	159	359	80	598	158	417	137	712
3- 4PM	183	434	165	782	131	406	140	677	219	455	96	770	168	438	142	748
4- 5PM	162	477	174	813	66	365	124	555	194	422	82	698	133	414	69	616
5- 6PM	126	440	179	745	83	407	126	616	184	413	74	671	146	426	81	653

PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Exhibit B
Exhibit J-2

D1530926
COUNTY TOWNSHIP NODE LOCATION YEAR
77 22 3181 0991 2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
ALL VEHICLES

PRINTER ID: IPRI003W PAGE 0002
CITY: DES MOINES
COUNTY: POLK

HOUR	******* NORTH LEG *******				******* EAST LEG *******				******* SOUTH LEG *******				******* WEST LEG *******			
	US 69				US 6				US 69				US 6			
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
6- 7PM	102	294	117	513	43	296	77	416	160	270	60	490	123	279	93	495
7- 8PM	109	237	108	454	33	227	77	337	152	262	59	473	90	205	56	351
8- 9PM	93	225	91	409	39	183	66	288	105	194	37	336	83	223	91	397
9-10PM	57	160	61	278	30	178	34	242	89	148	34	271	52	158	56	266
10-11PM	30	119	48	197	16	102	37	155	55	125	25	205	35	147	50	232
11-12AM	38	100	29	167	9	66	20	95	39	79	22	140	13	72	34	119
TOTALS	2013	5712	2251	9976	1487	5153	1584	8224	2523	5650	1248	9421	2316	5620	1824	9760

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

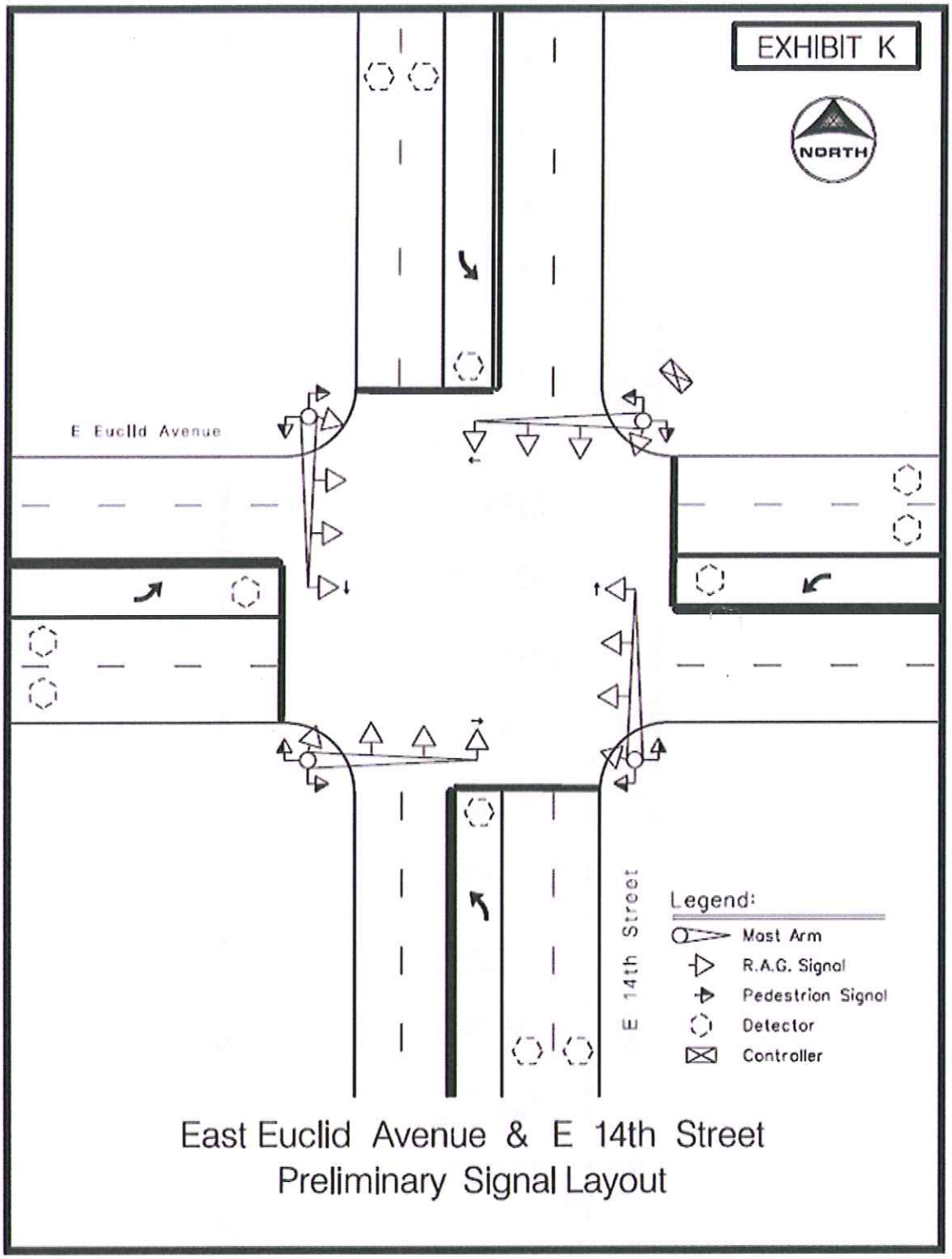


EXHIBIT K
NORTH
E Euclid Avenue
E 14th Street
Legend:
Mast Arm
R.A.G. Signal
Pedestrian Signal
Detector
Controller
East Euclid Avenue & E 14th Street
Preliminary Signal Layout

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County:	Polk	Prepared by:	Mike Ring	Date Prepared:	Aug 10, 2012
Intersection:	E 14th and Euclid				

Improvement

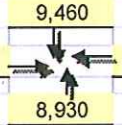
Proposed Improvement(s): Median island modification - traffic signal pole relocation

$ 170,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	5	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 170,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: IDOT — 2008 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



		12,935,600	Current Annual Entering Veh., **AEV** = DEV * 365
		41,145	veh / day, Final Year DEV, **FDEV**
		208.22	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**		$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$
35,440	Current Daily Entering Vehicles, **DEV**		

Crash Data

2008	First full year -->	2010	Last full year		3.0	years, Time Period, **T**	
	Additional months					values as of Dec. 2007	
0	Fatal Crashes		0	Fatalities @		$3,500,000	$ -
			3	Major Injuries @		$240,000	$ 720,000
22	Injury Crashes		5	Minor Injuries @		$48,000	$ 240,000
			24	Possible Injuries @		$25,000	$ 600,000
19	Property Damage Only			(assumed cost per crash)		$2,700	$ -
			-OR-	enter all Property Costs of all crashes:			$ 184,049
41	Total Crashes, **TA**					Total $ Loss, **LOSS**	$ 1,744,049

13.67	Current Crashes / Year, **AA** = TA / T	1.06	Crashes / MEV, Crash Rate, **CR**
$ 42,538	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
220.0	Total Expected Crashes, **TECR** = CR x TMEV	$ 344,309	Present Value of Avoided Crashes, **BENEFIT**
0.68	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 29,067	Crash Costs Avoided in First Year, AAR x AVC		
11.0	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 = $344,309 : $170,000 = **2.03** : 1

CASENUMBEI	LECASENUM	DATE	LITERAL	CSEVERITY	PROPDMG	MAJORCAUSE	INJSTATUS
2008419298	20080002674	20080123	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	2000	Other (explain in narrative): Vision obstructed	
2008419298					0		
2008421794		20080125	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3800	Driving too fast for conditions	
2008421794					0		
2008423938		20080202	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	4000	Ran Traffic Signal	Possible
2008427987	20080006138	20080220	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	5100	Ran off road - right	Possible
2008430240		20080229	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3900	FTYROW: Making left turn	
2008430240					0		
2008432783		20080313	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	1500	Lost Control	
2008432783					0		
2008446052		20080604	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	4000	Ran Traffic Signal	
2008446052					0		
2008446060		20080605	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	5000	FTYROW: Making left turn	
2008446060					0		
2008456736	20080030475	20080822	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3000	Other (explain in narrative): Other improper action	
2008456736					0		
2008462551		20080924	US 6/E EUCLID AVE & US 69/E 14TH ST	Minor Injury	10000	Ran Traffic Signal	Non-incapacitating
2008462551					0		Non-incapacitating
2008462551					0		
2008474436		20081123	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	14000	Ran Traffic Signal	Possible
2008474436					0		
2009486842	20090001643	20090116	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	2000	Followed too close	
2009486842					0		
2009488967	20090002505	20090124	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3000	Ran Traffic Signal	
2009488967					0		
2009489077		20090116	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3500	FTYROW: Making left turn	
2009489077					0		
2009490899	20090003280	20090130	US 6/E EUCLID AVE & US 69/E 14TH ST	Minor Injury	5000	Made improper turn	Non-incapacitating
2009490899					0		
2009493411		20090121	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	7500	Ran Traffic Signal	Possible
2009493411					0		
2009498431	20090008233	20090316	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	1300	Followed too close	
2009498431					0		
2009501610	20090011025	20090410	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	4500	Followed too close	Possible
2009501610					0		Possible
2009508873	20090016518	20090528	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	350	Followed too close	Possible
2009508873					0		
2009513965		20090625	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	2000	FTYROW: Making left turn	
2009513965					0		
2009522416		20090821	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	1250	Lost Control	Possible
2009522416					0		Possible
2009527082	20090018602	20090615	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	8000	FTYROW: Making left turn	
2009527082					0		
2009535566	20090036340	20091112	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	9000	Followed too close	
2009535566					0		
2009541396		20091128	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	3000	Unknown	
2009541396					0		

2009544420	20090040633	20091221	US 6/E EUCLID AVE & US 69/E 14TH ST	Major Injury	8000	FTYROW: Making left turn	Incapacitating
2009544420					0		Incapacitating
2009544420					0		Non-incapacitating
2010551957	20100002713	20100126	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	2099	FTYROW: Making left turn	
2010551957					0		
2010555753	20100004172	20100209	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	2100	Ran Traffic Signal	
2010555753					0		
2010558086		20100209	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	7500	Other (explain in narrative): Other improper action	Possible
2010558086					0		
2010558087		20100209	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	2800	Driving too fast for conditions	Possible
2010558087					0		
2010563601	20100008874	20100324	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	2500	Followed too close	Possible
2010563601					0		Possible
2010568733	20100012538	20100425	US 6/E EUCLID AVE & US 69/E 14TH ST	Minor Injury	7000	Unknown	Possible
2010568733					0		Non-incapacitating
2010569555	20100013270	20100430	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	500	Followed too close	Possible
2010569555					0		Possible
2010569555					0		Possible
2010577665	20100019515	20100621	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	500	Unknown	Possible
2010577665					0		
2010580230		20100630	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	0	Other (explain in narrative): No improper action	Possible
2010581140	20100022048	20100712	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	3000	Lost Control	Possible
2010581140					0		Possible
2010585087	20100025475	20100808	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	15000	Ran off road - right	Possible
2010586847	20100026874	20100819	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	7000	Ran off road - right	Possible
2010605114	20100039593	20101210	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	7000	Followed too close	
2010605114					0		
2010606901	20100039976	20101214	US 6/E EUCLID AVE & US 69/E 14TH ST	Property Damage Only	7000	Swerving/Evasive Action	
2010608267	20100040993	20101224	US 6/E EUCLID AVE & US 69/E 14TH ST	Possible/Unknown	1700	Driving too fast for conditions	Possible
2010608267					0		

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: E. Euclid Avenue and Dixon Street Traffic Signal Upgrade

Applicant: City of Des Moines

Contact Person: Jennifer L. Bohac Title: City Traffic Engineer

Complete Mailing Address: 400 Robert D. Ray Drive
Des Moines, Iowa 50309

Phone: 515-283-4973 (Area Code) E-Mail: jlbohac@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: _____ (Area Code) E-Mail: _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost: $ 180,000

Safety Funds Requested: $ 150,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Des Moines, Iowa

Signed: T.M. Franklin Cownie — AUG 13 2012

Signature — Date Signed

T.M. Franklin Cownie, Mayor

Typed Name

Attest: Diane Rauh — AUG 13 2012

Signature — Date Signed

Diane Rauh, City Clerk

Typed Name

★ **Roll Call Number** 12-1148

Agenda Item Number 6

Date July 23, 2012

APPROVING FY2014 TRAFFIC SAFETY FUND APPLICATIONS TO THE IOWA DEPARTMENT OF TRANSPORTATION

BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF DES MOINES, IOWA:

That the City Manager is hereby directed to submit applications to the Iowa Department of Transportation for Traffic Safety Funds to cover a portion of the construction costs for the following projects:

1. E. 30th Street and Dean Avenue Intersection Widening
2. S.E. 30th Street and Scott Avenue Intersection Widening
3. E. 14th Street and Euclid Avenue Intersection Modification
4. E. Euclid Avenue and Dixon Street Traffic Signal Upgrade

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

(Council Communication Number 12-399 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GRIESS	✓			
HENSLEY	✓			
MAHAFFEY	✓			
MEYER	✓			
MOORE	✓			
TOTAL	7			

MOTION CARRIED APPROVED

T. M. Franklin Cownie Mayor

CERTIFICATE

I, DIANE RAUH, 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.

Diane Rauh City Clerk

PROJECT DESCRIPTION

E. EUCLID AVE. (U.S. 6) AND DIXON STREET TRAFFIC SIGNAL UPGRADE PROJECT

Project Description:

The proposed improvement consists of upgrading the existing traffic signal installation at the intersection of East Euclid Avenue and Dixon Street. New overhead-mounted traffic signals with back-plates would be installed on all approaches, and side-of-pole signal indications would be included. East-west protected/permissive left-turn phases would be added. Combination poles would be used where possible. Pedestrian "countdown" signal indications would be installed on all approaches. Detection for fully-actuated operation would be installed. The new traffic signal poles would be located outside the 10-foot clear zone area. The upgraded traffic signal would continue to be interconnected to the city's traffic signal control system via existing fiberoptic cable.

The total project cost is estimated to be $180,000. Traffic Safety Funds in the amount of $150,000 are being requested, which will cover the construction portion of the project.

Existing Conditions:

The intersection of East Euclid Avenue and Dixon Street is a 4-legged location with the two streets intersecting at a 60-degree angle. East Euclid Avenue is a 4-lane, divided roadway with left turning lanes at Dixon, and is also designated as U.S. 6 on the state's Primary Highway System. It is identified as a Principal Arterial on the Metropolitan Planning Agency's Federal Functional Classification Network. Dixon Street is a 2-lane collector roadway, with a southbound left turn lane identified at Euclid. The northbound approach does not currently have a dedicated left turn lane, but is sufficiently wide to accommodate one, which would be incorporated into the project plans. The speed limit on Euclid is 35 mph, and 30 mph on Dixon Street. The surrounding area is generally industrial in nature, with a large amount of semi-truck traffic.

The intersection is currently signalized, and operates as a semi-actuated, two-phase signal (without left turn phases). There are no back-plates or side-of-pole signal heads for north-south traffic. No pedestrian signals currently exist at the intersection.

Traffic counts taken by the Iowa DOT in 2010 indicate 15,800 vehicles per day (vpd) on Euclid Avenue and 4,250 vpd on Dixon Street. The overall intersection truck percentage is 9%, with a high of 20% trucks on the south leg of Dixon Street. The "westbound-to-southbound" left turn is over 18% trucks.

Traffic signals are warranted based on Warrant No. 1B – Interruption of Continuous Traffic.

Project Justification:

The City's current analysis of the crash information for January, 2006 – December, 2010 (5-year period) indicates the following information:

Accident Type	Number
Right-Angle	13
Rear End	11
Left turning	3
Sideswipe	6
Head-on	1
Fixed Object	2
Total	36
Average per year:	**7.2**

Of the 36 reported crashes, there were 13 personal injury crashes involving 23 injuries, 3 of which were incapacitating. Right angle crashes accounted for 13 crashes (36%), rear-end accounted for 11 crashes (31%), and left-turning accounted for 3 crashes (8%). All of these types, which account for 75% of the total crashes, would generally be considered correctible by the improvements planned as part of this project.

Based on current IDOT value factors, the monetary benefit (present value of the avoided crashes) is $1,483,300 (See Exhibit "L-1"). Assuming an overall accident reduction of 10 percent and an estimated project life of 15 years. The request for $150,000 of Traffic Safety Funds relates to a benefit-cost factor of **2.34:1.**

Exhibit "C"

COST ESTIMATE

East Euclid Avenue and Dixon Street Traffic Signal Upgrading

TRAFFIC SIGNAL INSTALLATION:	**$150,000**
DESIGN/INSPECTION:	**$30,000**
TOTAL PROJECT COST:	**$180,000**
TSF FUNDS REQUESTED:	**$150,000**

Exhibit D

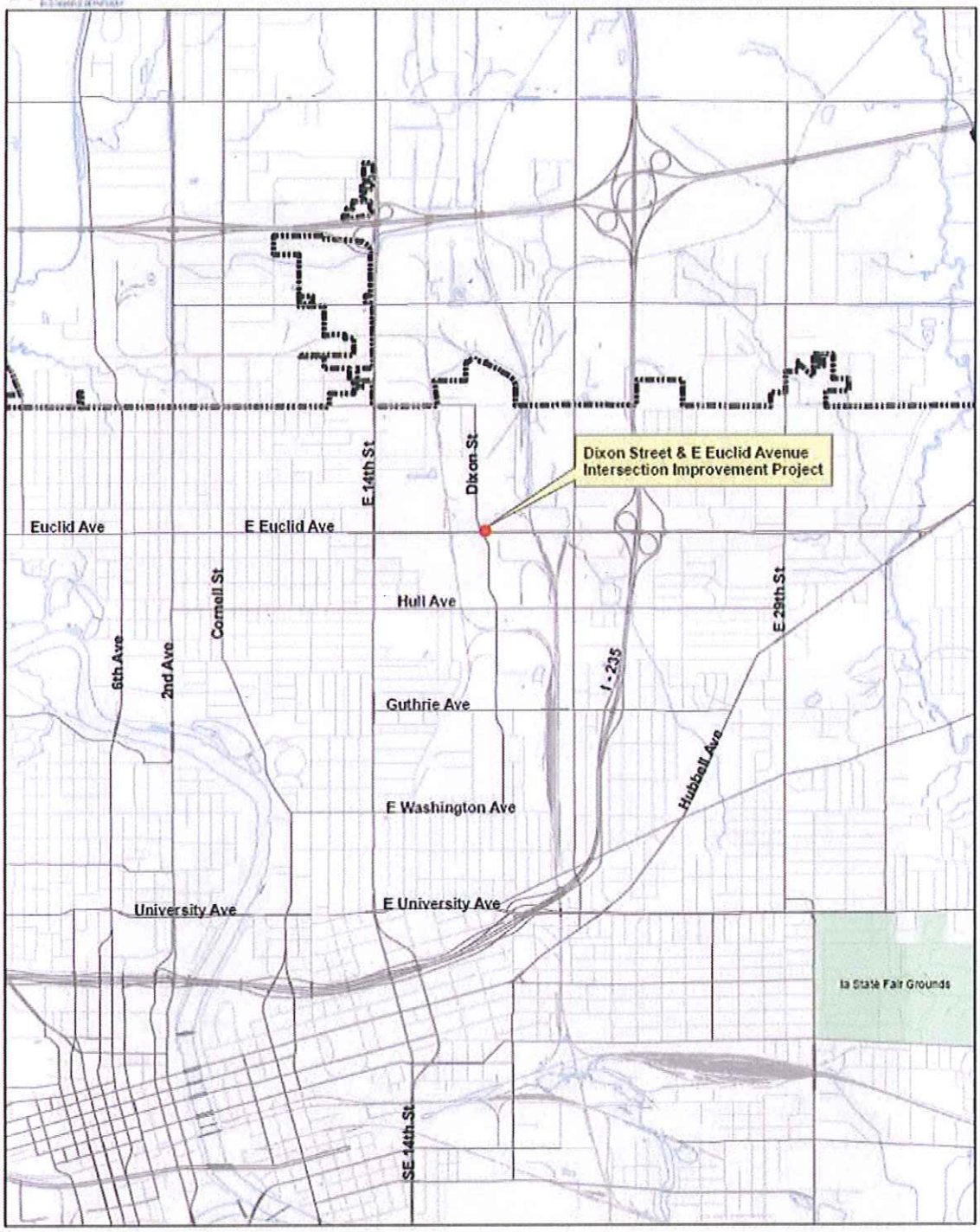
East Euclid Avenue and Dixon Street Traffic Signal Upgrading

TIME SCHEDULE

Project Approval:	**December 2012**
Agreement Signed:	**May 2013**
Project bid:	**March 2014**
Construction completed:	**August 2014**
Project Closeout:	**December 2014**

Exhibit E

Dixon Street & E Euclid Avenue Intersection Improvement Project



E Euclid Avenue, looking east toward Dixon Street 200 feet

E Euclid Avenue, looking east toward Dixon Street, near intersection

Dixon Street, looking north toward E Euclid Avenue 200 feet

Dixon Street, looking north toward E Euclid Avenue, near intersection

E Euclid Avenue, looking west toward Dixon Street, near intersection

E Euclid Avenue, looking west toward Dixon Street 200 feet

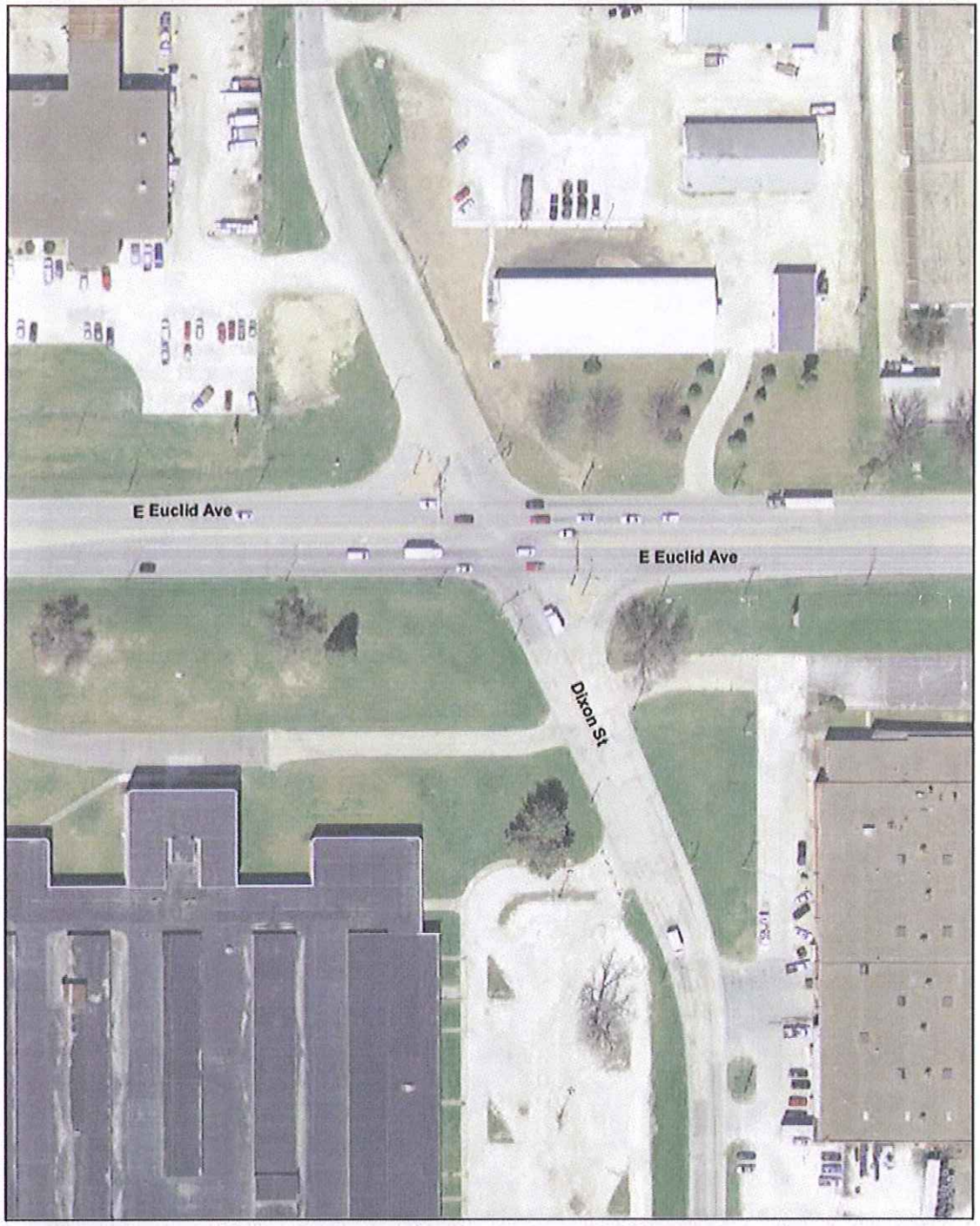
Dixon Street, looking south toward E Euclid Avenue, near intersection

Dixon Street, looking south toward E Euclid Avenue 200 feet

Exhibit H

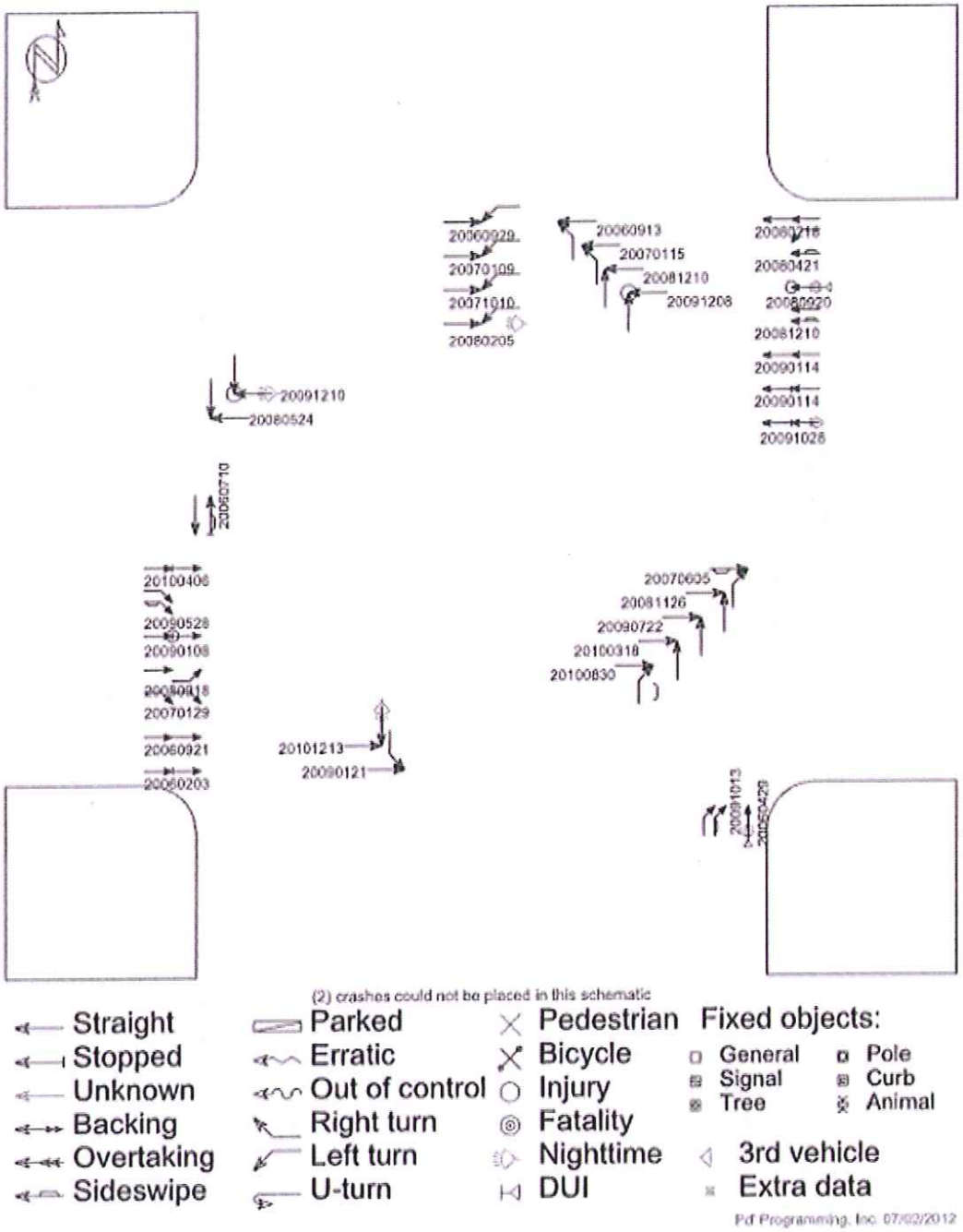
Dixon Street & E Euclid Avenue Intersection Improvement Project

Revised Date : June 30, 2012



Euclid and Dixon

2006-2010 Crash history



Crash reports for injury crashes will be submitted under separate cover.

DATE: 08-17-2010

IOWA DEPARTMENT OF TRANSPORTATION
VEHICULAR TURNING MOVEMENTS
ANNUAL AVERAGE DAILY TRAFFIC - YEAR 2008
IN DES MOINES

COUNTY:POLK
US 6 & DIXON ST

STATION NO 77 22 3189 0991

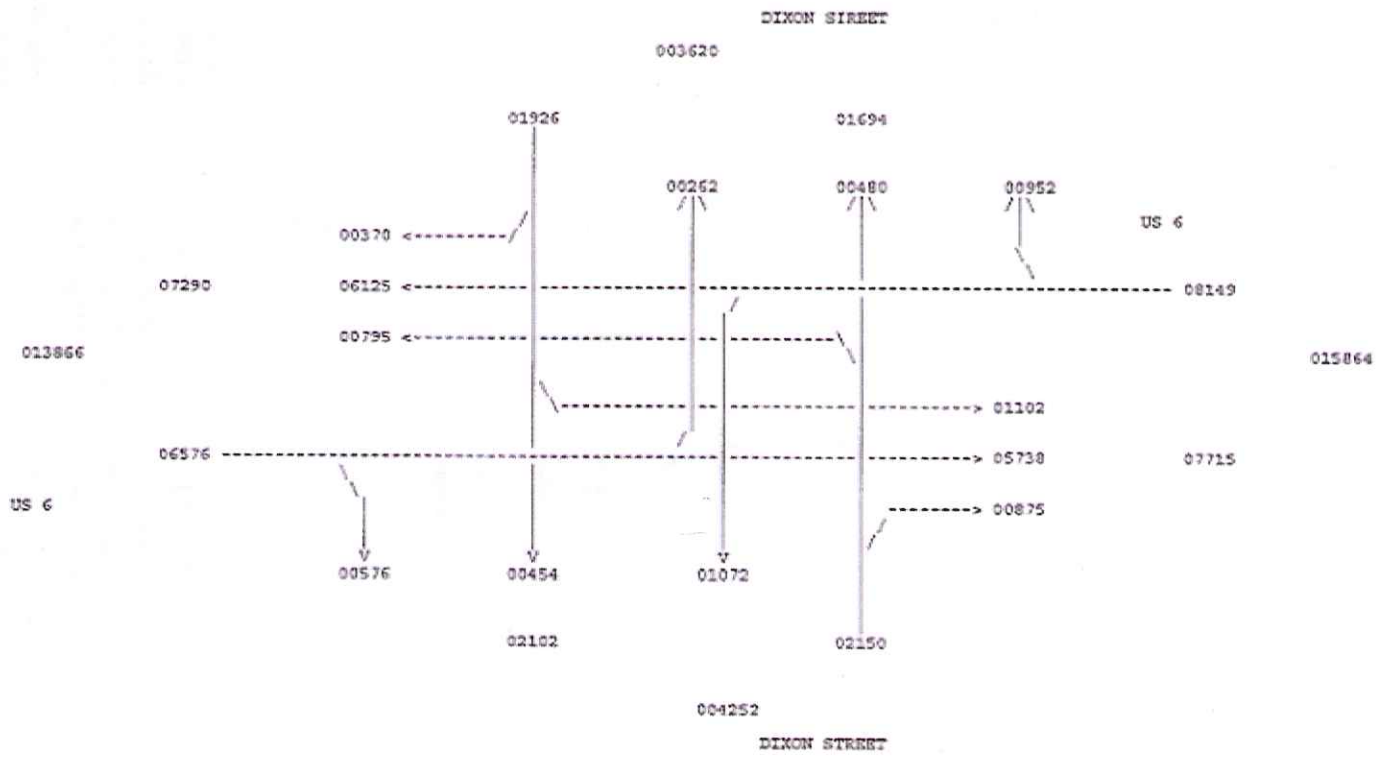


Exhibit J-1

D1530926
COUNTY TOWNSHIP NODE LOCATION YEAR
77 22 3189 0991 2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
ALL VEHICLES

PRINTER ID: IPRI003W PAGE 0001
CITY: DES MOINES
COUNTY: POLK

HOUR	******* NORTH LEG ******* DIXON STREET RT	ST	LT	TOTAL	******* EAST LEG ******* US 6 RT	ST	LT	TOTAL	******* SOUTH LEG ******* DIXON STREET LT	ST	RT	TOTAL	******* WEST LEG ******* US 6 LT	ST	RT	TOTAL
07- 8AM	4	31	39	74	131	382	127	640	30	13	32	75	20	244	46	310
08- 9AM	9	31	39	79	67	337	73	477	44	33	97	174	13	279	46	338
11-12PM	41	28	83	152	62	460	73	595	73	37	51	161	24	412	50	486
12-1 PM	38	33	78	149	81	489	67	637	88	41	40	169	36	448	45	529
3- 4PM	55	40	106	201	50	450	80	580	56	42	70	168	19	451	29	499
4- 5PM	20	29	106	155	52	512	60	624	61	45	79	185	15	583	45	643
5- 6PM	21	39	109	169	41	484	65	590	52	33	76	161	6	500	32	538
TOTALS	188	231	560	979	484	3114	545	4143	404	244	445	1093	133	2917	293	3343

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

D1530927
COUNTY TOWNSHIP NODE LOCATION YEAR
77 22 3189 0991 2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
SINGLE UNIT TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: DES MOINES
COUNTY: POLK

HOUR	NORTH LEG DIXON STREET ST	ST	LT	TOTAL	EAST LEG US 6 RT	ST	LT	TOTAL	SOUTH LEG DIXON STREET LT	ST	RT	TOTAL	WEST LEG US 6 LT	ST	RT	TOTAL
7- 8AM	1	2	6	9	3	20	3	26	4	3	6	13	1	7	2	10
8- 9AM	0	5	5	10	8	21	4	33	11	5	13	29	1	20	7	28
11-12PM	0	4	4	8	4	25	14	43	6	1	2	9	0	21	4	25
12- 1PM	0	5	1	6	1	18	6	25	7	10	2	19	5	12	4	21
3- 4PM	1	5	0	6	4	7	11	22	7	5	3	15	2	16	5	23
4- 5PM	0	6	5	11	5	27	10	42	11	7	9	27	0	21	6	27
5- 6PM	0	4	3	7	3	10	3	16	5	0	5	10	0	7	3	10
TOTALS	2	31	24	57	28	128	51	207	51	31	40	122	9	104	31	144

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Exhibit J-3

D1530928
COUNTY TOWNSHIP NODE LOCATION YEAR
77 22 3189 0991 2008

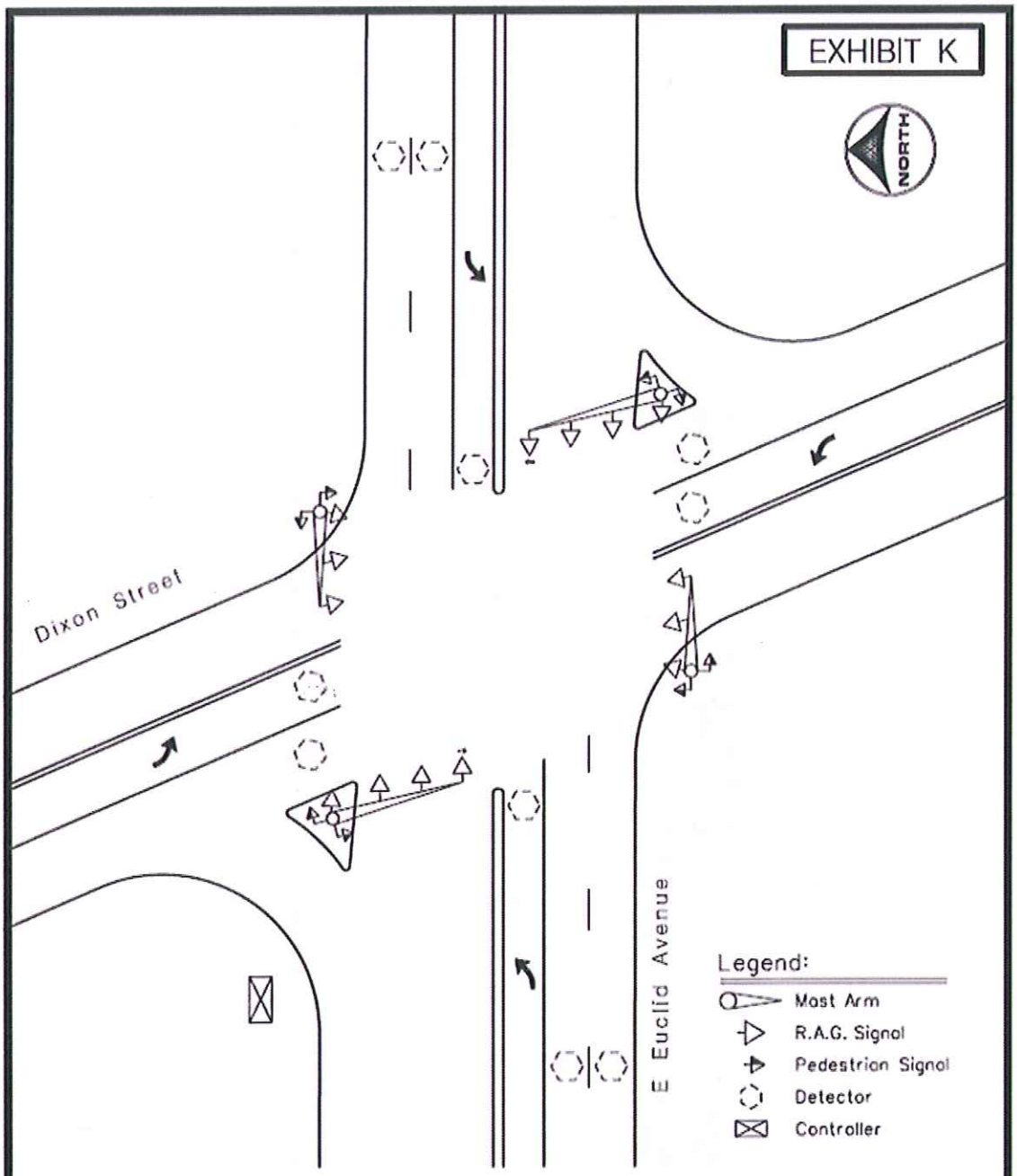
TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
COMBINATION TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: DES MOINES
COUNTY: POLK

HOUR	******* NORTH LEG DIXON STREET RT	ST	LT	TOTAL	******* US 6 RT	******* EAST LEG ST	LT	******** TOTAL	******* SOUTH LEG DIXON STREET LT	ST	RT	******* TOTAL	******* US 6 LT	******* WEST LEG ST	RT	******** TOTAL
7- 8AM	0	1	6	7	4	9	6	19	4	2	4	10	1	3	1	5
8- 9AM	4	3	4	11	4	6	7	17	5	4	14	23	1	5	4	10
11-12PM	4	3	7	14	4	3	15	22	6	9	6	21	1	6	9	16
12- 1PM	0	1	4	5	3	10	4	17	5	6	10	21	0	5	6	11
3- 4PM	1	6	5	12	2	9	6	17	4	3	4	11	2	1	1	4
4- 5PM	0	0	6	6	4	8	6	18	1	3	5	9	2	5	5	12
5- 6PM	0	3	5	8	2	4	4	10	1	0	1	2	0	4	1	5
TOTALS	9	17	37	63	23	49	48	120	26	27	44	97	7	29	27	63

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Exhibit J-4



East Euclid Avenue & Dixon Street
Preliminary Signal Layout

Exhibit L-1

Rev. 8/09

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: Mike Ring | Date Prepared: Aug 10, 2012

Intersection: Euclid and Dixon

Improvement

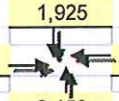
Proposed Improvement(s): Traffic Signal Upgrading

$ 150,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	10	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 150,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: IDOT | 2008 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,925		6,862,000	Current Annual Entering Veh., **AEV** = DEV * 365
6,575	8,150	21,826	veh / day, Final Year DEV, **FDEV**
2,150		110.46	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**		$TMEV = \frac{AEV}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right) \Big/ 10^6$
18,800	Current Daily Entering Vehicles, **DEV**		

Crash Data

2006	First full year -->	2010	Last full year		5.0	years, Time Period, **T**	
	Additional months					values as of Dec. 2007	
0	Fatal Crashes	0	Fatalities @		$3,500,000	$	-
		3	Major Injuries @		$240,000	$	720,000
13	Injury Crashes	3	Minor Injuries @		$48,000	$	144,000
		17	Possible Injuries @		$25,000	$	425,000
23	Property Damage Only		(assumed cost per crash)		$2,700	$	-
		-OR-	enter all Property Costs of all crashes:			$	194,300
36	Total Crashes, **TA**				Total $ Loss, **LOSS**	$	1,483,300

7.20	Current Crashes / Year, **AA** = TA / T	1.05	Crashes / MEV, Crash Rate, **CR**
$ 41,203	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
115.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 351,399	Present Value of Avoided Crashes, **BENEFIT**
0.72	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 29,666	Crash Costs Avoided in First Year, AAR x AVC		
11.6	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 = $351,399 : $150,000 = **2.34** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: IA 141 / Urbandale Dr Ramp Improvements at I-35/80

Applicant: Iowa DOT - District 1

Contact Person: Kurt Shackelford Title: D1 Traffic Tech

Complete Mailing Address: 1020 S 4th St
Ames, IA 50010

Phone: 515-239-1199 (Area Code) E-Mail: Kurtis.Shackelford@dot.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:

Application Type

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

Funding Amount

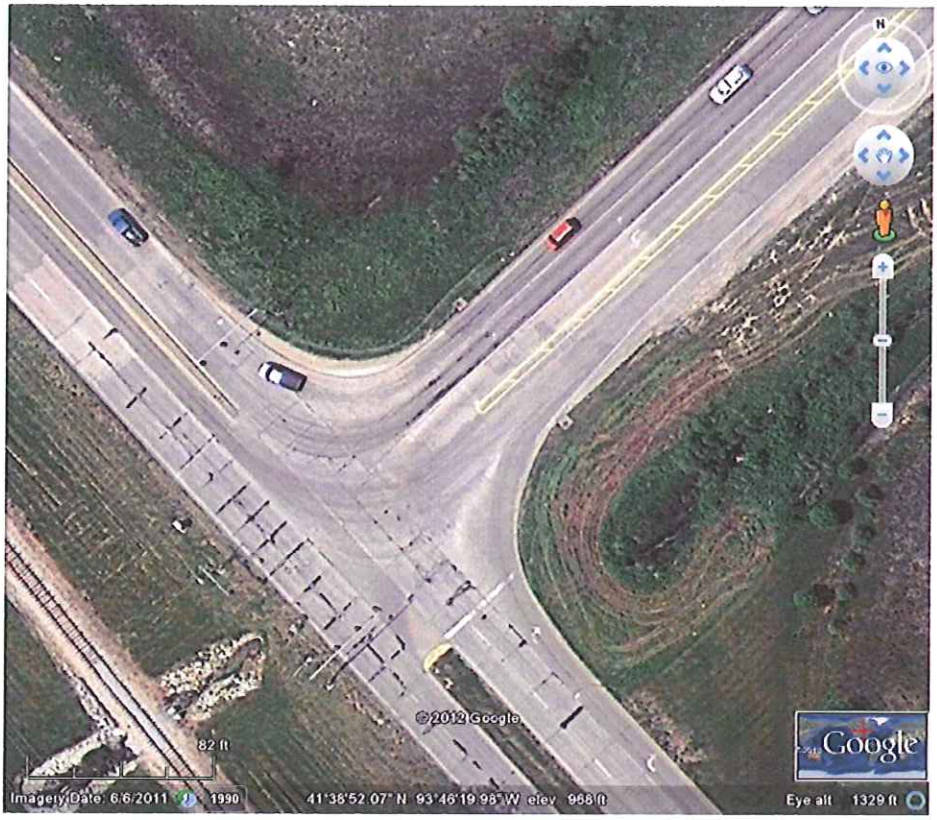
Total Project Cost $ 350,000.00

Safety Funds Requested $ 350,000.00

IA141/Urbandale Dr/North and South Ramp Terminals at I-35/80, Polk County, TSF Application (Ramp/Intersection Improvements)

1. Existing Conditions

IA 141 is a principal arterial roadway connecting Grimes and cities further north and west of the Des Moines metro area to the Interstates 35 & 80 (I-35/80) within the City of Urbandale. IA 141 is a four-lane divided roadway north of the SE 37th St intersection north through this study area and beyond. From the I-35/80 north ramp intersection to approximately 800 feet north of SE 37th St, IA 141 is a six-lane divided roadway. There is a box culvert underneath IA 141 located approximately 1,000 feet north of the SE 37th St intersection which is the break point between the four lanes to the north and six lanes to the south. IA 141 has at-grade intersections beginning with the I-35/80 interchange ramps on the south end north to the SE 11th St intersection. This corridor has five signalized intersections: one at each of the I-35/80 ramps, one at the SE 37th St intersection, one at the SE 19th St intersection, and one at the SE 11th St intersection. There is a free flowing movement between the north I-35/80 ramp and SE 37th St intersection for southbound traffic to enter I-35/80 southbound. IA 141 has a speed limit of 45 miles per hour (mph) from the south I-35/80 interchange ramp north to the right-in/right-out access south of SE 37th St intersection. The speed limit increases to 50 mph at that location north through the SE 37th St intersection to the box culvert north of that same intersection. The speed limit increases to 55 mph at the box culvert and continues north past the SE 11th St intersection.



2. Justification

South I-35/80 Ramp

AM Peak Hour – southbound left turning traffic queued out of the left turn lane a couple times during the peak hour (~ 350 feet).

PM Peak Hour – southbound left turning traffic queued out of the left turn lane and back to the I-35/80 underpass. Southbound traffic platoons arrive before this queuing traffic can fully move increasing the queue length back to and possibly beyond the north I-35/80 Ramp intersection (1,200 feet). Westbound ramp traffic (exiting I-35/80) tends to queue back to about the midpoint of the curve of the ramp (800 feet). However, most of this traffic turns right onto IA 141 and is not queued to that point for more than a few seconds. Traffic exiting I-35/80 onto this ramp tends to slow down on I-35/80 well before this point if there is a queue or not. Northbound traffic was forced to stop at the Plum Dr intersection (700 feet) due to this intersection's operation. The ramp traffic does clear on the given amount of green and through right turns on red.

During either peak hour it was noted there tends to be conflicts between aggressive drivers for the southbound left turning movement on permissive with northbound right turns both destined for the on ramp. As a part of this project, controller settings were changed to remove a continuous northbound right turn green arrow at the end of the associated through phase to allow southbound left turning vehicles to clear the intersection prior to the release of ramp.

3. Crash Analysis

The corridor and individual intersections were reviewed for crash tendencies. Crashes were reviewed from January 2006 through December 2010. The corridor experienced a crash rate 50% higher (185 crashes per hundred million vehicle miles traveled (HMVMT)) than the state average of 120 crashes per HMVMT. However, upon closer examination, 90% of the crashes occurred at the signalized intersection. Within this timeframe, no fatal crashes occurred along the corridor. Most intersections had a crash rate below the state average of 0.8 crashes per million entering vehicles (MEV). The exceptions to this are the South I-35/80 Ramp intersection having 0.85 crashes per MEV and the north I-35/80 Ramp intersection having 1.09 crashes per MEV. There was one major injury crash occurring at the SE 19th St intersection (drug/alcohol related).

One predominant trend in the corridor included rear end collisions at the North Ramp intersection w/ I-35/80, SE 37th St, SE 19th St, and SE 11th St. At each of these intersections rear end collisions comprised approximately 75% of all crashes. This can be attributed to traffic demands at or near roadway capacity, the lack of signal coordination, and the accompanying higher operating speeds mixing with long traffic queues.

Traffic Data

Traffic counts were collected at the Urbandale Dr & Meredith Dr and Urbandale Dr & Plum Dr intersections for the City of Urbandale as a part of another traffic study in early October 2011. Counts were collected at the remaining signalized intersections, as a part of this study, in early November 2011. The following is a summary of the data collected and significant volume movements for the AM and PM Peak hours in the corridor

AM Peak Hour

South I-35/80 Ramp a. Southbound through – 1,000 vph
Westbound right turn – 600 vph
Southbound left turn – 480 vph

North I-35/80 Ramp a. Southbound through – 880 vph
Northbound through – 770 vph
Westbound left turn – 600 vph

PM Peak Hour

South I-35/80 Ramp
Westbound right turn – 1,100 vph
Northbound right turn – 650 vph
Northbound through – 640 vph
Southbound left turn – 380 vph

North I-35/80 Ramp
Northbound through – 1,630 vph
Southbound through – 690 vph
Westbound right turn – 430 vph
Westbound left turn – 210 vph

4. Recommendations

IA 141/Urbandale Dr/South I-35/80 Ramp

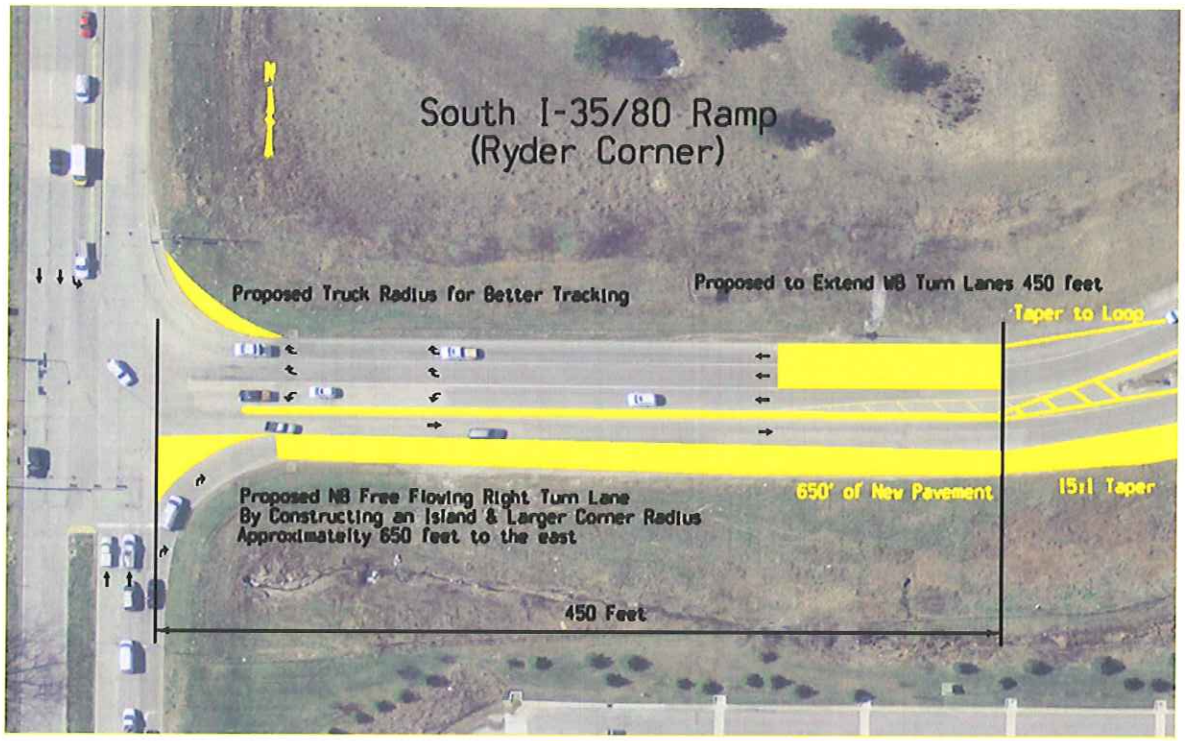
Change center westbound ramp lane to a right turn only lane, and enlarge NE quadrant radius due to truck tracking around corner. May require new traffic signal pole.

Lengthen westbound approach turn lanes to 450 feet of storage.

Develop northbound free flowing right turn lane by constructing an island, larger corner radius, and widening the on ramp to create two full lanes towards eastbound I-35/80. Merge this second ramp lane into the existing lane past the existing curvature on ramp (approximately 650 feet east of the intersection). The island and second lane will allow southbound left turning traffic to turn at the same time as northbound right turning traffic.

These improvements improve the PM intersection LOS to B

A westbound free right turn lane was considered, however, the distance to the I-35/80 underpass limited the available distance for an additional lane and merge into the existing lanes to only 480 feet. That distance is not adequate for both a merge area and an operational sufficient auxiliary lane.

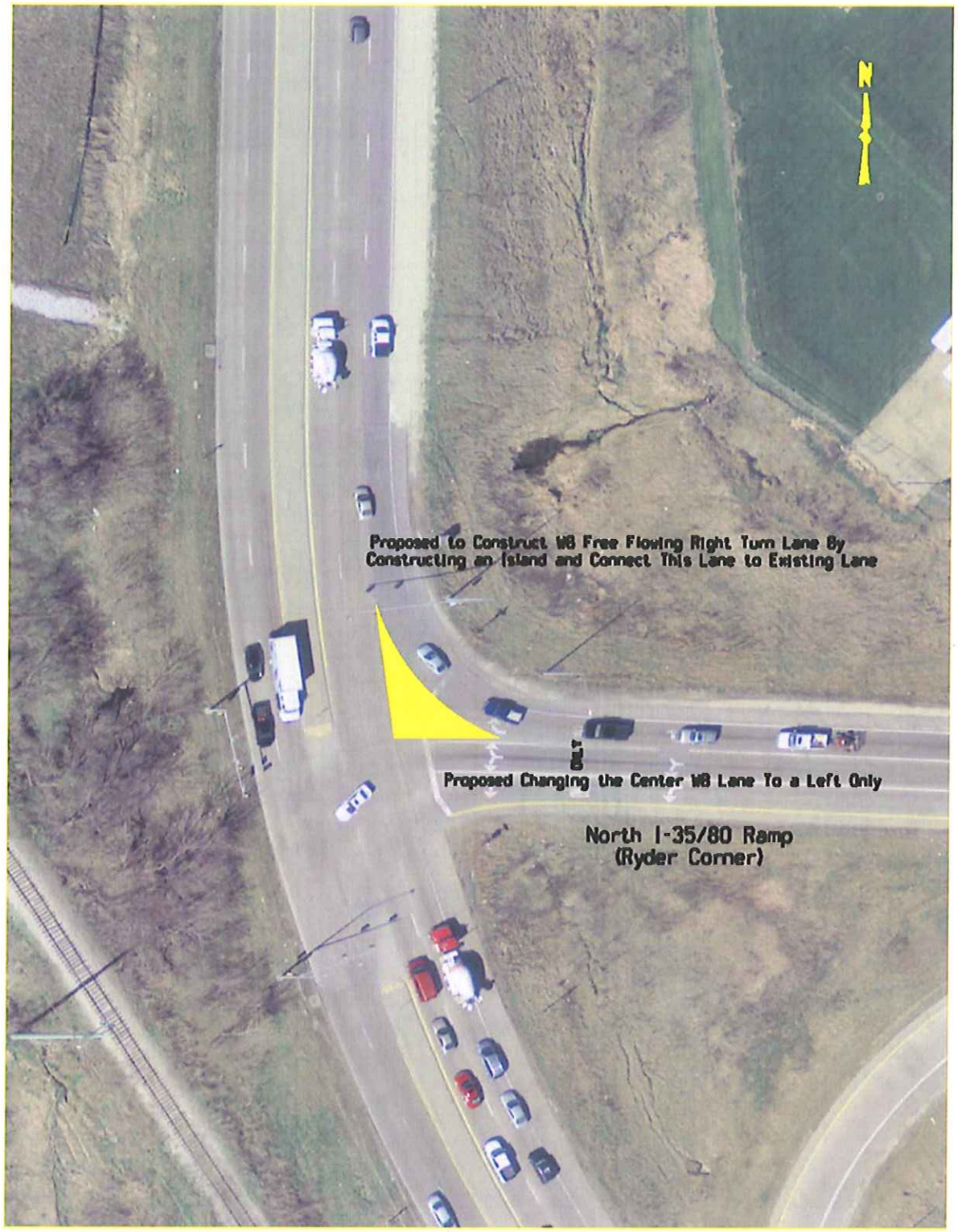

South I-35/80 Ramp
(Ryder Corner)
Proposed Truck Radius for Better Tracking
Proposed to Extend WB Turn Lanes 450 feet
Taper to Loop
Proposed NB Free Flowing Right Turn Lane
By Constructing an Island & Larger Corner Radius
Approximately 650 feet to the east
650' of New Pavement
15:1 Taper
450 Feet

IA 141 & Nort*h I-35/80 Ramp*

Change center westbound lane to a left turn only lane

Construct westbound free flowing right turn lane by constructing an island and connect this lane to the existing additional northbound lane that is added north of this intersection. Existing signal pole can be relocated to island.

These improvements will help separate the turning traffic movements and increase both the capacity of the left and right movements from the ramp, which in turn will decrease ramp vehicle queuing, and allow for signal timing adjustments to improve the overall LOS.


N
Proposed to Construct WB Free Flowing Right Turn Lane By Constructing an Island and Connect This Lane to Existing Lane
Proposed Changing the Center WB Lane To a Left Only
North I-35/80 Ramp
(Ryder Corner)

5. Cost Estimate and Proposed Funding Sources

The cost of the proposed improvements is estimated at $500,000.00. *Refer to Figure 2.* It is proposed to fund 100% of the cost of the project with TSIP funds.

6. Proposed Schedule

The project is proposed for letting in November 2013 with construction to be completed by end of construction 2014.

IA141/Urbandale Dr/North and South Ramp Terminals at I-35/80, Polk County, TSF Application (Ramp/Intersection Improvements)

Figure 1: <u>Location Map</u>

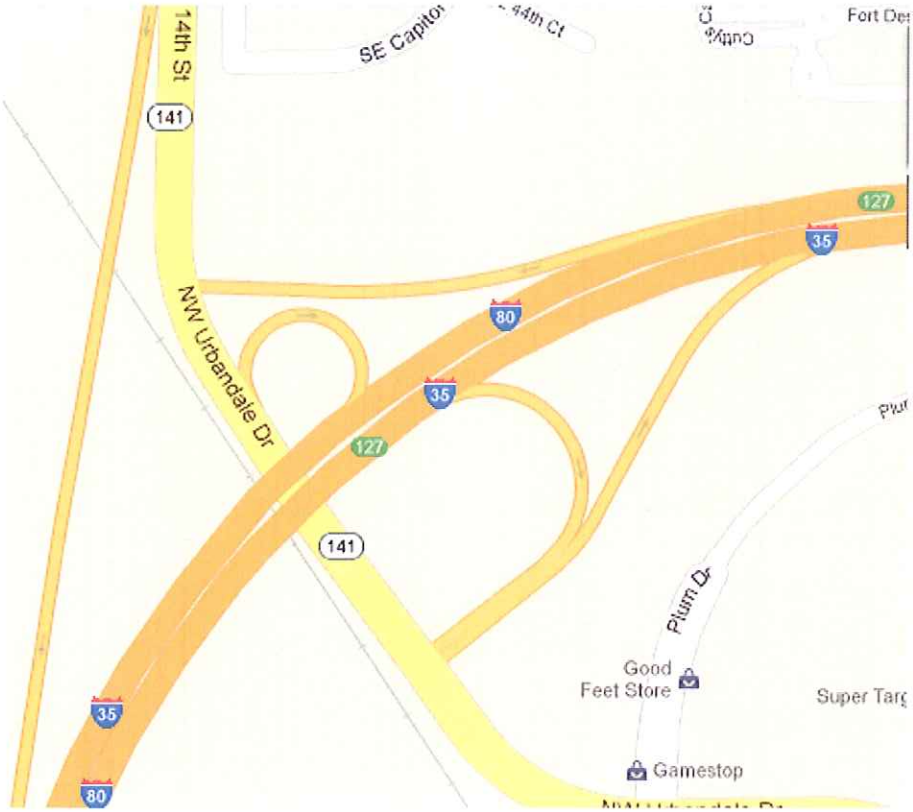


Figure 2: Cost Estimate Totals/Both Ramps

Item Number	Cat	Description	Units	Quantity	Unit Price	Cost
1	01	RIGHT OF WAY	ACRE	0	$130,000.00	$0
2	01	GEOMETRIC IMPROVEMENTS	SY	1,350	$100.00	$135,000.00
3	01	SIDEWALKS/TRAILS	SY	0	$60.00	$0
4	01	DRAINAGE	LS	2	$19,500.00	$40,500.00
5	01	TRAFFIC SIGNAL NORTH MODIFICATIONS	LS	1	$80,000.00	$80,000.00
5	01	TRAFFIC SIGNAL SOUTH MODIFICATIONS	LS	1	$10,000.00	$10,000.00
		SUBTOTAL				$265,500.00
		MISC. & CONT.			25%	$66,375.00
		TOTAL				**$331,375.00**

Figure 3: <u>Aerial View of Project Location</u>

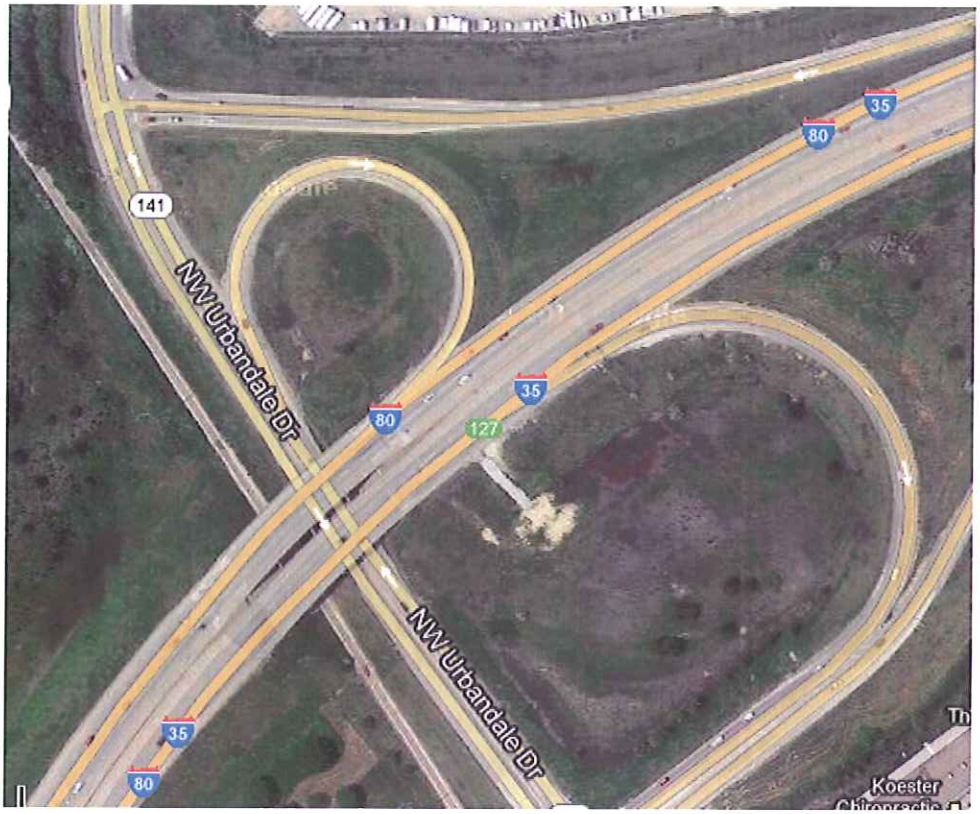


Figure 4: <u>South Ramp</u>

Figure 5: North Ramp

Assumptions

Limited improvements to include only 300 feet on the side street from the intersections.

ROW acquisition same as pavement needed when paving to outside of existing.

Storm Sewer/Drainage work is an additional 15% of the geometric improvements.

Significant grading required for ramp improvements, increased geometric improvements unit price to accommodate.

Reuse as much existing traffic signal and lighting equipment as feasible and relocate signal poles, cabinets, etc.

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

Rev. 7/10

County: Polk Prepared by: Kurtis Shackelford Date Prepared: Jul 24, 2012

Location: IA 141 @ Ryder corner both ramp terminals (Urbandale) Urbandale Dr

Improvement

Proposed Improvement(s): Signal Timing and functional Geometric Improvements.

$ 350,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	10	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 350,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa Department of Transportation 2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.80	40,400	I-35 Interchange/S limits Grim
0.80	miles total	

32,118	Current Vehicle Miles / Day, **VM**
85,219	End of Life Veh. Miles / Day
11,723,070	Current Veh. Miles / Year, **AM**
387,634,495	Total Projected Veh. Miles Over Life of Project, **TVMT**

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

5.0% Projected Traffic Growth (0%-10%), **G**

Crash Data

2006 First full year --> 2010 Last full year 5.0 years, Time Period, **T**

0 Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$ -
		0	Major Injuries @	$240,000	$ -
32	Injury Crashes →	3	Minor Injuries @	$48,000	$ 144,000
		29	Possible Injuries @	$25,000	$ 725,000
101	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 413,298
133	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,282,298

26.60	Current Crashes / Year, **AA** = TA / T	226.9	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 9,641	Cost per Crash, **AVCR** = LOSS / TA	$ 540,951	Present Value of Avoided Crashes, **BENEFIT**
879.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
2.66	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 25,646	Crash Costs Avoided in First Year, AAR x AVCR		
88.0	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 = $540,951 : $350,000 = **1.55** : 1

Iowa Department of Transportation

Rev. 3/08 A

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project US 65 & 32nd Street SW Improvements Project

Applicant City of Bondurant

Contact Person Mark Arentsen Title City Administrator

Complete Mailing Address 200 2nd St NE Box 37
Bondurant, IA 50035

Phone 515-967-2418 (Area Code) E-Mail marentsen@cityofbondurant.com

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 716,000.00

Safety Funds Requested $ 500,000.00

Rev. 3/08 A

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Bondurant

Signed: Mark Arentsen 8/15/12
Signature Date Signed

Mark Arentsen
Typed Name

Attest: Michelle Wells 8-15-12
Signature Date Signed

Michelle Wells
Typed Name

RESOLUTION NO. 12-146

A RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR IMPROVEMENTS AT INTERSECTION OF US 65 & 32ND STREET SW

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

WHEREAS, US 65 & 32nd Street, SW, has been identified as a location where vehicular safety could be improved and funded by TSIP, as described in an Iowa DOT Traffic Engineering Assistance Program (TEAP) Study.

WHEREAS, the improvements recommended in the TEAP study, including construction of turn lanes on 32nd Street, SW, approaches, reconstruction of US 65 left turn lanes and installation of a traffic signal, will help reduce crashes at this intersection.

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

1. The City Council supports and approves 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.
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 by the City Council of the City of Bondurant this 06th day of August, 2012.

CITY COUNCIL OF
THE CITY OF BONDURANT, IOWA

By: _____
Keith Ryan, Mayor

Attest:

Michelle Wells
Michelle Wells, Deputy City Clerk

City of Bondurant

200 Second Street, Northeast
Post Office Box 37
Bondurant, Iowa 50035-0037

Phone: (515) 967-2418
FAX: (515) 967-5732

E-mail: info@cityofbondurant.com

Website: www.cityofbondurant.com

Mayor:
Keith Ryan

City Administrator:
Mark Arentsen

Council Member:
Amy Bogaards
Jerry Fischer
Eric Johnson
Brian Lohse
Curt Sullivan

City Attorney:
David E. Brick

City Engineer:
Edwin R. Slattery

August 15, 2012

Mr. Terry Ostendorf
Office of Traffic & Safety
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

Dear Mr. Ostendorf—

The City of Bondurant is pleased to submit, for your consideration, an application for funding assistance through the Traffic Safety Improvement Program (TSIP). The proposed project eligible for funding assistance and consideration is the US 65 & 32nd Street SW Improvements Project.

The improvements include installation of a traffic signal at the intersection of US 65 & 32nd Street SW, reconstruction of US 65 turn lanes to provide offset left turn lanes, and construction of left turn lanes on 32nd Street SW. The proposed improvements are consistent with recommendations from the August 2012 Iowa DOT Traffic Engineering Assistance Program (TEAP) Study completed with the City and Iowa DOT District 1.

Based on traffic signal warrants and crash history identified in the TEAP Study, the proposed improvements are expected to improve safety at the intersection and reduce potential vehicle conflicts, while maintaining priority for through traffic on US 65 corridor.

The City is confident the analysis presented herein supports the applicability of the safety goals of the Traffic Safety Improvement Program and demonstrates the worthiness of the project for TSIP funding assistance.

Please feel free to contact me with any questions.

Sincerely,

Mark Arentsen
City Manager
City of Bondurant

BONDURANT
ON THE MOVE

Mission Statement:
At the City of Bondurant, it is our goal to:

1. Provide expedient, courteous service to new and prospective residents and businesses
2. Establish cost effective administration practices
3. Implement policies and projects which improves the City's image
4. Expand public safety services
5. Continually upgrade the City's infrastructure
6. Reduce the City tax rate
7. Improve recreation facilities & activities
8. Support Planned, organized growth
9. Expand the City's boundaries where practical
10. Promote economically feasible commercial development

NARRATIVE

Existing Conditions

The intersection of US 65 & 32nd Street SW is in the southern portion of the City of Bondurant. US 65 is also called NE Hubbell Avenue, and 32nd Street SW is also called NE 62nd Avenue when in Polk County jurisdiction. US 65 is a north/south national highway, and along this segment connects Des Moines and I-80 to points north, including Marshalltown via IA 330. In the proposed project area, US 65 is a four-lane, divided 130 ft rural cross-section with a 60 ft depressed grass median and gravel shoulders. The posted speed limit is 55 mph.

32nd Street SW is a two lane rural cross section, with an intersection of NE 62nd Avenue/NE 64th Street approximately 250 ft to the west. To the east is an intersection that includes a driveway for a light industrial/commercial land use on the north and a public street to the south. This public street, Haney Ave SW, leads to commercial land uses, including a convenience store. Lanes on 32nd Street SW at the intersection currently includes single eastbound and westbound lanes. The posted speed limit is 45 mph. The intersection is currently controlled by two-way STOP control for eastbound and westbound traffic, with YIELD control in the center median crossover for vehicles that cross the intersection as a two stage maneuver.

Future Land Use and US 65 Access Agreement
The land use surrounding the intersection is a mix of commercial, light industrial and agricultural. Much of the land currently used for agricultural is zoned for future light industrial uses. Recent development has increased traffic approaching the intersection. This development includes the gas station and commercial uses to the southeast, as well as the Wolf Creek subdivision approximately ½ mile east on 32nd Street SW. This subdivision has grown rapidly, at approximately 25 homes per year. There are currently 175-200 single family homes, and the ultimate build-out will include 375 single family homes.

In February 2010, the City and Iowa DOT signed an *Agreement for a Corridor Access Management Plan*, which shows the study intersection as a future traffic signal and discusses need for left turn lanes as necessary.

Traffic Counts
Traffic counts were collected by the Iowa DOT in 2008 and tube counts and peak hour turning movement counts were collected in Summer 2012 as part of an Iowa DOT TEAP Study of the intersection. US 65 counts in 2008 indicated an annual average daily traffic (AADT) volume of 12,500 vehicles per day (vpd). On 32nd St SW, 2012 24-hr tube counts indicate AADT of 3,600 vpd on the east leg and 1,900 vpd on west leg. Traffic on the east leg increased from 1,500 vpd to 3,600 vpd from 2008 to 2012. The traffic count records are provided in Section J of this application.

Crash History
Crash data for the intersection of US 65 & 32nd Street SW were obtained from the Iowa DOT CMAT and SAVER software. Crash reports for injury crashes were also obtained from Polk County Sheriff's office and the Iowa State Patrol. The crash data covers the period from January 2007 through December 2011, and preliminary crash data through May 2012.

The intersection is ranked #61 on the Iowa DOT Safety Improvement Candidate List (SICL), which ranks the top 200 intersections statewide based on crash frequency, crash rate and crash severity

During this five year and five month period, 19 crashes occurred, including one fatal crash, 7 personal injury crashes and 11 property damage only (PDO) crashes. The injury crashes resulted in 1 fatality, 1 major injury, 2 minor injuries and 6 possible injuries.

As summarized in Section I of this application, the primary "Major Cause" of crashes is a variety of Failures to Yield Right Of Way (13 of 19 crashes). This includes Failure To Yield Right Of Way From Stop Sign (8) and Yield Sign (2), and also one crash of major cause of Ran Stop Sign. The primary "Manner of Crash" (14 of 19) was broadside/right-angle crash, where a northbound or southbound vehicle crashed with an eastbound or westbound vehicle. In addition, there was one angle left turn crash involving eastbound and westbound vehicles, and one sideswipe crash involving a northbound vehicle and a westbound vehicle turning northbound, and one rear end crash.

In addition, two crashes have occurred through May 2012. The first involved a large truck running off the road, resulting in one minor injury, and the second involved a westbound semi-trailer and a northbound car, resulting in 2 minor injuries and $7,500 property damage. Detailed crash reports of these 2012 crashes were not available from the Sherriff's office.

Multiple factors contribute to these crashes, including the high speed of the roadway and increase of traffic volumes that results in drivers selecting smaller gaps in traffic, as well as the wide cross section and two-stage median crossing, and skewed alignment. US 65 is skewed approximately 65 degrees to the right side of the driver's view. Based on the crash types, 17 of the 19 crashes may be correctable by the installation a traffic signal (to assign right-of-way). Please see section I of this application for a crash summary, a collision diagram and detailed injury crash reports.

Traffic Signal Warrants

A traffic signal warrant analysis conducted as part of an Iowa DOT TEAP Study completed in August 2012 concluded that the intersection satisfied traffic signal warrant criteria as specified in the *Manual on Uniform Traffic Control Devices (MUTCD)*. Traffic data satisfied three warrants. These include Warrant 1: Eight Hour Vehicular Volume, specifically, Warrant 1-B which is "intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street". Also satisfied were Warrant 2: Four Hour Vehicular Volume and Warrant 3: Peak Hour Vehicular Volume. Iowa DOT District 1 and the Office of Traffic and Safety subsequently approved the TEAP report and the recommendation for a traffic signal.

Proposed Improvement Plan

Based on the intersection crash history, safety performance and traffic signal warrants discussed in the TEAP Study, the City of Bondurant proposes to install a traffic signal at US 65 & 32nd Street SW. Additional improvements will widen 32nd Street SW on both approaches to provide left turn lanes, and reconstruct the US 65 left turn lanes to provide offset left turn lanes to

improve driver visibility, so that turning vehicles from the other direction do not block the drivers view of oncoming traffic.

At the proposed signalized intersection, 32nd St SW traffic will be permissive only left turns with signal designed to allow future protected left turn with green arrow if necessary. US 65 traffic will have protected/permissive left turn phasing. The construction of left turn lanes on 32nd Street SW will provide more efficient movement of traffic on the minor street by removing left turn traffic from the through traffic, reducing delay of through vehicles waiting behind left turning vehicles, and allowing more green time for US 65 traffic phases.

A detailed layout of the proposed intersection geometry can be viewed in Section G of this application. The proposed signal layout and phasing details can be seen in Section K of this application.

Financing
The proposed improvements for the intersection of US 65 & 32nd Street SW are estimated to cost approximately $716,000. This includes costs for the turn lane construction and proposed traffic signal installation. An itemized breakdown of project costs can be found in Section C of this application. The City is requesting $500,000 in Traffic Safety Improvement Program (TSIP) funds to support this effort.

Agency Support
The City has coordinated with Iowa DOT District 1 in requesting a TEAP Study for this intersection, completed in August 2012. This TEAP Study was reviewed by Iowa DOT District 1 and Office of Traffic & Safety, and recommended the proposed signalization and associated roadway improvements. The proposed improvements are also consistent with the February 2010 "Agreement for a Corridor Access Management Plan" for US 65, agreed upon by the City and Iowa DOT which shows this intersection as a full access intersection with future traffic signal.

ITEMIZED PROJECT COST BREAKDOWN
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

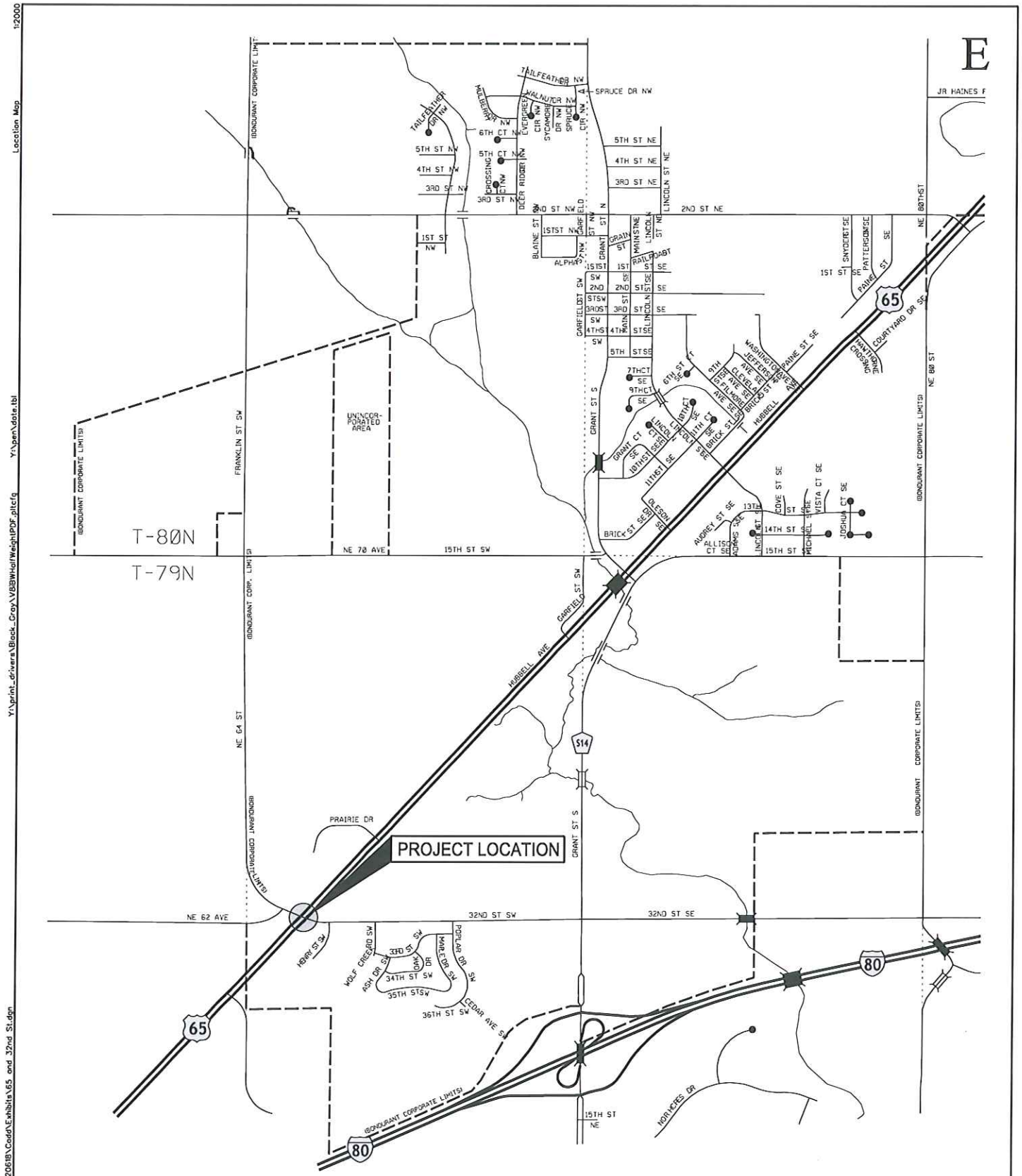
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1	Mobilization	1	LS	$ 20,000.00	$ 20,000.00
2	Traffic Control	1	LS	$ 15,000.00	$ 15,000.00
3	Pavement Removal	800	SY	$ 10.00	$ 8,000.00
4	PCC Pavement, 10"	2,790	SY	$ 80.00	$ 223,200.00
5	PCC Pavement, 8"	1,460	SY	$ 70.00	$ 102,200.00
6	Culvert Extension	40	LF	$ 80.00	$ 3,200.00
7	Pavement Markings, Durable	95	STA	$ 200.00	$ 19,000.00
8	Pavement Marking Symbols	6	EA	$ 250.00	$ 1,500.00
9	Traffic Signal	1	EA	$ 180,000.00	$ 180,000.00
				SUBTOTAL =	**$ 572,100.00**
				Construction Contengency (10%) =	$ 58,000.00
				Administration, Engineering, and Construction Services (15%) =	$ 85,900.00
				TOTAL =	**$ 716,000.00**

PROPOSED FUNDING SOURCES
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

SOURCE	AMOUNT
Traffic Safety Improvement Program Funding (TSIP - Site Specific)	$500,000
Local Funds / Potential Des Moines MPO funds	$216,000
PROJECT TOTAL	$716,000

PROPOSED PROJECT SCHEDULE
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

August 2012	TSIP Application
December 2012	Iowa DOT Approval
Jan. 2013	TSIP Agreement
Jan. 2013 – May 2013	Project Engineering
June 2013	Project Letting
July 2013 – Nov. 2013	Project Construction



SNYDER & ASSOCIATES
Engineers and Planners

LOCATION MAP
US 65 AND 32ND STREET SW
BONDURANT, IOWA

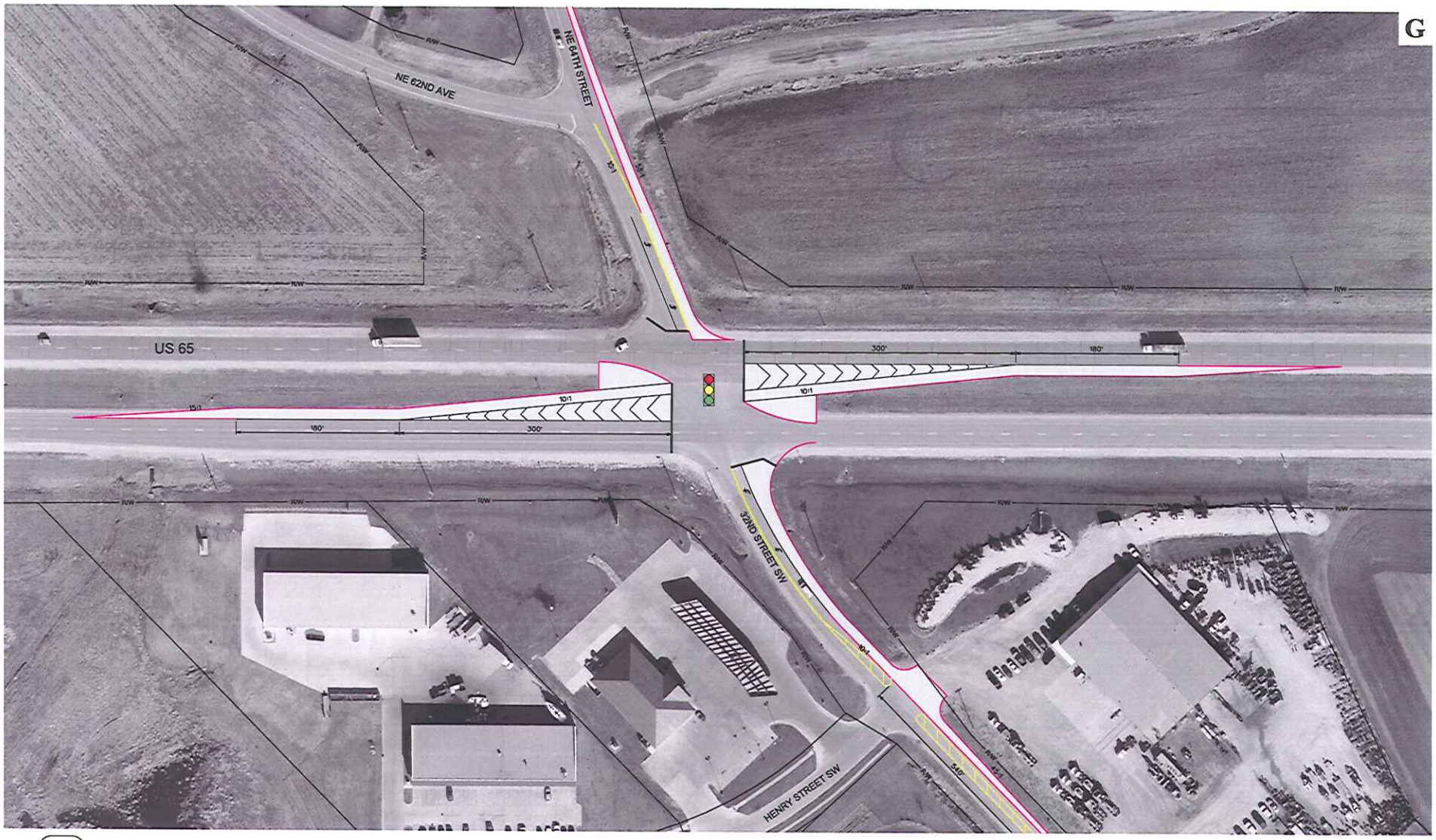
0 1000
SCALE (FEET)

Photo 1: Intersection of US 65 & 32nd St SW Looking East Showing Mixing of Median Traffic

Photo 2: Intersection of US 65 & 32nd St SW Looking North

Photo 3: Intersection of US 65 & 32nd St SW Looking East

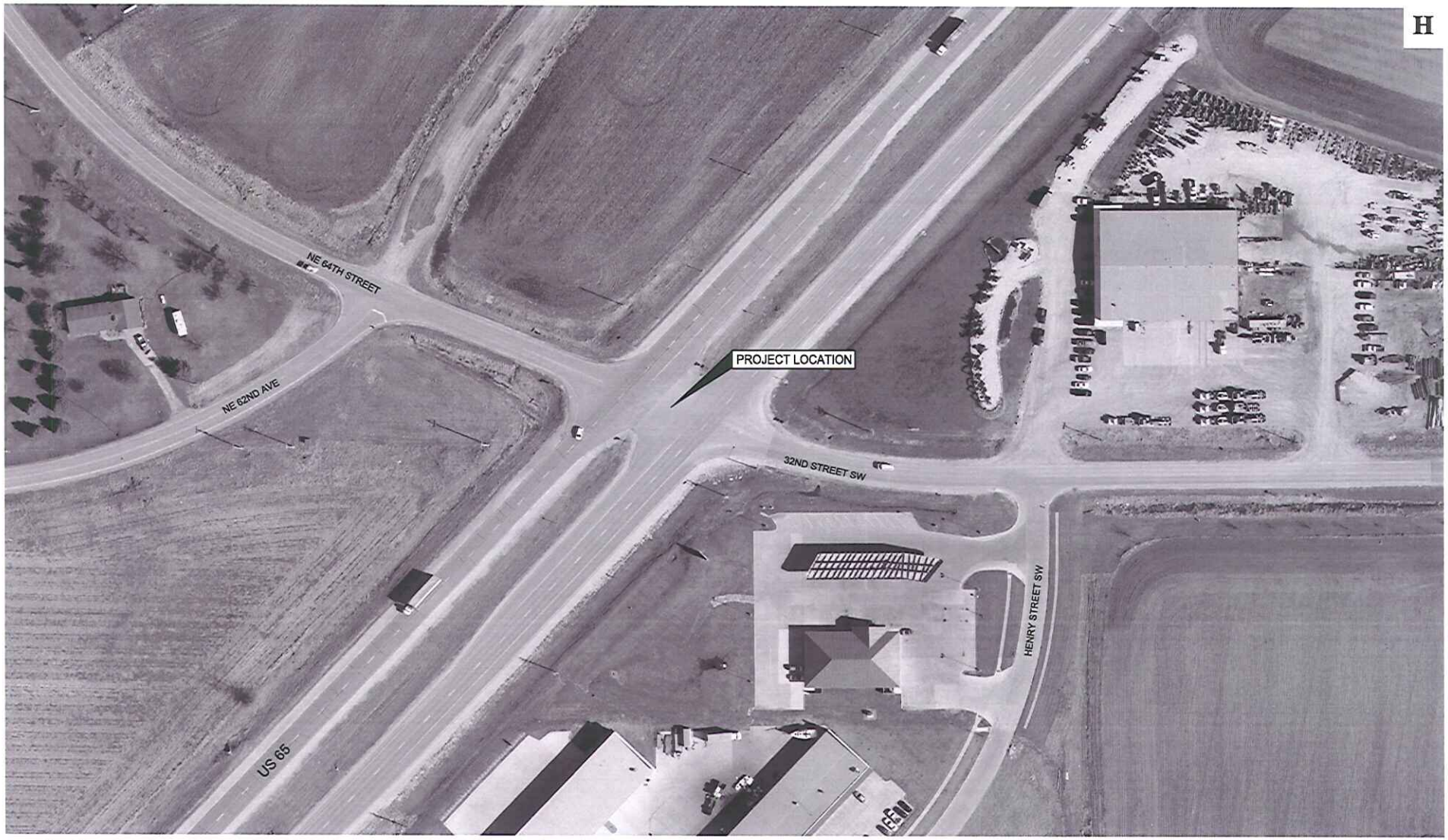
Photo 4: Intersection of US 65 & 32nd St SW Looking West



SNYDER & ASSOCIATES
Engineers and Planners

PROPOSED INTERSECTION IMPROVEMENTS
US 65 AND 32ND STREET SW
BONDURANT, IOWA

0 50
SCALE (FEET)



SNYDER & ASSOCIATES
Engineers and Planners

PROPOSED IMPROVEMENT AREA
US 65 AND 32ND STREET SW
BONDURANT, IOWA

0 50
SCALE (FEET)

N

CRASH DATA SUMMARY
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

Crash data for the intersection of US 65 & 32nd Street SW were obtained from the Iowa DOT CMAT and SAVER software. Crash reports for injury crashes were also obtained from Polk County Sheriff's office and the Iowa State Patrol. The crash data covers the period from January 2007 through December 2011, and preliminary crash data through May 2012.

The intersection is ranked #61 on the Iowa DOT Safety Improvement Candidate List (SICL), which ranks the top 200 intersections statewide based on crash frequency, crash rate and crash severity

During this five year and five month period, 19 crashes occurred, including one fatal crash, 7 personal injury crashes and 11 property damage only (PDO) crashes. The injury crashes resulted in 1 fatality, 1 major injury, 2 minor injuries and 6 possible injuries.

The primary "Major Cause" of crashes is a variety of Failures to Yield Right Of Way (13 of 19 crashes). This includes Failure To Yield Right Of Way From Stop Sign (8) and Yield Sign (2), and also one crash of major cause of Ran Stop Sign. The primary "Manner of Crash" (14 of 19) was broadside/right-angle crash, where a northbound or southbound vehicle crashed with an eastbound or westbound vehicle. In addition, there was one angle left turn crash involving eastbound and westbound vehicles, and one sideswipe crash involving a northbound vehicle and a westbound vehicle turning northbound, and one rear end crash.

In addition, two crashes have occurred through May 2012. The first involved a large truck running off the road, resulting in one minor injury, and the second involved a westbound semi-trailer and a northbound car, resulting in 2 minor injuries and $7,500 property damage.

Multiple factors contribute to these crashes, including the high speed of the roadway and increase of traffic volumes that results in drivers selecting smaller gaps in traffic, as well as the wide cross section and two-stage median crossing, and skewed alignment. US 65 is skewed approximately 65 degrees to the right side of the driver's view. Based on the crash types, 17 of the 19 crashes may be correctable by the installation a traffic signal (to assign right-of-way).

Detailed Injury Crash Report Notes
Detailed crash reports are provided for the five injury crashes responded to by the Polk County Sherriff. The 2012 injury crashes were not available from the Sherriff's office at time of application, and will be provided if received.

The crash report for the 2008fatal crash (WB car failure to yield from Yield Sign, collision with SB semi-trailer) is pending from the Iowa State Patrol, and will be provided when received

MAJOR CAUSE SUMMARY – 2007–MAY 2012 CRASHES
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

NUMBER OF COLLISIONS

1	Fatal Collisions, (F)	1	fatalities	1 injuries
7	Personal Injury Collisions, (PI)			9 injuries
11	Property Damage Only Collisions, (PDO)			
Totals: 19	Collisions	1	fatalities	10 injuries

COLLISION RATE = 0.63 Collisions per Million Entering Vehicles (MEV)

Collision Rate = 19 Total Collisions 30.07 MEV

TRAFFIC ASSIGNMENT

Average Annual Daily Traffic (AADT)

North Approach =	12500	Collision Period (years) =	5.4
South Approach =	12500		
East Approach =	3610		
West Approach =	1900	Million Entering Vehicles (MEV)	30.07

MAJOR CONTRIBUTING CAUSES

None apparent	3 FTYROW other	2 Failure to have control
Ran Traffic Signal	Wrong way on one way road	Headlights not on
1 Ran Stop Sign	Speed too fast for conditions	Inattentive or distracted
1 Crossed Centerline	Exceeding speed limit	Driver confused
Passing where prohibited	Drag racing	1 Vision obscured
Passing, interfered with other	Improper turn	Oversized vehicle
Left of center, not passing	Improper lane change	Overloaded, passengers/cargo
Failed to yield ROW(FTYROW)	Following too close	Inexperienced driver
8 FTYROW from stop sign	No signal or improper signal	Other
2 FTYROW from yield sign	Disregarded railroad signal	Driver asleep
1 FTYROW making left turn	Disregarded warning signal	Drinking driver
FTYROW from driveway	Reckless driving	Mechanical failure
FTYROW from parked position	Improper backing	Unknown
FTYROW to pedestrian	Illegal or improper parking	

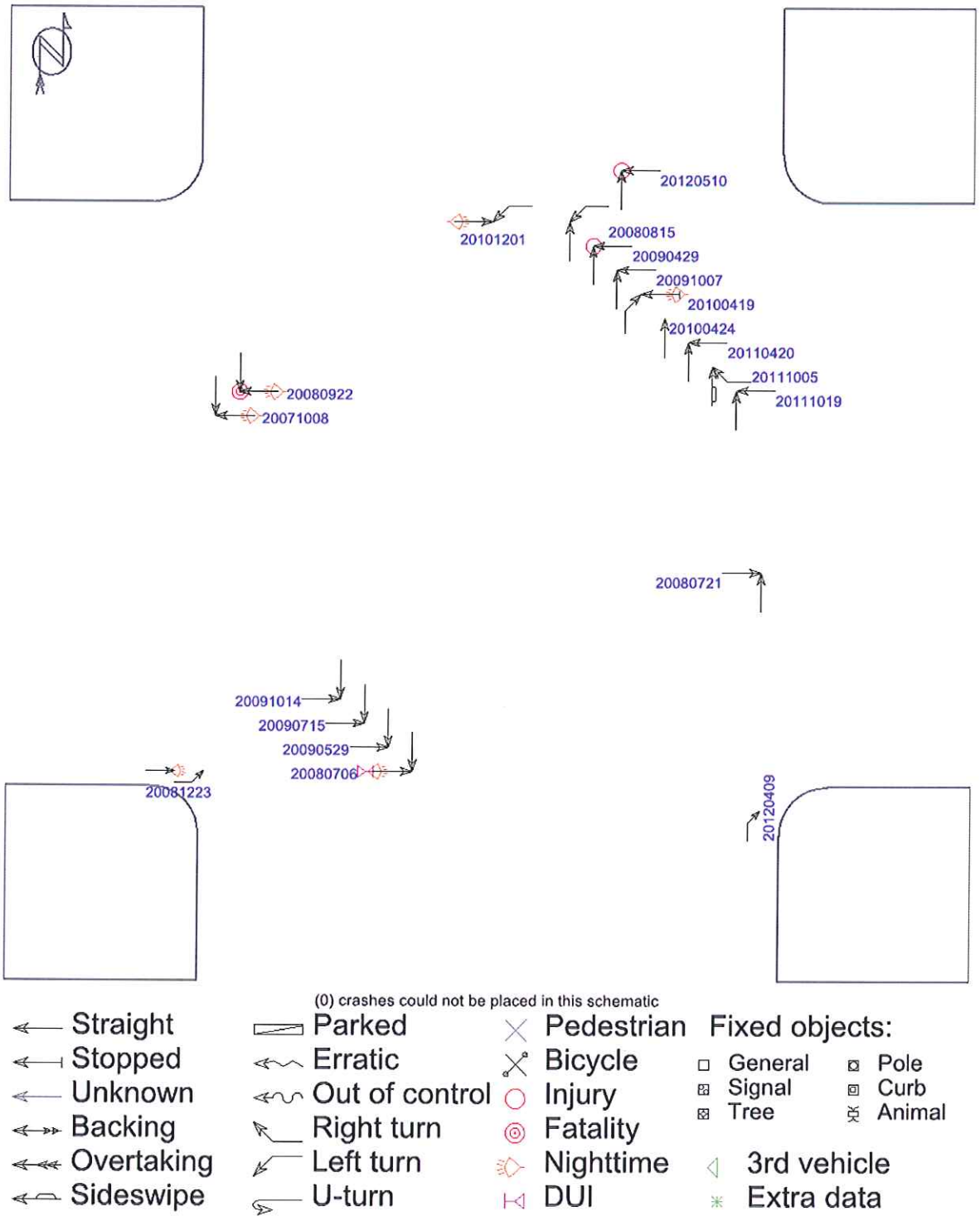
COLLISION TYPES

2 Out of control vehicle	1 Left turn collision	Fixed object
1 Rear end collision	Backing vehicle collision	Overturned vehicle
Head on collision	1 Sideswipe same	Pedestrian
14 Right angle collision	Sideswipe opposite	Bicycle

CRASH DAMAGES SUMMARY: 2007–MAY 2012 CRASHES
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

Ref. No.	Date	Time	Surface Condition	Crash Type	PI	Injuries					Property Damage		Correctable Y / N
						Fatal	Major	Minor	Poss	Total	Only	Amount	
1	10/8/2007	2:58 AM	Wet	RT Angle						0	X	$7,500	Y
2	7/6/2008	12:27 AM	Dry	RT Angle						0	X	$12,000	Y
3	7/21/2008	3:24 PM	Dry	Ran off Road						0	X	$1,000	Y
4	8/15/2008	8:06 AM	Dry	RT Angle	X				1	1		$7,500	Y
5	9/22/2008	9:17 PM	Dry	RT Angle	X	1			1	2		$20,000	Y
6	12/23/2008	5:15 PM	Wet	Rear End						0	X	$1,500	N
7	4/29/2009	4:40 PM	Dry	RT Angle	X		1			1		$3,000	Y
8	5/29/2009	1:04 PM	Dry	RT Angle						0	X	$5,500	Y
9	7/15/2009	8:43 PM	Dry	RT Angle						0	X	$4,000	Y
10	10/7/2009	4:54 PM	Dry	RT Angle	X				1	1		$8,000	Y
11	10/14/2009	11:05 AM	Dry	RT Angle						0	X	$10,200	Y
12	4/19/2010	9:43 PM	Gravel	RT Angle	X				1	1		$5,500	Y
13	4/24/2010	10:45 AM	Dry	RT Angle						0	X	$4,000	Y
14	12/1/2010	6:39 PM	Dry	Angle LT	X				1	1		$6,500	Y
15	4/20/2011	12:46 PM	Dry	RT Angle						0	X	$3,000	Y
16	10/5/2011	5:46 PM	Dry	Sideswipe						0	X	$4,000	Y
17	10/19/2011	1:45 PM	Dry	RT Angle						0	X	$20,000	Y
18	4/9/2012	11:49 AM	Dry	Ran off Road	X				1	1		$20,000	N
19	5/10/2012	2:53 PM	Dry	RT Angle	X			2		2		$7,500	Y
TOTAL (All Crashes)					8	1	1	2	6	10	11	150,700	
TOTAL (Correctable)					7	1	1	2	5	9	10	129,200	

COLLISION DIAGRAM: 2007–MAY 2012 CRASHES
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

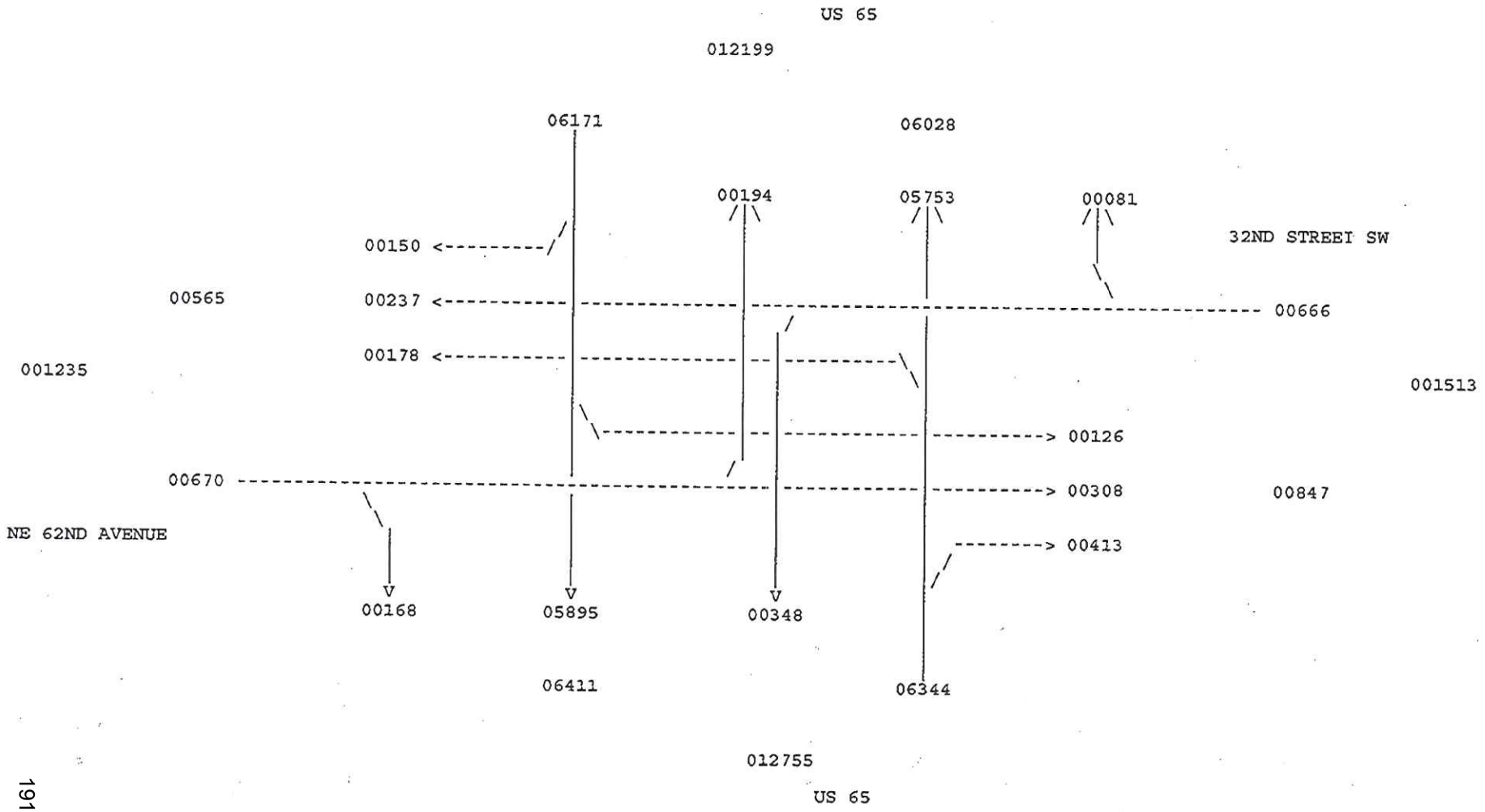


DATE: 08-17-2010

IOWA DEPARIMENT OF IRANSPORTATION
VEHICULAR TURNING MOVEMENTS
ANNUAL AVERAGE DAILY IRAFFIC - YEAR 2008
IN BONDURANT

COUNTY:POLK
US 65, NE 62ND AVE & 32ND ST SW

SIAIION NO. 77 23 8185 0991



D1530926

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
77	23	8185	0991	2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
ALL VEHICLES

PRINTER ID: TPRT003W PAGE 0001
CITY: BONDURANT
COUNTY: POLK

HOUR	******* NORTH LEG ******* US 65				******* EAST LEG ******** 32ND STREET SW				******* SOUTH LEG ******* US 65				******* WEST LEG ******** NE 62ND AVENUE			
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
07- 8AM	23	783	5	811	5	24	41	70	4	203	17	224	3	14	23	40
08- 9AM	8	450	5	463	4	19	27	50	8	217	27	252	6	13	20	39
11-12PM	7	340	6	353	6	15	22	43	9	251	18	278	6	17	12	35
12-1 PM	8	313	14	335	7	14	21	42	5	299	27	331	4	13	6	23
3- 4PM	6	327	9	342	4	20	24	48	14	489	35	538	14	26	7	47
4- 5PM	10	359	8	377	8	14	20	42	19	726	48	793	31	32	9	72
5- 6PM	14	413	17	444	7	14	21	42	31	728	37	796	34	41	8	83
TOTALS	76	2985	64	3125	41	120	176	337	90	2913	209	3212	98	156	85	339

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

J

D1530927

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
77	23	8185	0991	2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
SINGLE UNIT TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: BONDURANT
COUNTY: POLK

HOUR	******* NORTH LEG US 65			*******	******* EAST LEG 32ND STREET SW			********	******* SOUTH LEG US 65			*******	******* WEST LEG NE 62ND AVENUE			********
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
7- 8AM	0	7	1	8	1	1	1	3	1	14	1	16	0	1	1	2
8- 9AM	0	12	0	12	0	1	1	2	0	17	2	19	0	0	1	1
11-12PM	1	14	0	15	1	1	5	7	2	9	1	12	0	5	2	7
12- 1PM	0	17	2	19	2	2	4	8	1	22	5	28	1	3	0	4
3- 4PM	0	23	2	25	0	3	1	4	4	13	2	19	1	1	0	2
4- 5PM	3	12	2	17	0	1	3	4	1	18	0	19	0	3	4	7
5- 6PM	0	22	1	23	1	0	0	1	1	19	0	20	0	0	1	1
TOTALS	4	107	8	119	5	9	15	29	10	112	11	133	2	13	9	24

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

D1530928

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
77	23	8185	0991	2008

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
COMBINATION TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: BONDURANT
COUNTY: POLK

HOUR	******* NORTH LEG ******* US 65				******* EAST LEG ******** 32ND STREET SW				******* SOUTH LEG ******** US 65				******* WEST LEG ******** NE 62ND AVENUE			
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
7- 8AM	0	43	0	43	0	0	1	1	2	28	0	30	0	0	0	0
8- 9AM	0	44	0	44	0	1	2	3	0	32	3	35	1	2	3	6
11-12PM	0	49	1	50	0	1	2	3	0	41	4	45	1	0	1	2
12- 1PM	1	38	0	39	0	1	1	2	0	37	1	38	0	1	0	1
3- 4PM	1	37	1	39	0	0	1	1	0	32	2	34	1	0	0	1
4- 5PM	2	30	0	32	1	0	2	3	0	39	1	40	1	0	0	1
5- 6PM	5	32	0	37	1	1	1	3	1	31	1	33	0	0	0	0
TOTALS	9	273	2	284	2	4	10	16	3	240	12	255	4	3	4	11

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Description 1: US 65 & 32ND ST SW - EAST LEG
Description 2: US 65 & 32ND ST SW INTERSECTION STUDY
Description 3: BONDURANT, IOWA

Site: 000000000000

Seven Day Volume

Interval Begin	Tue 5/29/2012 WB	Tue EB	Wed 5/30/2012 WB	Wed EB	Thu 5/31/2012 WB	Thu EB	Fri 6/1/2012 WB	Fri EB	Sat 6/2/2012 WB	Sat EB	Sun 6/3/2012 WB	Sun EB	Mon 6/4/2012 WB	Mon EB	Mon - Fri Average WB	Mon - Fri Average EB
12:00 AM	-	-	6	13	7	16	4	10	6	8	13	15	5	5	5.5	11.0
1:00 AM	-	-	0	2	1	1	6	2	3	6	5	11	7	8	3.5	3.3
2:00 AM	-	-	2	5	0	4	11	8	1	1	5	2	1	1	3.5	4.5
3:00 AM	-	-	0	4	0	2	1	3	6	1	4	2	3	5	1.0	3.5
4:00 AM	-	-	3	1	6	6	8	3	4	3	3	1	6	4	5.8	3.5
5:00 AM	-	-	41	29	25	22	20	20	13	11	15	12	31	22	29.3	23.3
6:00 AM	-	-	93	85	89	82	92	71	38	33	18	11	95	83	92.3	80.3
7:00 AM	-	-	168	142	141	132	138	98	48	42	19	20	131	91	144.5	115.8
8:00 AM	-	-	108	101	99	73	93	83	70	73	48	50	98	78	99.5	83.8
9:00 AM	-	-	75	65	84	101	104	109	102	116	54	60	75	90	84.5	91.3
10:00 AM	-	-	75	66	73	73	71	81	97	125	65	66	78	67	74.3	71.8
11:00 AM	-	-	81	85	77	118	86	102	134	140	87	88	79	82	80.8	96.8
12:00 PM	-	-	87	99	71	123	85	124	105	117	93	109	70	99	78.3	111.3
1:00 PM	-	-	81	85	73	129	116	159	105	144	83	90	85	87	88.8	115.0
2:00 PM	-	-	80	93	77	114	100	140	120	133	80	100	-	-	85.7	115.7
3:00 PM	50	94	93	162	85	151	108	177	92	122	96	115	-	-	96.0	166.9
4:00 PM	133	215	111	247	100	249	147	212	109	139	93	126	-	-	122.8	230.8
5:00 PM	154	224	148	283	130	273	170	217	113	128	102	114	-	-	150.5	249.3
6:00 PM	122	145	107	165	116	190	106	137	92	90	94	102	-	-	112.8	159.3
7:00 PM	55	93	80	121	66	104	92	85	84	68	73	69	-	-	73.3	100.8
8:00 PM	66	77	59	79	37	62	57	71	71	96	54	61	-	-	54.8	72.3
9:00 PM	44	60	37	51	30	53	57	80	58	90	34	36	-	-	42.0	61.0
10:00 PM	28	42	18	19	30	31	49	53	39	46	32	20	-	-	31.3	36.3
11:00 PM	13	13	17	18	13	20	34	42	38	34	15	18	-	-	19.3	23.3
Totals	665	963	1570	2020	1430	2129	1755	2087	1548	1766	1185	1298	764	722	1579.4	2030.0
Combined	1628		3590		3559		3842		3314		2483		1486		3609.4	
Split (%)	40.8	59.2	43.7	56.3	40.2	59.8	45.7	54.3	46.7	53.3	47.7	52.3	51.4	48.6	43.8	56.2
Peak Hours 12:00 AM - 12:00 PM	-	-	7:00 AM	6:45 AM	7:00 AM	7:00 AM	7:15 AM	9:15 AM	11:00 A	11:00 A	11:00 A	10:45 A	6:45 AM	6:45 AM	7:00 AM	6:45 AM
Volume	-	-	168	152	141	132	144	114	134	140	87	91	132	117	144.5	121.0
Factor	-	-	0.76	0.88	0.90	0.70	0.80	0.81	0.88	0.81	0.78	0.78	0.85	0.68	0.93	0.84
12:00 PM - 12:00 AM	4:30 PM	4:45 PM	4:45 PM	4:30 PM	4:30 PM	4:30 PM	5:00 PM	4:45 PM	4:30 PM	3:30 PM	5:15 PM	4:15 PM	1:00 PM	12:00 P	5:00 PM	4:45 PM
Volume	163	241	151	306	134	302	170	234	127	152	107	135	85	99	150.5	267.8
Factor	0.97	0.94	0.84	0.91	0.86	0.83	0.90	0.91	0.88	0.78	0.79	0.87	0.79	0.85	0.91	0.91

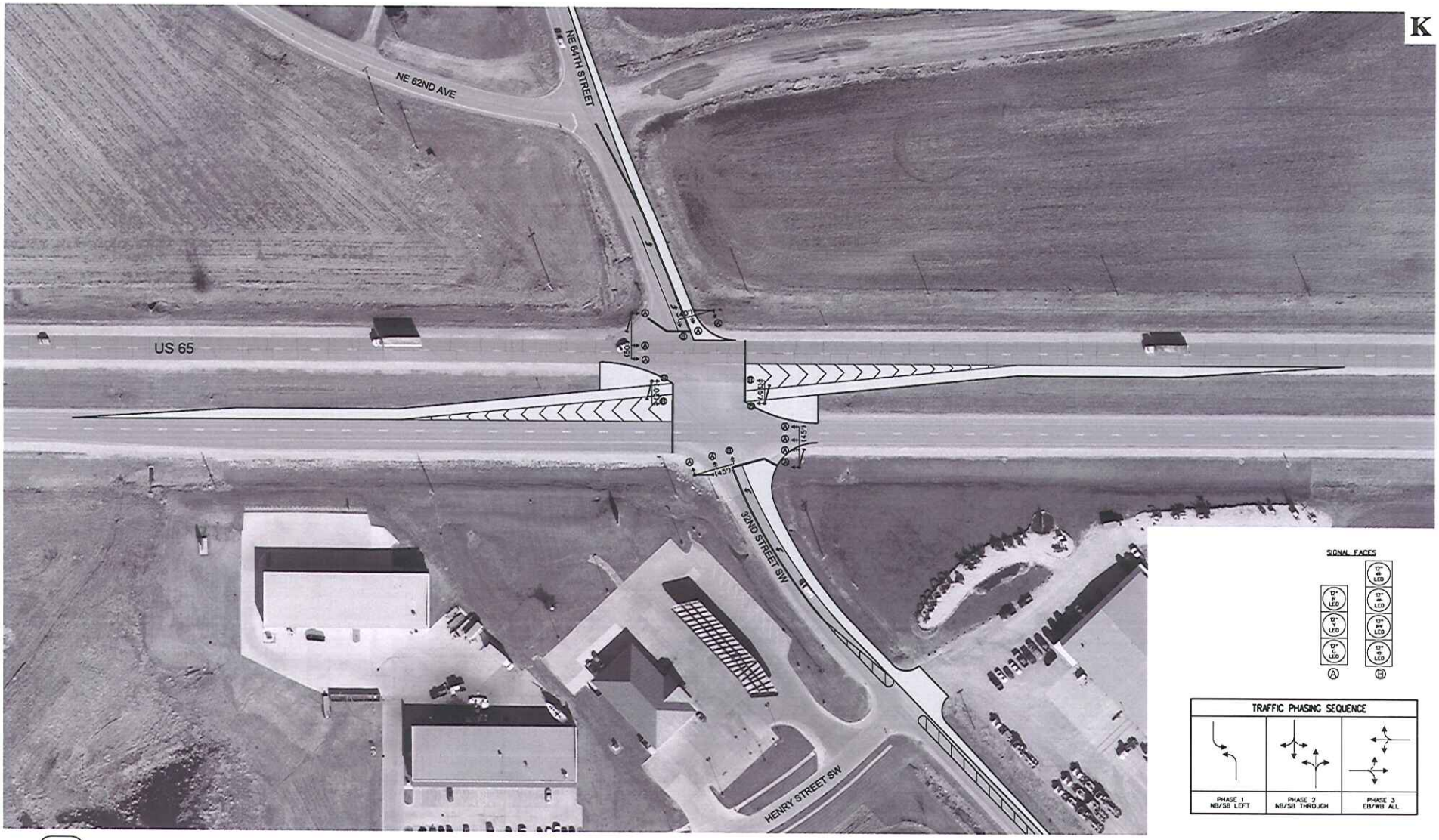
Description 1: US 65 & SW 32ND STREET - WEST LEG
Description 2: US 65 & SW 32ND STREET INTERSECTION STUDY
Description 3: BONDURANT, IA

Site: 000000000000

Weekly Volume

Interval	Mon 6/4/2012		Tue 6/5/2012		Wed 6/6/2012		Thu 6/7/2012		Fri 6/8/2012		Sat 6/9/2012		Sun 6/10/2012		Mon - Fri Average	
Begin	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	-	-	-	-	7	12	7	6	7	4	-	-	-	-	7.0	7.3
1:00 AM	-	-	-	-	1	2	1	5	0	2	-	-	-	-	0.7	3.0
2:00 AM	-	-	-	-	0	5	2	4	1	5	-	-	-	-	1.0	4.7
3:00 AM	-	-	-	-	0	2	2	3	3	4	-	-	-	-	1.7	3.0
4:00 AM	-	-	-	-	4	6	3	5	1	3	-	-	-	-	2.7	4.7
5:00 AM	-	-	-	-	12	12	23	16	18	17	-	-	-	-	17.7	15.0
6:00 AM	-	-	-	-	64	46	56	56	55	45	-	-	-	-	58.3	49.0
7:00 AM	-	-	-	-	103	73	110	74	98	72	-	-	-	-	103.7	73.0
8:00 AM	-	-	-	-	45	59	55	58	44	51	-	-	-	-	48.0	56.0
9:00 AM	-	-	-	-	37	43	50	30	23	29	-	-	-	-	44.0	40.8
10:00 AM	-	-	-	-	46	49	34	53	-	-	-	-	-	-	40.0	51.0
11:00 AM	-	-	-	-	45	55	30	42	-	-	-	-	-	-	37.5	48.5
12:00 PM	-	-	-	-	49	46	56	51	-	-	-	-	-	-	52.5	48.5
1:00 PM	-	-	-	-	36	58	55	52	-	-	-	-	-	-	45.5	55.0
2:00 PM	-	-	-	-	54	46	57	62	-	-	-	-	-	-	55.5	54.0
3:00 PM	-	-	-	-	70	73	69	75	-	-	-	-	-	-	69.5	74.0
4:00 PM	-	-	-	-	81	104	76	121	-	-	-	-	-	-	78.5	112.5
5:00 PM	-	-	23	19	91	108	87	91	-	-	-	-	-	-	89.3	96.9
6:00 PM	-	-	52	53	36	59	48	52	-	-	-	-	-	-	45.3	54.7
7:00 PM	-	-	33	42	38	36	41	44	-	-	-	-	-	-	37.3	40.7
8:00 PM	-	-	34	26	26	34	41	52	-	-	-	-	-	-	33.7	37.3
9:00 PM	-	-	22	21	30	25	27	21	-	-	-	-	-	-	26.3	22.3
10:00 PM	-	-	9	17	18	22	22	18	-	-	-	-	-	-	16.3	19.0
11:00 PM	-	-	6	10	11	10	4	7	-	-	-	-	-	-	7.0	9.0
Totals	-	-	179	188	904	985	956	998	250	232	-	-	-	-	919.0	979.9
Combined	-		367		1889		1954		482		-		-		1898.9	
Split (%)	-	-	48.8	51.2	47.9	52.1	48.9	51.1	51.9	48.1	-	-	-	-	48.4	51.6
Peak Hours																
12:00 AM - 12:00 PM	-	-	-	-	7:00 AM	7:15 AM	7:00 AM	6:45 AM	7:00 AM	7:30 AM	-	-	-	-	7:00 AM	7:00 AM
Volume	-	-	-	-	103	74	110	79	98	74	-	-	-	-	103.7	73.0
Factor	-	-	-	-	0.66	0.84	0.92	0.86	0.68	0.88	-	-	-	-	0.75	0.93
12:00 PM - 12:00 AM	-	-	5:45 PM	5:45 PM	4:45 PM	4:45 PM	4:30 PM	4:15 PM	-	-	-	-	-	-	5:00 PM	4:30 PM
Volume	-	-	63	62	92	124	89	132	-	-	-	-	-	-	89.0	122.5
Factor	-	-	0.68	0.82	0.92	0.84	0.79	0.87	-	-	-	-	-	-	0.87	0.89

K



SNYDER & ASSOCIATES
Engineers and Planners

PROPOSED TRAFFIC SIGNAL LAYOUT
US 65 AND 32ND STREET SW
BONDURANT, IOWA

BENEFIT/COST ANALYSIS
US 65 & 32ND ST SW IMPROVEMENTS
BONDURANT, IA

For the purposes of the benefit/ cost analysis, an estimated improvement life of 15 years was selected for the traffic signal as per the Iowa DOT TSIP B/C Analysis instructions. This is also the approximate improvement service life recommended for the addition of turn lanes, as proposed for US 65 and 32nd Street SW.

Based on a review of the *Crash Modification Factors Clearinghouse* website, a cumulative crash reduction factor (CRF) was applied for the proposed improvements. Applicable crash reduction factors include:

- **44%**, for installing traffic signal (Harkey, NCHRP Report 617, 2008)
- **20%**, for installing offset left turn lanes on US 65(This CRF is reduced since this is a less prominent crash type; CRF = 50, Maze, et al, NCHRP Report 650, 2010)

These two crash reduction factors result in a cumulative CRF of 55 (55% reduction). In addition, crash review indicates approximately 89% of the crashes that occurred over the 2007- May 2012 analysis period could possibly be correctable with the installation of a traffic signal and left turn lanes.

The fatality from the 2008 fatal crash (WB car failure to yield from Yield Sign, collision with SB semi-trailer) is counted as a "major injury", as it is the sole fatality during the analysis period.

The cumulative CRF of 55 is more conservative as the installation of a traffic signal may result in a reduction in higher severity, uncontrolled intersection crash types (broadside/right-angle and angle/left turn crashes) but an increase in lower severity, signalized intersection crash types, primarily rear end crashes. The current crash history includes 19 total crashes, 14 of which were right angle, and one (1) rear end crash. This is addressed in the cited CRF source report (NCHRP 617, pg 21):

> "The results indicated that when crash types are combined using the costs of the different crash types, the rear-end increase does not negate the effect on angle and left-turn crashes. There are significant reductions in crash costs, with the top row in the table indicating that total costs are reduced by 73 percent (100[1-0.265]). The results also provide guidance on the intersection conditions under which signal installation would be most beneficial. While there is little difference in the effects on three-leg sites versus four-leg sites and on sites with two lanes versus sites with four lanes on the major road, the results indicate that the benefits are greater on higher volume intersections and are greater where the ratio of expected right-angle crashes to rear-end crashes is higher."

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10 **L**

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: GEK Date Prepared: Aug 10, 2012

Intersection: US 65 & 32nd St SW - City of Bondurant

Improvement

Proposed Improvement(s): Install Traffic Signal at current two-way STOP controlled intersection with div. hwy median YIELD at median crossover. Install offset-left turn lanes on US 65, add 32nd St SW LT lanes.

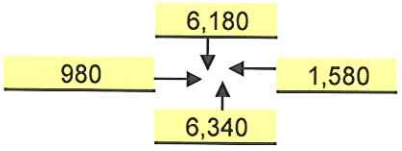
$ 500,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	55	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 500,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT for US 65; TEAP Study for 32nd St SW 2008; 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



5,504,200 Current Annual Entering Veh., **AEV** = DEV * 365

20,296 veh / day, Final Year DEV, **FDEV**

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

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

15,080 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2007 First full year --> 2011 Last full year 5.4 years, Time Period, **T**

5 Additional months values as of Dec. 2007

0	Fatal Crashes	0	Fatalities @	$3,500,000	$	-
		2	Major Injuries @	$240,000	$	480,000
8	Injury Crashes	2	Minor Injuries @	$48,000	$	96,000
		6	Possible Injuries @	$25,000	$	150,000
11	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	150,700
19	Total Crashes, **TA**		Total $ Loss, **LOSS**		$	876,700

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

$ 46,142 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 89,019 Crash Costs Avoided in First Year, AAR x AVC

33.4 Total Avoided Crashes, TECR x CRF/ 100

0.64 Crashes / MEV, Crash Rate, **CR**

CR = TA x 10^6 / (DEV x 365 x T)

$ 1,124,695 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 = $1,124,695 : $500,000 = **2.25** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: I-80 Eastbound On/Off Ramp and Highway 146 - Grinnell, Iowa

Applicant: City of Grinnell

Contact Person: Russ Behrens Title: City Manager

Complete Mailing Address: 927 Fourth Avenue
Grinnell, Iowa 50112

Phone: 641-236-2600 (Area Code) E-Mail: citymanager@grinnelliowa.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:

Application Type

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

Funding Amount

Total Project Cost $ 432,040

Safety Funds Requested $ 432,040

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Grinnell

Signed: Gordon R Canfield 8/15/12
Signature Date Signed

Gordon R. Canfield
Typed Name

Attest: P Kay Cmelik 8/15/12
Signature Date Signed

P. Kay Cmelik
Typed Name

RESOLUTION 2012-82

A RESOLUTION AUTHORIZING THE MAYOR TO SIGN THE APPLICATION AND CITY OF GRINNELL FILE AN APPLICATION TO THE IOWA DEPARTMENT OFTRANSPORTATION FOR ASSISTANCE UNDER THE TRAFFIC SAFETY IMPROVEMENT PROGRAM

WHEREAS, the City Council of the City of Grinnell requests to file a formal application for Traffic Safety Improvement funds; and

WHEREAS, the Mayor should be authorized to sign the application on behalf of the City; and WHEREAS, under the terms of the Iowa Code Chapter 761 – Chapter 164 and administrative rules of the Iowa Department of Transportation, the State of Iowa has authorized the making of grants and loans to cities to aid in financing the construction of specific safety projects.

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

SECTION 1. The City of Grinnell endorses the development of this site – specific safety project.

SECTION 2. The City council authorizes the Mayor to sign the formal application for Traffic Safety Improvement funds.

PASSED AND APPROVED on the 6th day of August, 2012.

Gordon R. Canfield, Mayor

ATTEST:

Kay Cmelik, City Clerk

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

August 15, 2012

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

Dear Terry,

Included is the Traffic Safety Improvement Application for the City of Grinnell, I-80 Eastbound Exit/Entrance Ramp and Highway 146 Improvements. All of the necessary components of the application have been completed with the exception of the investigating officer's accident reports. These reports are currently being compiled and should be available to submit within the next week. In the interim, accident reports from the CMAT database have been analyzed and attached as well as the report created by Zachary Hans. If you have any questions regarding the material submitted in the application please feel free to contact me by phone or e-mail.

Sincerely,

SHIVE-HATTERY, INC.

Michael L. Anthony, PE
Civil Engineer
515-223-8104
manthony@shive-hattery.com

Project # 407584-1

The City of Grinnell is preparing to complete improvements to the Highway 146 corridor in the vicinity of the I-80 interchange. The City has expressed safety concerns about the intersection of the I-80 eastbound ramps and Highway 146, and would like to include improvements to the intersection as a part of the above mentioned project.

The existing geometric layout of the intersection includes STOP control for eastbound traffic exiting I-80, YIELD control for southbound left turning vehicles, and YIELD control for northbound left turning vehicles once they enter the median of Highway 146. The combination of STOP and YIELD traffic control can be confusing for some motorists, especially when conflicting traffic is present in the intersection. Highway 146 has a posted speed limit of 55 MPH through the intersection and several serious crashes, including one fatality have occurred at the intersection within the past five years.

The I-80 interchange with Highway 146 is a diamond configuration. The eastbound exit ramp includes a 14' travel lane, 2' left paved shoulder, and a 10' right paved shoulder. The intersection includes a one-lane eastbound approach that is STOP controlled, a two-lane southbound approach with a YIELD controlled left turn slip lane through the median, and a one-lane northbound approach with a large right turn radius onto the I-80 eastbound entrance ramp. The intersection also includes a slip lane for eastbound vehicles turning northbound within the median, and is YIELD controlled prior to entering Highway 146. The I-80 eastbound ramps are offset by approximately 90', with the exit ramp located south of the entrance ramp. Refer to ***Section H*** for an aerial view of existing intersection geometry.

The proposed interchange modifications include re-alignment of the I-80 eastbound exit ramp to remove the offset between the I-80 exit and entrance ramps at Highway 146, a dedicated southbound left turn lane, and removal of the YIELD controlled, left turn slip lane through the Highway 146 median. Improvements would also include the addition of a raised median to accommodate a future pedestrian/bicyclist trail planned for the east side of the intersection. Refer to ***Section G*** for proposed improvements.

Crash history for the intersection from 2007 through 2011 has been analyzed for trends and safety issues within the current intersection geometry. In the 5 year period, ten crashes have been recorded at

the intersection, resulting in one minor injury, one major injury and one fatality. Out of the ten total crashes, almost 50% involved eastbound vehicles which failed to yield to oncoming northbound traffic. Due to the large skew angle, drivers making this maneuver have limited to no visibility of approaching northbound traffic. This also creates a potential hazard to oncoming southbound vehicles turning left onto the I-80 eastbound entrance ramp, as both vehicles have yield conditions within the median. Drivers making a left turn onto Highway 146 northbound must look for traffic behind them over their right shoulder and may not be focused on approaching southbound vehicles turning left onto I-80 eastbound. Additionally, the yield condition for both south and eastbound left-turning maneuvers in combination with the complex intersection geometry can make it confusing for drivers to know where traffic is coming from and what movements they are to yield to. Refer to ***Section I*** for crash history and officer accident reports.

The proposed improvements will provide users with a traditional, 90 degree intersection geometry, consistent with driver expectations, enhanced sight distance, and aid in gap acceptance decisions. The proposed improvements are expected to result in a safer intersection and reduced number of injury crashes per year.

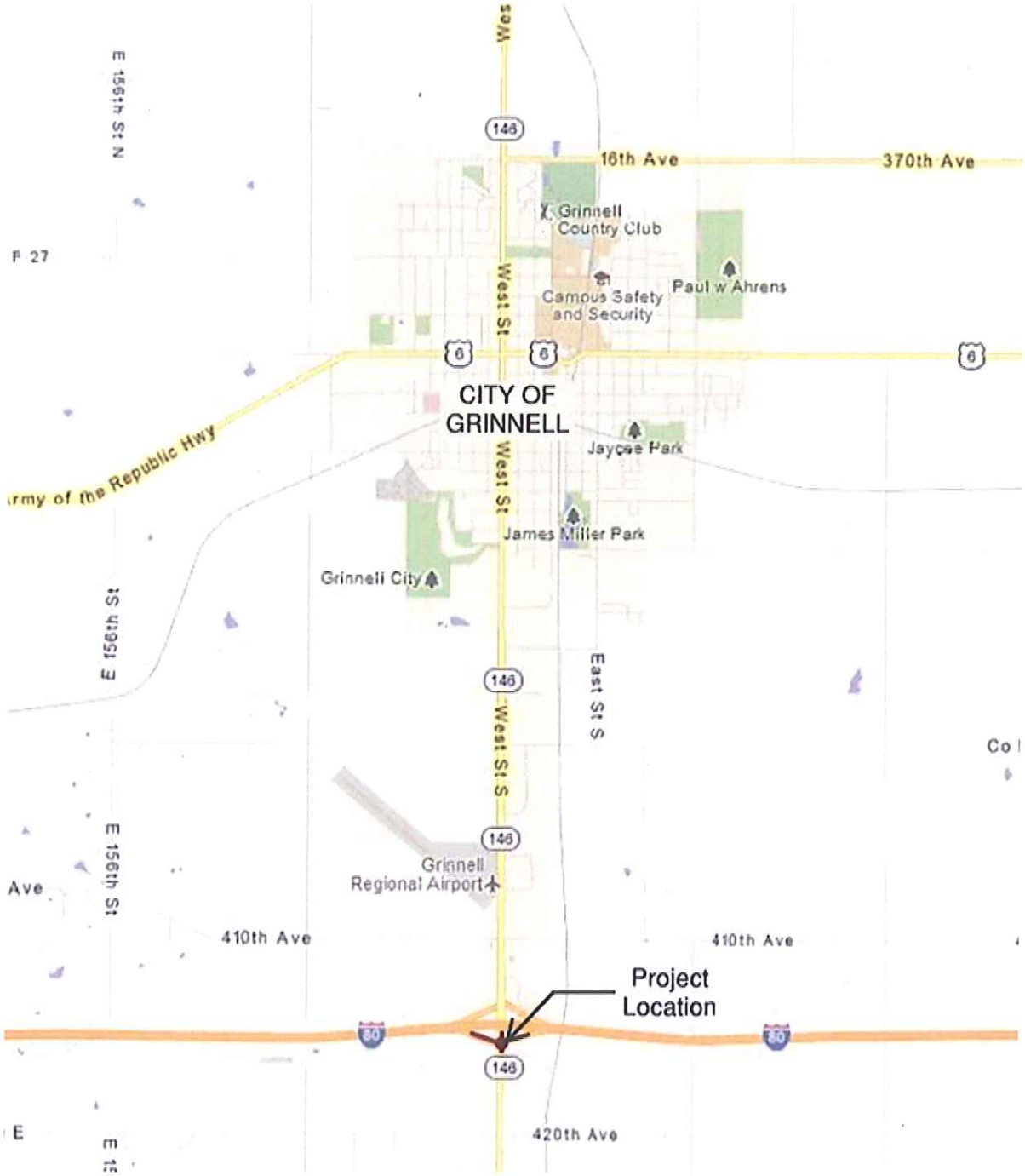
SHIVEHATTERY
ARCHITECTURE + ENGINEERING

CITY OF GRINNELL - I-80 Eastbound Exit/Entrance Ramp and Highway 146
OPNION OF ANTICIPATED CONSTRUCTION COSTS
AUGUST 15, 2012 - DESIGN PHASE

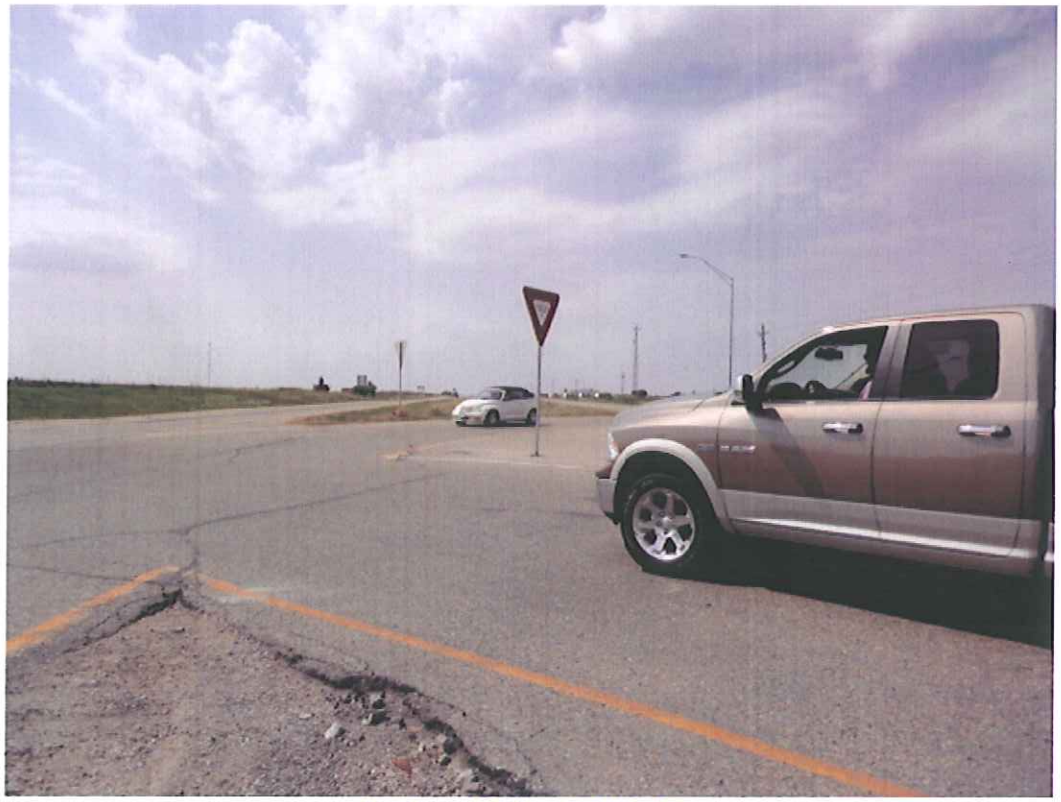
#	ITEM DESCRIPTION	QUANTITY	UNITS		UNIT COST		TOTAL COST
1	Clearing and Grubbing	1	LS	*	$8,000.00	=	$8,000
2	Excavation, Class 10, Roadway and Borrow	960	CY	*	$5.00	=	$4,800
3	Embankment in Place	3,480	CY	*	$14.00	=	$48,720
4	Topsoil, Strip, Salvage and Respread	1,225	CY	*	$12.00	=	$14,700
5	Subgrade Preparation	10	STA	*	$1,150.00	=	$11,500
6	Granular Subbase, 6"	420	TON	*	$32.00	=	$13,440
7	Std/Slip-Form PCC Reinforced Pavement, Class C, Class 3, 9-In.	2,450	SY	*	$47.50	=	$116,375
8	Median PCC 6-In	145	SY	*	$35.00	=	$5,075
9	Temporary Pavement	915	SY	*	$60.00	=	$54,900
10	Granular Shoulders, Type A	285	TON	*	$28.00	=	$7,980
11	Utility Fixture Adjustment	5	EA	*	$400.00	=	$2,000
12	Remove and Reinstall Sign as Per Plan	16	EA	*	$150.00	=	$2,400
13	Reinforced Box Culvert 5ft X 5ft	46	LF	*	$1,500.00	=	$69,000
14	Removal of Pavement	3,165	SY	*	$10.00	=	$31,650
15	Construction Survey	1	LS	*	$3,500.00	=	$3,500
16	Painted Pavement Markings, Waterborne	10	STA	*	$100.00	=	$1,000
17	Traffic Control	1	LS	*	$15,000.00	=	$15,000
18	Mobilization	1	LS	*	$13,000.00	=	$13,000
19	Seeding, Fertilizing and Mulching - Native Grass	1	AC	*	$4,500.00	=	$4,500
20	Silt Fence / Erosion Control	1,500	LF	*	$3.00	=	$4,500
					SUBTOTAL		**$432,040**
					GRAND TOTAL		**$432,040**

Improvements to the I-80 and Highway 146 Intersection which are to be funded through Traffic Safety Improvement Fund will be designed as part of the Highway 146 Corridor Improvement Project. The Highway 146 Corridor Project is a Federally Funded Project currently scheduled for a January 2013 Letting under the "Minor" Project Development Schedule. The schedule proposed for these projects is as follows:

- **August 2012** – Submit for 2013 TSIP Funds
- **August – December** – Proceed with design of all improvements in accordance with the Federal Aid Process for an Iowa DOT Letting
- **December 2012** – TSIP Funds are awarded
- **January 2013** – Highway 146 Corridor Improvements are let in accordance with the Iowa DOT, Federal Aid, Minor Project Schedule
- **Spring 2013** – Construction begins on Highway 146 Corridor Improvement Project – A staged construction will allow funds allocated for TSIP funded elements to happen later in the schedule
- **July 2013** –TSIP funds are awarded for the I-80 and Highway 146 Intersection Improvements
- **November 2013** – Construction complete on TSIP funded portion of I-80 and Highway 146 Improvements


E 156th St N
West St
146
16th Ave
370th Ave
Grinnell Country Club
Camous Safety and Security
Paul w Ahrens
6
CITY OF GRINNELL
Jaycee Park
Army of the Republic Hwy
James Miller Park
Grinnell City
E 156th St
East St S
West St S
Grinnell Regional Airport
410th Ave
Project Location
80
420th Ave

Hwy 146 Looking South



Southbound Slip Lane, Yield Conflict

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View From I-80 Eastbound Exit Ramp Towards Entrance Ramp

View From I-80 Eastbound Exit Ramp Looking North

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View From I-80 Eastbound Exit Ramp Looking South/East

I-80 Eastbound Exit Ramp Looking West

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ARCHITECTURE + ENGINEERING

Eastbound Slip Lane

Hwy 146 looking North

Hwy 146 Northbound Lane

View From I-80 Eastbound Entrance Ramp towards Exit Ramp

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View of Intersection looking North West

Hwy 146 Northbound

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View of Existing Median Looking North

G. Plan View
INTERSTATE 80
INTERSTATE 80
MEDIAN INFILL
10' SHARED USE PATH
I-80 EASTBOUND EXIT RAMP
LEFT TURN LANE
I-80 EASTBOUND ENTRANCE RAMP
RAISED ISLAND
PROPOSED I-80 EXIT RAMP ALIGNMENT
Hwy 146
HIGHWAY 146 PROPOSED IMPROVEMENTS
GRINNELL, IOWA
LEGEND
10' SHARED USE PATH
MEDIAN / ISLAND
PCC PAVING
EXISTING ROW
SCALE IN FEET
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EXISTING SITE GEOMETRY
HWY 146 & I-80
GRINNELL, IOWA
H. Aerial Photo
410TH AVE
LANG CREEK AVE
INTERSTATE 80
HWY 146
HWY 146
HWY 146
INTERSTATE 80
410TH AVE
0
250
500
SCALE IN FEET
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Intersection at I-80 Eastbound Off-Ramp and Highway 146
Crash History 2007 - 2011 Grinnell, Iowa

Source: CMAT Version 4.5.1

Crash Type	Crash Severity					Direction Veh. 1				Direction Veh. 2				Surface				Time of Day	
	Fatal	Major	Minor	POD	Unkn.	N	E	S	W	N	E	S	W	Dry	Wet	Snow	Unknown	Day	Night
Rear-End				1			1				1					1		1	
Angle, Oncoming Left Turn		1		1	1		2	1		2		1		3				3	1
Broadside	1			1	1		3					3		3				3	
Sideswipe, Same Direction				1	1		2			2				2				2	
Non-Colision			1					1						1				1	

Major Cause				
Broadside	Angle, Oncoming Left Turn	Rear-End	Sideswipe, Same Direction	Non-Collision
FTY from Stop Sign	Ran Stop Sign	Excess Speed/Conditions	FTY from Yield Sign	Reckless Driving
FTY from Stop Sign	FTY from Yield Sign		FTY from Yield Sign	
FTY from Stop Sign	FTY from Yield Sign			

Crash History

Interstate 80 Eastbound & Westbound Ramps with Iowa 146

2007 to Preliminary 2012

Table 1. Crash Severity, Interstate 80 Eastbound & Westbound Ramps with Iowa 146

	Crash Severity					Grand Total
	Fatal	Major Injury	Minor Injury	Possible/ Unknown Injury	Property Damage Only	
Eastbound	1	1	1	3	4	10
2007					2	2
2008		1		1		2
2009			1		1	2
2010				1	1	2
2011	1			1		2
Prelim. 2012						
Westbound					6	6
2007					3	3
2008					2	2
2009						
2010						
2011					1	1
Prelim. 2012						
Grand Total	1	1	1	3	10	16

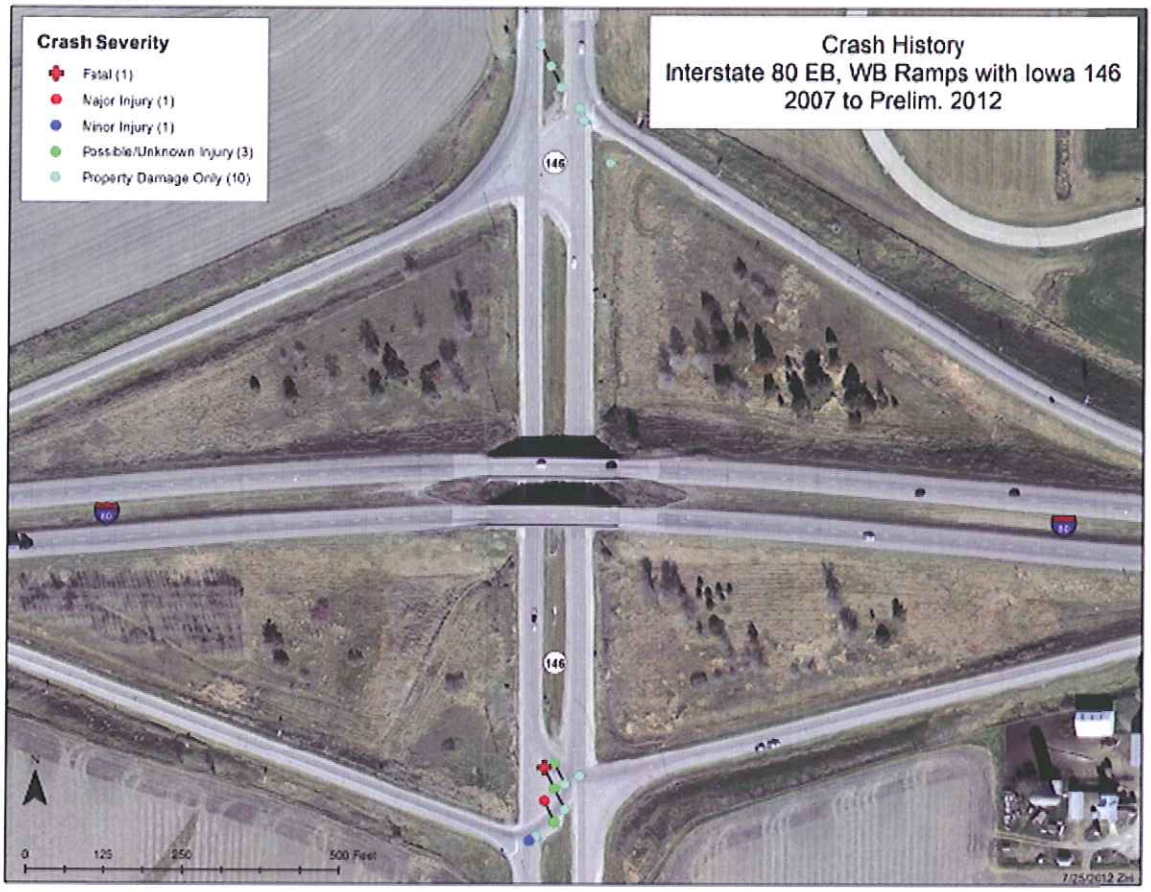


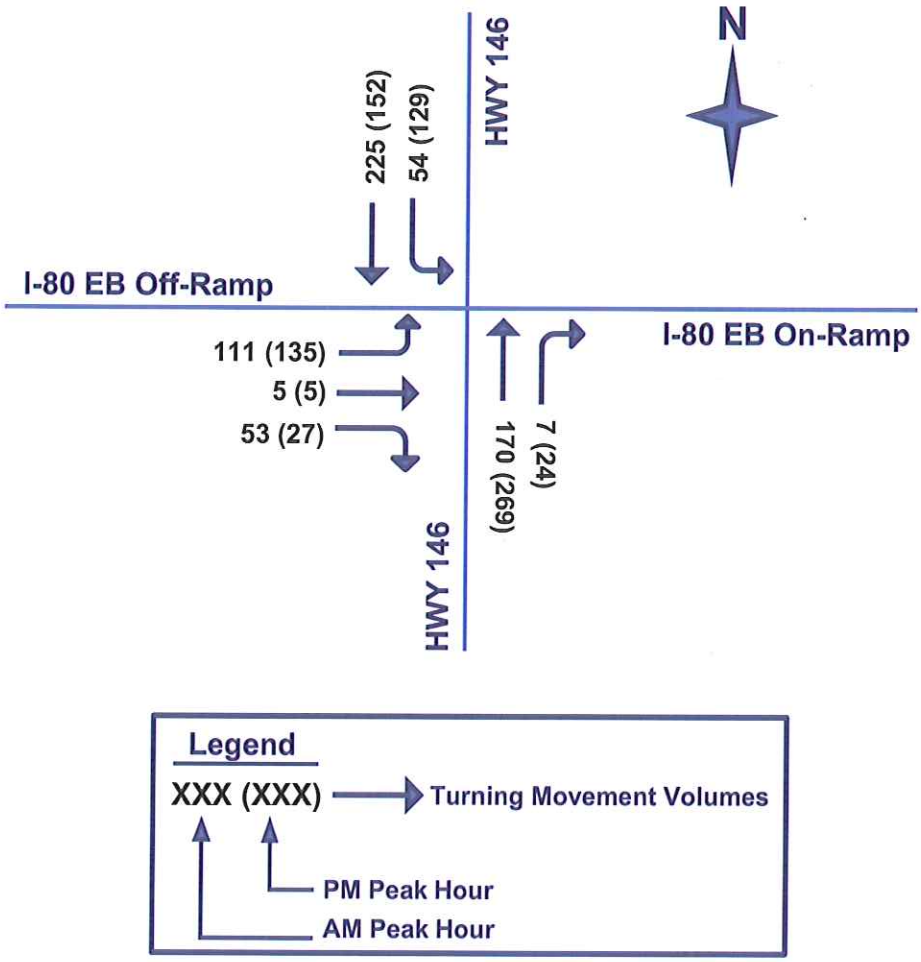
Figure 1. Crash Severity, Interstate 80 Eastbound & Westbound Ramps with Iowa 146

Table 2. Manner of Crash/Collision, Interstate 80 Eastbound & Westbound Ramps with Iowa 146

	Manner of Crash/Collision						Grand Total
	Angle - oncoming left turn	Broadside	Non-collision	Rear-end	Sideswipe - same direction	Not Reported	
Eastbound	3	3	1	1	2		10
2007		1			1		2
2008	1				1		2
2009			1	1			2
2010	1	1					2
2011	1	1					2
Prelim. 2012							
Westbound			1	3	1	1	6
2007			1	1		1	3
2008				1	1		2
2009							
2010							
2011				1			1
Prelim. 2012							
Grand Total	3	3	2	4	3	1	16

Table 3. Major Cause, Interstate 80 Eastbound & Westbound Ramps with Iowa 146

	Major Cause								Grand Total
	Animal	Driving too fast for conditions	Ran Stop Sign	FTYROW: From stop sign	FTYROW: From yield sign	Inattentive/distracted by: Use of phone or other device	Operating vehicle in an erratic/reckless/careless/negligent /aggressive manner	Other improper action	
Eastbound		1	1	3	4		1		10
2007				1	1				2
2008			1		1				2
2009		1					1		2
2010				1	1				2
2011				1	1				2
Prelim. 2012									
Westbound	1					1	2	2	6
2007	1					1		1	3
2008							2		2
2009									
2010									
2011								1	1
Prelim. 2012									
Grand Total	1	1	1	3	4	1	3	2	16


N
HWY 146
225 (152)
54 (129)
I-80 EB Off-Ramp
111 (135)
5 (5)
53 (27)
I-80 EB On-Ramp
170 (269)
7 (24)
HWY 146
Legend
XXX (XXX)
Turning Movement Volumes
PM Peak Hour
AM Peak Hour

Rev. 7/10

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Poweshiek Prepared by: David R. Fliehler Date Prepared: Aug 8, 2012

Intersection: Highway 146 and I-80 exit/entrance ramps

Improvement

Proposed Improvement(s): re-alignment of the I-80 eastbound exit ramp, dedicated southbound left turn lane, removal of the Yield control in the Highway 146 median, and a raised island n the east side of the intersectior

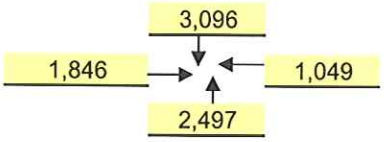
$ 432,040	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	78	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 432,040	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT May 27,2010 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,098,120 Current Annual Entering Veh., **AEV** = DEV * 365

10,151 veh / day, Final Year DEV, **FDEV**

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

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

8,488 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2007 First full year --> 2011 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

1	Fatal Crashes		Fatalities @	$3,500,000	$ -
		2	Major Injuries @	$240,000	$ 480,000
5	Injury Crashes	1	Minor Injuries @	$48,000	$ 48,000
		3	Possible Injuries @	$25,000	$ 75,000
4	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 148,650
10	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 751,650

2.00	Current Crashes / Year, **AA** = TA / T	0.65	Crashes / MEV, Crash Rate, **CR**
$ 75,165	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
32.7	Total Expected Crashes, **TECR** = CR x TMEV	$ 1,406,836	Present Value of Avoided Crashes, **BENEFIT**
1.56	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 117,257	Crash Costs Avoided in First Year, AAR x AVC		
25.5	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 = $1,406,836 : $432,040 = **3.26** : 1

B/C ANALYSIS INSTRUCTIONS

revised 7/2010
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.

Crash Reduction Factors
Crash Reduction Factors should be obtained from the "Crash Modification Factors 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.

Start with a conservative (low) CRF value. If your benefit/cost ratio is greater than 1.8 you are finished. If the benefit/cost ratio is lower, try less conservative values of CRF. You will have to decide how realistic the CRF is for your particular location and situation.

If more than one safety improvement will be made, the cummulative 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:	48	58			
Cummulative CRF =	78.16				

If the improvements have different service lives, the shortest value must be used.

CounterMeasure	CRF
Intersection Sight Distance	48
Add Left Turn Lane	58

Iowa Department of Transportation
Request for Traffic Safety Funds

GENERAL INFORMATION

Location/Title of Project: Upgrade Signs / Add Beacons at the intersection of NE 112th Street and IA Highway 163

Applicant: County of POLK

Contact Person: Kurt D. Bailey, P.E.

Title: County Engineer

Complete Mailing Address: 5885 N.E. 14th Street
Des Moines, IA 50313

Daytime Telephone: (515) 286-3705 ***Fax Number:*** (515) 286-3437

If more than one highway authority is involved in this project, please indicate the contact person(s), mailing address(es), and telephone number(s) of the additional highway authority.

Mr. Tony Gustafson
Asst. District 1 Engineer
Iowa Department of Transportation
1020 S. 4th Street, Ames, IA 50010
515-239-1430
tony.gustafson@dot.iowa.gov

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Nature of Application:

- ✓ Site Specific
- ✓ **Traffic Control Device**
- Safety Study

Funding:

Total Cost of the Proposed Project	$38,000
Safety Funds Requested for the Project	$38,000

CERTIFICATION - NE 112 Street and IA Hwy 163 Application

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 Polk County. I understand the attached resolution binds Polk County to assume responsibility if any additional funds are committed, and to ensure maintenance of any new or improved secondary roads.

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

Representing the **COUNTY OF POLK**

Signed: _____ 8/7/12
Signature in Ink — Date Signed
Angela Connolly, Chair
Polk County Board of Supervisors

Attested: _____ 8/7/12
Signature in Ink — Date Signed
Jamie Fitzgerald, Polk County Auditor

Res. No. 113-12
August 7, 2012

RESOLUTION

Moved by Hockensmith Seconded by Mauro 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 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 intersection of NE 112th Street and Iowa Highway 163; and

WHEREAS, the Polk County Public Works Department recommends that an application be submitted to the Iowa Department of Transportation for possible Traffic Safety Funding for the above referenced intersection improvement project.

NOW, THEREFORE, BE IT RESOLVED that the Polk County Board of Supervisors endorse this intersection improvement project and will authorize maintenance of the improvements within the County's jurisdiction after construction is completed; and

BE IT FURTHER RESOLVED that the Chairperson of the Polk County Board of Supervisors be authorized to sign said funding application and direct the Polk County Public Works Department to submit the application to the Iowa Department of Transportation for possible Traffic Safety Improvement Funding.

POLK COUNTY BOARD OF SUPERVISORS:

Angela Connolly
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Request: $38,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

AUG - 7 2012

ALLOWED BY VOTE OF BOARD

Angela Connolly
CHAIRPERSON

E.J. Giovannetti	Yea	Nay
Robert Brownell	Yea	Nay
John F. Mauro	Yea	Nay
Tom Hockensmith	Yea	Nay
Angela Connolly	Yea	Nay

Yea 5 Nay 0
Above tabulation made by BD

#17

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 forty (40) intersections that have experienced a history of accidents over the last 10 years. One of the intersections we reviewed was the intersection of NE 112th Street and IA Highway 163. Although some roadway improvements were made at this intersection in 2008, we continue to see accidents occur at this intersection. As shown in Section K, a majority of the accidents involved a driver either running a stop sign or failing to yield to through traffic on Hwy 163.

This intersection is located one mile west of the Polk County line, 3 miles south of Mitchellville, and 4 miles east of Pleasant Hill. This section of Hwy 163 is a four-lane roadway with a Principal Arterial federal functional classification, and a posted speed limit of 65 mph. This route serves not only as a significant freight corridor to the Des Moines Metro area, it also serves as a major commuter route for residents in Jasper and Marion Counties.

NE 112th Street is a 24' wide HMA roadway with the stop conditions at Hwy 163. It is classified as a Major Collector north of Hwy 163, and a Minor Arterial south of Hwy 163 (old Hwy 316). NE 112th Street is the main access road to Runnells and Mitchellville, as well as a major route to Lake Red Rock and its associated recreational areas, as well as the cities of Pleasantville and Knoxville.

Even though there appears to plenty of sight distance from the stop condition, motorists are still failing to either see or acknowledge the stop condition or on-coming traffic. This behavior seems to occur frequently at on-grade intersections with 4-lane expressways. With a posted speed limit of 65 mph, it is also likely that the severity of future accidents will be high.

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 flashing beacons and Intersection warning signs on Hwy 163 and red flashing beacons on the NE 112th Street stop signs to give additional warning to motorists, especially those on Hwy 163, that traffic may be entering Hwy 163 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 13:1.

The Polk County Public Works Department thanks the Iowa Department of Transportation for their consideration of this project.

C

ENGINEER'S ESTIMATE NE 112th Street and IA Highway 163 Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Removal and Salvage Sign As Per Plan	EA	2.00	$ 45.00	$ 90.00
2	TYPE A SIGNS, SHEET ALLUMINUM (New Warning and Stop signs)	SF	60.00	$ 30.00	$ 1,800.00
3	Traffic Control	LS	1.00	$ 750.00	$ 750.00
4	FLAGGERS	EA	3.00	$ 320.00	$ 960.00
5	Mobilization	LS	1.00	$ 1,400.00	$ 1,400.00
6	Continuous Operating, Single Head, Solar Beacon on Warning Sign, RED	EA	2.00	$ 5,500.00	$ 11,000.00
7	Continuous Operating, Single Head, Solar Beacon on Warning Sign, YELLOW	EA	4.00	$ 5,500.00	$ 22,000.00
				TOTAL ESTIMATED CONSTRUCTION COST	**$ 38,000.00**

D

PROJECT TIME SCHEDULE

Proposed N.E. 112th Street /Highway 163 Advanced Signing with Solar Powered Beacons

IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

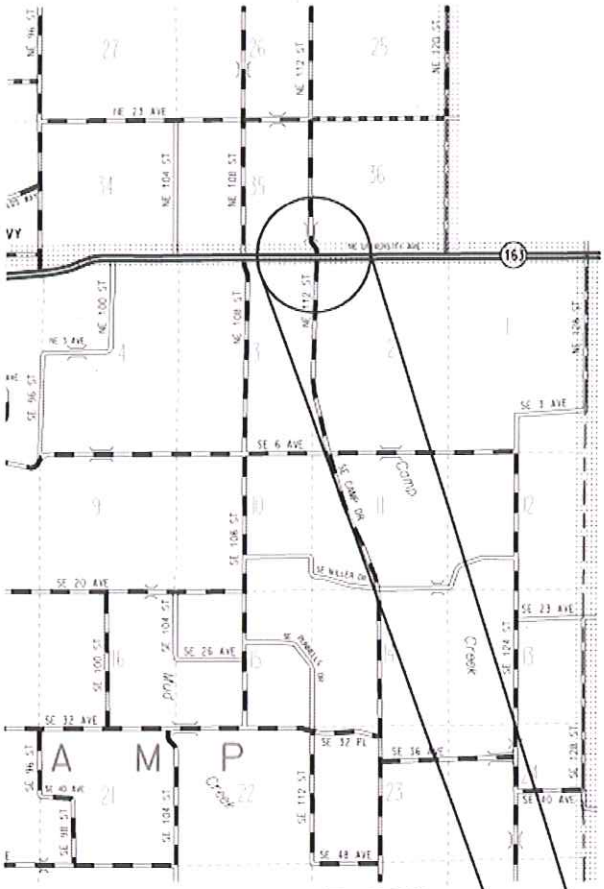
Polk County, Iowa

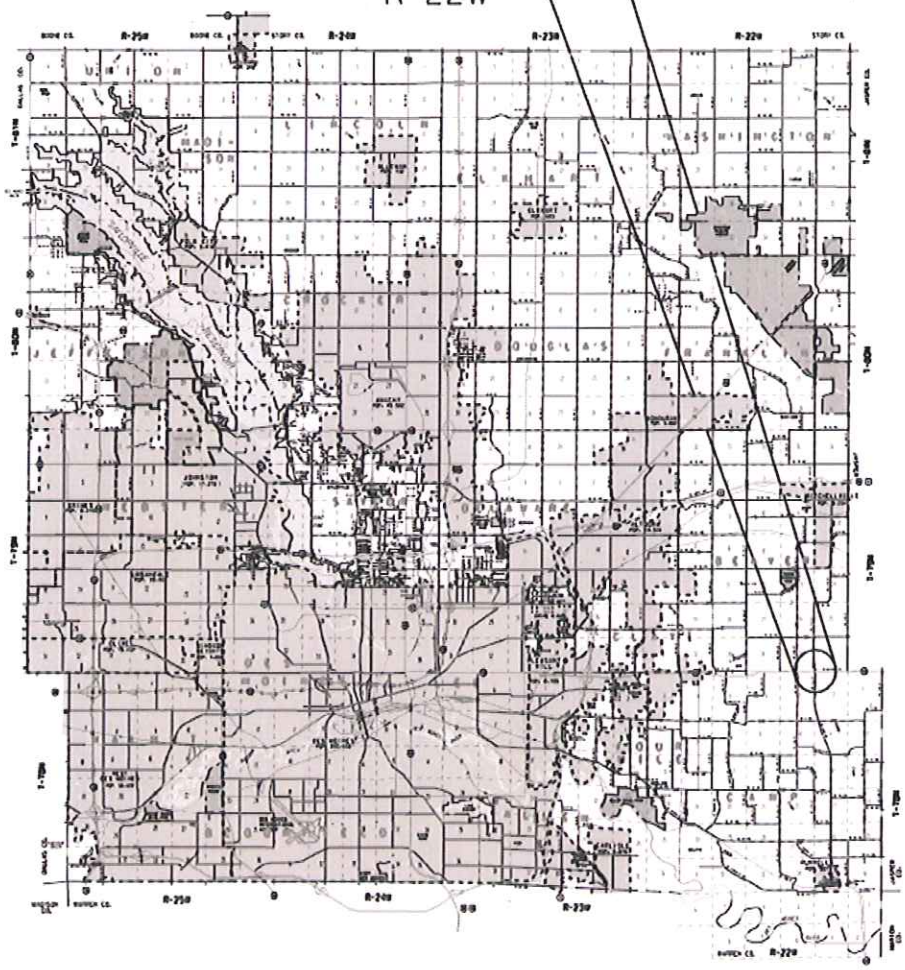
PROJECT PHASE	2013											
(YEAR 2013)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement												
Project Design and Project Plan Approvals												
Iowa DOT Bid Letting												
Project Construction												
Project Closeout												

E

NORTH

NO SCALE





FILE NAME AND DATE
PLOTTED BY

F

Figure 1 Eastbound IA Hwy 163 Approaching Intersection.

Figure 2 Westbound IA Hwy 163 Approaching Intersection.

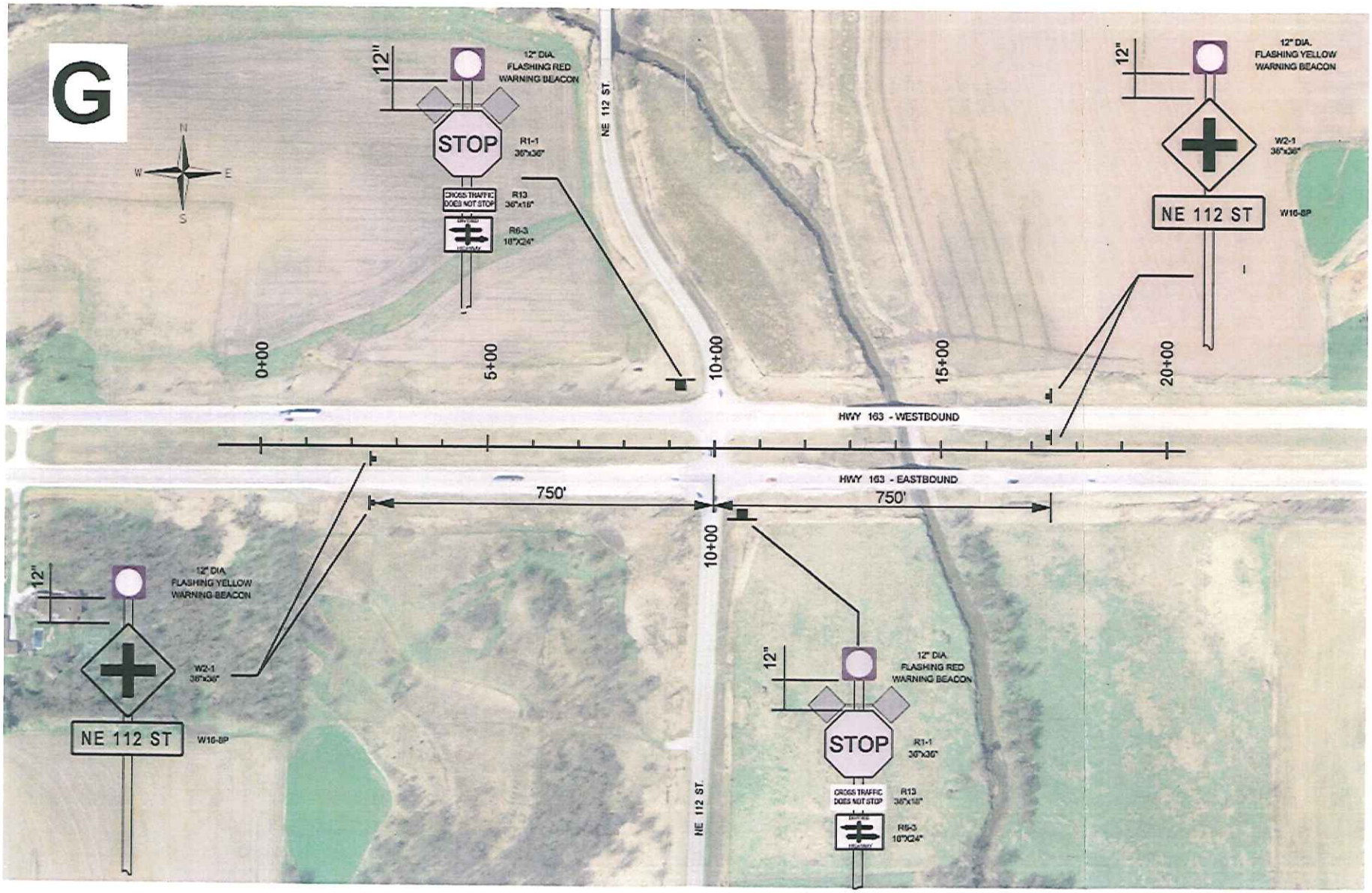
Figure 3 Northbound NE 112 Street Approaching Intersection.

Figure 4 Northbound NE 112 Street Approaching Intersection.

Figure 5 Looking West from Northbound Stop Condition- NE 112 Street.

Figure 6 Southbound NE 112 Street Approaching Intersection

Figure 7 Southbound NE 112 Street Approaching Intersection

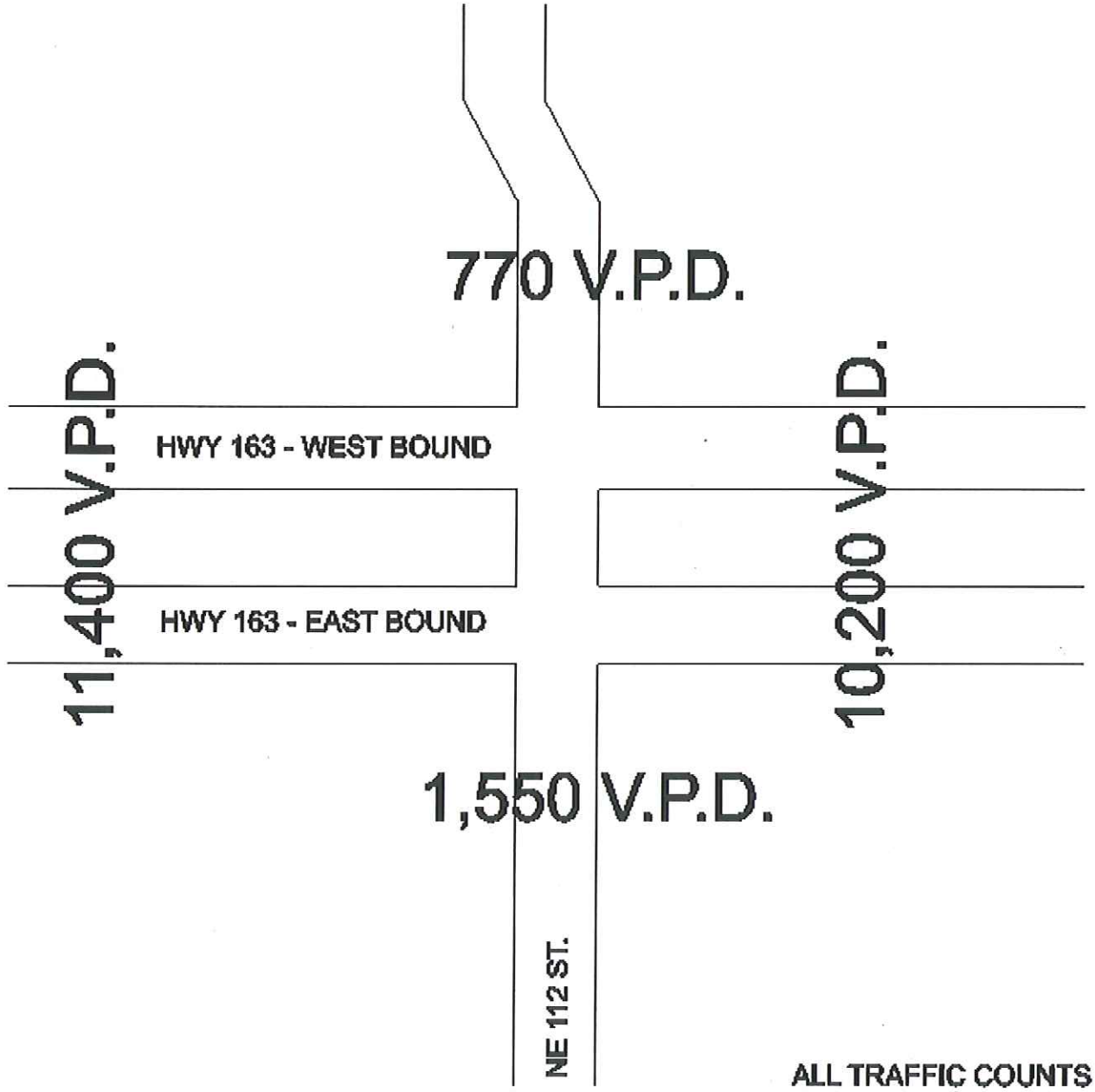

G
N
W
E
S
12"
12" DIA.
FLASHING RED
WARNING BEACON
STOP
R1-1
36"x36"
CROSS TRAFFIC
DOES NOT STOP
R13
36"x18"
R6-3
18"X24"
NE 112 ST.
12"
12" DIA.
FLASHING YELLOW
WARNING BEACON
W2-1
36"x36"
NE 112 ST
W16-8P
0+00
5+00
10+00
15+00
20+00
HWY 163 - WESTBOUND
HWY 163 - EASTBOUND
750'
750'
10+00
12"
12" DIA.
FLASHING YELLOW
WARNING BEACON
W2-1
36"x36"
NE 112 ST
W16-8P
12"
12" DIA.
FLASHING RED
WARNING BEACON
STOP
R1-1
36"x36"
CROSS TRAFFIC
DOES NOT STOP
R13
36"x18"
R6-3
18"X24"
NE 112 ST.

TRAFFIC VOLUME INFORMATION
NE 112 ST. AT HWY 163
NODE : 24-0182

H

NORTH

NO SCALE



ALL TRAFFIC COUNTS
I.D.O.T. 2008 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

TRAFFIC COUNTS AT INTERSECTION OF NE 112 ST. AND HWY 163

FILE NAME AND DATE
PLOTTED BY

J

H

K I

ACCIDENT HISTORY - NE 112 Street and Hwy 163

Acc. No.	Node No.	Date of Accident	Type of Accident		Property Damage	Accident Description	Time of Accident	ROAD/ WEATHER Cond.	LIGHT CONDITIONS	AGE OF DRIVER AT FAULT	AGE OF OTHER DRIVER	Direction of Veh. At fault	Direction of Other Veh.
1	34-8381	10/9/2007	PDO		$ 1,200	FTY from Stop Sign	7:25 AM	Dry, Clear	Daylight	75	49	SB	WB
2	34-8381	2/13/2008	PI	1 possible	$ 1,000	Lost Control due to Vehicle Running Stop Sign	1:35 PM	Dry, Clear	Daylight	UKN	20	NB	EB
3	34-8381	7/31/2008	PDO		$ 12,000	Failure to stop in a safe and sure distance	3:34 PM	Dry, Clear	Daylight	20	25	EB	EB
4	34-8381	8/10/2008	PDO		$ 6,000	FTY FROM STOP	9:37 PM	Dry, Clear	Dark- lighted	37	37	NB	WB
5	34-8381	8/11/2008	PDO		$ 1,400	REAR-END- Left Turn	8:25 PM	Dry, Clear	Daylight	26	28	NB	NB
6	34-8381	8/12/2008	PI	1 minor	$ 17,500	FTY FROM STOP	7:26 AM	Dry, Clear	Daylight	36	52	NB	EB
7	34-8381	9/27/2008	PI	1 possible	$ 6,000	FTY FROM STOP	11:20 AM	Dry, Clear	Daylight	17	34	NB	EB
8	34-8381	10/5/2008	PDO		$ 11,000	FTY FROM STOP	10:45 AM	Dry, Clear	Daylight	27	21	SB	EB
9	34-8381	10/9/2008	PI	1 minor	$ 13,000	FTY FROM STOP	7:53 AM	Dry, Clear	Daylight	43	46	NB	EB
10	34-8381	10/15/2008	PI	1 possible	$ 5,000	FTY FROM STOP	7:37 PM	Dry, Clear	Dark- lighted	29	72	SB	WB
11	34-8381	1/22/2009	PI	1 minor	$ 10,000	FTY FROM STOP	12:21 PM	Dry, Clear	Daylight	70	73	NB	EB
12	34-8381	4/28/2009	PDO		$ 8,000	FTY FROM STOP	9:45 AM	Dry, Clear	Daylight	85	33	SB	WB
13	34-8381	8/31/2010	PDO		$ 3,000	FTY FROM STOP	4:40 PM	Dry, Clear	Daylight	87	29	NB	EB
14	34-8381	1/26/2011	PDO		$ 5,500	RAN STOP SIGN	9:25 AM	Wet, Cloudy	Daylight	22	32	NB	EB
15	34-8381	4/23/2012	PI	1 minor	$ 8,000	FTY FROM STOP	8:43 PM	Dry, Clear	Dark- lighted	21	65	NB	EB
16	34-8381	6/2/2012	PI	2 - Major 1 - Minor 1 - Poss	$ 11,000	FTY FROM STOP	1:44 PM	Dry, Clear	Daylight	65	49	NB	EB
16		**Total Accidents**		**0 fatality 2 major 5 minor 4 poss**	**$ 119,600**	**Total Property Damage**							

% of Accidents that were FTY or RAN Stop Sign	**88%**
% of FTY or RAN Stop Sign where NB was at fault	**71%**
% of FTY or RAN Stop Sign where EB was hit	**71%**
% of FTY or RAN Stop Sign w/Driver Age under 25 or over 65	**71%**
% of FTY or RAN Stop Sign w/Driver at Fault under 25 or over 65	**57%**

SUMMARY

0	Fatalities @	$ 3,500,000		$ -
2	Major @	$ 240,000		$ 480,000
5	Minor @	$ 48,000		$ 240,000
4	Possible @	$ 25,000		$ 100,000
	Property Damage			$ 119,600

TOTAL DAMAGE $ 939,600

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

L

County: Polk Prepared by: Kurt D. Bailey Date Prepared: Jul 26, 2012

Intersection: NE 112th St. and IA Hwy 163

Improvement

Proposed Improvement(s): Improve Signing and install Flashing Beacons above Stop signs and on Intersection warning signs.

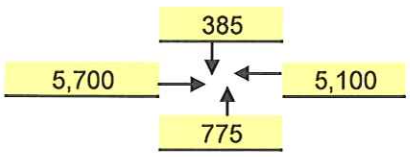
$ 38,000	Estimated Improvement Cost, **EC**	8	Est. Improvement Life, years, **Y**
$ 1,000	Other Annual Cost (after initial year), **AC**	52	Crash Reduction Factor (integer), **CRF**
$ 6,733	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 44,733	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: 2008 DOT Counts 2008 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,365,400 Current Annual Entering Veh., **AEV** = DEV * 365

14,013 veh / day, Final Year DEV, **FDEV**

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

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

11,960 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2007 First full year --> 2011 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of Dec. 2007

0	Fatal Crashes	0	Fatalities @	$3,500,000	$	-
		2	Major Injuries @	$240,000	$	480,000
8	Injury Crashes	5	Minor Injuries @	$48,000	$	240,000
		4	Possible Injuries @	$25,000	$	100,000
8	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	119,600
16	Total Crashes, **TA**		Total $ Loss, **LOSS**		$	939,600

2.91	Current Crashes / Year, **AA** = TA / T	**0.67**	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 58,725	Cost per Crash, **AVC** = LOSS / TA		
25.0	Total Expected Crashes, **TECR** = CR x TMEV	**$ 639,078**	Present Value of Avoided Crashes, **BENEFIT**
1.51	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 88,835	Crash Costs Avoided in First Year, AAR x AVC		
13.0	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 = $639,078 : $44,733 = **14.29** : 1

A

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Dysart Rd. fr 0.25 mi So. of Washburn Rd. to Orange Rd.

Applicant: Black Hawk County

Contact Person: Lynn Kloberdanz Title: Engineering Technician

Complete Mailing Address: 316 E 5th St. Rm. 211
Waterloo, Iowa 50703

Phone: 319-833-3008 (Area Code) E-Mail: lkloberdanz@co.black-hawk.ia.us

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 1,391,740

Safety Funds Requested $ 500,000

A.

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the County of Black Hawk

Signed: John Miller 8-14-12

Signature Date Signed

John Miller, Chair, Board of Supervisors

Typed Name

Attest:

Signature Date Signed

Grant Veeder, County Auditor

Typed Name

Dysart Rd. V37 Safety Improvement Project

B.

From 0.25 mile South of Washburn Rd.
to Orange Rd.

A Safety Improvement project is planned for 1.25 miles of Dysart Rd. (V37) from 0.25 mile south of Washburn Rd. to Orange Rd., which is also the Waterloo Corporate Limit. The speed limit throughout the road segment is 55 mph. The Average Annual Daily Traffic (AADT) for the first 0.25 mile, from D35 to D38, is 1550 and the next mile from D38 to the end of the project is 1900 AADT.

The BH County Landfill is located 1.5 miles west of Dysart Rd. on D38. A Basic Materials rock quarry is located four (4) miles south of this project on Dysart Rd. which generates heavy truck traffic.

Manual traffic counts were taken in early June 2012 by county personnel at the intersections of Dysart Rd. with both Washburn Rd. (D38) and Schrock Rd. (D35) that include turning movements and 15-minute interval counts. The truck counts varied from 226 AADT(15%) between D35 and D38 to 195 AADT (11.9%) north of D38.

The asphalt-paved road is 22 feet wide with granular shoulders four feet wide. The road was originally graded for paving in the early 1960s and surfaced in 1964. A three (3) inch asphalt overlay was placed in 1973. In 1999, surface milling was performed to level longitudinal ruts and a two (2) inch asphalt overlay was placed.

The north-bound lane, which carries loaded trucks from the quarry, has longitudinal ruts that vary from 0.5 to 2.0 inches deep. The south-bound lane has less rutting, but has center-lane cracking and some areas of pavement failure.

The 10-year crash total for this 1.25 mile road segment is 19 crashes, including 1 fatal, 1 major injury and 8 with minor or possible injuries. Of the 19, one was attributed to an animal, five to driving too fast for conditions, five to swerving/evasive action, three to running off the road and four to running or failing to yield from a stop sign. Twelve (12) or 63% of the crashes occurred during snow, ice, slush or wet conditions.

The severe rutting on this road may have contributed to the high percentage of crashes that occurred during snow, ice, slush or wet conditions since the ruts prevent water from draining from the roadway and also inhibit snow and ice removal efforts.

Black Hawk County proposes to improve this road by milling approx. five-six (5-6) inches of asphalt and overlaying with eight (8) inches of P.C. concrete. The improvements will also include two (2) feet of PCC paved shoulder and adding a south to west-bound turning lane at the intersection with Washburn Rd. (D38).

These improvements will improve surface friction, prevent rutting, prevent shoulder edge rutting and provide two additional feet of hard-surfaced recovery area for swerving vehicles to regain control. In addition, the turn lane at D38 will take the high volume of trucks slowing to turn west (to the landfill) at that location out of the south-bound lane.

C.

C.

Dysart Rd. Safety Improvements - Cost Estimate

0.25 mi south of Washburn Rd. to Orange Rd. (1.25 miles)

	Amount
Add turn lane at Washburn Rd. (D38)	$800,000
Scarification	$24,000
PCC, 8" depth x 22' width	$403,349
PCC, 8" depth x 2' wide paved shoulder (x2)	$66,991
Excavation, Class 13, Widening	$10,000
Shoulder Rock	$10,000
Driveways	$5,000
Pavement Markings	$2,400
Traffic Control	$20,000
Mobilization	$50,000
	$1,391,740

Funding

Safety Funds	500,000
Farm-to-Market	891,740
	$1,391,740

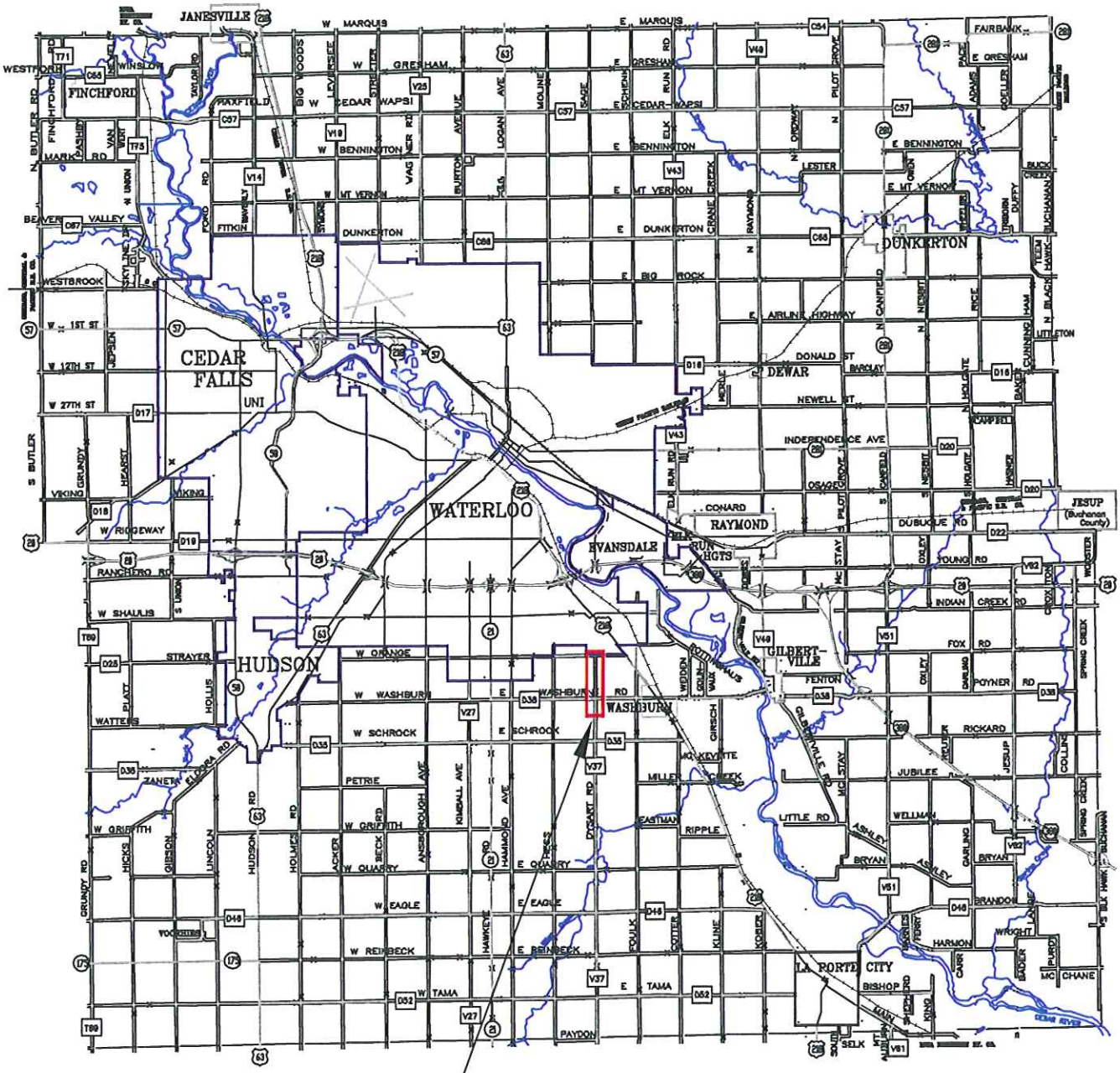
Dysart Rd. V37 Safety Improvement Project D.

From 0.25 mile South of Washburn Rd.
to Orange Rd.

The Safety Improvement project for 1.25 miles of Dysart Rd. (V37) from 0.25 mile south of Washburn Rd. to Orange Rd. will be designed during calendar year 2013 for a Spring 2014 letting with construction to take place from May to October 2014.

Project Completion Date will be no later than **November 2014**.

BLACK HAWK COUNTY, IOWA



Dysart Rd. S-bound lane rutting ¼ mile N. of Washburn Rd.

F.

Dysart Rd. rutting just South of Washburn Rd.

Dysart Rd. rut – Close-up

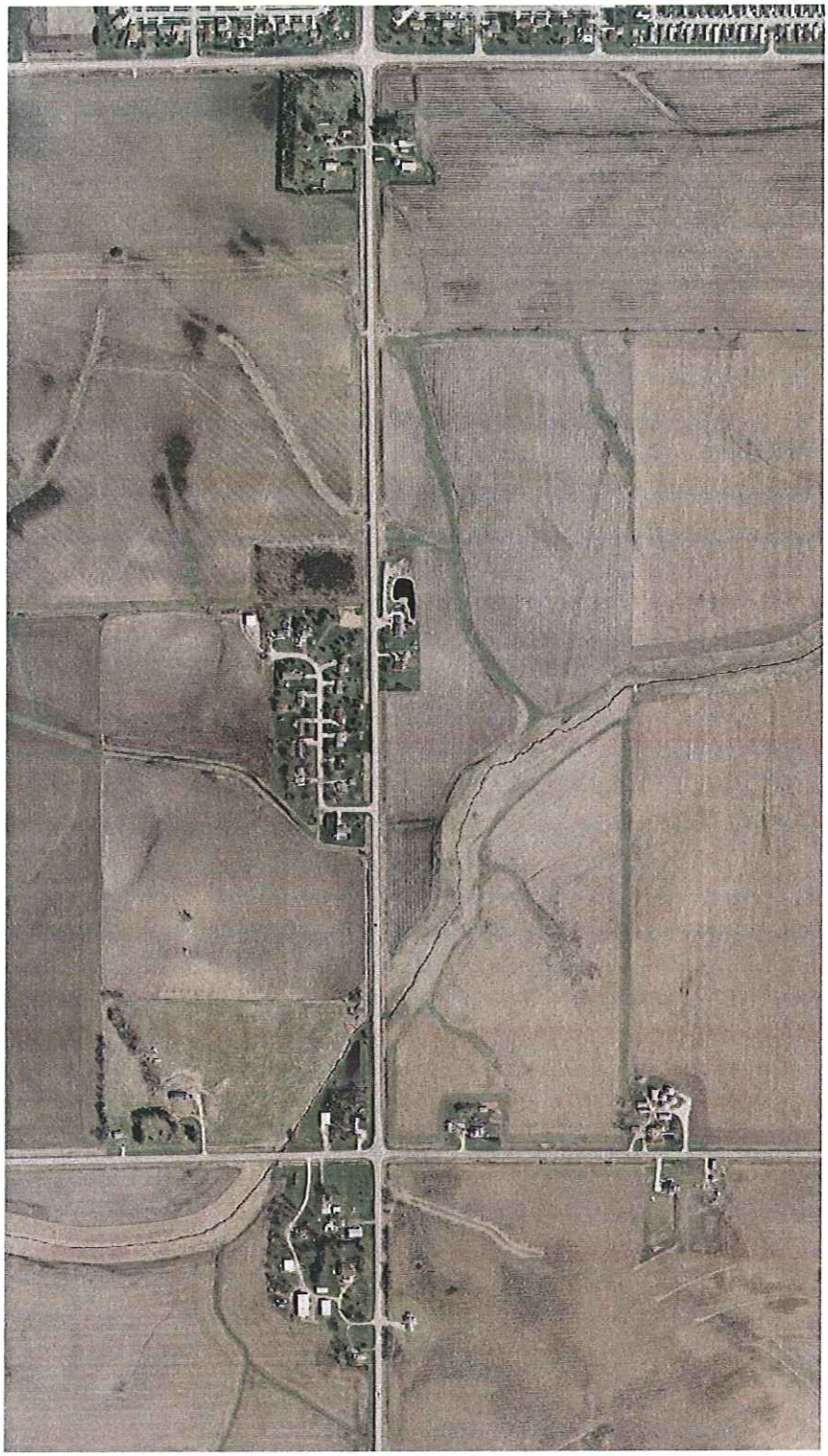
Dysart Rd. V37 Safety Improvement Project G.

The existing pavement is 22 feet wide. Two feet of the existing 4-ft. shoulders will be paved.

The project will require additional right of way on the east side of Dysart Rd. in order to add the south-bound turn lane at the Washburn Rd. intersection. The plans have not been developed to the point of defining specific right of way needs, although the close proximity of the residential property northwest of the Washburn Rd. intersection will require a change in the horizontal alignment and adding right of way on the east side of Dysart Rd. at that location.

A preliminary plan for the right of way needs at the Washburn Rd. intersection could be submitted within one week, if required.

H.



Orange Rd.

Washburn Rd. D38

J.

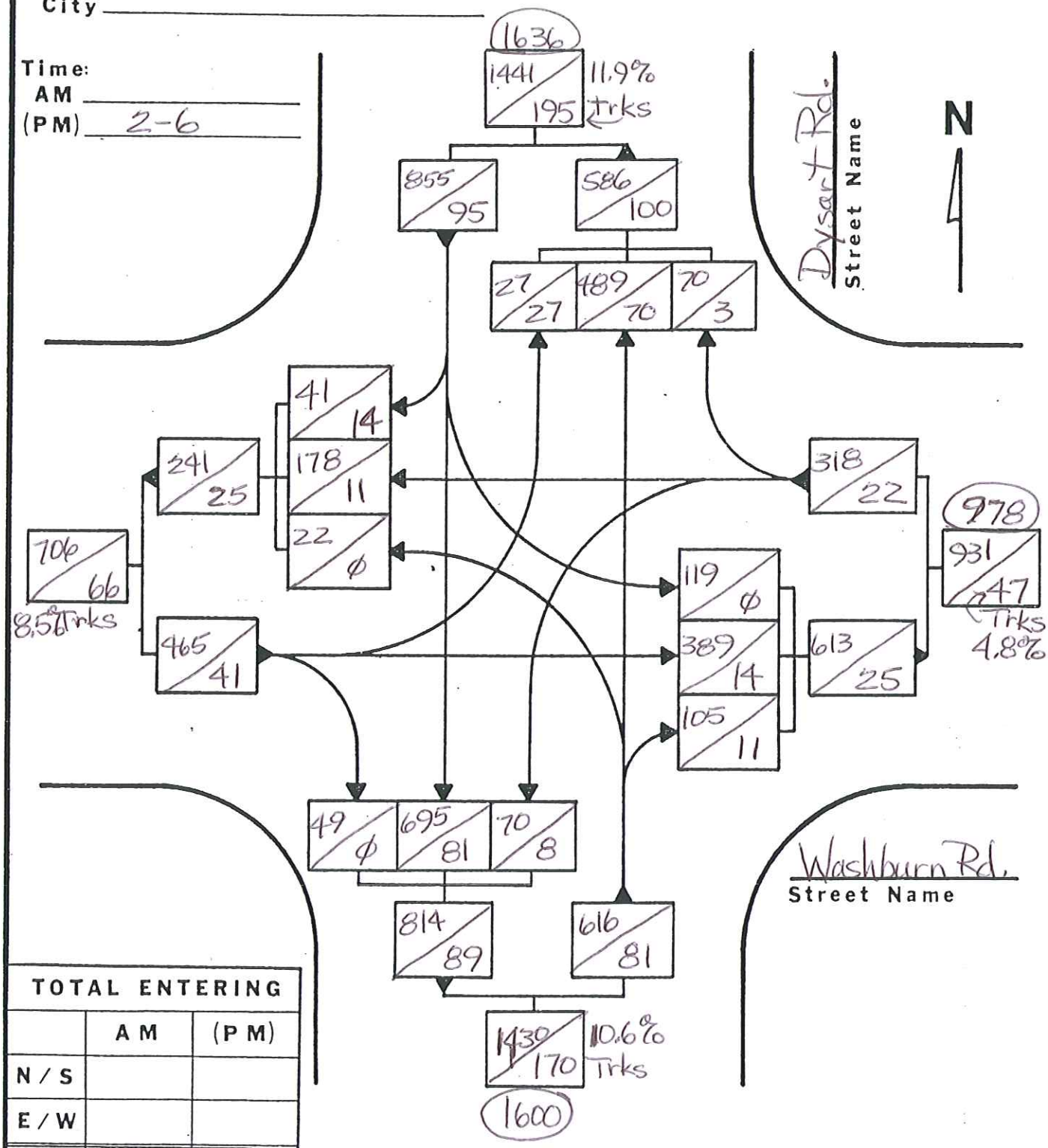
GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

Observer Corina Lickness Date June 6, 2012 Day Wed.

Intersection of Dysart Rd (V37) and Washburn Rd. (D38)

City

Time:
AM
(PM) 2-6



TOTAL ENTERING		
	AM	(PM)
N / S		
E / W		
Total		

3301RV

J.

TURNING MOVEMENT FORM

Form 202-G
T.I., 3-83

TRANSPORTATION INVENTORY

Iowa Department of Transportation

NORTH

STATION NO. _____ DATE _____ COUNTER _____

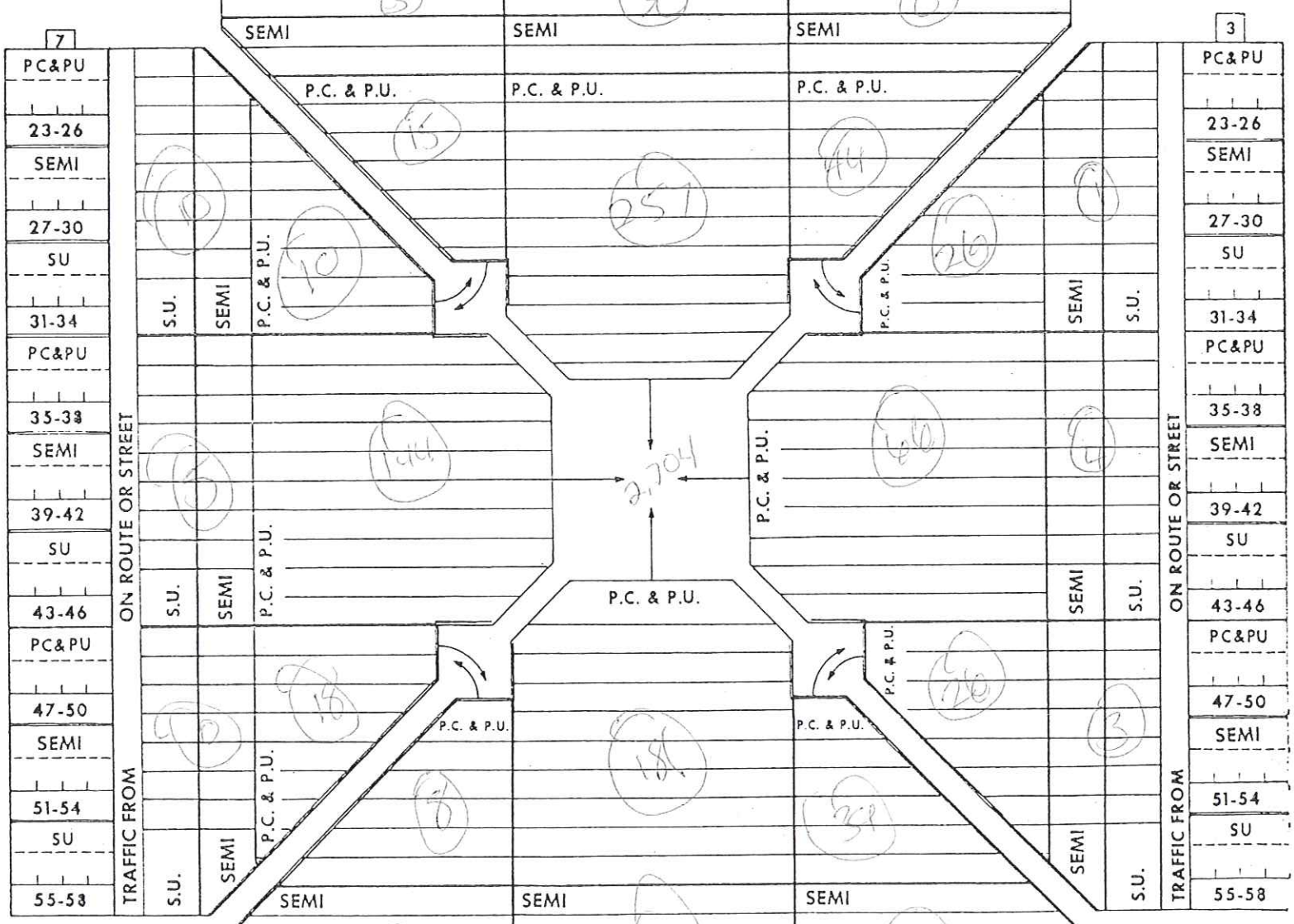
HOUR _____ DAY _____ WEATHER _____

REMARKS DuSart Totals

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET



5								
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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J.

TURNING MOVEMENT FORM

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 2:00 - 2:15 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd N/S

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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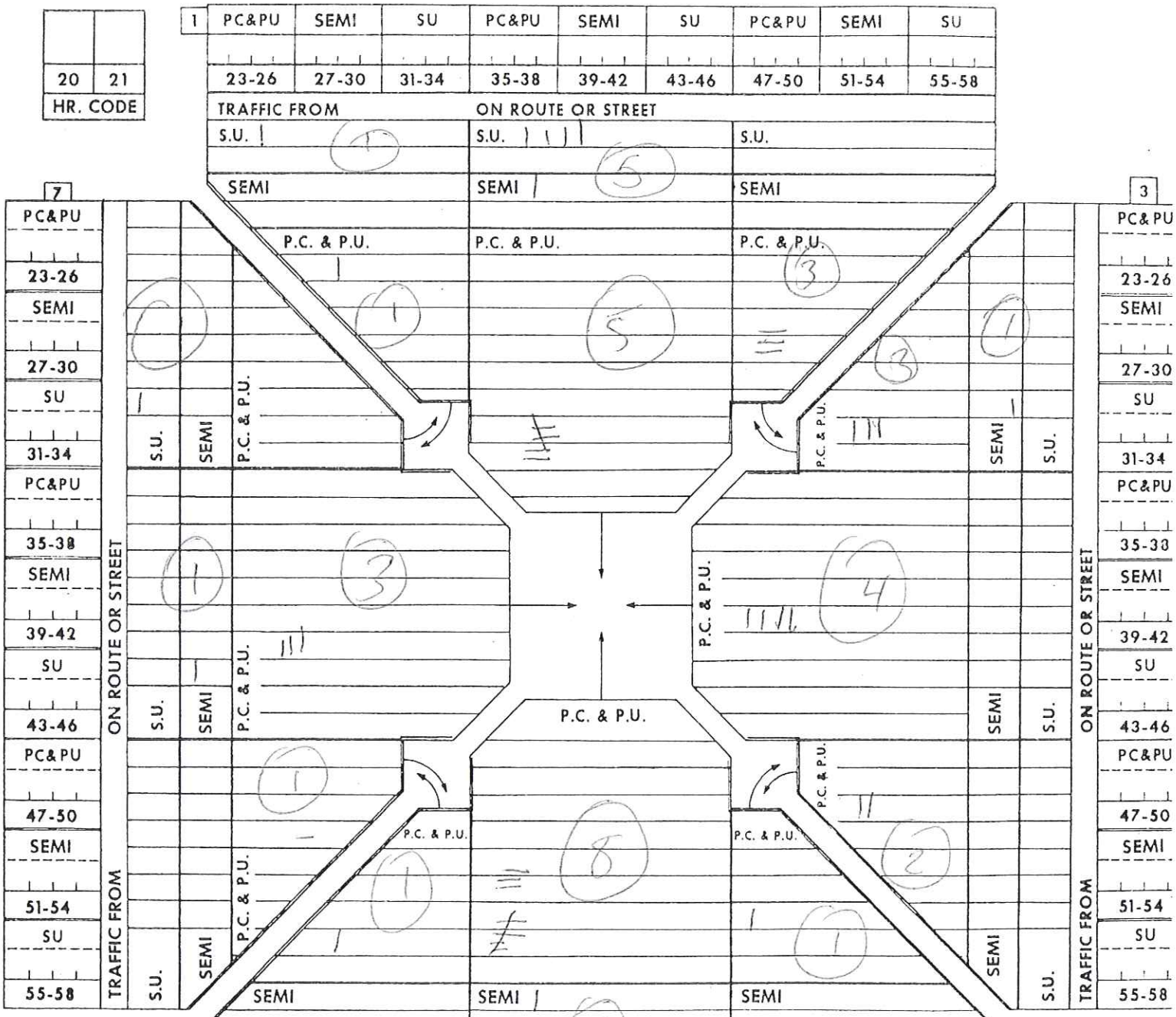
TRAFFIC FROM ON ROUTE OR STREET



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	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

TRAFFIC FROM ON ROUTE OR STREET

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

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Iowa Department of Transportation
TRANSPORTATION INVENTORY

NORTH

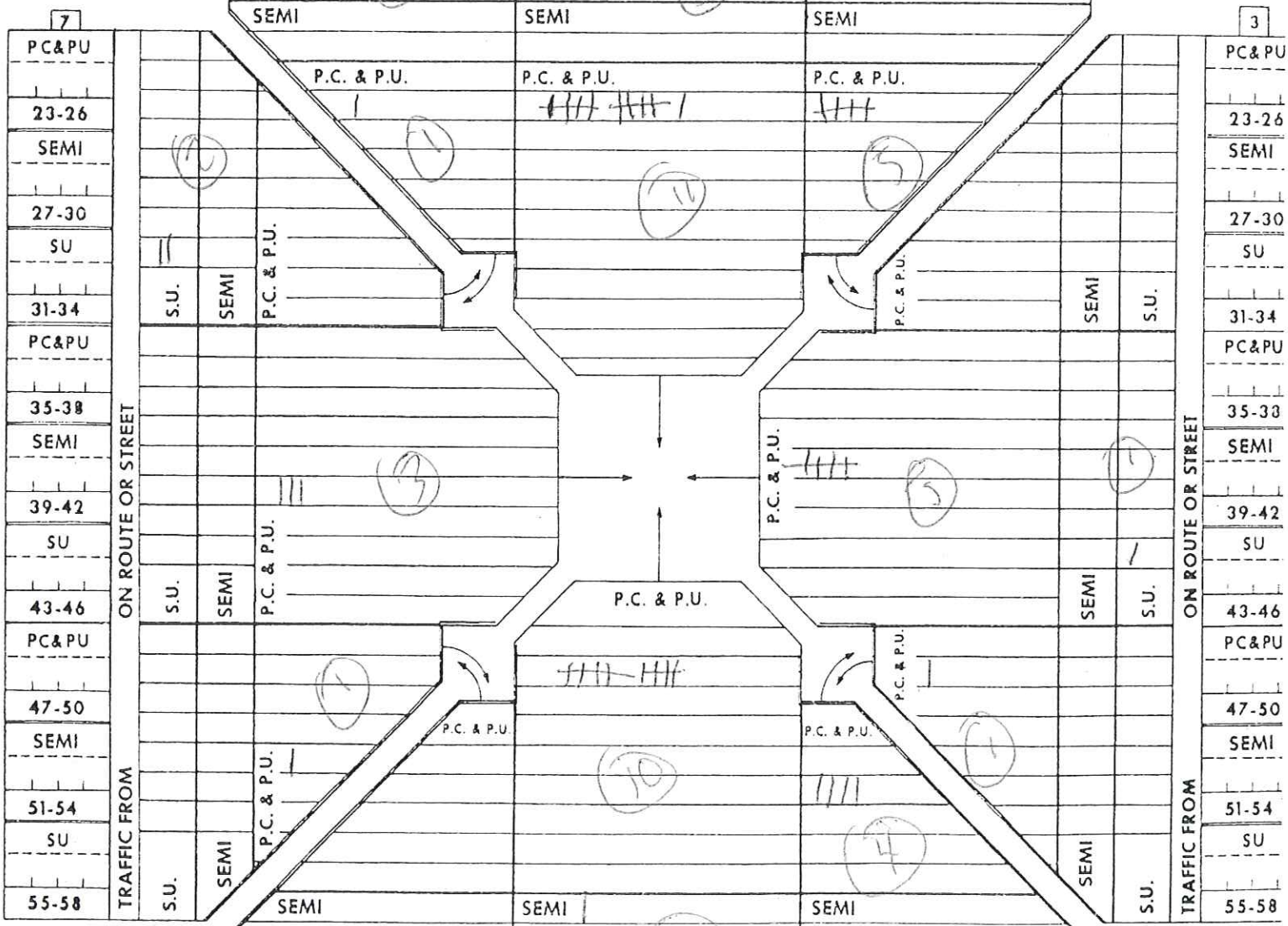
STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 2:15 - 2:30 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58



5	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

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TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 2:30 - 2:45 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1

PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET

S.U. S.U. S.U.

SEMI SEMI SEMI

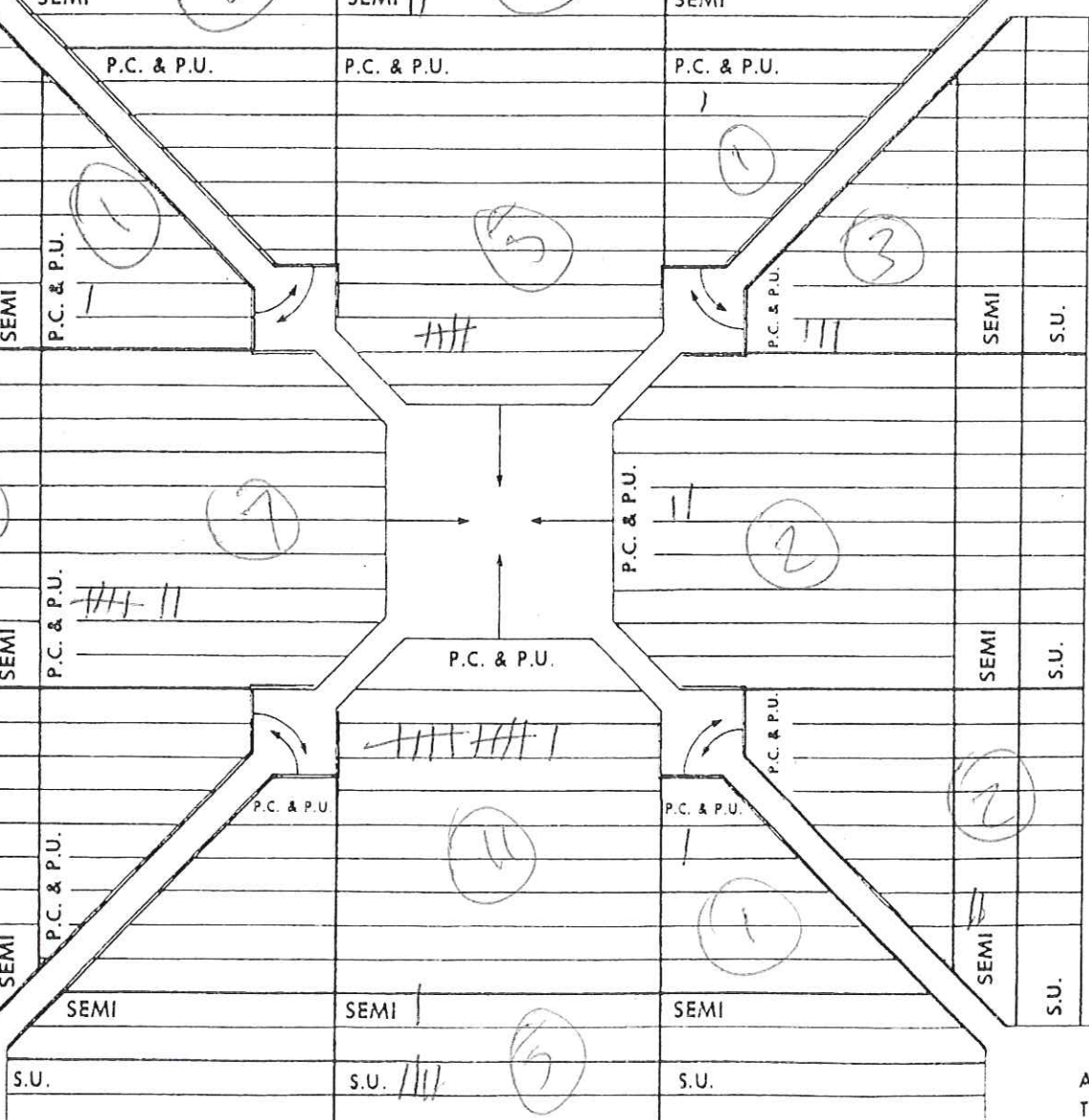
7

PC&PU
23-26
SEMI
27-30
SU
31-34
PC&PU
35-38
SEMI
39-42
SU
43-46
PC&PU
47-50
SEMI
51-54
SU
55-58

ON ROUTE OR STREET

TRAFFIC FROM

S.U. SEMI



3

PC&PU
23-26
SEMI
27-30
SU
31-34
PC&PU
35-38
SEMI
39-42
SU
43-46
PC&PU
47-50
SEMI
51-54
SU
55-58

ON ROUTE OR STREET

TRAFFIC FROM

S.U. SEMI

SEMI SEMI SEMI

S.U. S.U. S.U.

TRAFFIC FROM ON ROUTE OR STREET

5

23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

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TURNING MOVEMENT FORM

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 2:45 - 3:00 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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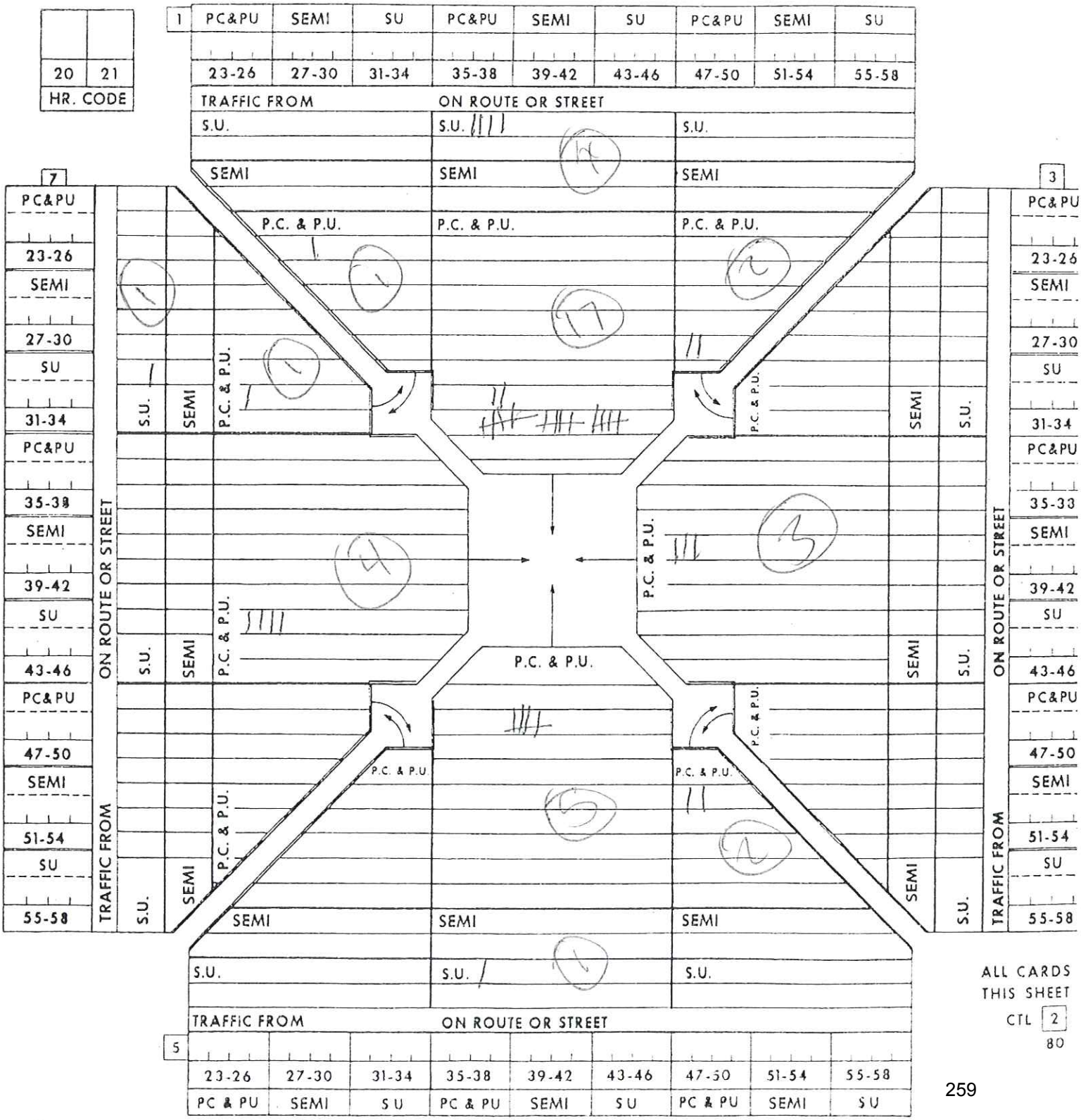

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TURNING MOVEMENT FORM

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T.I., 3-83

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 3:00 - 3:15 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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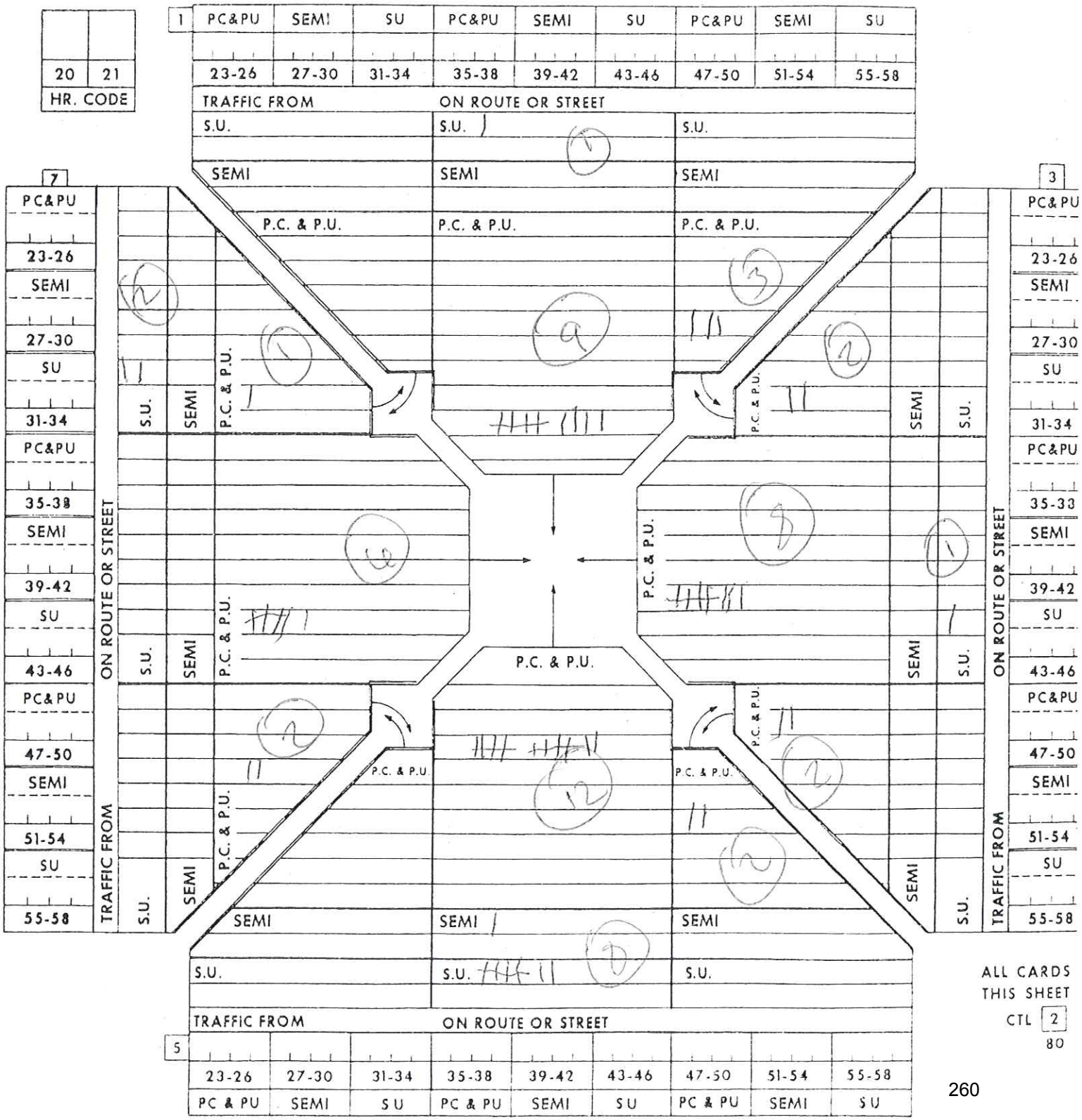

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TURNING MOVEMENT FORM

Form 202-G
T.I. 3-83

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

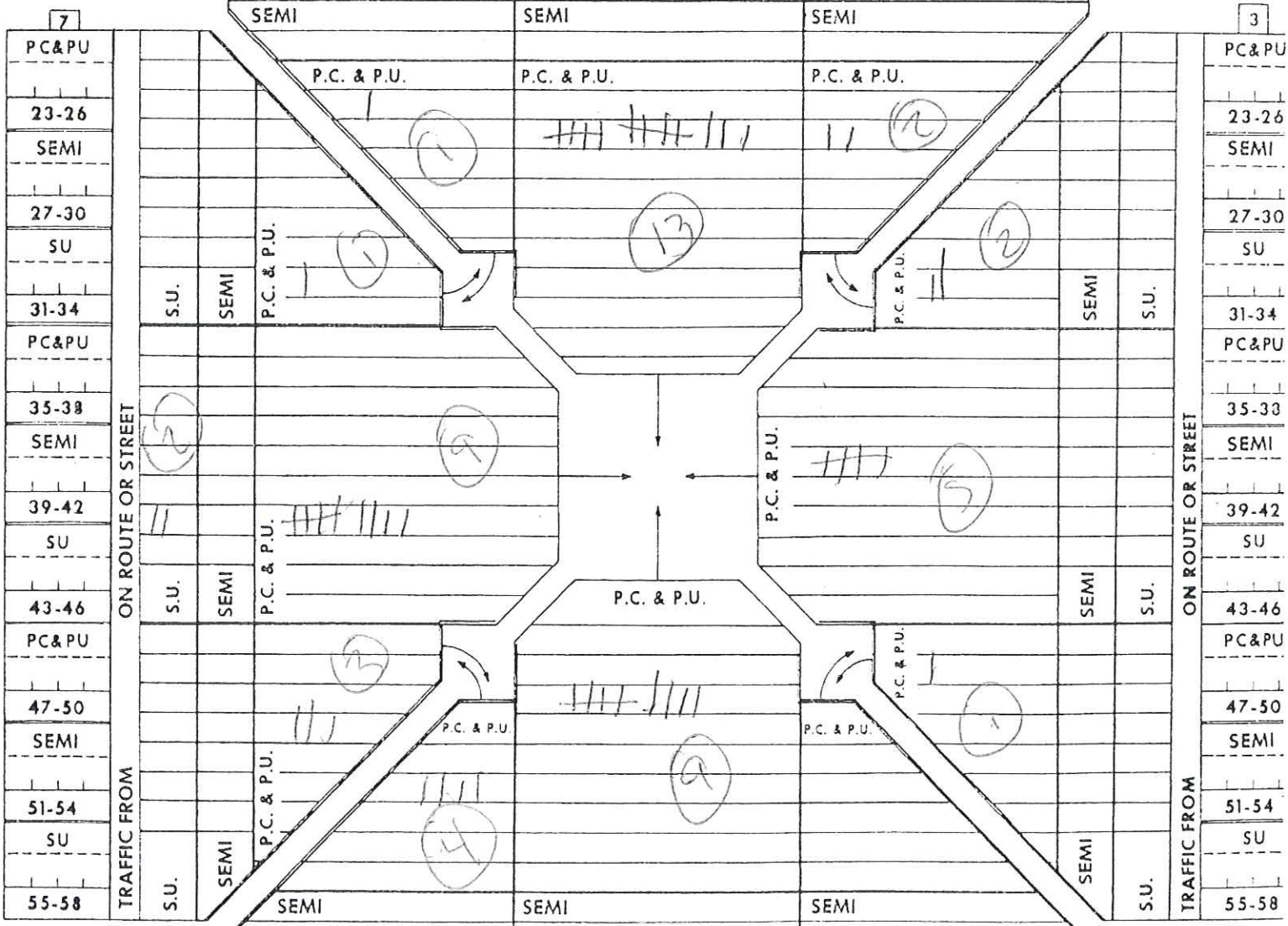
HOUR 3:15 - 3:30 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET



5	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

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TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 3:30-3:45 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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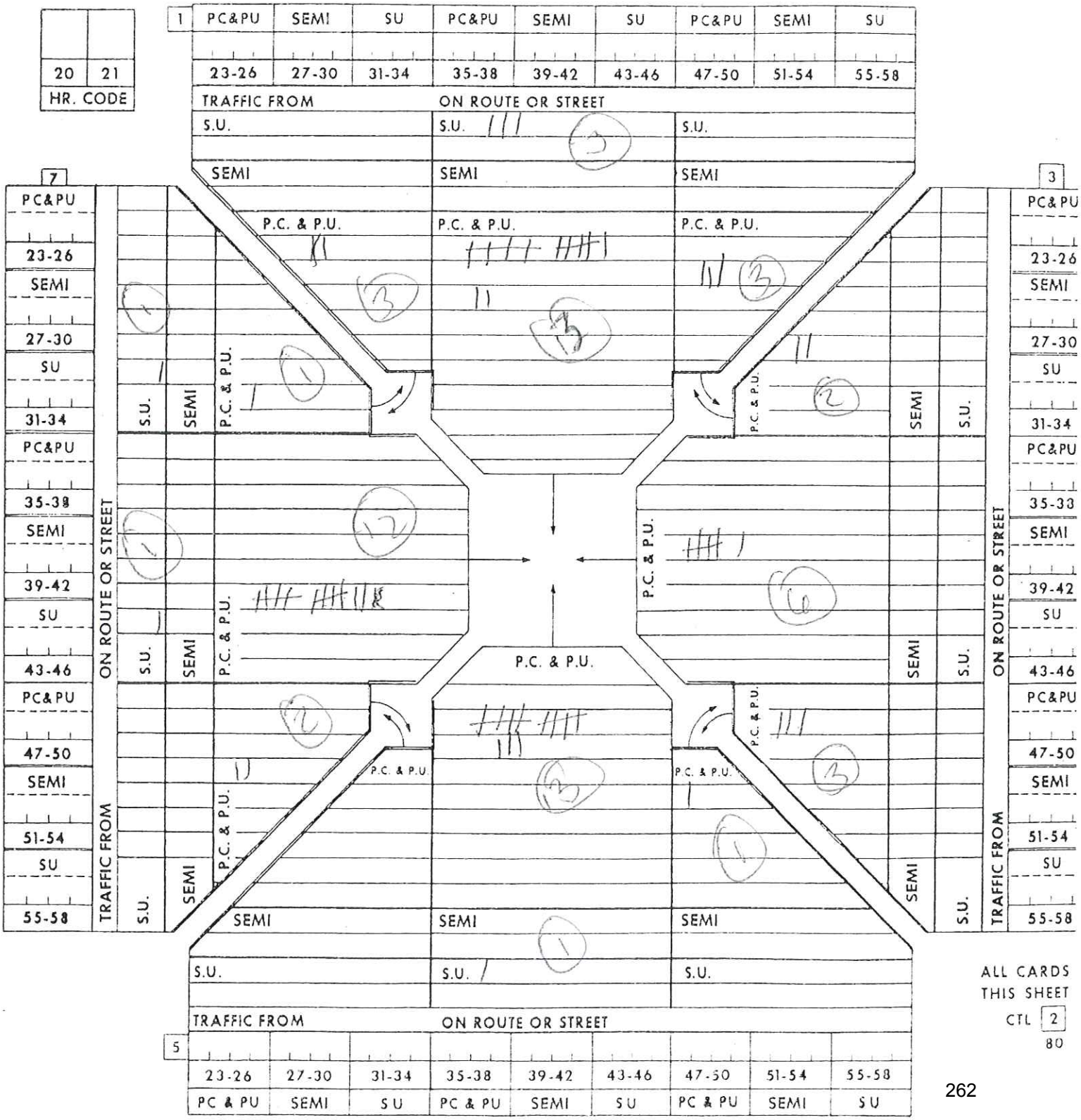

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Form 202-G
T.I. 3-83

TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 3:45 - 4:00 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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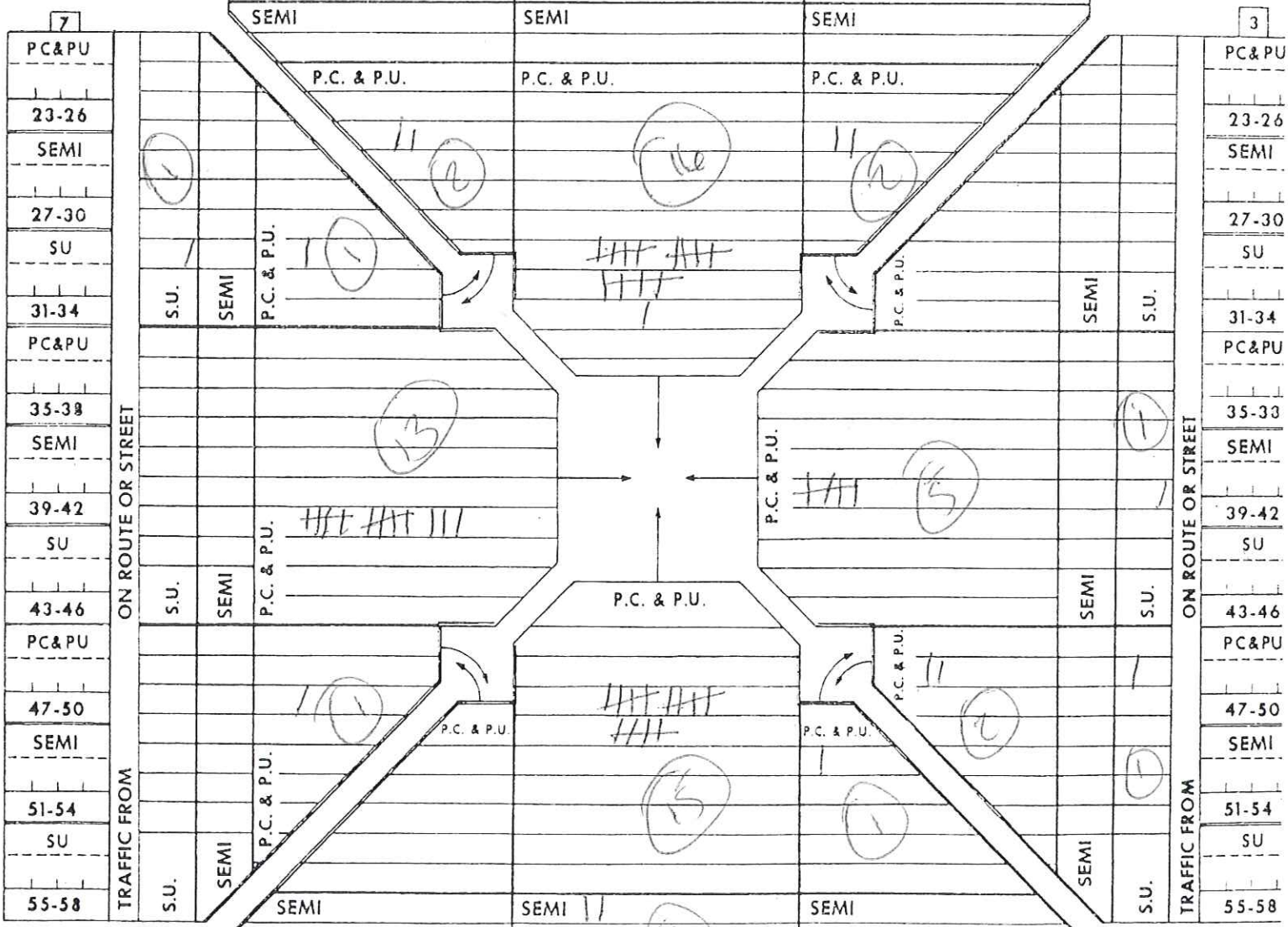

5	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

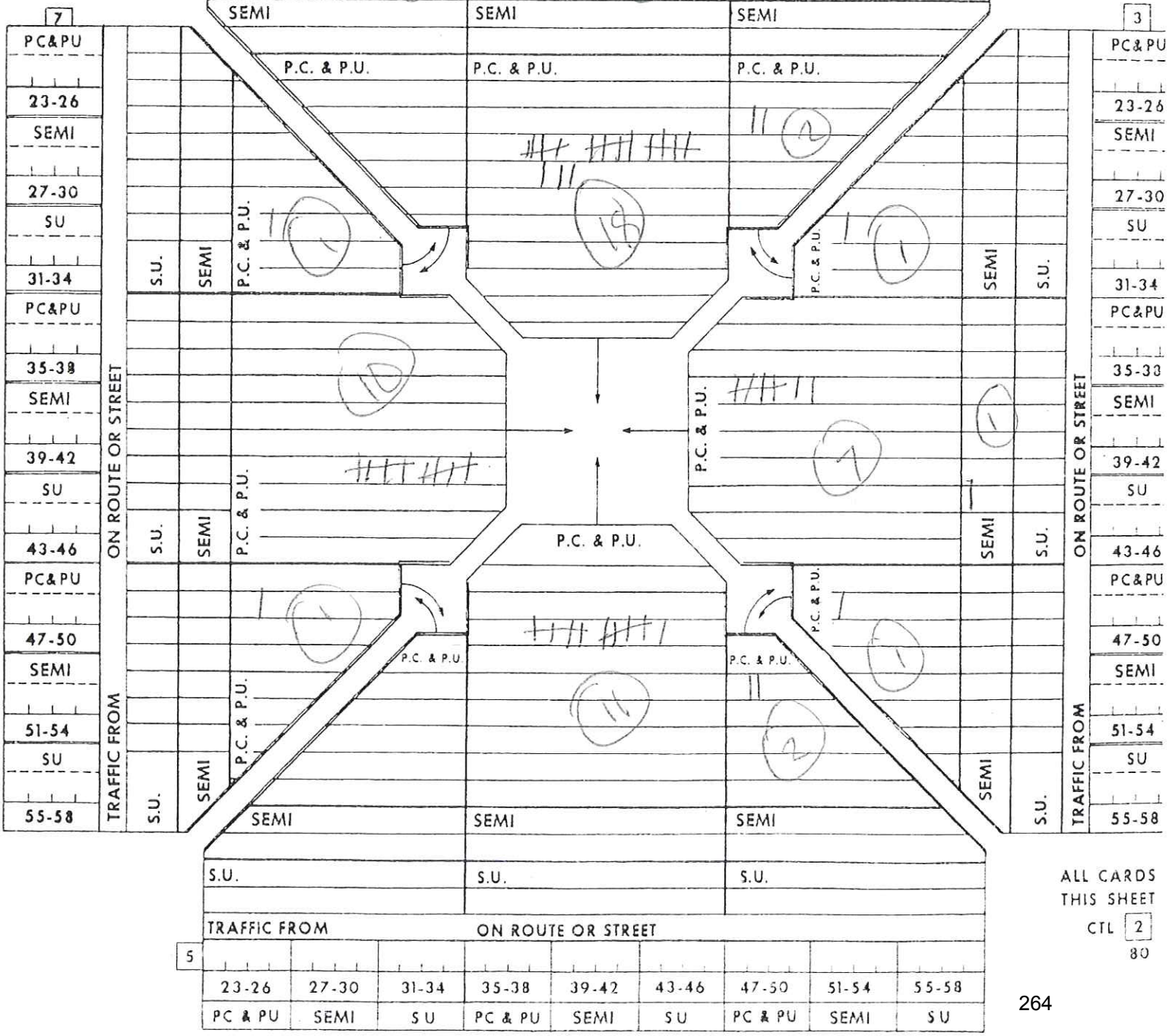
STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 4:00 - 4:15 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58



23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 4:15 - 4:30 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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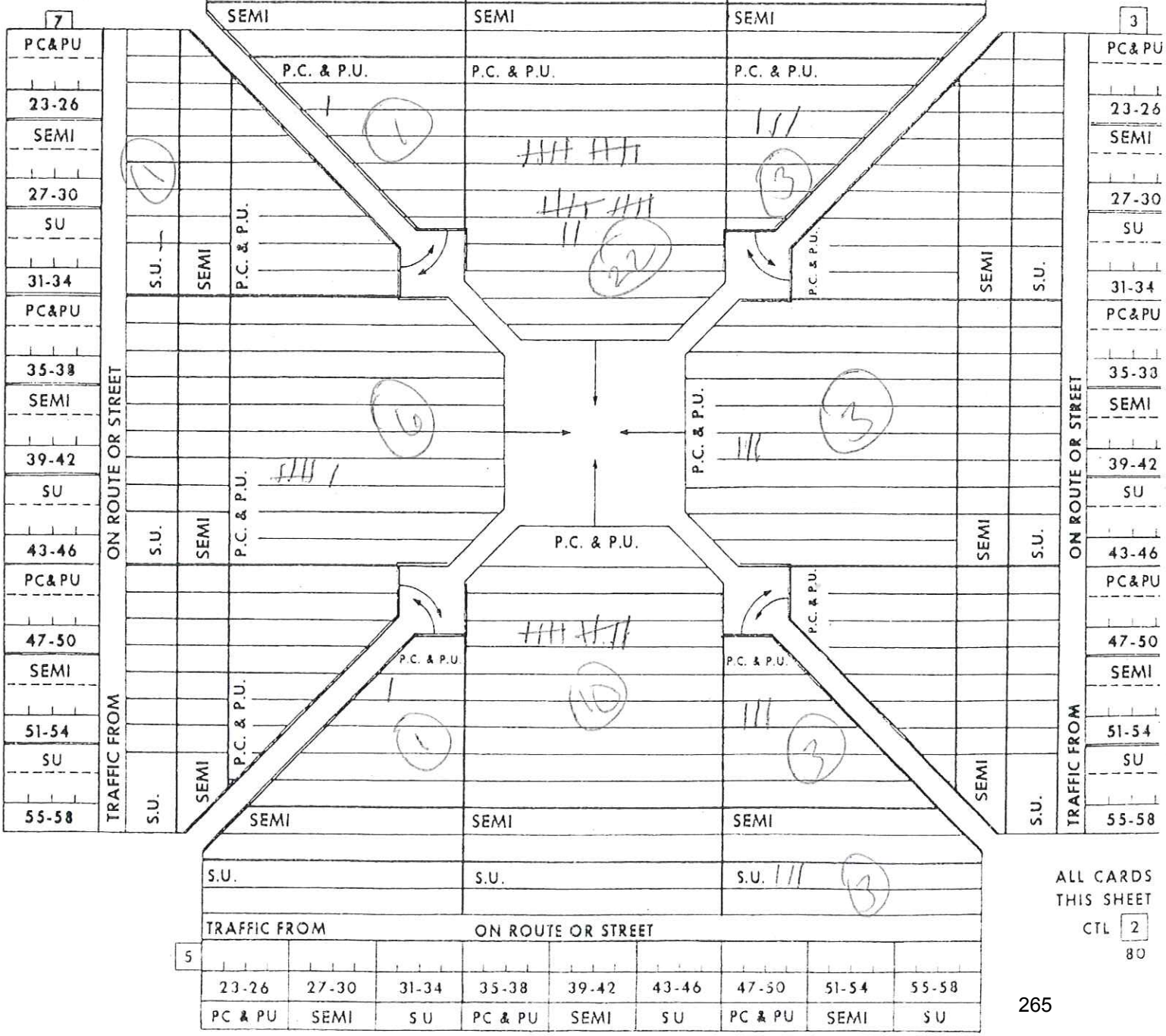

23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

Iowa Department of Transportation

Form 202-G
T.I. 3-83

TRANSPORTATION INVENTORY

NORTH

STATION NO. ______ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 4:30-4:45 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

Card 1 — TRAFFIC FROM ______ ON ROUTE OR STREET

PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

North approach (traffic from north):
- S.U. / SEMI / P.C. & P.U. — left column: 1 (1); center column: 20 (20); right column: 1 (1)

West approach (Card 7 — TRAFFIC FROM ______ ON ROUTE OR STREET):

Field	Columns
PC&PU	23-26
SEMI	27-30
SU	31-34
PC&PU	35-38
SEMI	39-42
SU	43-46
PC&PU	47-50
SEMI	51-54
SU	55-58

- S.U. 1 (1); P.C. & P.U. 1 (1)
- P.C. & P.U. 8 (8)
- P.C. & P.U. 1 (1)

East approach (Card 3 — TRAFFIC FROM ______ ON ROUTE OR STREET):

Field	Columns
PC&PU	23-26
SEMI	27-30
SU	31-34
PC&PU	35-38
SEMI	39-42
SU	43-46
PC&PU	47-50
SEMI	51-54
SU	55-58

- P.C. & P.U. 2 (2)
- P.C. & P.U. 2 (2)

South approach (traffic from south):
- P.C. & P.U. — center column: 14 (14); right column: 7 (7)
- SEMI / S.U. — center column: S.U. 1 (1)

Card 5 — TRAFFIC FROM ______ ON ROUTE OR STREET

23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET CTL 2 80

J.

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T.I., 3-83

TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

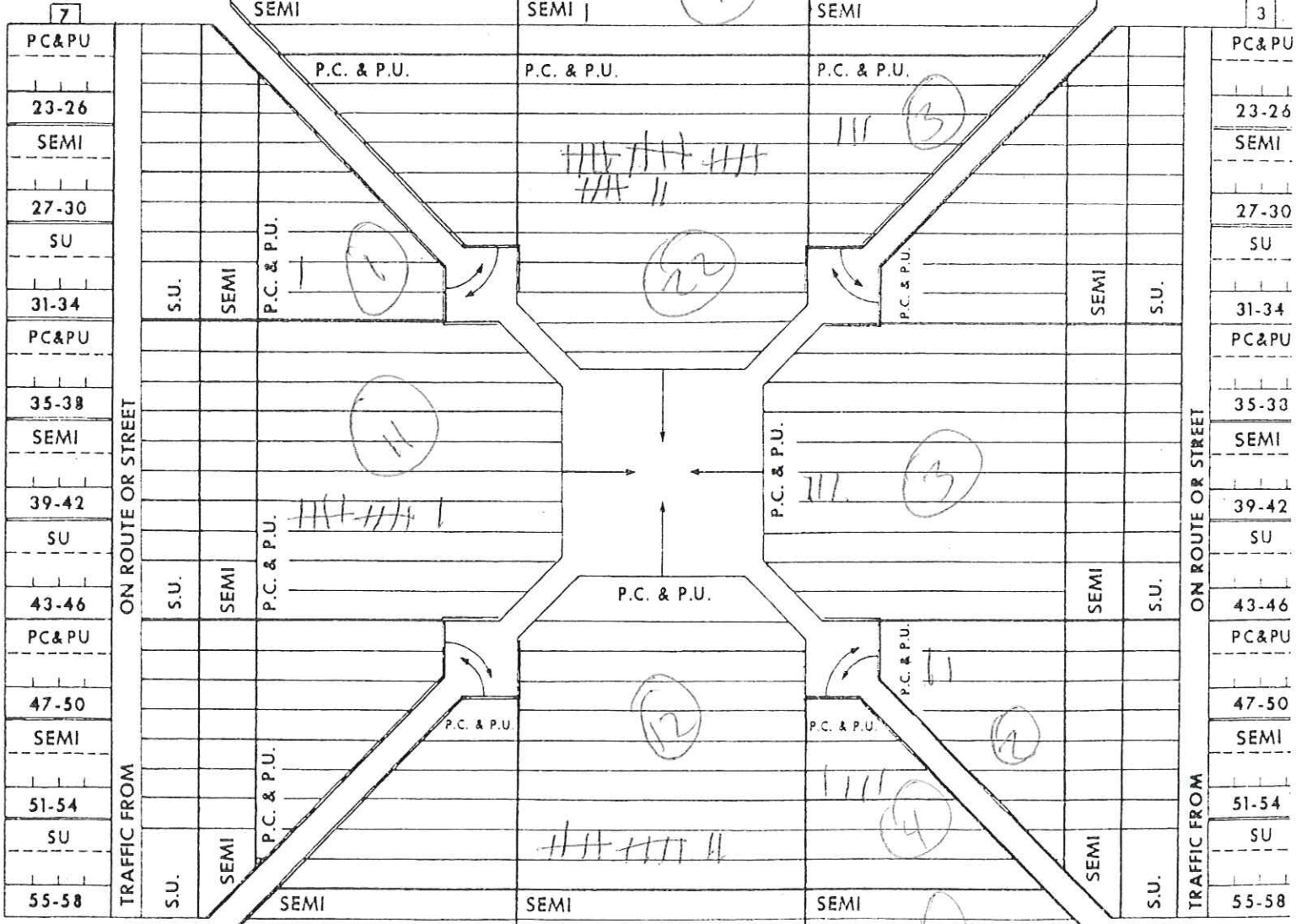
HOUR 4.45 - 5:00 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET



TRAFFIC FROM ON ROUTE OR STREET

5								
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

Form 202-G
T.I. 3-83

TRANSPORTATION INVENTORY

Iowa Department of Transportation

NORTH

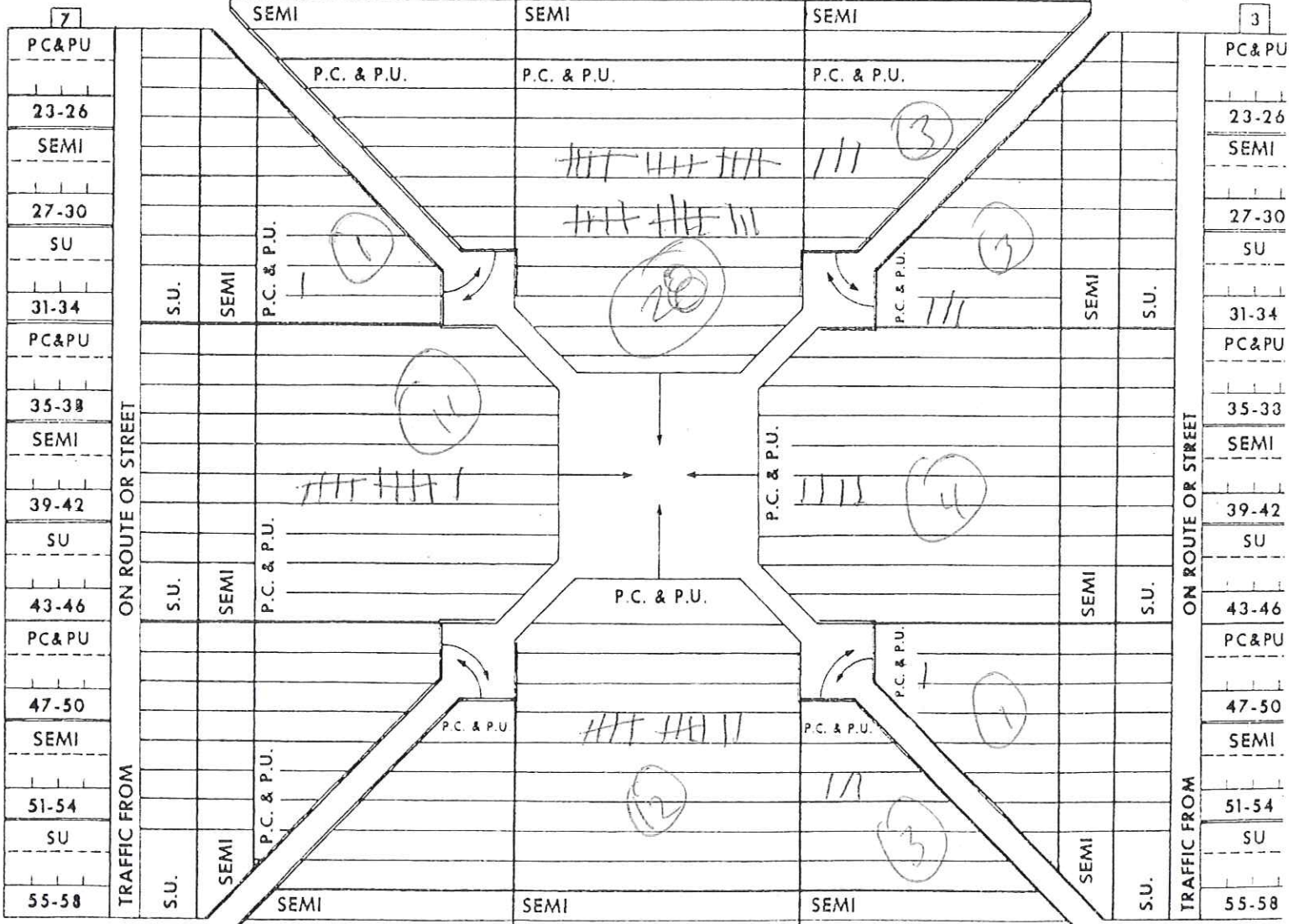
STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 5:00 - 5:15 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58



5								
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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J.

Form 202-G
T.I., 3-83

TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

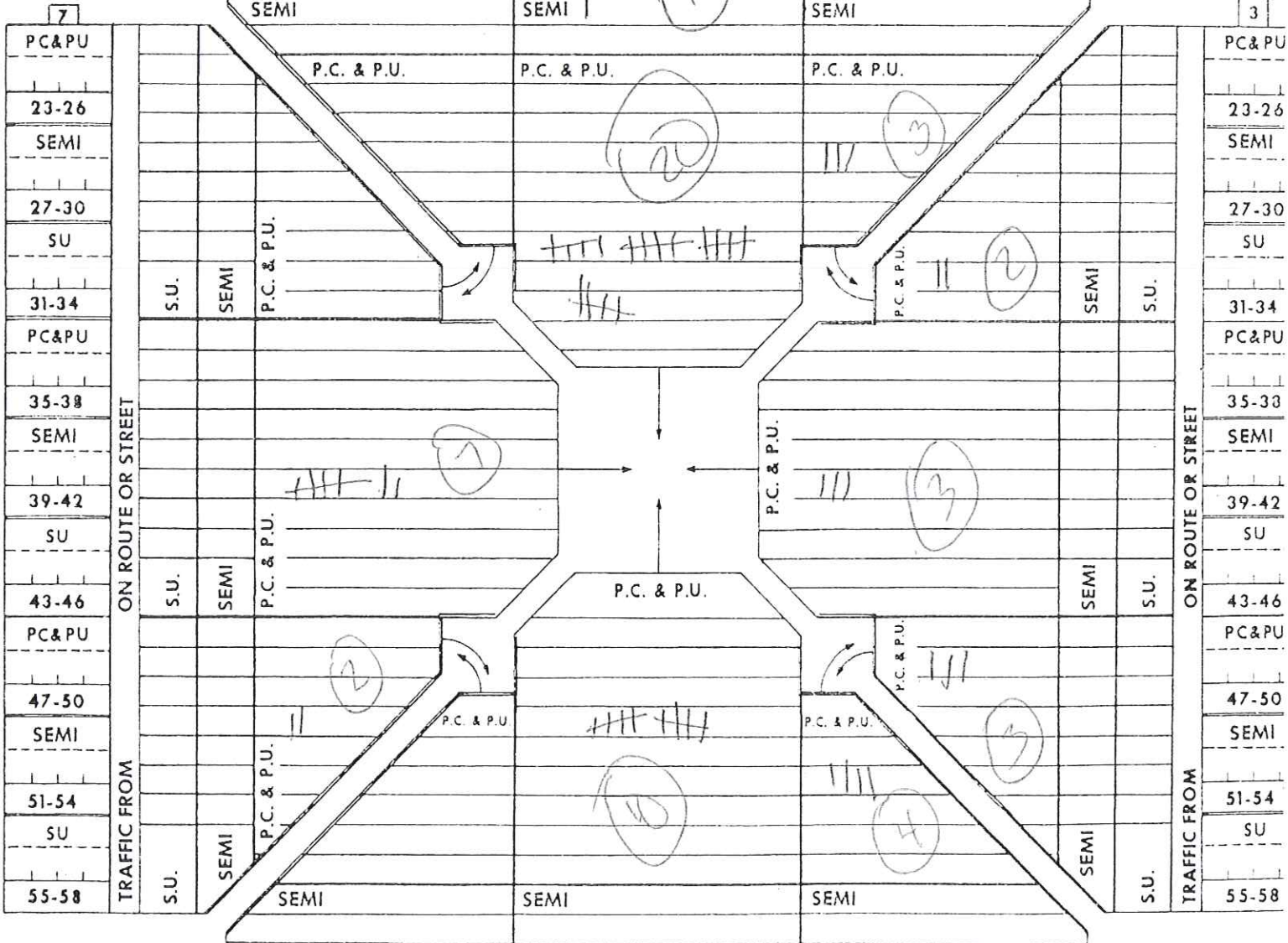
STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 5:15 - 5:30 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58



5	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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Form 202-G
T.I. 3-83

TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR 5:30 - 5:45 DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
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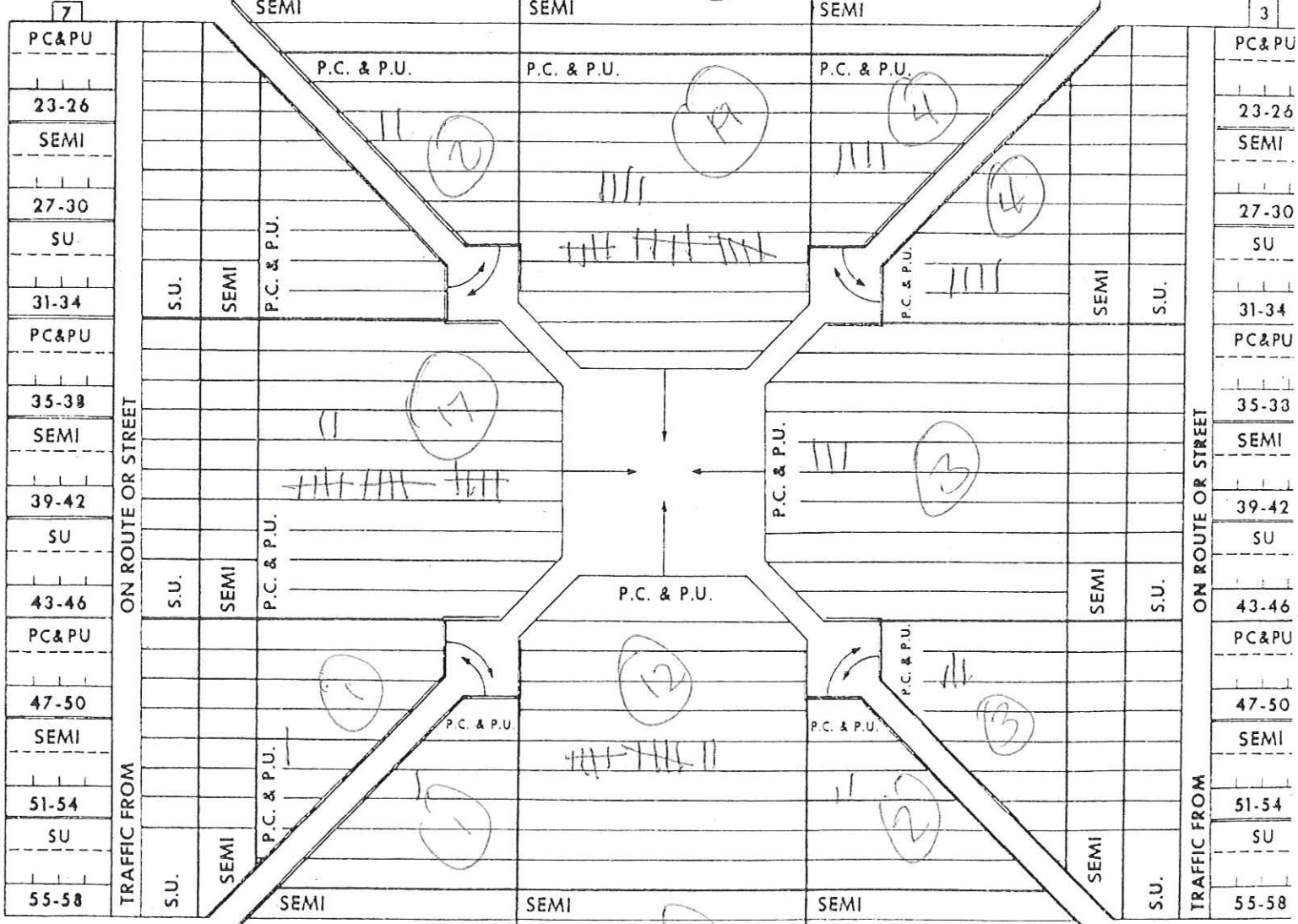
TRAFFIC FROM ON ROUTE OR STREET



5	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58
	PC & PU	SEMI	SU	PC & PU	SEMI	SU	PC & PU	SEMI	SU

ALL CARDS THIS SHEET

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TURNING MOVEMENT FORM

Form 202-G
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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

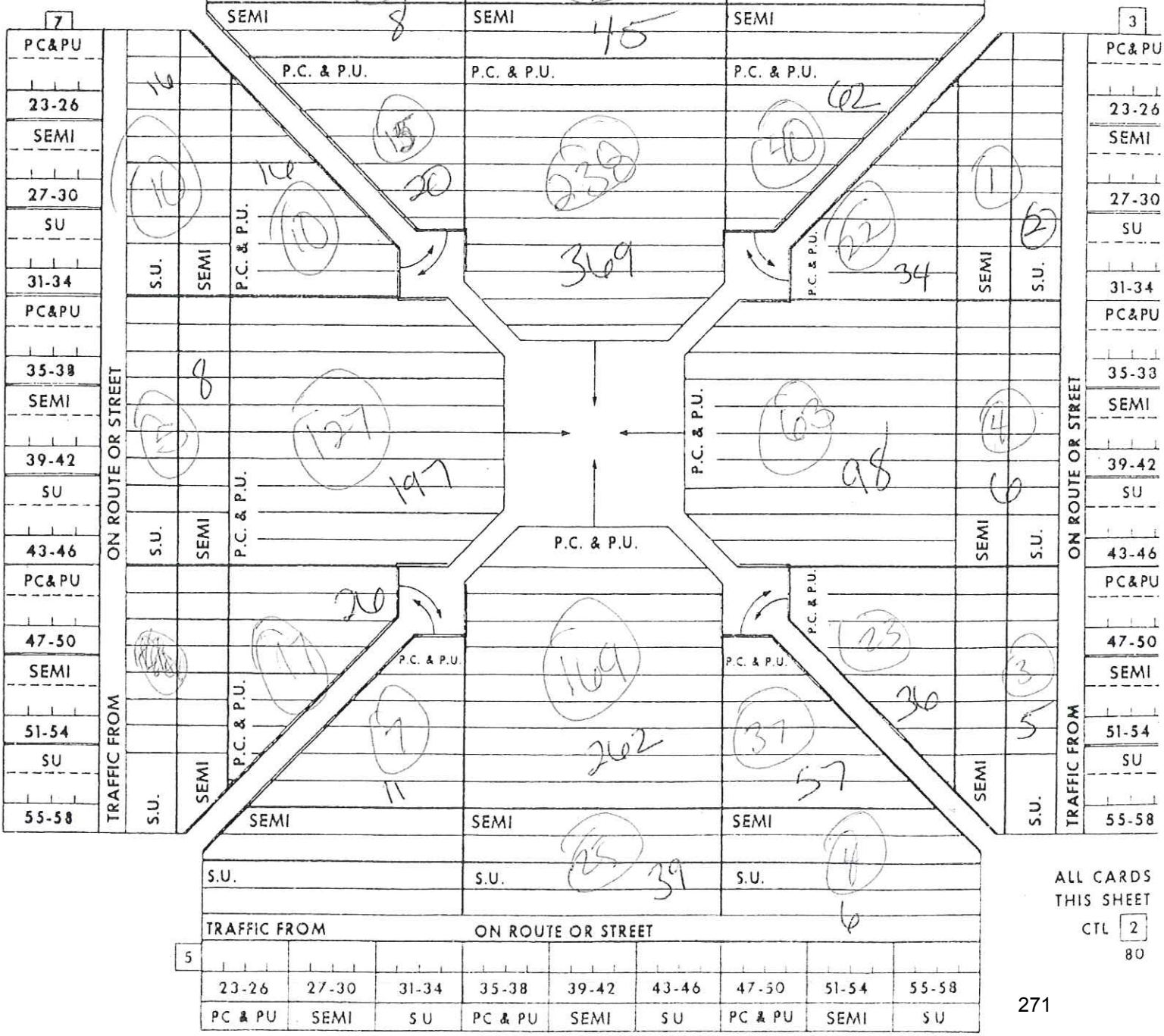
STATION NO. _____ DATE June 6th, 12 COUNTER Corina Lickness

HOUR ~~5:45 6:00~~ totals DAY Wednesday WEATHER Sunny

REMARKS Dysart Rd Washburn

20	21
HR. CODE	

1	PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
	23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58



ALL CARDS THIS SHEET

CTL 2

80

L.

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Black Hawk Prepared by: Lynn Kloberdanz Date Prepared: Jul 20, 2012

Location: Dysart Road (V37) from 0.25 mile south of Washburn Rd. (D38) to Orange Rd.

Improvement

Proposed Improvement(s): Resurface pavement, pave shoulders, and add a turn lane at Washburn Rd. intersection and install edgeline rumble strips

$ 500,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	57	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 2009 Date of traffic count

Length (mi.)	Two-way veh/day	Description
1.00	1,900	D38 to Orange Rd.
0.25	1,550	D35 to D38
1.25	miles total	

2,288 Current Vehicle Miles / Day, **VM**

3,079 End of Life Veh. Miles / Day

834,938 Current Veh. Miles / Year, **AM**

14,438,922 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

2002 First full year --> 2011 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

1	Fatal Crashes →		Fatalities @	$3,500,000	$ -
		3	Major Injuries @	$240,000	$ 720,000
9	Injury Crashes →	6	Minor Injuries @	$48,000	$ 288,000
		4	Possible Injuries @	$25,000	$ 100,000
13	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 263,400
23	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,371,400

2.30	Current Crashes / Year, **AA** = TA / T	275.5	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 59,626	Cost per Crash, **AVCR** = LOSS / TA	$ 987,625	Present Value of Avoided Crashes, **BENEFIT**
39.8	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
1.31	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 78,170	Crash Costs Avoided in First Year, AAR x AVCR		
22.7	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 = $987,625 : $500,000 = **1.98** : 1

Iowa Department of Transportation

Rev. 3/08

ORIGINAL

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Signalization of US 18/ N Main Street in Algona

Applicant: Iowa DOT - District 2

Contact Person: David Little Title: Assistant District Engineer

Complete Mailing Address: 1420 Fourth Street SE, Mason City, IA 50401

Phone: 641-422-9464 (Area Code) E-Mail: david.little@dot.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): City of Algona, IA

Contact Person: Keri Navratil Title: City Administrator

Complete Mailing Address: 112 W. Call Street, Algona, IA 50511

Phone: 515-295-2411 (Area Code) E-Mail: knavratil@ci.algona.ia.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 415,000

Safety Funds Requested $ 415,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Iowa Department of Transportation - District 2

Signed: Vicki L Dumdei 8-14-12

Signature Date Signed

Vicki L. Dumdei

Typed Name

Attest: David L Little Aug 14, 2012

Signature Date Signed

David L. Little

Typed Name

DOCUMENT A

From: Cole O'Donnell [mailto:codonnell@ci.algona.ia.us]
Sent: Monday, November 07, 2011 8:42 AM
To: Clark, Robert [DOT]
Subject: Re: North Main St Intersection in Algona

Robert,

The City of Algona wishes to proceed with the signaling project at the intersection of US Hwy 18 and Main St in Algona. Please inform us of when the project will be scheduled for construction.

Thank you,

Cole S. O'Donnell, MPA, ICMA-CM
City Administrator
City of Algona, Iowa
(515)295-2411
(515)295-4897(F)
www.ci.algona.ia.us

DOCUMENT B

Existing Conditions:

The intersection of US 18 and North Main Street in Algona is a T-intersection and was listed on Iowa's 2010 Severe Safety Needs Report. North Main Street makes up the south leg of the intersection while US 18 makes up the east and west legs. This is a one-way stop controlled intersection with traffic on North Main Street required to stop.

At this intersection US 18 is a four lane undivided corridor with a speed limit of 45 mph. There are no turn lanes on US 18. Railroad tracks cross US 18 in a diagonal fashion at the centerline approximately 60 feet west of the North Main Street centerline. This railroad crossing is signalized but does not have crossing gates.

North Main Street is a 2-lane corridor with a posted speed limit of 30 mph. North Main meets US 18 at a skew angle at this intersection. There is a "Stop" sign in place in a raised pork chop stop island as well as a combination back-to-back "Stop" sign and "Do No Enter" sign in place for the right turn lane. There is not a "Stop Ahead" sign along North Main Street in advance of this intersection. The city of Algona has street lighting along the north and south sides of US 18 and along the east side of North Main Street near this intersection.

The sight distances at this intersection are approximately 960 feet looking west and approximately 4,900-plus feet looking east.

This intersection sees 8,335 daily entering vehicles. The AADT for US 18 at this intersection is 6,323 vehicles per day on the west and 5,853 on the east. North Main Street on the south leg of this intersection has an AADT of 4,493 vehicles per day. There were 21 total crashes at the intersection from 2007-2011 for a crash rate of 1.38 crashes/million entering vehicles. That compares with a statewide average of 0.9 for a primary highway intersecting with a city street.

According to the 2007-2011 crash history, 21 crashes took place at this intersection with 13 injuries. Of those injuries, 4 were major injuries, 4 were minor injuries and 5 were possible injuries.

Of the 21 crashes from 2007-2011, 2 were Ran Stop Sign major causes, 9 were Failure to Yield Right of Way from Stop Sign, 2 were Failure to Yield Right of Way making a left turn and 1 was because of making an improper turn.

Concept and Justification:

District 2 is requesting Traffic Safety Funds to install traffic signals at the intersection of US 18 and North Main Street in Algona. The District feels the signals would address many of the crashes taking place at this intersection. Fourteen of the 21 crashes involved drivers' failure to navigate the intersection. Also, 10 of the 13 injuries were a result of the 9 FTYROW from stop sign and 2 ran stop sign major cause crashes. The intersection skew angle may contribute to the crashes under stop-control operations.

If approved the funds would go towards installation of the traffic signals as well as two railroad crossing gates, cantilevers and prediction circuitry.

The Benefit Cost Ratio for installing these improvements at this intersection works out to 1.77:1.

Early coordination of the design has occurred with the Union Pacific Railroad and the railroad supports this project.

The City of Algona supports this application and understands the future maintenance and operations of these proposed traffic signals is the responsibility of the city. There is significant commercial and industrial development along the US 18 corridor in this area, and the heavy intersection turning movements reflect the traffic patterns used by motorists accessing these businesses for shopping and/or employment.

DOCUMENT C

Itemized Cost Breakdown

• Traffic Signal	$120,000
○ Controller	
○ Cabinet	
○ Poles	
○ Heads	
○ Hardware	
• RR Crossing Active Warning Devices	$295,000
○ Two gates	
○ Cantilevers	
○ Prediction circuitry	
Total	**$415,000**

Funding – Requesting TSIP funding to cover full costs of project under the Site Specific Category.

DOCUMENT D

Time Schedule:

Application submittal: August 15th, 2012

Application Award: December 2012

Project Development: July/August 2013

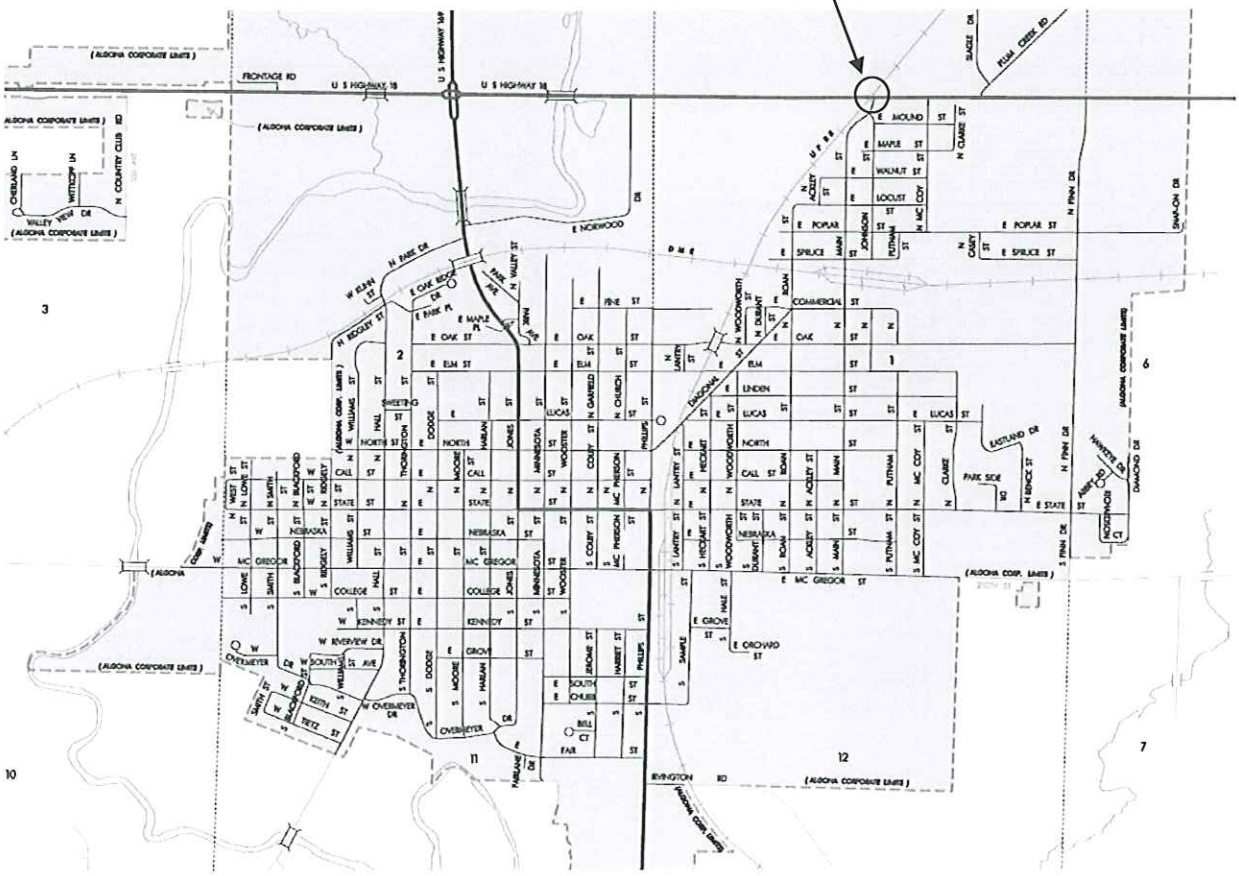
Project Letting: March 2014

Project Construction: Construction Season 2014

Project Completion: FY 2014

DOCUMENT E

Project Location—Intersection of US 18 and N. Main Street in Algona

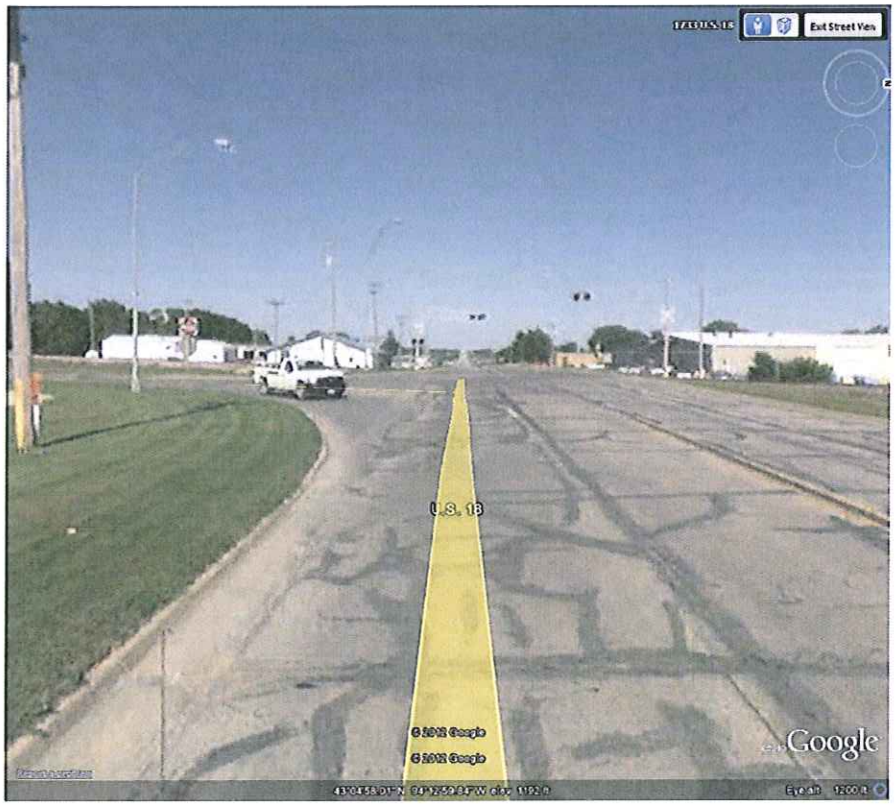


DOCUMENT F

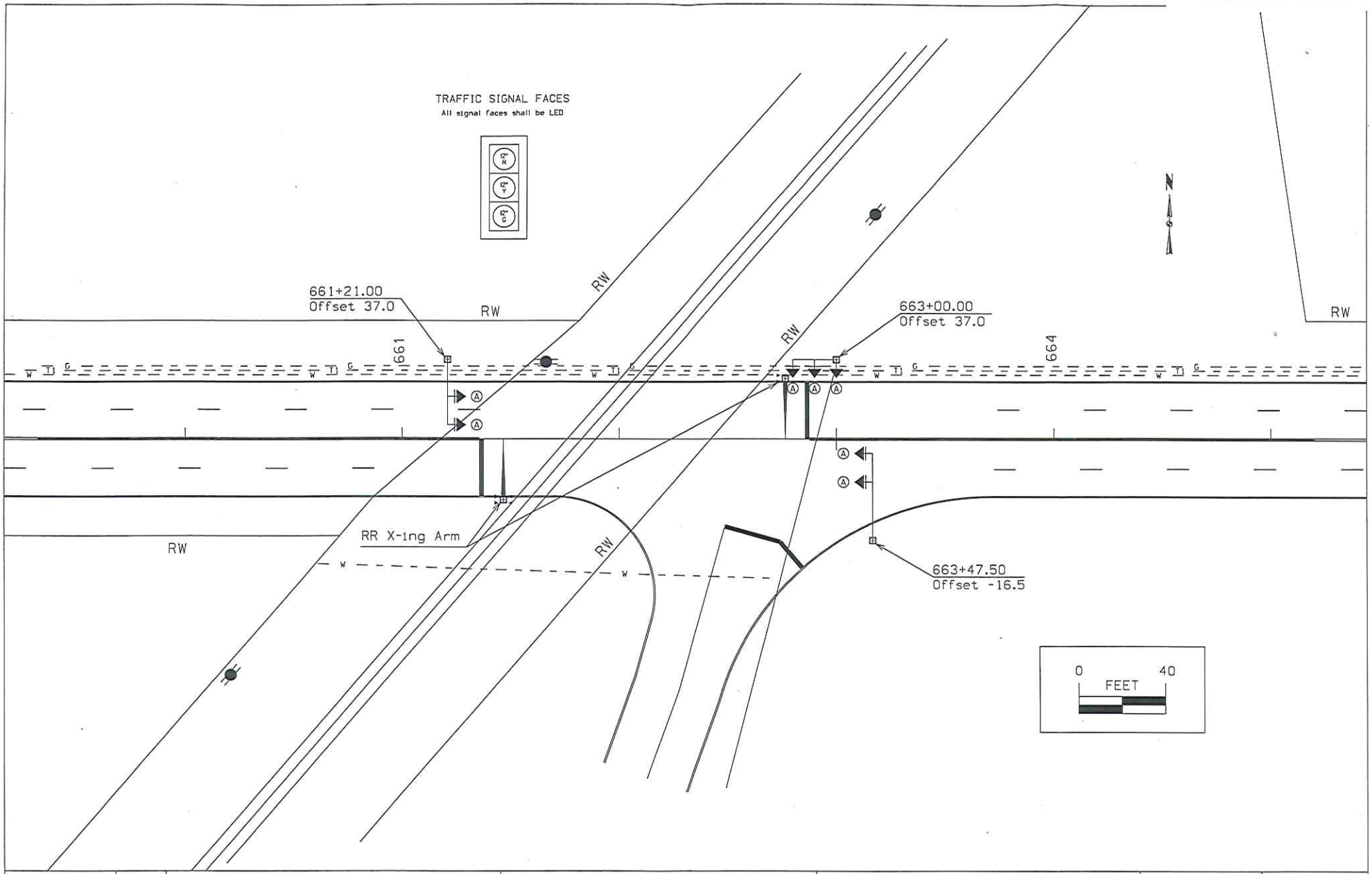
Approaching US 18 on North Main Street

EB US 18 Approach to N. Main Street in Algona

WB US 18 Approach to N. Main Street in Algona



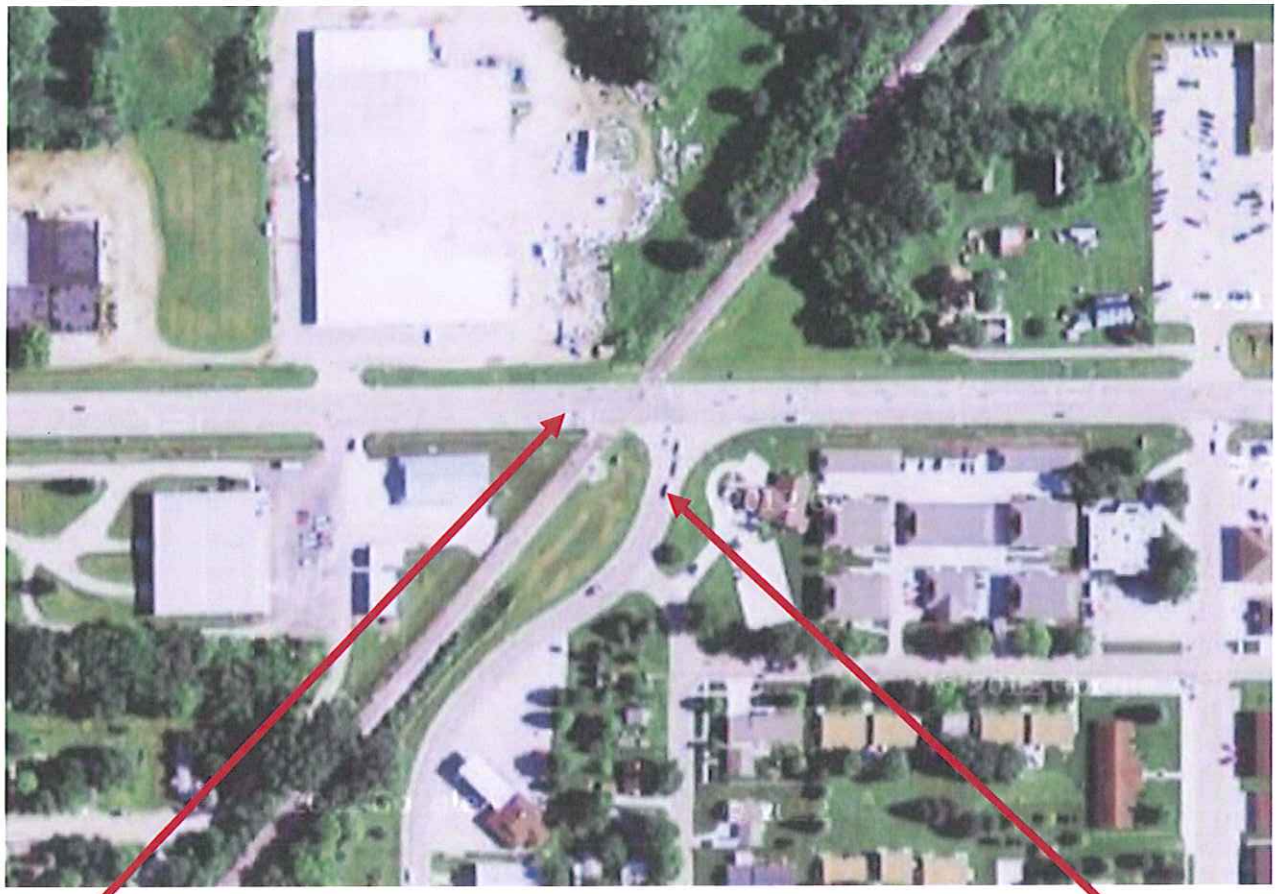
DOCUMENT G



ENGLISH	IOWA DOT	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER N.

SYSTEMTIME SYSTEMDATE USERNAME DGNSPEC

DOCUMENT H



2007-2011 Crash History
for the Intersection of
US 18 & North Main Street
in Algona, Iowa

CASENUMBER	DATE	TIME	DAY	COUNTY	CITY	LITERAL	CSEVERITY	FATALITIES	INJURIES	PROPDMG	MAJORCAUSE	LIGHT	SURF_COND	INITDIR	DRIVERAGE
2007215823	20070330	1403	Friday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	3000	FTYROW: From stop sign	Daylight	Wet	South	22
2007215823		0						0	0	0				East	83
2007216584	20070405	1500	Thursday	Kossuth	Algona	US 18 & N MAIN ST	Minor Injury	0	3	10500	FTYROW: From stop sign	Daylight	Dry	North	88
2007216584		0						0	0	0				East	16
2007216584		0						0	0	0					
2007380011	20070627	1303	Wednesday	Kossuth	Algona	US 18 & N MAIN ST	Major Injury	0	1	3500	FTYROW: From stop sign	Daylight	Dry	North	38
2007380011		0						0	0	0				East	57
2007415738	20071226	1451	Wednesday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	1500	Followed too close	Daylight	Ice	East	19
2007415738		0						0	0	0				East	71
2008432040	20080304	657	Tuesday	Kossuth	Algona	US 18 & N MAIN ST	Major Injury	0	1	9000	Ran Stop Sign	Dawn	Dry	North	72
2008432040		0						0	0	0				West	63
2008439796	20080426	1142	Saturday	Kossuth	Algona	US 18 & N MAIN ST	Possible/Unknown	0	1	2000	Ran Stop Sign	Daylight	Dry	North	65
2008439796		0						0	0	0				East	72
2008481620	20081201	1654	Monday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	4000	Other (explain in narrative): Other improper action	Dark - roadway lighted	Ice	North	46
2008481620		0						0	0	0				North	51
2009506287	20090501	1433	Friday	Kossuth	Algona	US 18 & N MAIN ST	Minor Injury	0	2	5500	FTYROW: From stop sign	Daylight	Dry	North	34
2009506287		0						0	0	0				East	83
2009515835	20090705	1555	Sunday	Kossuth	Algona	US 18 & N MAIN ST	Major Injury	0	2	3000	Operating vehicle in an erratic/reckless/careless/negligent/aggressive manner	Daylight	Dry	West	50
2009515835		0						0	0	0				West	47
2009523433	20090812	2257	Wednesday	Kossuth	Algona	N MAIN ST	Property Damage Only	0	0	3100	Made improper turn	Dark - unknown roadway lighting	Unknown	South	85
2009548853	20091229	643	Tuesday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	4000	FTYROW: From stop sign	Dawn	Ice	North	34
2009548853		0						0	0	0				East	15
2010553931	20100107	1641	Thursday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	5000	FTYROW: From stop sign	Dusk	Snow	North	28
2010553931		0						0	0	0				East	29
2010568649	20100326	1738	Friday	Kossuth	Algona	US 18 & N MAIN ST	Possible/Unknown	0	1	4000	FTYROW: From stop sign	Daylight	Dry	North	32
2010568649		0						0	0	0				East	46
2010571802	20100426	818	Monday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	1600	FTYROW: Making left turn	Daylight	Wet	East	29
2010571802		0						0	0	0				West	72
2011617749	20110207	1642	Monday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	1700	Followed too close	Daylight	Dry	North	56
2011617749		0						0	0	0				North	46
2011628503	20110427	1231	Wednesday	Kossuth	Algona	US 18 & N MAIN ST	Possible/Unknown	0	1	1000	Followed too close	Daylight	Dry	North	42
2011628503		0						0	0	0				North	54
2011638747	20110714	1450	Thursday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	2700	Followed too close	Daylight	Dry	North	58
2011638747		0						0	0	0				North	23
2011638943	20110629	2202	Wednesday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	2500	Followed too close	Dark - roadway lighted	Dry	West	16
2011638943		0						0	0	0				West	17
2011643779	20110818	1612	Thursday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	5000	FTYROW: From stop sign	Daylight	Dry	North	64
2011643779		0						0	0	0				East	61
2011649174	20110910	1630	Saturday	Kossuth	Algona	US 18 & N MAIN ST	Property Damage Only	0	0	8000	FTYROW: Making left turn	Daylight	Dry	West	27
2011649174		0						0	0	0				East	92
2011649177	20110923	1645	Friday	Kossuth	Algona	US 18 & N MAIN ST	Minor Injury	0	1	8000	FTYROW: From stop sign	Daylight	Dry	East	49
2011649177		0						0	0	0				North	70

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

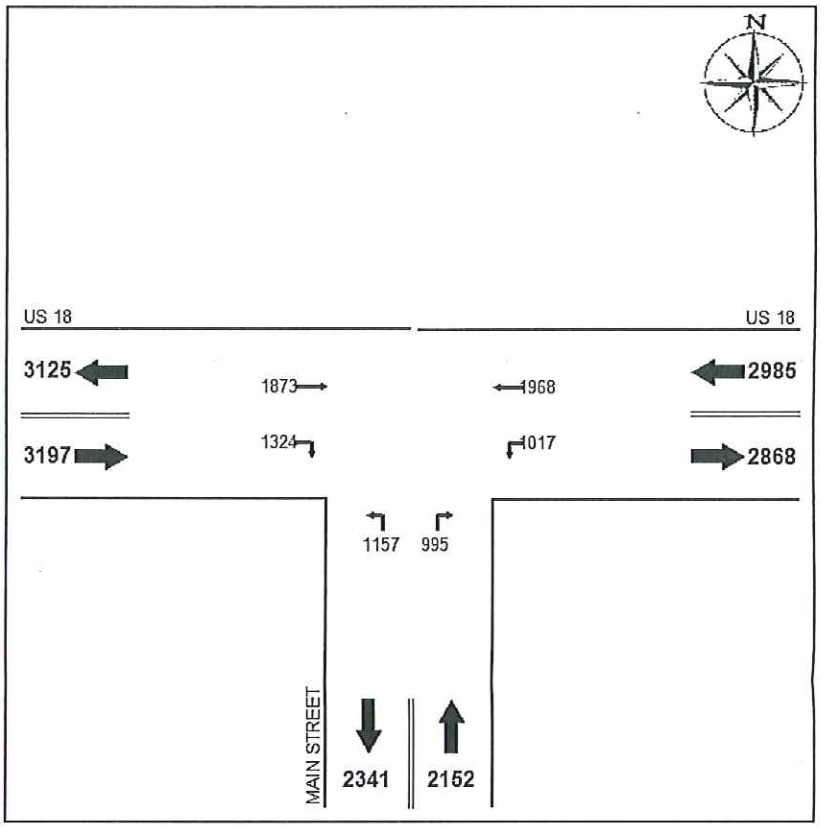
Station Number:
55320189099

Count Date:
Thursday, April 28, 2011

County:
Kossuth

Location Description:
US 18 & Main St

Volume Factor: 1.793
Pass Class Factor: 1.837
SU Class Factor: 1.546
Combo Class Factor: 1.498



Raw Data-All Vehicles:

	E Leg		S Leg		W Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	78	101	68	44	88	64
08:00	59	162	82	68	137	73
11:00	70	140	73	64	134	104
12:00	70	150	122	79	166	119
15:00	120	221	94	100	187	129
16:00	95	186	100	96	188	110
17:00	68	138	97	99	144	130

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

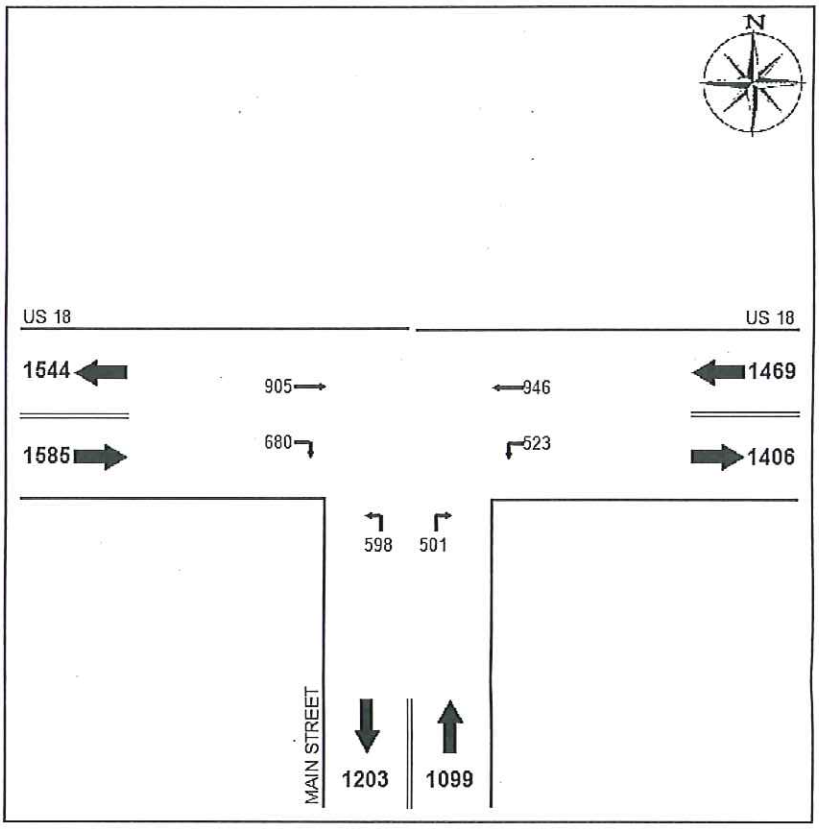
Station Number:
55320189099

Count Date:
Thursday, April 28, 2011

County:
Kossuth

Location Description:
US 18 & Main St

Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A



Raw Data-Passenger Vehicles:

	E Leg		S Leg		W Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	72	92	65	36	75	54
08:00	52	122	75	58	112	64
11:00	60	104	68	55	109	96
12:00	63	128	111	72	142	113
15:00	117	205	88	96	163	122
16:00	92	168	97	91	171	107
17:00	67	127	94	93	133	124

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

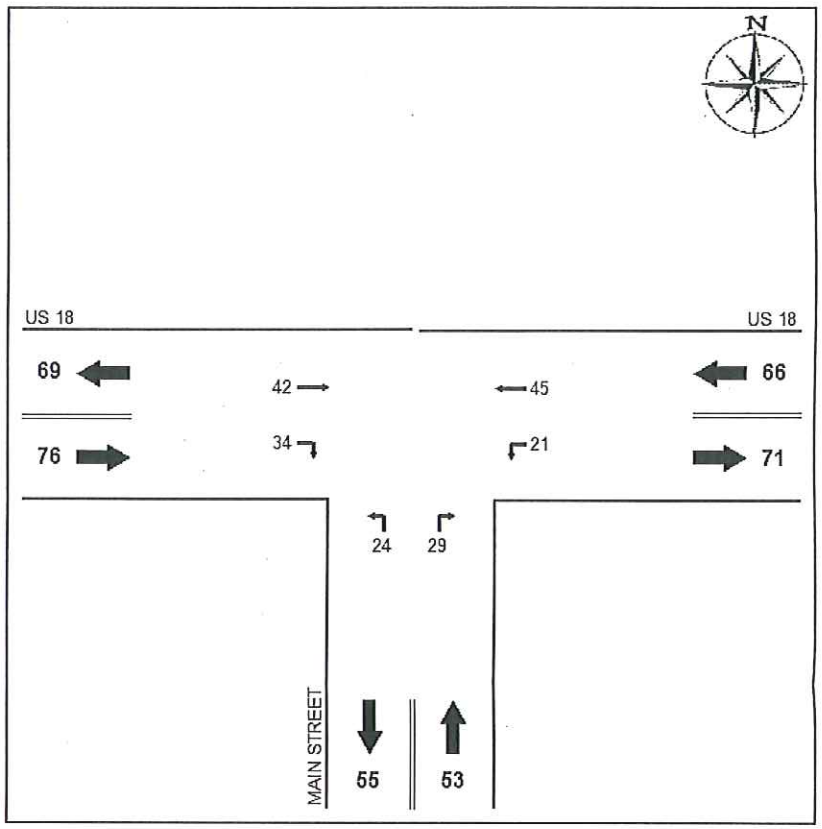
Station Number:
55320189099

Count Date:
Thursday, April 28, 2011

County:
Kossuth

Location Description:
US 18 & Main St

Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A



Raw Data-Single-Unit Trucks:

	E Leg		S Leg		W Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	3	1	2	6	1	7
08:00	4	9	4	7	7	7
11:00	4	6	4	6	5	6
12:00	4	10	6	3	12	4
15:00	2	8	3	2	8	4
16:00	3	9	2	3	6	3
17:00	1	2	3	2	3	3

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

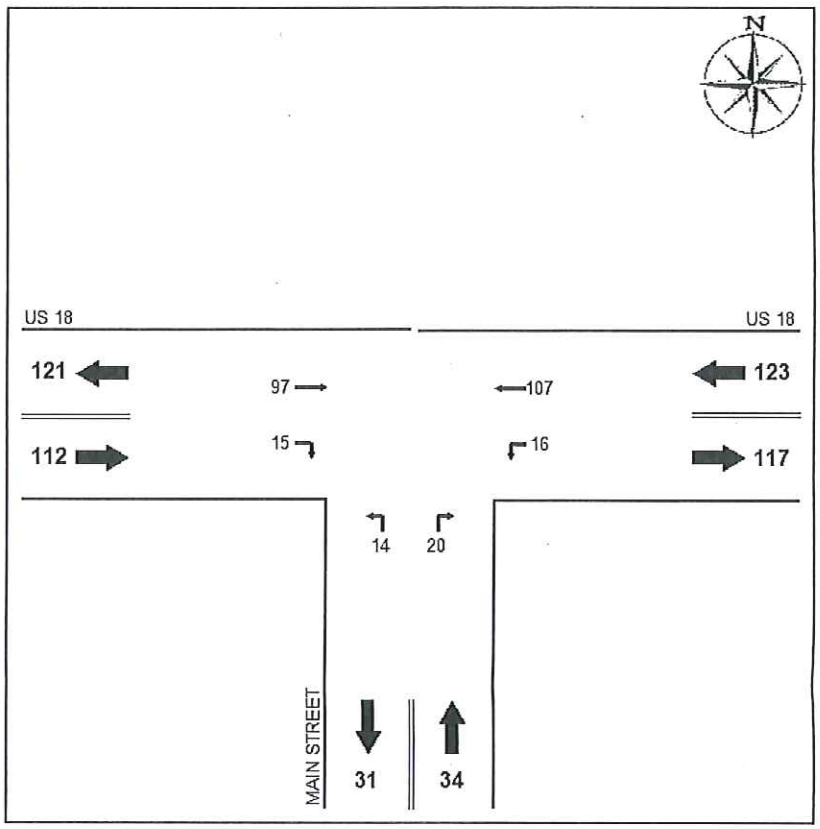
Station Number:
55320189099

Count Date:
Thursday, April 28, 2011

County:
Kossuth

Location Description:
US 18 & Main St

Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A



Raw Data-Combination Trucks:

	E Leg		S Leg		W Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	3	8	1	2	12	3
08:00	3	31	3	3	18	2
11:00	6	30	1	3	20	2
12:00	3	12	5	4	12	2
15:00	1	8	3	2	16	3
16:00	0	9	1	2	11	0
17:00	0	9	0	4	8	3

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Kossuth Prepared by: David Little Date Prepared: Jul 27, 2012

Intersection: Intersection of US 18 and N. Main Street in the City of Algona

Improvement

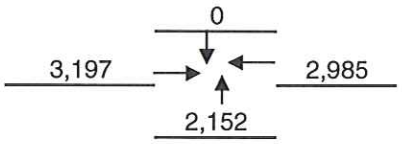
Proposed Improvement(s): Installation of new Traffic Signals with RR Signal Interconnection, installation of new RR gates, cantilevers and prediction circuitry.

$ 415,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	22	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 415,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Count 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,041,910	Current Annual Entering Veh., **AEV** = DEV * 365
10,419	veh / day, Final Year DEV, **FDEV**
50.75	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.5%	Projected Traffic Growth (0%-10%), **G**
8,334	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2007 First full year --> 2011 Last full year 5.0 years, Time Period, **T**

0 Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$	-
		4	Major Injuries @	$240,000	$	960,000
9	Injury Crashes →	4	Minor Injuries @	$48,000	$	192,000
		5	Possible Injuries @	$25,000	$	125,000
12	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	88,600
21	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,365,600

4.20	Current Crashes / Year, **AA** = TA / T	1.38	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 65,029	Cost per Crash, **AVC** = LOSS / TA	$ 734,954	Present Value of Avoided Crashes, **BENEFIT**
70.1	Total Expected Crashes, **TECR** = CR x TMEV		
0.92	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 60,086	Crash Costs Avoided in First Year, AAR x AVC		
15.4	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 = $734,954 : $415,000 = **1.77** : 1

A.

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Dysart Rd. (V37) fr Eagle Rd. to 0.75 mi North of Schrock Rd.

Applicant: Black Hawk County

Contact Person: Lynn Kloberdanz Title: Engineering Technician

Complete Mailing Address: 316 E 5th St. Rm. 211
Waterloo, Iowa 50703

Phone: 319-833-3008 (Area Code) E-Mail: lkloberdanz@co.black-hawk.ia.us

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 2,212,265

Safety Funds Requested $ 450,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the County of Black Hawk

Signed: John M. Miller 8-14-12

Signature Date Signed

John Miller, Chair, Board of Supervisors

Typed Name

Attest: Grant Veeder

Signature Date Signed

Grant Veeder, County Auditor

Typed Name

Dysart Rd. V37 Safety Improvement Project B.

A safety improvement project is planned for 4.75 miles of Dysart Rd., route V37 from Eagle Rd. (D46) on the south limit to 0.75 mile north of Schrock Rd. (D35). The speed limit throughout the road segment is 55 mph. The Average Annual Daily Traffic (AADT) over the four miles from D46 to D35 is 1210 and the last 0.75 mile is 1550 AADT.

Basic Materials rock quarry is located one-half mile north of D46 on Dysart Rd. which generates a high percentage of loaded trucks.

Manual traffic counts were taken in early June 2012 by county personnel at the intersection of Dysart Rd. and Schrock Rd. (D35) that include turning movements and 15-minute interval counts. The truck counts varied from 296 AADT (20%) south of D35 to 226 AADT(15%) north of D35. The count summary sheet is included with this application.

Dysart Road is 22 feet wide, paved with asphalt and has granular shoulders four feet wide. The road was originally graded for paving in the early 1960s and surfaced with six (6) inches of asphalt-treated base and a ¾" asphalt overlay in 1964. A second asphalt overlay was placed three (3) inches deep in 1973. In 1999, surface milling was performed to level the longitudinal ruts and a two (2) inch asphalt overlay was placed.

Currently the north-bound lane, which carries loaded trucks from the quarry, again has longitudinal ruts that vary from 0.5" to 2.0" depths. The south-bound lane has less rutting, but has extensive cracking in the center of the lane.

The 10-year crash total for this 4.75 mile segment is 24 crashes, including 2 major injury, 2 minor and 4 possible injury crashes. Of the 24 crashes, nine were attributed to animals, four (4) to swerving/evasive action and four (4) to running off the road. Nine (9) or 37.5% of the crashes occurred during snow, ice, slush or wet conditions.

Black Hawk County proposes to repave this road by milling approx. five (5) inches of asphalt and overlaying with eight (8) inches of PCC. The improvements will also include two (2) feet of PCC paved shoulder with edgeline rumble strips.

These improvements will improve surface friction, prevent rutting, alert drivers who leave the travel lanes and provide two additional feet of hard-surfaced recovery area for swerving vehicles to regain control. In addition, improvements will be made to the sight triangles at the D35 intersection.

C.

C.

Dysart Rd. Safety Improvements - Cost Estimate

Eagle Rd. to 3/4 mi north of Schrock Rd. (4.75 miles)

		Amount
Scarification		$91,959
PCC, 8" depth x 22' width		$1,532,650
PCC, 8" depth for wider paved radii @ corners		$90,000 *
PCC, 8" depth x 2' wide paved shoulder (x2)		$285,000 *
Excavation, Class 13, Widening		$29,868 *
Milled Shoulder Rumble Strips		$27,588 *
Shoulder Rock		$38,000
Driveways		$12,000
Pavement Markings		$5,200
Traffic Control		$20,000
Mobilization		$60,000
	subtotal	**$2,192,265**
Right-of-Way for daylighting		$20,000 *
	Total	$2,212,265

*Safety Improvement Items

Funding

Safety Funds	$450,000
Farm-to-Market	$1,762,265
	$2,212,265

D.

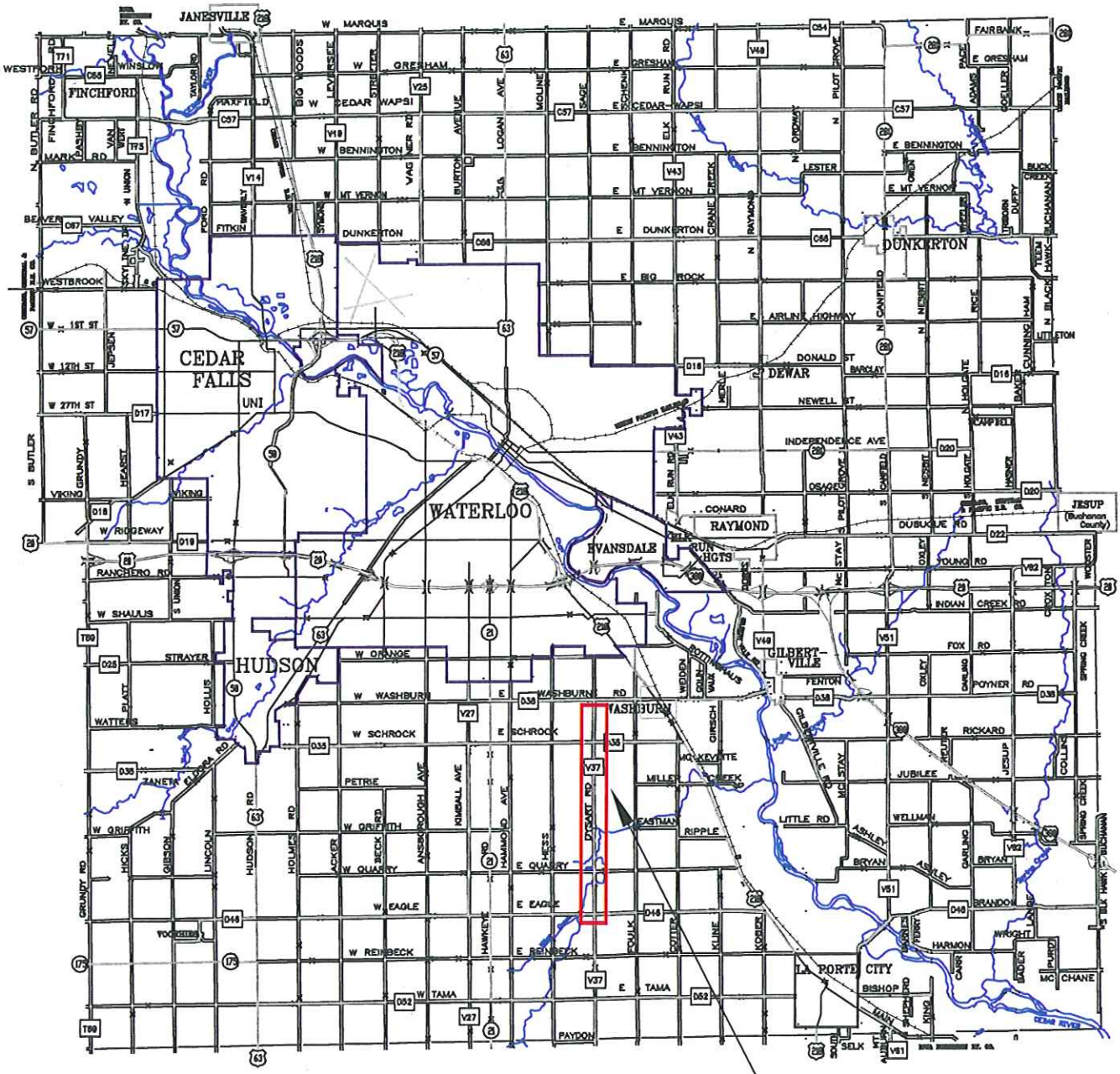
Dysart Rd. V37 Safety Improvement Project D.

From Eagle Rd. to 0.25 mile South of Washburn Rd.

The Safety Improvement project for 4.75 miles of Dysart Rd. (V37) from Eagle Rd. (D46) to 0.25 mile south of Washburn Rd. will be designed during calendar year 2013 for a Spring 2014 letting with construction to take place from May to October 2014.

Project Completion Date will be no later than **November 2014**.

BLACK HAWK COUNTY, IOWA

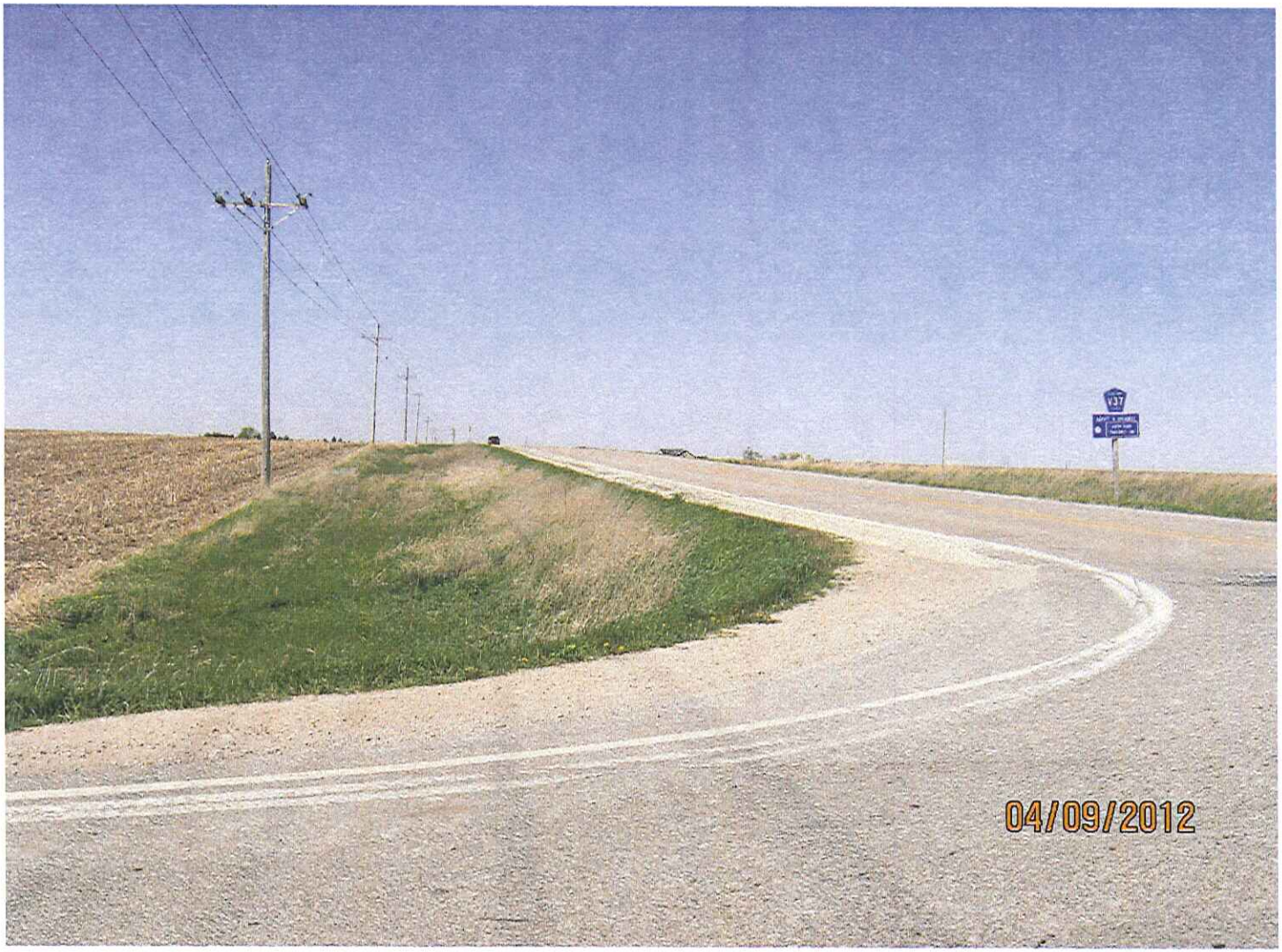


Proposed Safety Improvement Project

Dysart Rd. from Eagle Rd. looking North

F.

Dysart Rd. from Eagle Rd. looking Northeast



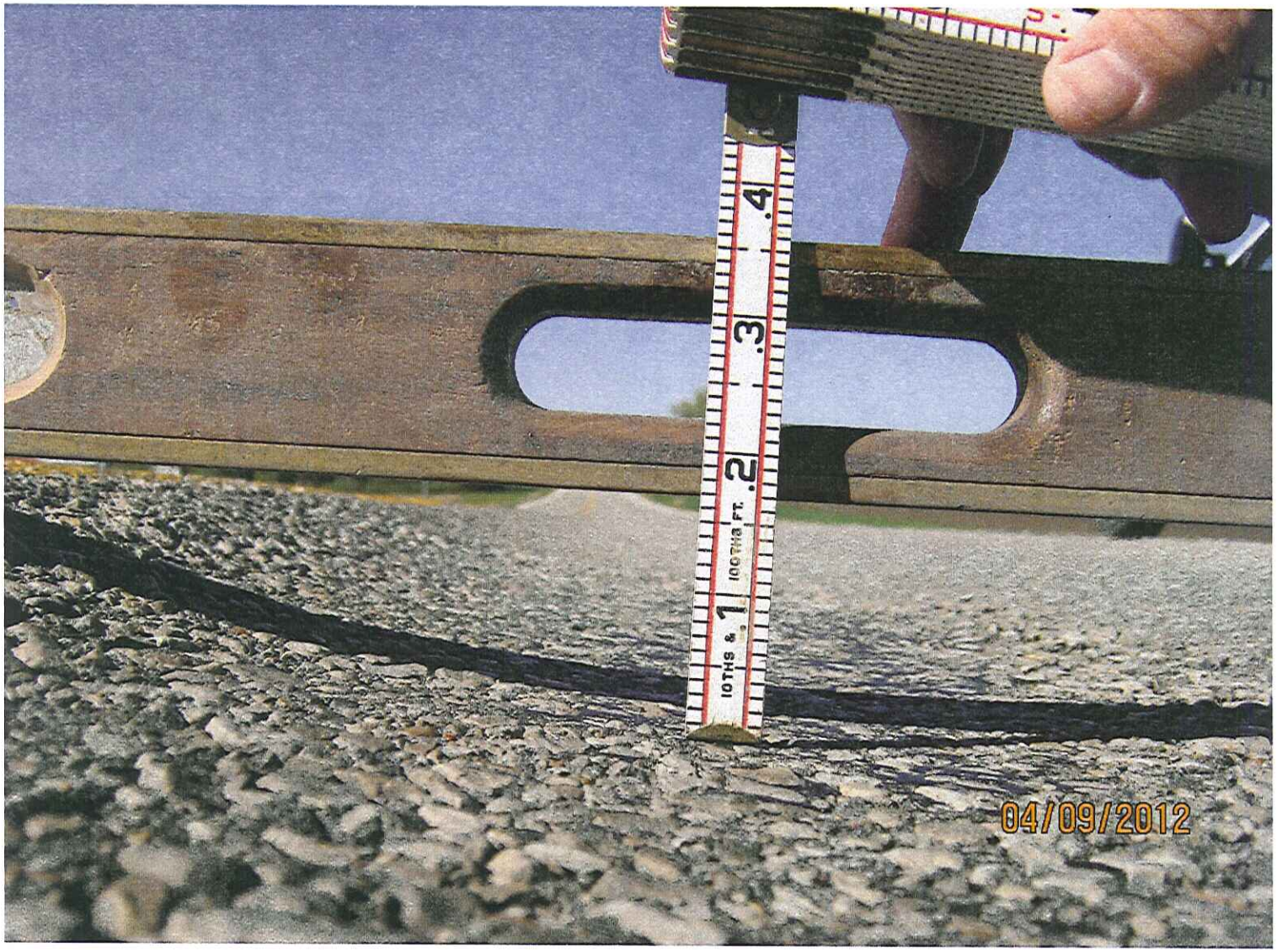
Dysart Rd. from Schrock Rd. looking North

F.

Dysart Rd. from Schrock Rd. looking South

Dysart Rd. rutting ¼ mile North of Schrock Rd.

Dysart Rd. rutting



Dysart Rd. – Depth of Ruts

Dysart Rd. V37 Safety Improvement Project G.

The existing pavement is 22 feet wide. Two feet of the existing 4-ft. shoulders will be paved.

The project will only require additional right of way for daylighting at Schrock Rd. and Eagle Rd. intersections. The plans have not been developed to the point of defining specific right of way needs.

H-1

Quarry Rd.

Eagle Rd. D46

H-2

Schrock Rd. D35

H-3

Schrock Rd. D35

J.

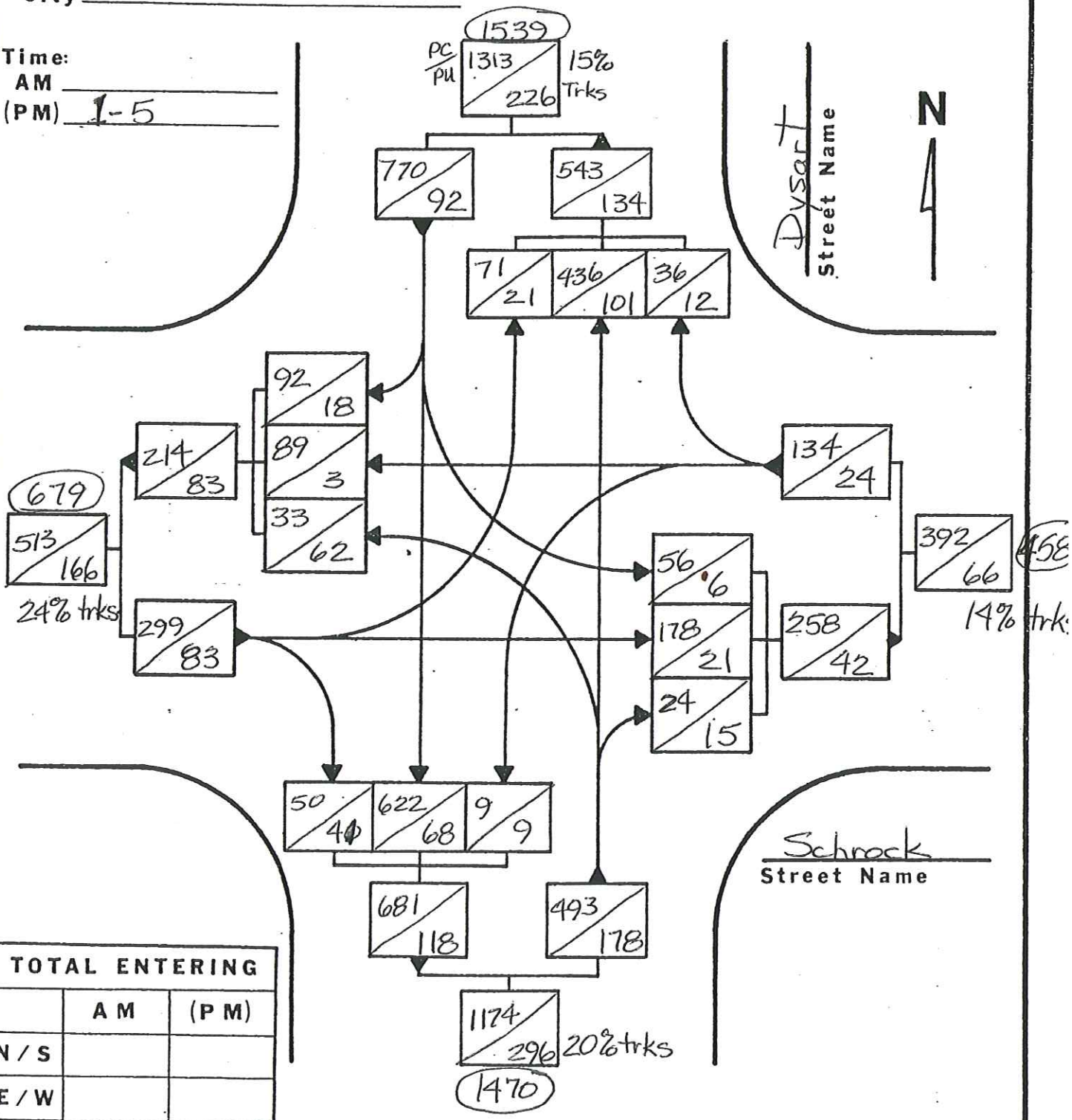
GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

Observer Corina Lickness Date Jun 7, 2012 Day Thurs.

Intersection of Dysart Rd (V37) and Schrock Rd. (D35)

City

Time:
AM
(PM) 1-5



TOTAL ENTERING		
	AM	(PM)
N/S		
E/W		
Total		

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TURNING MOVEMENT FORM

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 1 - 1:15 DAY Thursday WEATHER Partly Cloudy

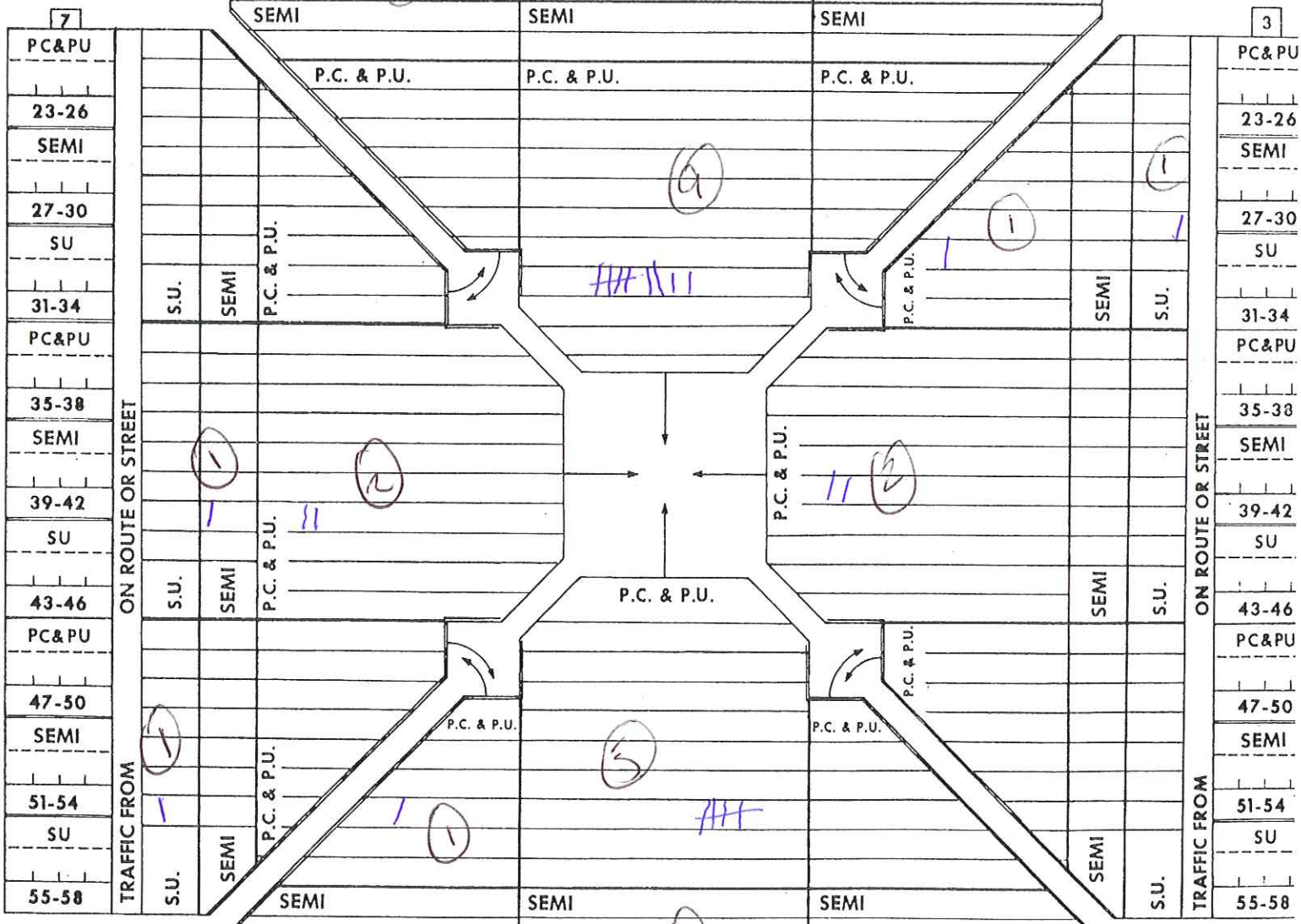
REMARKS Pysart Rd. & ~~Washburn~~ Schrock Rd

20	21
HR. CODE	

1

PC&PU	SEMI	SU	PC&PU	SEMI	SU	PC&PU	SEMI	SU
23-26	27-30	31-34	35-38	39-42	43-46	47-50	51-54	55-58

TRAFFIC FROM ON ROUTE OR STREET



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TRAFFIC FROM ON ROUTE OR STREET

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 1:15 - 1:30 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & ~~Washburn~~ Schrock Rd

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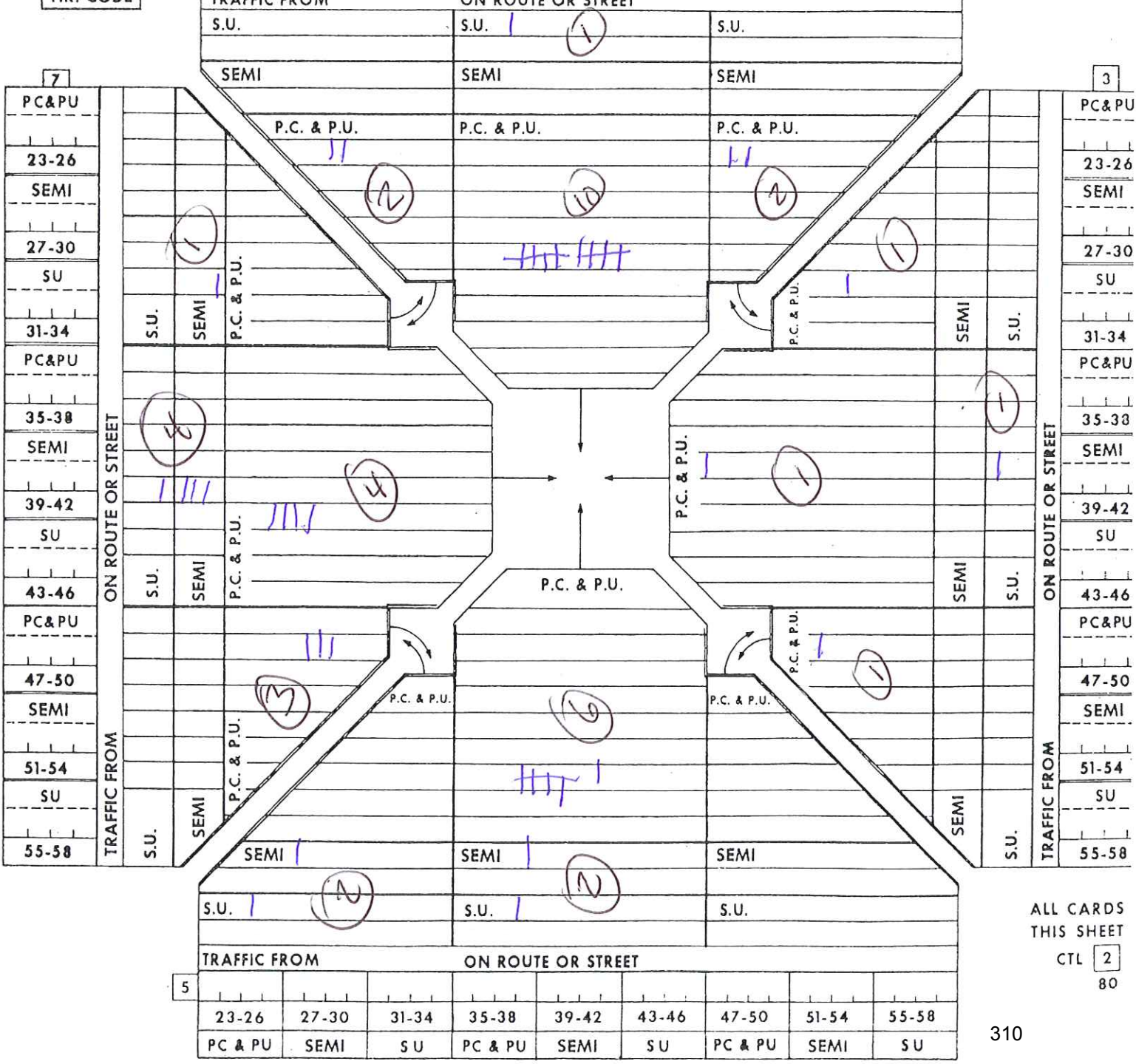

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TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 1:30 - 1:45 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd & ~~Washburn~~ Schrock Rd

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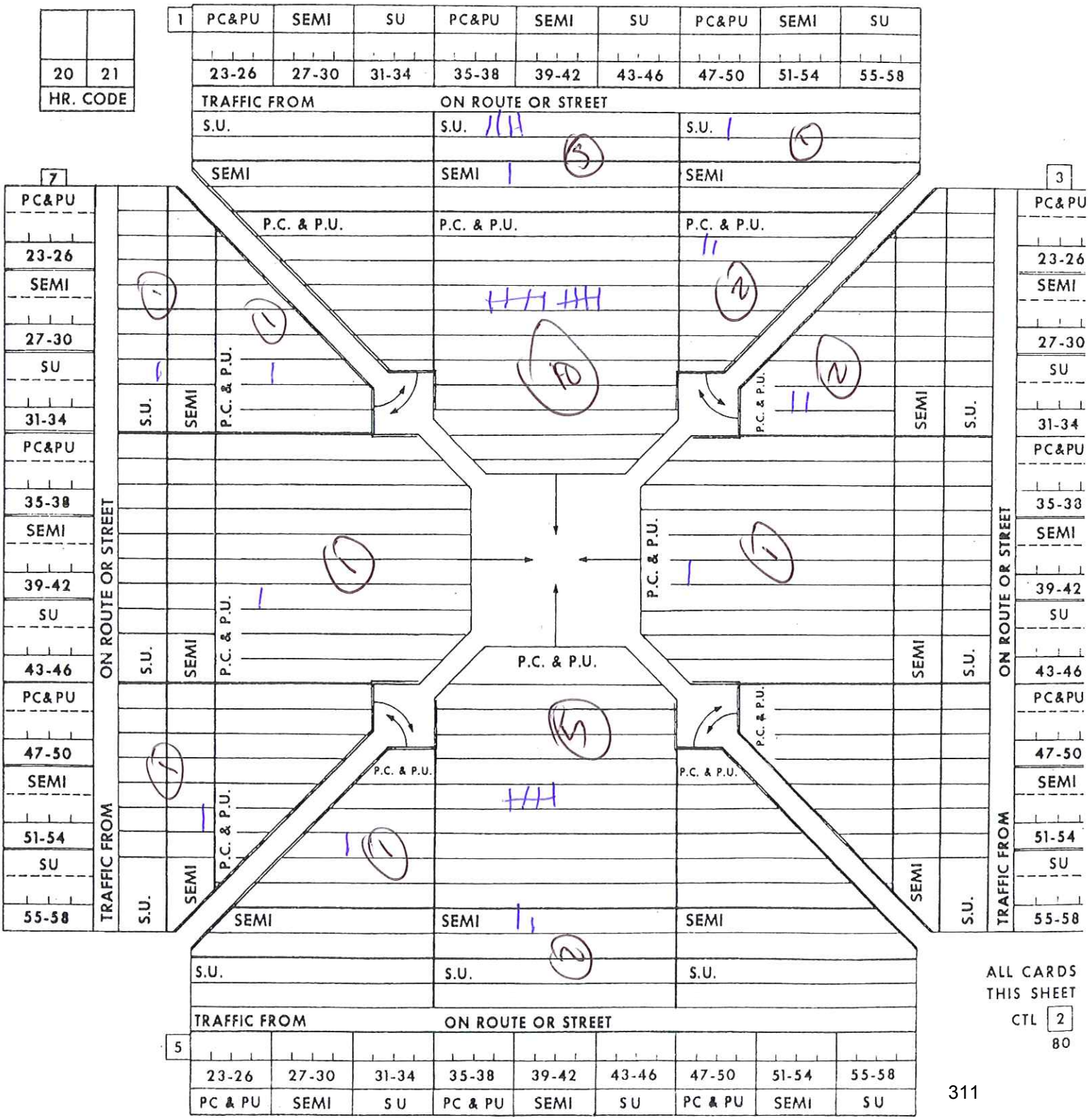

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 1:45 - 2:00 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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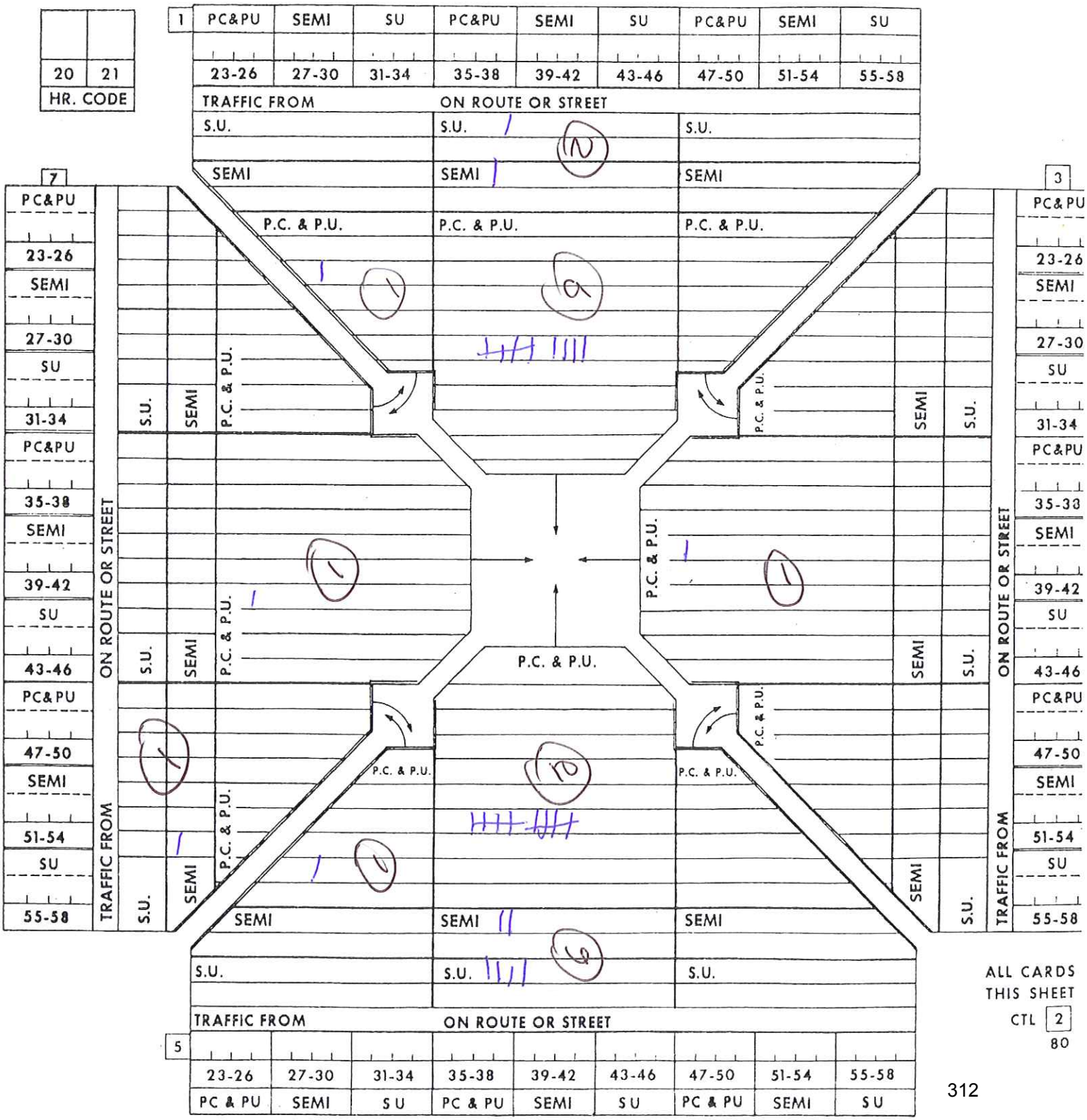

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TURNING MOVEMENT FORM

Iowa Department of Transportation

TRANSPORTATION INVENTORY

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HOUR 2:00 - 2:15 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd & Washburn Rd

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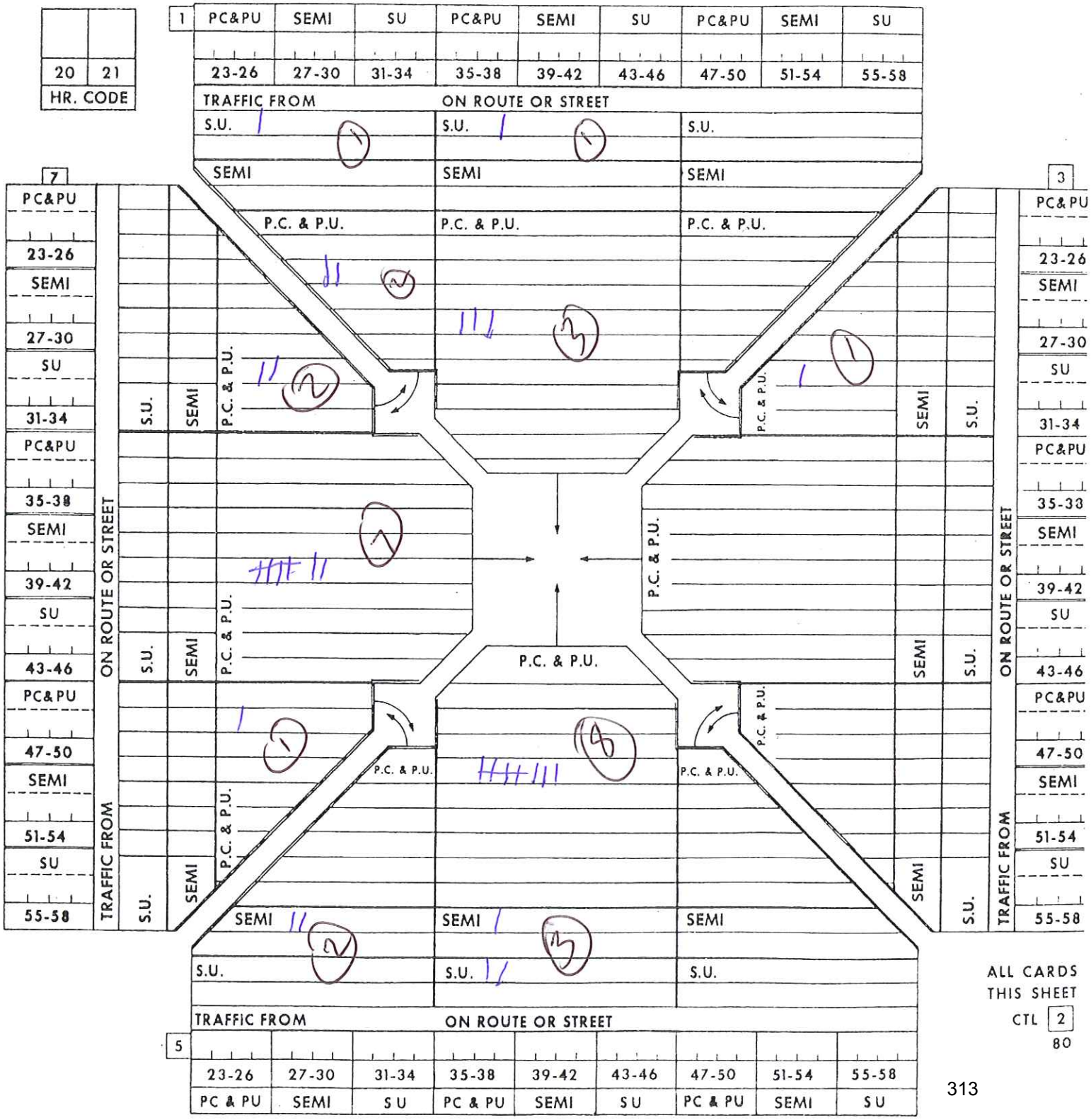

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T.I., 3- 83

Iowa Department of Transportation

TRANSPORTATION INVENTORY

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HOUR 2:15 - 2:30 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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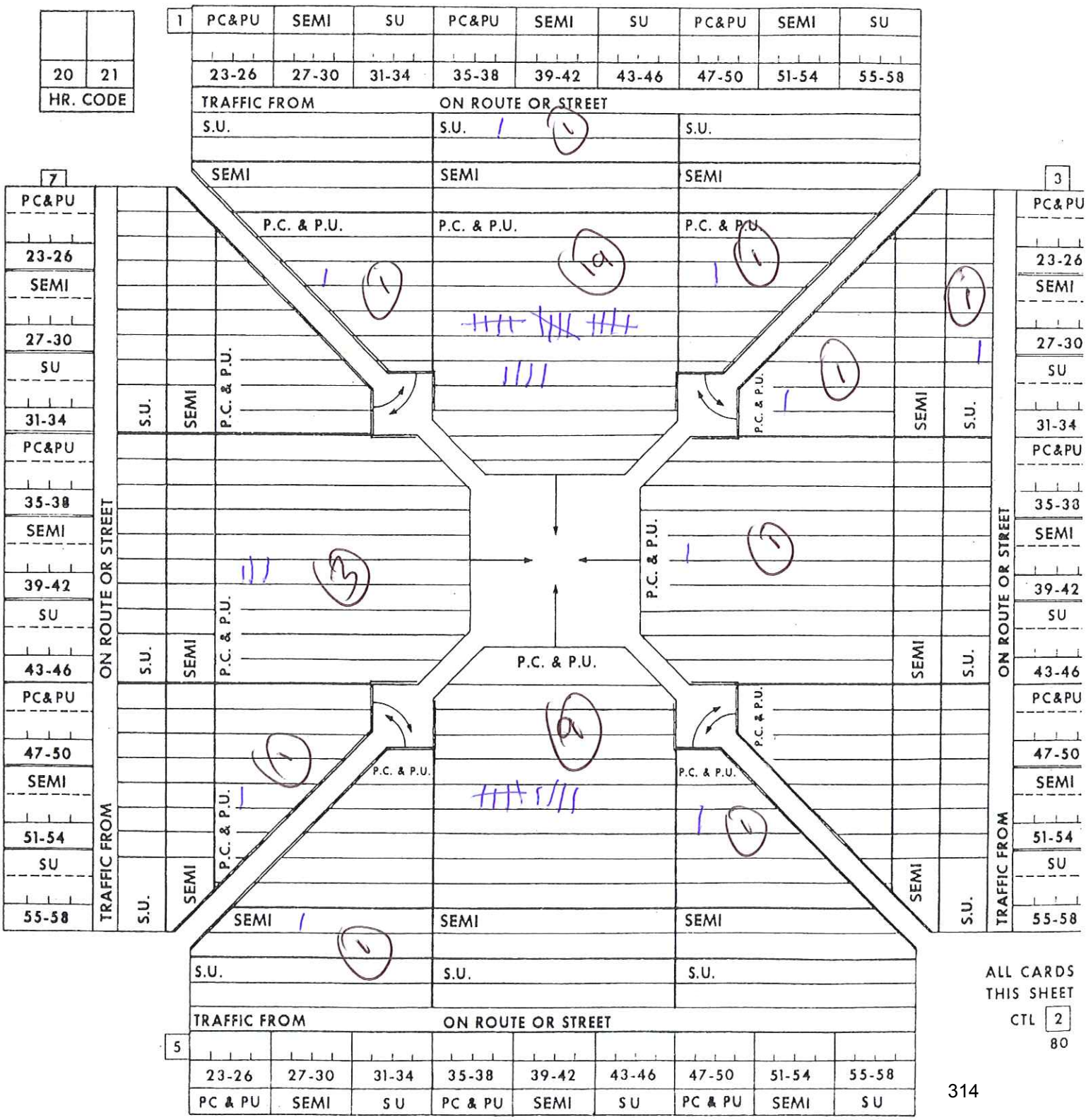

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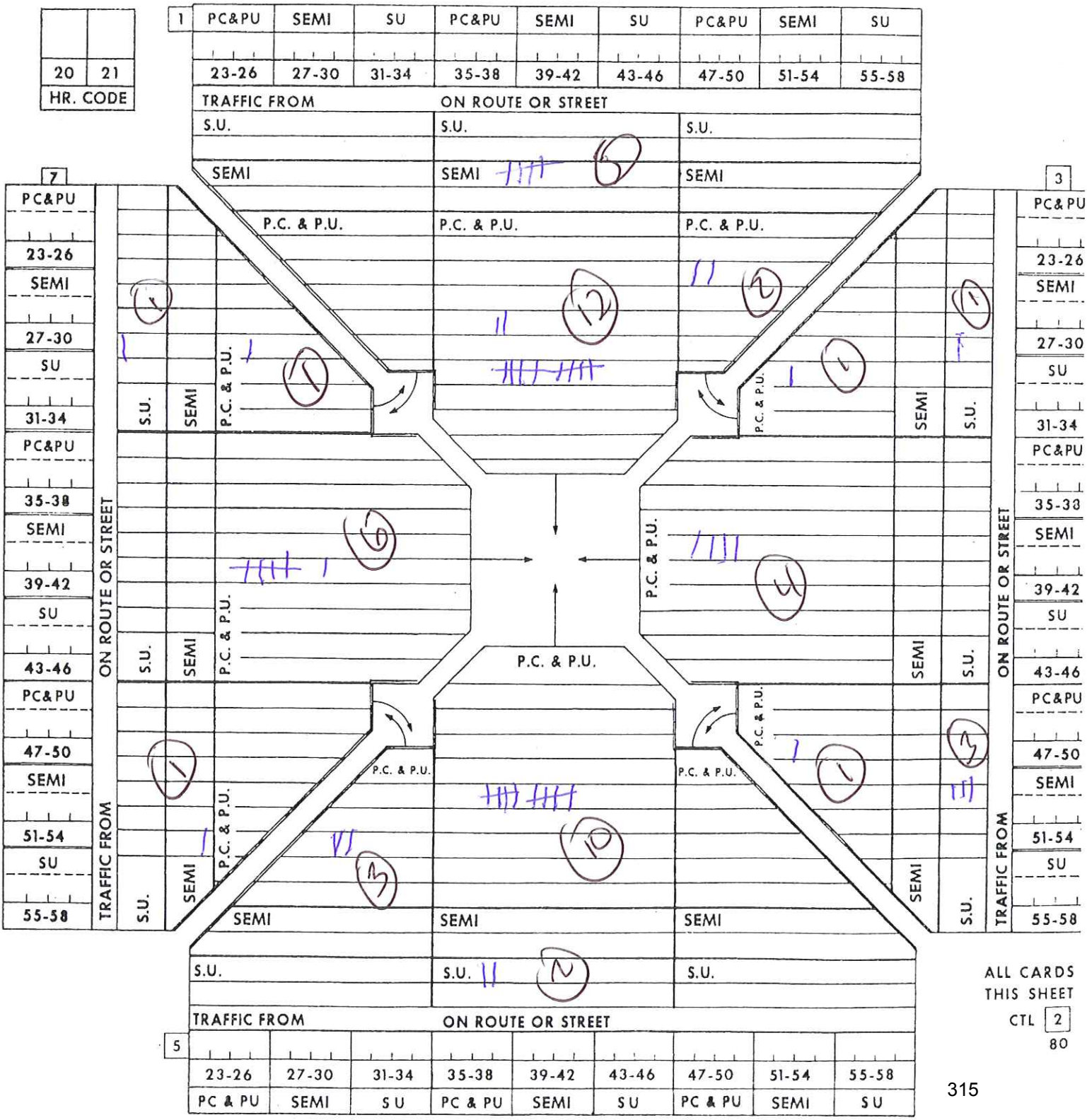

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TRANSPORTATION INVENTORY

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HOUR 2:45 - 3:00 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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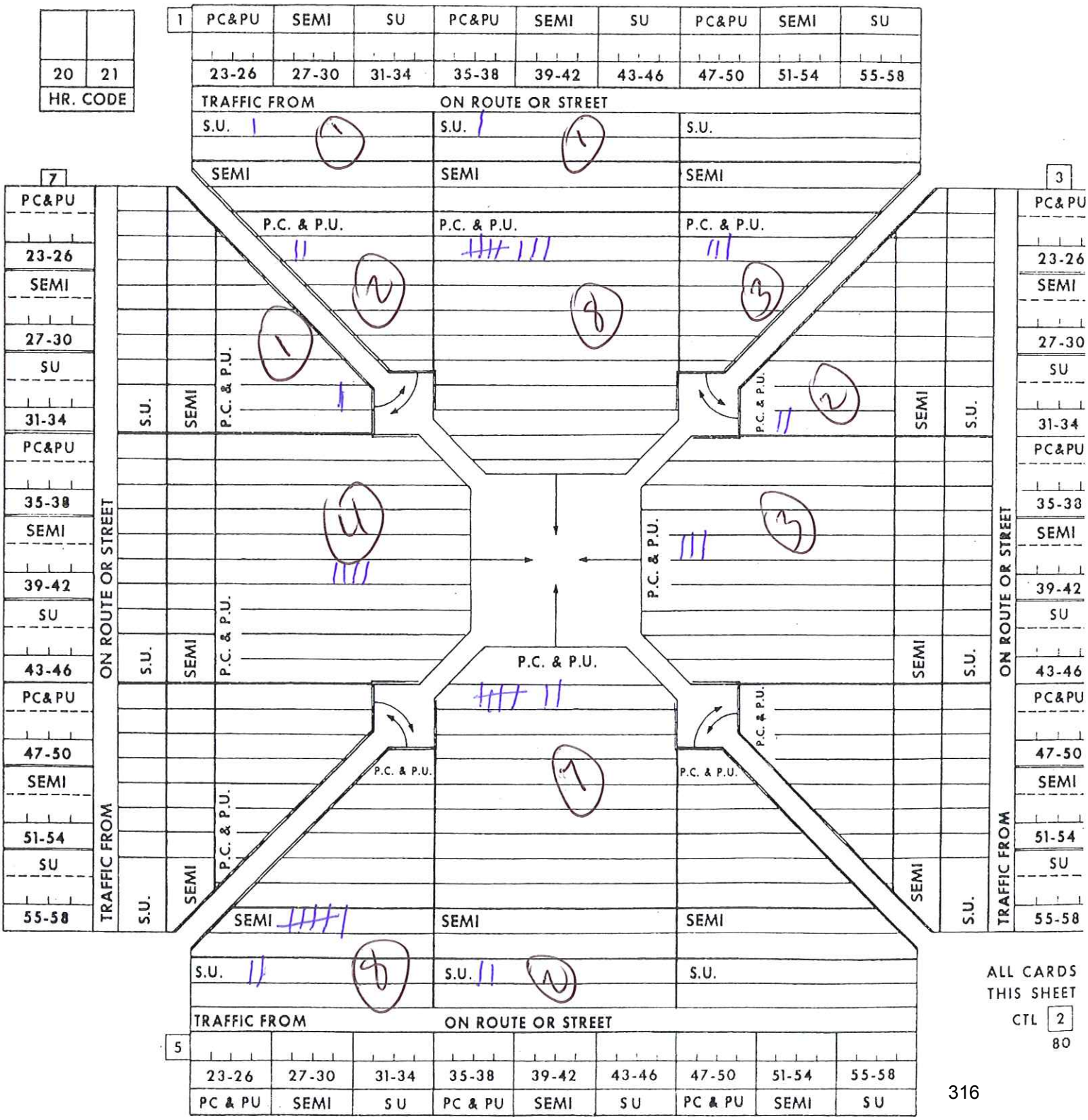

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TRANSPORTATION INVENTORY

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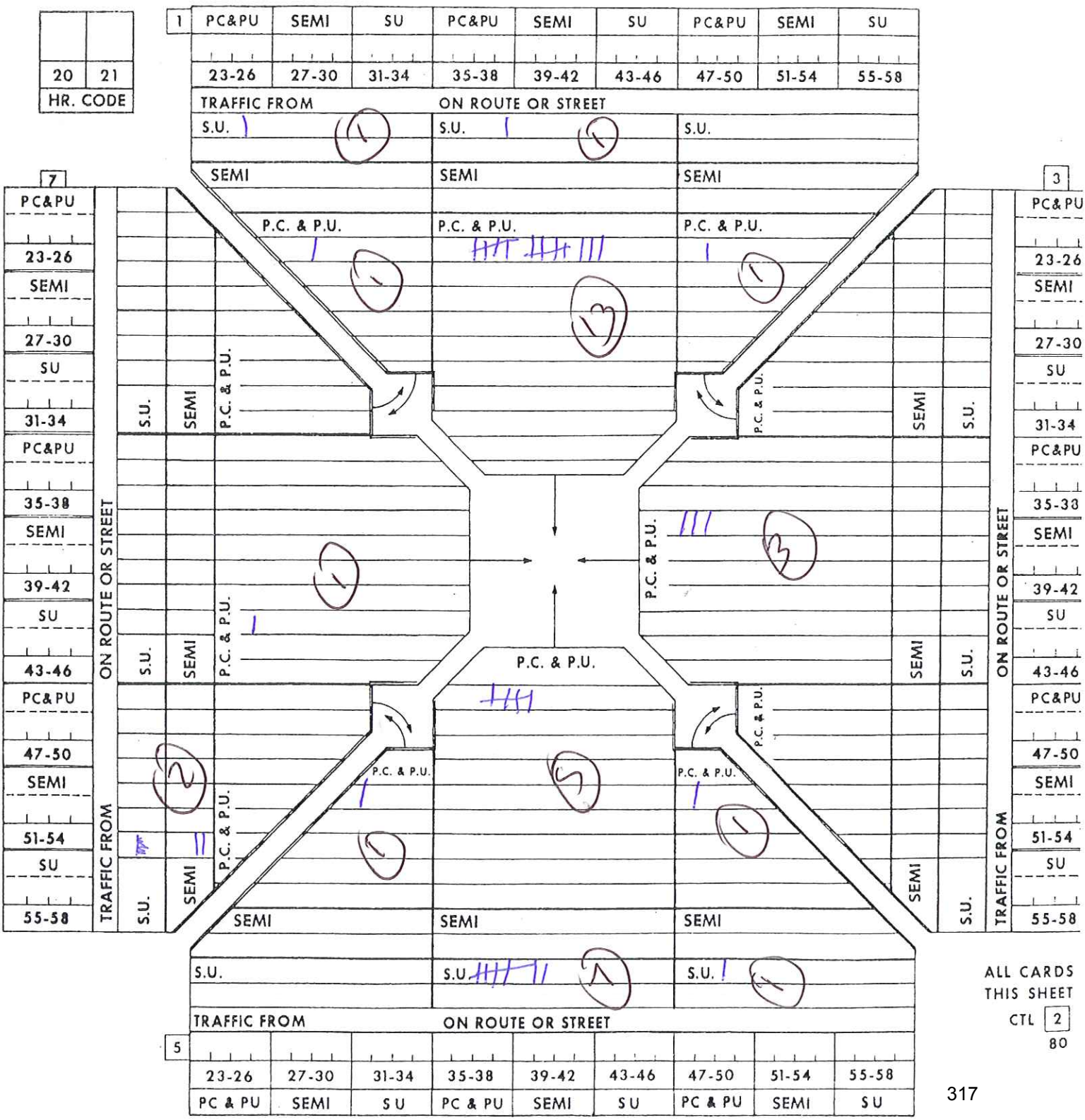

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Iowa Department of Transportation

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REMARKS Pysart Rd. & Washburn Rd

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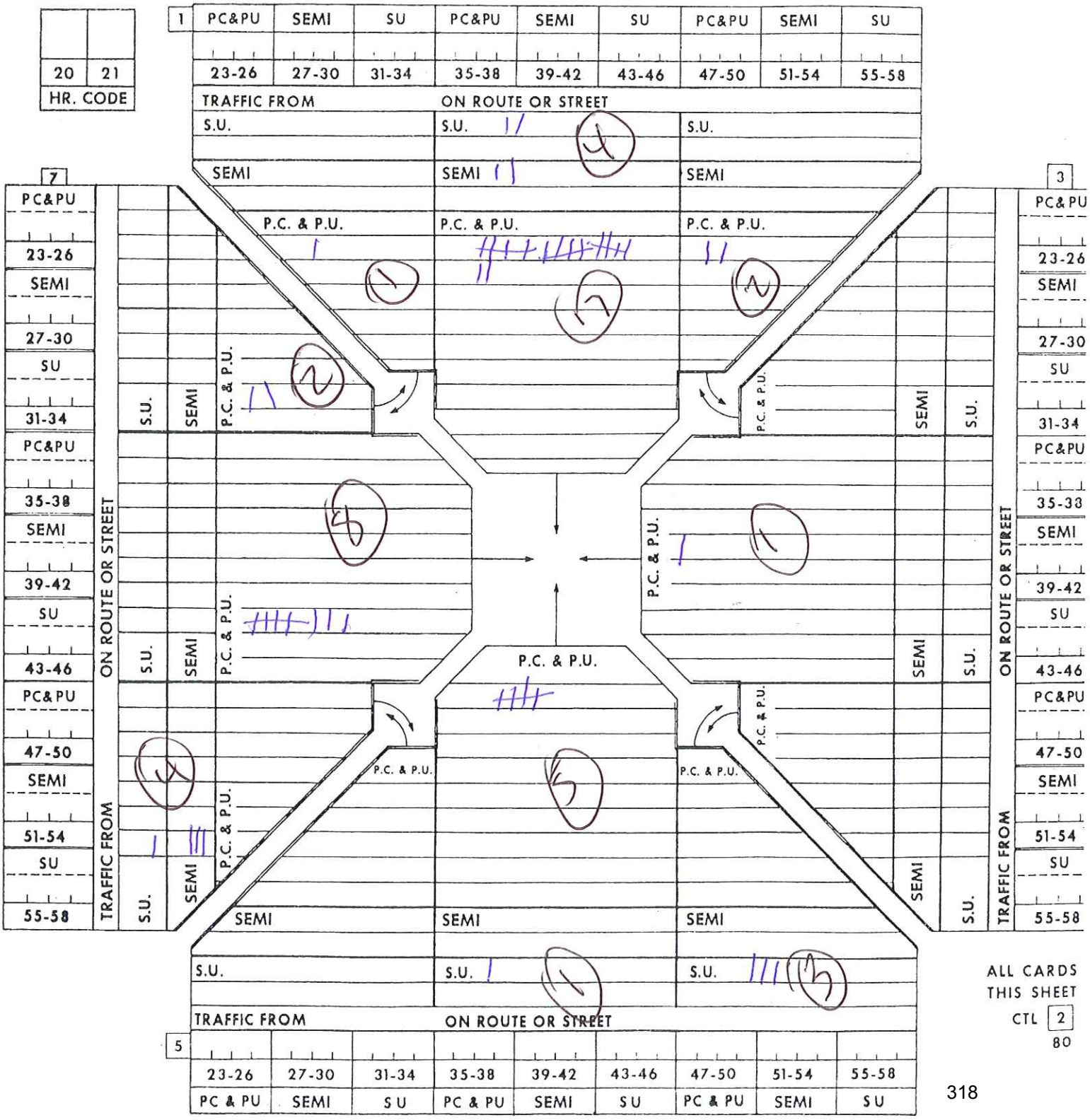

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HOUR 3:30 - 3:45 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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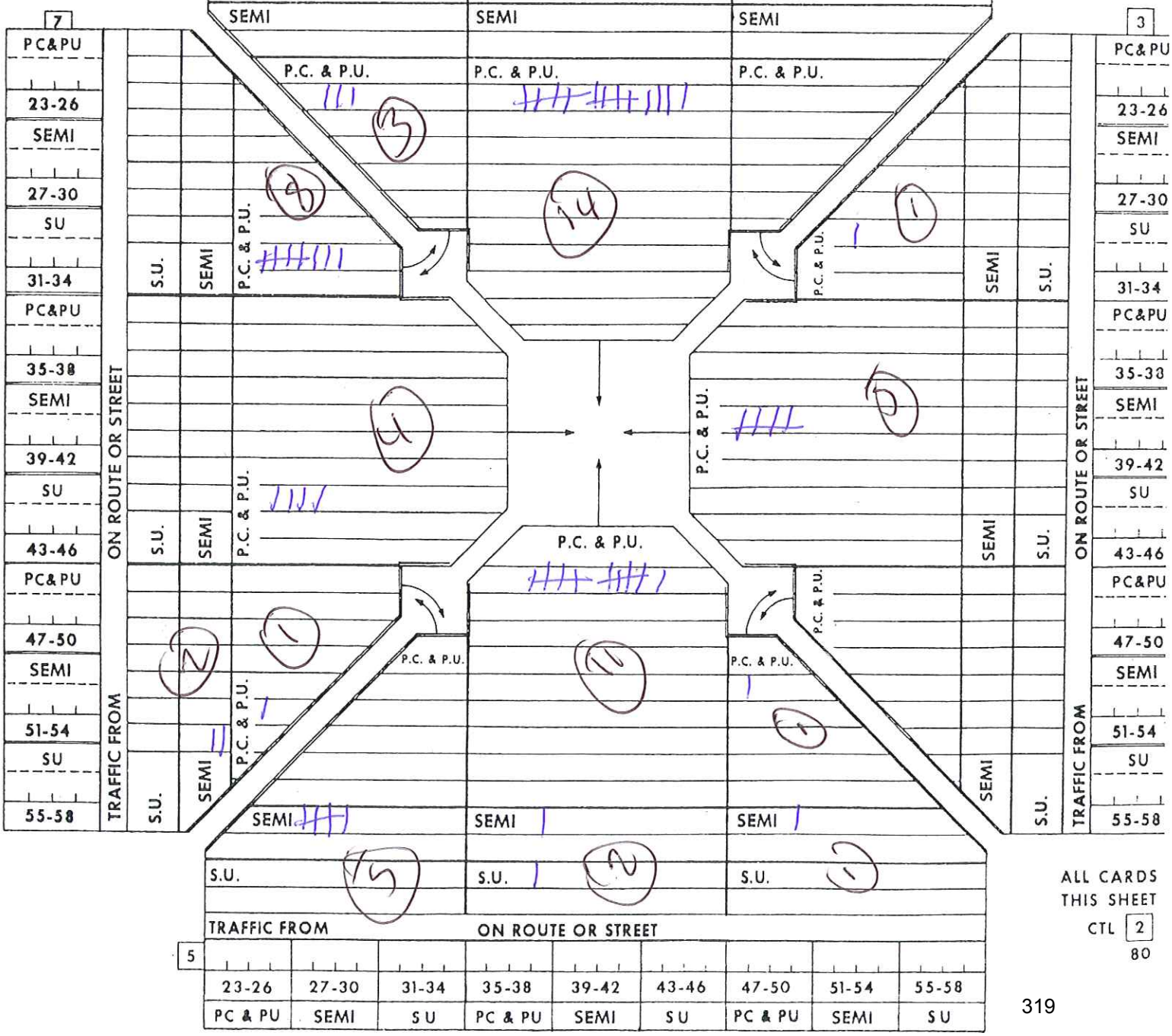

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

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HOUR 3:45 - 4:00 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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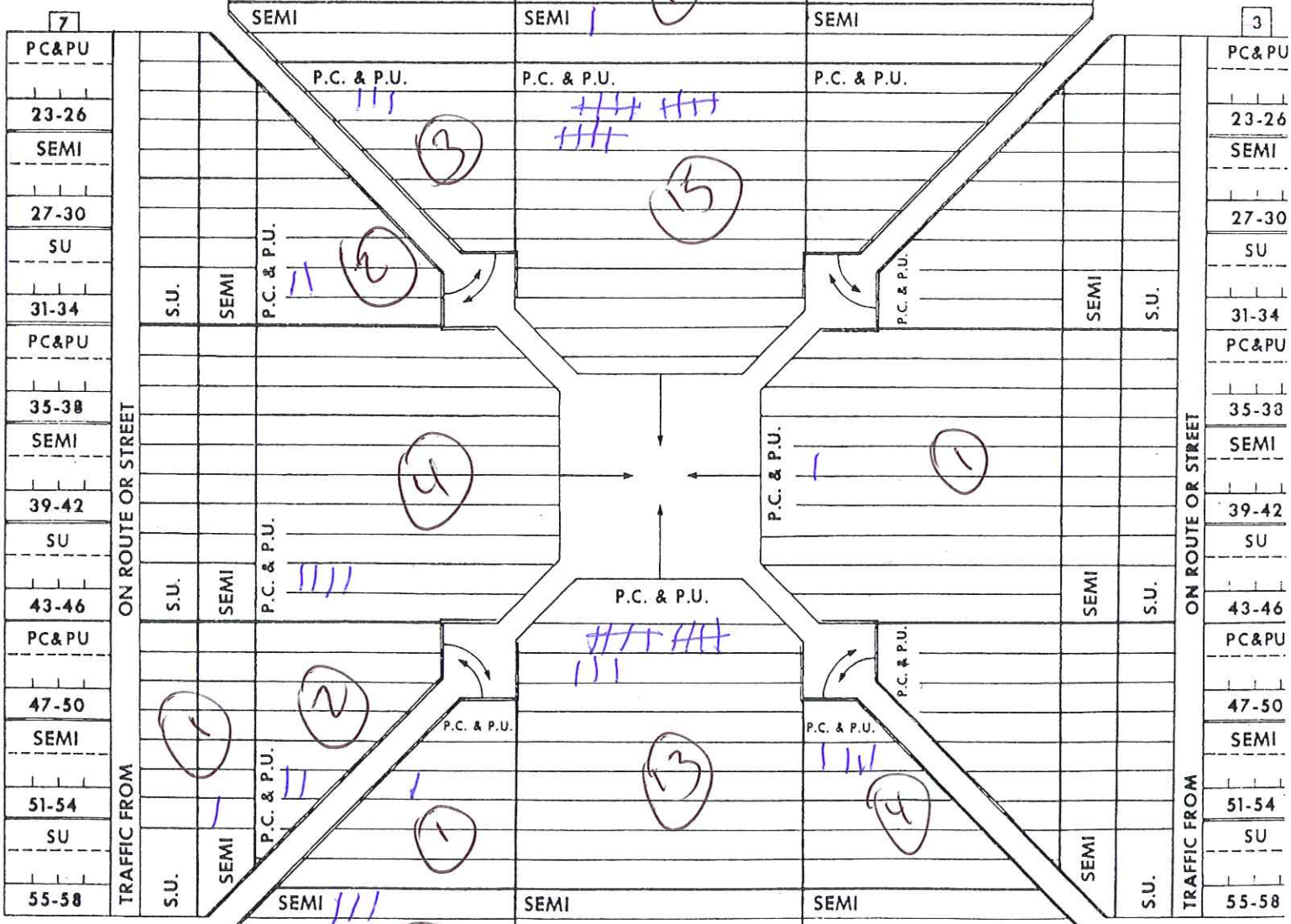

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 4:00 - 4:15 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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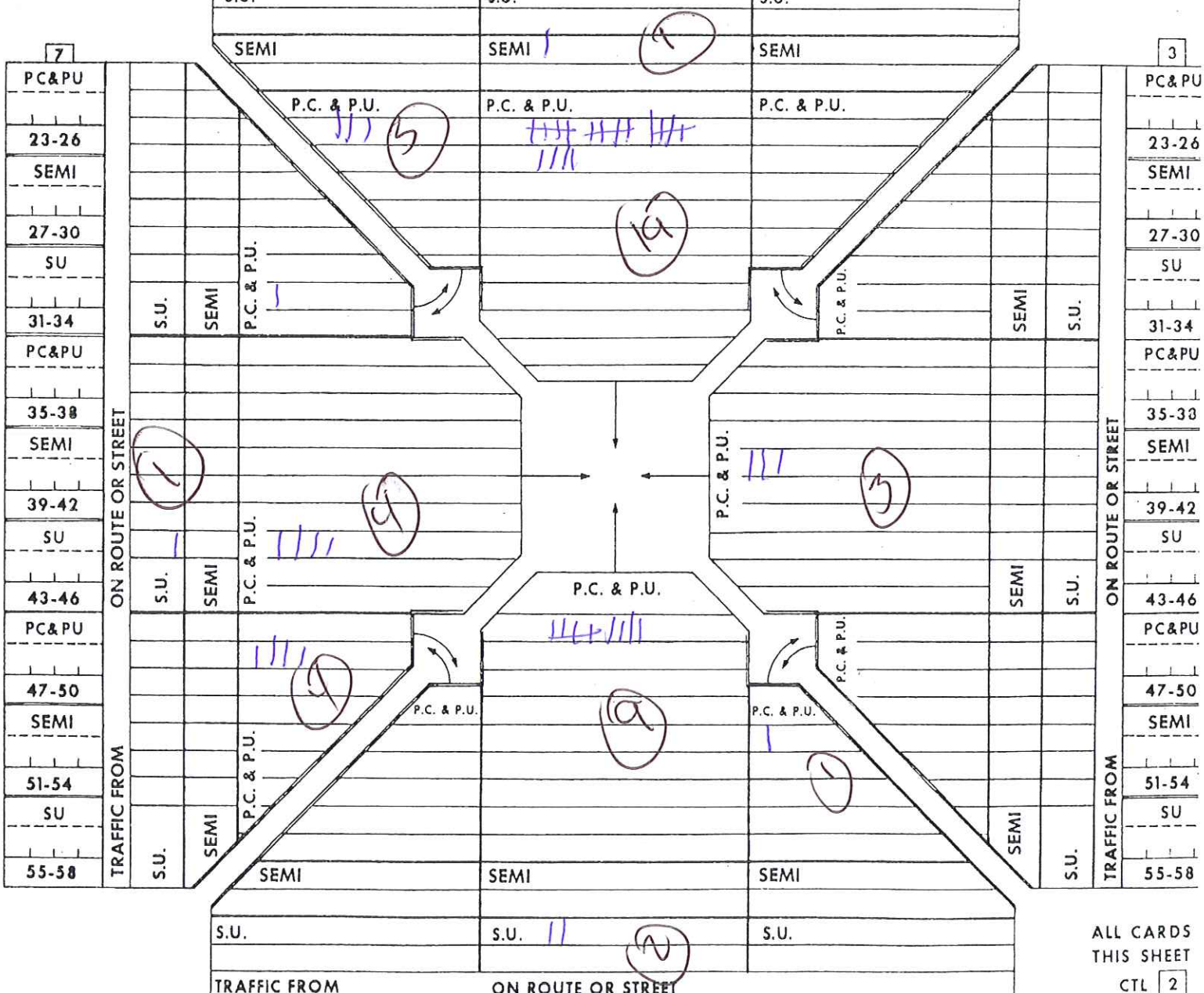
TRAFFIC FROM ON ROUTE OR STREET



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Iowa Department of Transportation

TRANSPORTATION INVENTORY

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HOUR 4:15 - 4:30 DAY Thursday WEATHER Partly Cloudy

REMARKS Dysart Rd. & Washburn Rd

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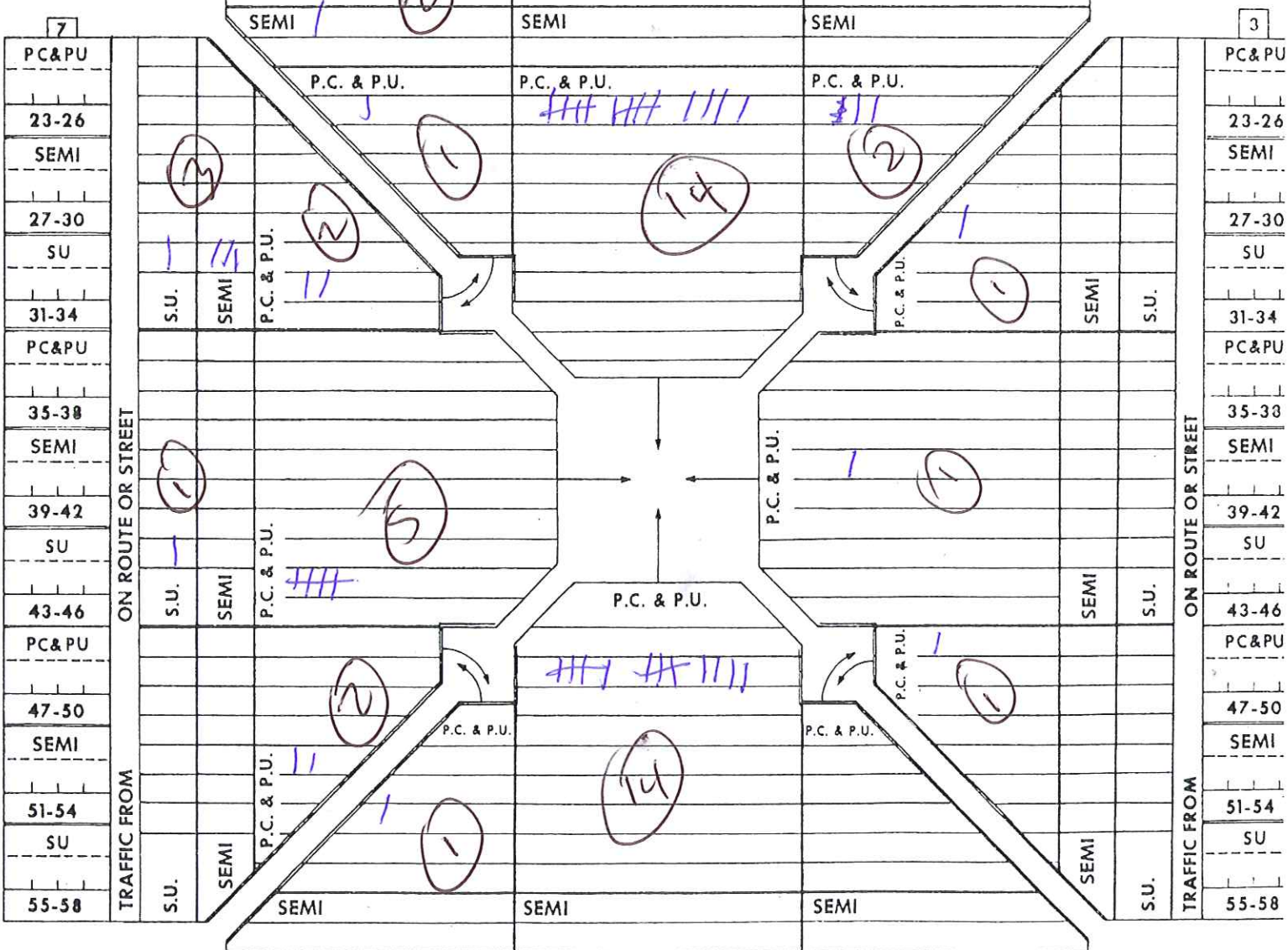

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Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corinna Lickness

HOUR 4:30 - 4:45 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd

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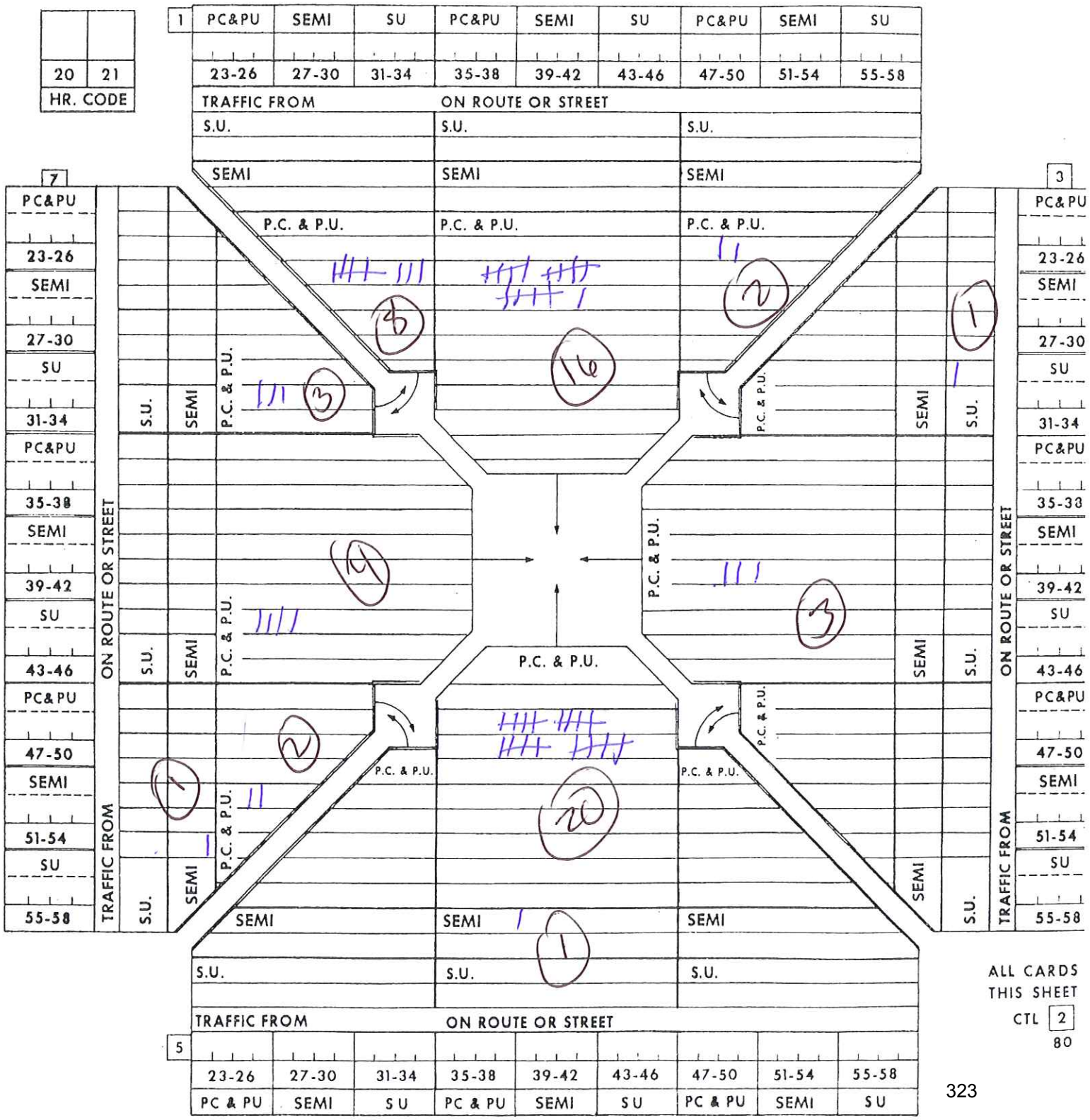

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TURNING MOVEMENT FORM

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T.I., 3-83

Iowa Department of Transportation

TRANSPORTATION INVENTORY

NORTH

STATION NO. _____ DATE June 7, 12 COUNTER Corina Lickness

HOUR 4:45 - 5:00 DAY Thursday WEATHER Partly Cloudy

REMARKS Pysart Rd. & Washburn Rd Schrock

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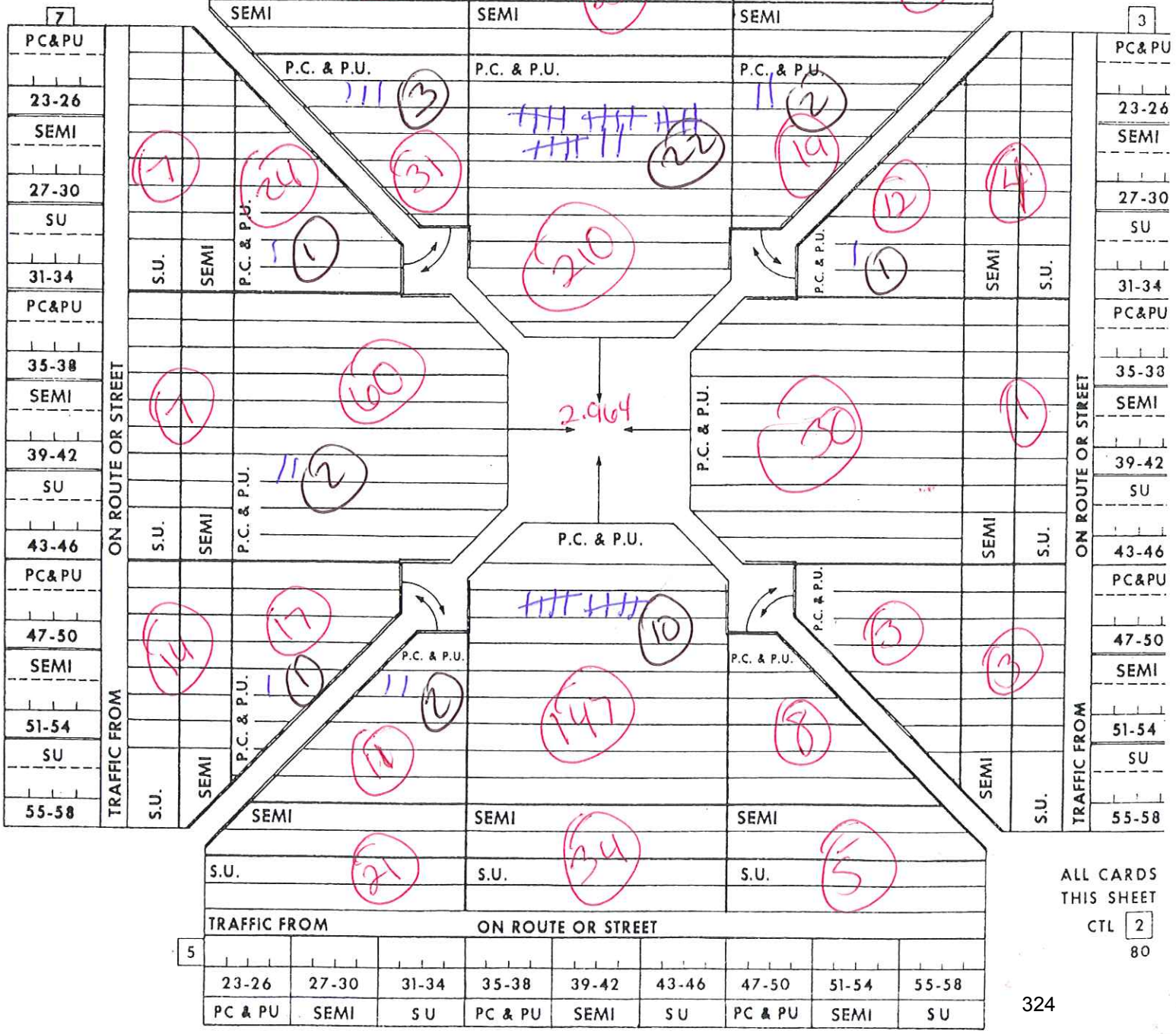

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L.

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Black Hawk Prepared by: Lynn Kloberdanz Date Prepared: Jul 20, 2012

Location: Dysart Rd (V37) from D46 to 0.75 mi north of Schrock Rd.

Improvement

Proposed Improvement(s): Resurface with PCC, increase sight distance at intersections, pave shoulders and install edgeline rumble strips on roadway with shoulder width less than 5 feet

$ 450,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	77	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
		$ 450,000	Present Value All Costs, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2009 Date of traffic count

Length (mi.)	Two-way veh/day	Description
4.00	1,210	D46 to D35
0.75	1,550	North of D35
4.75	miles total	

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

6,003 Current Vehicle Miles / Day, **VM**

8,079 End of Life Veh. Miles / Day

2,190,913 Current Veh. Miles / Year, **AM**

37,888,363 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

2002 First full year --> 2011 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

Fatal Crashes →	0	Fatalities @	$3,500,000	$	-
	2	Major Injuries @	$240,000	$	480,000
8 Injury Crashes →	2	Minor Injuries @	$48,000	$	96,000
	6	Possible Injuries @	$25,000	$	150,000
16 Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR- enter all Property Costs of all crashes:		$	174,700
24 Total Crashes, **TA**			Total $ Loss, **LOSS**	$	900,700

2.40	Current Crashes / Year, **AA** = TA / T	109.5	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 37,529	Cost per Crash, **AVCR** = LOSS / TA	$ 876,242	Present Value of Avoided Crashes, **BENEFIT**
41.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
1.85	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 69,354	Crash Costs Avoided in First Year, AAR x AVCR		
32.0	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 = $876,242 : $450,000 = **1.95** : 1

Iowa Department of Transportation

Rev. 3/08

ORIGINAL

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Four- to Three-Lane Convesion, IA 3 in Clarion

Applicant: Iowa DOT - District 2

Contact Person: David L. Little Title: Assistant District Engineer

Complete Mailing Address: 1420 Fourth Street SE

Phone: 641-422-9464 (Area Code) E-Mail: david.little@dot.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): City of Clarion

Contact Person: Jon DeVries Title: Director of Public Works

Complete Mailing Address: City Hall, 121 1st SW, Clarion, IA 50525

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 75,000

Safety Funds Requested $ 75,000

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Iowa Department of Transportation

Signed: Vicki L Dumdei 8-14-12

Signature Date Signed

Vicki L. Dumdei

Typed Name

Attest: David L Little Aug 14, 2012

Signature Date Signed

David L. Little

Typed Name

DOCUMENT A

From: Jon DeVries [mailto:clarion@mchsi.com]
Sent: Tuesday, August 07, 2012 2:19 PM
To: Clark, Robert [DOT]
Cc: Kathy Showalter
Subject: Fw: IA 3 Three-Lane Conversion in Clarion.

Robert
The Council decided to apply for the TSIP's last night. It was decided to wait for another presentation until we get a response from the DOT about the grant's. We decided to have public invited meeting to inform them of the three lane conversion and that it would be a good idea for your presentation at that time. We'll let you know as soon as we decide on the presentation date. Any questions, please let me know. Thanks.

Jon DeVries
Director of Public Works
City of Clarion
515-532-2847

DOCUMENT B

Existing Conditions:

The City of Clarion is the County Seat of Wright County and has a population of 2,968. (2000 Census)

The portion of the IA 3 corridor that lies within the corporate limits of Clarion is an undivided four-lane facility. The length of the four-lane undivided section is approximately 1.2 miles in length, is fully developed with a mix of commercial and residential properties, and is posted for a 30 mph regulatory speed through most of the corridor. There is on-street parking for short segments of the corridor in the downtown area.

There are three signalized intersections in the corridor, located at the IA 3 and R-38 (2nd Street W), IA 3 and Main Street, and IA 3 and 4th Street E intersections. Two of these three signal systems are not warranted, however, a review by Traffic and Safety suggests that these signals should be left in place. The signals at 4th Street E are warranted based on the school crossing warrant.

Crash History:

The existing four-lane corridor had experienced 52 reported crashes from 2007 through 2011, resulting in relatively few injuries (only 1 minor injury and 7 possible injuries). However, there were total property damage losses estimated at over $190,000 in the corridor during this time period.

The reported crashes are typical of urban, four-lane undivided corridors, including: 13 rear-end crashes, 6 angle on-coming left-turn crashes, 12 broadside crashes, 11 sideswipe same direction crashes, 1 head-on, and 1 sideswipe opposite direction crash. Many of these crash types are addressable through a four-lane to three-lane conversion.

Persaud, et. al, recommends a crash modification factor of 0.53 for all crashes when considering a four-lane to three-lane conversion project. This crash modification factor is consistent with documented results from past four-lane to

three-lane conversion projects in District 2, and has been used in preparing the benefit/cost analysis.

Source: Persaud, B., Lana, B., Lyon, C., and Bhim, R. "Comparison of empirical Bayes and full Bayes approaches for before–after road safety evaluations ." Accident Analysis & Prevention, Vol. 42, Issue 1, pp. 38-43 (2010)

Proposed Concept:

District 2 is requesting Traffic Safety Funds in the amount of $75,000 to convert IA 3 in Clarion from a four lane corridor to a three lane corridor with a continuous center turn lane. The project would start at 4th Street Northwest and end at Nelson Avenue Southeast. The District feels this project would address many of the crashes in this corridor:

- The number of Sideswipe Same Direction Crashes that have occurred along this corridor should be reduced because motorists will no longer be changing lanes.
- There should be a reduction in the number of rear end crashes involving left turning vehicles waiting for oncoming traffic to clear because these vehicles would be in the center left turn lane.

Other benefits would include:

- The 85th percentile speeds may be closer to the posted speed limits because the reasonable drivers would be setting the speed of the traffic queue.
- Pedestrians crossing IA 3 would only have 1 lane of approaching traffic in each direction to watch for rather than the present 4 lanes of traffic.
- Right turning semi traffic could be closer to the center of IA 3 as they start their turn movement which should help them in completing this sometimes challenging movement.
- The width of IA 3 near the intersection with R 38/2nd Street Southwest is approximately 44'. Normally, a 14' wide center left turn lane and 2 – 12' wide through lanes would be installed with the 3-lane conversion. This

would leave approximately 3' on each side of IA 3 which should give semi traffic more room to complete their right turn movements.

- This additional 3' on each side of IA 3 would also create more room between eastbound thru traffic and vehicles parallel parked on the south side of IA 3 thru the downtown area.

It is believed the existing signals will function after the 4-to-3 lane conversion without modification.

Also, District 2 has an IA 3 resurfacing project under development for Fiscal Year 2014 from Goldfield to Clarion. The project limits for the resurfacing project are undetermined at this time, but if this project extends into the City of Clarion, there will be necessary coordination between that project and this one. This application has been developed to include grooving and durable pavement markings. If the three-lane conversion will take place on schedule and be followed up in the near future by resurfacing, we will reconsider whether to use durable markings on the existing pavement.

The Benefit Cost Ratio for this conversion is calculated at 8.63 to 1.

Justification:

The Clarion City Council is in support of this project. District 2 staff have made a presentation to the City Council and staff concerning the benefits of a three-lane conversion in this community. We will also provide additional support to the city and community in terms of public education as the project nears. Clarion has a high number of trucks traveling through and turning in the corridor from nearby grain and ethanol facilities and manufacturing plants.

DOCUMENT C

Estimated Project Cost: Clarion IA 3 - Four-to-Three Lane Conversion

Item:	
Remove markings	$2,000
Grooving for markings	$6,000
Paint markings	$19,000
Removal of Signs	$1,000
Place signs	$3,000
Traffic Control	$5,000
Flaggers	$10,000
Mobilization	$25,000
Misc and Contingency	$4,000
Total	$75,000

DOCUMENT D

Time Schedule:

Application submittal: August 15th, 2012

Application Award: December 2012

Project Development: July/August 2013

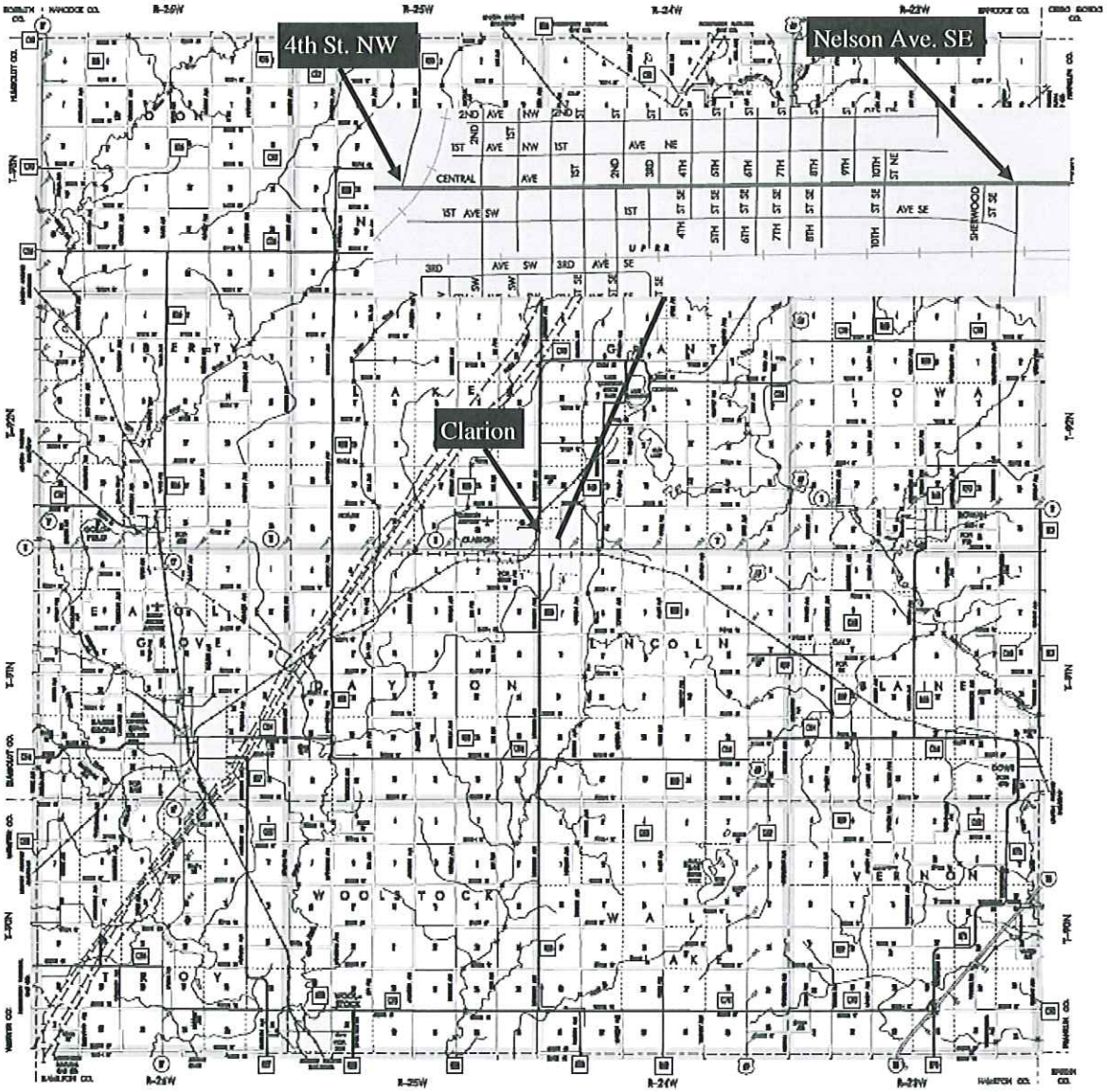
Project Letting: March 2014

Project Construction: Construction Season 2014

Project Completion: FY 2014

DOCUMENT E

WRIGHT COUNTY



WB IA 3 in Clarion, near 8th Street E

WB IA 3 in Clarion, near 1st Street E

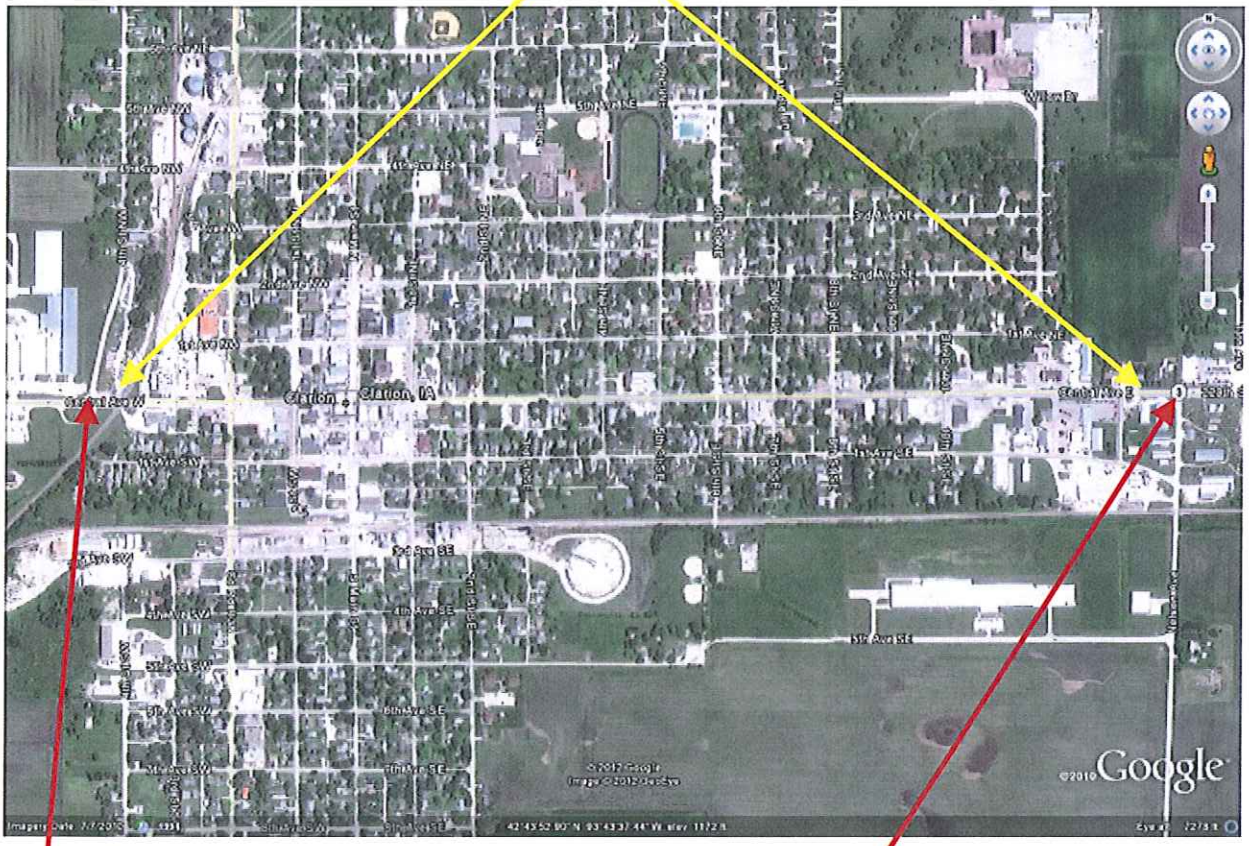
Document G

Plan of Existing Conditions and Proposed Improvements

- Plans not available at this time.
- Concept should be sufficiently detailed in the narrative.
- Conversion to be done within existing pavement surface. No widening, reconstruction, or ROW will be involved.

DOCUMENT H

IA 3-Clarion



Nelson Ave. SE

4TH Street NW

DOCUMENT J

2011

ROUTE	SECTION DESCRIPTION	RURAL / MUNICIPAL	SECTION LENGTH (MILES)	ANNUAL AVERAGE DAILY TRAFFIC	VEHICLE CLASSIFICATION DISTRIBUTION OF ANNUAL AVERAGE DAILY TRAFFIC											AVERAGE DAILY VEHICLE MILES	
					MOTOR CYCLES	PASSENGER CARS, VANS PICKUPS	TOTAL TRUCKS & BUSES	SINGLE UNIT TRUCKS				COMBINATION TRUCKS				ALL VEHICLES	TRUCKS & BUSES
								BUSES	2 AXLE	3 AXLE	4 OR MORE AXLES	4 OR LESS AXLES	5 AXLE	5 OR MORE AXLES	MULTIPLE TRAILER		
ROUTE 3																	
	99 WRIGHT COUNTY																
3	EAST JCT IA 17 & LOCUST STREET	M	0.268	3650	17	2935	698	18	77	23	2	68	476	15	19	978	187
3	EAST LIMITS OF GOLDFIELD	M	0.293	2520	12	2105	403	18	76	22	2	34	234	7	10	738	118
3	INTERSECTION CO RD R33	R	3.867	2520	12	2105	403	18	76	22	2	34	234	7	10	9745	1558
3	WEST LIMITS OF CLARION	R	3.986	3160	15	2741	403	18	76	22	2	34	234	7	10	12596	1606
3	INTERSECTION 8TH STREET WEST	M	0.608	4190	21	3765	403	18	76	22	2	34	234	7	10	2548	245
3	INTERSECTION 2ND STREET WEST	M	0.390	5100	26	4625	448	25	105	31	3	34	234	7	10	1989	175
3	INTERSECTION MAIN STREET	M	0.132	5200	27	4725	448	25	105	31	3	34	234	7	10	686	59
3	INTERSECTION 6TH STREET EAST	M	0.393	5600	29	5123	448	25	105	31	3	34	234	7	10	2201	176
3	EAST LIMITS OF CLARION	M	0.996	5300	27	4824	448	25	105	31	3	34	234	7	10	5279	446
3	JUNCTION CO RD R45	R	0.501	3050	15	2634	401	18	75	22	2	34	234	7	10	1528	201
3	SOUTH JUNCTION US 69	R	2.988	3050	15	2634	401	18	75	22	2	34	234	7	10	9113	1198
	DUPLICATE ROUTE WITH US 69																
	NORTH JCT US 69 TO INT CO RD R65																
3	& BINGHAN STREET (ROWAN)	R	3.283	1730	8	1461	260	11	48	14	2	22	153	5	6	5680	854
3	WEST LINE OF FRANKLIN COUNTY	R	2.744	1610	8	1343	260	11	48	14	2	22	153	5	6	4418	713
	35 FRANKLIN COUNTY																
3	INTERSECTION BALSAM AVENUE	R	1.044	1650	7	1312	330	14	59	17	2	28	196	6	7	1723	345
3	I 35 INTERCHANGE	R	4.114	1740	8	1402	330	14	59	17	2	28	196	6	7	7158	1358
3	INTERSECTION CO RD S25	R	1.389	2770	13	2256	501	23	100	29	3	41	284	9	12	3848	696
3	JUNCTION CO RD S41	R	5.636	2790	13	2301	476	23	100	29	3	38	264	8	11	15724	2683
3	WEST LIMITS OF HAMPTON	R	1.978	4620	23	4121	476	23	100	29	3	38	264	8	11	9138	942
3	INTERSECTION 5TH STREET WEST	M	0.461	5200	13	4720	468	13	114	22	4	45	216	22	32	2397	216
3	INTERSECTION FEDERAL STREET	M	0.278	6700	17	6215	468	13	114	22	4	45	216	22	32	1863	130
3	INTERSECTION US 65	M	0.251	7500	19	7013	468	13	114	22	4	45	216	22	32	1883	117
3	INTERSECTION 8TH STREET EAST	M	0.250	4370	23	4013	334	19	82	24	3	24	171	5	6	1093	84
3	EAST LIMITS OF HAMPTON	M	0.850	2120	10	1822	287	12	51	15	2	24	171	5	6	1802	244
3	INTERSECTION CO RD S56	R	3.978	2170	11	1866	293	12	52	15	2	25	175	5	6	8632	1166
3	WEST LINE OF BUTLER COUNTY	R	4.192	1950	9	1648	293	12	52	15	2	25	175	5	6	8174	1228
	12 BUTLER COUNTY																
3	JUNCTION MAIN STREET (DUMONT)	R	2.693	1950	9	1648	293	12	52	15	2	25	175	5	6	5251	789
	EAST JUNCTION CO RD T16 &																
3	MONTROSE AVENUE (DUMONT)	R	0.336	2340	11	2036	293	12	52	15	2	25	175	5	6	786	98
3	WEST JUNCTION IA 14	R	7.937	1990	9	1655	325	17	73	21	2	25	175	5	6	15795	2580
3	WEST LIMITS OF ALLISON	R	0.014	2490	11	2028	450	21	91	26	3	37	255	8	11	35	6
3	JUNCTION MAIN STREET	M	0.753	2440	11	1986	443	21	89	26	3	36	250	8	11	1837	334
3	EAST JUNCTION IA 14 & CHERRY ST	M	0.238	3400	17	2940	443	21	89	26	3	36	250	8	11	809	105
3	EAST LIMITS OF ALLISON	M	0.465	2210	11	1876	323	12	52	15	2	29	199	6	8	1028	150
3	INTERSECTION CO RD T47	R	2.514	2260	11	1920	329	12	53	15	2	29	203	6	8	5682	827
3	JUNCTION IA 188	R	3.512	2560	12	2218	329	12	53	15	2	29	203	6	8	8991	1155
3	JUNCTION CO RD T55	R	0.502	3760	19	3305	436	29	125	37	4	28	199	6	8	1888	219
3	NORTH LIMITS OF SHELL ROCK	R	4.093	3900	19	3444	436	29	125	37	4	28	199	6	8	15963	1785
3	INTERSECTION PUBLIC ROAD	M	0.735	4060	20	3612	427	29	123	36	4	28	194	6	7	2984	314
3	EAST LIMITS OF SHELL ROCK	M	0.277	6900	35	6261	603	38	162	47	5	41	289	9	12	1911	167

Traffic Signals:

No modifications are proposed to the existing traffic signals in the corridor as a result of the four-to-three lane conversion project. The City of Clarion is requesting support from TSIP under the Traffic Control Devices category for signal modifications under separate application.

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Wright | Prepared by: D. Little | Date Prepared: Aug 13, 2012

Location: IA 3 in Clarion, from 4th St NW to Nelson Avenue

Improvement

Proposed Improvement(s): Four- to three-lane conversion of IA 3

$ 75,000	Estimated Improvement Cost, **EC**	20	Est. Improvement 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, **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 Count | 2007 Date of traffic count

Length (mi.)	Two-way veh/day	Description
1.18	5,929	from 4th Street NW to Nelson /
1.18	miles total	

6,996 Current Vehicle Miles / Day, **VM**

8,537 End of Life Veh. Miles / Day

2,553,620 Current Veh. Miles / Year, **AM**

56,228,176 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

2007 First full year --> 2011 Last full year | 5.0 years, Time Period, **T**

Additional months | values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$ -
		0	Major Injuries @	$240,000	$ -
7	Injury Crashes →	1	Minor Injuries @	$48,000	$ 48,000
		7	Possible Injuries @	$25,000	$ 175,000
45	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 190,204
52	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 413,204

10.40	Current Crashes / Year, **AA** = TA / T	407.3	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 7,946	Cost per Crash, **AVCR** = LOSS / TA	$ 646,951	Present Value of Avoided Crashes, **BENEFIT**
229.0	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
5.51	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 43,800	Crash Costs Avoided in First Year, AAR x AVCR		
121.4	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 = $646,951 : $75,000 = **8.63** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project IA Highway 3 (Central Avenue) and R38/2nd St SW

Applicant

Contact Person Jon DeVries Title Director of Public Works

Complete Mailing Address 121 First ST SW
Clarion Iowa 50525

Phone 515/532-2847 (Area Code) E-Mail clarion@mchsi.com

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

Co-Applicant(s)

Contact Person Title

Complete Mailing Address

Phone (Area Code) E-Mail

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 54,900

Safety Funds Requested $ 45,900

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Clarion

Signed: _____ _____
Signature Date Signed

Mike Nail, Mayor
Typed Name

Attest: _____ 7-9-12
Signature Date Signed

Rochelle Pohlman, City Administrator
Typed Name

RESOLUTION NO: 12-22

A RESOLUTION APPROVING APPLICATIONS FOR FUNDING FROM THE IOWA DEPARTMENT OF TRANSPORTATION'S TRAFFIC SAFETY IMPROVEMENT PROGRAM FOR PROJECTS ALONG IOWA HIGHWAY 3

WHEREAS, the City of Clarion (the City) wishes to improve the safety of three intersections along Iowa Highway 3 by replacing traffic control devices at two highway intersections - Iowa Highway 3 and Main Street and Iowa Highway 3 and 4th Street - and making site specific improvements at Iowa Highway 3 and 2nd St West; and

WHEREAS, the City wishes to seek funding by submitting two applications, due August 15, 2012, for these improvements through the use of the Iowa DOT Traffic Safety Improvement Program.

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

The City wholeheartedly endorses these applications requesting financial assistance from the Iowa Department of Transportation to improve traffic safety along Iowa Highway 3.

The Mayor and City Clerk/Administrator are hereby authorized to execute any and all documents necessary to submit the applications.

PASSED AND APPROVED this 9th day of July, 2012.

Michael Nail, Mayor

ATTEST:

Rochelle Pohlman, City Clerk/Administrator

Narrative:

The City of Clarion desires to make traffic safety improvements along Iowa Highway 3 in the central portion of town. Traffic flows are changing. From 2007 to 2011, using annual average daily traffic count data from the DOT Traffic Flow Maps, traffic on Highway 3 has decreased somewhat – going from traffic counts of 5700 (207) to 5300 (2011) on the east side entering Clarion and 4300 (2007) to 4100 (2011) as vehicles exit Clarion. On the other hand, on R38, also known as 2nd St SW/NW in town or locally as County K, traffic has increased. The lastest traffic counts are from 2011. Traffic counts going south changed slightly from 2940 (2007) to 3020 (2011). Traffic heading northbound more than doubled the counts of 1420 (2007) to 3500 (2011). In addition to these changes, Casey's opened a new gas station at this location in January 2012 and trucks come to deliver gas to this business on a regular basis. The speed limit on Highway 3 through downtown Clarion ranges from 25 to 30 miles per hour with no sight restrictions.

The City has experienced a number of accidents along a 1.18 mile stretch of Highway 3. The crash history for 2006-2010 showed 59 crashes.[1] Over that period of time, the crash rate for this corridor was 462.1 crashes per hundred million vehicle miles (C/HMVM) which compares unfavorably to a statewide average crash rate of 325 C/HMVM. Some of these crashes, especially one that occurred after the 2010 report involved trucks at the intersection of Highway 3 and the road known by multiple names –R38 or County K or 2nd Street SW. Traffic signal poles and/ or the control box have been damaged. The signals are on poles which have been hit by west bound traffic turning north by making a right hand turn, probably heading to the Cooperative. There have been accidents this year at this intersection.

As measured by IDOT District Traffic Technician Bob Clark, the traffic signal pole in the northeast quadrant from the Highway 3 intersection is approximately 32' 11". It is impossible to place a guardrail to protect the pole at this site because it would be within the clear zone and it would block the sidewalks. The City intends to move the pedestal farther north at its expense and desires to use TSIP funds to upgrade the pedestal lights to mast arm mounted traffic signals. Upgrading the signals at this corner, which are 25 years old, will require extensive renovation.

[1] IDOT email from Bob Clark, IDOT District 2 Technician

Costs for Safety Improvements at Highway 3 and County K/R38/Second Ave W:

1. Replace controller and cabinet	$15,000

(Naztec controller with Garmin GPS to interconnect all three intersections wirelessly. This would also handle loops, pedestrian phases and vehicle phases if modifications from four lanes to three lanes are made at a later date.)

2. Replace four (4) loop detectors	$ 4,800
3. Ten (10) new vehicle signal heads with LED indicators and backplates	$12,500
4. Install LED four (8) count-down pedestrian heads $1,250 each	$10,000
5. Pedestrian push buttons eight (8) at $150 each plus additional wiring	$ 3,200
TOTAL	$45,900
City expense to move NE Pole	$ 9,000

SCHEDULE

July 9, 2012	City council approves submission of TSIP grant
July 31, 2012	Review of TSIP application with IDOT
August 14, 2012	Submit TSIP application to IDOT
August 15, 2012	TSIP application deadline
December, 2012	IDOT notice of grant approval given
Spring, 2013	Let bids
Summer, 2013	Award bids and begin construction
July 1, 2013	Funding available
September 1, 2013	Construction complete

Tab E

mapquest

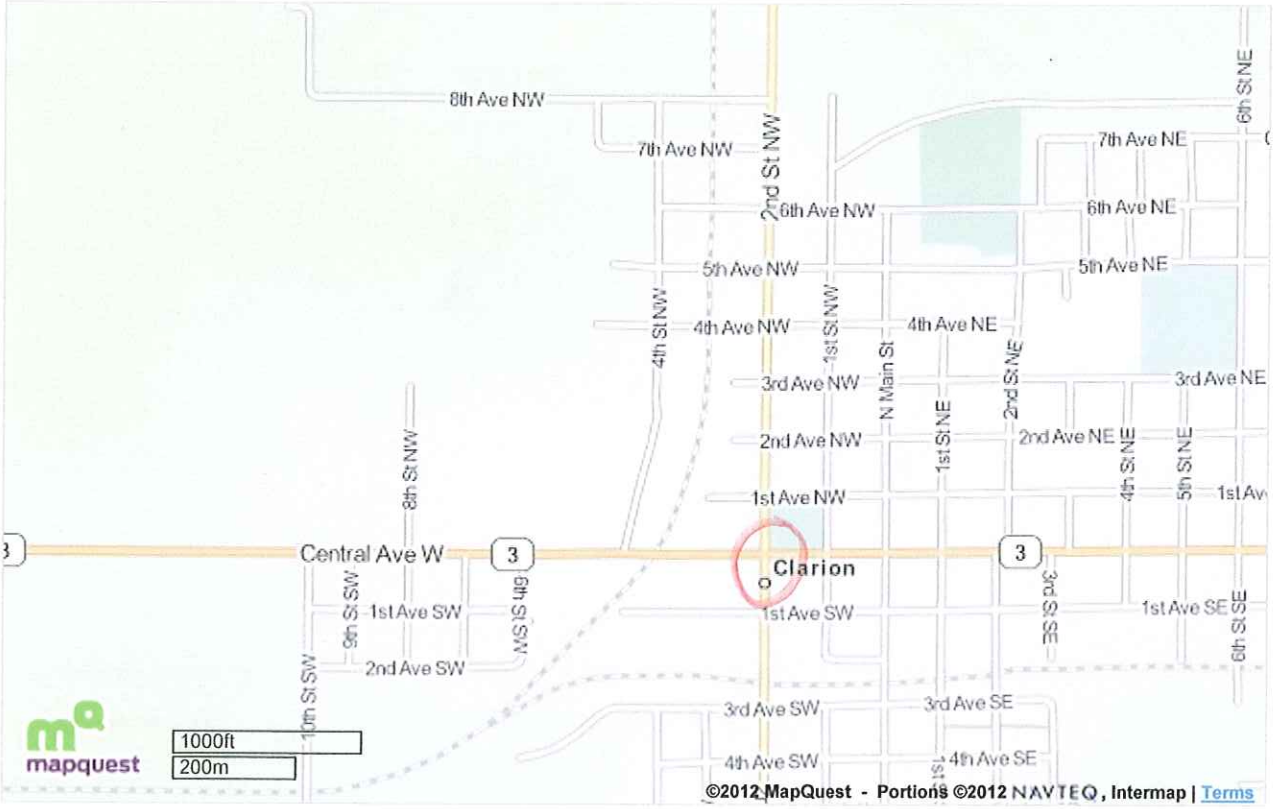
Map of:

[100-1699] Highway 3

Clarion, IA 50525

Notes

TSIP- Site Specific
Highway 3 and County K/R38/2nd St NW/SW



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Photos

Intersection Highway 3 and R38/County K

Casey's and Kum & Go are both on the south side of Highway 3. Casey's opened in January 2012,

1. View of Highway 3 traffic signals on southeast corner and northeast corner (looking from the northwest corner toward the southeast corner). Casey's in on the southeast corner of the intersection. This pole with barrier cones will be moved to the north within the right of way. It has been hit a number of times and damaged.

2. View of traffic signals on southwest corner and northwest corner looking from the northeast corner toward the southwest. Kum & Go is on the southwest corner of the intersection.

3. Another view of southeast corner signals.

1
WELCOME TO
CLARION
CASEY'S
GENERAL STORE
CASEY'S General Store
SUPER UNL.
DIESEL
3
BREADSTICKS

2
Kum & Go
SUPER UNL 3.39
DIESEL 3.65
Kum & Go
Kum & Go
3

CASEY'S
GENERAL STORE
SUPER UNL
3.39 9
DIESEL
3.65 9
Pay at Pump

Tab G

D

STATE OF IOWA

STATE HIGHWAY COMMISSION

PLAN & PROFILE OF PROPOSED IMPROVEMENT

ON THE

PRIMARY ROAD SYSTEM

GRADING - P.C.C. PAVING & A.C. SURF.

PROJECT NO. F. - 29 (10)

WRIGHT COUNTY

IOWA NO. 3 IN THE CITY OF CLARION

SCALES: PLAN 1 INCH = 50 FT. PROFILE HOR. 1 INCH = 50 FT. VERT. 1 INCH = 5 FT.

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR CONSTRUCTION WORK, SERIES OF 1956, SHALL APPLY TO WORK ON THIS PROJECT

CONSTRUCTION PLANS SHOWING PROJECT AS BUILT

One Copy Prepared by Res. Const. Engineer Date 4-18-61

One Copy Approved and Forwarded To Ames

Asst. District Engineer Date

Two Copies to be Made and Returned to:

Glen Doty District Engineer

George Henely Res Maint Engineer

CONVENTIONAL SIGNS

- CITY LIMITS
- STATE OR COUNTY LINES
- SECTION LINES
- FENCE LINES
- RIGHT OF WAY LIMITS
- GUARD RAIL
- TRAVELED WAY
- BASE OR SURVEY LINE
- RAILROADS
- PRESENT TILE DRAINS
- PROPOSED TILE DRAINS
- CULVERTS
- TELEPHONE, TELEGRAPH OR TRANSMISSION LINES
- PRIMARY ROAD NUMBERS
- U. S. ROAD NUMBERS

INDEX OF SHEETS

SHEET NO. 1 TITLE PAGE.
" " 2 ESTIMATE OF QUANTITIES.
" " 3 TYPICAL SECTIONS AND JOINT DETAILS.
" " 4 TYPICAL SECTIONS, COMBINED SIDEWALK & RETAINING WALL DETAILS & SLAB TYPE MANHOLE DETAILS
" " 5 INTERSECTION LAYOUTS & LIST OF EXPANSION JOINTS.
" " 6 INTERSECTION LAYOUTS.
" " 7 CONCRETE STEP DETAILS.
" " 8 SPECIAL DETAILS FOR PROPOSED STEP AND RETAINING WALL.
" " 9 DETAILS OF TYPE "S" INTAKE.
" " 10 DETAILS OF TYPE "H-2" INTAKE.
" " 11 DETAILS OF "GE" INTAKE.
" " 12 DETAILS OF WIRE REINFORCEMENT.
" " 13 DETAILS OF PROJECT SIGNS, BOX TYPE STORM SEWER MANHOLE, REPLACING PAVEMENT CUTS AND FULL DEPTH BASE REPAIR.
" " 14 DETAILS OF DRIVES AND ALLEYS & ACCESS CONTROL POINTS
" " 15 & 16 DETAILS OF SOIL SURVEY
" " 17 PLAN AND PROFILE STA. 704 + 00 TO STA. 715 + 00.
" " 18 " " " " 715 + 00 " " 730 + 00
" " 19 " " " " 730 + 00 " " 745 + 00
" " 20 " " " " 745 + 00 " " 760 + 00
" " 21 " " " " 760 + 00 " " 770 + 00
" " 22 TO 75 INCLUSIVE, CROSS SECTIONS.

" " 13A DETAIL OF RAILROAD CROSSING PROTECTION (SIGNALS)
" " 13B DETAIL OF 36" REFLECTOR CROSSING SIGN ASSEMBLY.

40 Sheets

MILEAGE SUMMARY

DIV. 1

STA. 704 + 00.0 TO STA. 767 + 48.0 - - - - - - - - - - - - - 6346.0 FT.

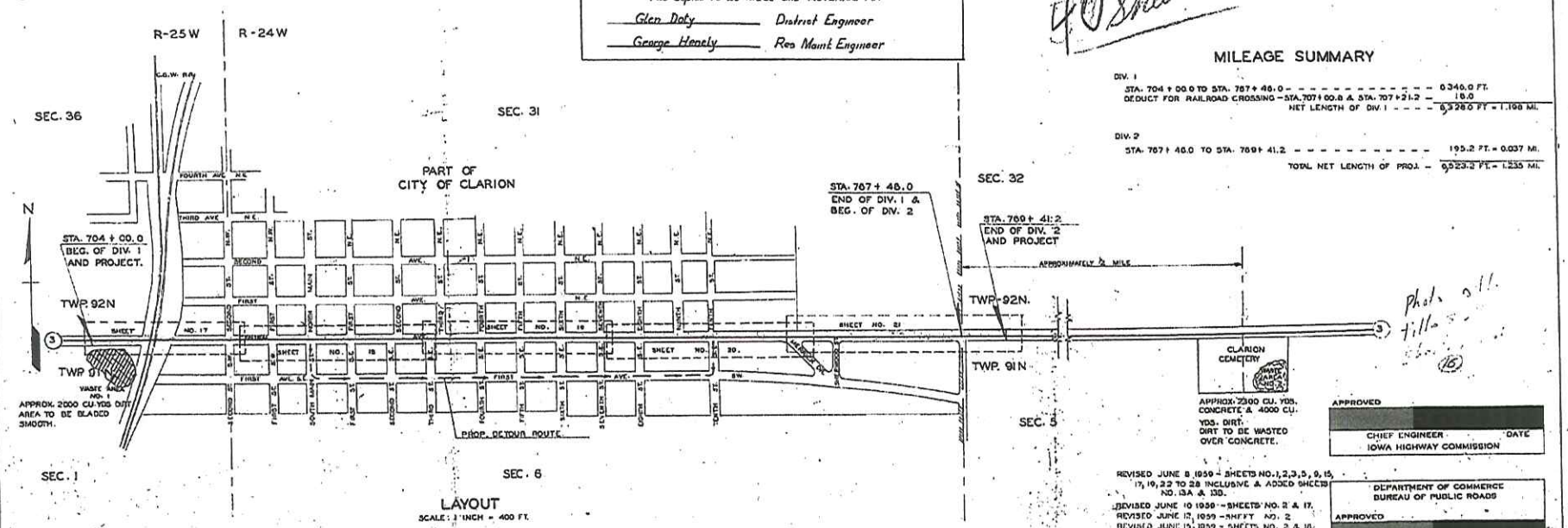
DEDUCT FOR RAILROAD CROSSING - STA. 707 + 00.8 & STA. 707 + 21.2 - 18.0

NET LENGTH OF DIV. 1 - - - - 6,328.0 FT. = 1.198 MI.

DIV. 2

STA. 767 + 48.0 TO STA. 769 + 41.2 - - - - - - - - - - - 195.2 FT. = 0.037 MI.

TOTAL NET LENGTH OF PROJ. - 6,523.2 FT. = 1.235 MI.



LAYOUT

SCALE: 1 INCH = 400 FT.

Photo 2 11 Tills

REVISED JUNE 8, 1959 - SHEETS NO. 1, 2, 3, 5, 9, 15, 17, 19, 22 TO 28 INCLUSIVE & ADDED SHEETS NO. 13A & 13B.

REVISED JUNE 10 1959 - SHEETS NO. 2 & 17.

REVISED JUNE 12, 1959 - SHEET NO. 2

REVISED JUNE 15, 1959 - SHEETS NO. 2 & 10.

APPROVED

CHIEF ENGINEER DATE

IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DISTRICT ENGINEER DATE

6 + 17 + 20

WRIGHT CO. F PROJ. NO. 29 (10) SHEET NO. 1

Wright County Project F-29(10) Sheet 22 Sheets 1 of 1

ESTABLISHED WIDTH OF RIGHT OF WAY ..... FT.

STA. 704 + 00.0 BEG. OF PROJECT

CITY OF CLARION

IOWA STATE RAILROAD CROSSING NO. 152.8

~~To be Removed~~

~~Prop. Double "H-2" Intake & 45' of 15" 2000D Pipe. Prop. F.L. 93.2±~~

Prop. H-2 Intake and 43' of 15" 2000D Pipe

LAKE TWP. T-92N-R-25W SEC. 36

GRANT TWP. T-92N-R-24W. SEC. 31

DAYTON TWP. T-91N-R-25W. SEC. 1

LINCOLN TWP. T-91N-R-24W. SEC. 6

No Street Platted Return not built

Prop. Standard Storm Sewer Manhole to connect to present 18" Storm Sewer.

~~Prop. 190' of 24" 1500D Pipe.~~

~~Prop. Double "H-2" Intake. Prop. F.L. 93.0~~

~~Prop. 37' of 18" 1500D Pipe.~~

~~Prop. 12' of 12" 1500D & 1-12"x6" T Branch Section 1500D.~~

3" gap in pipe to make well around water main

Half of W. 2ND. Street to be Kept open for cross traffic at all times.

Contractor to re-plan his work as to construct the pavement width and maintain traffic on either side during construction period as per article 2302.09 from Sta. 704+00 to Sta. 707+00, and from Sta. 753+ (10th street) to Sta. 764+61 (End of Project.)

From Sta. 704+00 to Sta. 714+00 Contractor to remove any old curb & gutter & excavation and place 6" crushed limestone necessary to maintain two way traffic along north side while it of proposed pavement is constructed. Contractor to sew car 11'0" 2' North of ℄ from Sta. 706+80 to Sta. 708+10 and from Sta. 709+60 to Sta. 710+40 to construct South half of pavement.

PURCHASED FROM Edna Clendy 0.06 Acres
ACQUIRED Nov. 18, 1958
CONSIDERATION $250.00
TITLE Easement
RECORDED IN BOOK 56 PAGE 146
COUNTY RECORDED Wright County

Railroad Company ~~to~~ relocated and installed automatic signals during construction of project. Also 1st, 4th, 5th, 6th & 7th tracks to be removed by Railroad Company in conjunction with prop. new Construction. 50" Reflector sign assembly ~~to be~~ furnished and placed by State maintenance force.

SCALE 1"=50'

Note
Sta. 708+70 to Sta. 709+60 Center 22 ft. of present slab ~~to be~~ broken and left in place.

BENCH MARKS: #32A Sta. 703+90 (x) on 4th step of house 35' Rt. Elev. 599.30
~~#33 Sta. 704+00.2 - 22.5' Rt. Arrow head on Hydrant Elev. 600.33~~
#34 Sta. 710+61.5 - 45.2' Lt. Cut (x) on East End Pump Isle Elev. 601.26

See Resident Engineers to scale plat for form grades

Proposed Standard Portland Cement Concrete Pavement (6" 6.5 sk with 6" Concrete Integral Curb)

Wright Co. F Proj. No. 25(10) Sheet No. 11

355

mapquest

Map of:

Clarion, IA

Notes

Clarion Iowa
Intersection of Iowa Highway 3 and R38
Site Specific TSIP grant applictaion
Tab H - aerial view

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Iowa Department of Transportation

Tab J

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

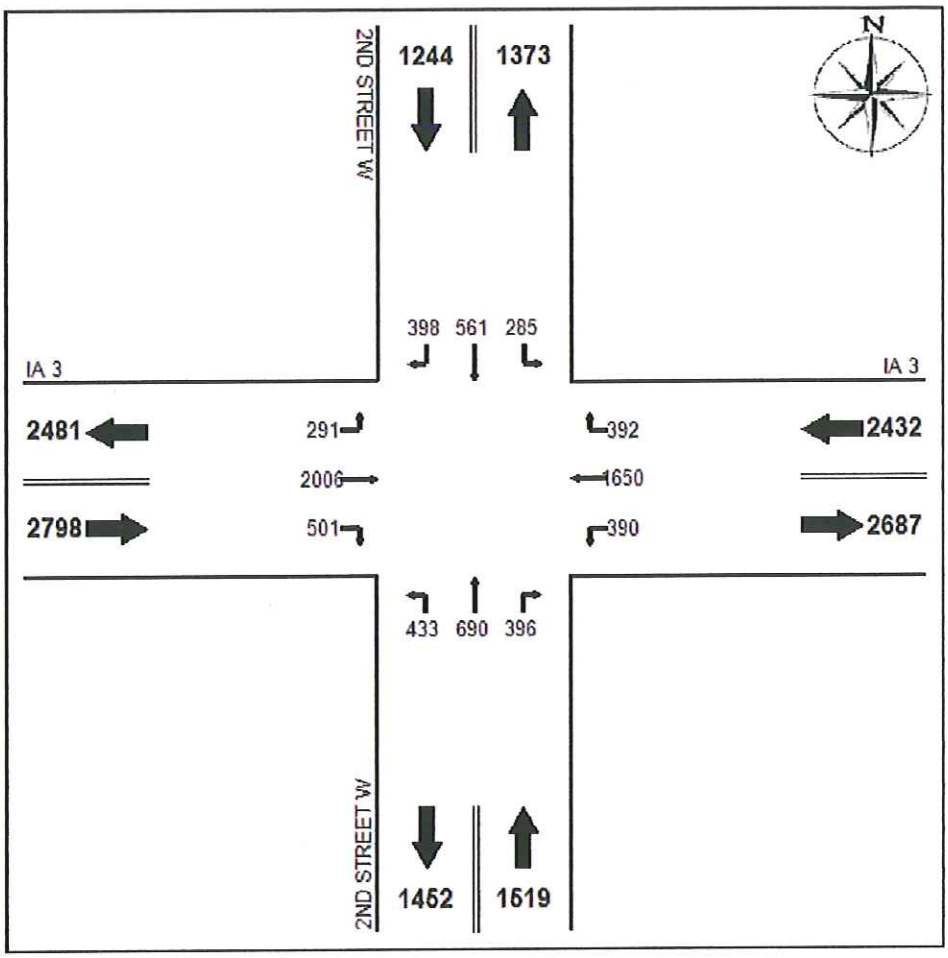
Station Number:
99330101099

Count Date:
Thursday, May 19, 2011

County:
Wright

Location Description:
IA 3 & 2ND ST W

Volume Factor: 1.768
Pass Class Factor: 1.800
SU Class Factor: 1.504
Combo Class Factor: 1.515



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	21	43	38	27	124	27	22	43	18	18	119	25
08:00	23	42	23	39	138	30	35	45	42	20	136	39
11:00	21	35	27	25	117	23	35	49	32	26	165	40
12:00	25	45	28	28	199	37	50	58	39	20	193	41
15:00	21	44	44	30	115	35	40	60	24	18	162	51
16:00	27	61	45	28	125	36	27	71	38	28	189	44
17:00	23	44	18	41	117	32	34	61	28	34	168	41

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Passenger Vehicles

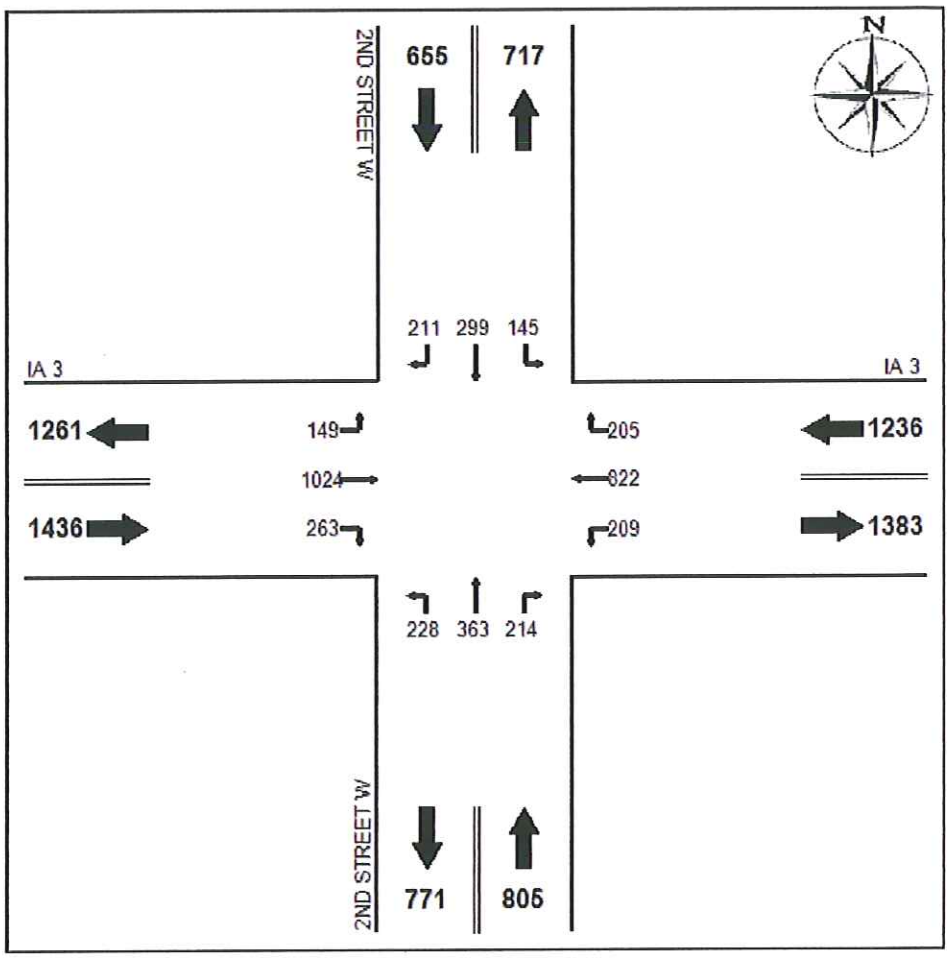
Station Number:
99330101099

Count Date:
Thursday, May 19, 2011

County:
Wright

Location Description:
IA 3 & 2ND ST W

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*
07:00	17	42	36	26	111	22	22	42	18	17	106	23
08:00	20	39	19	38	113	26	30	37	41	17	118	34
11:00	18	34	22	22	98	22	33	47	27	19	149	37
12:00	23	42	28	28	168	34	48	53	39	17	178	41
15:00	18	41	43	28	100	34	36	59	23	17	142	47
16:00	26	57	45	26	118	36	26	65	38	28	172	41
17:00	23	44	18	41	114	31	33	60	28	34	159	40

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Single-Unit Trucks

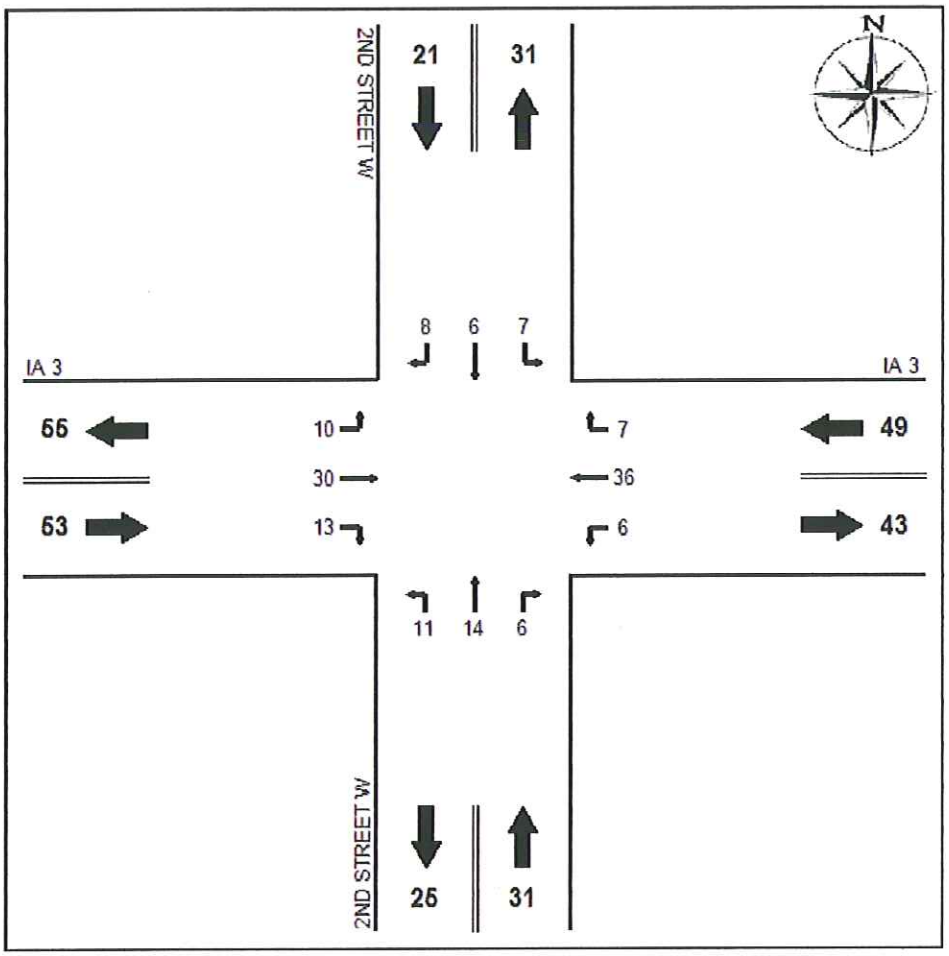
Station Number:
99330101099

Count Date:
Thursday, May 19, 2011

County:
Wright

Location Description:
IA 3 & 2ND ST W

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*
07:00	1	0	1	1	2	3	0	1	0	0	4	0
08:00	1	1	1	0	11	2	4	6	1	3	6	5
11:00	1	1	5	3	8	0	1	1	4	5	3	3
12:00	2	0	0	0	8	1	2	3	0	1	6	0
15:00	2	2	1	2	3	0	3	0	1	1	6	2
16:00	0	2	0	0	3	0	0	2	0	0	3	2
17:00	0	0	0	0	1	1	1	1	0	0	2	1

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Combination Trucks

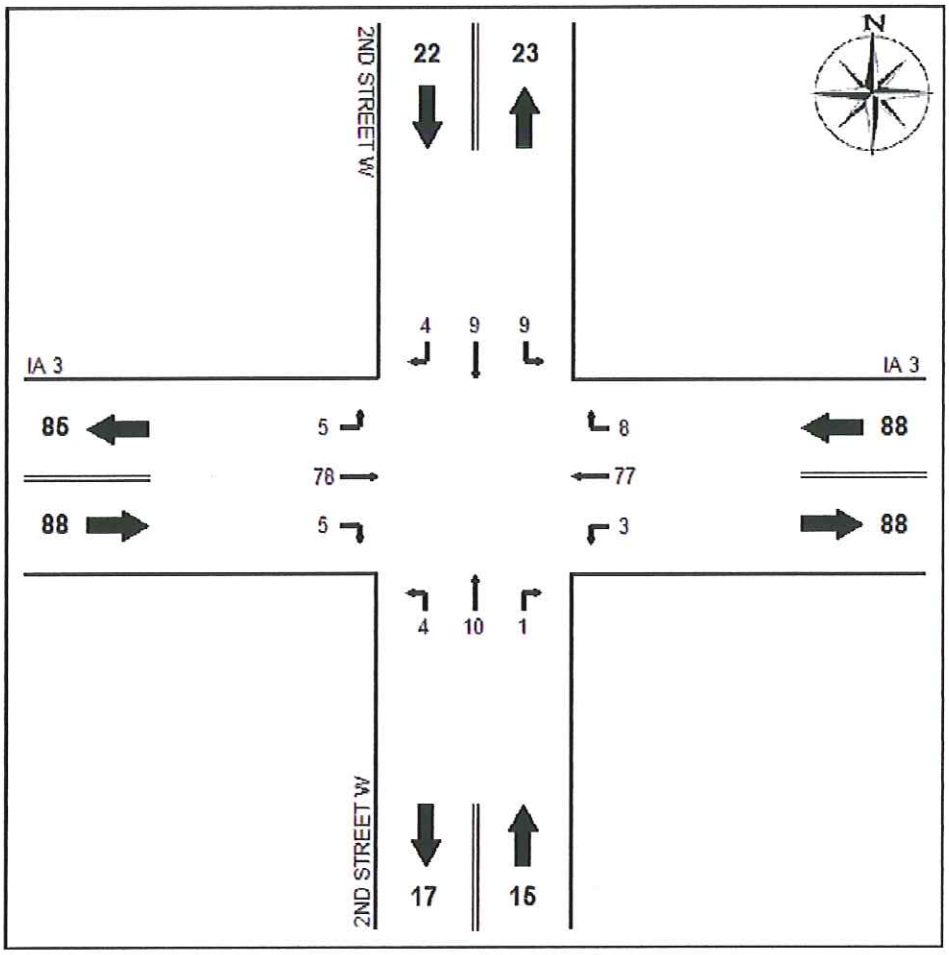
Station Number:
99330101099

Count Date:
Thursday, May 19, 2011

County:
Wright

Location Description:
IA 3 & 2ND ST W

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*
07:00	3	1	1	0	11	2	0	0	0	1	9	2
08:00	2	2	3	1	14	2	1	2	0	0	12	0
11:00	2	0	0	0	11	1	1	1	1	2	13	0
12:00	0	3	0	0	23	2	0	2	0	2	9	0
15:00	1	1	0	0	12	1	1	1	0	0	14	2
16:00	1	2	0	2	4	0	1	4	0	0	14	1
17:00	0	0	0	0	2	0	0	0	0	0	7	0

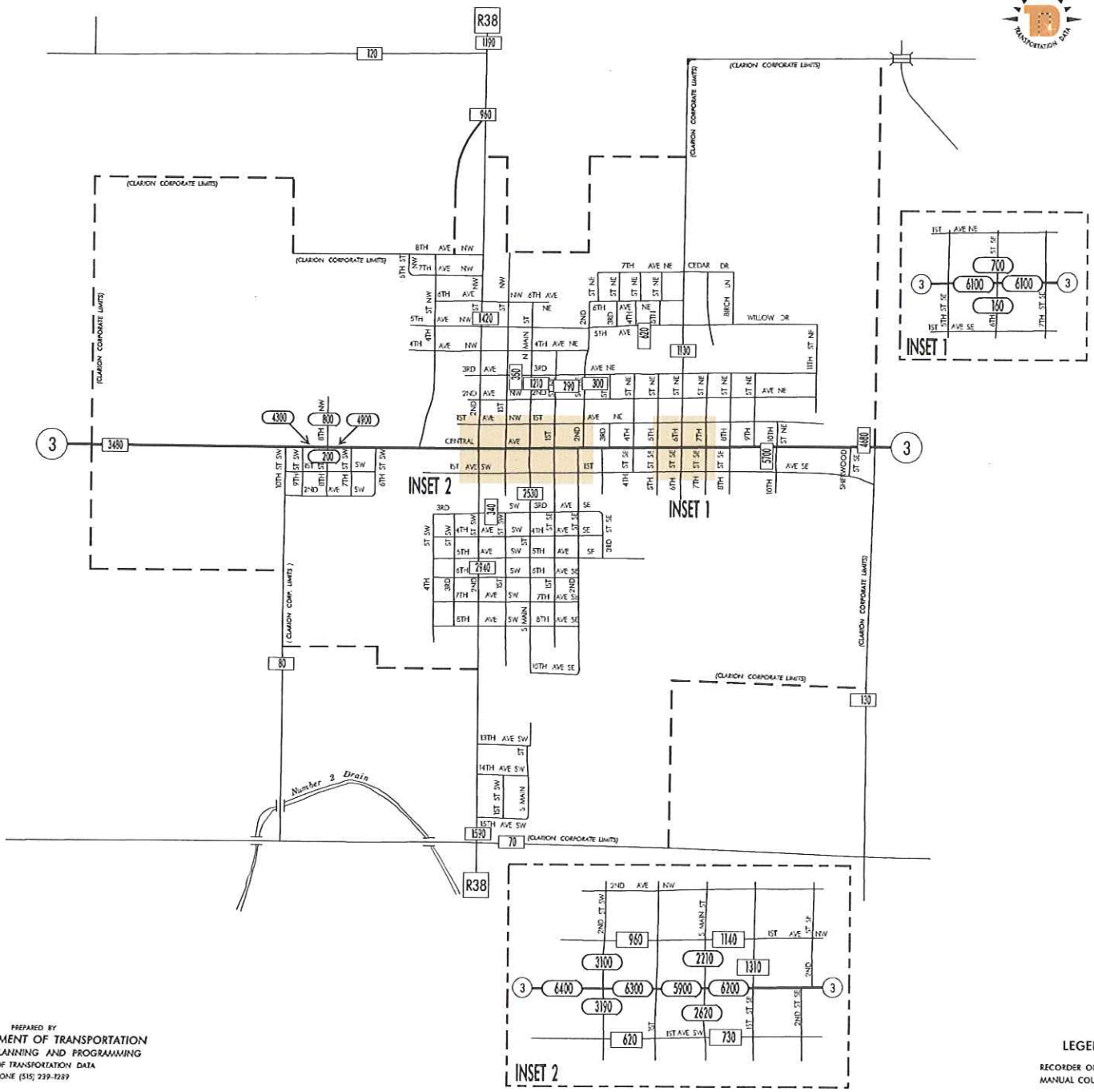
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

CLARION

WRIGHT COUNTY

2007 ANNUAL AVERAGE DAILY TRAFFIC



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

LEGEND
RECORDER ONLY
MANUAL COUNT

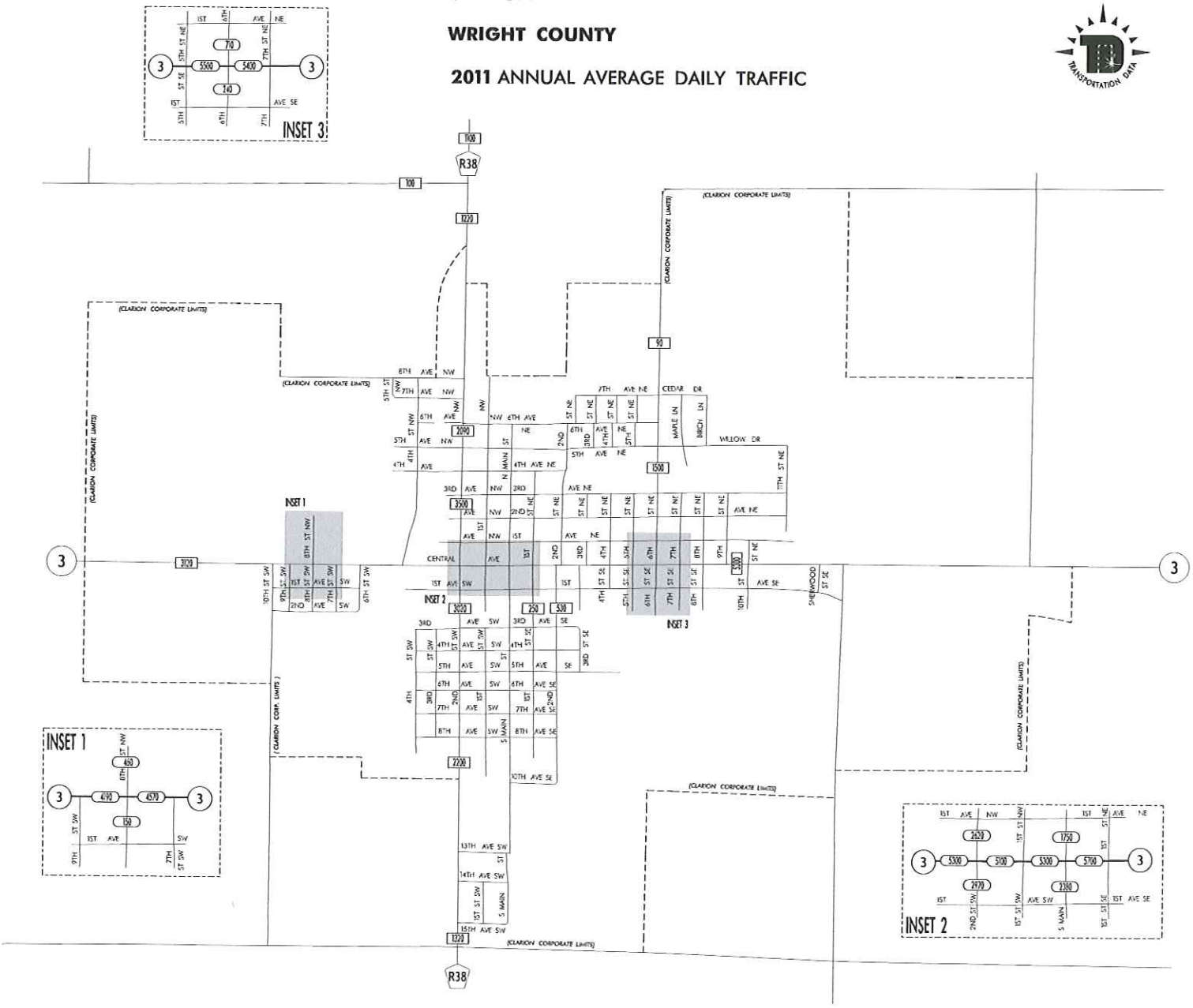
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

CLARION

WRIGHT COUNTY

2011 ANNUAL AVERAGE DAILY TRAFFIC



PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION
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OFFICE OF TRANSPORTATION DATA
PHONE (515) 239-1289

LEGEND

RECORDER ONLY
MANUAL COUNT

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Wright Prepared by: Terry O Date Prepared: Aug 15, 2012

Intersection: IA Hwy 3 & Co Rd. R-38

Improvement

Proposed Improvement(s): Upgrade & Replace Traffic Signals & Mast Arm Traffic Signals

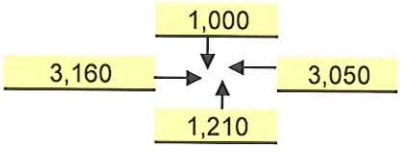
$ 45,900	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	20	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 45,900	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,073,300 Current Annual Entering Veh., **AEV** = DEV * 365

8,420 veh / day, Final Year DEV, **FDEV**

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

0.0% Projected Traffic Growth (0%-10%), **G**

8,420 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2006 First full year --> 2011 Last full year 6.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes		Fatalities @	$3,500,000	$ -
			Major Injuries @	$240,000	$ -
4	Injury Crashes	1	Minor Injuries @	$48,000	$ 48,000
		5	Possible Injuries @	$25,000	$ 125,000
13	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 67,800
17	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 240,800

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

$ 14,165 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 8,027 Crash Costs Avoided in First Year, AAR x AVC

8.5 Total Avoided Crashes, TECR x CRF/ 100

0.92 Crashes / MEV, Crash Rate, **CR**

CR = TA x 10^6 / (DEV x 365 x T)

$ 89,244 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 = $89,244 : $45,900 = **1.94** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: U.S. Hwy 169 (Phillips St.) & McGregor St. Traffic Signals

Applicant: City of Algona

Contact Person: Jason Etnyre Title: Director Public Works

Complete Mailing Address: 112 West Call Street
Algona, IA 50511

Phone: 515-295-2411 (Area Code) E-Mail: jetnyre@ci.algona.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: _____

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost: $ 411,890

Safety Funds Requested: $ 411,890

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Algona

Signed: Lynn R. Kueck 08/06/12

Signature Date Signed

Lynn R. Kueck, Mayor

Typed Name

Attest: Rexann McEnroe 8/6/12

Signature Date Signed

Rexann McEnroe, City Clerk

Typed Name

RESOLUTION NO. 07-56

RESOLUTION APPROVING AND AUTHORIZING SUBMISSION OF REQUEST TO THE IOWA DEPARTMENT OF TRANSPORTATION (IDOT) FOR TRAFFIC SAFETY FUNDS THROUGH THE TRAFFIC SAFETY IMPROVEMENT PROGRAM TO RELOCATE AND UPDATE THE TRAFFIC SIGNAL AT US HWY 169 / SOUTH PHILLIPS STREET AND EAST MCGREGOR STREET

WHEREAS, the City of Algona, Iowa, has identified a number of safety issues and concerns at the intersection of East McGregor Street and US Highway 169 / South Phillips Street, and

WHEREAS, the City of Algona, Iowa, proposes to make improvements to the traffic operations at East McGregor Street and US Highway 169 / South Phillips Street through new traffic signal equipment, control cabinet, and relocating the traffic signal equipment and control cabinet, and

WHEREAS, the improved traffic signal system will provide protected left turns at East McGregor Street and US Highway 169 / South Phillips Street and will locate the system out of the required clear zone.

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

Section 1: That the City of Algona, Iowa, wishes to apply for assistance from the Iowa Department of Transportation by submitting a request for Traffic Safety Funds through the Traffic Safety Improvement Program.

Section 2: That Mayor Lynn R. Kueck and City Clerk Rexann McEnroe are hereby directed and given authority to execute said request and agreement for funding assistance for the proposed East McGregor Street and US Highway 169 / South Phillips Street intersection safety improvements, if approved, on behalf of the City of Algona, Iowa.

PASSED AND APPROVED this 6th day of August, 2007.

Lynn R. Kueck

Lynn R. Kueck, Mayor

ATTEST:

Rexann McEnroe

Rexann McEnroe, City Clerk

PROJECT NARRATIVE

U.S. HIGHWAY 169 (PHILLIPS STREET) AND EAST MCGREGOR STREET

TRAFFIC SAFETY IMPROVEMENT PROGRAM

ALGONA, IOWA

The intersection of U.S. Highway 169 (Phillips Street) and East McGregor Street in Algona, Iowa has a history of crashes related to left turning movements. The intersection is located in the midst of a business district. Three of the four corners are occupied by retail businesses (Kum-N-Go, Pro Build Building Center, & Northwest Communications). In addition, Lucia Wallace Elementary School is located two blocks south of the intersection and the Algona High School and Middle School is located two blocks east and two blocks south of the intersection. Lane configurations at the intersection consist of an undivided four-lane for north-south traffic (U.S. Highway 169) and a two lane street for east-west traffic (E. McGregor St. & County Road B-40). The current traffic signal system is two-phase actuated, but unable to accommodate additional traffic phases.

Turning movements at the intersection are influenced by the trip generation characteristics of the retail businesses surrounding the intersection and the elementary, middle, and high schools located within a few blocks. A significant number of crashes occurring at this intersection are left-turn related in the north-south direction of traffic. The high occurrence of crashes can be directly attributed to the lane configurations restricting sight distance for left-turning traffic. The intersection crash rate is 1.73 crashes per million entering vehicles which is above the statewide average. In addition, numerous service calls have been required to repair signal collisions and knockdowns from 1988 to 2012.

The proposed improvement concept is to upgrade the traffic signal to provide protected left turns for the north-south direction traffic. The new signal system will provide a fully actuated operation meeting the demands of the traffic characteristics. The improvements for the intersections include:

- The north-south traffic movements will be split (sequential phasing) to achieve protected left turns.
- All four radii of the intersection will be increased to accommodate the truck traffic through the intersection.
- The east and west approaches to the intersection will be widened to provide full-width right-turn lanes.
- The 10-foot clear zones will be protected on all four legs of the intersection

The signal layout and widening geometrics are in accordance with the MUTCD and AASHTO guidelines.

ENGINEER'S OPINION OF PROBABLE PROJECT COST

TRAFFIC SIGNALIZATION IMPROVEMENTS
AT THE INTERSECTION OF U.S. 169 AND MCGREGOR STREET
ALGONA, IOWA
CS-TSF-0085-(611)--85-55

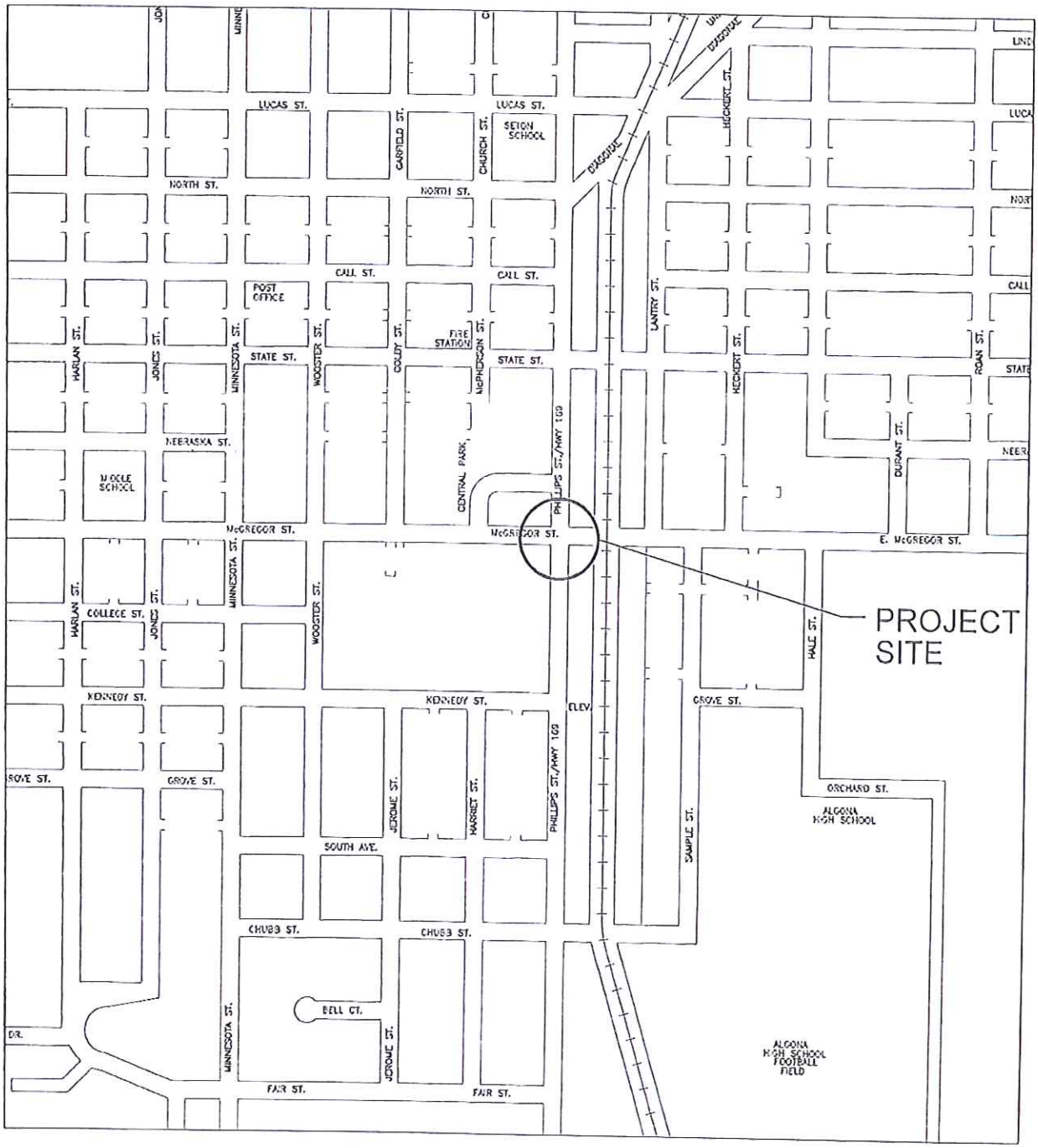
ESTIMATED PROJECT QUANTITIES					ESTIMATED COSTS		
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	UNIT PRICES	TOTAL	
1	1090-105-D-0	MOBILIZATION	LS	1	$15,000.00	$15,000	
2	1070-206-A-0	TRAFFIC CONTROL	LS	1	$5,000.00	$5,000	
3	7040-108-H-0	PAVEMENT REMOVAL	SY	482.3	$8.00	$3,858	
4	2010-108-E-0	UNCLASSIFIED EXCAVATION	CY	197.0	$15.00	$2,955	
5	2010-108-G-0	SUBGRADE PREPARATION	SY	840.9	$2.00	$1,682	
6	2010-108-I-0	SUBBASE, 6", CLASS A CRUSHED STONE	CY	140.1	$45.00	$6,305	
7	7010-108-A-0	PORTLAND CEMENT CONCRETE PAVEMENT, 8"	SY	694.3	$44.00	$30,549	
8	7020-108-A-0	HOT MIX ASPHALT SURFACE COURSE, 2"	TN	114.3	$90.00	$10,287	
9	7040-108-G-0	PAVEMENT MILLING FOR RESURFACING	SY	875.8	$3.00	$2,627	$78,263
10	7030-108-H-1	DRIVEWAY, 7", PCC	SY	192.9	$48.00	$9,259	
11	7030-108-H-2	DRIVEWAY, CLASS A CRUSHED STONE	TN	20.0	$40.00	$800	
12	7030-108-E-0	SIDEWALK, 6", PCC	SY	124.6	$55.00	$6,853	
13	7030-108-A-0	REMOVE SIDEWALK AND DRIVEWAY	SY	434.3	$7.00	$3,040	
14	7030-108-G-0	DETECTABLE WARNINGS FOR CURB RAMPS	SF	136.0	$45.00	$6,120	$26,072
15	4020-108-A-0	STORM SEWER, 15" 2000D R.C.P.	LF	44.0	$60.00	$2,640	
16	4020-108-A-0	STORM SEWER, 18" 2000D R.C.P.	LF	30.0	$65.00	$1,950	
17	6010-108-A-0	CIRCULAR STORM SEWER MANHOLE, SW-401	EA	1	$3,500.00	$3,500	
18	6010-108-B-0	OPEN THROAT INTAKE, SW-508	EA	1	$4,500.00	$4,500	
19	6010-108-B-0	OPEN THROAT INTAKE UNDER PAVEMENT, SW-541	EA	2	$4,500.00	$9,000	
20	6010-108-H-0	REMOVAL OF MANHOLES AND INTAKES	EA	5	$750.00	$3,750	
21	PER EST REF INFO	CONNECT TO EXISTING STORM SEWER	EA	6	$1,000.00	$6,000	$31,340
22	8010-108-A-0	TRAFFIC SIGNALIZATION	LS	1	$200,000.00	$200,000	
23	IDOT SPEC 2527	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT BASED	STA	20.3	$200.00	$4,056	
24	IDOT SPEC 2527	PAINTED SYMBOL AND LEGEND, WATERBORNE OR SOLVENT BASED	EA	8	$180.00	$1,440	
25	IDOT SPEC 2524	TYPE A SIGN, SHEET ALUMINUM	SF	22	$45.00	$990	$206,486
26	PER EST REF INFO	RAILROAD PROTECTIVE LIABILITY INSURANCE	LS	1	$3,200.00	$3,200	
27	9010-108-A-0	SEEDING AND FERTILIZING	LS	1	$1,000.00	$1,000	
28	2010-108-L-0, 3010-108-F-0	TESTING	LS	1	$3,000.00	$3,000	$7,200

CONTINGENCIES =	$17,468
ESTIMATED TOTAL CONSTRUCTION COST =	$366,830
ENGINEERING, LEGAL, ADMIN. =	$45,000
TOTAL PROJECT COST =	$411,830

PROPOSED PROJECT DEVELOPMENT TIMELINE
TRAFFIC SIGNALIZATION IMPROVEMENTS AT THE INTERSECTION OF U.S. HWY. 169 AND MCGREGOR STREET
ALGONA, IOWA

	2012					2013											
TASK	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Application Submittal																	
Submittal Review																	
Application Approval/ Project Agreement Development																	
Design																	
Bid Letting																	
Construction																	

TRAFFIC SAFETY IMPROVEMENT PROGRAM
HWY 169 AND McGREGOR
ALGONA, IA



LOCATION MAP

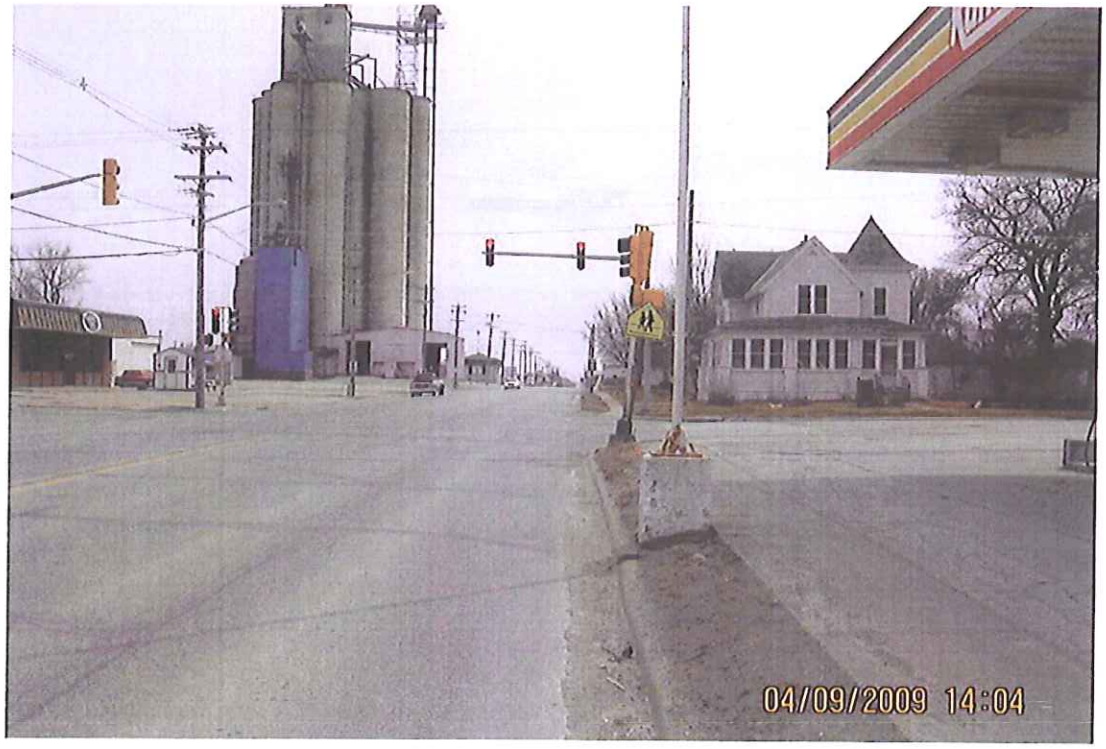
N.T.S.

Looking North on U.S. Hwy 169

Looking East on McGregor Street

Looking West on McGregor Street

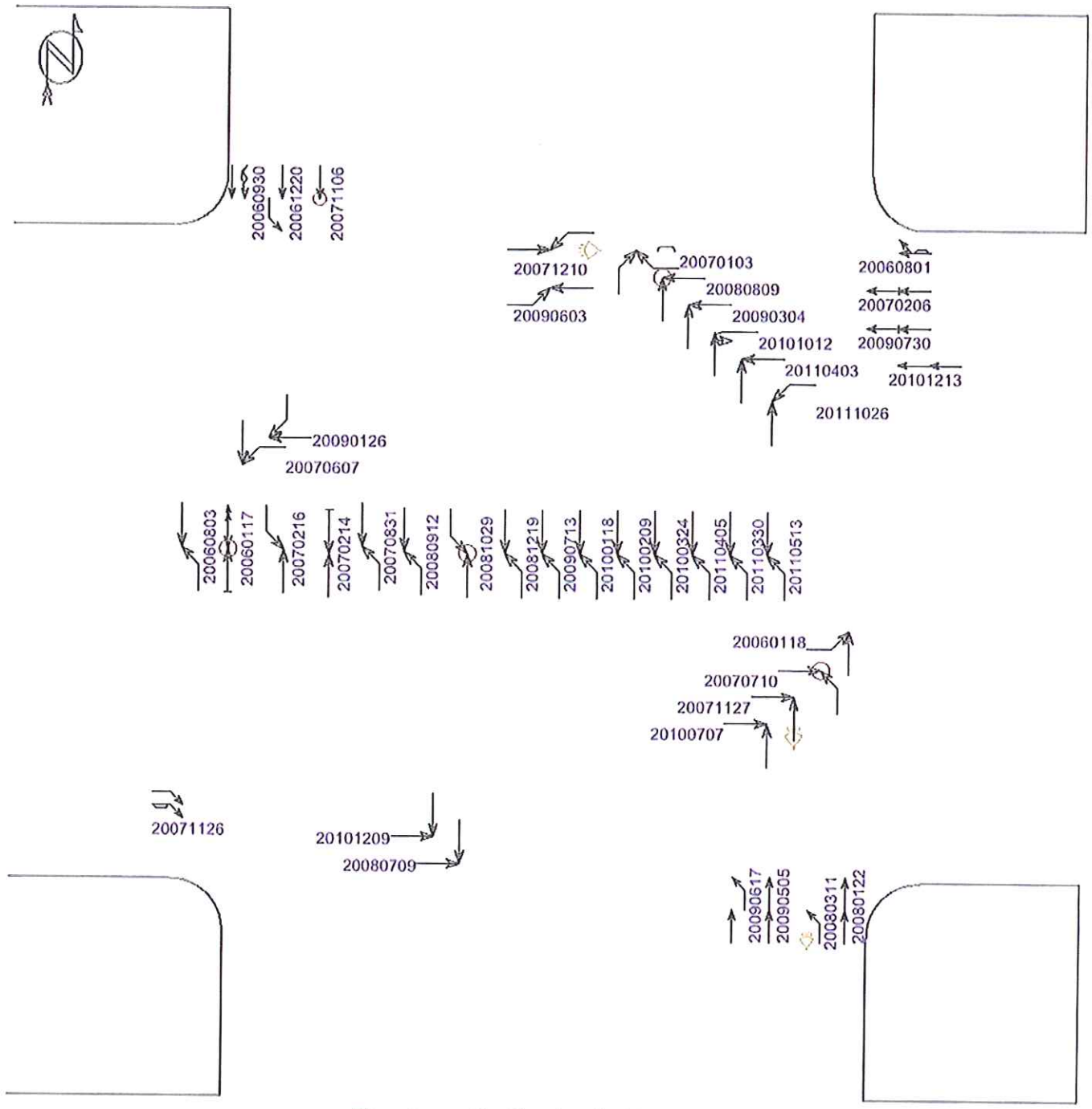
Looking West on McGregor Street



Looking South on U.S. Hwy. 169

US 169 and McGregor St

2006 - 2011 Reportable Crashes



(1) 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

Pd' Programming, Inc. 07/30/2012

11/23/2004
7:00-8:00
AM

Intersection Hourly Volumes
Phillips (N/S) & McGregor (E/W)

N ↑

1

truck %				0%	21%	0%			
	trucks			0	5	0			
		cars		4	19	7			
			volume	4	24	7			
0%	0	3	3		35		12	12	0	0%
0%	0	14	14	24		25	5	5	0	0%
29%	2	5	7		22		8	8	0	0%
				5	17	0	volume			
				4	14	0		cars		
				1	3	0			trucks	
				20%	16%	#DIV/0!				truck %

truck %				4%	16%	0%			
	trucks			1	24	0			
		cars		25	122	36			
			volume	26	146	36			
4%	1	22	23		0.61		35	35	0	0%
0%	0	68	68	0.56		0.61	43	43	0	0%
8%	4	44	48		0.61		34	34	0	0%
				23	165	26	volume			
				22	146	24		cars		
				1	19	2			trucks	
				4%	12%	8%				truck %

2

truck %				0%	13%	0%			
	trucks			0	4	0			
		cars		2	28	10			
			volume	2	32	10			
0%	0	3	3		44		5	5	0	0%
0%	0	11	11	25		18	8	8	0	0%
0%	0	11	11		56		5	5	0	0%
				6	41	9	volume			
				6	36	8		cars		
				0	5	1			trucks	
				0%	12%	11%				truck %

1	105	105		
2	143	143	Hourly volume	673
3	144	144		
4	280	280		

3

truck %				13%	16%	0%			
	trucks			1	5	0			
		cars		7	26	5			
			volume	8	31	5			
33%	1	2	3		44		7	7	0	0%
0%	0	15	15	28		23	9	9	0	0%
0%	0	10	10		49		7	7	0	0%
				4	40	5	volume			
				4	33	4		cars		
				0	7	1			trucks	
				0%	18%	20%				truck %

4

truck %				0%	17%	0%			
	trucks			0	10	0			
		cars		12	49	14			
			volume	12	59	14			
0%	0	14	14		85		11	11	0	0%
0%	0	28	28	62		46	21	21	0	0%
10%	2	18	20		87		14	14	0	0%
				8	67	12	volume			
				8	63	12		cars		
				0	4	0			trucks	
				0%	6%	0%				truck %

Algona 15min Traffic Count
7-8 AM
7/2/2005

11/23/2004
8:00 - 9:00
AM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

N

1

truck %				0%	17%	0%			
	trucks			0	8	0			
		cars		11	39	26			
			volume	11	47	26			
0%	0	18	18		84		9	9	0	0%
3%	2	64	65	109		51	38	33	5	13%
4%	1	24	25		101		4	3	1	25%
				11	76	14	volume			
				10	67	13		cars		
				1	9	1			trucks	
				9%	12%	7%				truck %

truck %				0%	16%	4%			
	trucks			0	32	2			
		cars		28	171	53			
			volume	28	203	55			
0%	0	34	34		0.60		39	36	3	8%
2%	2	119	121	0.59		0.79	84	74	10	12%
7%	4	57	61		0.60		38	31	7	18%
				39	248	35	volume			
				37	214	32		cars		
				2	34	3			trucks	
				5%	14%	9%				truck %

2

truck %				0%	15%	0%			
	trucks			0	11	0			
		cars		7	60	11			
			volume	7	71	11			
0%	0	4	4		69		12	12	0	0%
0%	0	25	25	47		42	17	16	1	6%
17%	3	15	18		84		13	10	3	23%
				9	64	11	volume			
				8	55	11		cars		
				1	9	0			trucks	
				11%	14%	0%				truck %

1	345	345		
2	262	262	Hourly volume	955
3	170	170		
4	203	203		

3

truck %				0%	17%	13%			
	trucks			0	7	1			
		cars		6	34	7			
			volume	6	41	8			
0%	0	5	5		55		9	7	2	22%
0%	0	8	8	20		35	18	15	3	17%
0%	0	7	7		60		8	7	1	13%
				10	45	5	volume			
				10	34	3		cars		
				0	11	2			trucks	
				0%	24%	40%				truck %

4

truck %				0%	14%	10%			
	trucks			0	6	1			
		cars		4	38	9			
			volume	4	44	10			
0%	0	7	7		59		9	8	1	11%
0%	0	22	22	40		33	11	10	1	9%
0%	0	11	11		77		13	11	2	15%
				9	63	5	volume			
				9	58	5		cars		
				0	5	0			trucks	
				0%	8%	0%				truck %

11/23/2004
9:00-10:00
AM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

1

truck %				0%	11%	0%				N
	trucks			0	5	0				
		cars		7	39	6				
			volume	7	44	6				
0%	0	5	5		57		8	8	0	0%
0%	0	9	9	32		16	5	4	1	20%
11%	2	16	18		61		3	3	0	0%
				8	45	8	volume			
				7	37	6		cars		
				1	8	2			trucks	
				13%	16%	25%				truck %

truck %				0%	15%	0%				
	trucks			0	24	0				
		cars		18	139	22				
			volume	18	163	22				
0%	0	18	18		0.59		33	32	1	3%
0%	0	39	39	0.55		0.71	32	30	2	6%
12%	6	46	52		0.52		26	25	1	4%
				31	162	35	volume			
				30	143	30		cars		
				1	19	5			trucks	
				3%	12%	14%				truck %

2

truck %				0%	10%	0%				
	trucks			0	4	0				
		cars		4	35	5				
			volume	4	39	5				
0%	0	3	3		48		12	11	1	8%
0%	0	14	14	29		32	13	13	0	0%
8%	1	11	12		51		7	7	0	0%
				10	35	8	volume			
				10	32	4		cars		
				0	3	2			trucks	
				0%	9%	33%				truck %

3

truck %				0%	15%	0%				
	trucks			0	6	0				
		cars		1	33	7				
			volume	1	39	7				
0%	0	5	5		47		7	7	0	0%
0%	0	9	9	23		25	7	7	0	0%
22%	2	7	9		54		11	11	0	0%
				7	40	7	volume			
				7	35	7		cars		
				0	5	0			trucks	
				0%	13%	0%				truck %

4

truck %				0%	22%	0%				
	trucks			0	9	0				
		cars		6	32	4				
			volume	6	41	4				
0%	0	5	5		51		6	6	0	0%
0%	0	7	7	25		18	7	6	1	14%
8%	1	12	13		62		5	4	1	20%
				6	42	14	volume			
				6	39	13		cars		
				0	3	1			trucks	
				0%	7%	7%				truck %

1	166	166		
2	160	160	Hourly volume	631
3	149	149		
4	156	156		

11/23/2004
10:00-11:00
AM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

N

1

truck %				0%	10%	0%				
	trucks			0	4	0				
		cars		5	35	6				
			volume	5	39	6				
13%	1	7	8		50		8	8	0	0%
11%	1	8	9	26		31	15	14	1	7%
11%	1	8	9		41		8	8	0	0%
				7	29	5	volume			
				7	27	5		cars		
				0	2	0			trucks	
				0%	7%	0%				truck %

truck %				0%	10%	0%				
	trucks			0	16	0				
		cars		18	148	27				
			volume	18	164	27				
4%	1	23	24		0.84		48	47	1	2%
5%	1	21	22	0.81		0.63	53	52	1	2%
6%	3	35	38		0.85		46	44	2	4%
				31	157	29	volume			
				29	136	26		cars		
				2	21	3			trucks	
				6%	13%	10%				truck %

2

truck %				0%	5%	0%				
	trucks			0	2	0				
		cars		2	38	10				
			volume	2	40	10				
0%	0	8	8		52		18	17	1	6%
0%	0	3	3	21		55	17	17	0	0%
10%	1	9	10		52		23	22	1	4%
				7	39	7	volume			
				6	36	7		cars		
				1	2	0			trucks	
				14%	5%	0%				truck %

1	148	148		
2	183	183	Hourly volume	657
3	136	136		
4	190	190		

3

truck %				0%	16%	0%				
	trucks			0	6	0				
		cars		5	28	6				
			volume	5	34	6				
0%	0	2	2		45		6	6	0	0%
0%	0	5	5	13		14	2	2	0	0%
17%	1	5	6		64		6	5	1	17%
				6	46	12	volume			
				6	37	9		cars		
				0	9	3			trucks	
				0%	20%	25%				truck %

4

truck %				0%	6%	0%				
	trucks			0	4	0				
		cars		6	47	5				
			volume	6	51	5				
0%	0	6	6		62		16	16	0	0%
0%	0	5	5	24		44	19	19	0	0%
0%	0	13	13		60		9	9	0	0%
				11	44	5	volume			
				10	36	5		cars		
				1	8	0			trucks	
				9%	18%	0%				truck %

11/23/2004
2:00-3:00
PM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

N ↑

1

truck %				0%	16%	0%			
	trucks			0	8	0			
		cars		7	42	5			
			volume	7	50	5			
0%	0	3	3		62		9	8	1	11%
9%	2	21	23	32		33	20	18	2	10%
17%	1	5	6		61		4	3	1	25%
				9	65	7	volume			
				8	55	7		cars		
				1	10	0			trucks	
				11%	15%	0%				truck %

truck %				4%	16%	10%			
	trucks			1	30	3			
		cars		27	155	27			
			volume	28	185	30			
4%	1	28	27		0.86		30	29	1	3%
6%	4	60	64	0.88		0.50	55	52	3	5%
11%	5	42	47		0.57		38	27	11	29%
				36	221	25	volume			
				33	185	24		cars		
				3	36	1			trucks	
				8%	16%	4%				truck %

2

truck %				0%	11%	11%			
	trucks			0	5	1			
		cars		6	39	8			
			volume	6	44	9			
0%	0	8	8		59		11	11	0	0%
14%	1	6	7	30		34	13	13	0	0%
0%	0	15	15		64		10	5	5	50%
				9	50	5	volume			
				8	39	4		cars		
				1	11	1			trucks	
				11%	22%	20%				truck %

1	208	208		
2	187	187	Hourly volume	786
3	191	191		
4	200	200		

3

truck %				25%	23%	0%			
	trucks			1	10	0			
		cars		3	33	4			
			volume	4	43	4			
13%	1	7	8		51		6	6	0	0%
5%	1	19	20	39		34	13	12	1	8%
9%	1	10	11		67		15	10	5	33%
				8	50	9	volume			
				8	45	9		cars		
				0	5	0			trucks	
				0%	10%	0%				truck %

4

truck %				0%	15%	17%			
	trucks			0	7	2			
		cars		11	41	10			
			volume	11	48	12			
0%	0	8	8		71		4	4	0	0%
0%	0	14	14	37		22	9	9	0	0%
20%	3	12	15		70		9	9	0	0%
				10	56	4	volume			
				9	46	4		cars		
				1	10	0			trucks	
				10%	18%	0%				truck %

11/23/2004
3:00-4:00
PM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

N

1

truck %				5%	14%	0%			
	trucks			1	9	0			
		cars		18	55	8			
			volume	19	64	8			
0%	0	7	7		91		8	7	1	13%
5%	1	18	19	42		35	20	20	0	0%
0%	0	16	16		87		8	7	1	13%
				6	71	10	volume			
				6	55	7		cars		
				0	16	3			trucks	
				0%	23%	30%				truck %

truck %				3%	13%	2%			
	trucks			2	38	1			
		cars		62	262	50			
			volume	64	300	51			
0%	0	49	49		0.82		51	48	3	6%
5%	5	93	103	0.50		0.41	162	155	7	4%
6%	6	65	71		0.96		55	51	4	7%
				44	261	37	volume			
				44	226	33		cars		
				0	35	4			trucks	
				0%	13%	11%				truck %

2

truck %				0%	16%	0%			
	trucks			0	16	0			
		cars		16	85	9			
			volume	16	101	9			
0%	0	15	15		126		6	6	0	0%
3%	1	29	30	61		55	34	33	1	3%
19%	3	13	16		83		15	14	1	7%
				12	65	6	volume			
				12	60	5		cars		
				0	5	1			trucks	
				0%	8%	17%				truck %

1	256	256		
2	325	325	Hourly volume	1248
3	373	373		
4	294	294		

3

truck %				6%	10%	6%			
	trucks			1	8	1			
		cars		15	72	16			
			volume	16	80	17			
0%	0	14	14		113		18	17	1	6%
4%	1	24	25	62		109	78	74	4	5%
4%	1	22	23		69		13	12	1	6%
				11	67	11	volume			
				11	58	11		cars		
				0	9	0			trucks	
				0%	13%	0%				truck %

4

truck %				0%	9%	0%			
	trucks			0	5	0			
		cars		13	50	17			
			volume	13	55	17			
0%	0	13	13		65		19	18	1	5%
7%	2	27	29	58		63	30	28	2	7%
13%	2	14	16		83		19	18	1	5%
				15	58	10	volume			
				15	53	10		cars		
				0	5	0			trucks	
				0%	9%	0%				truck %

11/23/2004
4:00-5:00
PM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

1

truck %				0%	7%	0%				N
	trucks			0	5	0				
		cars		16	64	10				
			volume	16	69	10				
0%	0	13	13		97		15	14	1	7%
4%	1	26	27	56		53	24	22	2	6%
0%	0	18	18		63		14	13	1	7%
				19	64	15	volume			
				19	56	13		cars		
				0	8	2			trucks	
				0%	13%	13%				truck %

truck %				0%	10%	0%				
	trucks			0	6	0				
		cars		9	55	15				
			volume	9	61	15				
7%	1	14	15		65		7	7	0	0%
0%	0	18	18	40		39	21	21	0	0%
0%	0	7	7		79		11	10	1	9%
				9	64	6	volume			
				9	58	5		cars		
				0	6	1			trucks	
				0%	9%	17%				truck %

3

truck %				0%	16%	0%				
	trucks			0	9	0				
		cars		14	47	15				
			volume	14	56	15				
0%	0	11	11		65		10	10	0	0%
9%	2	20	22	46		46	25	25	0	0%
0%	0	13	13		69		11	10	1	9%
				14	57	15	volume			
				14	55	14		cars		
				0	2	1			trucks	
				0%	4%	7%				truck %

4

truck %				0%	9%	0%				
	trucks			0	4	0				
		cars		14	39	13				
			volume	14	43	13				
0%	0	21	21		70		9	9	0	0%
9%	2	21	23	61		37	13	12	1	8%
0%	0	17	17		79		15	15	0	0%
				20	47	12	volume			
				17	36	10		cars		
				3	11	2			trucks	
				15%	23%	17%				truck %

truck %				0%	10%	0%				
	trucks			0	24	0				
		cars		55	205	53				
			volume	55	229	53				
2%	1	59	60		0.87		41	40	1	2%
6%	5	85	90	0.81		0.53	83	80	3	4%
0%	0	55	55		0.87		51	48	3	6%
				62	232	48	volume			
				59	205	42		cars		
				3	27	6			trucks	
				5%	12%	13%				truck %

1	306	306		
2	243	243	Hourly volume	1059
3	263	263		
4	247	247		

11/23/2004
5:00-6:00
PM

Intersection 15 Minute Volumes and Peak Hour Factors
Phillips (N/S) & McGregor (E/W)

1

truck %				0%	10%	0%			
	trucks			0	6	0			
		cars		22	52	24			
			volume	22	58	24			
0%	0	11	11		104		10	10	0	0%
0%	0	28	28	56		42	18	18	0	0%
0%	0	17	17		82		14	14	0	0%
				19	51	12	volume			
				19	44	11		cars		
				0	7	1			trucks	
				0%	14%	8%				truck %

N

truck %				2%	6%	0%			
	trucks			1	11	0			
		cars		63	178	60			
			volume	64	189	60			
5%	2	37	39		0.75		49	49	0	0%
0%	0	95	95	0.84		0.93	74	71	3	4%
5%	3	52	55		0.86		34	32	2	6%
				51	165	45	volume			
				50	170	43		cars		
				1	15	2			trucks	
				2%	8%	4%				truck %

2

truck %				0%	4%	0%			
	trucks			0	2	0			
		cars		12	45	13			
			volume	12	47	13			
14%	1	6	7		72		7	7	0	0%
0%	0	20	20	35		32	18	17	1	6%
0%	0	8	8		71		7	7	0	0%
				11	52	8	volume			
				10	50	8		cars		
				1	2	0			trucks	
				9%	4%	0%				truck %

1	284	284		
2	210	210	Hourly volume	940
3	227	227		
4	219	219		

3

truck %				6%	7%	0%			
	trucks			1	3	0			
		cars		17	40	14			
			volume	18	43	14			
0%	0	8	8		75		21	21	0	0%
0%	0	24	24	50		41	16	14	2	13%
11%	2	16	18		61		4	4	0	0%
				9	38	14	volume			
				9	34	13		cars		
				0	4	1			trucks	
				0%	11%	7%				truck %

4

truck %				0%	0%	0%			
	trucks			0	0	0			
		cars		12	41	9			
			volume	12	41	9			
8%	1	12	13		62		11	11	0	0%
0%	0	23	23	49		42	22	22	0	0%
8%	1	11	12		67		0	7	2	22%
				12	44	11	volume			
				12	42	11		cars		
				0	2	0			trucks	
				0%	5%	0%				truck %

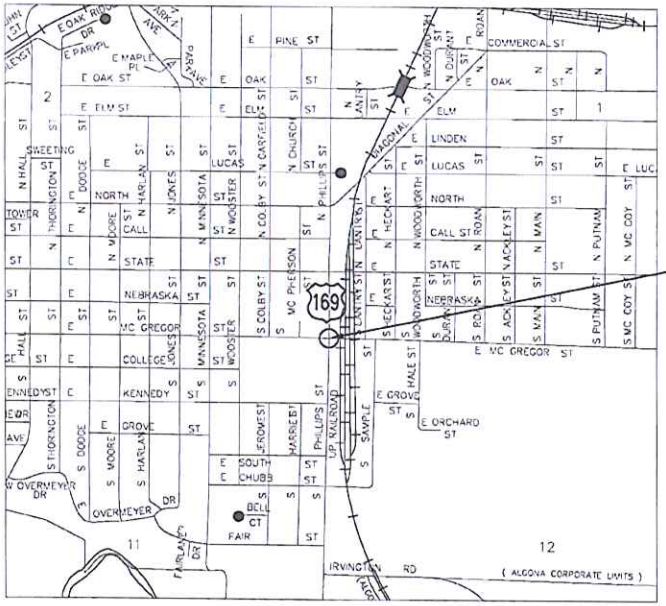
URBAN ROAD SYSTEM
CITY OF ALGONA, IOWA
PLANS OF
TRAFFIC SIGNALIZATION IMPROVEMENTS
AT THE INTERSECTION OF
U.S. 169 AND McGREGOR STREET
CS-TSF-0085-(611)--85-55

PROJECT NUMBER
CS-TSF-0085-(611)--85-55

THE CURRENT EDITION OF THE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS SHALL APPLY TO CONSTRUCTION WORK ON THE PROJECT, PLUS THE BIDDING INFORMATION, CONTRACT PROVISIONS, AND SPECIAL PROVISIONS OF KUEHL & PAYER, LTD.

NO MILEAGE SUMMARY

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com



PROJECT LOCATION

PROJECT LOCATION

SCALE
0 1/4 MILE

I&S GROUP
One firm - start to finish ™
ARCHITECTS • ENGINEERS • PLANNERS • LAND SURVEYORS • SCIENTISTS

INDEX OF SHEETS

No.	Description
A.01	TITLE SHEET
B.01	CONSTRUCTION NOTES/TYPICAL SECTION
C.01	ESTIMATED QUANTITIES AND ESTIMATE REFERENCE INFORMATION
D.01	PLAN SHEET
J.01	PAVEMENT MARKING AND SIGNAGE
L.01	JOINTING AND STAKING PLAN
M.01	STORM SEWER SHEET
N.01	TRAFFIC SIGNAL DETAIL SHEET
N.02	TRAFFIC SIGNAL NOTES
N.03	PHASING DIAGRAM AND TABULATIONS
N.04	WIRING DIAGRAM
R.01	REMOVAL SHEET
S.01	SIDEWALK LAYOUT
S.02	SIDEWALK COMPLIANCE TABULATION

CITY OF ALGONA, IOWA

Approved for Letting

Public Works Director Date

LICENSED PROFESSIONAL ENGINEER
KENT L. RODE
16323
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.

Kent L. Rode Date

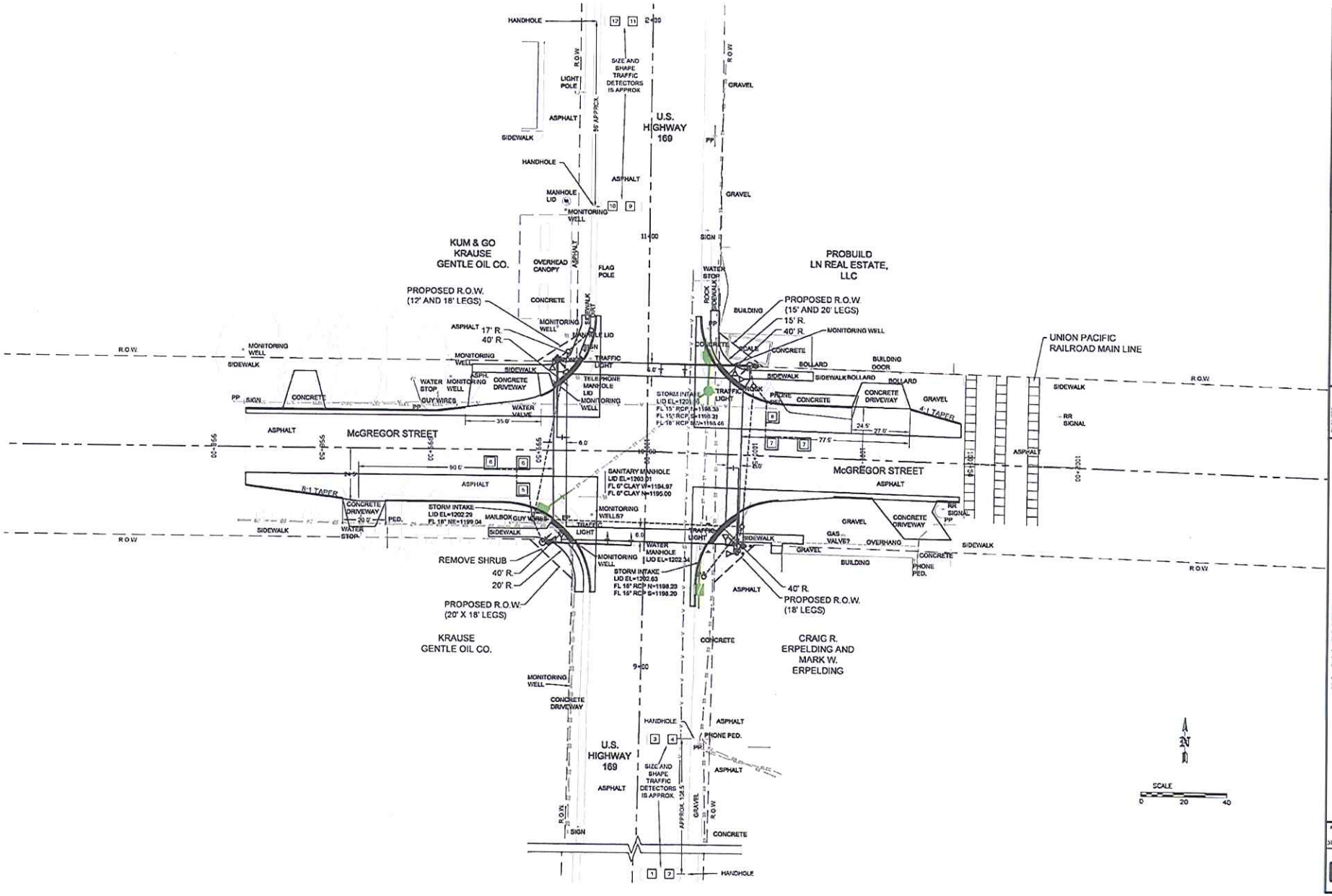
My license renewal date is December 31, 2013.
Sheets covered by this seal: ALL SHEETS LISTED IN THE INDEX

LETTING DATE

PROJECT NUMBER
CS-TSF-0085-(611)--85-55
TRAFFIC SIGNALIZATION

CITY OF ALGONA
KOSSUTH COUNTY

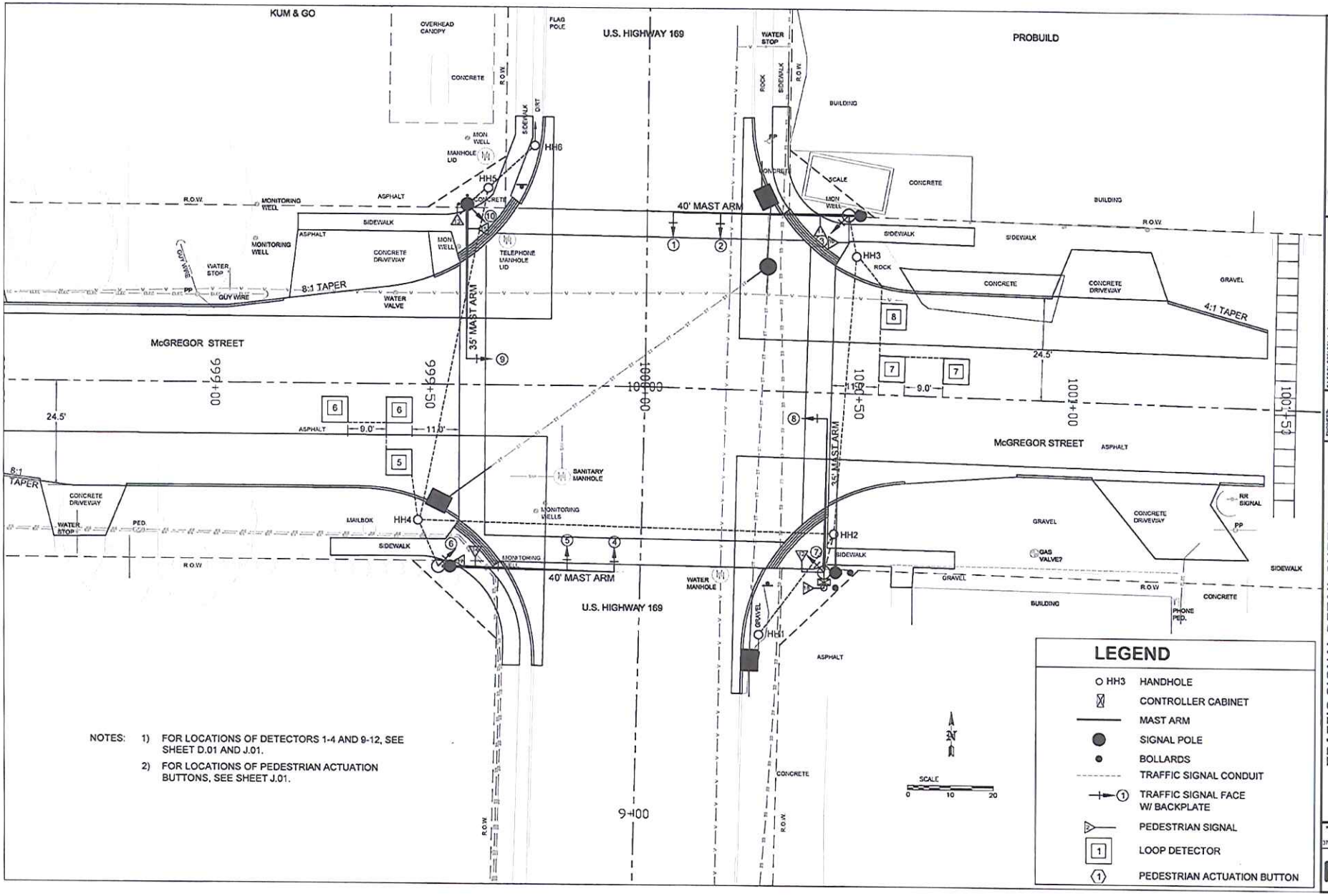
F:\5000\75105.01 Algona Hwy 169- Traffic Signal\dwg\A.01-Title.dwg 3-16-2012



PLAN SHEET
TRAFFIC SIGNALIZATION IMPROVEMENTS
U.S. HWY 169 AND McGREGOR STREET

PROJECT NO 375105 01 | DATE 8-2 2012

SHEET D.01



NOTES:
1) FOR LOCATIONS OF DETECTORS 1-4 AND 9-12, SEE SHEET D.01 AND J.01.
2) FOR LOCATIONS OF PEDESTRIAN ACTUATION BUTTONS, SEE SHEET J.01.

IS GROUP

TRAFFIC SIGNAL DETAIL SHEET
TRAFFIC SIGNALIZATION IMPROVEMENTS
U.S. HWY 169 AND McGREGOR STREET

PROJECT NO 375105.01
DATE 8-2 2012
SHEET N.01

TRAFFIC SIGNALIZATION NOTES

1. THE INTENT OF THE PROJECT IS TO INSTALL NEW POLES, MAST ARMS, CONTROLLER, CONTROL BOX, TRAFFIC SIGNAL HEADS, LUMINAIRES, PEDESTRIAN SIGNAL HEADS, CONDUIT AND WIRING. THE EXISTING LOOP DETECTORS ON U.S. HWY 169 WILL BE UTILIZED AS CONSTRUCTED. NEW LOOP DETECTORS WILL BE PLACED ON MCGREGOR STREET.
2. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT INCLUDING TRAFFIC SIGNAL POLES, SIGNAL HEADS, PEDESTRIAN HEADS, CONTROLLER, CONTROLLER BOX AND APPURTENANCES SHALL BE REMOVED, SALVAGED AND DELIVERED TO A SITE WITHIN THE CITY LIMITS AS DESIGNATED BY THE CITY OF ALGONA. EXISTING BASES AND WIRING SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
3. ALL QUANTITIES SHOWN IN THE TRAFFIC SIGNAL PLANS AND SPECIFICATIONS ARE FOR INFORMATION AND ESTIMATING PURPOSED ONLY. THE CONTRACTOR'S LUMP SUM BID SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL TRAFFIC SIGNAL INSTALLATION IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS.
4. PROVIDE TRAFFIC CONTROL DEVICES AS REQUIRED TO FACILITATE CONSTRUCTION OF TRAFFIC SIGNALS IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR THE STREETS AND HIGHWAYS, AS ADOPTED BY THE IOWA DEPARTMENT OF TRANSPORTATION PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130.
5. THE PLAN LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO STARTING ANY EXCAVATION ON THE PROJECT TO ESTABLISH LOCATIONS, AND COORDINATE CONSTRUCTION ACTIVITIES.
6. CONTRACTOR SHALL FURNISH A SCHEDULE OF UNIT PRICES FOR ESTIMATED TRAFFIC SIGNAL QUANTITIES. PAYMENT WILL BE BASED ON PLAN QUANTITIES. QUANTITIES WILL NOT BE FIELD MEASURED.
7. UNLESS OTHERWISE DIRECTED, TRAFFIC SIGNAL HEADS ON MAST ARMS ARE TO BE ALIGNED OVER THE CENTER OF INTERSECTION APPROACH LANES. APPROXIMATE LOCATIONS ARE AS SHOWN IN THE TRAFFIC SIGNAL LAYOUT SHEET. CONTRACTOR SHALL FIELD VERIFY SIGNAL HEAD LOCATIONS.
8. ALL VEHICULAR TRAFFIC SIGNAL LAMPS SHALL BE L.E.D. BACKPLATES AND SIGNAL HEAD VISORS SHALL BE PROVIDED FOR ALL SIGNAL HEADS.
9. ALL HANDHOLES SHALL BE HEAVY-DUTY PRECAST TRAFFIC TYPE. THE LOCATIONS OF ALL HANDHOLES ARE APPROXIMATE ONLY AND ARE SUBJECT TO ADJUSTMENT IN THE FIELD BY THE ENGINEER.
10. ALL PEDESTRIAN SIGNAL HEADS SHALL BE A 16" SINGLE HOUSING WITH AN L.E.D. PORTLAND ORANGE FILLED IN UPRAISED HAND ON ONE SIDE AND AN L.E.D. OUTLINED LUNAR WHITE WALKING PERSON ON THE OTHER SIDE.
11. ALL DETECTOR UNITS SHALL BE PROVIDED WITH DELAY AND EXTENSION TIMING CAPABILITIES. THE DELAY INHIBIT ON EACH UNIT SHALL BE IN EFFECT DURING THE ASSOCIATED GREEN PHASE.
12. TWO OF THE FOUR NEW POLES SHALL BE COMBINATION STREET LIGHTING AND SIGNAL POLES AND SHALL BE PLACED IN THE OPPOSING SOUTHEAST AND NORTHWEST CORNERS. LUMINAIRE ARMS SHALL BE 12 FEET LONG SINGLE TRUSS LUMINAIRE ARMS MATCHING THE CITY'S EXISTING LIGHTING (VALMONT DS66) AND PLACED AT 45 DEGREES TO SIGNAL ARMS. LIGHT FIXTURES SHALL BE TYPICAL COBRA HEAD 250 WATT HIGH PRESSURE SODIUM FIXTURES WITH A 40 FOOT LUMINAIRE MOUNTING HEIGHT.
13. CONTRACTOR SHALL JACK ONE 3" DIAMETER STEEL CONDUIT ACROSS MCGREGOR STREET ON EACH SIDE OF U.S. HWY. 169. CONDUIT SHALL EXTEND A MINIMUM 5' BACK OF CURB AND SHALL BE CAPPED FOR FUTURE HIGHWAY LIGHTING USE. ALGONA MUNICIPAL UTILITIES WILL PROVIDE LOCATE BALLS FOR EACH OF THE CAPPED ENDS.
14. THE CONTROLLER SHOULD DWELL IN RED. IN THE EVENT OF A DETECTION ON PHASE C AND EITHER PHASE A OR PHASE B WHILE ON THE OPPOSITE U.S. 169 LEG, THE CONTROLLER WILL FIRST GO TO THE NEXT U.S. 169 PHASE PRIOR TO PHASE C. IF THERE IS THEN A DETECTION FROM THE ORIGINAL U.S. 169 PHASE, THE CONTROLLER WILL NEXT CYCLE TO PHASE C BEFORE RETURNING TO THE ORIGINAL PHASE.
15. A NEW CONTROLLER AND CONTROLLER CABINET SHALL BE FURNISHED AND INSTALLED. THE NEW CABINET WILL BE POST MOUNTED ON THE TRAFFIC SIGNAL POLE IN THE SE QUADRANT. AMU WILL PROVIDE ELECTRIC POWER TO POLE BASE. THE CONTRACTOR SHALL PROVIDE CONNECTION TO THE METER USING A 40 AMP - 120 VOLT CIRCUIT BREAKER TYPE WEATHER PROOF DISCONNECT. ALL COSTS ASSOCIATED WITH THE ELECTRICAL SERVICE CONNECTION SHALL BE INCLUDED IN THE LUMP SUM BID FOR THE TRAFFIC SIGNALS
16. THE CONTRACTOR SHALL PROVIDE THE CITY WITH OPERATION AND MAINTENANCE DATA FOR THE TRAFFIC SIGNAL ITEMS (CATALOG CUTS ACCEPTABLE) THAT ARE PROPOSED FOR INSTALLATION.
17. CONTRACTOR SHALL PLACE BOLLARDS TO PROTECT SIGNAL POLES AT THE NW AND SE QUADRANTS.
18. THE CONTROLLER SHALL BE A PEEK MODEL 3000 OR APPROVED EQUAL TO BE COMPATIBLE WITH EXISTING CITY EQUIPMENT. IT SHOULD PROVIDE THE FOLLOWING FEATURES:
    - A. 32 BIT MICROPROCESSOR.
    - B. PORTABLE DATA CARD TO TRANSFER TIMING BETWEEN CONTROLLERS.
    - C. KEYBOARD WITH DEDICATED FUNCTION AND NUMERIC KEYS.
    - D. ALPHANUMERIC MENU DISPLAY, MINIMUM SIZE 8 ROWS X 40 COLUMNS.
    - E. MENU SCREENS PROGRAMMABLE TO ALLOW DELETION OF UNWANTED DISPLAYS.
    - F. CONTEXT SENSITIVE HELP SCREENS SELECTED ON KEYBOARD.
    - G. EXPANDABLE TO 16 PHASES, 16 OVERLAPS, 2 EXCLUSIVE PEDESTRIAN SEQUENCES.
    - H. ADVANCE WARNING BEACON LOGIC.
    - I. PREEMPTION CAPABLE.
18. THE CONFLICT MONITOR SHOULD PROVIDE THE FOLLOWING FEATURES:
    - A. NONVOLATLE RETENTION OF FAULT STATUS. DISPLAY ALL CHANNELS AND COLORS WHEN POWER RESTORED.
    - B. POWER FAILURE COUNT. LOGS UP TO 200 FAILURES.
    - C. LOG DATE AND TIME OF 100 EVENTS (MIN) INCLUDING RESET. DISPLAY STATUS AT TIME OF FAULT.
    - D. SELECTABLE INPUT TO DETECT MALFUNCTIONING CONTROLLER.
    - E. SELECTABLE LATCH OPTIONS FOR CVM AND 24V FAILURES.
    - F. ENHANCED CHANNEL MONITORING TO PERMIT SELECTABLE COLOR FAULT INDICATIONS.
    - G. ENHANCED ABSENCE MONITORING TO PERMIT ABSENCE DETECTION WITH WALK INPUT ACTIVE.
    - H. INDIVIDUAL CHANNEL ABSENCE TIMERS.
    - I. MULTIPLE STATUS BITS FOR REMOTE MONITORING.
19. LOOP DETECTOR AMPLIFIERS SHOULD PROVIDE THE FOLLOWING FEATURES:
    - A. SHELF MOUNT TYPE WITH DELAY, EXTENSION AND MAX. PRESENCE TIMERS.
    - B. LCD VIEW OF ALL OPERATIONS, LOOP DIAGNOSTICS AND PROGRAMMABLE FEATURES.
    - C. LOOP INDUCTANCE CHANGE BAR GRAPH ON LCD.
    - D. DISPLAY LOOP INDUCTANCE IN MICROHENRIES.
    - E. DISPLAY PERCENTAGE INDUCTANCE SHIFT RATIO.
    - F. DISPLAY TOTAL NUMBER OF LOOP FAILURES SINCE LAST RESET.
    - G. DISPLAY SHORTED OR OPEN LOOP CONDITIONS.

ESTIMATED MATERIALS AND EQUIPMENT QUANTITIES--TRAFFIC SIGNALIZATION

INTERSECTION	TRAFFIC SIGNAL POLES W/ MAST ARMS	TRAFFIC SIGNAL POLES W/ MAST ARMS AND LUMINAIRE ARMS	TRAFFIC ACTUATED CONTROLLER	NEW CABINET	TRAFFIC SIGNAL HEADS						BACKPLATES	LUMINAIRES 250 WATT HPS	HAND HOLE	STEEL CONDUIT (JACKED) (LF)		STEEL CONDUIT (JACKED) FOR FUTURE USE (LF)	PVC CONDUIT (LF)			SIGNAL CABLE AND CONDUCTORS (LF)						LOOP DETECTORS	REMOVE EXISTING BASES	INSTALL TRAFFIC SIGNAL BASES (3' x 10') REFER TO FIG. 86107	REMOVE & SALVAGE EXISTING TRAFFIC SIGNAL POLES
					MAST ARM MOUNT		POLE MOUNT		PEDESTRIAN											NUMBER OF CONDUCTORS									
					R.GID	R.GID	STEEL BRACKET		COMBINATION HANDMAN	ACTUATION BUTTONS																			
					NUMBER OF SECTIONS IN SIGNAL HEAD																								
					4-12"	3-12"	3-12"		1-16"					3"	3"		2"	3"	4"	7	5	2 DET	2 PB	TR	GND				
US 169 AND McGREGOR STREET	2	2	1	1	2	4	4		8	8	10	2	6	241	165		70	40	10	652	506	876	448	525	361	6	4	4	4

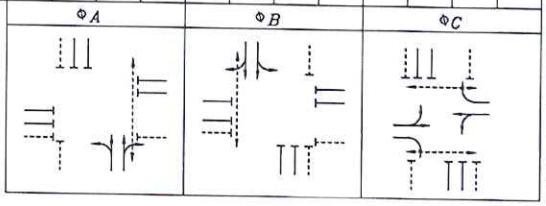
TRAFFIC SIGNAL NOTES
TRAFFIC SIGNALIZATION IMPROVEMENTS
U.S. HWY 169 AND McGREGOR STREET

PROJECT NO 075105.01 | DATE 6-12-2012 | SHEET N.02

PHASING DIAGRAM

	SIGNAL NUMBER	INTERVAL MOVEMENT		PHASE A 1	PHASE A 2	PHASE A 3	PHASE A 4	PHASE B 5	PHASE B 6	PHASE B 7	PHASE B 8	PHASE C 9	PHASE C 10	PHASE C 11	PHASE C 12
VEHICULAR	1	U.S. 169	NB	G & GA	G & GA	Y	R	R	R	R	R	R	R	R	R
	2 - 3	U.S. 169	NB	G	G	Y	R	R	R	R	R	R	R	R	R
	4	U.S. 169	SB	R	R	R	R	G & GA	G & GA	Y	R	R	R	R	R
	5 - 6	U.S. 169	SB	R	R	R	R	G	G	Y	R	R	R	R	R
	7 - 8	McGREGOR STREET	EB	R	R	R	R	R	R	R	R	G	G	Y	R
	9 - 10	McGREGOR STREET	WB	R	R	R	R	R	R	R	R	G	G	Y	R
PEDESTRIAN	11 - 12	NORTHBOUND/ SOUTHBOUND EAST		W	FDW	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW
	13 - 14	NORTHBOUND/ SOUTHBOUND WEST		DW	DW	DW	DW	W	FDW	FDW	DW	DW	DW	DW	DW
	15 - 16	WESTBOUND/ EASTBOUND NORTH		DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	FDW	DW
	17 - 18	WESTBOUND/ EASTBOUND SOUTH		DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	FDW	DW

NORTH



RECOMMENDED INITIAL TIME SETTINGS (SECONDS)

	PHASE A	PHASE B	PHASE C
MINIMUM GREEN	10.0	10.0	8.0
PASSAGE	2.0	2.0	1.0
MAXIMIM GREEN	33.0	33.0	20.0
YELLOW	3.5	3.5	3.0
ALL RED	1.0	1.0	1.5
WALK	7.0	7.0	7.0
PEDESTRIAN CLEARANCE	20.0	20.0	20.0

SCHEDULE OF DETECTORS

DETECTOR NUMBER	STATION	LOCATION	TYPE OF DETECTOR	REMARKS
1	STA. 7+58.5, 6' RT.	NORTHBOUND, INSIDE LANE	DILEMMA ZONE	U.A.C.
2	STA. 7+58.5, 18' RT	NORTHBOUND, OUTSIDE LANE	DILEMMA ZONE	U.A.C.
3	STA. 8+67, 6' RT	NORTHBOUND, INSIDE LANE	PRESENCE	U.A.C.
4	STA. 8+67, 18' RT	NORTHBOUND, OUTSIDE LANE	PRESENCE	U.A.C.
5	STA. 999+43, 18' RT	EASTBOUND	PRESENCE	McGREGOR STREET
		USE ONE NEW 6' X 6' MANUFACTURED PREFORMED DETECTOR		
6	STA. 999+43, 6' RT	EASTBOUND	PRESENCE	McGREGOR STREET
		USE TWO NEW 6' X 6' MANUFACTURED PREFORMED DETECTORS		
7	STA. 1000+57, 6' LT	WESTBOUND	PRESENCE	McGREGOR STREET
		USE TWO NEW 6' X 6' MANUFACTURED PREFORMED DETECTORS		
8	STA. 1000+57, 18' LT	WESTBOUND	PRESENCE	McGREGOR STREET
		USE ONE NEW 6' X 6' MANUFACTURED PREFORMED DETECTOR		
9	STA. 11+13, 6' LT	SOUBHBOUND, INSIDE LANE	PRESENCE	U.A.C.
10	STA. 11+13, 18' LT	SOUTHBOUND, OUTSIDE LANE	PRESENCE	U.A.C.
11	STA. 12+00, 6' LT	SOUTHBOUND, INSIDE LANE	DILEMMA ZONE	U.A.C.
12	STA. 12+00, 18' LT	SOUTHBOUND, OUTSIDE LANE	DILEMMA ZONE	U.A.C.

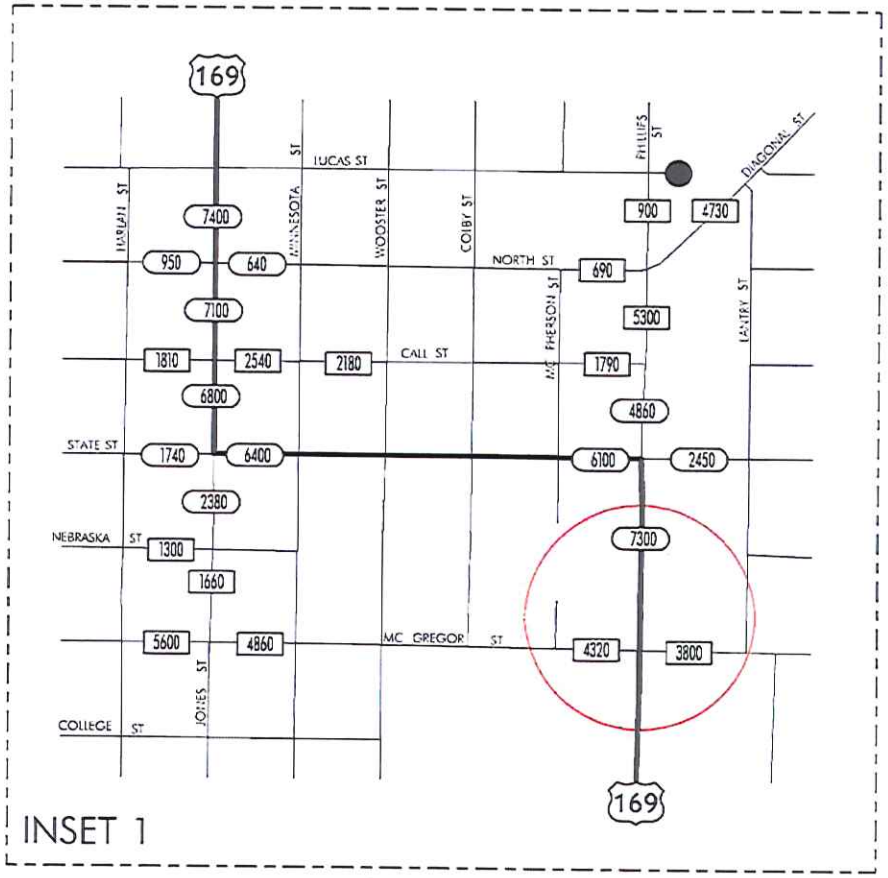
IS GROUP

ENGINEER: K.L. Eide
DESIGNED: K.L. Eide
DRAFTSMAN: DRAFTSMAN
CHECKED: K.L. Eide
JOB: 375105.03
DATE: 8/21/2012
BY: ET

PHASING DIAGRAM AND TABULATIONS
TRAFFIC SIGNALIZATION IMPROVEMENTS
U.S. HWY 169 AND McGREGOR STREET

PROJECT NO 375105.01
DATE 8-2 2012
SHEET N.03

2011 AADT



INSET 1

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Kossuth Prepared by: Kent L. Rode, P.E. Date Prepared: Aug 1, 2012

Intersection: US Hwy. 169 & McGregor Street in Algona.

Improvement

Proposed Improvement(s): Upgrade signals to provide protected left turns for the north/south traffic.

Improve turning radii, provide full-width rt-turn lanes on minor approach and provide 10 foot clear zone at inters.

$ 411,890 Estimated Improvement Cost, **EC**

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

$ - Present Value Other Annual Costs, **OC**

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

15 Est. Improvement Life, years, **Y**

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

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

$ 411,890 Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: DOT 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

3,650 ↓

2,160 → ✦ ← 1,900

↑ 3,650

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

11,360 Current Daily Entering Vehicles, **DEV**

4,146,400 Current Annual Entering Veh., **AEV** = DEV * 365

15,289 veh / day, Final Year DEV, **FDEV**

71.71 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

2006 First full year --> 2011 Last full year 6.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes →		Fatalities @	$3,500,000	$ -
			Major Injuries @	$240,000	$ -
5	Injury Crashes →	5	Minor Injuries @	$48,000	$ 240,000
		10	Possible Injuries @	$25,000	$ 250,000
38	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 116,500
43	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 606,500

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

$ 14,105 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 100,073 Crash Costs Avoided in First Year, AAR x AVC

122.7 Total Avoided Crashes, TECR x CRF/ 100

1.73 Crashes / MEV, Crash Rate, **CR**

CR = TA x 10^6 / (DEV x 365 x T)

$ 1,264,351 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 = $1,264,351 : $411,890 = **3.07** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Co. Rd. C20/3' HMA Paved Shoulders & Rumble Strips

Applicant: Humboldt County

Contact Person: Paul Jacobson P.E. Title: County Engineer

Complete Mailing Address: 2221 220th Street
Humboldt, Iowa 50548

Phone: 515/332-2366 (Area Code) E-Mail: engineer@goldfieldaccess.net

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 133,466

Safety Funds Requested $ 133,466

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Humboldt County Board of Supervisors

Signed: Jerry R Haverly — 8/13/12

Signature — Date Signed

Jerry Haverly

Typed Name

Attest: Peggy J. Rice — 8/13/12

Signature — Date Signed

Peggy Rice

Typed Name

RESOLUTION NO. 2012-12

RESOLUTION AUTHORIZING THE COUNTY ENGINEER TO SUBMIT AN APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION FOR TRAFFIC SAFETY IMPROVEMENT FUNDS ($133,466) FOR THE PAVED SHOULDER PROJECT ON COUNTY ROAD C20 (120TH STREET).

WHEREAS, the Iowa Department of Transportation provides funding for certain road improvements through the Traffic Safety Funds; and

WHEREAS, the County of Humboldt County has deemed it necessary and desirable to seek funds for the shoulder improvements on County Road C20; and

WHEREAS, the County Engineers office has prepared an application for traffic safety funding in the amount of $133,466; and

WHEREAS, it would be in the best interest of the County of Humboldt County to submit said application.

NOW THEREFORE BE IT RESOLVED BY THE HUMBOLDT COUNTY BOARD OF SUPERVISORS, that the County Engineer is hereby authorized and directed to submit a application, a copy of which is attached hereto and by this referenced made a part hereof, to the Iowa Department of Transportation in the amount of $133,466 for Traffic Safety Improvement Funds for shoulder improvements on County Road C20.

HUMBOLDT COUNTY BOARD OF SUPERVISORS

By Jerry R Haverly
Jerry Haverly, Chairman

Attest:

Peggy J. Rice
County Auditor

Dated: August 13, 2012

1. **Existing Condition**

The proposed project is located on County Road C20 (120th Street) east of the city of Livermore in Humboldt County. The roadway is a rural highway with 4' granular shoulders. The roadway surface is ACC, 22' in width. The posted speed limit is 55 mph. The average traffic volume in 2011 was approximately 250 vpd. Both curves currently have chevrons in place.

2. **Proposed Concept**

The proposed concept is to replace 3' of the existing granular shoulders with 3' ACC paved shoulders 200' before PC of the first curve thru 200' past PT of the second curve with Milled Rumble Strips on both sides of the curves.

3. **Justification**

From 2007 to 2011 there were a total of 2 related serious crashes due to failure to navigate the existing curves and a alcohol related accident.

4. **Cost Estimate and Proposed Funding Sources**

The cost of the proposed improvements is estimated at $133,466.00. It is proposed to fund 100% of the cost of the project with TSIP funds.

5. **Proposed Schedule**

The project is proposed for letting in April 2013 with construction to be completed by November 2013.

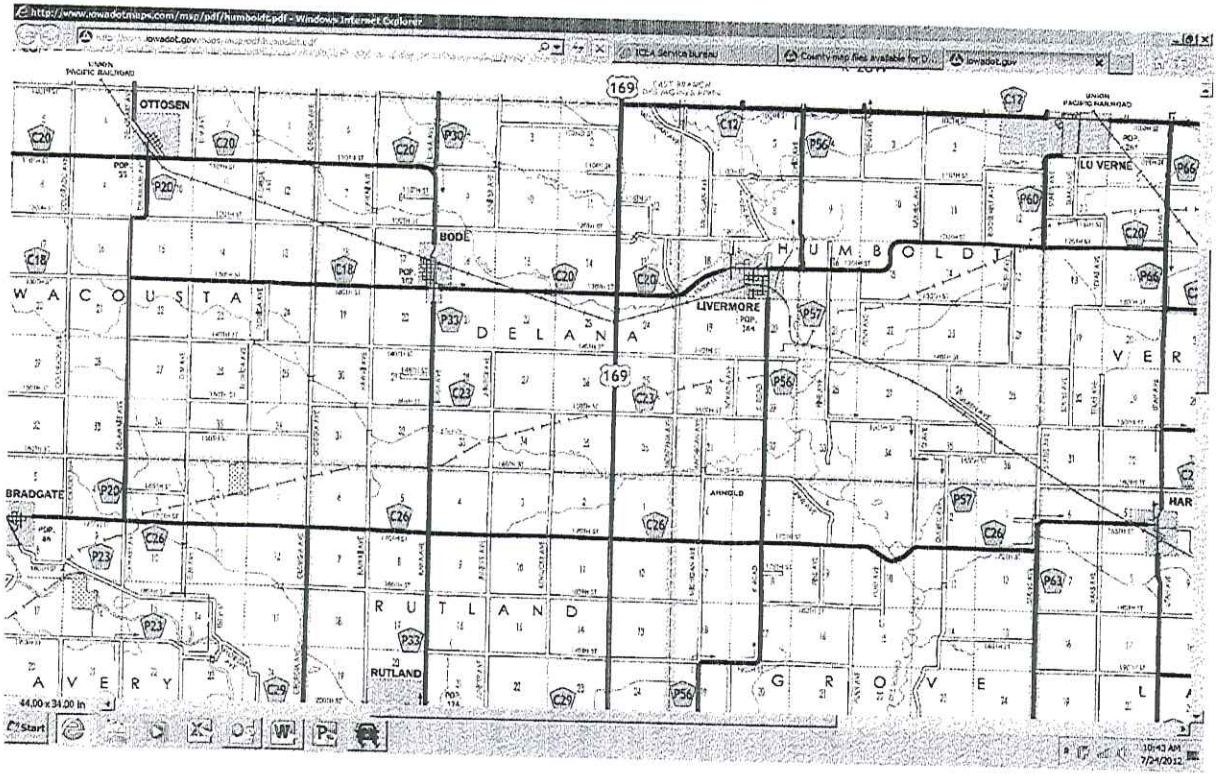
Cost Estimate

Project No.
C20 CURVES

County
Humboldt

Type of Work

Line No. Item No.	Item on Which bid is placed Bidder shall show unit price and extension for each item and total for each group	Item Quantity and Units	Amount Unit Price		Amount Amount
1	Excavation, Class 13	585 C.Y.	$ 11.91		$ 6964.00
2	Paved Shoulder, HMA, Mixture, 6IN.	859 TON	$ 133.00		$ 114,247.00
3	Traffic Control	L.S.	$ 1,500.00		$ 1,500.00
4	Flaggers	EA.	$ 1,280.00		$ 1,280.00
5	Mobilization	L.S.	$ 5,000.00		$ 5,000.00
6	Milled Shoulder Rumble Strip, HMA	80 STA	$ 31.25		$ 2,500.00
7	Painted Pavement Markings, 8"	80 STA	$ 50.00		$ 1,975.00
		Total Amount			$ 133,466.00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OTTOSEN
BODE
LIVERMORE
LU VERNE
ARNOLD
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169
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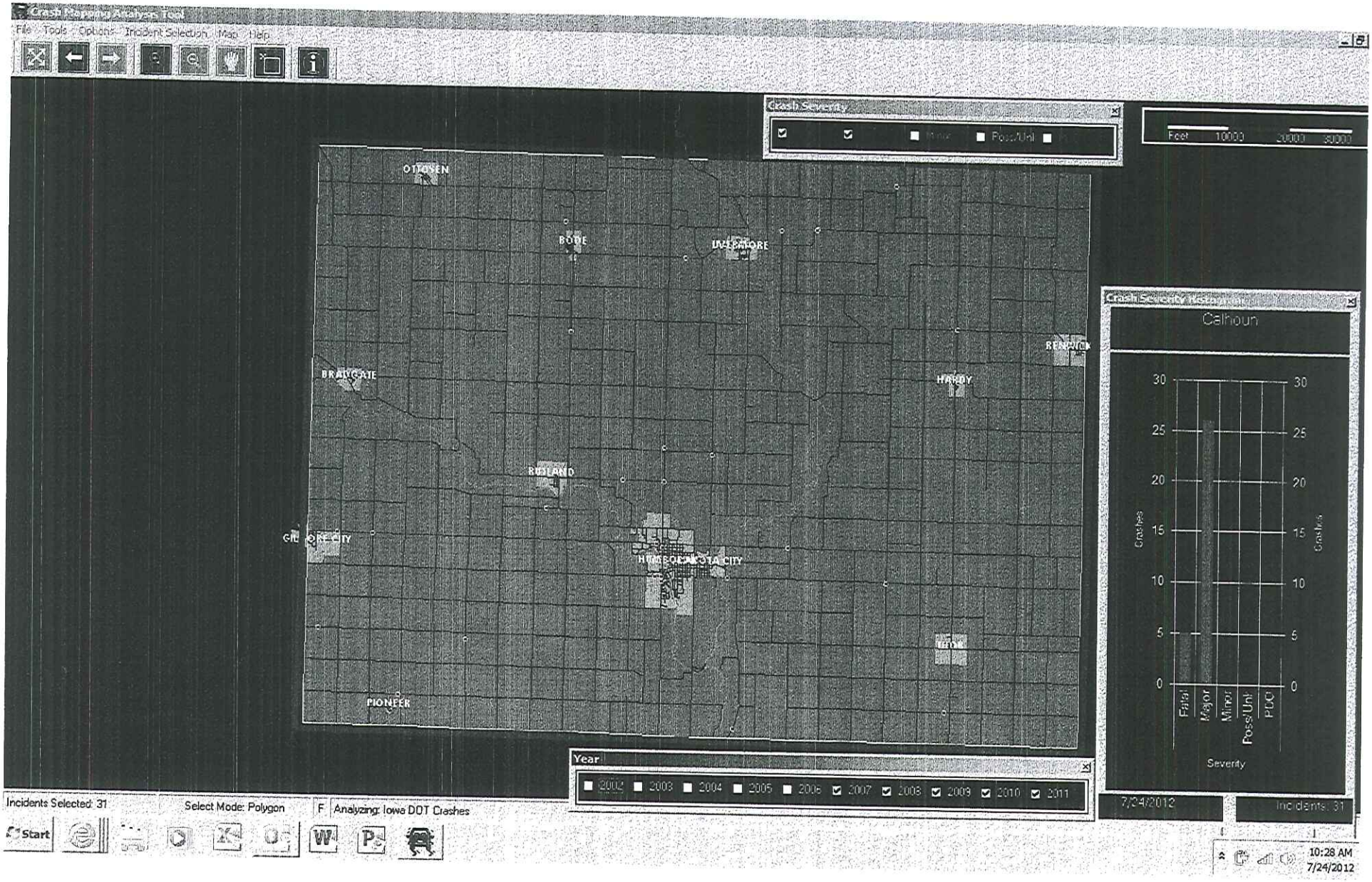
Crash Severity Analysis Tool
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BODE
LAKEFIELD
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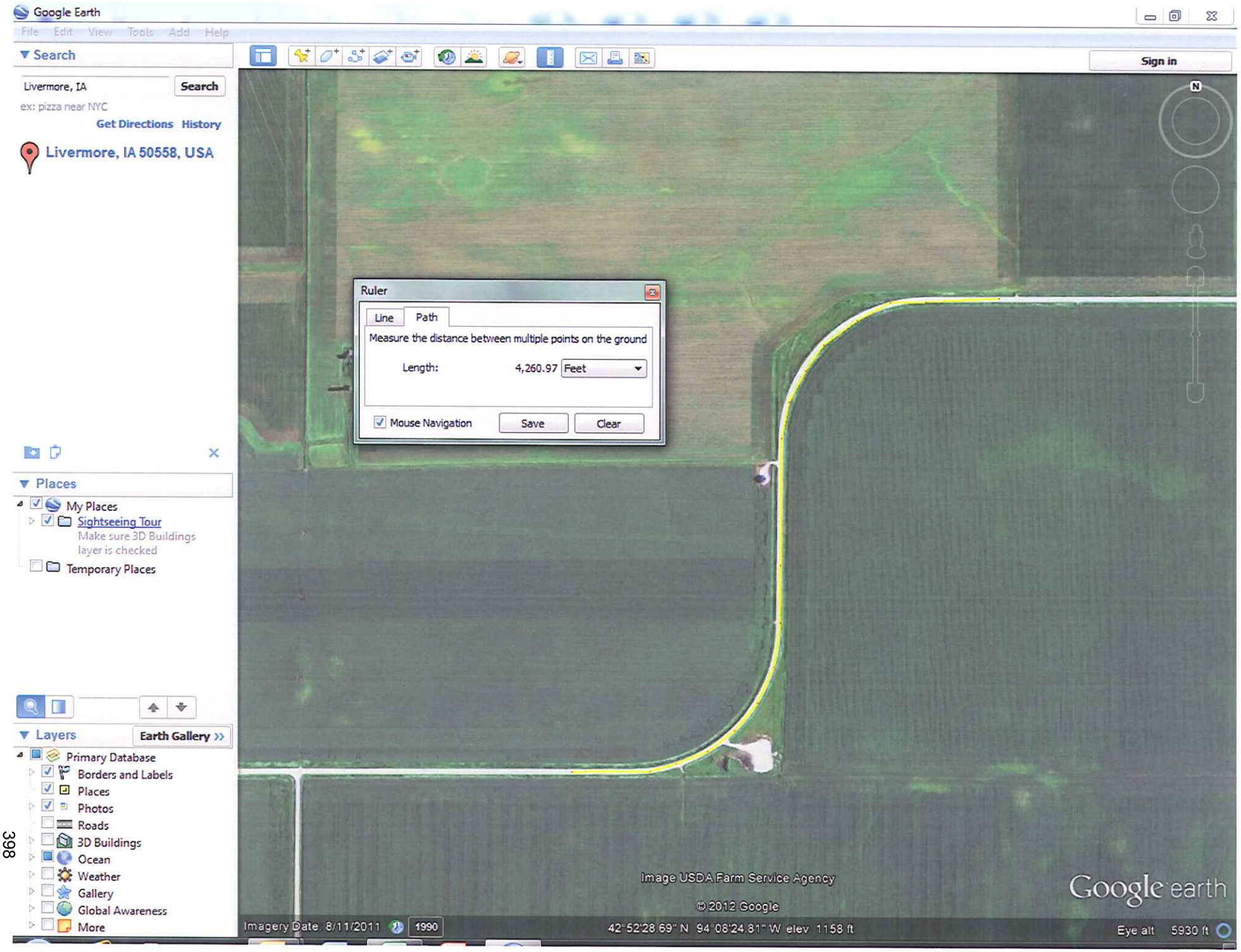
GILMORE CITY
HUMBOLDT
PIONEER
Year
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Calhoun
Crashes
Fatal
Major
Minor
Poss/Unk
PDO
Severity
7/24/2012
Incidents: 31
Incidents Selected: 31
Select Mode: Polygon
Analyzing: Iowa DOT Crashes
Start
10:28 AM
7/24/2012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Livermore, IA
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Livermore, IA 50558, USA
Sign in
Ruler
Line
Path
Measure the distance between multiple points on the ground
Length: 4,260.97 Feet
Mouse Navigation
Save
Clear
Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
Temporary Places
Layers
Earth Gallery
Primary Database
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Image USDA Farm Service Agency
© 2012 Google
Google earth
Imagery Date 8/11/2011
1990
42°52'28.69" N 94°08'24.81" W elev 1158 ft
Eye alt 5930 ft

Iowa Department of Transportation

Abbreviated Crash Report

Humboldt County C20 curves E of Livermore 2007-2011

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
04/27/2008	2008438794			Major	C020 / 120TH ST measuring 2006 Feet West from C020 / 120TH ST and
06/28/2008	2008448734	31266ISP		Fatal	C020 / 120TH ST measuring 2096 Feet West from C020 / 120TH ST and

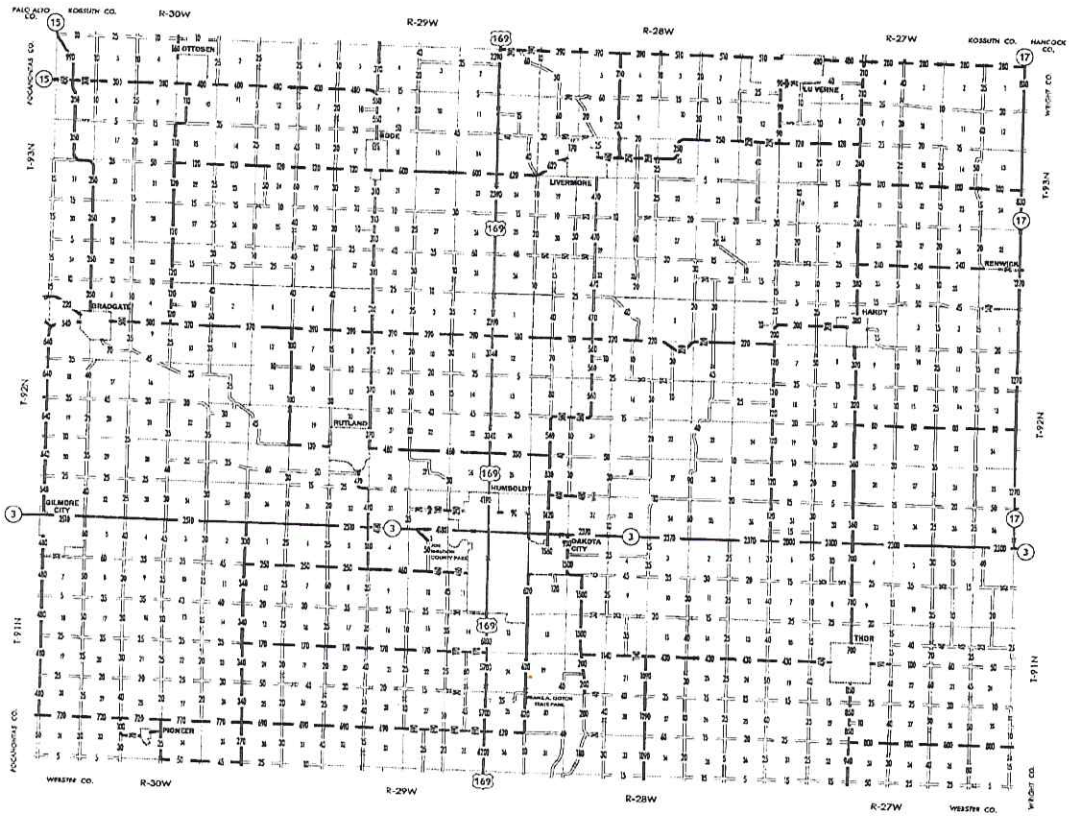
Selection Filter:

((MAJORCAUSE <> 1)) AND ((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: RBS

Notes: All Crashes EXCEPT animals

2011 ANNUAL AVERAGE DAILY TRAFFIC



TRAFFIC FLOW MAP OF

HUMBOLDT COUNTY

IOWA

Prepared by
Iowa Department of Transportation

OFFICE OF TRANSPORTATION DATA
Phone: (515) 239-1289
WWW.IOWADOT.GOV/MAPS

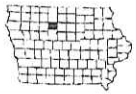
In Cooperation With
United States
Department of Transportation

JANUARY 1, 2011

MILES
0 1 2 3 4 5 6
KILOMETERS
0 1 2 3 4 5 6
1 - 16 - 11

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
INTERMEDIATE ROAD
GRAVEL ROAD
EARTHEN ROAD
LOCAL NOT OPEN ROAD



2011

46

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Humboldt County Prepared by: DLP Date Prepared: Aug. 7, 2012

Location: Along C20 east of Livermore in curved portions of roadway

Improvement

Proposed Improvement(s): Add 3' Paved shoulders from 200' before PC of 1st curve thru 200' past PT of 2nd curve and/or paint wider edge line in conjunction with rumble stripes

$ 133,466	Estimated Improvement Cost, **EC**	20	Est. Improvement 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, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 133,466	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: 2011 Iowa DOT ADT maps 2011 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.75	250	200' B4 PC to 200' after 2nd P
0.75	miles total	

188 Current Vehicle Miles / Day, **VM**

229 End of Life Veh. Miles / Day

68,438 Current Veh. Miles / Year, **AM**

1,506,926 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

2007 First full year --> 2011 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

Fatal Crashes	Fatalities @	$3,500,000	$	-
	2 Major Injuries @	$240,000	$	480,000
2 Injury Crashes	Minor Injuries @	$48,000	$	-
	Possible Injuries @	$25,000	$	-
Property Damage Only	(assumed cost per crash)	$2,700	$	5,400
	-OR- enter all Property Costs of all crashes:			
2 Total Crashes, **TA**		Total $ Loss, **LOSS**	$	485,400

0.40	Current Crashes / Year, **AA** = TA / T	584.5	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 242,700	Cost per Crash, **AVCR** = LOSS / TA	$ 286,788	Present Value of Avoided Crashes, **BENEFIT**
8.8	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.08	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 19,416	Crash Costs Avoided in First Year, AAR x AVCR		
1.8	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 = $286,788 : $133,466 = **2.15** : 1

Rev. 3/08 A

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: County Road B-20 Reconstruction

Applicant: Cerro Gordo County

Contact Person: Mary K. Kelly, P.E. Title: County Engineer

Complete Mailing Address: 2716 S. Federal Ave.
Mason City, IA 50401

Phone: 641-424-9037 (Area Code) E-Mail: mkelly@co.cerro-gordo.ia.us

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 2,100,000

Safety Funds Requested $ 400.000

Rev. 3/08 A

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Cerro Gordo County

Signed: Mary K Kelly — 8-14-12
Signature — Date Signed

Mary K. Kelly, County Engineer
Typed Name

Attest: Shelly Tuttle — 8/14/12
Signature — Date Signed

Shelly Tuttle, Admininstrative Assistant
Typed Name

A

RESOLUTION
2012 - 76

A RESOLUTION APPROVING SUBMITTAL OF SAFETY FUNDING APPLICATION

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

WHEREAS, traffic crash history shows the existing alignment of B-20 at the curve north of 300th Street is a problem area and these accidents could be reduced with appropriate horizontal realignment and widening of the pavement; and

WHEREAS, the reconstruction of County Road B-20 from Eagle east and south to 300th Street is included in the Cerro Gordo County Five Year Construction Program; and

WHEREAS, the Cerro Gordo County Engineer recommends that the application be submitted to the Iowa Department of Transportation for possible Traffic Safety Funding for a portion of the above said project.

NOW, THEREFORE, BE IT RESOLVED that the Cerro Gordo County Board of Supervisors endorses the above said project and will authorize maintenance of the improvement after it is constructed; and

BE IT FURTHER RESOLVED that the Chairperson of the Cerro Gordo County Board of Supervisors be authorized to sign the said application and direct the Engineering Department to submit the same to the Iowa Department of Transportation for Traffic Safety Improvement Funding.

Motion was made by Supervisor Urdahl and seconded by Supervisor Dougherty to adopt the foregoing resolution. Vote taken thereon resulted as follows:

Ayes: Urdahl, Dougherty, Amosson
Nays: None
Absent/Not Voting: None

Resolution declared adopted this 14th day August, 2012.

Robert E. Amosson
Chairman, Board of Supervisors
Cerro Gordo County

ATTEST:

Sandy Shonka, Deputy Auditor
Cerro Gordo County

Section B : Project Narrative

Cerro Gordo County has included the reconstruction of County Road B-20 in the Five Year Construction Program. Throughout the planning during the project development, the County has reviewed the crash history and determined there exists a safety issue at a horizontal curve located within the project limits.

County Road B-20 reconstruction project is located between Eagle Avenue east and south to 300th Street. This is a three mile segment of road which has a Federal Functional Classification as a Major Collector and an annual average daily traffic (AADT) count of 1520 vpd as of 2009 Iowa DOT traffic counts. This route serves several local residents, farmers and acts as a major commuter route to Winnebago Industries and Forest City from the Mason City area.

Going 2 miles east from Eagle Avenue on B-20, there is an existing horizontal curve which has a posted advisory speed of 40 mph in each direction. At the middle of the curve, there is a gravel road (310th Street) which intersects perpendicular to the high side of curve. The curve is delineated with objects markers in both directions. The existing horizontal curve is 1,511 feet long with a 5.5% superelevation and a radius of 955 feet .

Cerro Gordo County proposes to make the following improvements to increase the safety of this corridor:

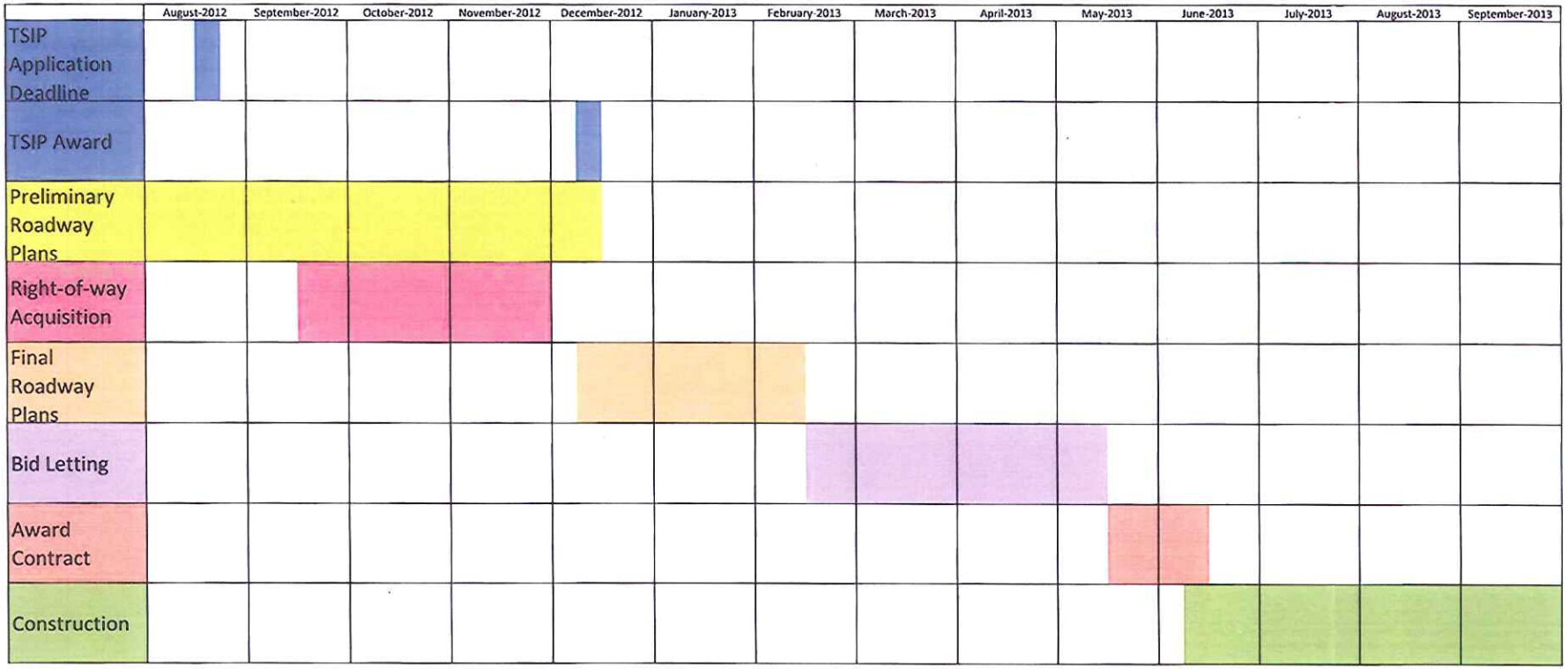
1. Widen the existing 22' wide pavement with 8' granular shoulders to 24' wide pavement with 7' granular shoulders.
2. Install 4" rumble stripes/strips on 1' paved shoulder along the edges of the curve from the PC to the PC.
3. Improve the horizontal curve to a 55 mph design with a 6% to 8% superelevation.
4. Provide a minimum of 3:1 foreslopes with no obstructions located in the clear zone where practical.

Making the above safety enhancements should improve the corridor for the travelling public by reducing the single vehicle run off the road crashes. It will also decrease the maintenance cost by eliminating the need for constant edge rutting which can contribute to the run off the road crashes.

C. Itemized Break Down of Costs

			Engineers Estimate	
Description	Units	Quantity	Unit Cost	Total
EXCAVATION, CL 10, RDWY+BORROW	CY	27960	$ 4.00	$ 111,840
MODIFIED SUBBASE	CY	1470	$ 25.00	$ 36,750
GRANULAR SHLD, TYPE B	TON	560	$ 15.00	$ 8,400
SHLD FINISH, EARTH	STA	34	$ 55.00	$ 1,870
HMA (1M ESAL) BASE/INTER/SURF, NO FRIC	TON	1980	$ 35.00	$ 69,300
ASPH BINDER, PG 58-28	TON	118.8	$ 575.00	$ 68,310
RUMBLE STRIPES	STA	31	$ 30.00	$ 930
GRANULAR SURF ON RD, CL A CR STONE	TON	200	$ 15.00	$ 3,000
EXCAVATION, CL 20, RDWY PIPE CULV	CY	120	$ 7.00	$ 840
APRON, CONC, 24"	EA	2	$ 900.00	$ 1,800
CULV, CONC RDWY PIPE, 24"	LF	100	$ 54.00	$ 5,400
APRON, METAL, 18"	EA	2	$ 1,655.00	$ 3,310
CULV, CMP ENT, 18"	LF	100	$ 26.00	$ 2,600
SUBDRAIN, STD, PERFORATED, 12"	LF	600	$ 30.00	$ 18,000
RMVL+CRUSH OF PAV'T	SY	4160	$ 4.00	$ 16,640
PAINTED PAV'T MARK, WATERBORNE/SOLVENT	STA	68	$ 9.00	$ 612
TRAFFIC CONTROL	LS	1	$ 3,000.00	$ 3,000
MOBILIZATION	LS	1	$ 10,000.00	$ 10,000
SILT FENCE	LF	1000	$ 2.50	$ 2,500
ESTIMATE SUBTOTAL				$ 365,102
10% Contingency				$ 36,510
ESTIMATE TOTAL				$ 401,612

SECTION D: Proposed Time Schedule



Major Milestones

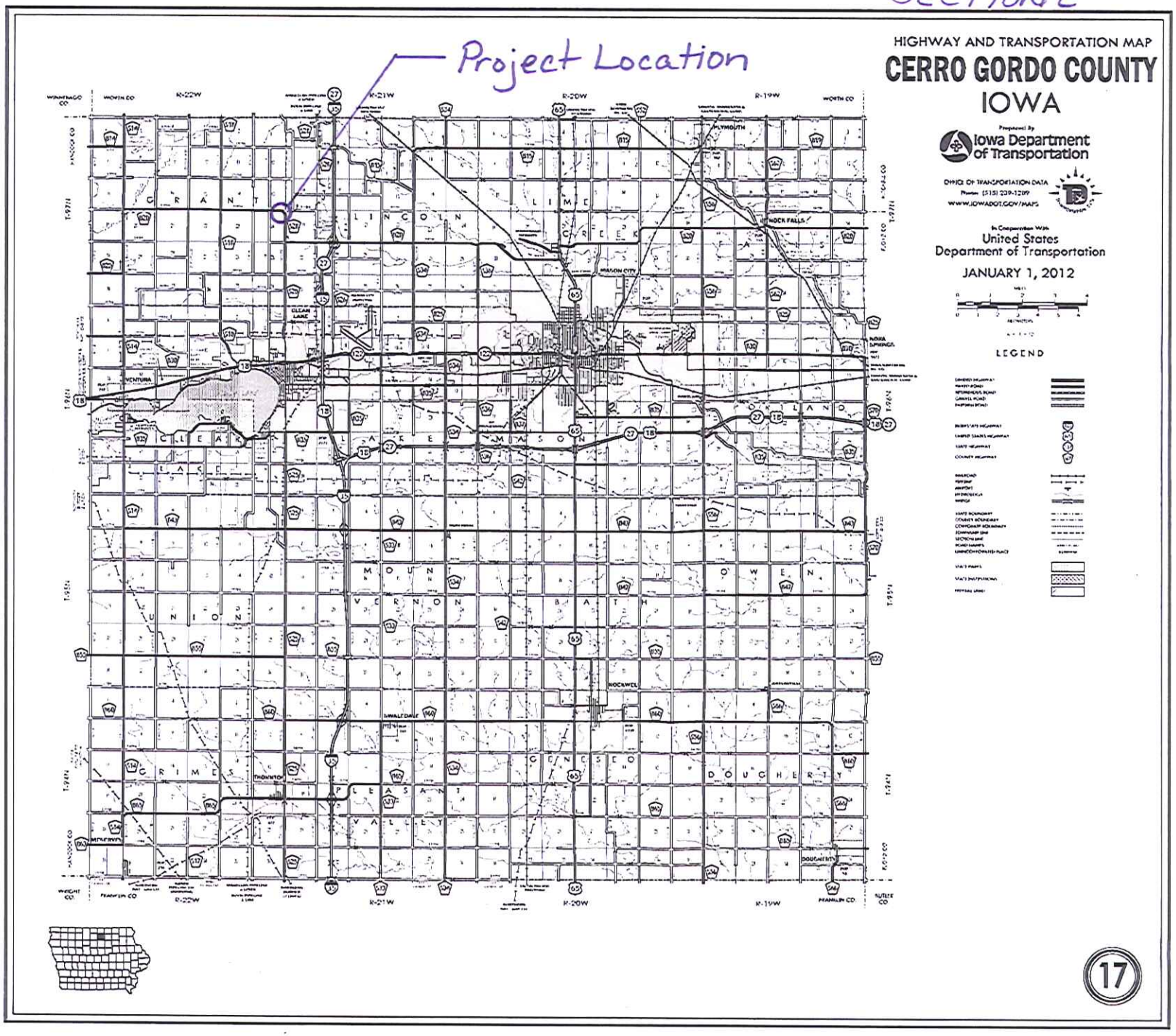
Proposed Award of Funding: December 2013

Final Plans Due: February 19, 2013

Proposed Letting Date: May 21, 2013

Proposed Construction: July 2013

SECTION E


Project Location
HIGHWAY AND TRANSPORTATION MAP
CERRO GORDO COUNTY
IOWA
Prepared By
Iowa Department of Transportation
OFFICE OF TRANSPORTATION DATA
WWW.IOWADOT.GOV/MAPS
In Cooperation With
United States Department of Transportation
JANUARY 1, 2012
LEGEND
GRANT
LINCOLN
LIME CREEK
CLEAR LAKE
LAKE MASON
MOUNT VERNON
BATH
OWEN
UNION
CRIMS
PLEASANT VALLEY
CENTER
DOUGHERTY
VENTURA
MASON CITY
PLYMOUTH
ROCKWELL
SWALEDALE
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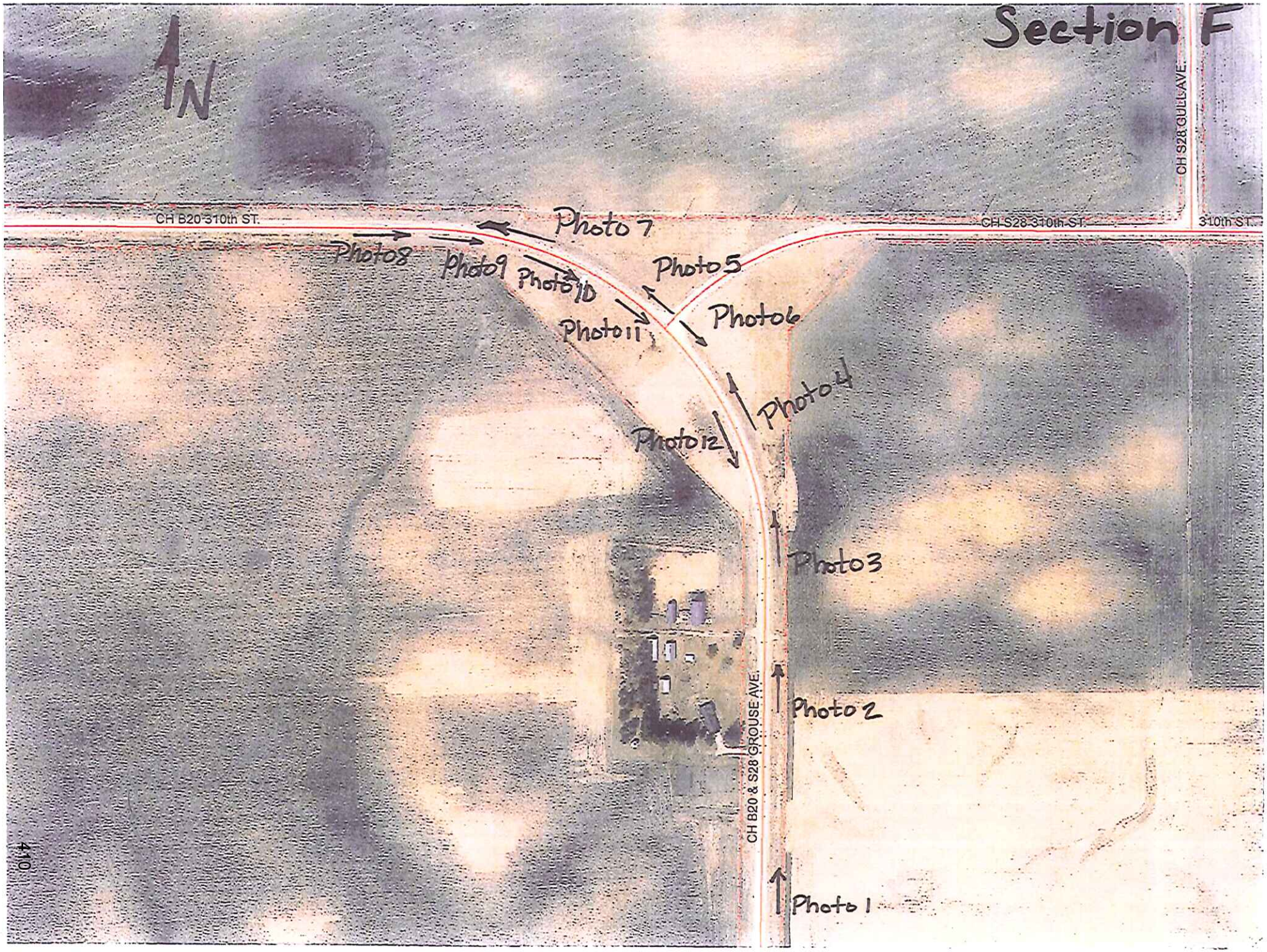
17


Section F
N
CH B20 310th ST.
CH S28 310th ST.
CH S28 GUELL AVE.
310th ST.
CH B20 & S28 GROUSE AVE.
Photo 1
Photo 2
Photo 3
Photo 4
Photo 5
Photo 6
Photo 7
Photo 8
Photo 9
Photo 10
Photo 11
Photo 12

F

Photo 1- North Bound just south of PC.

Photo 2- North Bound near PC. 310th Street can e seen in the background.

F

Photo 3- North westerly going through curve.

Photo 4- North westerly coming up to 310th Street.

F

Photo 5- At the stop sign at 310th Street looking westerly.

Photo 6- At the stop sign on 310th Street looking south westerly.

F

Photo 7- Going westerly out of the curve near the PC.

Photo 8- Going easterly at the PC.

F

Photo 9- Going easterly through the curve.

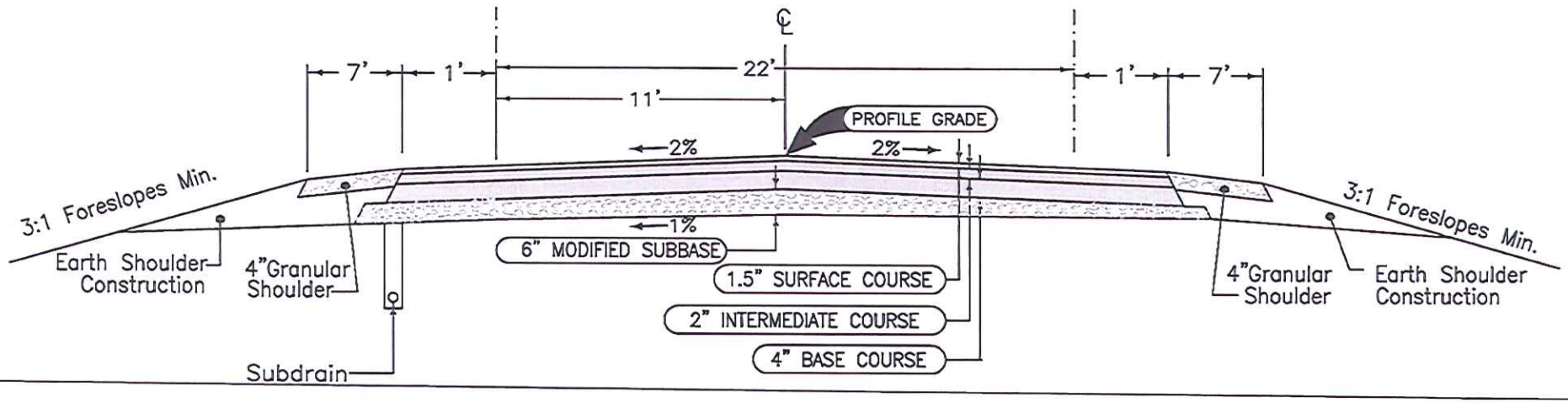
Photo 10- Going easterly through the curve coming up to 310th Street.

F

Photo 11- Going south easterly through the curve at 310th Street.

Photo 12- Going southerly nearing PC.

Typical Cross Section



PAGE OF

PROJECT NO.
xxxxxxxxxxxxxxxxxx
B-20 Between Eagle
And Grouse Avenues

CERRO GORDO COUNTY

Letting Date

ROADENG Section	Scale 1:83	P. 24
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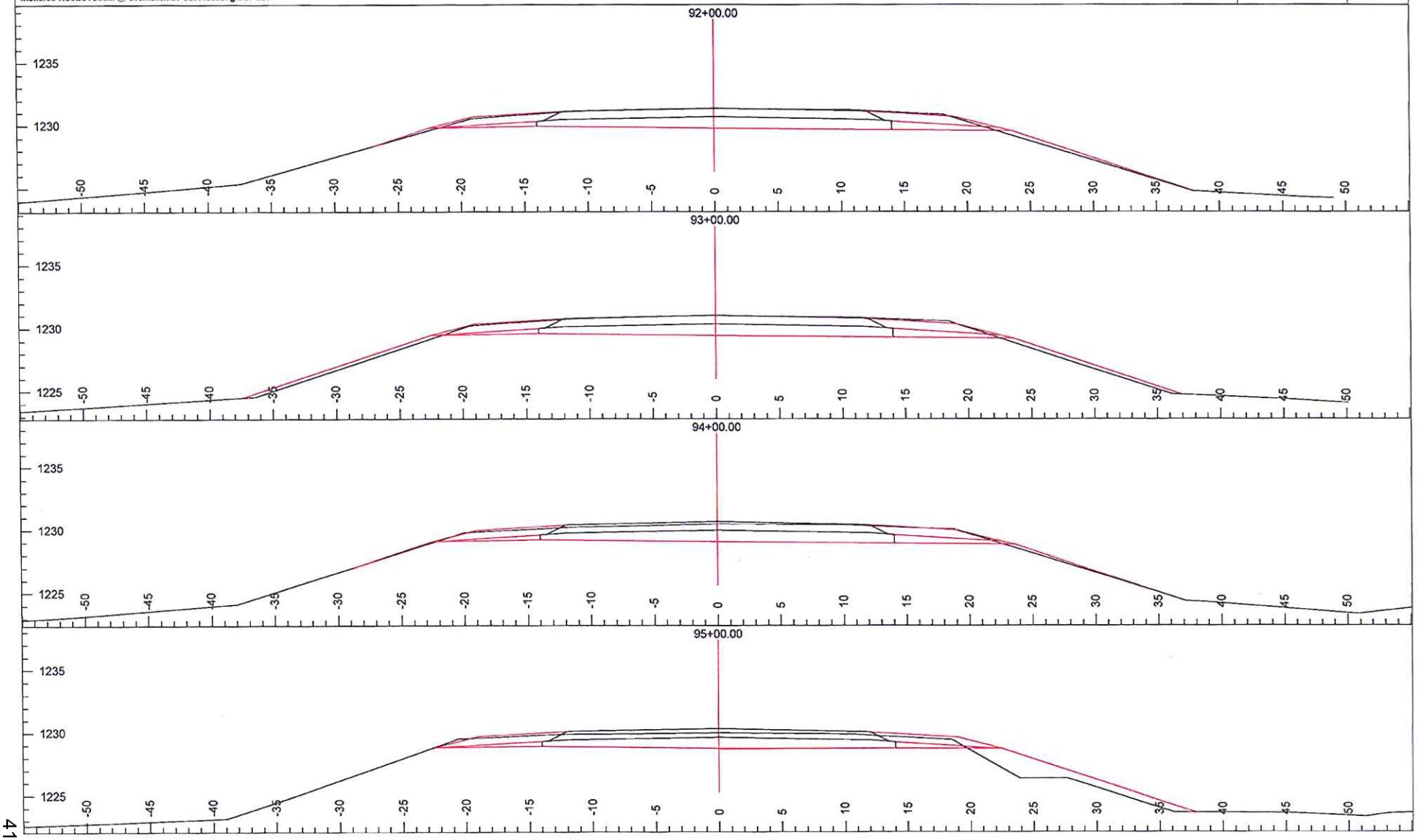

ROADENG Section | Scale 1:83 | P. 25

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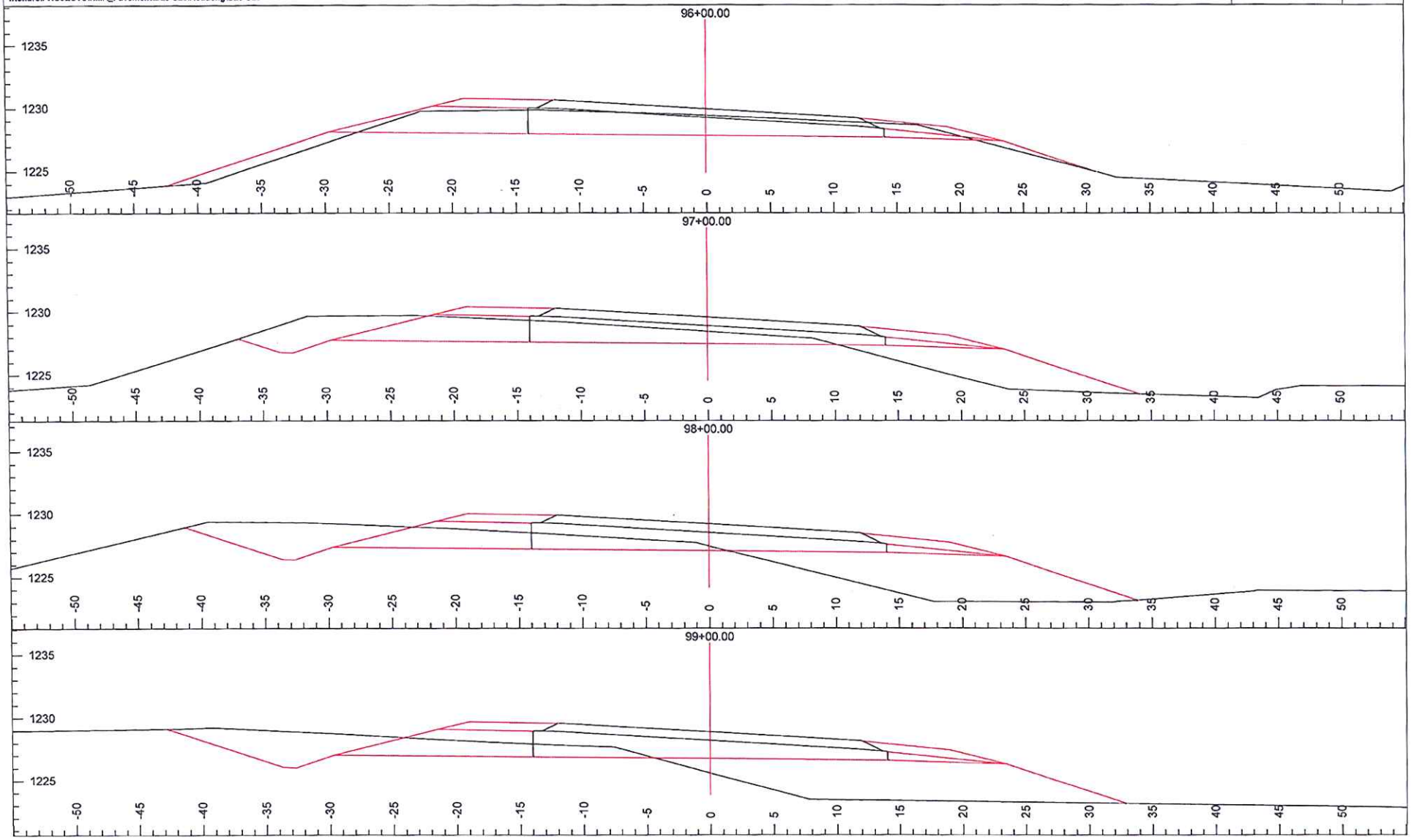

ROADENG Section | Scale 1:83 | P. 26

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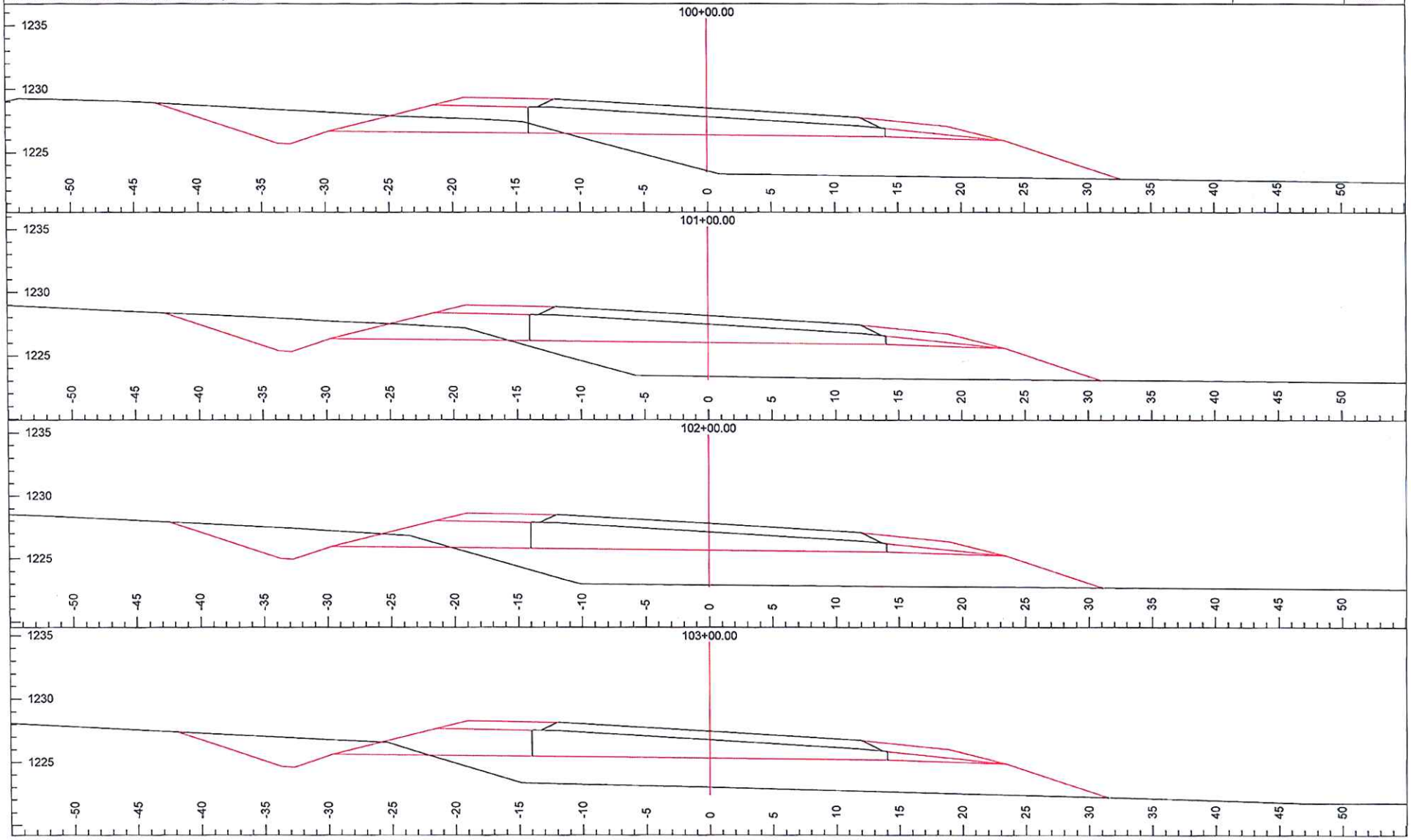

ROADENG Section

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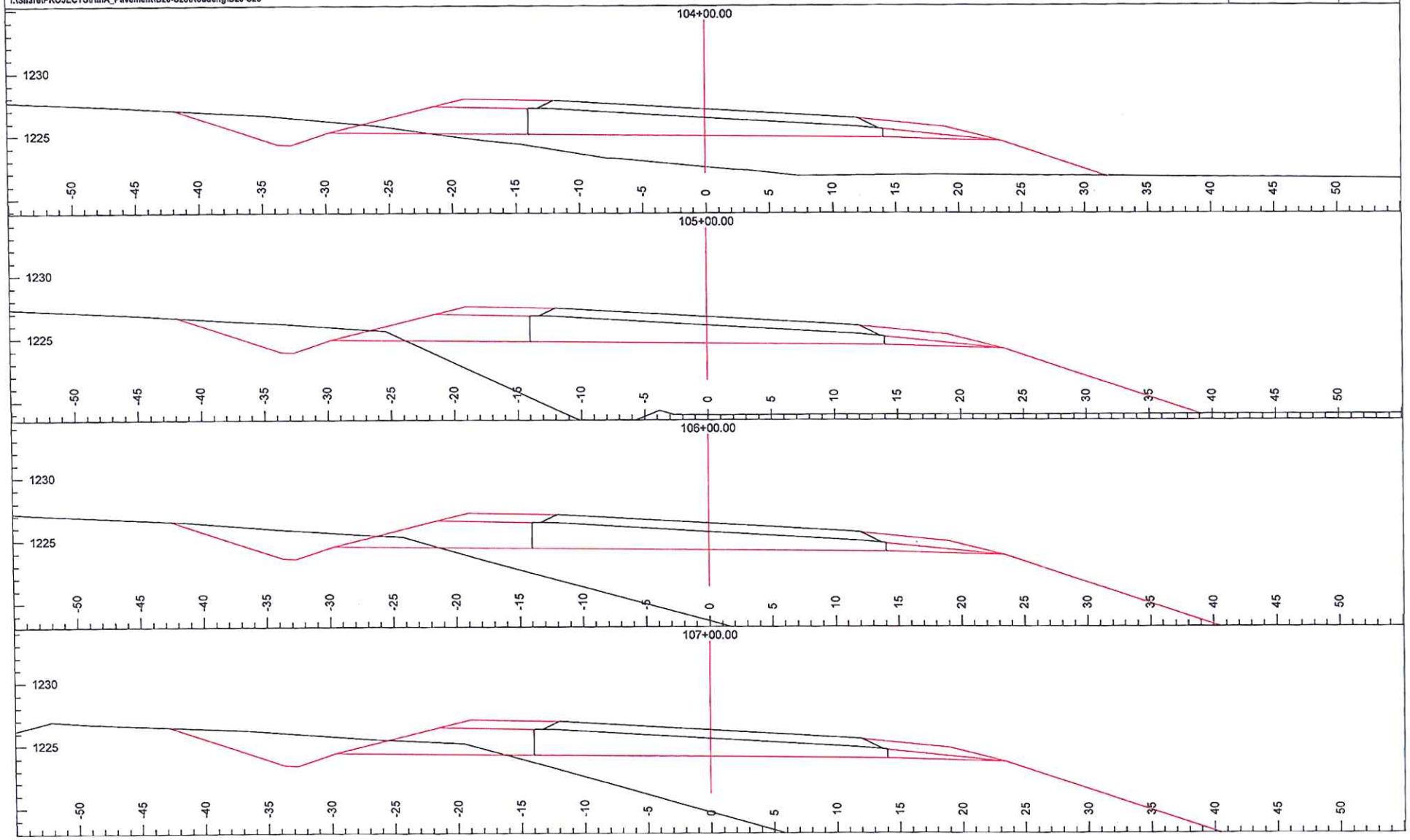
Scale 1:83

P. 27

12/08/14



ROADENG Section | Scale 1:83 | P. 28

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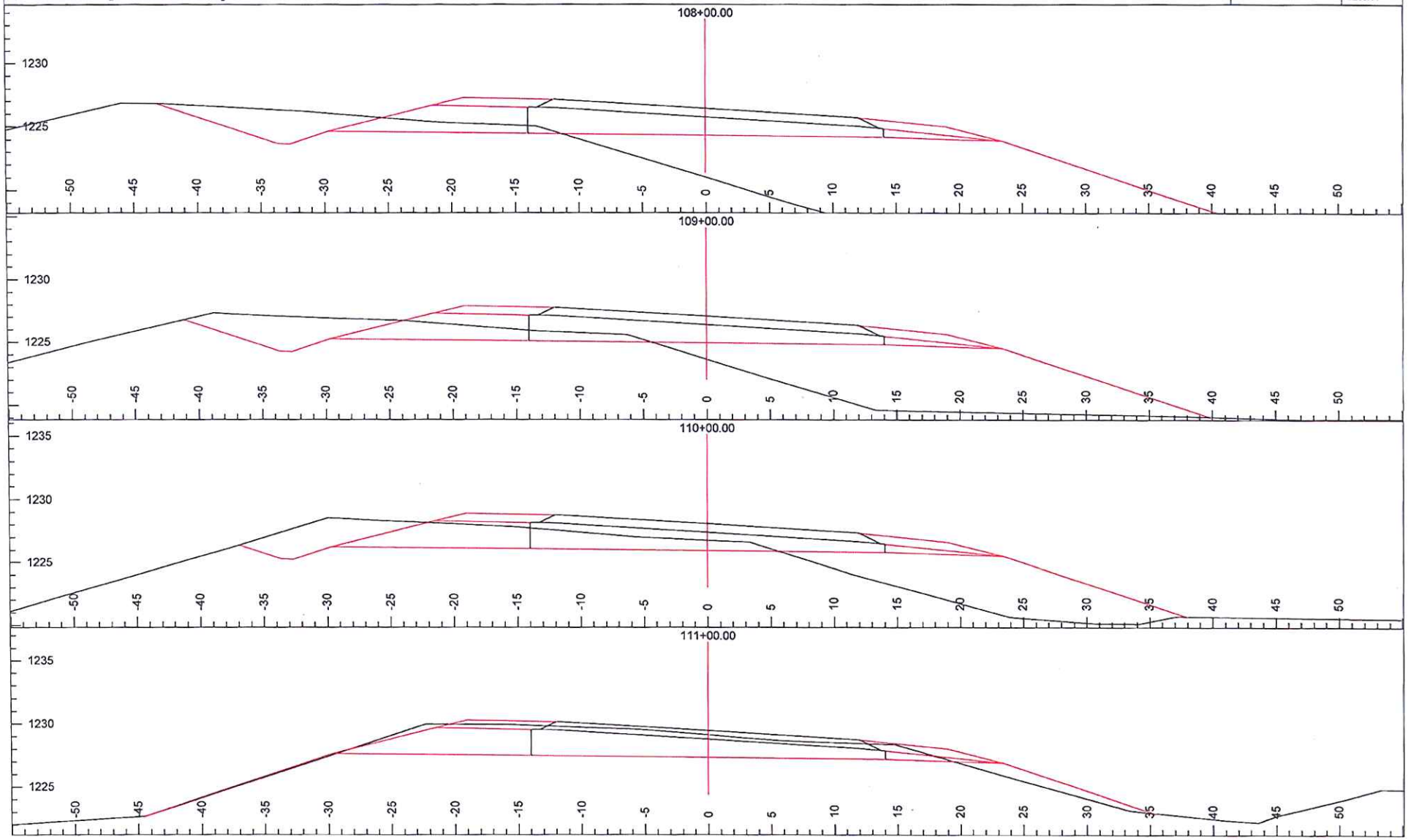

ROADENG Section

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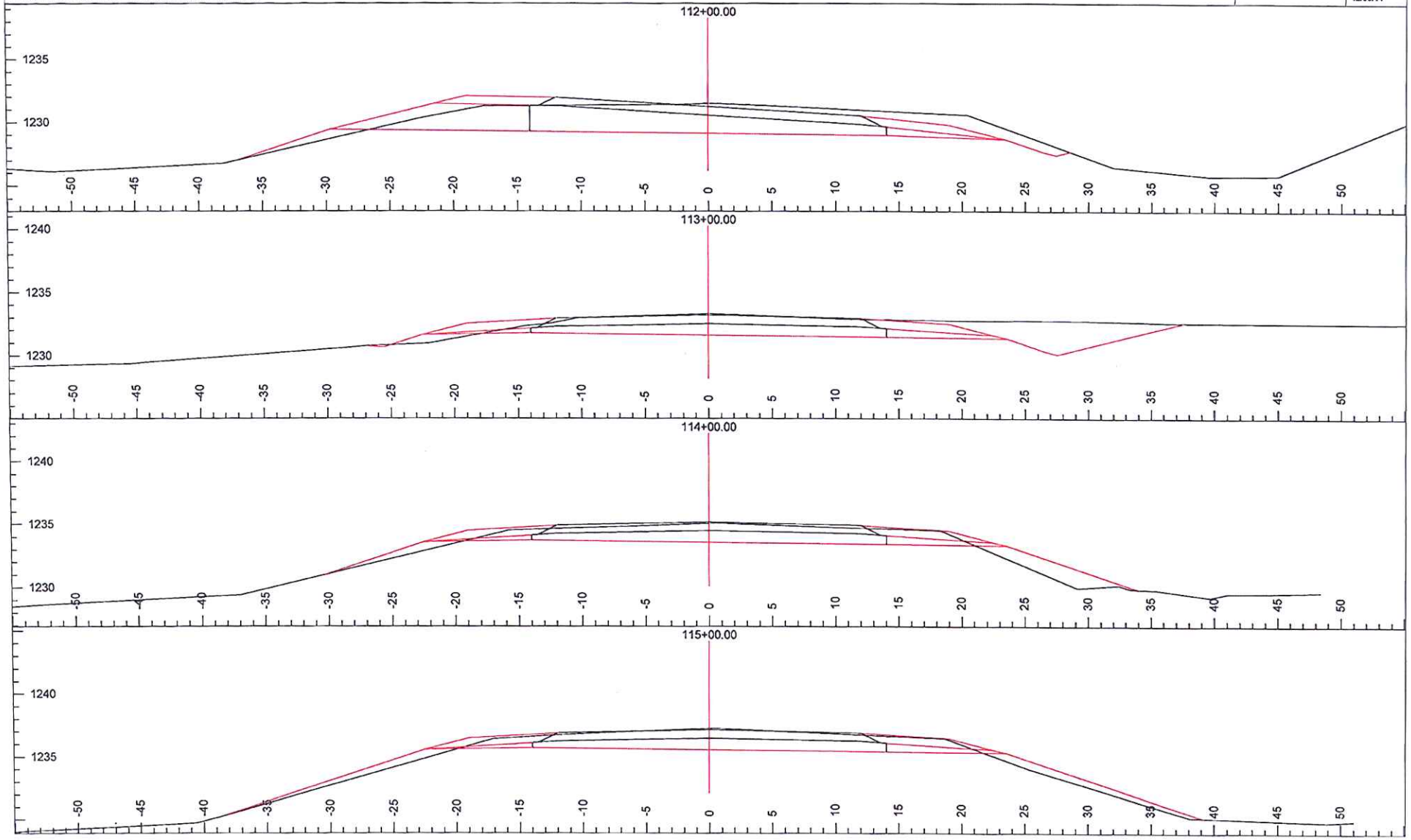
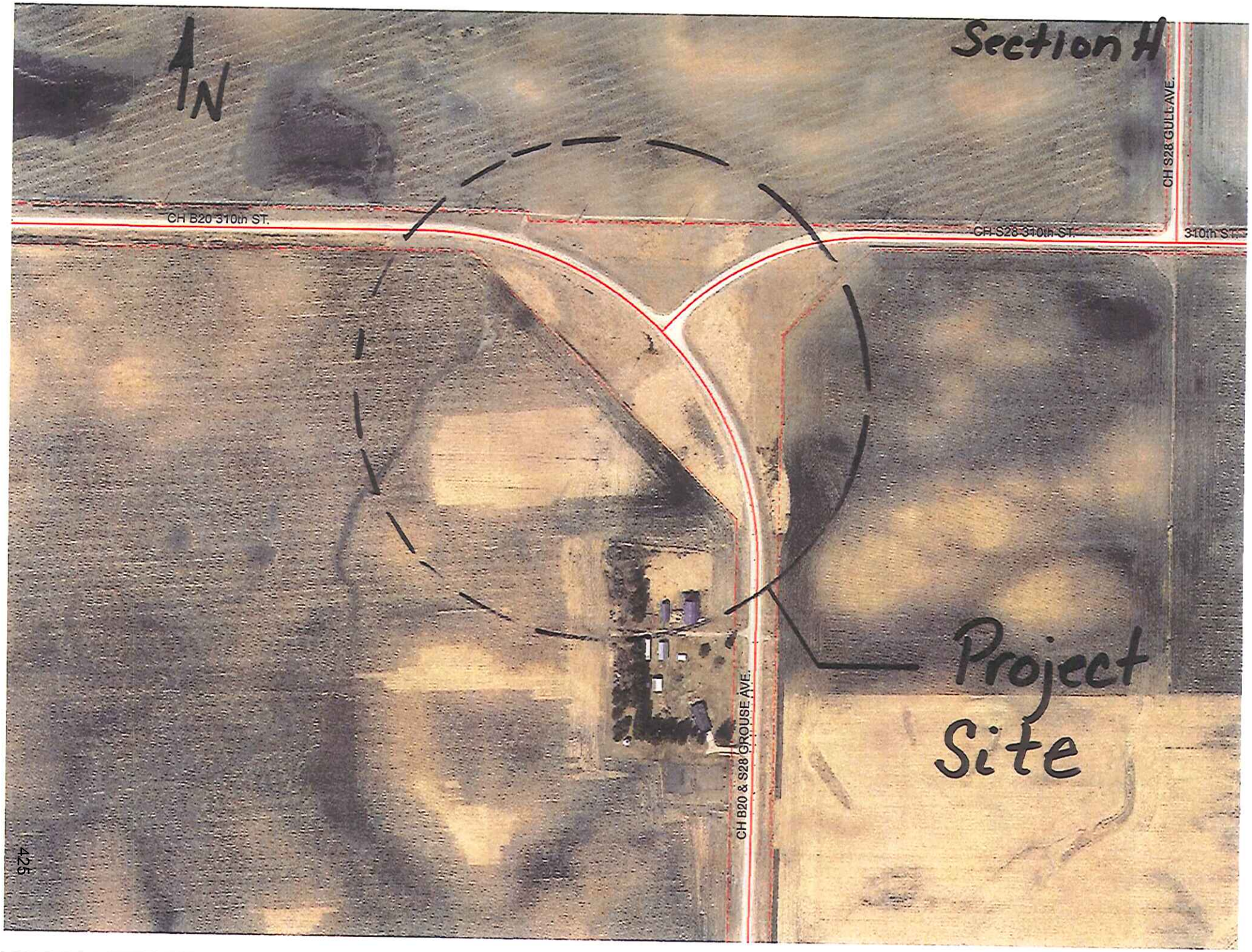
Scale 1:83

P. 29

12/08/14




N
Section H
CH B20 310th ST.
CH S28 310th ST.
CH S28 GULL AVE.
310th ST.
CH B20 & S28 GROUSE AVE.
Project Site

Section J

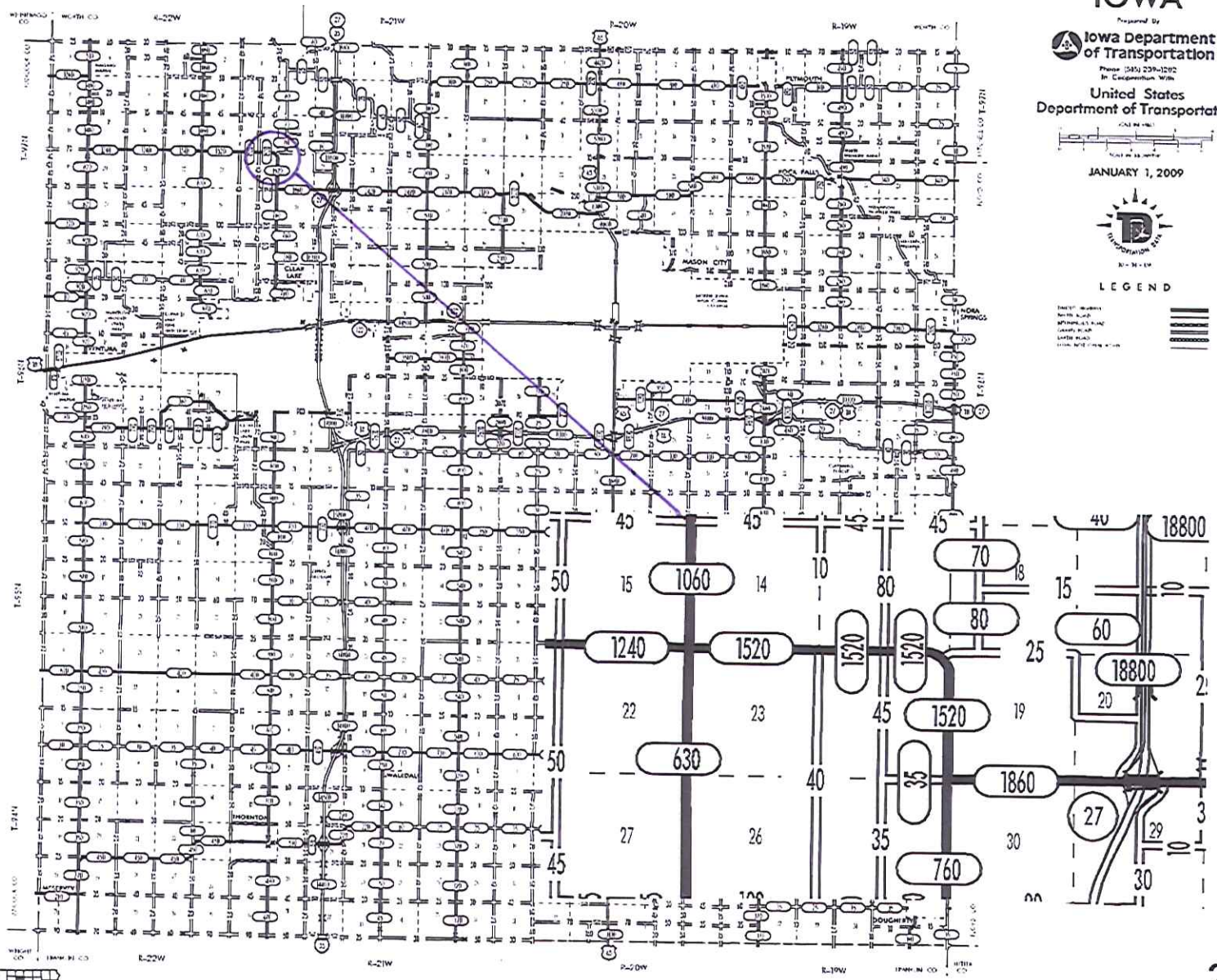
(2009) ANNUAL AVERAGE DAILY TRAFFIC
2005 ANNUAL AVERAGE DAILY TRAFFIC

TRAFFIC FLOW MAP OF
CERRO GORDO COUNTY
IOWA

Prepared By
Iowa Department of Transportation
Phone (515) 239-1202
In Cooperation With
United States Department of Transportation

JANUARY 1, 2009

LEGEND



2009

17

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

Rev. 7/10

County: Cerro Gordo Prepared by: Mary Kelly Date Prepared: Aug 10, 2012

Location: County Road B-20 at the curve at 310th Street

Improvement

Proposed Improvement(s): Reconstruct horizontal curve to a 55 mph design speed and widen road from 22' wide to 24' wide and place 4" rumble stripes in 1' paved shoulder.

$ 400,000	Estimated Improvement Cost, **EC**	20	Est. Improvement 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**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 400,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2009 Traffic Count 2009 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.30	1,520	
0.30	miles total	

456 Current Vehicle Miles / Day, **VM**

556 End of Life Veh. Miles / Day

166,440 Current Veh. Miles / Year, **AM**

3,664,843 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

2005 First full year --> 2011 Last full year 7.0 years, Time Period, **T**

Additional months values as of Dec. 2007

1	Fatal Crashes →	1	Fatalities @	$3,500,000	$ 3,500,000
		2	Major Injuries @	$240,000	$ 480,000
6	Injury Crashes →	1	Minor Injuries @	$48,000	$ 48,000
		3	Possible Injuries @	$25,000	$ 75,000
5	Property Damage Only		(assumed cost per crash)	$2,700	$ 32,400
			-OR- enter all Property Costs of all crashes:		
12	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 4,135,400

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

$ 344,617 Cost per Crash, **AVCR** = LOSS / TA

37.7 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 135,877 Crash Costs Avoided in First Year, AAR x AVCR

8.7 Total Avoided Crashes, TCR x CRF/ 100

1,030.0 Crashes / HMVM, Crash Rate, **CR**
CR = TA x 10^8 / (AM x T)

$ 2,007,006 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 = $2,007,006 : $400,000 = **5.02** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Correction of Skew at US 18/X-26 near Monona

Applicant: Iowa DOT - District 2

Contact Person: David Little Title: Assistant District Engineer

Complete Mailing Address: 1420 Fourth Street SE, Mason City, IA 50401

Phone: 641-422-9464 (Area Code) E-Mail: david.little@dot.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:

Application Type

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

Funding Amount

Total Project Cost $ 43,600

Safety Funds Requested $ 43,600

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Iowa Department of Transportation - District 2

Signed: _____ Aug 23, 2012
Signature Date Signed

David L. Little
Typed Name

Attest: _____ August 23, 2012
Signature Date Signed

Krista L. Rostad
Typed Name

DOCUMENT A

From: Dan Canton [mailto:d.canton@mononaiowa.com]
Sent: Monday, August 20, 2012 5:17 PM
To: Clark, Robert [DOT]
Cc: 'gfpassmore'
Subject: Intersection of US 18/52 and Falcon Drive

Bob,

In the interest of Public Safety, the city of Monona would support the proposed change at the intersection of US 18/52 and Falcon Drive as discussed today. It is our understanding that with the placement of additional asphalt along the width of Falcon Drive near the stop sign area, as well as changing the pavement markings, vehicles would be able to stop in a perpendicular position to US 18/52 instead of a skew. It is also understood that the proposed change would be at no cost to the city.

Thank you.

Daniel A. Canton
City Administrator
104 East Center Street ~ P.O. Box 298
Monona, IA 52159
Phone: 563-539-2355
Fax: 563-539-4774
Cell: 563-880-6801
Email: d.canton@mononaiowa.com

DOCUMENT B

Existing Conditions:

X 26/Falcon Avenue intersects with US 18/US 52 at a skew angle on both sides of this intersection. Monona Chief of Police Jane Scott-Quandahl feels the skewed angle of this intersection is to blame. She feels the majority of the right angle crashes are being caused by motorists who are not seeing approaching vehicles because they may be hidden behind the vehicle post that is in place between the side window and windshield. She said these motorists need to ~~be~~ lean~~ing~~ ~~ahead~~ forward ~~or something~~ to make sure there are no approaching vehicles prior to pulling out onto US 18/US 52 from the "Stop" signs.

This is a 2-way stop controlled intersection with X 26/Falcon Avenue traffic being required to stop. There are supplemental "Cross Traffic Does Not Stop" signs in place below the 2 "Stop" signs located on the north leg of the intersection and below the 1 "Stop" sign located on the south leg of the intersection.

US 18/US 52 is a 2-lane corridor at this location with a posted speed limit of 55 mph. There is an eastbound right turn lane, approximately 260' in length, and an eastbound left turn lane, approximately 215' in length, on US 18/US 52 approaching this intersection. There is a westbound right turn lane, approximately 515' in length, and a westbound left turn lane, approximately 220' in length, on US 18/US 52 approaching this intersection. There is no posted speed limit on the south X 26/Falcon Avenue leg of this intersection and this is a 2-lane corridor with no turn lanes.

There is a 25 mph posted speed limit on the north X 26/Falcon Avenue leg of this intersection and there is a raised stop island in place with a right turn lane that

follows the radius of the intersection. An urban cross section begins along this north leg approximately 135' north of the US 18/US 52 centerline. There are "Stop Ahead" signs in place along northbound and southbound X 26/Falcon Avenue approaching this intersection. Intersection lighting consists of 2 installations in the northwest quadrant of the intersection and 1 installation in the northeast quadrant.

The intersection sight distances looking east and west along US 18/US 52 were measured with a target placed on the north X 26/Falcon Avenue leg of the intersection. The results show a sight distance of approximately 2,375' looking east and approximately 2,510' looking west.

The 2009 AADT for this intersection was 2957 for the north X 26/Falcon Avenue leg, 4007 for the east US 18/US 52 leg, 2357 for the south X 26/Falcon Avenue leg and 2841 for the west US 18/US 52 leg. The intersection sees a total of 6,081 daily entering vehicles.

There is a Kwik Star Convenience Store, which has gas and diesel available, located in the southwest quadrant of this intersection. There are other commercial businesses located on each side of X 26/Falcon Avenue north of this intersection.

Thirteen crashes have taken place at this intersection from 1/1/2007-12/31/11. Those 13 crashes resulted in 14 injuries; 2 were listed as major, 8 as minor and 4 as possible. These numbers give this intersection a crash rate 1.17. That compares to a statewide average of 0.8.

Proposed Concept:

The District would like to align X26/Falcon Avenue at more of a 90 degree angle with US 18/US 52. We feel this would reduce the number of Failure to Yield Right of Way from a Stop Sign major cause crashes.

The District proposes to accomplish this by removing the raised stop island on the north leg of the intersection and using paint lines. This would require minimal pavement widening to make the side roads "square-up" with the mainline.

Safety Justification:

Ten of the crashes and 11 of the injuries, including the two major injuries, have a major cause listed as Failure to Yield Right of Way from a Stop sign. The sight distance on either side of the intersection is adequate. By setting vehicles at a 90 degree angle to US 18/US 52, drivers will have a safer sight distance triangle and be able to better see oncoming vehicles in order to cross the primary roadway safely. This will reduce failure-to-yield and broadside crashes.

Total Project Costs (includes all sections): $43,600
Total PSS Base Costs (includes all sections, no M&C): $0
4.50% Inflation, Calculated to Section Letting Dates: $0

No	Code	Item Description	Unit	Quan.	BidX 6 Months	
					Unit Price	Est. Cost
1	2102-2710070	EXCAVATION, CL 10, RDWY+BORROW	CY	1,000	$4.00	$4,000
2	2115-0100000	MODIFIED SUBBASE	CY	85	$30.00	$2,550
3	2121-7425010	GRANULAR SHLD, TYPE A	TON	35	$16.00	$560
4	2122-5500060	PAVED SHLD, HMA, 6"	SY	515	$25.00	$12,875
5	2212-5070322	PATCH, PARTIAL-DEPTH REPAIR HMA	SY	53	$45.00	$2,399
6	2212-5070330	PATCH BY COUNT (HMA)	EACH	2	$112.00	$224
7	2301-4875006	MEDIAN, PCC, 6"	SY	40	$45.00	$1,800
8	2510-6745850	RMVL OF PAV'T	SY	490	$5.25	$2,573
9	2527-9263109	PAINTED PAV'T MARK, WATERBORNE SOLVENT	STA	8	$12.00	$93
				Sub-Total		**$27,074**
10	2528-8445110	%TRAFFIC CONTROL	LS	10.0%	% of Sub-Total	$2,700
11	2533-4980005	%MOBILIZATION	LS	10.0%	% of Sub-Total	$2,700
12		%DRAINAGE	LS	4.0%	% of Sub-Total	$1,100
				Sub-Total		**$33,574**
13	0000-0000100	%UNQUANTIFIED BIDITEMS	LS	30.0%	% of Sub-Total	$10,070
				TOTAL		**$43,600**

DOCUMENT D

Time Schedule:

Application submittal: August 24th, 2012

Application Award: December 2012

Project Development: July/August 2013

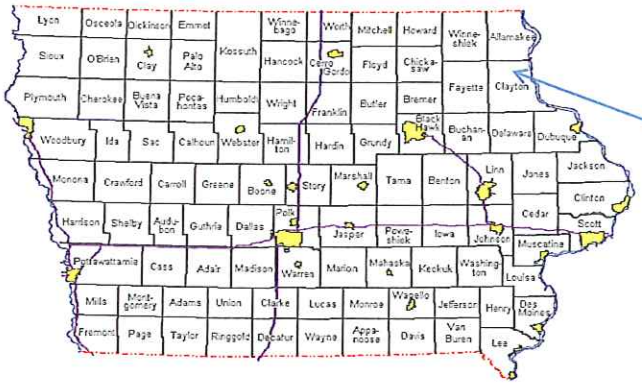
Project Letting: March 2014

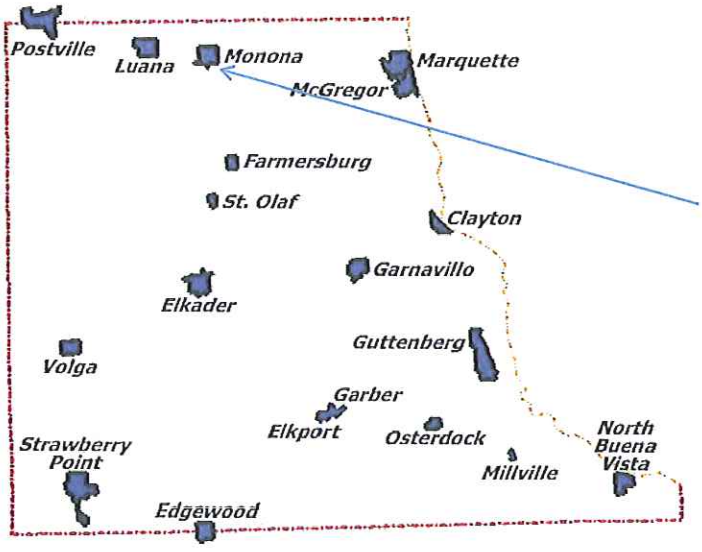
Project Construction: Construction Season 2014

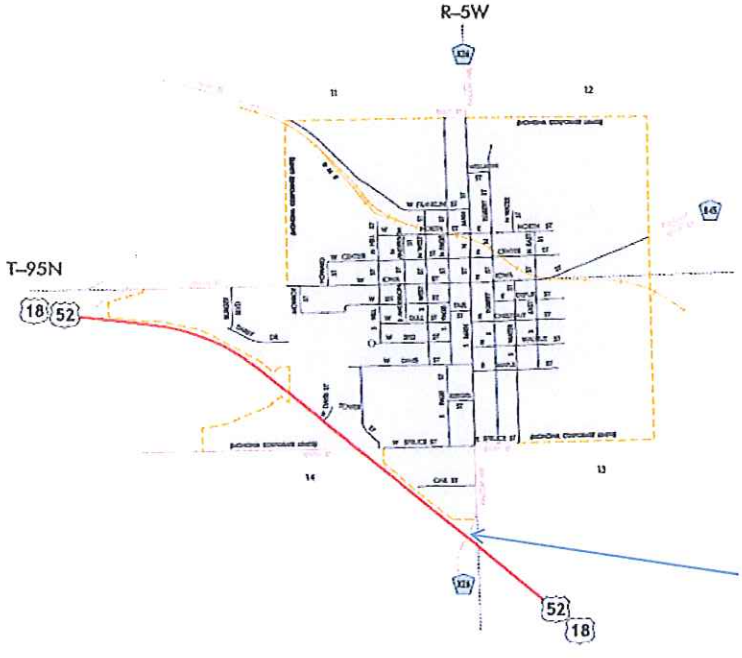
Project Completion: FY 2014

US 18/US 52/X-26 Intersection

Document E





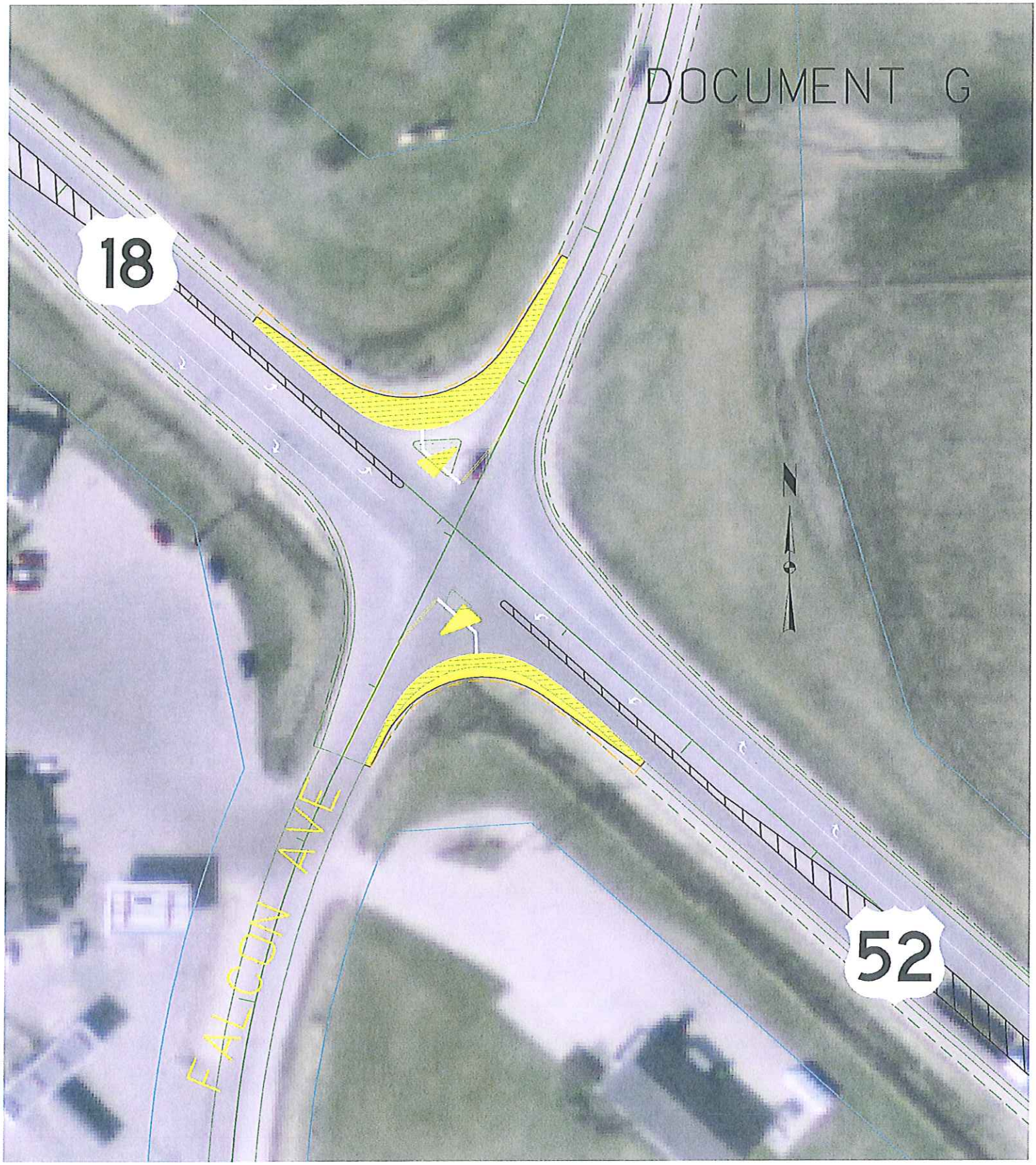


DOCUMENT F

Google

Address **Falcon Avenue / Main Street / U.S. 18**

Address is approximate

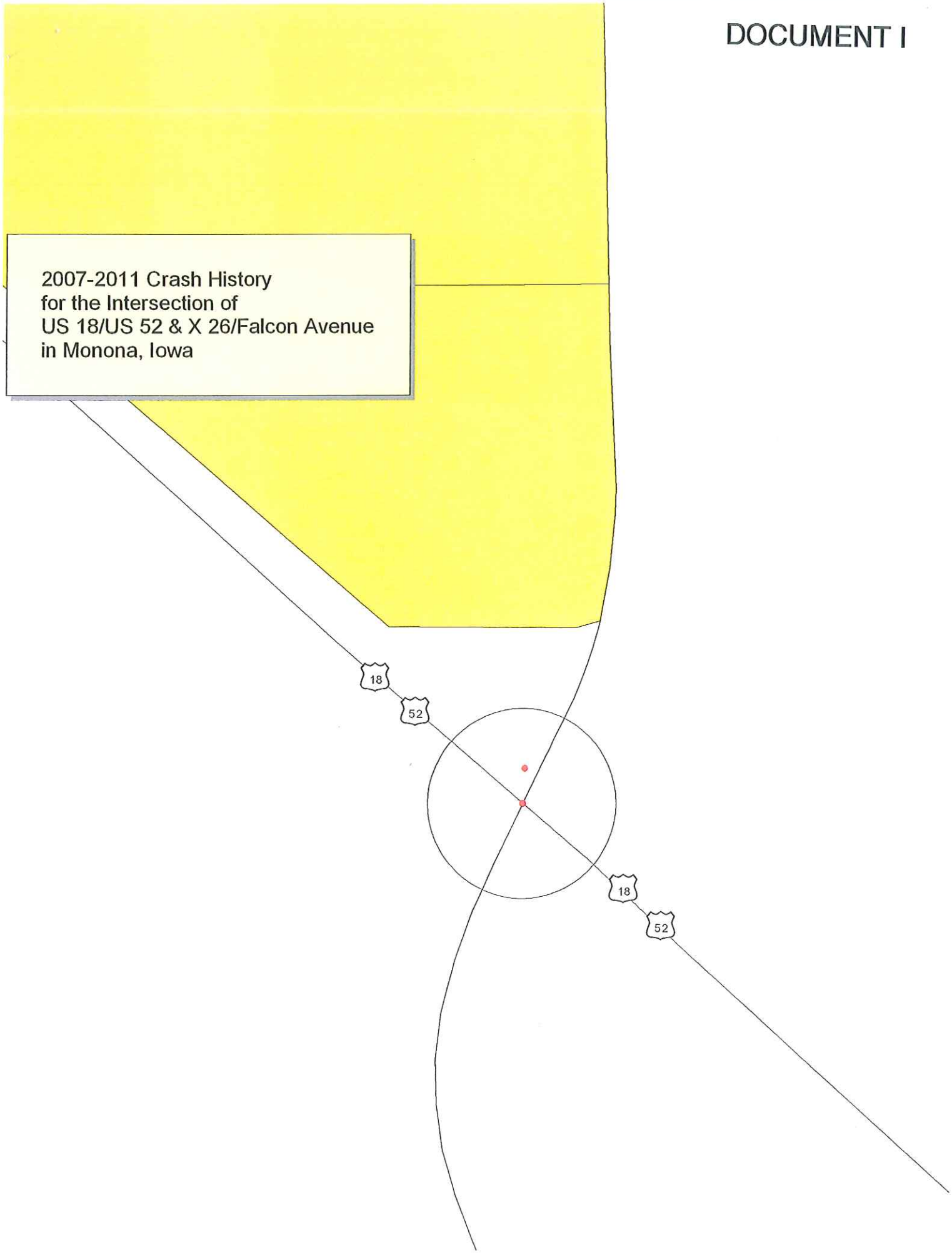

DOCUMENT G
18
52
FALCON AVE
N

DOCUMENT H

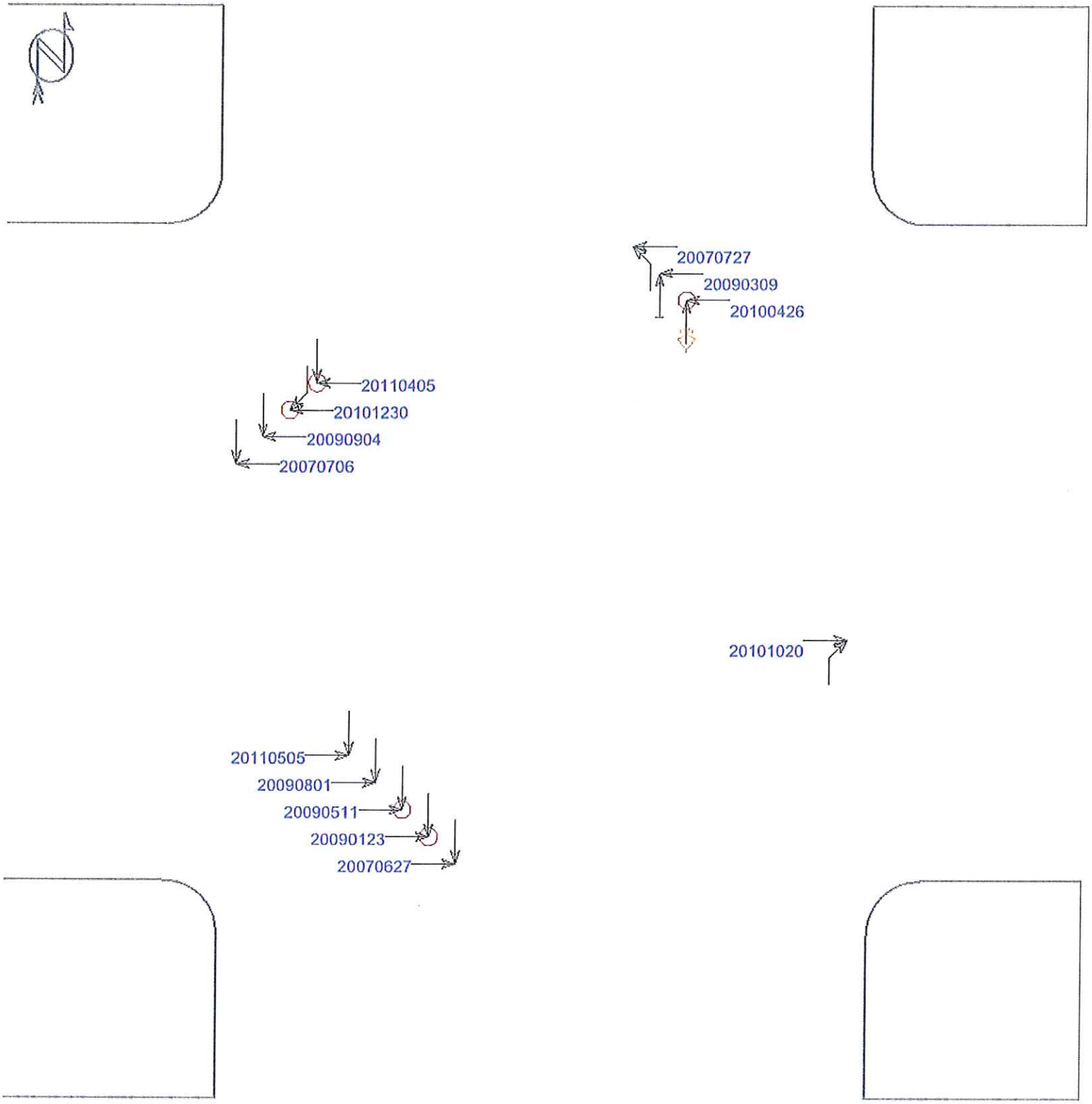
US 18/US 52 & X 26/Falcon Avenue

DOCUMENT I

2007-2011 Crash History
for the Intersection of
US 18/US 52 & X 26/Falcon Avenue
in Monona, Iowa



2007 - 2011 Reportable Crashes



(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

2007-2011 Crash History
for the Intersection of
US 18/US 52 & X 26/Falcon Avenue
in Monona, Iowa

Year Range	Major Cause	Crashes						Injuries						
		Total	Fatal	Major	Minor	Possible	PDO	Total	Fatalities	Major	Minor	Possible	Unknown	Uninjured
2007 thru 2011	Animal													
	Ran Traffic Signal													
	Ran Stop Sign													
	Crossed centerline													
	FTYROW: At uncontrolled intersection													
	FTYROW: Making right turn on red signal													
	FTYROW: From stop sign	10		1	3	1	5	11		2	6	3		13
	FTYROW: From yield sign													
	FTYROW: Making left turn	1					1							2
	FTYROW: From driveway													
	FTYROW: From parked position													
	FTYROW: To pedestrian													
	FTYROW: Other (explain in narrative)													
	Traveling wrong way or on wrong side of road													
	Driving too fast for conditions													
	Exceeded authorized speed													
	Made improper turn													
	Improper Lane Change													
	Followed too close													
	Disregarded RR Signal													
	Disregarded Warning Sign													
	Operating vehicle in an erratic/reckless/careless/negligent/aggressive manner													
	Improper Backing													
	Illegally Parked/Unattended													
	Swerving/Evasive Action													
	Over correcting/over steering													
	Downhill runaway													
	Equipment failure													
	Separation of units													
	Ran off road - right													
	Ran off road - straight													
	Ran off road - left													
	Lost Control													
	Inattentive/distracted by: Passenger													
	Inattentive/distracted by: Use of phone or other device													
	Inattentive/distracted by: Fallen object													
	Inattentive/distracted by: Fatigued/asleep													
	Other (explain in narrative): Vision obstructed	1			1			2			2			
	Oversized Load/Vehicle													
	Cargo/equipment loss or shift													
	Other (explain in narrative): Other improper action													
	Unknown													
	Other (explain in narrative): No improper action	1				1		1				1		1
	None indicated													
	Totals[1]:	13		1	4	2	6	14		2	8	4		16

Developed by: Robert Clark
District 2 Traffic Technician
August 20, 2012
using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)

[1]The values in this table represent crashes and injuries that involved one of these major causes. These values are derived from a combination of crash report data fields. Unless an error exists in the data, the totals represented here will most likely sum to the total frequency of crashes.

2007-2011 Crash History
for the Intersection of
US 18/US 52 & X 26/Falcon Avenue
in Monona, Iowa

		Crashes						Injuries						
Year Range	Manner of Crash/Collision	Total	Fatal	Major	Minor	Possible	PDO	Total	Fatalities	Major	Minor	Possible	Unknown	Uninjured
2007 thru 2011	Non-collision													
	Head-on													
	Rear-end	1					1							2
	Angle - oncoming left turn	1					1							2
	Broadside	11		1	4	2	4	14		2	8	4		12
	Sideswipe - same direction													
	Sideswipe - opposite direction													
	Unknown													
	Not Reported													
	Totals[1]:	13		1	4	2	6	14		2	8	4		16

Developed by: Robert Clark
District 2 Traffic Technician
August 20, 2012
using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)

[1]The values in this table represent crashes and injuries that involved one of these manners of crashes/collisions. Unless a data error exists, the totals represented here will most likely sum to the total frequency of crashes.

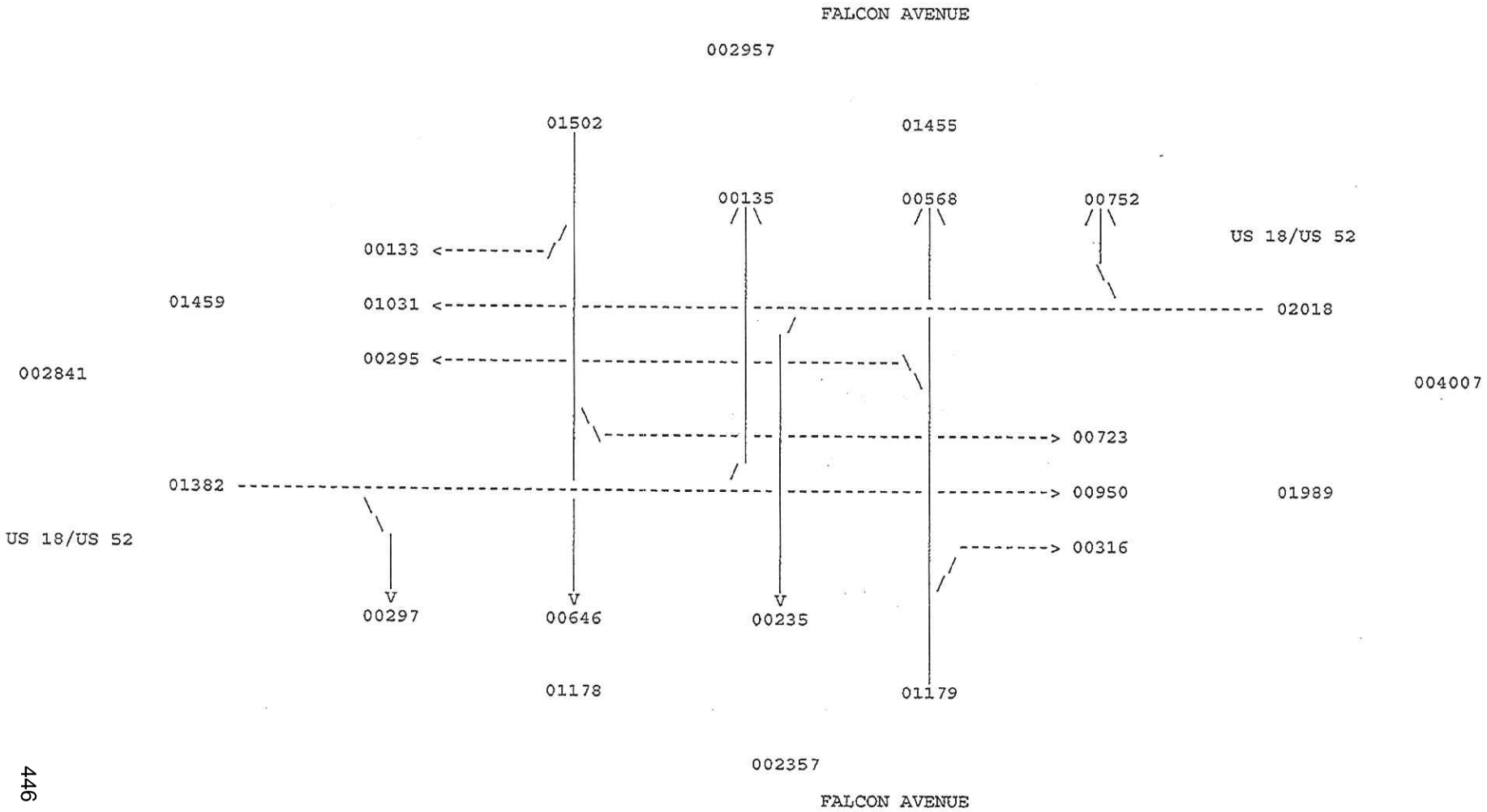
Intersection / Spot Location Crash Rate					
name:	US 18/US 52 & X 26/Falcon Avenue				
location:	Monona, Iowa				
Traffic (two-way)					
north AADT	2,957	vehicles/day			
east AADT	4,007	vehicles/day			
south AADT	2,357	vehicles/day			
west AADT	2,841	vehicles/day		**6,081**	daily entering vehicles
Crash history					
Time period					
start date	1/1/2007				
end date	12/31/2011			**5.00**	years
Crashes					
	13	crashes		**1.17**	crashes / million entering vehicles

DATE: 07-27-2010

IOWA DEPARTMENI OF TRANSPORTATION
VEHICULAR TURNING MOVEMENTS
ANNUAL AVERAGE DAILY TRAFFIC - YEAR 2009
IN MONONA

COUNIY:CLAYTON
US 18, US 52 & FALCON AVE

STATION NO. 22 52 5181 0991



DOCUMENT J

D1530926

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
22	52	5181	0991	2009

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
ALL VEHICLES

PRINTER ID: TPRT003W PAGE 0001
CITY: MONONA
COUNTY: CLAYTON

HOUR	******* NORTH LEG ******* FALCON AVENUE				******* EAST LEG ******** US 18/US 52				******* SOUTH LEG ******* FALCON AVENUE				******* WEST LEG ******** US 18/US 52			
	RT	ST	LT	TOTAL	RI	ST	LI	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
07- 8AM	7	53	45	105	47	76	24	147	29	35	20	84	7	72	15	94
08- 9AM	3	34	40	77	43	68	14	125	23	35	23	81	9	63	21	93
11-12PM	5	43	42	90	54	69	14	137	22	49	12	83	9	61	23	93
12-1 PM	10	39	37	86	48	75	16	139	19	44	21	84	9	74	20	103
3- 4PM	15	61	76	152	58	93	25	176	22	41	31	94	14	87	21	122
4- 5PM	13	44	75	132	64	82	15	161	15	45	31	91	15	86	28	129
5- 6PM	16	61	60	137	76	72	14	162	23	46	26	95	7	50	26	83
TOTALS	69	335	375	779	390	535	122	1047	153	295	164	612	70	493	154	717

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

D1530927

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
22	52	5181	0991	2009

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
SINGLE UNIT TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: MONONA
COUNTY: CLAYTON

HOUR	******* NORTH LEG FALCON AVENUE				******* EAST LEG US 18/US 52			********	******* SOUTH LEG FALCON AVENUE			*******	******* WEST LEG US 18/US 52			********
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
7- 8AM	0	1	2	3	3	8	1	12	2	1	1	4	1	5	1	7
8- 9AM	1	1	2	4	3	2	1	6	3	3	3	9	0	2	4	6
11-12PM	0	4	2	6	5	6	2	13	1	5	0	6	2	2	3	7
12- 1PM	0	2	3	5	3	2	2	7	3	2	3	8	0	3	1	4
3- 4PM	3	1	2	6	3	2	0	5	0	3	1	4	1	5	0	6
4- 5PM	0	1	4	5	1	3	1	5	0	1	1	2	1	4	1	6
5- 6PM	0	1	0	1	1	1	0	2	0	1	1	2	0	1	0	1
TOTALS	4	11	15	30	19	24	7	50	9	16	10	35	5	22	10	37

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

D1530928

COUNTY	TOWNSHIP	NODE	LOCATION	YEAR
22	52	5181	0991	2009

TURNING MOVEMENT SYSTEM
TRAFFIC COUNT SUMMARY
COMBINATION TRUCKS

PRINTER ID: TPRT003W PAGE 0001
CITY: MONONA
COUNTY: CLAYTON

HOUR	******* NORTH LEG FALCON AVENUE			*******	******* EAST LEG US 18/US 52			********	******* SOUTH LEG FALCON AVENUE			*******	******* WEST LEG US 18/US 52			********
	RT	ST	LT	TOTAL	RT	ST	LT	TOTAL	LT	ST	RT	TOTAL	LT	ST	RT	TOTAL
7- 8AM	1	3	2	6	1	21	5	27	5	1	3	9	1	34	1	36
8- 9AM	0	0	1	1	3	26	2	31	4	0	5	9	0	25	7	32
11-12PM	0	0	2	2	3	31	5	39	6	1	1	8	2	27	0	29
12- 1PM	0	2	3	5	1	36	4	41	4	0	1	5	0	32	2	34
3- 4PM	0	2	0	2	2	21	6	29	5	0	7	12	0	15	5	20
4- 5PM	0	0	0	0	1	12	0	13	2	0	5	7	0	12	4	16
5- 6PM	1	1	0	2	0	11	2	13	1	1	2	4	0	5	1	6
TOTALS	2	8	8	18	11	158	24	193	27	3	24	54	3	150	20	173

STATION DISPLAYED
PF4 QUARTER HOUR PF5 CLASS PF7 BKWD PF8 FWD PF15 MAIN MENU PF21 SCREEN PRINT CLEAR EXIT

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Clayton Prepared by: David Little Date Prepared: Aug 23, 2012

Intersection: Intersection of US 18/52 and X-26 (Main Street/Falcon Avenue) in Monona

Improvement

Proposed Improvement(s): Realign intersection to improve skew angle

$ 43,600	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	8	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 43,600	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2009 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

1,502 ↓
1,382 → ✱ ← 2,018
↑ 1,179

2,219,565 Current Annual Entering Veh., **AEV** = DEV * 365

8,190 veh / day, Final Year DEV, **FDEV**

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

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

1.5% Projected Traffic Growth (0%-10%), **G**

6,081 Current Daily Entering Vehicles, **DEV**

Crash Data

2007 First full year --> 2011 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$ -
		2	Major Injuries @	$240,000	$ 480,000
7	Injury Crashes →	8	Minor Injuries @	$48,000	$ 384,000
		4	Possible Injuries @	$25,000	$ 100,000
6	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 99,400
13	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 1,063,400

2.60	Current Crashes / Year, **AA** = TA / T	1.17	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 81,800	Cost per Crash, **AVC** = LOSS / TA	$ 262,235	Present Value of Avoided Crashes, **BENEFIT**
60.1	Total Expected Crashes, **TECR** = CR x TMEV		
0.21	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 17,014	Crash Costs Avoided in First Year, AAR x AVC		
4.8	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 = $262,235 : $43,600 = **6.01** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Waterloo/ Systemic Safety Improvements at Signalized Intersections on Washington Street

Applicant: City of Waterloo

Contact Person: Mohammad Elahi Title: Traffic Engineer

Complete Mailing Address: 408 E. 6th Street
Waterloo, Iowa 50703

Phone: (319) 291-4440 (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:

Application Type

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

Funding Amount

Total Project Cost $ $249,800

Safety Funds Requested $ 249,800

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Waterloo

Signed: Ernest G. Clark — 9/6/12

Signature — Date Signed

Ernest G. Clark

Typed Name

Attest: Suzy Schaves — 9-6-2012

Signature — Date Signed

Suzy Schaves

Typed Name

SYSTEMIC SAFETY IMPROVEMENTS AT SIGNALIZED INTERSECTIONS ON WASHINGTON STREET (US 218) IN WATERLOO, IOWA

B. NARRATIVE

Some of the US 218 (Washington Street) intersections in Waterloo are among the locations with the most need for traffic safety improvements. US 218 is a high speed, high volume urban expressway with a high volume of trucks. Some US 218 ramps, connections, and part of the main highway itself are called Washington Street. Some of the injury crash hotspots are on Washington Street. These are intersections of Washington and US 63, Washington and Ansborough, and Washington and W. 9th. This proposal offers to implement systemic improvements on all Washington (US 218) intersections. A common problem is the cross street not being immediately obvious to the driver. Another problem is inadequate traffic signal numbers or placement. Countermeasures are proposed.

This proposal is for installing high durability, high visibility intersection pavement markings, installing signal heads over the lanes lacking one, and installing nearside signal heads. These should make the beginning of the cross street more conspicuous as well as reduce confusion. Other than the 3 intersections with problems, this proposal looks at traffic safety feature as an integral part of the US 218/Washington Street, not a post-crash measure needed after people are injured or killed. The purpose is to minimize the risk of future crash occurrence and severity at all of these intersections, not just the 3 hotspots. In addition to countermeasures mentioned above, some other specific improvements are proposed at each of the locations.

Table 1 shows an overall list of objectives and countermeasures to achieve them.

Table 1: List of Objectives & Type of Improvement

TO	MEASURE 1	MEASURE 2	MISCELLANEOUS
Make the beginning of the cross street easily noticeable.	Install high durability high visibility stop bars.	Install near side signal heads.	(Modify / install street name signs.)
Give warning of imminent encounter with red light.	Install advance end of green warning system.	Install extra signs as necessary.	
Reduce confusion and increase reaction time.	Install 1 signal head over each lane.	Install signal heads configurations with appropriate arrow indications.	Use signs, extra signal heads, and pavement markings as necessary.
Eliminate Signal View Obstruction.	Cut trees.	Relocate signs.	

Table 2 contains the list of intersections and the countermeasures proposed at each location. The rest of the proposal presents intersections of Washington with Ansborough, US 63, and W. 9th Street. These three locations are grouped together at each section. The rest of the intersections improvements are in summary forms.

Table 2: List of Intersections on Washington Street (US 218) and Proposed Actions

PROPOSED ACTION → / INTERSECTION ↓	HIGH DURABILITY HIGH VISIBILITY STOP BAR	ONE SIGNAL HEAD OVER EACH LANE	NEAR SIDE SIGNAL HEAD	HIGH DURABILITY OTHER PAVEMENT MARKINGS	MAST ARM	ADVANCE END OF GREEN WARNING SYSTEM	REMOVE TREE	MOVE SIGN	MISC.
Ansborough & SB Ramp*	✓	✓	✓						✓
Ansborough & NB Ramp*	✓	✓	✓						
Fetcher & SB Ramp	✓	✓		✓					
Fletcher & NB Ramp	✓	✓		✓					
Sergeant Rd & W Washington St	✓		✓			✓		✓	
63 & Washington (Under the Bridge) *	✓	✓				✓		✓	✓
Park, W 4th, W 5th, and W 6th	✓		✓						
W 9th *	✓	✓	✓	✓	✓	✓			
W 11th	✓	✓	✓						
W 18th	✓								
Mitchell	✓	✓	✓	✓					
Hawthorne	✓						✓	✓	
San Marnan & SB Ramp**									✓
San Marnan & NB Ramp**									✓

* Section B narratives for marked intersections continue on the next page.

** Detection is needed but not included in this proposal.

SECTION B NARRATIVE - CONTINUED

WASHINGTON (RAMPS) & ANSBOROUGH AVENUE

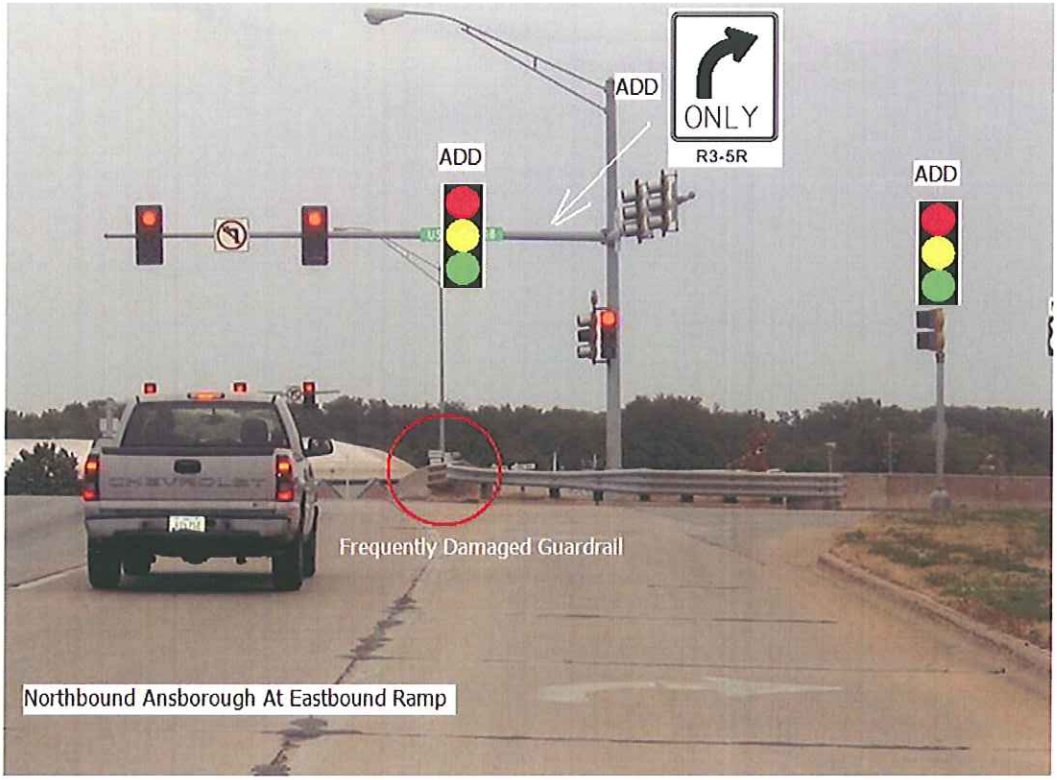
Washington (218 Ramps) & Ansborough

The location has a history of high number of reported injury crashes. Ansborough Avenue is a 35 mph urban arterial, it crosses US 218 ramps. Speed limit on US 218 is 65 mph. 2009, 2010, and 2011 records shows 31 crashes. 9 did not happen at that intersection. Some other crashes were due to hard-to-control factors. Among these were 2 police chases, alcohol related crashes, and a few ice, snow, or slipping incidents. Red light runners were mostly on Ansborough Avenue. Site investigation showed a need for some signal modification and pavement markings. These should help the drivers make timely decisions regarding which lane they are supposed to be in. It should also help them recognize the beginning of the intersection more readily and hence reduce the risk of red light crashes. Use of "arrow" signal heads should enhance the operations.

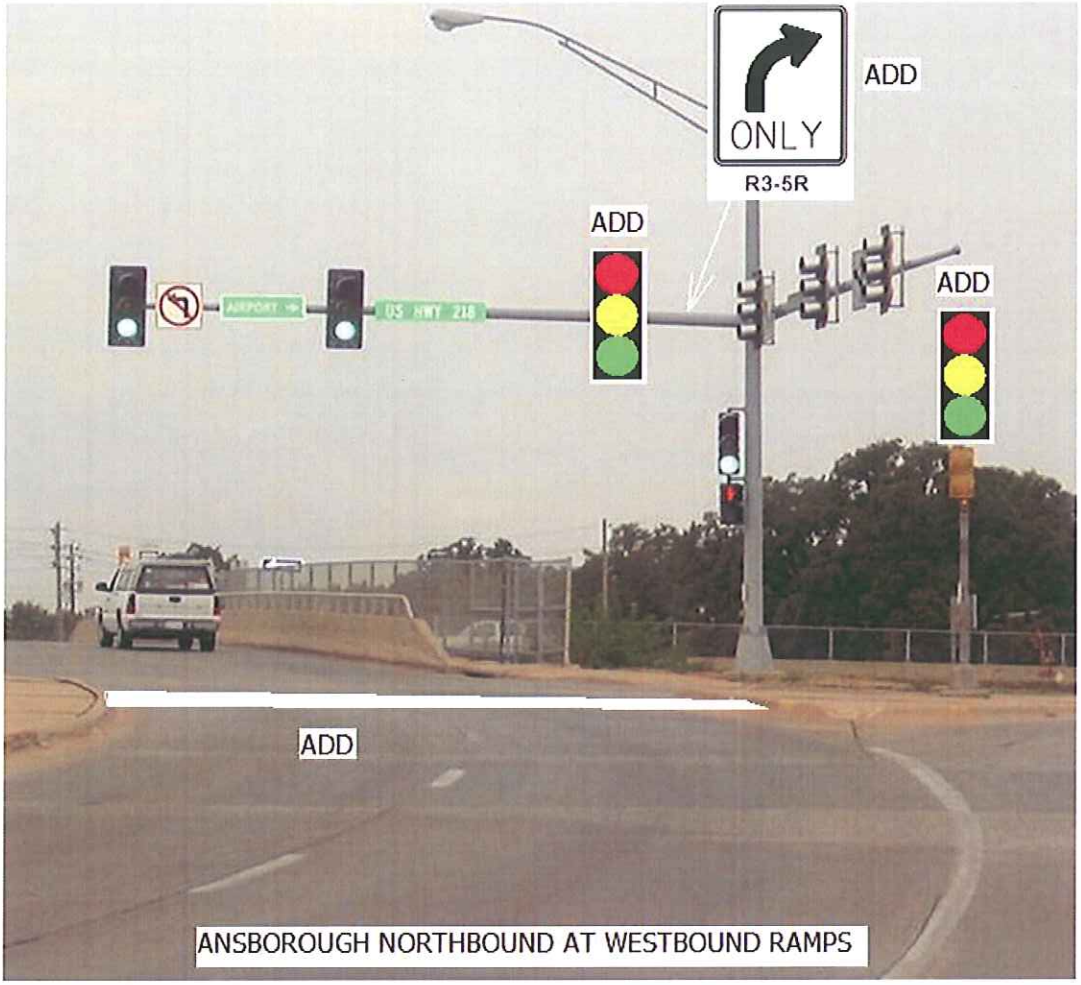
Westbound Ramp Approach: No violations were reported in that direction.

Eastbound Ramp Approach: A specific pattern was not found. A signal head over the left turn lane is needed.

Southbound & Northbound Ansborough: Several red light runners contributed to crashes. A signal head over NB Ansborough at EB Ramp, and a signal head over SB Ansborough at WB Ramp are needed. Both approaches need pavement markings. Use of appropriate "arrow" signal heads will help operations. The guardrail on NB Ansborough bridge approach is frequently damaged. Adding an object marker behind the guardrail or reflective sheeting on the face of the guardrail could help.

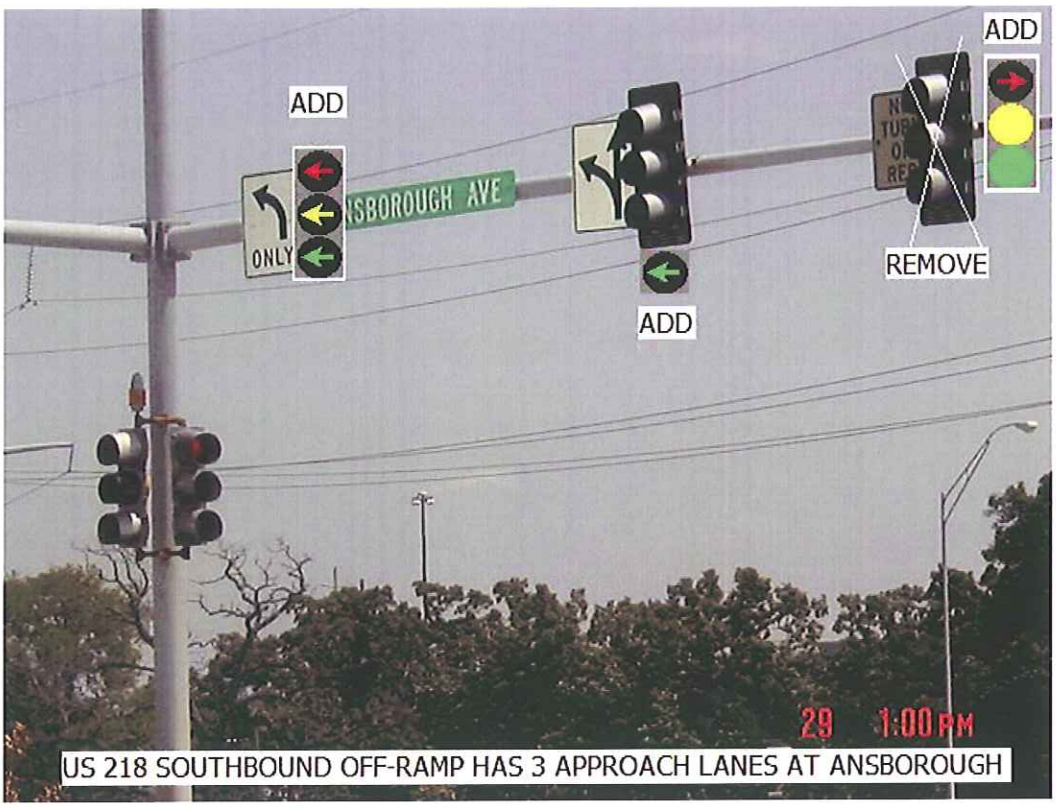


Typical Improvements Repeated Throughout the Project



Typical Improvements (The proposed signal heads is on the mast arm is over the left turn lane but in the picture it does not appears correctly)

Typical Improvements To Help Demark the Cross Street



Typical Improvements (Signal head arrangements will be per 2009 MUTCD)

Elements To consider Beyond This Project:

- There are several Lost-Control and Slipped crashes. Examining pavement friction in the area, particularly the eastbound ramp intersection approaches, might be justified.
- 7 injury crashes happened when it was dark, mostly around midnight and early morning hours. 5 involved alcohol. Lighting appears adequate. There are a high number of drinking establishments in the vicinity of this interchange.

SECTION B NARRATIVE - CONTINUED

WASHINGTON STREET (SB 63) AND NORTHBOUND US 63

UNDER THE BRIDGE

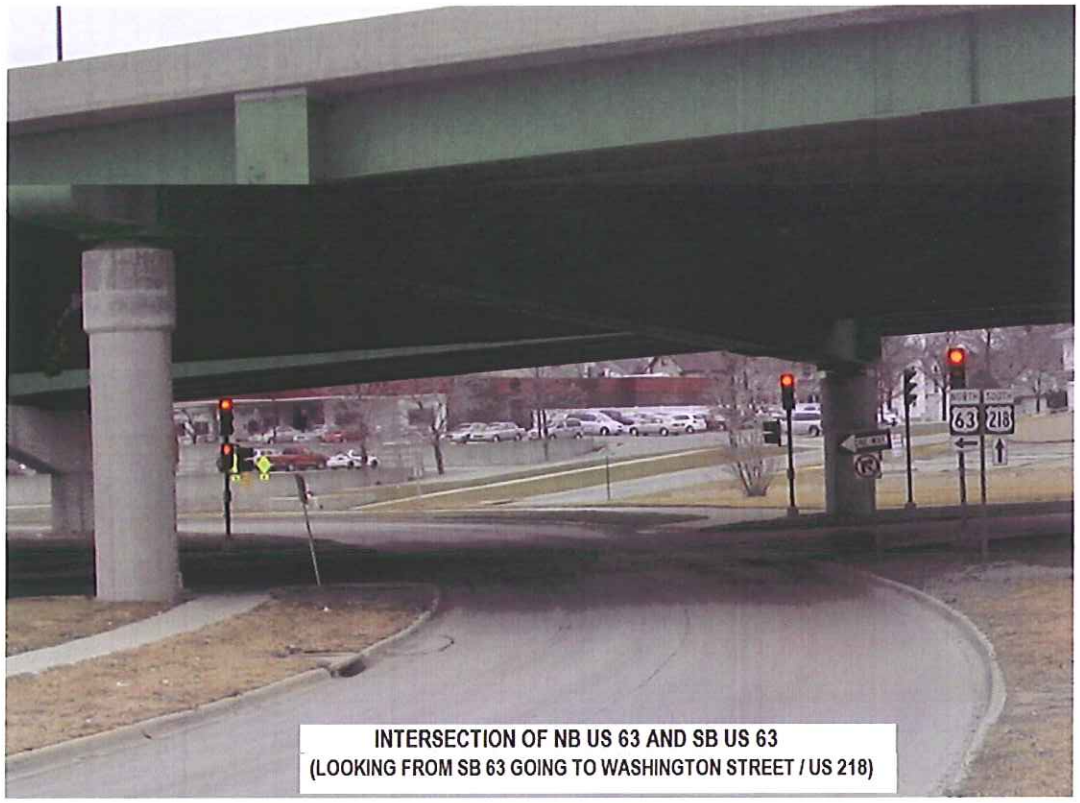
Washington Street (SB 63 to 218) and Northbound US 63 - Under the Bridge

Introduction

The intersection experiences a high number of red light running crashes. Red light violations could be attributed to the horizontal approach curves, bridge piers, and inadequate traffic control devices. A series of problems and solutions are presented here.

Existing Conditions and Problem

The intersection is signalized. See Exhibit 1. Both approaches are one-way streets with 35 mph posted speed limits. The intersection experiences a large number of red light running crashes. Drivers on southbound 63 commit most of the red light violations. Northbound 63 has 4 lanes. Washington Street has 2 lanes. Both streets approach the intersection with a horizontal curve. The intersection is located directly under US 218 bridges.



INTERSECTION OF NB US 63 AND SB US 63
(LOOKING FROM SB 63 GOING TO WASHINGTON STREET / US 218)

Exhibit 1

Deficiencies and Proposed Actions

Six deficiencies are identified and countermeasures are proposed.

1- Due to the horizontal curve the signals are not readily noticed by the drivers. Sight distance and line of sight problems exist.
PROPOSED ACTION: Install advance end of green warning systems. A warning system already exists on NB 63 approach but is not standard and does not convey a readily recognizable message. Locate advance warning flashing beacons' locations and timing to fit the approach situation if necessary. Use signs per MUTCD Section 2C.36 and Section 4L-23. MUTCD requires a Signal Ahead sign if Be Prepared To Stop sign is to be used. Exhibits 2 and 3 show the proposed signs and the advance end of green flashing beacon assembly.

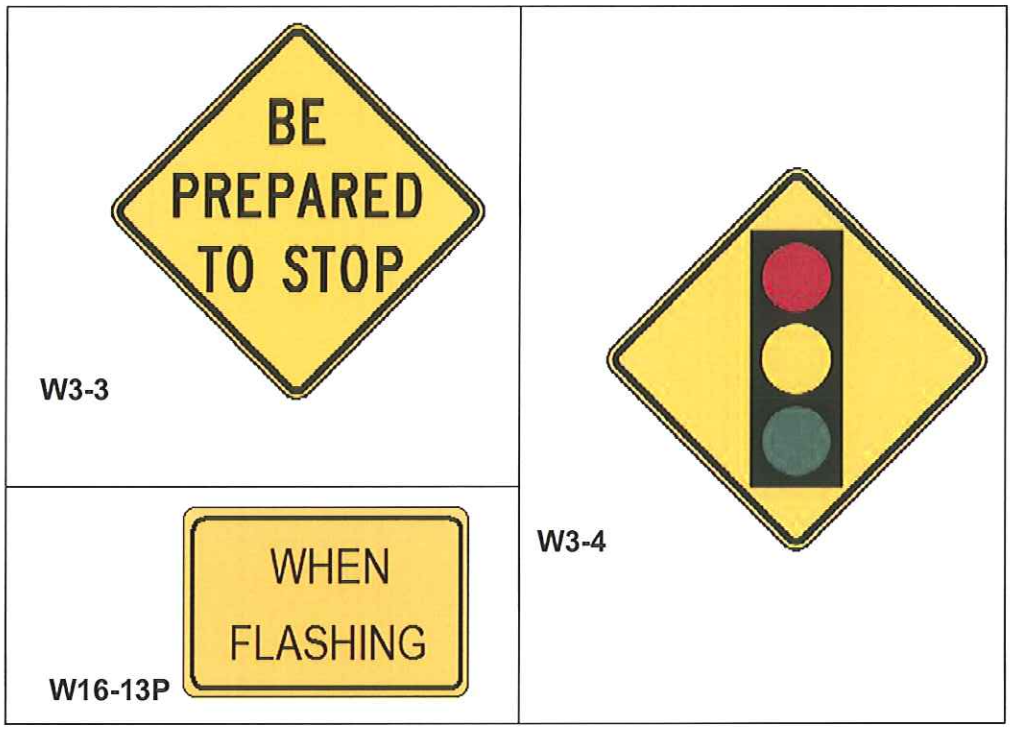


Exhibit 2: Proposed MUTCD Signs

Exhibit 3: Proposed Advance Warning Assembly

B

2- No overhead signal heads exist on SB 63, the approach with most red light runners.

PROPOSED ACTION: Install one overhead signal head over each lane. The proposal is shown on Exhibit 4. Due to the approach curvature, install the heads as close to the stop bar as possible to be seen as early as possible by approaching vehicles.

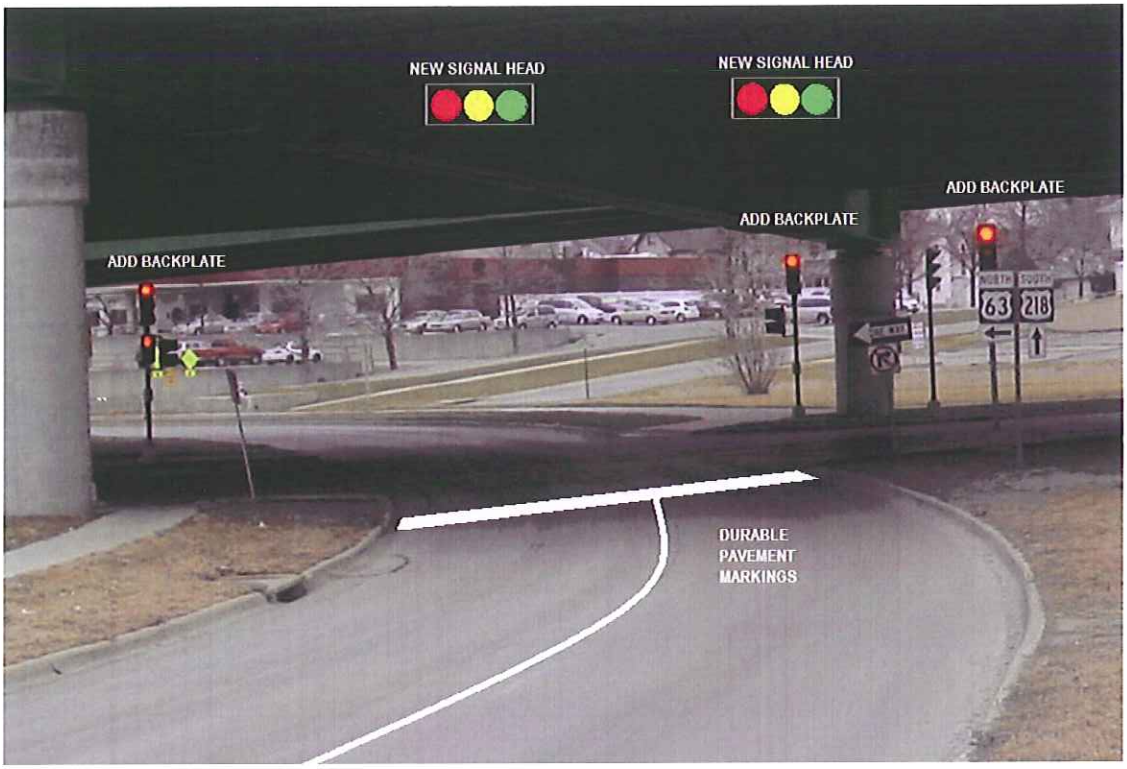


Exhibit 4: Proposed Traffic Control Devices – SB Washington

3 - Faded or non-existent pavement markings particularly stop bars.
PROPOSED ACTION: Use high durability intersection pavement markings. Please see Exhibit 4.

4- Pedestal mounted signals heads have no backplates.
PROPOSED ACTION: Use signal heads with backplates on 4 pedestal poles.

5- The combination sign "North / 63 / LA" and "South / 218 / SA" is too close to the intersection. It does not give enough time to the driver to make appropriate decisions.
PROPOSED ACTION: Relocated this sign to approximately 105' in advance of the near side traffic signal. This action reduces clutter at the intersection.

6- Northbound US 63 signals have no backplates. See Exhibit 5.
PROPOSED ACTION: Add backplates.

B

Exhibit 5: Need for Backplates, Northbound US 63

SECTION B NARRATIVE - CONTINUED

Southbound Washington & W. 9th

Southbound Washington & W. 9th

The intersection was on the list of locations with possible red light running problems. Accident reports confirmed southbound 218 red light running crash problems. About half of those end up being injury crashes, some very severe. The intersection has the highest number of sever injury crashes in Waterloo. Many are injury crashes.

3 lanes of 218 southbound approach and 2 lanes of Washington Street approach merge to form a 5 lane approach to W 9th street. There are some weaving movements. Traffic on 218 has a high truck percentage elevating the risk of sever crashes. The posted speed limit on US 218 at this location is 45 mph, with the posted speed limit decreasing from 55 mph on US 218 approximately 900' in advance of the West 9th Street. The posted speed limit also increases from 35 mph to 45 mph approximately 900' in advance of the West 9th Street for southbound Washington. This Washington Street corridor serves as a link from northbound and southbound US 63 to southbound US 218. There is an overhead truss installation in place on US 218, approximately 1,000' in advance of the West 9th Street centerline, with dual "Signal Ahead-Symbol" signs, dual interconnected Advance Warning Flasher Amber Flashing Beacons and an electronic "Prepare To Stop" sign. The posted speed limit on West 9th Street is 30 mph. There is intersection lighting in place in the southeast and southwest quadrants of this intersection, and tower lighting in place near the northeast quadrant.

Red light running could be attributed to 4 factors[1]. Countermeasures to improve 3 of the conditions are proposed. Part of the red-light running crash problem can be attributed to 1) the intersection not being readily noticeable, 2) inadequate number of overhead signal heads, and 3) visual noise from the commercial signs particularly when it is cloudy or dark. See Exhibit 6. The following improvements are proposed to counter these 3 conditions:

1- Make the beginning of the intersection more recognizable by installing a durable stop bar and nearside signal heads.
2- Install a signal head over the far left and far right lanes.
3-Install an advance end of green "Prepare To Stop" system on Washington. One already exists on US 218.

Exhibit 7 shows the conceptual layout of some of the proposed traffic control devices.

[1] Part of the red light running crash problem could be due to the weaving movements. Some vehicles have to weave through several lanes to make a left or right turn at W 9th, losing sight of the signals. This problem requires a more extensive long-term solution not addressed here.

Exhibit 6: Lack of Signal Heads Over Far Right an Far Left Lanes, Visual Noise, and Relatively Inconspicuous Start of the Intersection

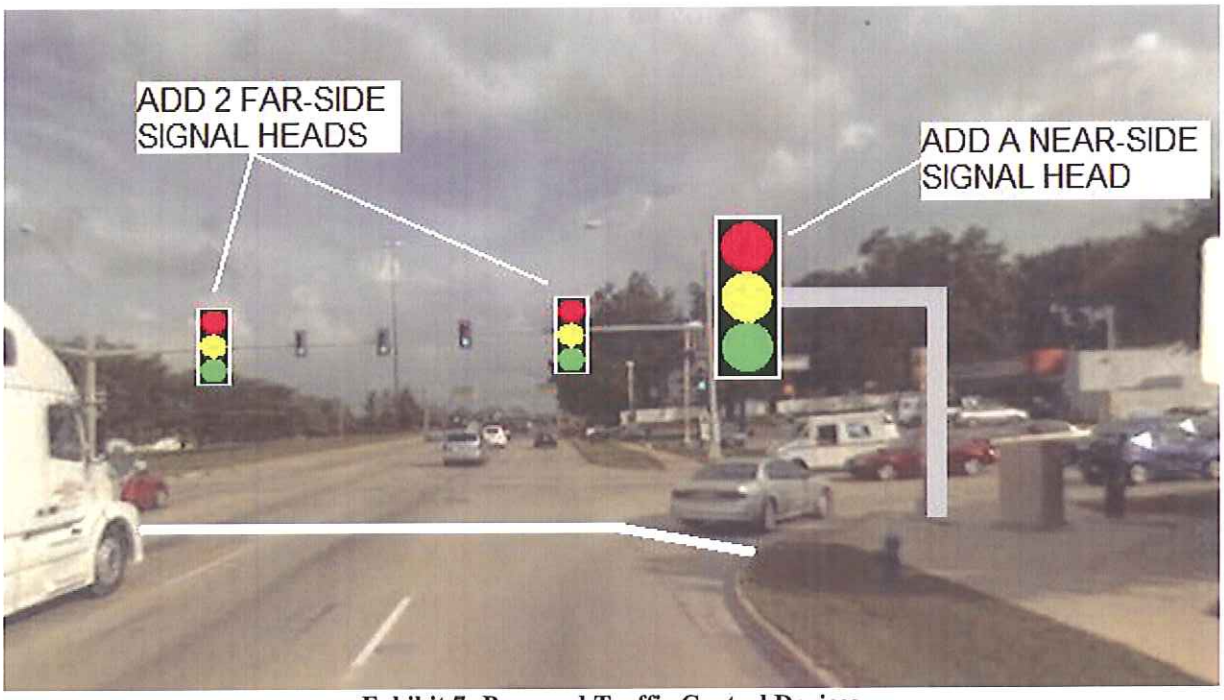


Exhibit 7: Proposed Traffic Control Devices

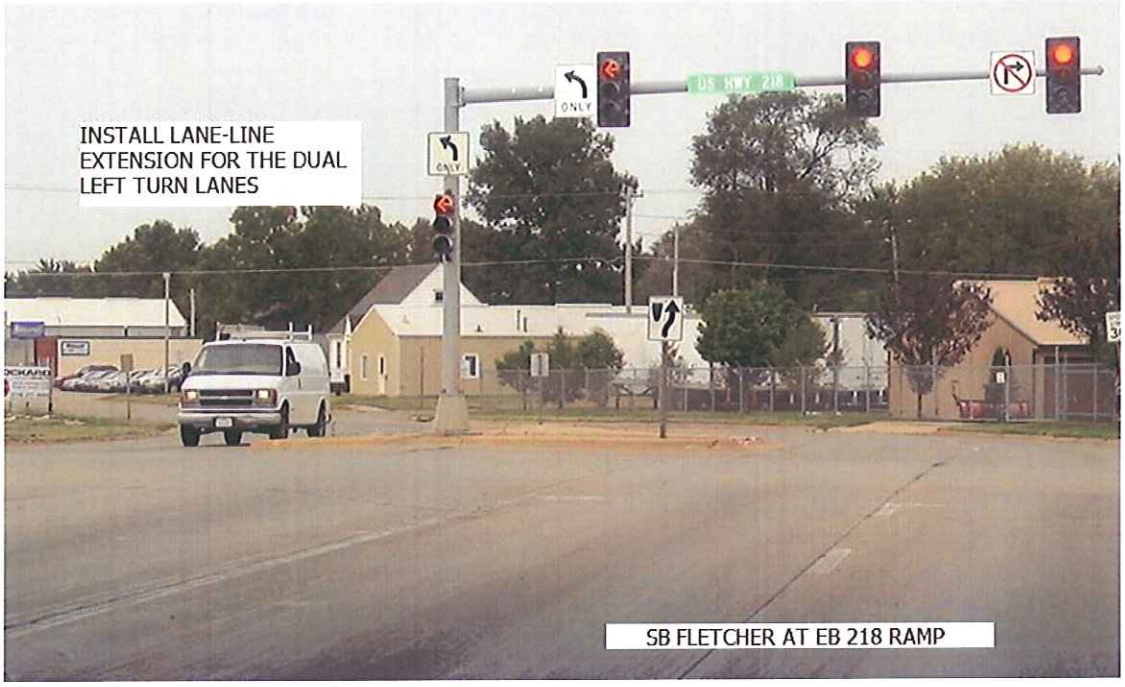
OTHER SIGNALIZED INTERSECTIONS

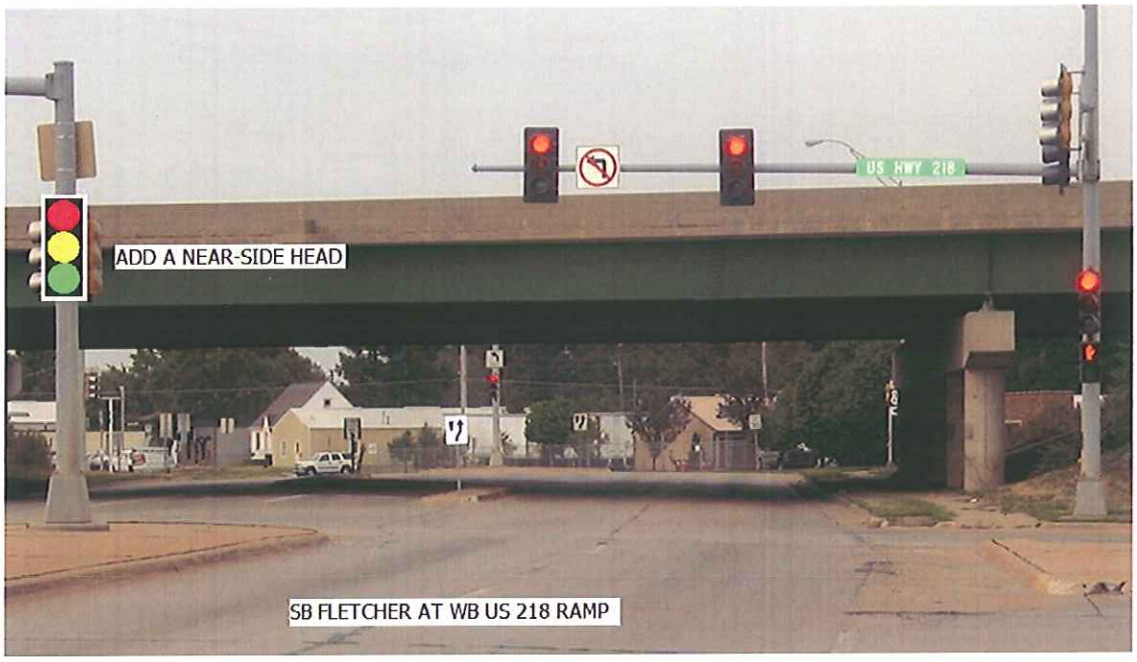
FLETCHER AT WASHINGTON (US 218 RAMPS)
SERGEANT RD/ W WASHINGTON ST (SOUTHBOUND US 218 OFF-RAMP TO US 63)
WASHINGTON AT PARK, W. 4TH, W. 5TH, AND W. 6TH
W 11TH STREET AT WASHINGTON (US 218)
WILLISTON/218 AT WASHINGTON (US 218)
HAWTHORNE AT WASHINGTON (US 218)
MITCHELL AT WASHINGTON (US 218)

The proposed improvements are to reduce risk of red light running crashes. High durability stop bars and a near side signal heads are the most common treatments. The proposed actions are, in most cases, not based on crash history but are preventive measures.

FLETCHER AT WASHINGTON (US 218 RAMPS)

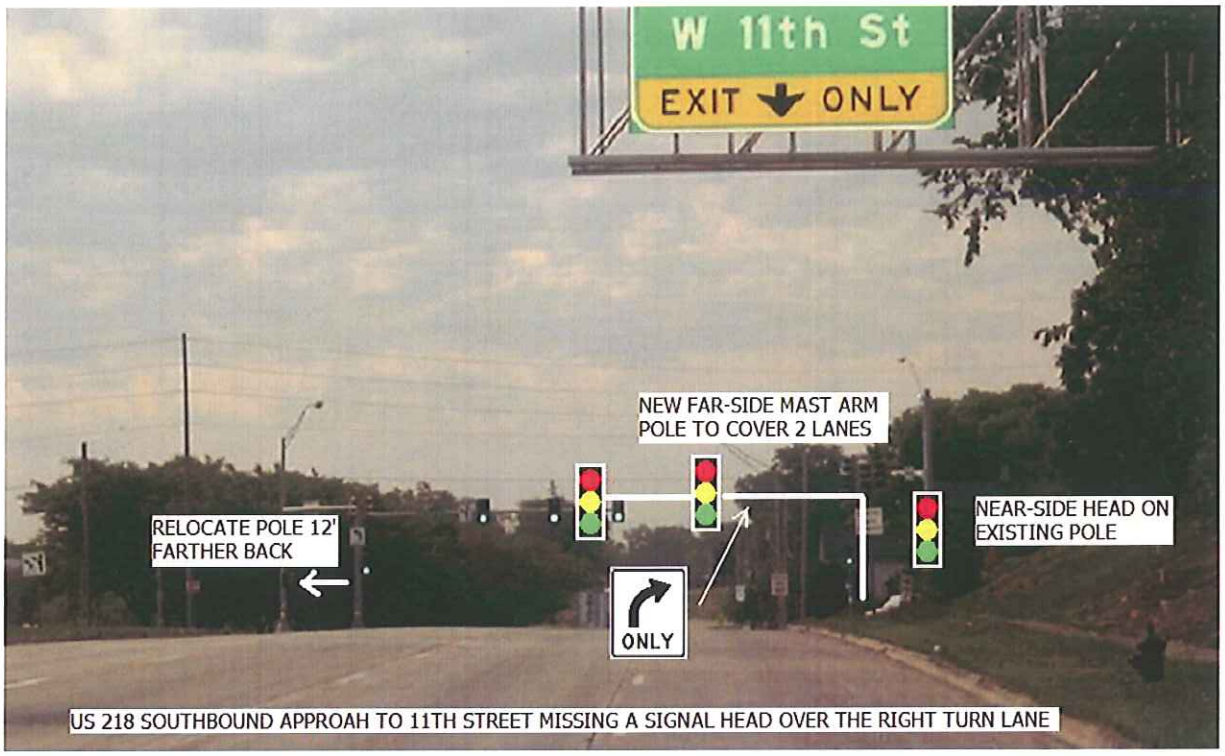
Install lane line extensions through the intersection for the dual left turn lanes. Install near-side signal heads on Fletcher.



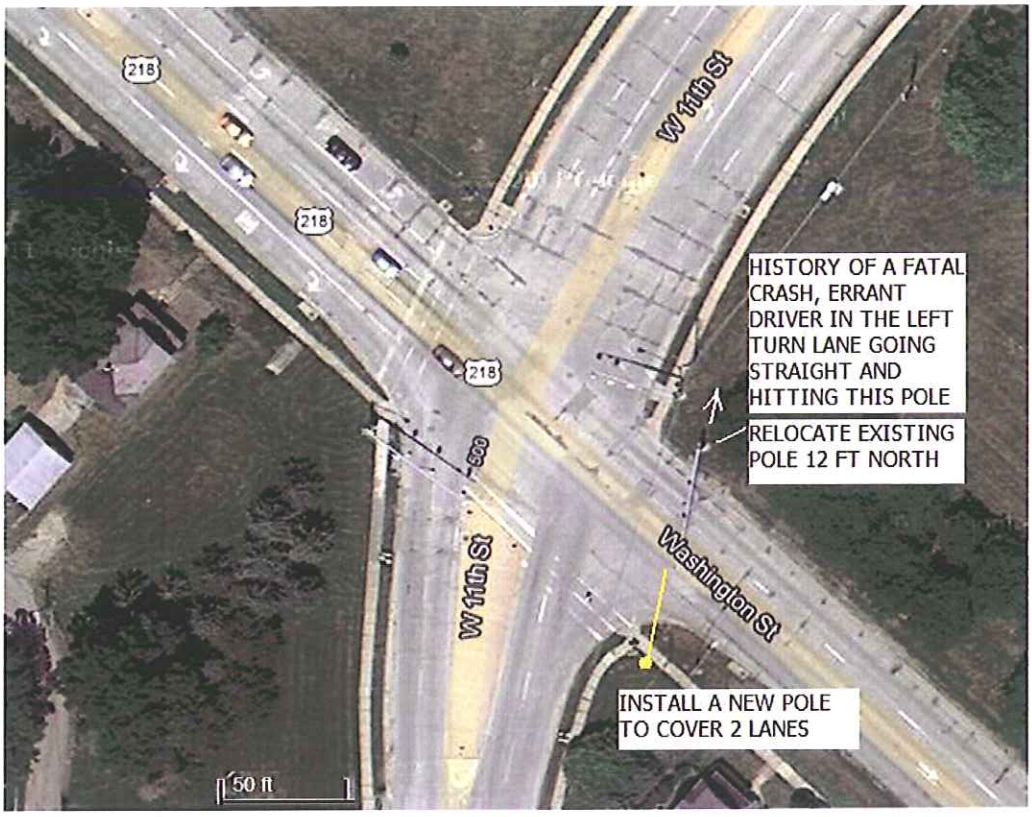


SERGEANT RD/ WASHINGTON ST (SOUTHBOUND US 218 OFF-RAMP TO US 63)
Northbound Sergeant Road (cross street to the ramp) experiences the most number of red light crashes. Add high visibility stop bar and a simple advance end of green warning system. Install high durability stop bar on northbound Sergeant Road. Install a near-side signal head on US 218 Ramp. Relocate a sign.

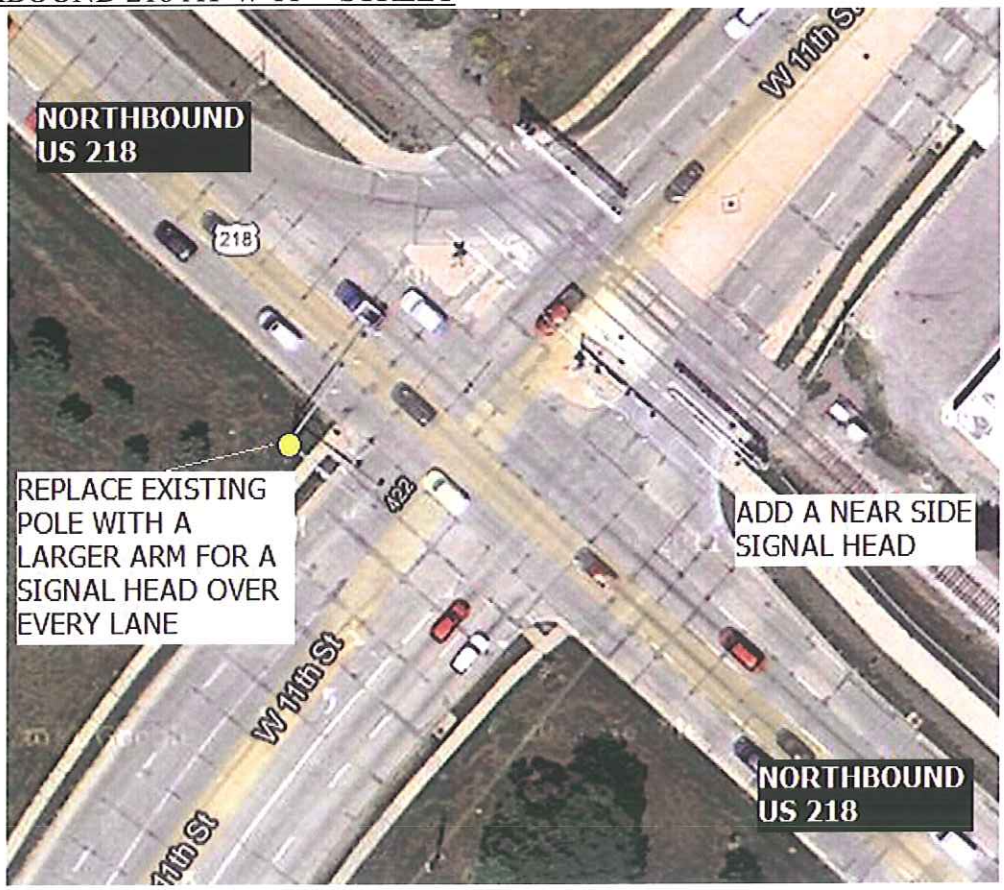
SOUTHBOUND 218 AT W 11TH STREET
The existing mast-arm poles covers 3 lanes only; there are 4 lanes. This pole is located directly in front of a the left turn pocket. An errand driver in the left turn pocket did not turn left and hit the pole causing a fatal crash. Relocate this pole farther back. Install a new pole on the other side of Washington Street to have a signal head over each lane.


W 11th St
EXIT ONLY
NEW FAR-SIDE MAST ARM POLE TO COVER 2 LANES
RELOCATE POLE 12' FARTHER BACK
NEAR-SIDE HEAD ON EXISTING POLE
ONLY
US 218 SOUTHBOUND APPROAH TO 11TH STREET MISSING A SIGNAL HEAD OVER THE RIGHT TURN LANE

WASHINGTON ST.
SOUTH ST.
CORNER LOT BELONGS TO CITY OF WATERLOO



NORTHBOUND 218 AT W 11TH STREET



NORTHBOUND US 218 AT WILLISTON/218
Westbound Williston Approach needs improvements.

SOUTHBOUND US 218 AT HAWTHORNE
Signal view is obstructed. Remove the trees and relocate the sign.

NORTHBOUND US 218 AT HAWTHORNE
Add a near-side signal head.

MITCHELL
Add high durability stop bars and a near-side signal head on both US 218 approaches.

C

C. ITEMIZED BREAKDOWN OF ALL COSTS:

WASHINGTON AND ANSBOROUGH

1	ADD AND MODIFY SIGNAL HEADS	3,500
2	DURABLE PAVEMENT MARKINGS ON ANSBOROUGH	8,000
3	RELOCATE STREET NAME SIGNS	200
4	NEARSIDE POST MOUNTED SIGNAL HEADS	3000
5	INCIDENTAL (CONDUITS, CABLES, ETC)	1500
6	TRAFFIC CONTROL	1,500
	TOTAL	$17,700

WASHINGTON AND US 63

1	ADVANCE END OF GREEN WARNING SYSTEMS, INCLUDING COMMUNICATION DEVICES, POWER, SIGNS AND POSTS	20,000
1	DURABLE PAVEMENT MARKINGS	6,000
2	SIGNAL HEADS WITH BACK-PLATES AND BRACKETS	3,000
3	SIGNS	300
4*	ADD BACKPLATES	500
5*	TWO SIGNAL HEADS, HANG UNDER BRIDGE DECK, COMPLETE INCLUDING HANGER ASSEMBLY	3,000
6	TRAFFIC CONTROL	1,500
7	INCIDENTALS, CONDUITS, CABLES, ETC.	1,000
	TOTAL	$35,300

* Iowa DOT approval required

WASHINGTON AND W. 9TH STREET

1	ADVANCE END OF GREEN WARNING SYSTEMS	17,000
2	DURABLE PAVEMENT MARKINGS	6,000
3	SIGNAL HEADS WITH BACK-PLATES AND BRACKETS	4,000
4	NEARSIDE POLE	9,000
5	TRAFFIC CONTROL	2,000
6	INCIDENTALS, CONDUITS, CABLES, ETC.	1,000
	TOTAL	$39,000

OTHER INTERSECTIONS (BREAKDOWN ON NEXT TWO PAGES)

1	SOUTHBOUND FLETCHER	4,300
2	NORTHBOUND FLETCHER.	4,300
3	SERGEANT ROAD	11,200
4	PARK, W. 4TH, W. 5TH, AND W. 6TH	33,600
5	SOUTHBOUND 218 AT W 11TH	30,800
6	NORTHBOUND 218 AT W 11TH	30,600
7	NORTHBOUND US 218 AT WILLISTON/218	16,400
8	SOUTHBOUND 218 TO HAWTHORNE	9,500
9	NORTHBOUND US 218 AT HAWTHORNE:	700
10	MITCHELL	16,400
	TOTAL	$157,800

TOTAL: $249,800

C

1-SOUTHBOUND FLETCHER

NEARSIDE PEDESTAL SIGNAL HEAD FLETCHER	$1,400
CONDUIT, WIRES, PUSH CONDUIT, ETC.	$200
DUAL LEFT LANE LINE EXTENSION THROUGH INTERSECTION	$2,500
TRAFFIC CONTROL	$200
TOTAL	$4,300

2-NORTHBOUND FLETCHER.

NEARSIDE PEDESTAL SIGNAL HEAD	$1,400
CONDUIT, WIRES, PUSH CONDUIT, ETC.	$200
DUAL LEFT LANE LINE EXTENSION THROUGH INTERSECTION	$2,500
TRAFFIC CONTROL	$200
TOTAL	$4,300

3-SERGEANT ROAD

NEARSIDE PEDESTAL SIGNAL HEAD	$1,400
HIGH DURABILITY STOP BAR ON SERGEANT RD	$3,000
SIMPLE ADVANCE END OF GREEN WARNING ON NORTHBOUND SERGEANT RD	$5,000
CONDUIT, WIRES, PUSH CONDUIT, ETC.	$800
TRAFFIC CONTROL	$1,000
RELOCATE SIGN (COORDINATE WITH DISTRICT 2)	0
TOTAL	$11,200

4-PARK, W. 4TH, W. 5TH, AND W. 6TH

NEAR SIDE SIGNAL HEADS ON WASHINGTON	$1,400
HIGH DURABILITY STOP BARS ON WASHINGTON	$6,000
TRAFFIC CONTROL	$1,000
TOTAL EACH:	$8,400

TOTAL ALL 4 INTERSECTIONS **$33,600**

5-SOUTHBOUND 218 AT W 11TH

SIGNAL HEADS ON SOUTHBOUND 218 AT W. 11TH	$2,100
DUAL LEFT LANE LINE EXTENSION THROUGH INTERSECTION	$2,500
RELOCATE MAST ARM POLE	$5,000
NEW MAST ARM POLE	$12,000
HIGH DURABILITY STOP BARS	$6,000
TRAFFIC CONTROL	$2,000
SIGN	$200
INCIDENTALS CONDUIT, WIRES, PUSH CONDUIT, ETC.	$1,000
TOTAL:	$30,800

C

6-NORTHBOUND 218 AT W 11TH

SIGNAL HEADS NORTHBOUND 218 AT W. 11TH	$2,100
REPLACE DOUBLE ARM MAST ARM POLE	$20,000
HIGH DURABILITY STOP BARS	$6,000
TRAFFIC CONTROL	$2,000
INCIDENTALS CONDUIT, WIRES, PUSH CONDUIT, ETC.	$500
TOTAL:	**$30,600**

7-NORTHBOUND US 218 AT WILLISTON/218

NEAR SIDE SIGNAL HEADS ON WESTBOUND WILLISTON	$1,400
HIGH DURABILITY STOP BARS	$7,500
TRAFFIC CONTROL	$3,000
TOTAL:	$16,400

8 SOUTHBOUND 218 TO HAWTHORNE

SOUTHBOUND 218 TO HAWTHORNE REMOVE TREES	$1,500
RELOCATE SIGN (COORDINATE WITH DISTRICT 2)	0
HIGH DURABILITY STOP BARS	$6,000
TRAFFIC CONTROL	$2,000
TOTAL:	$9,500

9-NORTHBOUND US 218 AT HAWTHORNE:

ADD A NEARSIDE SIGNAL HEAD	$ 700

10-MITCHELL

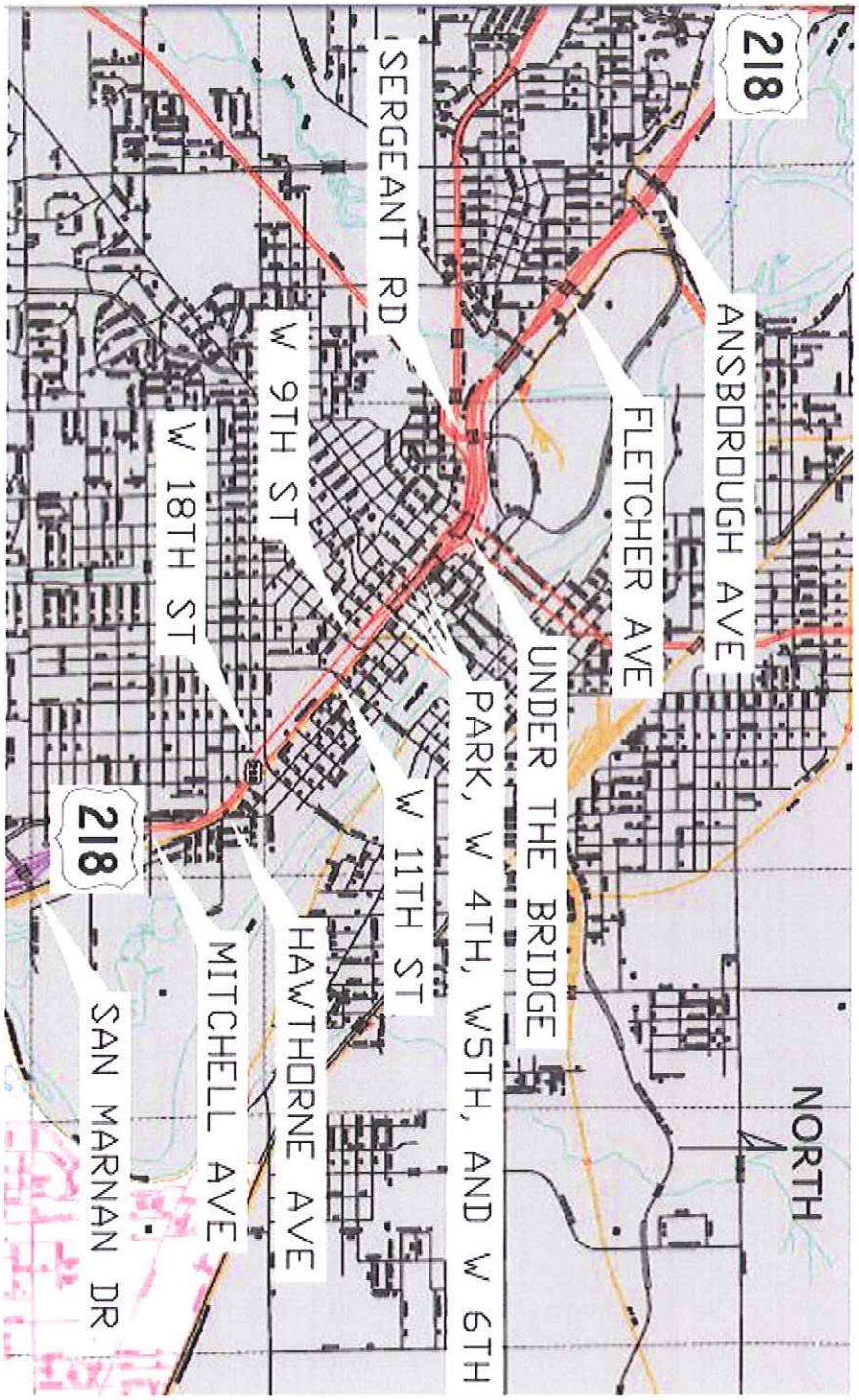
NEAR SIDE SIGNAL HEADS	$1,400
HIGH DURABILITY STOP BARS	$12,000
TRAFFIC CONTROL	$3,000
TOTAL:	$16,400

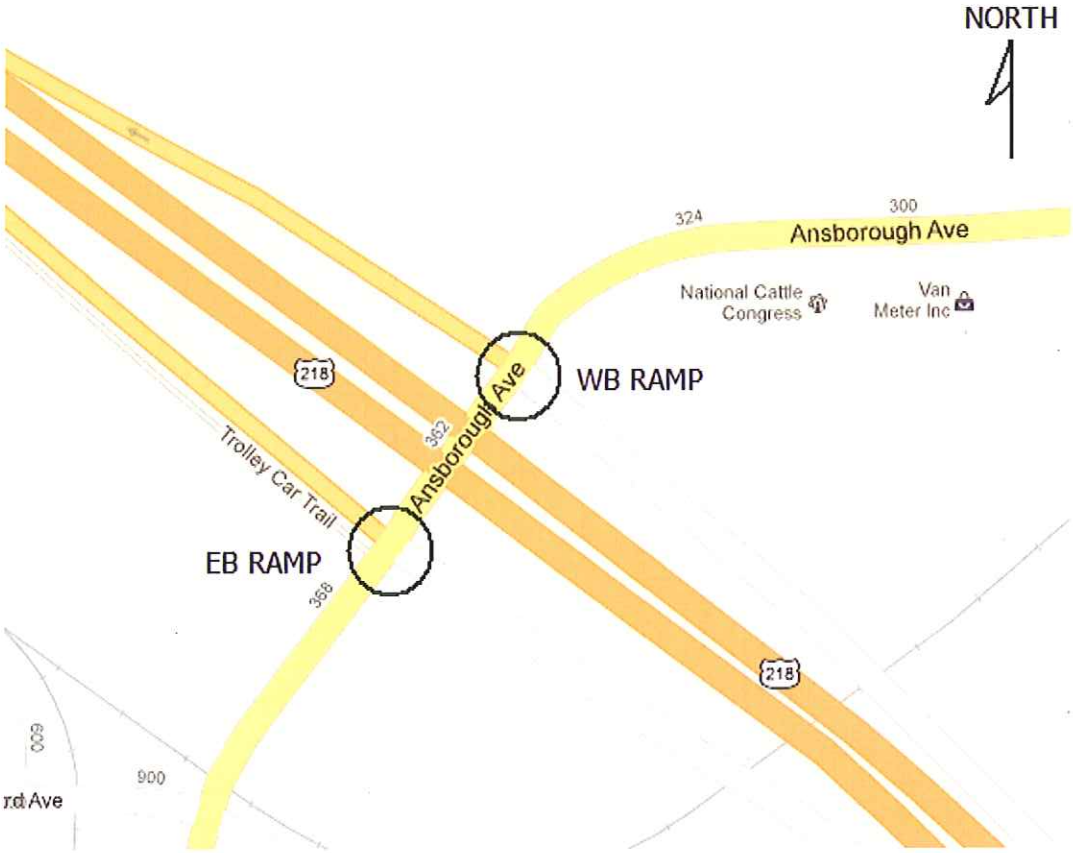
D. TIME SCHEDULE

	2013											2014							
	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
START	♦																		
DOT Agreement Exchange	▬	▬	▬																
Design			▬	▬	▬	▬													
Letting						▬	▬												
Construction							▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
END																			♦

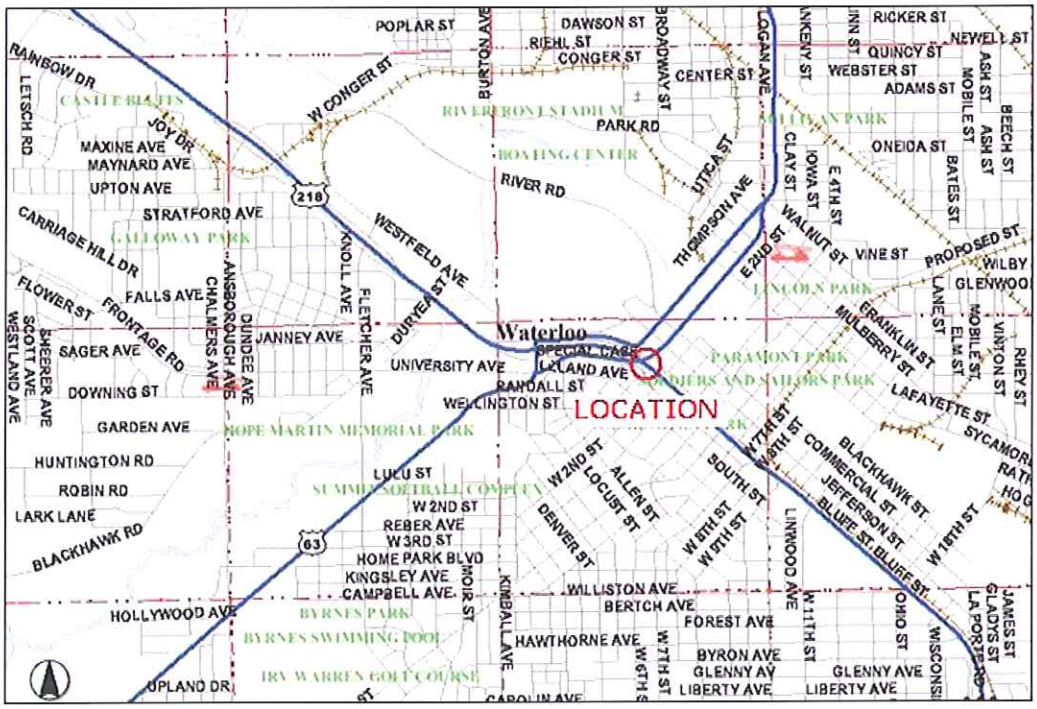
E

E. LOCATION MAP

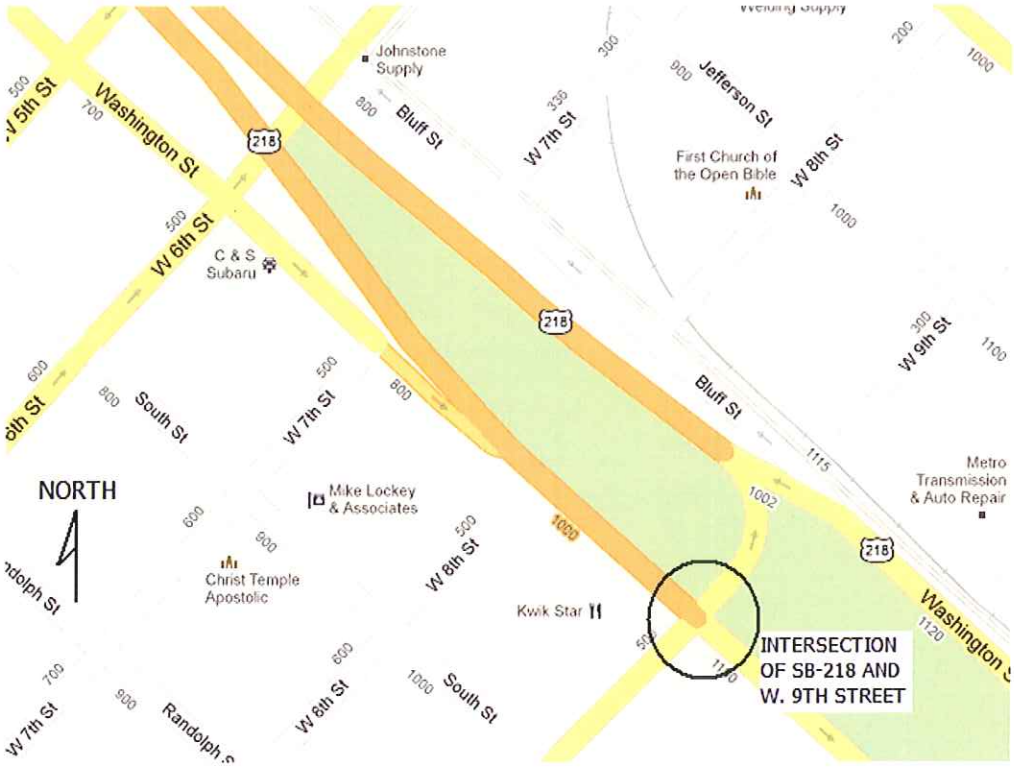




Washington and Ansborough



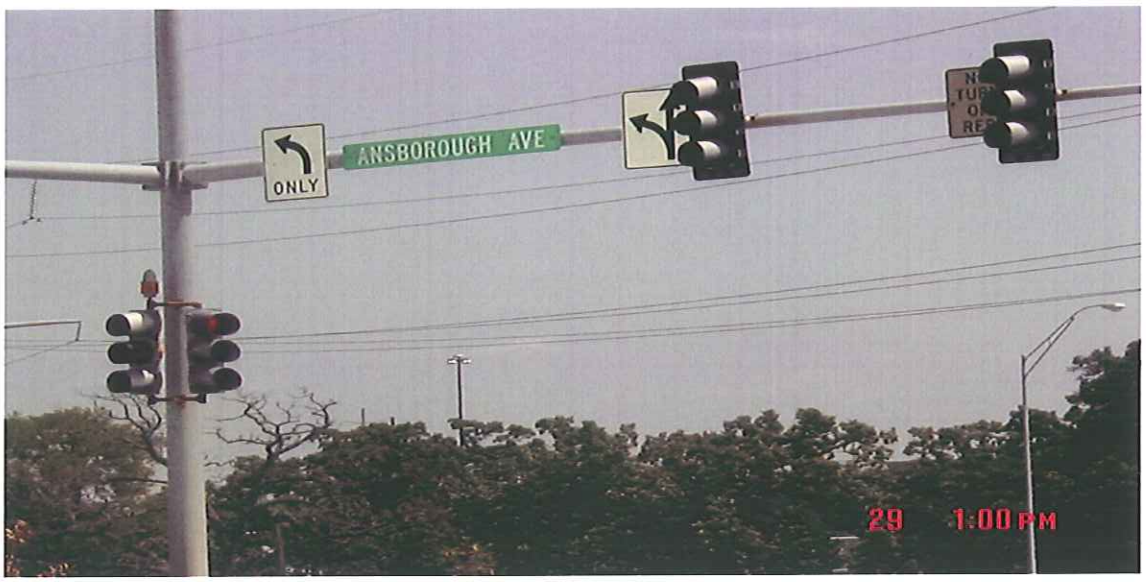
Southbound Washington and Northbound US 63- Under the Bridge



Southbound 218 and W 9th Street

F. COLOR PICTURES

NORTHBOUND ANSBOROUGH AT EASTBOUND US 218 RAMPS



US 218 Eastbound Ramp at Ansborough

F

Washington Approach to Northbound US 63

Washington and W. Park Avenue

F

Washington and W 4th Street

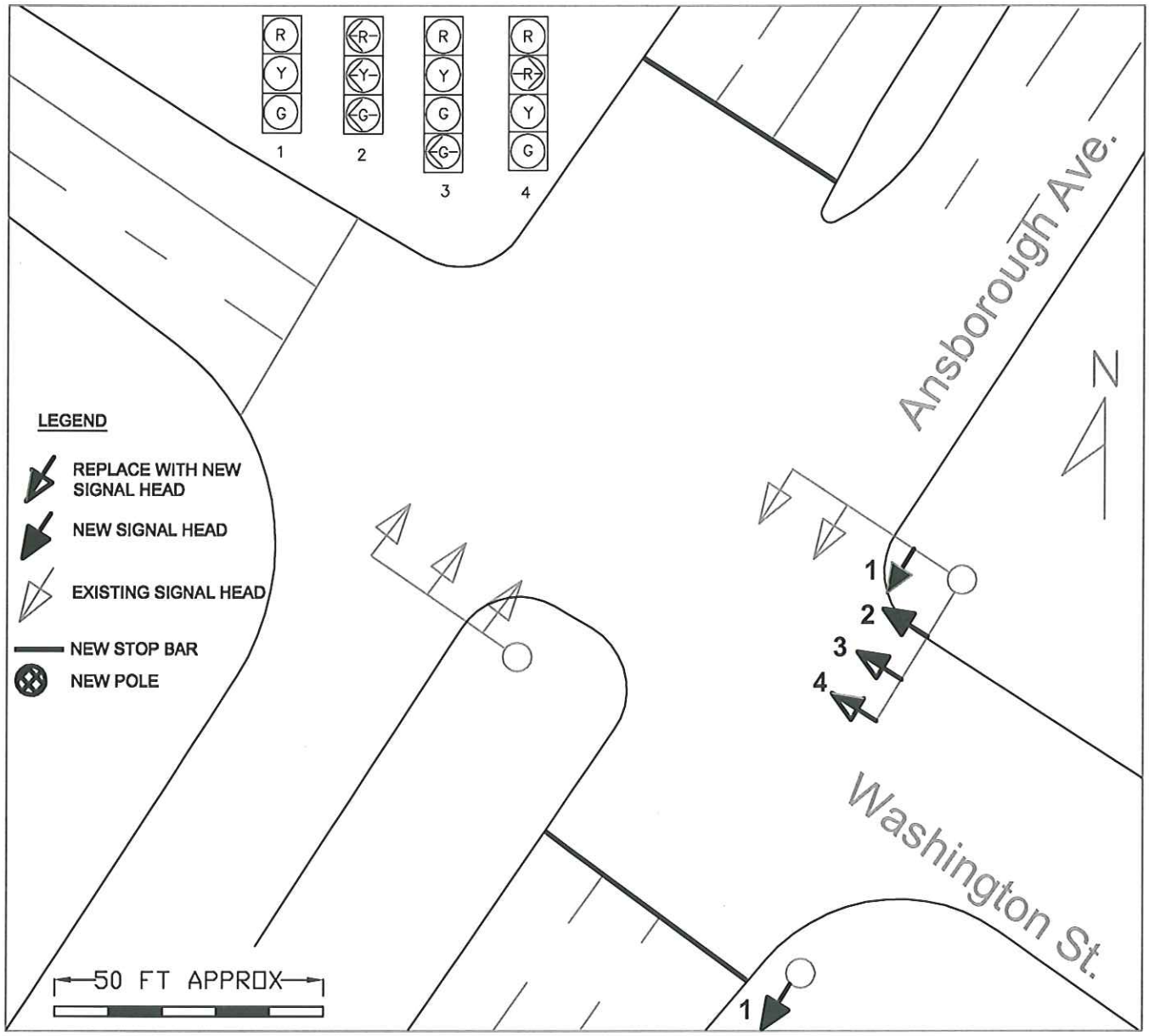
Washington and W 5th Street

Southbound US 218/Washington Aprroach to W 9th Street

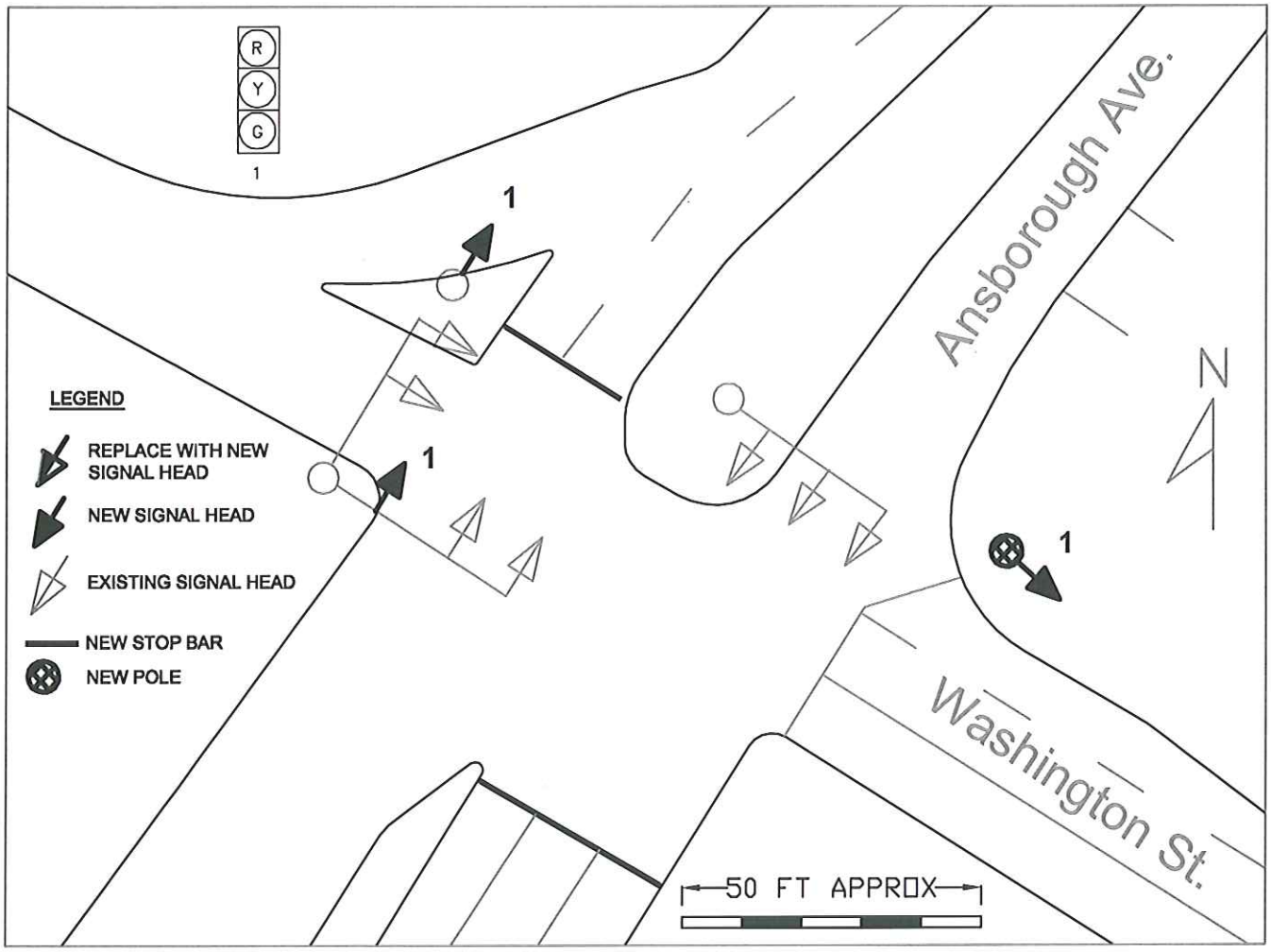
SB Washington and W 11th Street

G: PLAN VIEW

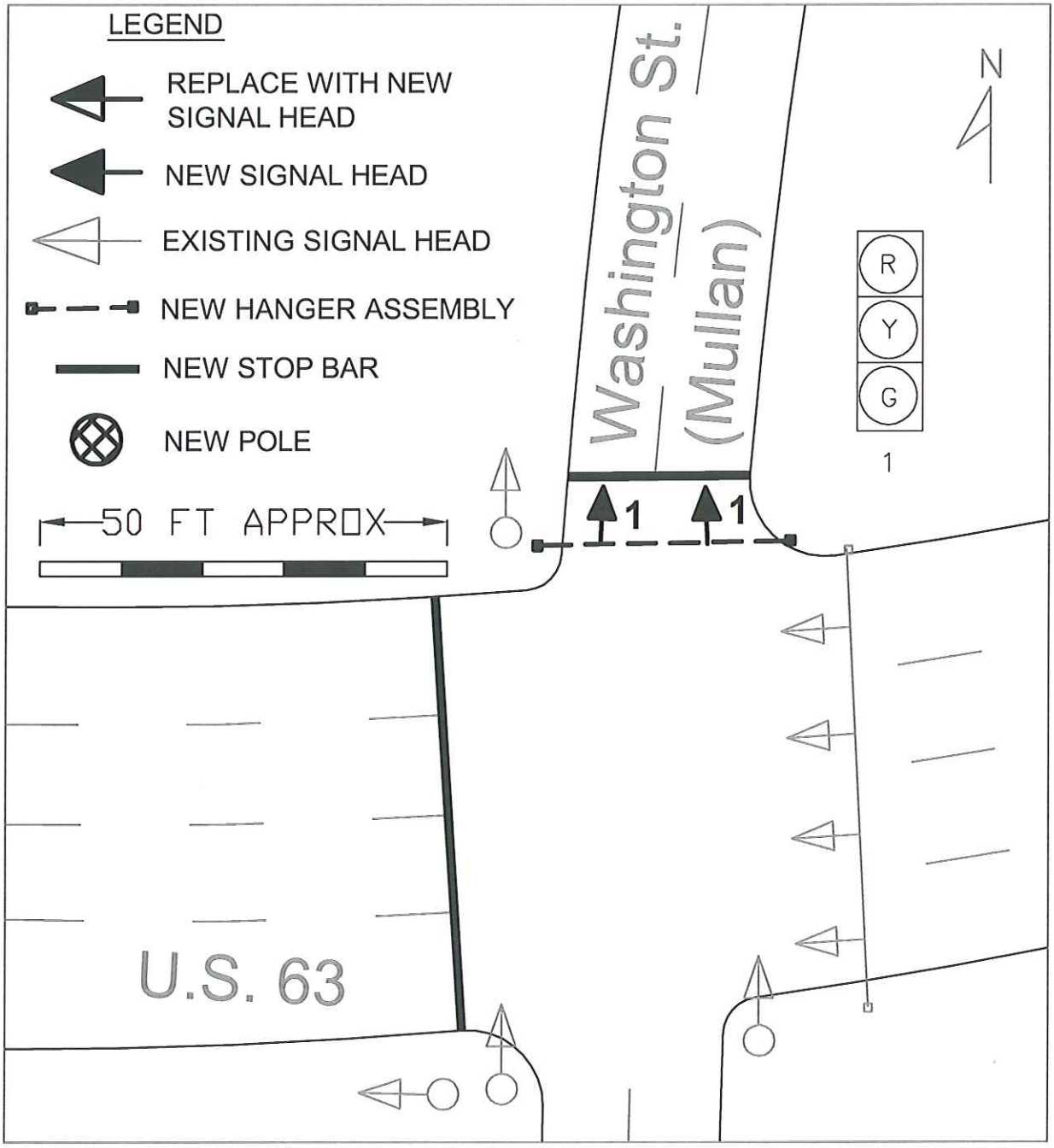
All work is done within right of way. No right of way is required



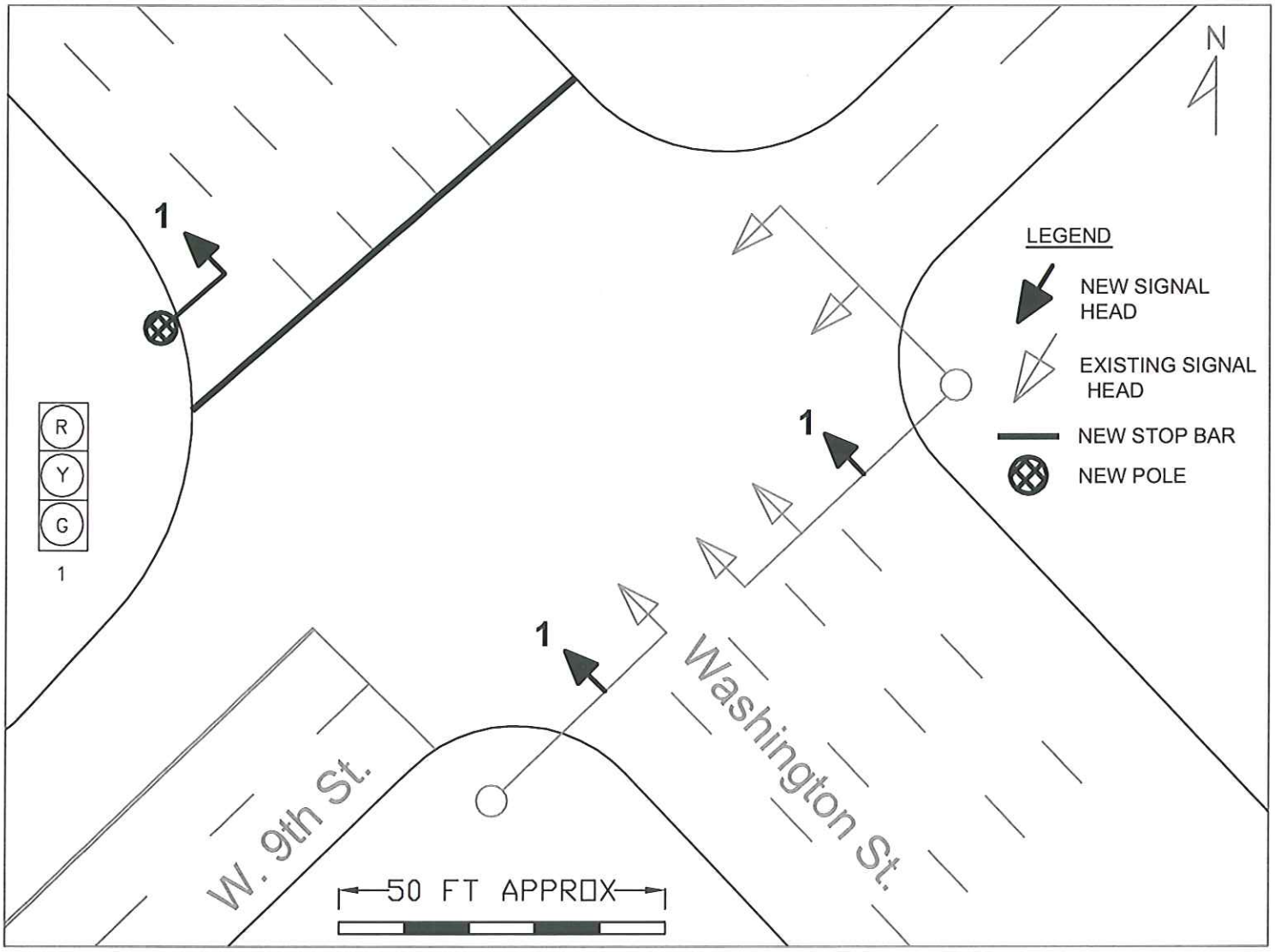
ANSBOROUGH AVE AT EASTBOUND WASHINGTON ST (SOUTHBOUND 218 OFF-RAMP)



ANSBOROUGH AVE AT WESTBOUND WASHINGTON ST (NORTHBOUND 218 ON-RAMP)



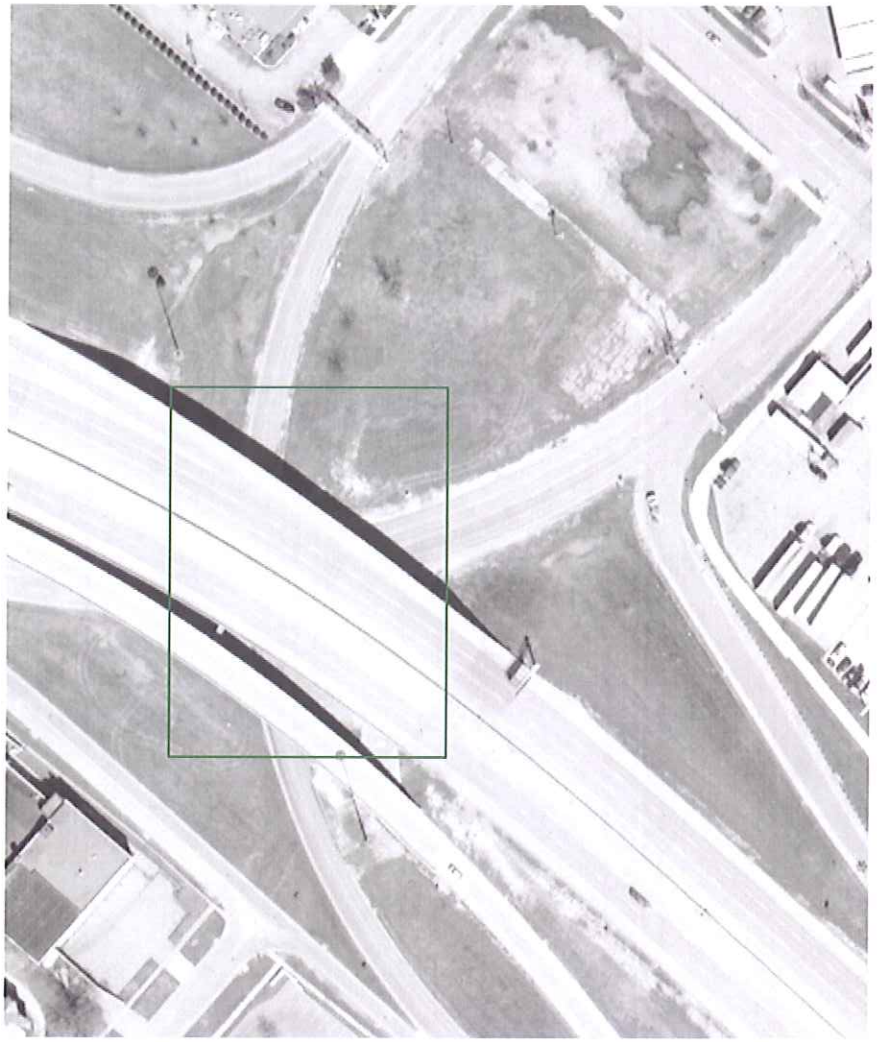
US 63 (W. 1ST ST) AT WASHINGTON ST (MULLAN AVE)



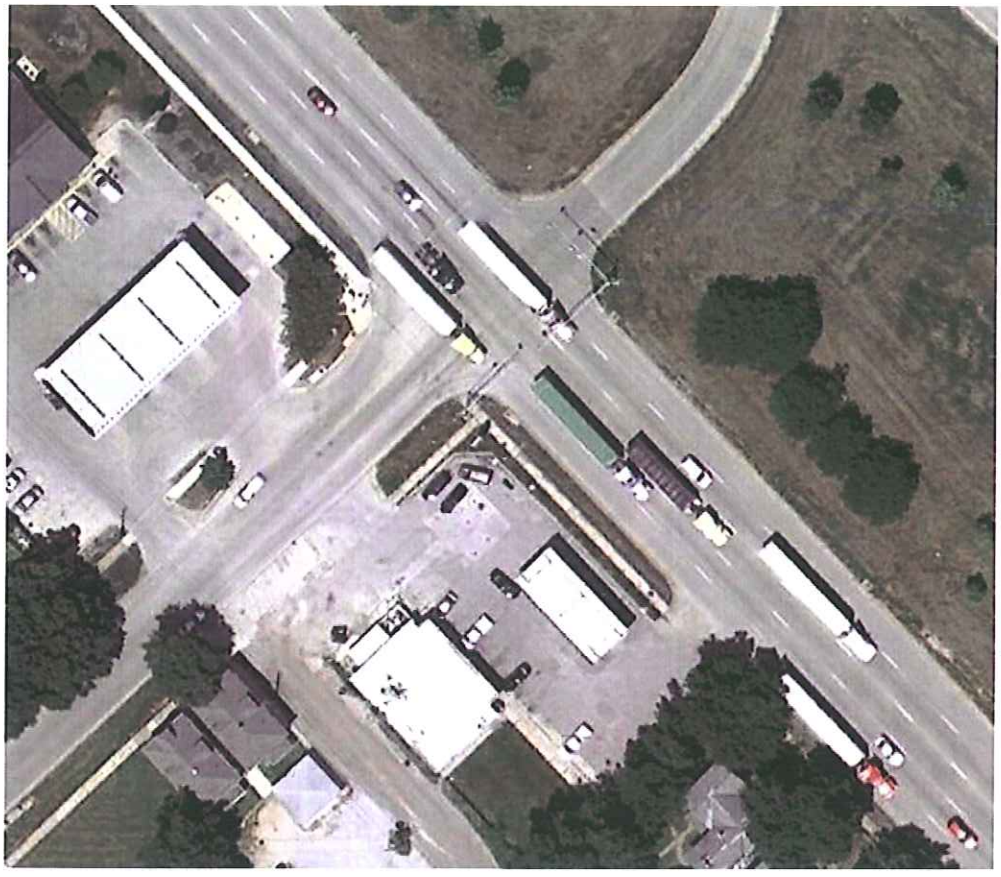
WEST 9TH ST AT WASHINGTON ST
(SOUTHBOUND 218)

H: Aerial Photos

Washington (US 218) & Ansborough



Washington & US 63 - Under the Bridge

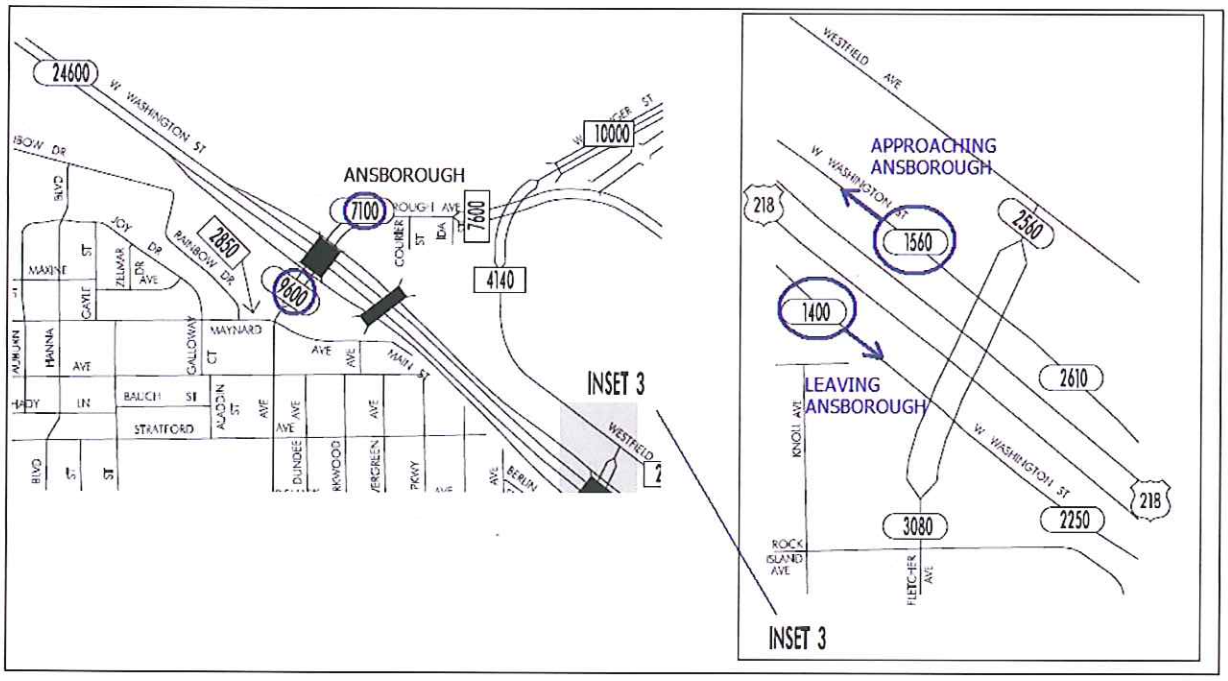


Southbound Washington & W 9th Street

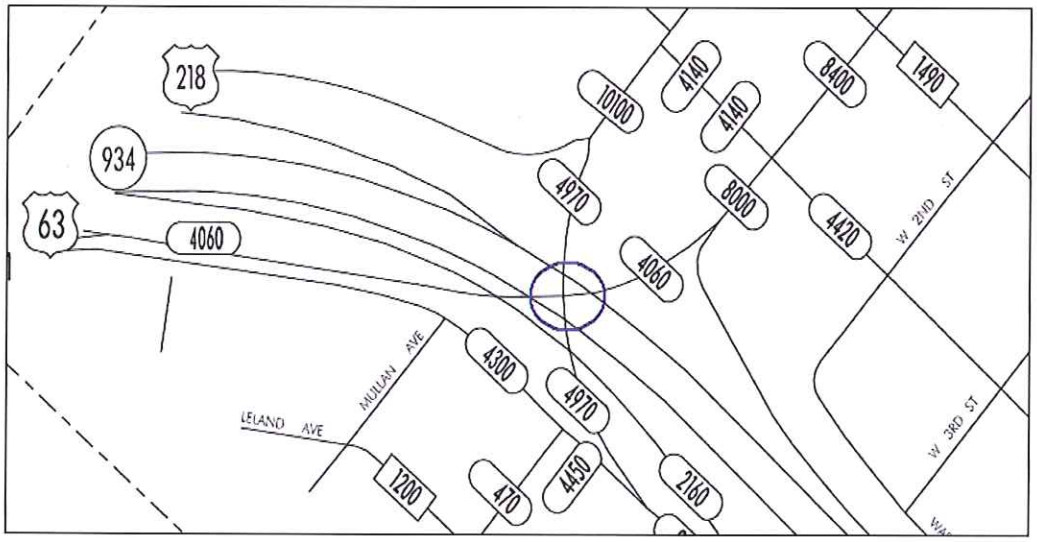
Southbound Washington & W 9th Street

J. TRAFFIC VOLUMES AND/OR TURNING MOVEMENT

Source: 2009 Iowa DOT Counts;
http://www.iowadotmaps.com/msp/traffic/2009/cities/WaterlooC.pdf

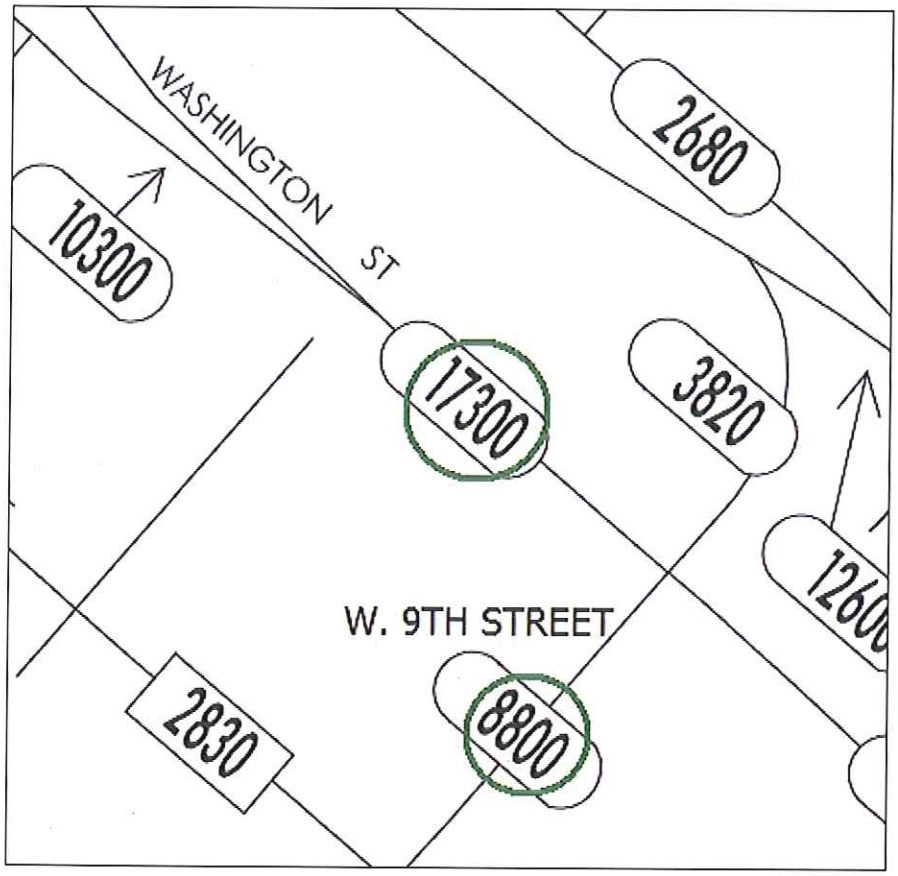


Washington and Ansborough



Washington and Northbound US 63

J



Washington and W. 9th

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 8/09

Iowa DOT Office of Traffic & Safety

County: Black Hawk Prepared by: M.E. Date Prepared: Aug 15, 2012

Intersection: Various

Improvement

Proposed Improvement(s): add signal heads, backplates, install high durability pavement markings, install advanced end of green warning system, improve signage

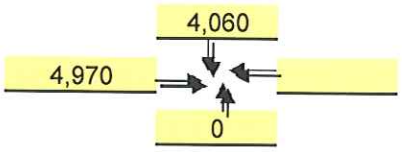
$ 250,000	Estimated Improvement Cost, **EC**	5	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	45	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 250,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2009 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,295,950 Current Annual Entering Veh., **AEV** = DEV * 365

9,491 veh / day, Final Year DEV, **FDEV**

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

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

9,030 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2006 First full year --> 2011 Last full year 6.4 years, Time Period, **T**

5 Additional months values as of Dec. 2007

	Fatal Crashes		Fatalities @	$3,500,000	$ -
		4	Major Injuries @	$240,000	$ 960,000
21	Injury Crashes	9	Minor Injuries @	$48,000	$ 432,000
		16	Possible Injuries @	$25,000	$ 400,000
0	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 99,800
21	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 1,891,800

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

$ 90,086 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 132,672 Crash Costs Avoided in First Year, AAR x AVC

7.5 Total Avoided Crashes, TECR x CRF/ 100

0.99 Crashes / MEV, Crash Rate, **CR**

CR = TA x 10^6 / (DEV x 365 x T)

$ 602,092 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 = $602,092 : $250,000 = **2.41** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Dickinson County, Diamond Lake Twp., between Sec 23/24 and 24/25; 130th Street, 1.07 miles east of Hwy 86.

Applicant: Dickinson County Engineering

Contact Person: Dan Eckert Title: County Engineer

Complete Mailing Address: 1802 Hill Avenue, Suite 2101
Courthouse
Spirit Lake, IA 51360-1141

Phone: (712) 336-2944 (Area Code) E-Mail: deckert@co.dickinson.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:

Application Type

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

Funding Amount

Total Project Cost $ 325,000

Safety Funds Requested $ 325,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Constituents of DICKINSON COUNTY

Signed: _____ 02/07/2012
Signature Date Signed

David Gottsche
Typed Name

Attest: _____ 02/07/2012
Signature Date Signed

Nancy Reiman
Typed Name

September 27, 2012

Terry Ostendorf
Iowa Department of Transportation
Office of Traffic & Safety

Re: TSIP Application

In chronological order, the response to your email dated Monday, September 17, 2012 to Daniel Eckert:

B. Narrative

Route Analysis:

Macro: Intersecting State Highway 86 is in the IDOT five-year program for reconstruction. I think construction begins next year (the 130th St and Hwy 86 intersection will be reconstructed to current standards).

Micro: 130th Street is a 1.07 mile segment of a ~3.5 mile shortcut to Spirit Lake (the lake). The remaining ~2.5 miles have been graded for paving.

The site was constructed in 1942 and essentially remains unchanged, with a road top average width of 26-28 feet and 1.5 foot shoulders on both sides. Exceptions to shoulder widths occur principally in front of residences (approximately 2.5 to 3.0 feet).

The lakeshore side of 130th Street leaves little room for snow storage, which makes the snow removal process difficult and inefficient in this area. Furthermore, trees on the off-lake side encroach on ditch expansion. Frank Franek, Maintenance Foreman, reports three (3) snow trap spots around the lake.

The solutions to the above mentioned problems are to:

1. Increase the shoulder widths to 6 feet,
2. Move the existing road alignment around the lake to the south. However, costs may prohibit such action. Nevertheless, long range planning may require an accommodation of this vision and there may not be a better time to acquire the necessary land from the Iowa Department of Natural Resources. Currently, a six-foot shoulder would be sufficient.

C. Itemized Costs

Please see the attached Excel Spreadsheet.

D. Time Line

Somewhat indeterminate. I would anticipate Winter design and Spring bid letting with a 'Late Start Date' of September 1, 2013. We employ this method to give the Contractor's flexibility in planning, increase bid competition, and decrease our costs.

E. Location Map

Attached.

F. A few color pictures

Attached

G. Plan view of the existing condition and proposed site.

Attached

H. Aerial Photo of the Site

Attached.

Rick Heckenlively

G:2012/Finance/Miscellaneous/TSIP App Letter/.doc

Prepared by Dickinson County Engineering
Type of Work: Grading, 130th Street

Estimate of Construction Costs
Project No.: TBD

RFH
ESTIMATE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	RFH ESTIMATE
462-1	EXCAVATION, CLASS 10, R&B	35000.000	CY	$ 4.00	$ 140,000.00
462-2	EXCAVATION, CLASS 12, BOULDERS	80.000	CY	$ 30.00	$ 2,400.00
462-3	TOPSOIL: STRIP, SALVAGE, & SPREADING	2225.000	CY	$ 4.00	$ 8,900.00
462-4	RECLAIM PRESENT SURFACING MATERIAL	1060.000	CY	$ 2.00	$ 2,120.00
462-5	BACKFILL, GRANULAR, FURNISH & PLACE ONLY	600.000	CY	$ 4.50	$ 2,700.00
462-6	EXC., CLASS 20, FOR RDWY PIPE CULVERTS	800.000	CY	$ 4.00	$ 3,200.00
462-7	APRONS, CONCRETE,36" DIA.	6.000	EACH	$ 1,100.00	$ 6,600.00
462-8	APRONS, CONCRETE, 48" DIA.	4.000	EACH	$ 2,000.00	$ 8,000.00
462-9	CULVERT, CONC. RDWY PIPE, 36" DIA.	216.000	LF	$ 120.00	$ 25,920.00
462-10	CULVERT, CONC. RDWY PIPE, 48" DIA.	54.000	LF	$ 150.00	$ 8,100.00
462-11	APRONS, UNCLASSIFIED, 18 IN. DIA.	20.000	EACH	$ 300.00	$ 6,000.00
462-12	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA.	420.000	LF	$ 27.50	$ 11,550.00
462-13	SUBDRAIN, PERFORATED PLASTIC PIPE, 10"	675.000	LF	$ 30.00	$ 20,250.00
462-14	SUBDRAIN, CMP, 8"	300.000	LF	$ 13.00	$ 3,900.00
462-15	SUBDRAIN, CMP, 12"	250.000	LF	$ 15.00	$ 3,750.00
462-16	REVETMENT, CLASS E, RIPRAP	75.000	TON	$ 40.00	$ 3,000.00
462-17	SILT FENCE	1400.000	LF	$ 2.00	$ 2,800.00
462-18	SILT FENCE FOR DITCH CHECKS	400.000	LF	$ 2.50	$ 1,000.00
462-19	MOBILIZATION	1.000	LS	$ 5,000.00	$ 5,000.00
462-20	GRANULAR MATERIAL FOR BEDDING, PLACE ONLY	100.000	CY	$ 5.00	$ 500.00
462-21	MULCHING	11.000	ACRES	$ 200.00	$ 2,200.00
462-22	SEEDING AND FERTILIZING (RURAL)	11.000	ACRES	$ 350.00	$ 3,850.00
462-23	**SUBTOTAL**				**$ 271,740.00**
462-24	**ROW**				**$ 50,000.00**
	TOTAL +10%				**$ 321,740.00**
					$ 353,914.00

HIGHWAY AND TRANSPORTATION MAP

DICKINSON COUNTY
IOWA

Prepared By

Iowa Department of Transportation

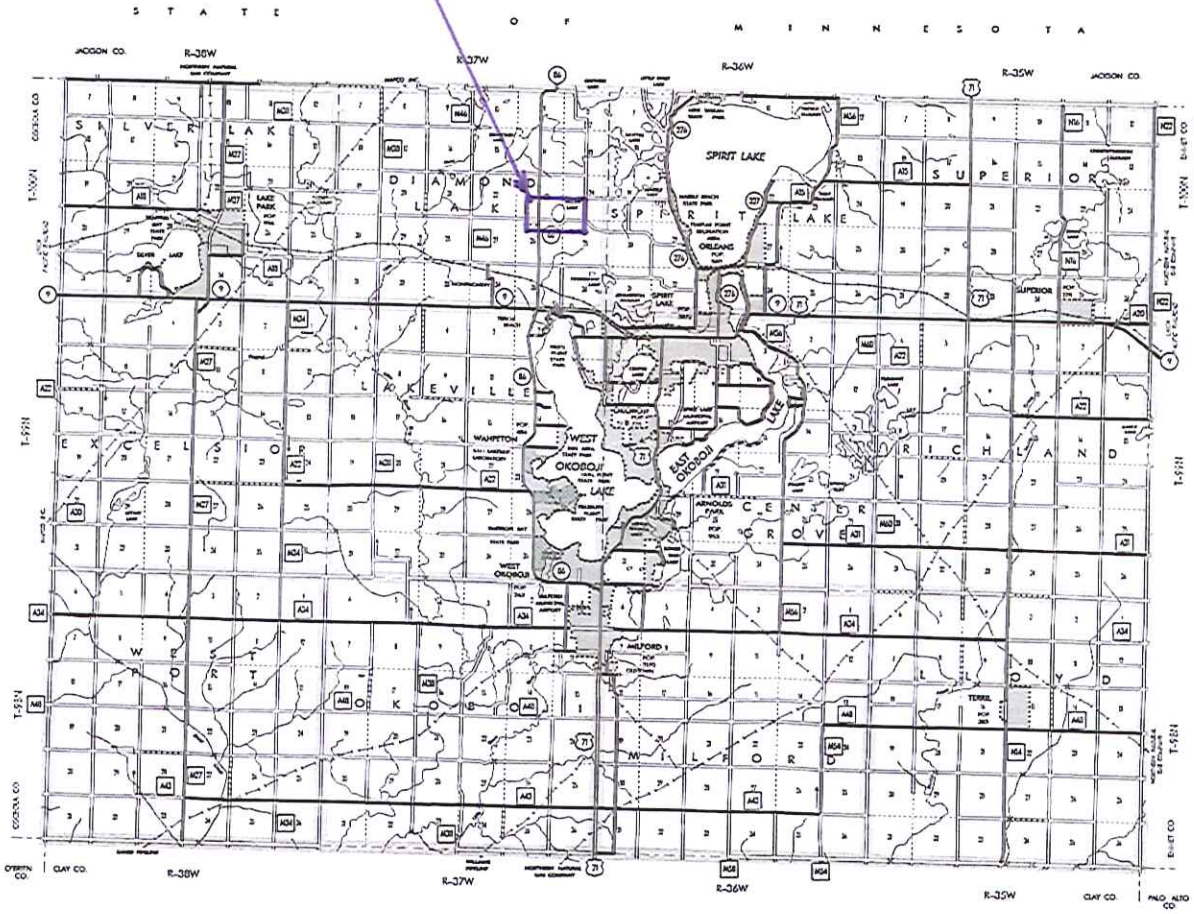
Phone (515) 239-1267
In Cooperation With

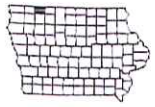
United States Department of Transportation

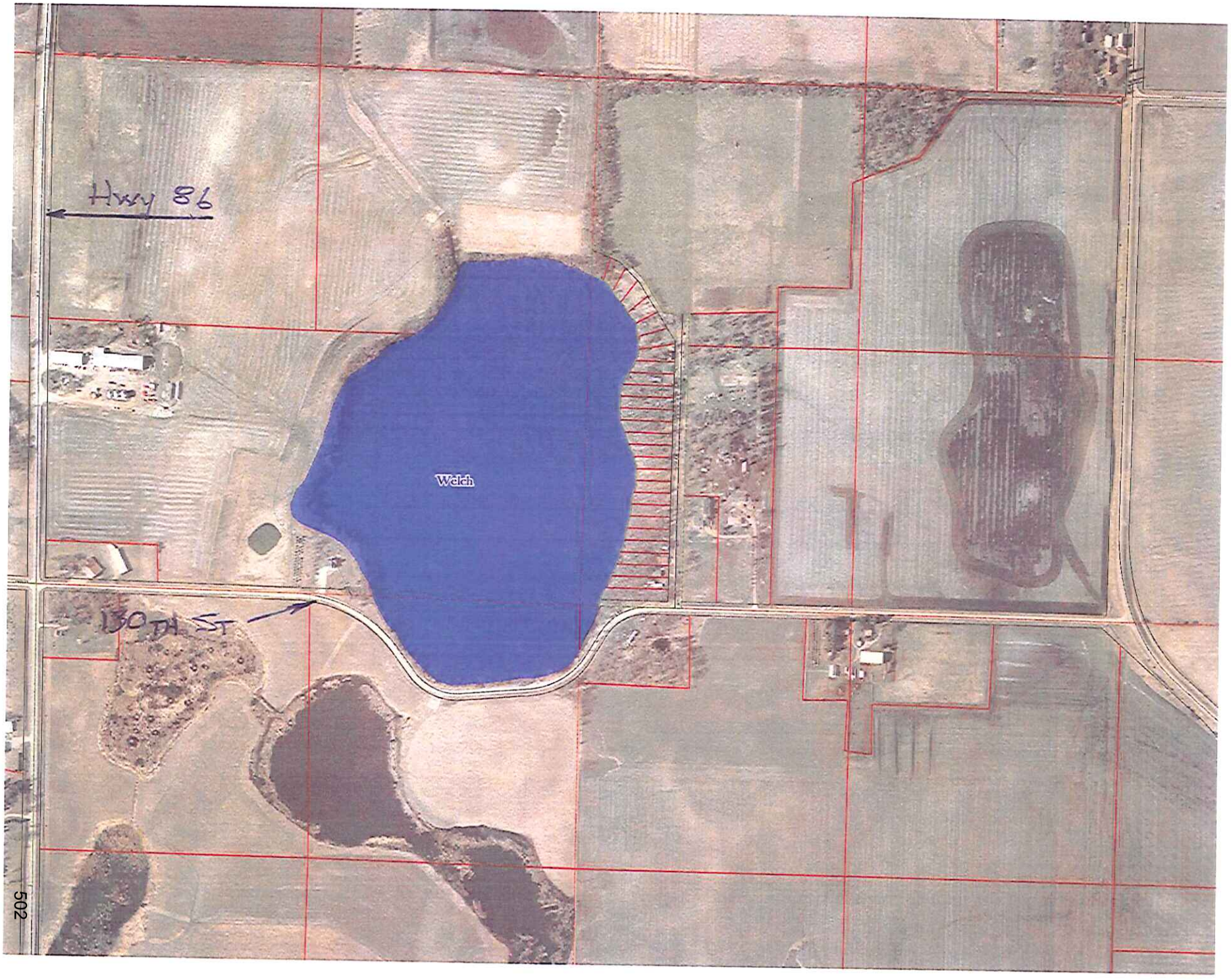
JANUARY 1, 1997

LEGEND

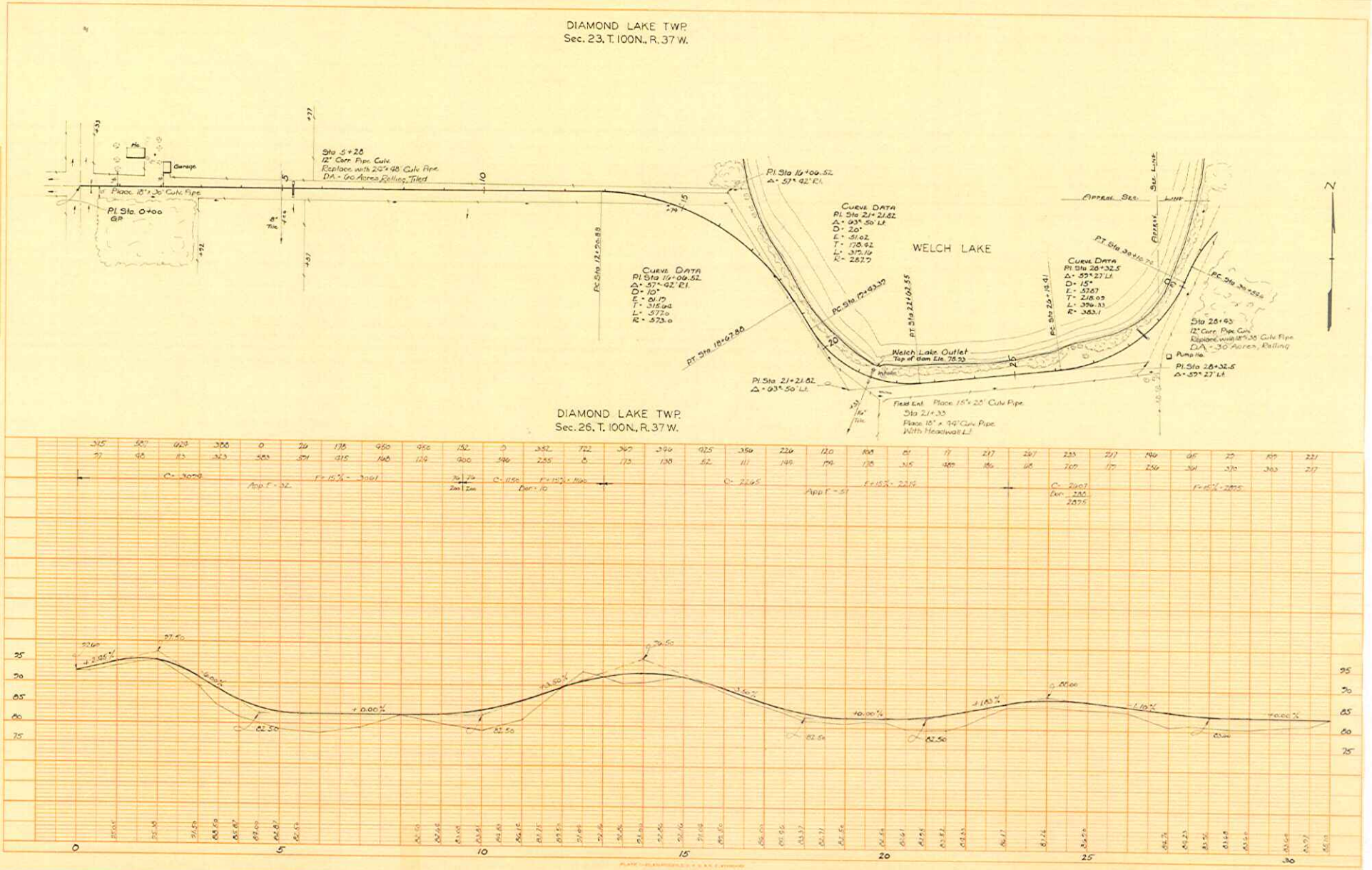
TSIP
130TH ST



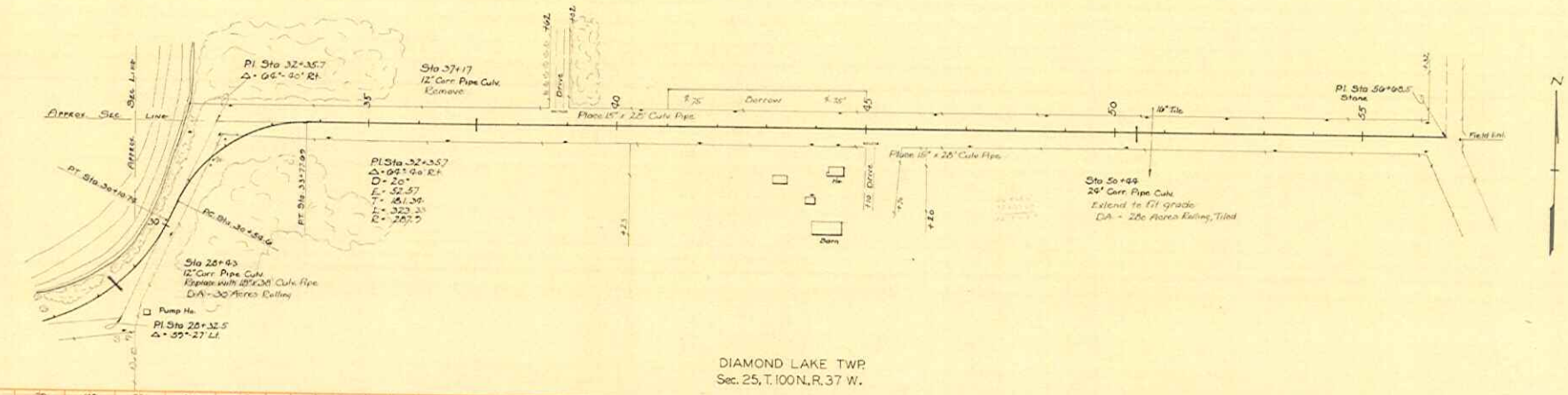



Hwy 86
Welch
130TH ST

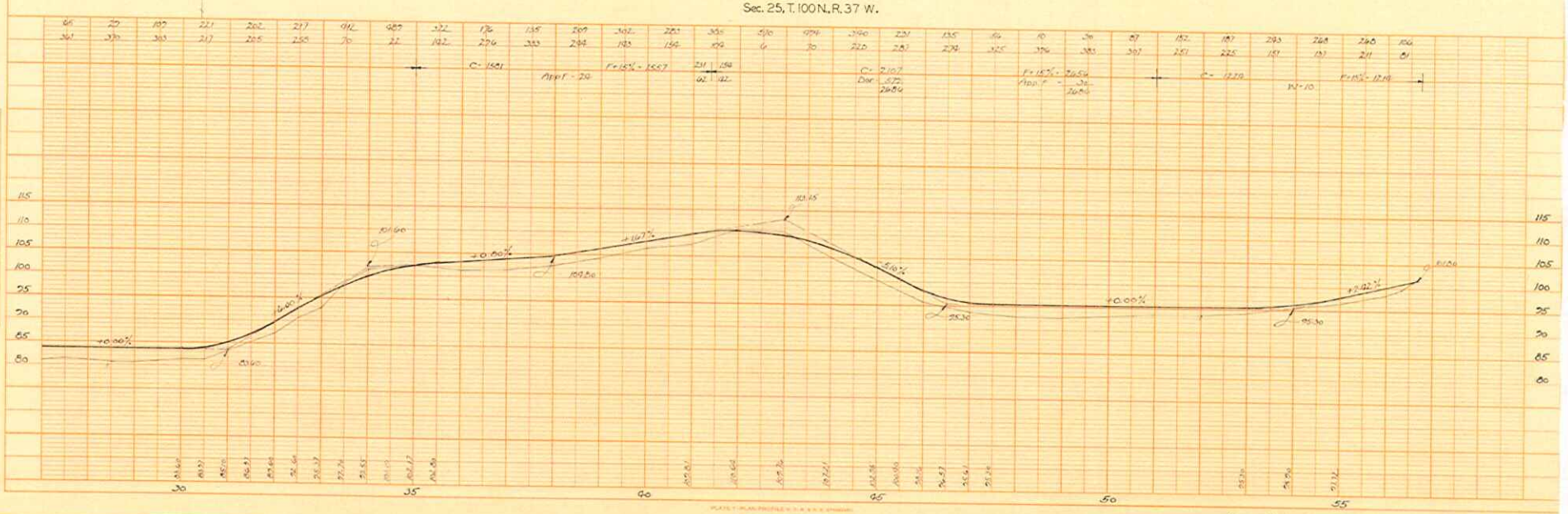
09/26/2012


DIAMOND LAKE TWP.
Sec. 23, T. 100N., R. 37 W.
Garage
Place 15" x 36' Culv. Pipe
Pl. Sta. 0+00
BP
Sta. 5+28
12" Corr. Pipe Culv.
Replace with 24" x 48' Culv. Pipe
DA - 60 Acres Rolling, Tiled
Pl. Sta. 16+06.52
Δ = 57° 42' Rt.
Curve Data
Pl. Sta. 16+06.52
Δ = 57° 42' Rt.
D = 10°
E = 81.17
T = 318.64
L = 572.6
R = 573.0
PC Sta. 12+56.88
PT Sta. 18+67.80
Curve Data
Pl. Sta. 21+21.82
Δ = 93° 50' Lt.
D = 20°
E = 51.62
T = 130.42
L = 375.14
R = 287.3
WELCH LAKE
PC Sta. 17+93.39
PT Sta. 22+62.55
Welch Lake Outlet
Top of Dam Elv. 78.33
Inlet
Pl. Sta. 21+21.82
Δ = 93° 50' Lt.
Field Est. Place 15" x 25' Culv. Pipe
Sta. 21+33
Place 15" x 94' Culv. Pipe
With Headwall Lt.
Curve Data
Pl. Sta. 28+32.5
Δ = 55° 27' Lt.
D = 15°
E = 52.67
T = 218.03
L = 394.33
R = 383.1
PC Sta. 26+12.41
PT Sta. 30+16.74
PC Sta. 30+55.6
Appral. Sec. Line
Sec. Line
Sta. 28+93
12" Corr. Pipe Culv.
Replace with 18" x 35' Culv. Pipe
DA - 30 Acres, Rolling
Pump Hse.
Pl. Sta. 28+32.5
Δ = 55° 27' Lt.
N
DIAMOND LAKE TWP.
Sec. 26, T. 100N., R. 37 W.
PLAN
PROFILE
DIAMOND LAKE TWP. 1942 CONST.
Sec. 23+26

DIAMOND LAKE TWP.
Sec. 24, T. 100N., R. 37 W.



DIAMOND LAKE TWP.
Sec. 25, T. 100N., R. 37 W.



Diamond Lake Twp. 1942 Const.
Sec 24-25

505

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Dickinson Prepared by: Rick Heckenlively Date Prepared: 01.17.12

Location: Diamond Lake Twp., T-100N, R-37W, between Sec 23/24 and 24/25; 130th Street, 1.07 mi east of Hwy 86

Improvement

Proposed Improvement(s): Widen Shoulder to 6'; Foreslope 3:1; correct horizontal and vertical curves (rfh).

$ 325,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	36	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 325,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT Transportation Data, AADT files 2007/2003 Date of traffic count

Length (mi.)	Two-way veh/day	Description
1.07	100	130th St
1.07	miles total	

107 Current Vehicle Miles / Day, **VM**

131 End of Life Veh. Miles / Day

39,055 Current Veh. Miles / Year, **AM**

859,952 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

2006 First full year --> 2010 Last full year 5.0 years, Time Period, **T**

0 Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$3,500,000	$ -
		2	Major Injuries @	$240,000	$ 480,000
1	Injury Crashes →	0	Minor Injuries @	$48,000	$ -
		3	Possible Injuries @	$25,000	$ 75,000
0	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 6,800
1	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 561,800

0.20	Current Crashes / Year, **AA** = TA / T	512.1	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 561,800	Cost per Crash, **AVCR** = LOSS / TA	$ 597,469	Present Value of Avoided Crashes, **BENEFIT**
4.4	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.07	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 40,450	Crash Costs Avoided in First Year, AAR x AVCR		
1.6	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 = $597,469 : $325,000 = **1.84** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project C-38/K-42 Intersection - NE Corner Sec 34-92-46

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:

Application Type

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

Funding Amount

Total Project Cost $ 1,650,000

Safety Funds Requested $ 200,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Plymouth County Board of Supervisors

Signed: Jim Henrich 8-14-12

Signature Date Signed

Jim Henrich

Typed Name

Attest: Stacey Feldman 8-14-12

Signature Date Signed

Stacey Feldman

Typed Name

B: Narrative

C-38/K-42 Intersection at the NE Corner Sec 34-92-46

This section of roadway was graded in 1962 with a 34 ft. top and 2:1 foreslopes. The roadway was then paved in 1965 as an asphalt road. The grade line of this roadway essentially follows the existing topography and vertical curves meet a 45 mph standard at best.

The intersection in question is a T intersection with C-38 as the through roadway in the east/west direction. The sight distance west of the intersection is marginal at approximately 600 ft.. There is a down grade of approximately 4% from the west as traffic approaches the intersection. The traffic count on C-38 is 980 VPD and the traffic count on K-42 is 570 VPD. An ethanol plant has been constructed one mile south of this intersection and truck traffic has dramatically increased. Approximately 100 trucks /day service the ethanol plant alone with the majority of the trucks traveling through the C-38/K-42 intersection.

Because of the increase in truck traffic, plans call for overlaying the existing roadway in order to maintain the pavement. An improvement in sight distance at the intersection is a goal of the county along with the construction of a turn lane on C-38 allowing for better traffic flow of trucks traveling to the ethanol plant.

The proposed project will reconstruct this intersection to meet current roadway standards. This will include increasing the sight distance from 600 ft. to over 800 ft., widening the shoulders from 4 ft. to 8 ft., flattening foreslopes from 2:1 to 3:1, flattening the roadway profile from 4% to 3% and providing a turning lane for traffic turning off of County Road C-38 onto County Road K-42.

The traffic accident data supports the conclusion that sight distance is a problem at this location. Of the accidents with two vehicles, all of them have north and east bound vehicles with the north bound vehicles turning in front of the east bound vehicles. Two of those accidents have been broadsides. We are fortunate that we have not had any serious or fatal accidents to this point. However, we believe since we will be overlaying this roadway now is the time to also improve the intersection by improving the sight distance and providing a turning lane for truck traffic so as to allow the east bound traffic to proceed through.

C: Cost

Removal of asphalt	$ 23,500
Class 10 Roadway	53,500
Modified Subbase	34,500
24" RCP	5,000
Pavement (9")	137,000
Shoulder Construction	6,500
Total	$260,000

The total overlay project is estimated at $1,650,000. These funds are being derived from TIF Funds brought about from the construction of the ethanol plant.

D: Time Schedule

This project is scheduled to be let in January or February of 2013 with the construction of to be completed during the 2013 construction season.

E: Map

See enclosed map showing the intersection location as well as the road miles to be overlayed.

F: Color Pictures

Enclosed

G: Plan View

Plan profile sheet is enclosed.

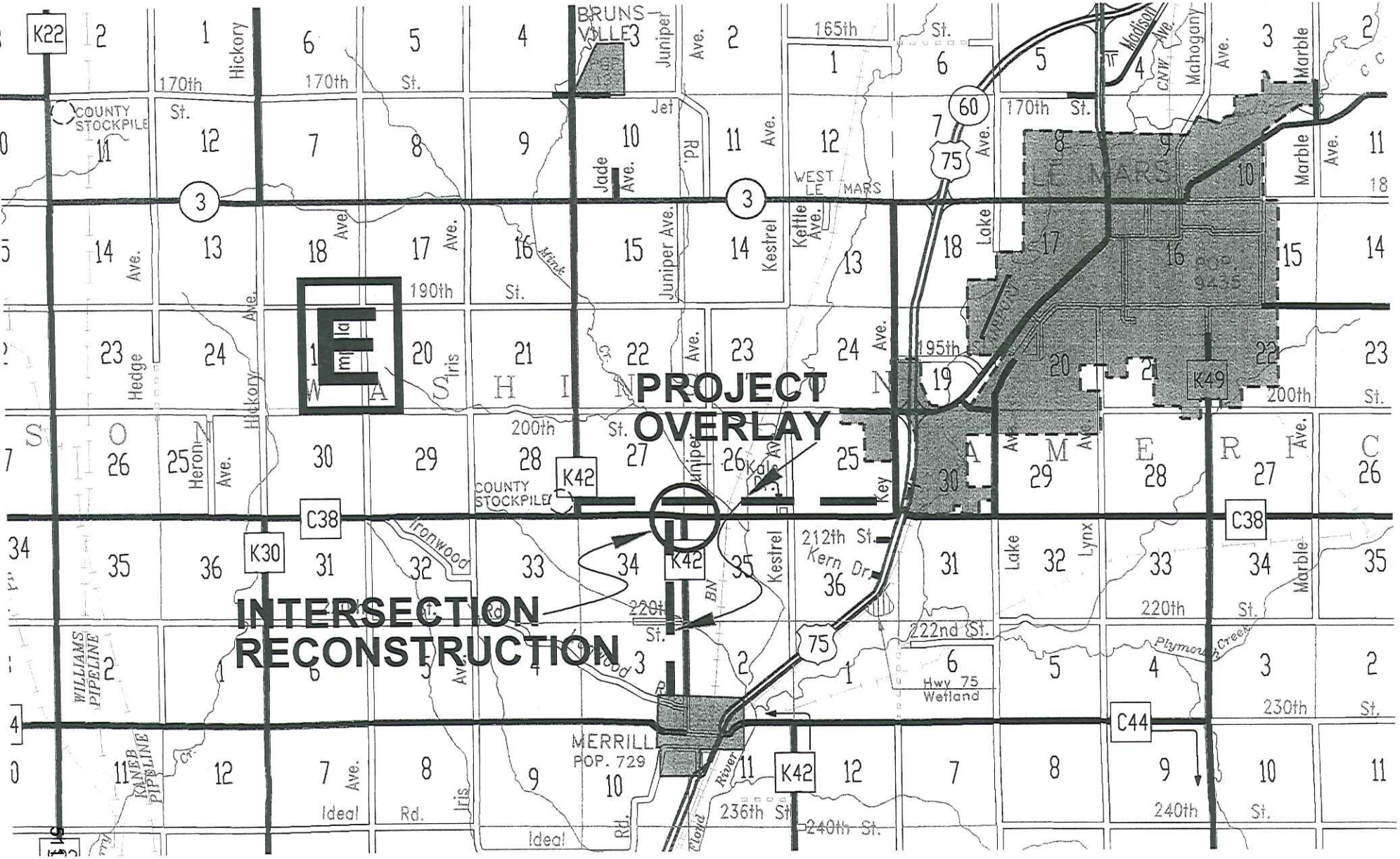
H: Recent Traffic Volumes

A map showing the traffic count of this roadway by IDOT for 2011 is enclosed.

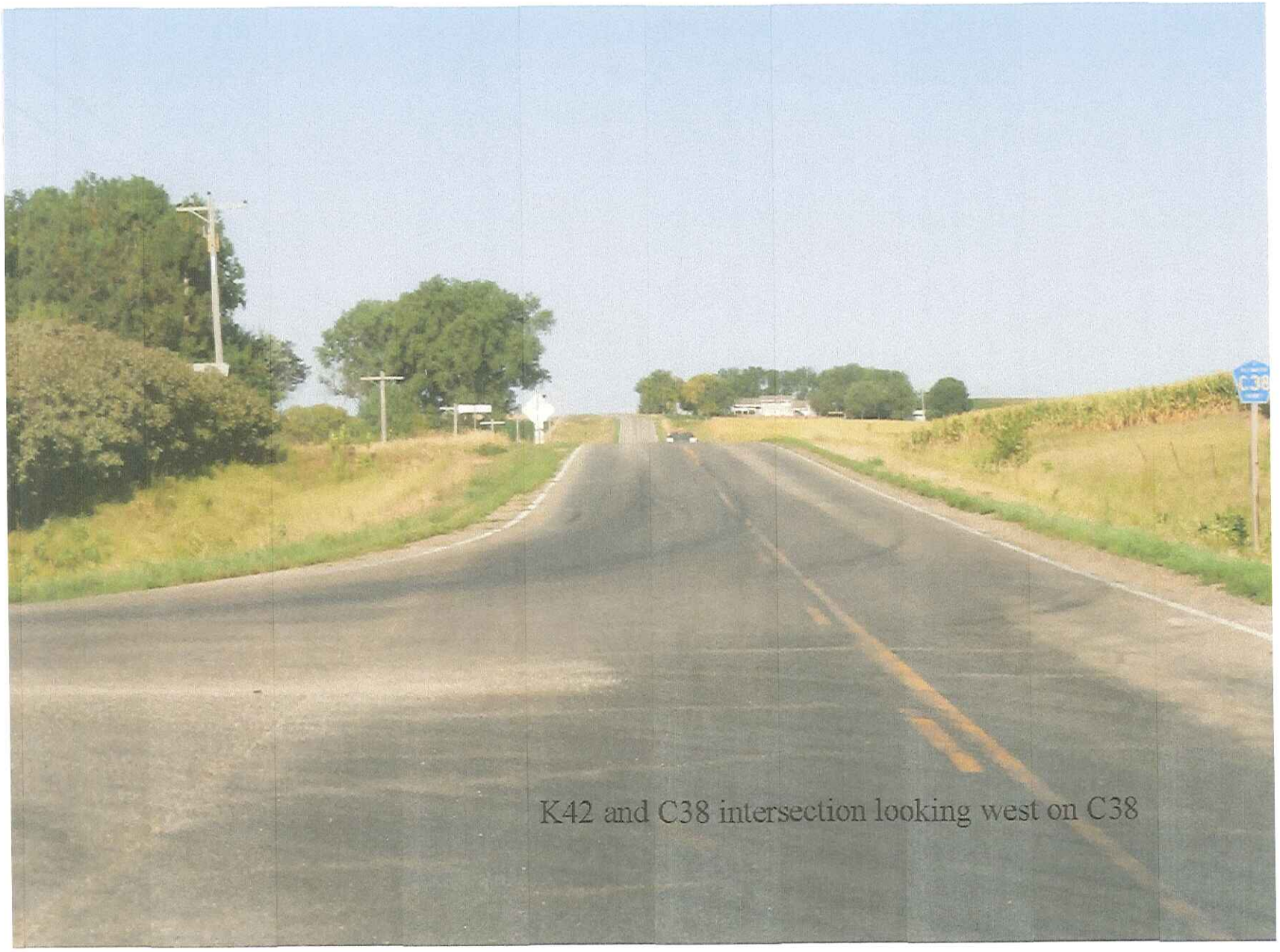
I: Signals - NA

J: B/C Worksheet

Enclosed


PROJECT OVERLAY
INTERSECTION RECONSTRUCTION
BRUNSVILLE
WEST LE MARS
LE MARS
MERRILL
POP. 729
COUNTY STOCKPILE
Hwy 75 Wetland
WILLIAMS PIPELINE
KANEB PIPELINE
K22
K42
K30
K49
C38
C44
3
60
75
170th St.
190th St.
200th St.
195th St.
212th St.
220th St.
222nd St.
230th St.
236th St.
240th St.
Hickory Ave.
Juniper Ave.
Jade Ave.
Kestrel
Kettle Ave.
Lake
Marble Ave.
Mahogany Ave.
Madison Ave.
Hedge
Iris
Heron Ave.
Ironwood
Kern Dr.
Plymouth Creek
Floyd River
Ideal Rd.
Mink Cr.
CNW
BN

08-13-12
Looking W. on C-38 at the K-42 intersection.



K42 and C38 intersection looking west on C38

Looking east on C38. View shows a truck turning
on to C38 from K42

08-13-12
Looking E. on C-38 approx.
300' W. of the K-42
intersection.

08-13-12
Looking E. on C-38 approx. 300' W. of the K-42 intersection.

K42 and C38 intersection. Looking north from K42

STOP

STOP

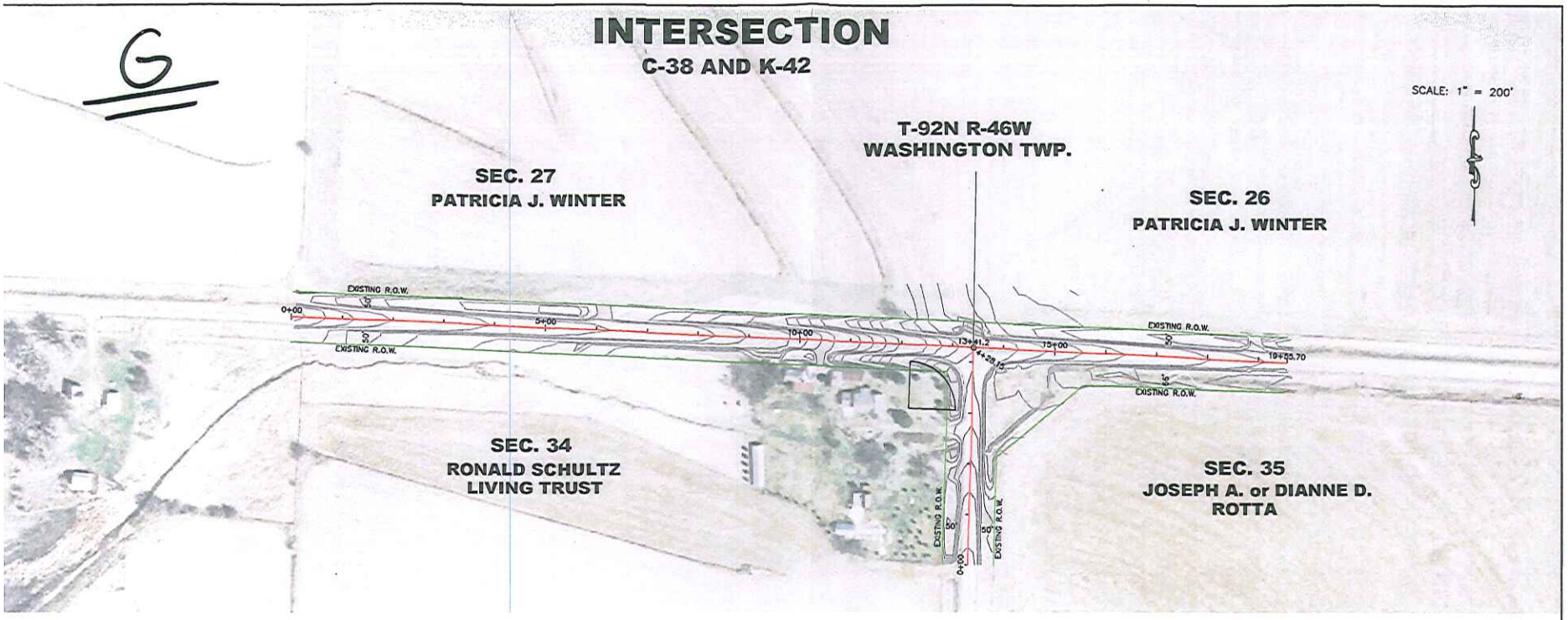
C38 and K42 intersection looking south

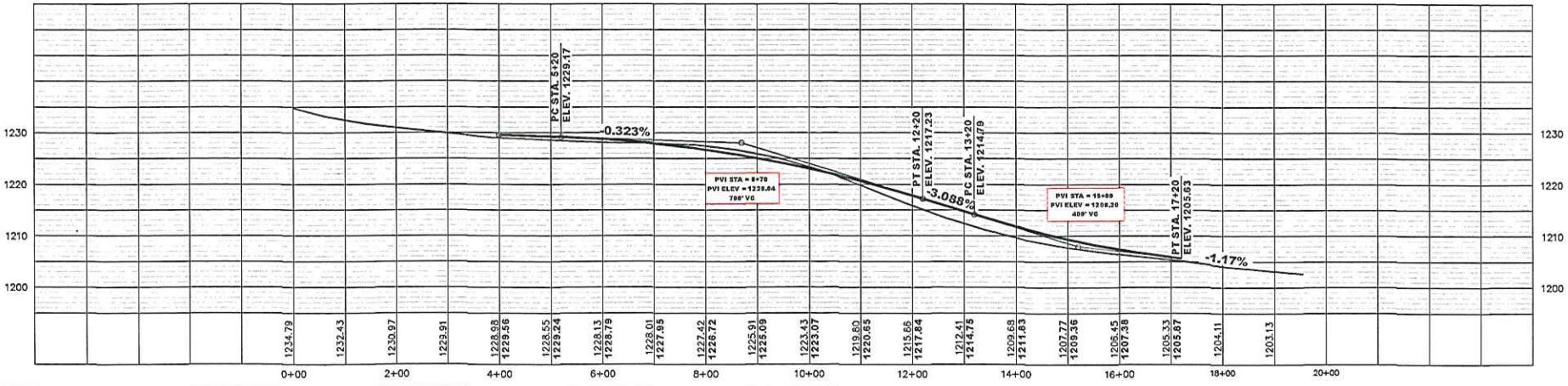
G

INTERSECTION

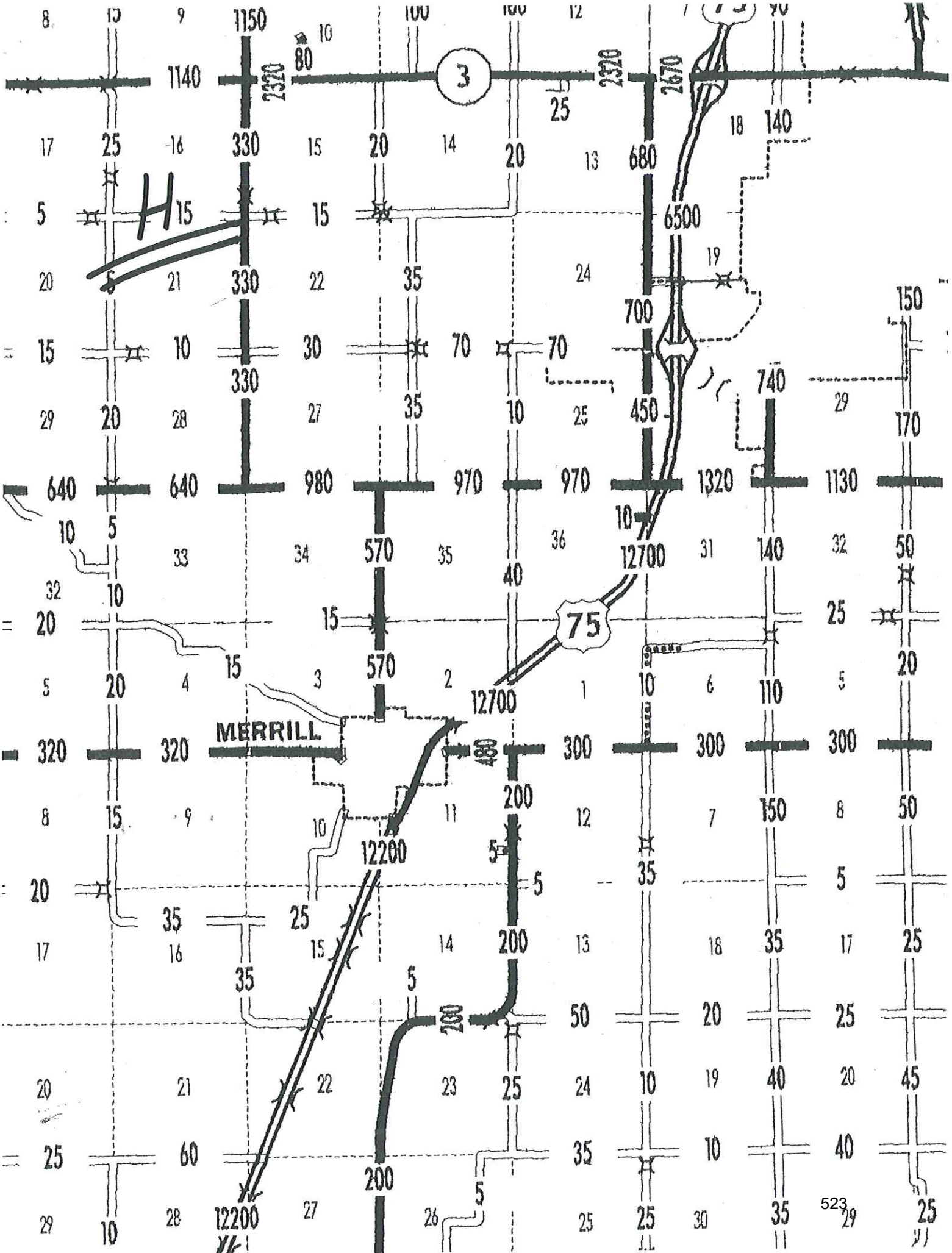
C-38 AND K-42

SCALE: 1" = 200'





PLYMOUTH COUNTY PROJECT NO. L-PCC-C-38-2013--73-75 SHEET 9


MERRILL
75
3

J

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Plymouth Prepared by: Terry O Date Prepared: Aug 14, 2012

Intersection: County Road C-38 & K-42

Improvement

Proposed Improvement(s): Flatten foreslopes, widen shoulders to 8 ft, increase sight distance & add turn lanes.

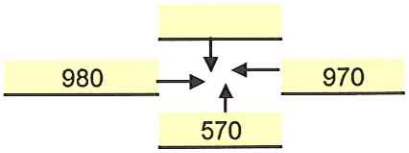
$ 200,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	64	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 200,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



919,800 Current Annual Entering Veh., **AEV** = DEV * 365

5,522 veh / day, Final Year DEV, **FDEV**

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

4.0% Projected Traffic Growth (0%-10%), **G**

2,520 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2003 First full year --> 2010 Last full year 8.0 years, Time Period, **T**

Additional months values as of Dec. 2007

	Fatal Crashes		Fatalities @	$3,500,000	$ -
			Major Injuries @	$240,000	$ -
2	Injury Crashes		Minor Injuries @	$48,000	$ -
		4	Possible Injuries @	$25,000	$ 100,000
6	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 81,200
8	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 181,200

1.00	Current Crashes / Year, **AA** = TA / T	1.09	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 22,650	Cost per Crash, **AVC** = LOSS / TA		
29.8	Total Expected Crashes, **TECR** = CR x TMEV	$ 278,769	Present Value of Avoided Crashes, **BENEFIT**
0.64	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 14,496	Crash Costs Avoided in First Year, AAR x AVC		
19.1	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 = $278,769 : $200,000 = 1.39 : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Co. Rd E16 Resurfacing with Paved Shoulders

Applicant: Crawford County

Contact Person: Paul J. Assman, P.E. & P.L.S Title: County Engineer

Complete Mailing Address: P.O. Box 458, 1202 Broadway, Denison, Iowa 51442

Phone: 712-263-2449 (Area Code) E-Mail: cracoeng@frontiernet.net

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 1,297,525

Safety Funds Requested $ 500,000

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Crawford County

Signed: _____ 8/9/12
Signature Date Signed

Paul J. Assman
Typed Name

Attest: Chuck Ettleman 8/9/12
Signature Date Signed

Chuck Ettleman
Typed Name

RESOLUTION NO. 2012-38

WHEREAS, The Crawford County Board of Supervisors recognizes the need to incorporate safety features in pavement resurfacing projects, and

WHEREAS, Transportation Safety Improvement Program (TSIP) Funds are annually made available 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 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,

THEREFORE, BE IT HEREBY RESOLVED, that the Board of Supervisors of Crawford County, Iowa, as part of the application for TSIP funds, resolve to commit to the additional funds needed above and beyond those granted to Crawford County by the Transportation Safety Improvement Program and to supply the Construction and Engineering cost for the E16 Pavement Resurfacing and Widening Project (extending from Co. Rd. L51 east to the city of Schleswig) from existing county funding and also resolve to maintain the facility for the useful life of the improvement.

Approved this 7th day of August, 2012

CRAWFORD COUNTY BOARD OF SUPERVISORS

Chairman

ATTEST:

Crawford County Auditor

Co. Rd. E16 Base Widening, Shoulder Paving and Resurfacing Project

Location: from the west corporate limits of the City of Schleswig, west to the intersection with Co. Rd. L51.

Existing Conditions: the proposed project represents a roadway typical to many rural areas in Iowa. The pavement, completed in 1960, is the first section of paved roadway in Crawford County. Copies of the original grading and paving cross sections as well as the overlay cross section are included herewith. The original grading was completed within a 66 foot right of way. The foreslopes were generally constructed at a 2:1 slope with a few areas at a 1.5:1 slope. The original paving was a 20 foot wide 7" thick PCC pavement. In 1997 the 20 foot paved surface was overlaid with a 3 ½" to 4" HMA surface. Given the current funding scenario complete reconstruction of the roadway, while the best long term option, is not possible. The necessary level of funding simply does not exist. An HMA overlay incorporating several safety features including paved shoulders, milled rumble strips and safety edge is considered the overall best affordable option.

Proposed Concept: The proposed concept is to add a 4.0 foot paved shoulder with milled rumble strips and safety edge to both sides of the existing 20 foot wide pavement. A 5" thick HMA overlay will be placed over the entire width of the widened pavement. The resulting pavement will have 11.0 foot lane widths and 3.0 foot wide paved shoulders for an overall paved width of 28.0 feet. The proposed pavement cross section detail, milled shoulder rumble strip details and safety edge details are attached herewith.

Justification: The roadway segment in question is an eligible High Risk Rural Road (HRRR) corridor (see attached HRRR 2011 corridor map). The map showing the "Crashes by Severity" as well as the individual "Crash Detail Reports" are attached to this application.

Cost Estimate and Proposed Funding Sources: A detailed cost estimate and schedule of proposed funding is attached to this application.

Proposed Schedule: The project is slated for a January 2014 letting with construction during the 2014 construction season.

CRAWFORD COUNTY ENGINEER'S OFFICE
ENGINEERS CONSTRUCTION COST ESTIMATE

PREPARED BY: PAUL J. ASSMAN
DATE: 6/7/12

E16 HMA OVERLAY WITH BASE WIDENING, PAVED SHOULDERS, MILLED RUMBLE STRIPS & SAFETY EDGE

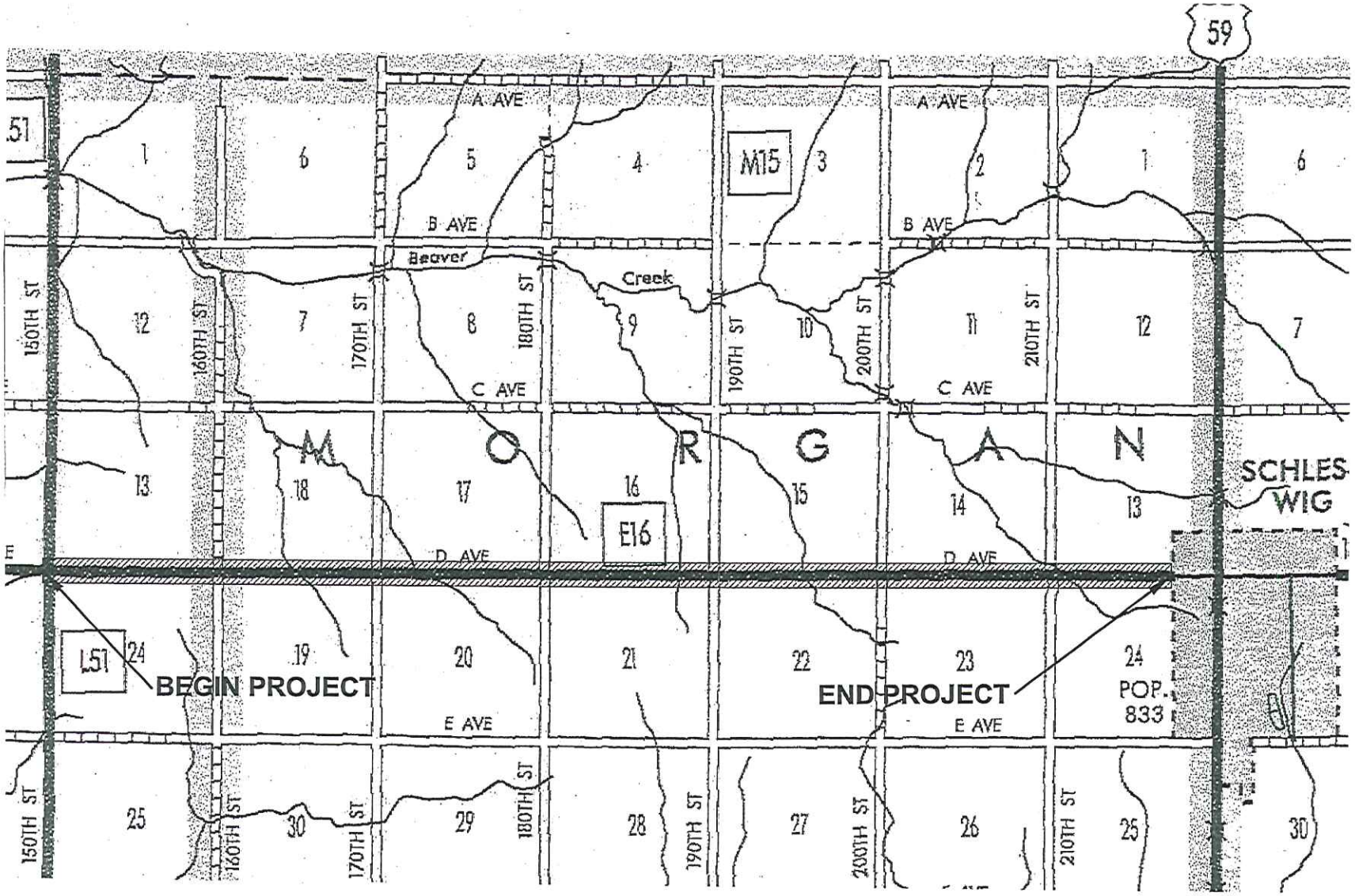
ITEM NO.	ITEM CODE	ITEM	UNITS	TOTAL	UNIT PRICE	Total Project Amount	Paved Shoulder Total	Paved Shoulder & Safety Amount
1	2122-5500060	Excavation Class 13 for Widening	CY	4400	$12.50	$55,000.00	4400	$55,000.00
2	2213-2713300	Base Widening, Hot Mix Asphalt	Ton	8909	$27.50	$244,997.50	8909	$244,997.50
3	2114-5145150	Pavement Scarification	SY	79200	$1.50	$118,800.00	0	$0.00
4	2303-0001000	HMA MIXTURE, Wedge, Leveling,or Stregthening Course	Ton	500	$50.00	$25,000.00	0	$0.00
5	2303-0021750	HMA Mixture (300,000 ESAL) Base Course 3/4" mix	Ton	22485	$29.00	$652,065.00	6892	$199,868.00
6	2303-0023500	Hot Mix Asphalt Mixture (300,000 ESAL) Interm, Surface 1/2" mix)	Ton	9636	$31.00	$298,716.00	2954	$91,574.00
7	2303-0245828	Asphalt Binder, PG 58-28	Ton	2463	$585.00	$1,440,855.00	1126	$658,710.00
8	2527-9263109	Painted Pavement Markings, Waterborne or Solvent-based	Sta	560	$8.10	$4,536.00	0	$0.00
9	2528-8445110	Traffic Control	LS	1	$15,000.00	$15,000.00	0.5	$7,500.00
10	2528-8445113	Flaggers	Each	125	$315.00	$39,375.00	65	$20,475.00
11	2528-8445115	Pilot Cars	Each	40	$470.00	$18,800.00	20	$9,400.00
12	2533-4980005	Mobilization	LS	1	$20,000.00	$20,000.00	0.5	$10,000.00
13	2548-0000110	Milled Shoulder Rumble Strups, HMA	Sta	520	$8.60	$4,472.00	520	$4,472.00
14	2527-9263109	Asphalt Emulsion for Fog Seal (Shoulder Rumble Strips)	Gal	572	$4.50	$2,574.00	572	$2,574.00
		TOTAL ESTIMATED PROJECT COST				***$2,933,144.50***		***$1,297,524.50***

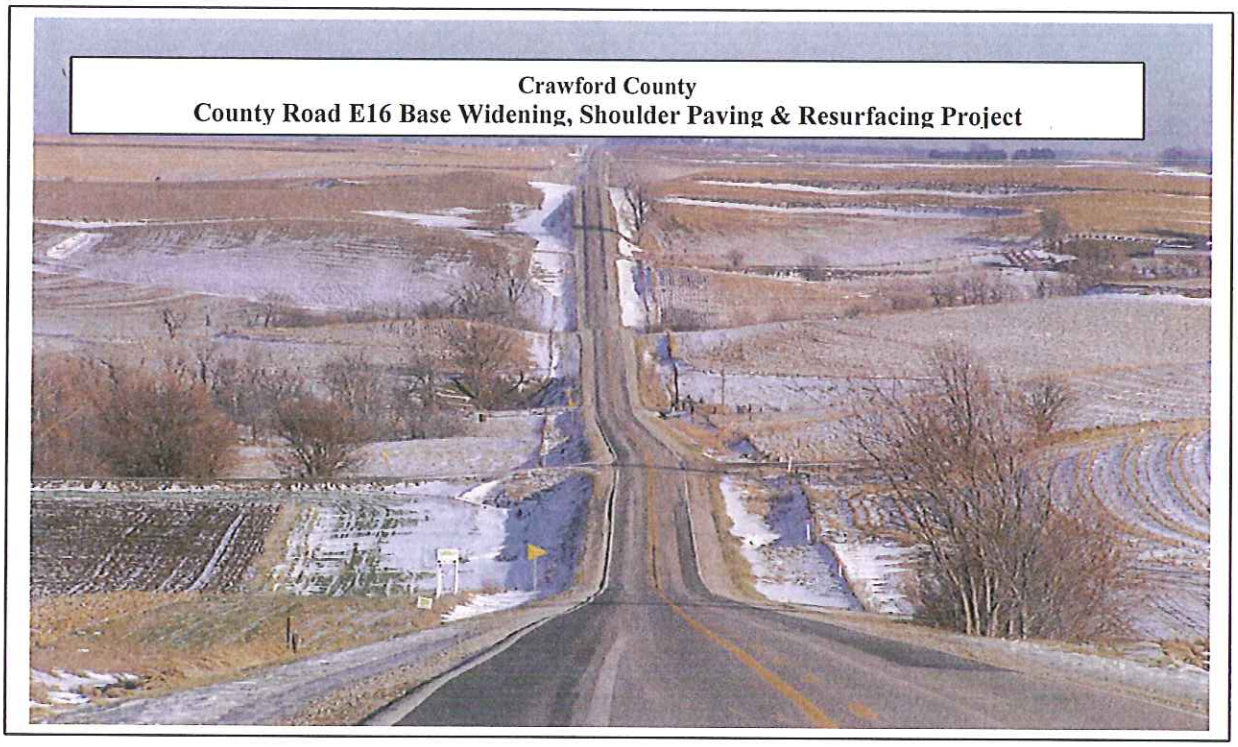
Anticipated Project Funding	
Surface Transportation Program	***$ 1,500,000.00***
Transportation Safety Improvement Program	***$ 500,000.00***
Crawford County Farm to Market Funds	***$ 933,144.50***
TOTAL ANTICIPATED FUNDING	***$ 2,933,144.50***

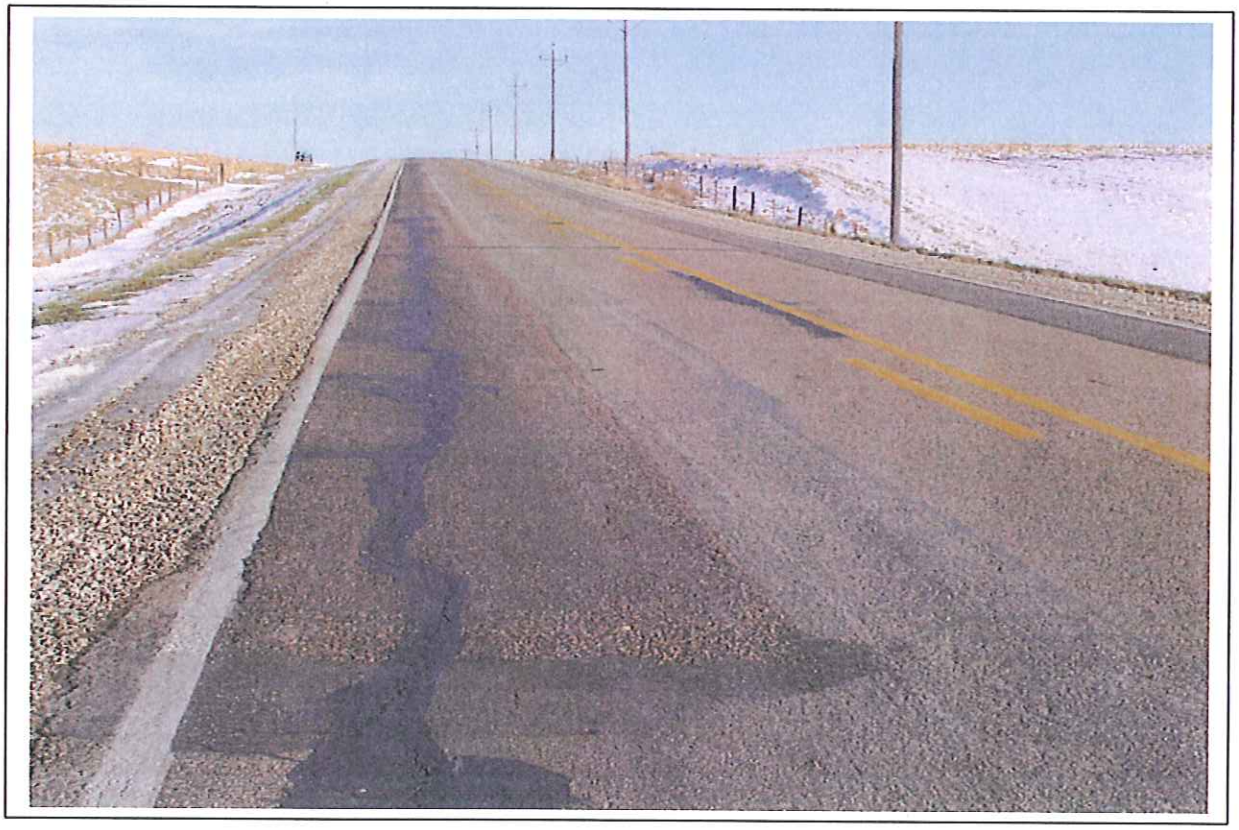
CRAWFORD COUNTY

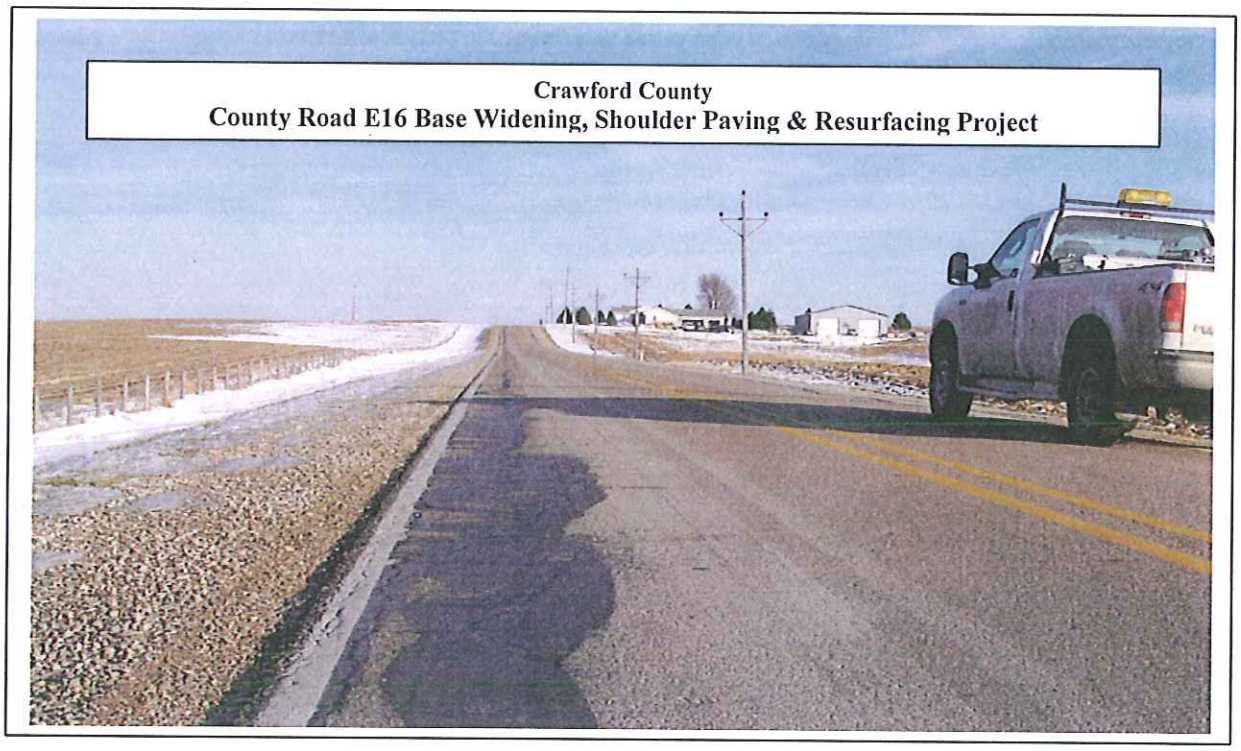
COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

LOCATION MAP




Crawford County
County Road E16 Base Widening, Shoulder Paving & Resurfacing Project

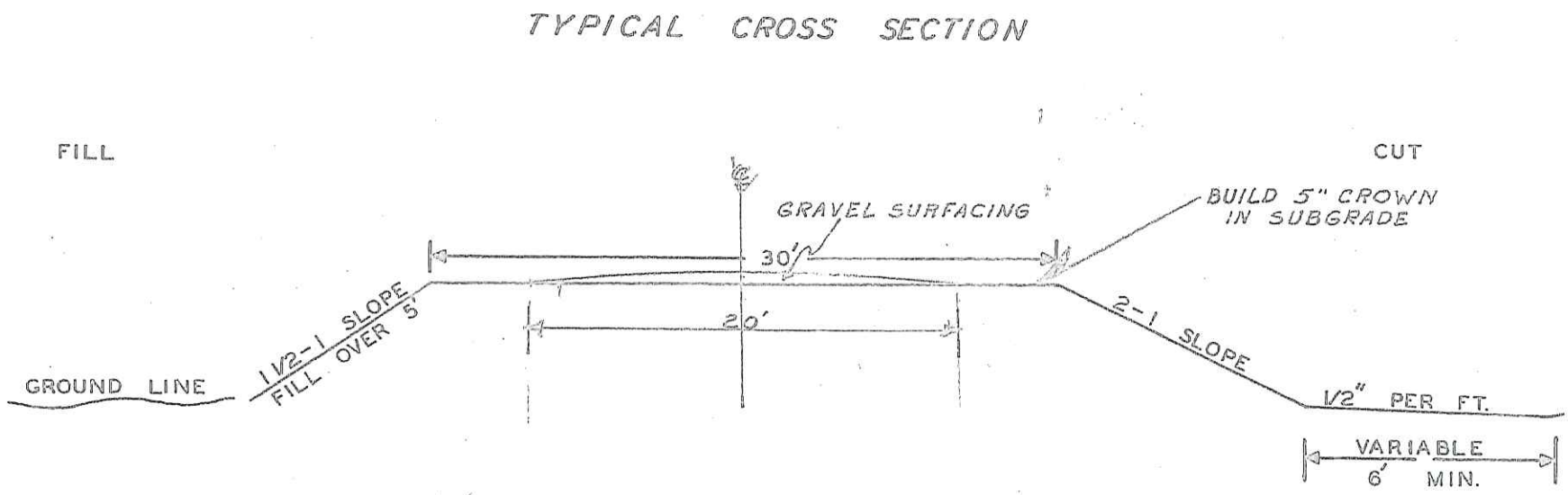



Crawford County
County Road E16 Base Widening, Shoulder Paving & Resurfacing Project

CRAWFORD COUNTY

COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

ORIGINAL GRADING CROSS SECTION



Rate of Application:

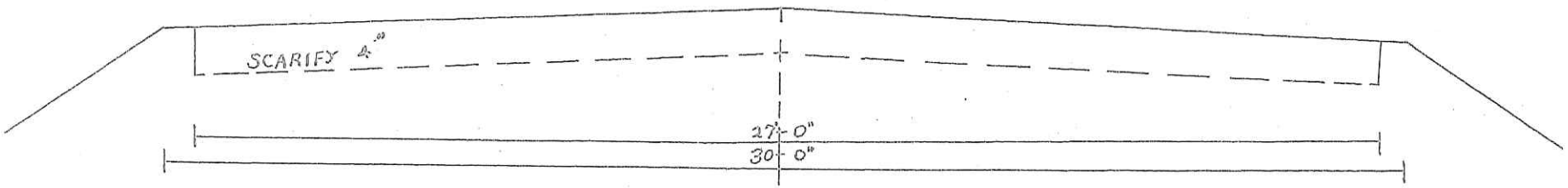
1000 cu. yds. of Class "C" gravel surfacing per mile. Includes 50 cu. yd. per mile for drives and road approaches.

CRAWFORD COUNTY

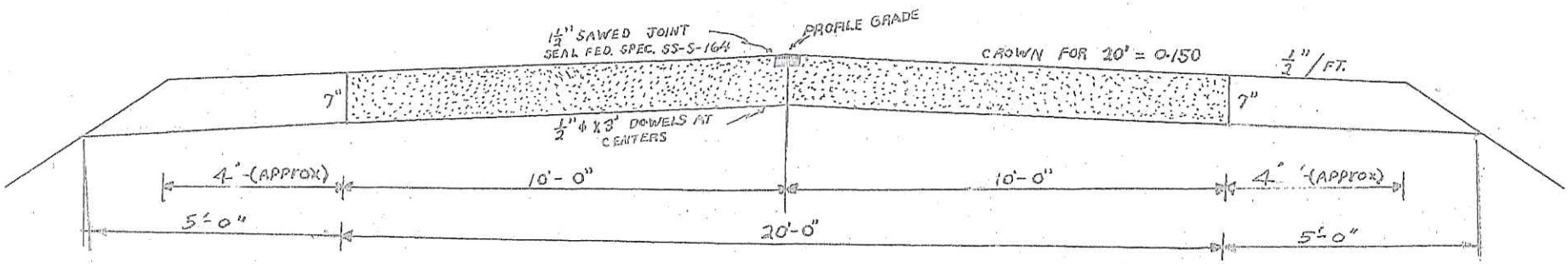
COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

ORIGINAL PAVING CROSS SECTION

TYPICAL CROSS SECTION
GRADING



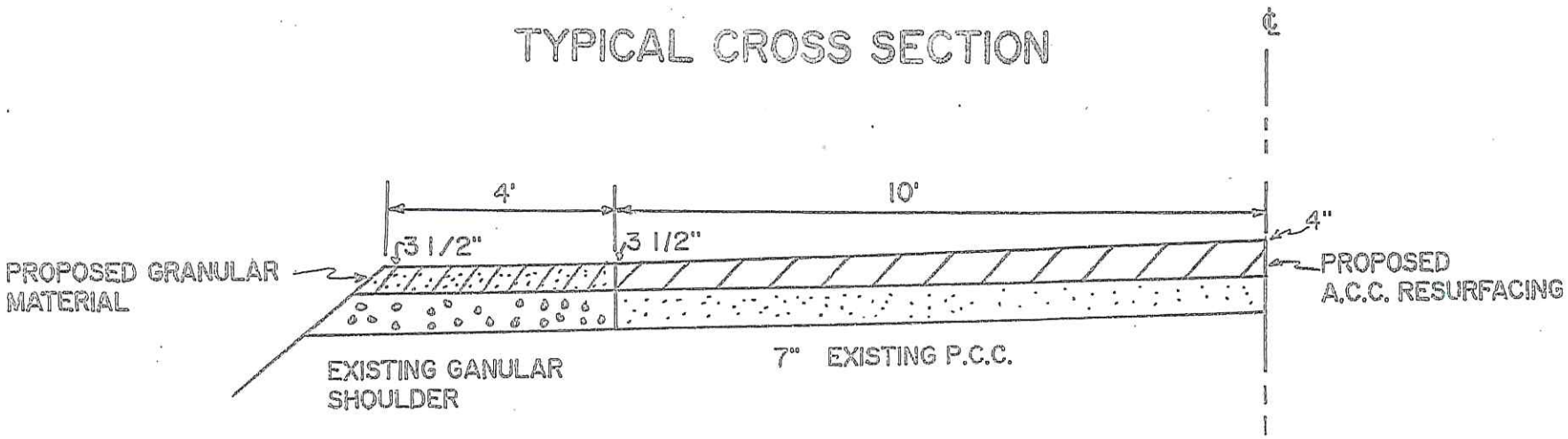
TYPICAL CROSS SECTION
CONCRETE PAVING



CRAWFORD COUNTY

COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

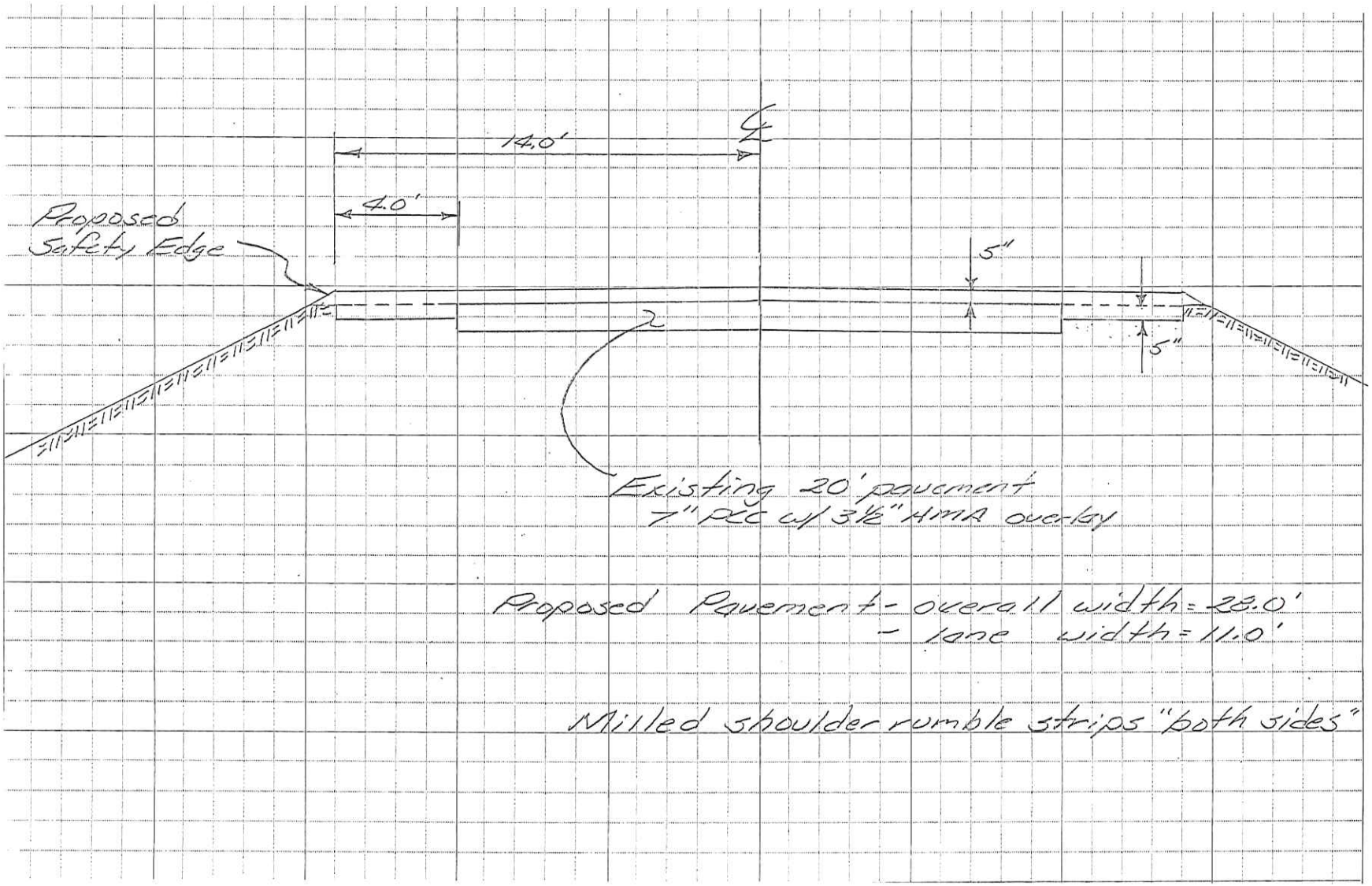
1997 HMA OVERLAY CROSS SECTION



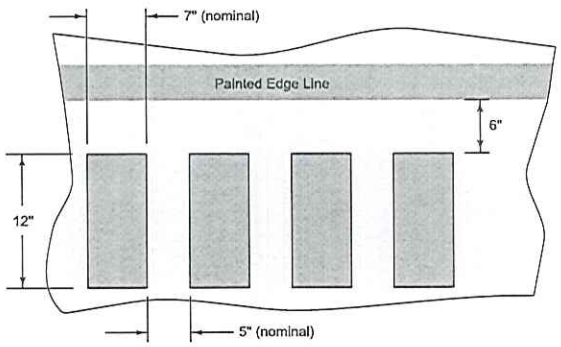
CRAWFORD COUNTY

COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

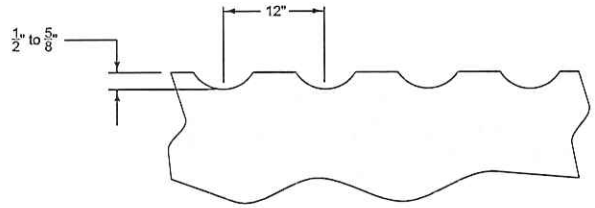
PROPOSED CROSS SECTION



DESIGNER INFO



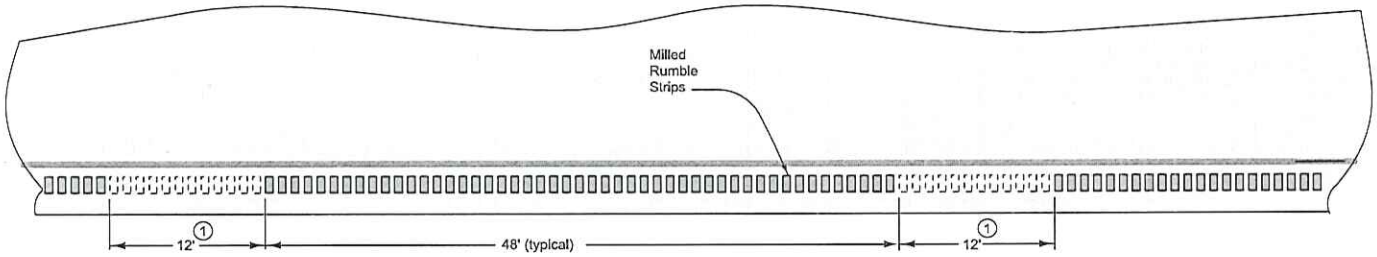
PLAN



SECTION

MILLED RUMBLE STRIP

(1) Place continuous Milled Rumble Strips (no 12-foot gaps) on all median-side shoulders and on all interstate shoulders.



GAP DETAILS (1)

Possible Contract Items:
Asphalt Emulsion for Fog Seal (Shoulder Rumble Strips)
Milled Shoulder Rumble Strips, HMA Surface
Milled Shoulder Rumble Strips, PCC Surface

Possible Tabulation:
112-10

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
4	04-17-12

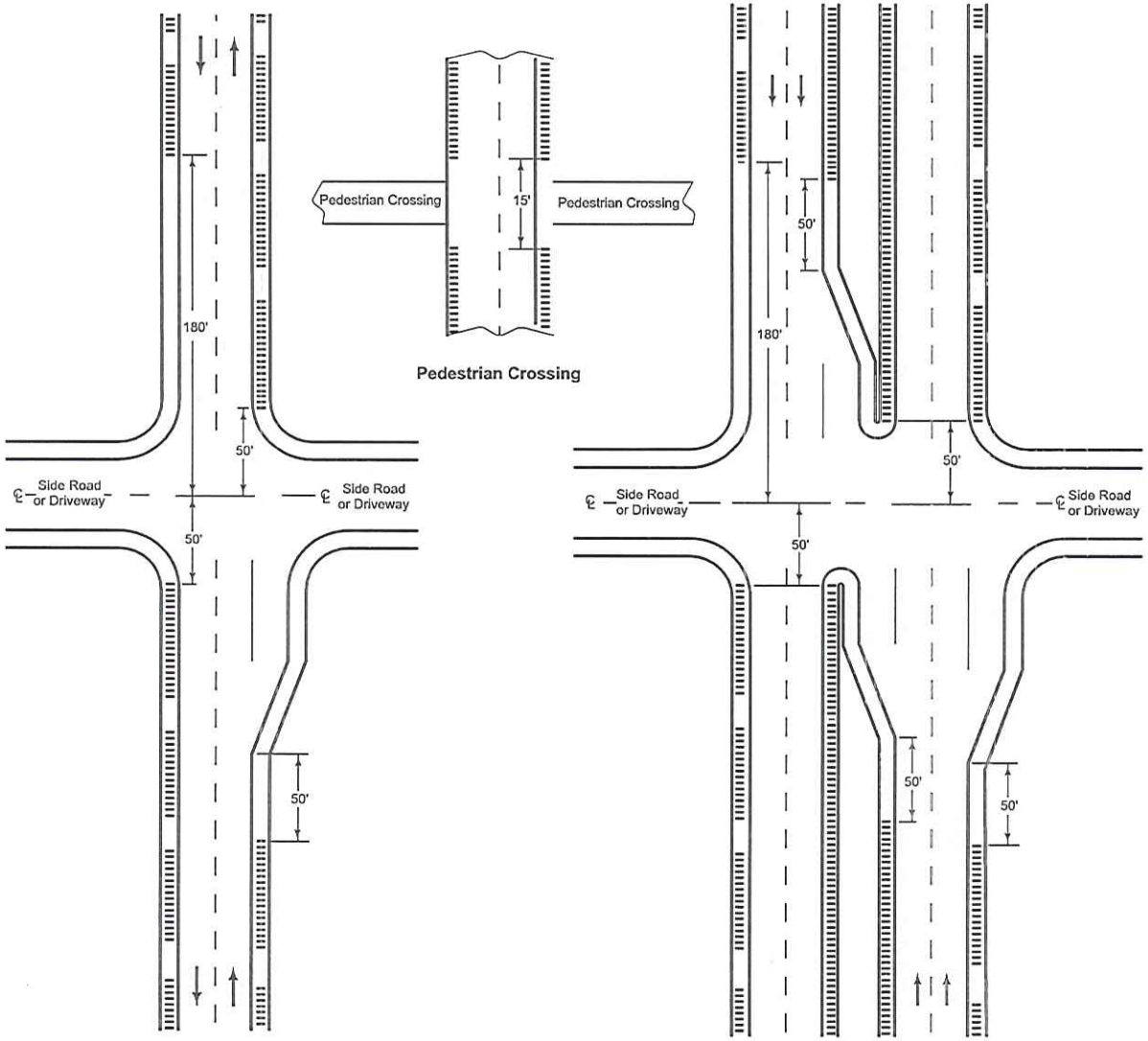
PV-12

SHEET 1 of 2

REVISIONS: Added drawing to sheet 2 to clarify procedure for gapping rumble strips for a pedestrian crossing.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

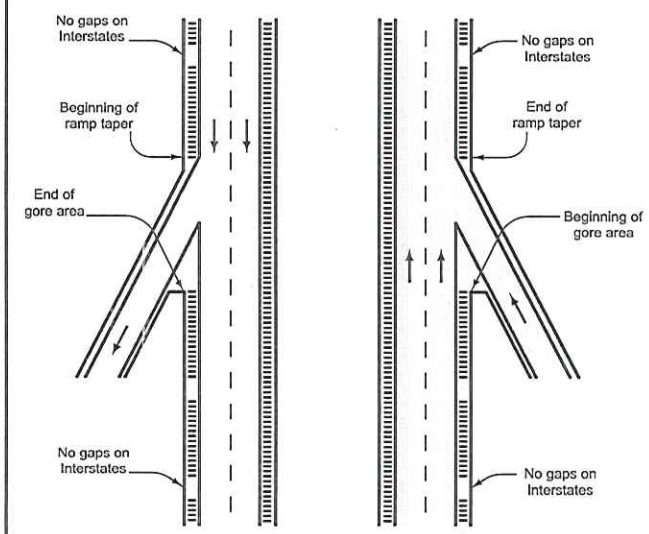
MILLED SHOULDER RUMBLE STRIPS



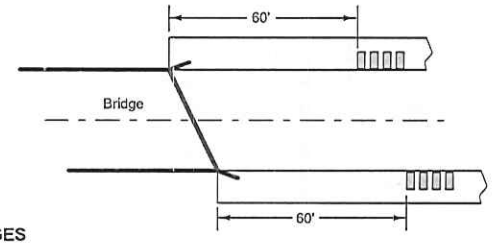
UNDIVIDED HIGHWAYS

DIVIDED HIGHWAYS

INTERSECTION SITUATIONS



RAMP AND LOOP TERMINALS ①



BRIDGES

① Place continuous Milled Rumble Strips (no 12-foot gaps) on all median-side shoulders and on all interstate shoulders.

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
4	04-17-12

PV-12

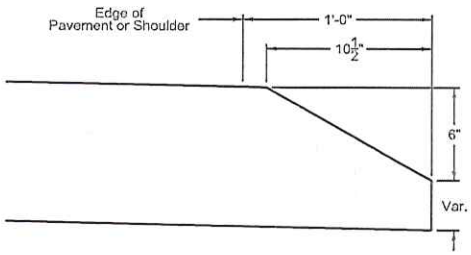
SHEET 2 of 2

REVISIONS: Added drawing to sheet 2 to clarify procedure for gapping rumble strips for a pedestrian crossing.

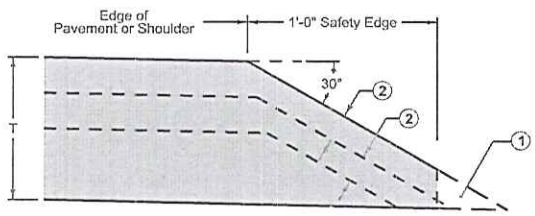
Deanna Maifield

APPROVED BY DESIGN METHODS ENGINEER

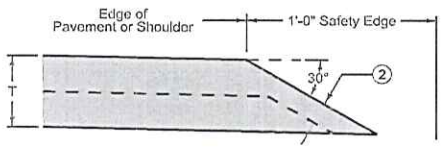
MILLED SHOULDER RUMBLE STRIPS



PCC



T > 8"



T < 8"

HMA

Quantities for Safety Edge are included in the estimated quantity of the pavement or shoulder. For HMA quantities calculated by area, the Safety Edge is measured as one foot of width regardless of thickness.

See paving typicals for placement within roadway.

The number of HMA lifts shown are for illustration purposes only.

(1) Material in excess of 1' width is contractor's option.

(2) Coverage thickness to exceed nominal maximum aggregate size.

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
1	10-18-11

PV-3

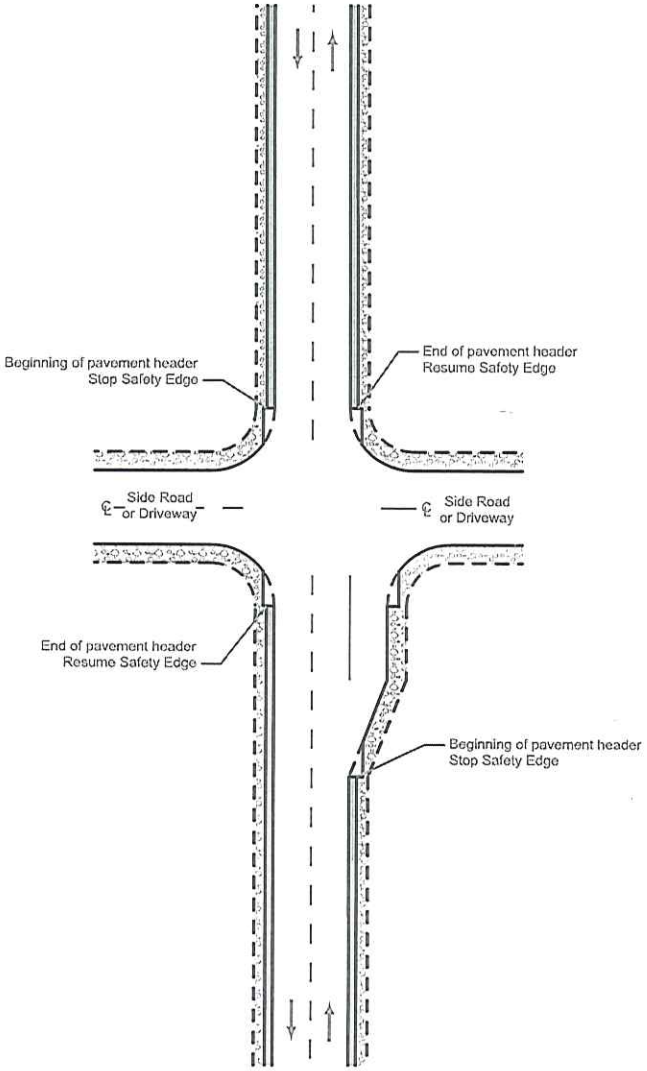
SHEET 1 of 2

REVISIONS: Modified HMA drawings. Added circle notes 1 and 2.

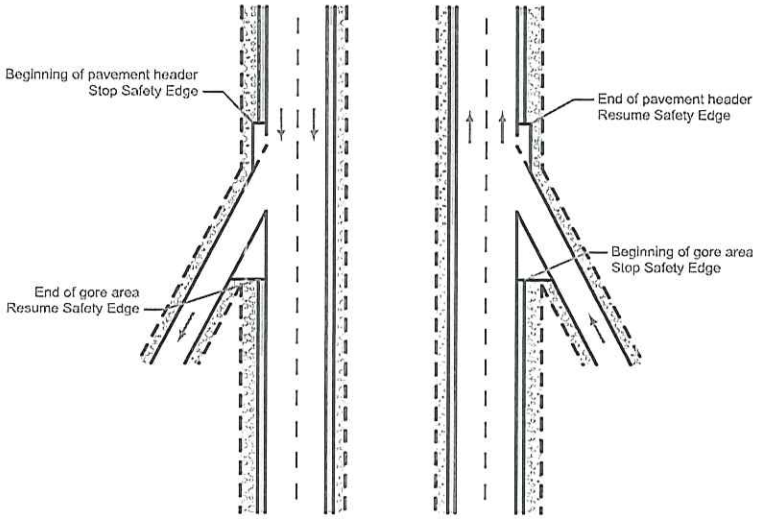
Deanna Maifield

APPROVED BY DESIGN METHODS ENGINEER

SAFETY EDGE



AUXILIARY LANES
AND INTERSECTIONS



RAMPS AND LOOPS

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
1	10-18-11

PV-3

SHEET 2 of 2

REVISIONS: Modified HMA drawings. Added circle notes 1 and 2.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

SAFETY EDGE

Iowa Department of Transportation

Major Cause Summary

Crawford County E16 from 150th St W. to Schleswig

Report Version 1.1 Jan 2005

Analysis Years: 2006 [2], 2007 [3], 2008 [2], 2009 [3], 2010 [3]

Crash Summary:

Fatal	1
Major Injury	1
Minor Injury	-
Possible/Unknown	1
PDO	10
Total Crashes	13

Injury Summary:

Fatal	1
Major Injury	1
Minor Injury	-
Possible	1
Unknown	-
Total Injuries	3

Surface Condition Summary:

Dry	7
Wet	-
Ice	3
Snow	2
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	1
Total Crashes	13

TOT Property Damage: $70,150

AVG Property Damage: $5,396

Major Cause Summary:

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

Selection Filter:

((YEAR = 2006 or YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010))

Analyst: RBS

Notes: All Crashes 2006-2010

All 6AM - 6PM

Iowa Department of Transportation

Driver and Time Summary

Crawford County E16 from 150th St W. to Schleswig

Report Version 1.0 Aug 2008

Crash Time of Day Summary:

From To	00:00 01:59	02:00 03:59	04:00 05:59	06:00 07:59	08:00 09:59	10:00 11:59	12:00 13:59	14:00 15:59	16:00 17:59	18:00 19:59	20:00 21:59	22:00 23:59	NR	Total	%
SUN	-	-	-	-	-	-	1	-	1	-	-	-	-	2	15
MON	-	-	-	1	-	-	-	-	-	-	-	-	-	1	8
TUE	-	-	-	3	-	-	-	-	-	-	-	-	-	3	23
WED	-	-	-	-	-	1	-	-	1	-	-	-	-	2	15
THU	-	-	-	-	-	-	1	1	1	-	-	-	-	3	23
FRI	-	-	-	-	1	-	1	-	-	-	-	-	-	2	15
SAT	-	-	-	-	-	-	-	-	-	-	-	-	-		
Tot.				4	1	1	3	1	3					13	
%				31	8	8	23	8	23						100

Driver Age/Gender Summary:

Age	Male	Female	NR	Drivers	%
<14	-	-	-		
14	-	-	-		
15	-	-	-		
16	-	-	-		
17	-	-	-		
18	1	-	-	1	6
19	-	-	-		
20	-	-	-		
21 to 24	1	1	-	2	11
25 to 29	1	1	-	2	11
30 to 34	2	2	-	4	22
35 to 39	-	-	-		
40 to 44	-	-	-		
45 to 49	2	-	-	2	11
50 to 54	2	-	-	2	11
55 to 59	1	-	-	1	6
60 to 64	1	2	-	3	17
65 to 69	-	-	-		
70 to 74	-	1	-	1	6
75 to 79	-	-	-		
80 to 84	-	-	-		
85 to 89	-	-	-		
90 to 94	-	-	-		
95 plus	-	-	-		
NR	-	-	-		
Drivers	11	7	0	18	
%	61	39	0		100

Drug/Alcohol Summary:

	Total	%
Drug		
Alcohol, Less than Statutory		
Alcohol, Statutory		
Drug/Alcohol, Less than Statutory		
Drug/Alcohol, Statutory		
Refused		
Under Influence of Alc/Drugs/Meds		
None Indicated	13	100
Total Crashes	13	100

Fixed Object Struck Summary:

	Vehs.	%
Bridge/Bridge rail/Overpass		
Underpass/Structure Support		
Culvert		
Ditch/Embankment	4	22
Curb/Island/Raised Median		
Guardrail		
Concrete Barrier		
Tree		
Pole - Utility/Light/Etc	1	6
Sign Post		
Mailbox		
Impact Attenuator		
Other Fixed Object		
None	13	72
Total Vehicles	18	100

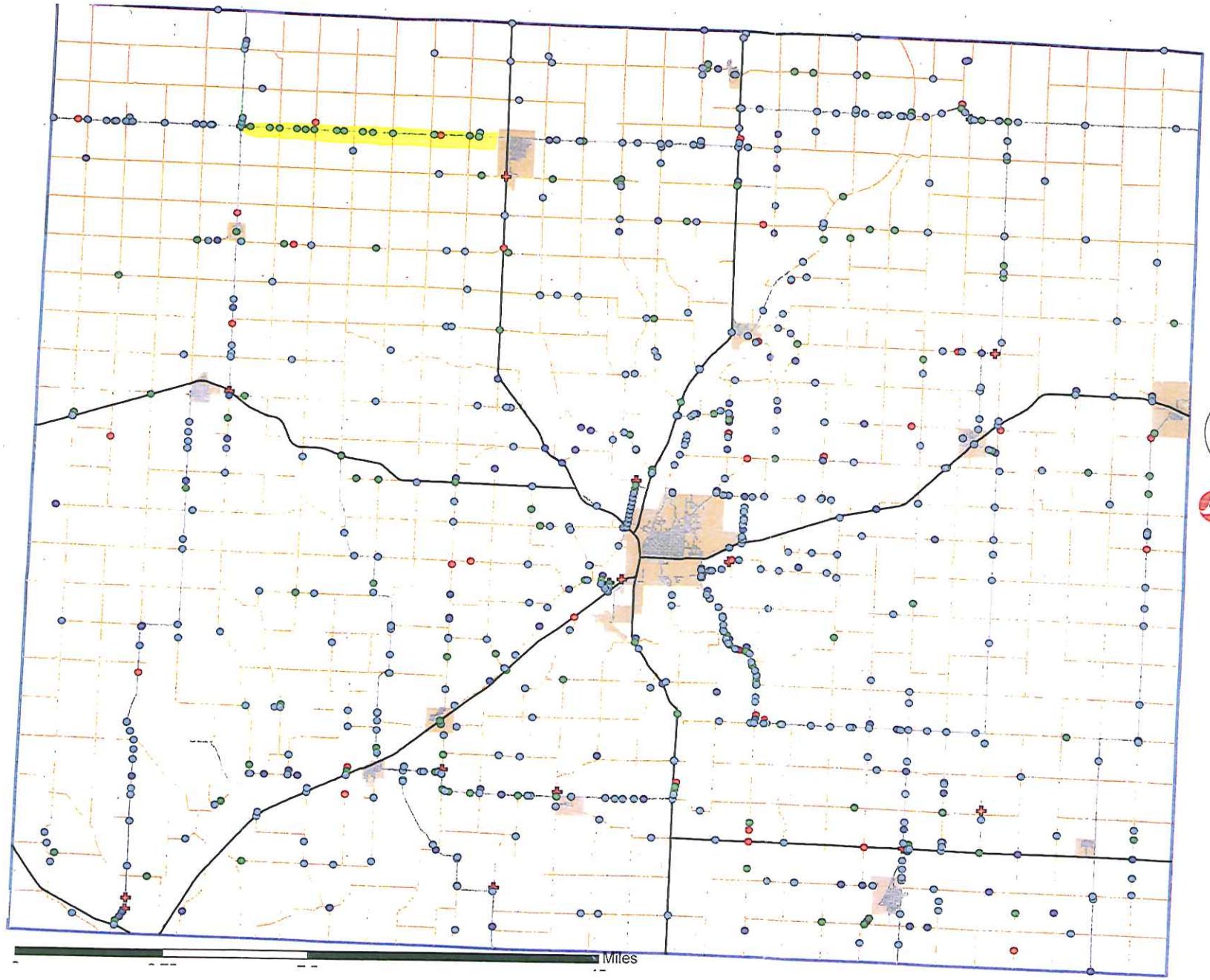
Selection Filter:

((YEAR = 2006 or YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010))

Analyst: RBS

Notes: All Crashes 2006-2010

Crashes by Severity on Secondary Roads in Crawford County (01-10)



Iowa Traffic Safety Data Service

ctre Center for Transportation Research and Education

Iowa State University

Governor's Traffic Safety Bureau

Iowa Department of Transportation

Crashes located on, or at an intersection with, secondary roads.

N

Legend

- PDO (500)
- Possible/Unknown (126)
- Minor Injury (107)
- Major Injury (52)
- Fatal (16)
- Primary Roads
- Paved Roads
- Unpaved Roads
- Corporate Boundaries
- County Boundaries

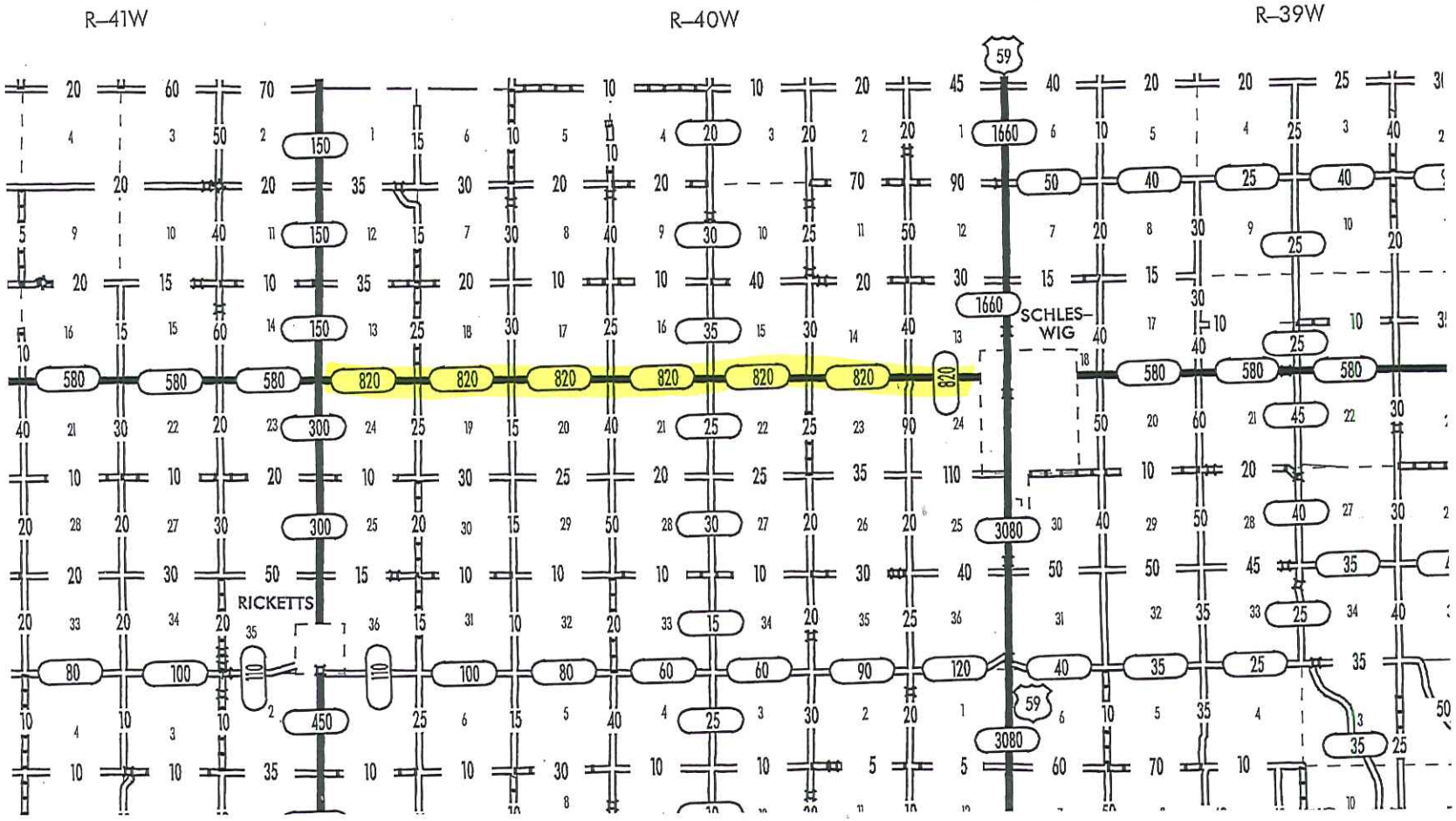
Disclaimer:
The information contained in this report was derived from the May 2, 2011, Iowa Department of Transportation crash database. If errors or odd cases are found, please communicate the case number or send a printed crash report to Michael Pawlovich, Iowa DOT, Office of Traffic and Safety, (Michael.Pawlovich@dot.iowa.gov, 515.239.1428). Since the databaseis actively being updated, edited, and reviewed, some of the fatality totals may differ from the Fatality Analysis Reporting System (FARS).

Produced by: Justin Pottorff
Date Produced: September 23, 2011

CRAWFORD COUNTY

COUNTY ROAD E16 BASE WIDENING, SHOULDER PAVING & RESURFACING PROJECT

2008 IDOT TRAFFIC COUNT MAP



E16 - WEST END

DAY	DATE	EB	SB	WB	NB	TOTAL	PEAK AM/ VOLUME	PEAK PM/ VOLUME	(EB) % TRUCKS	(WB) % TRUCKS
Thursday	08/25/2005	286		308		594	10:00/41	4:00/69	34.2%	12.4%
Friday	08/26/2005	391		378		769	6:00/53	3:00/61	36.6%	11.1%
Saturday	08/27/2005	327		321		648	10:00/59	3:00/56	21.4%	4.7%
Sunday	08/28/2005	334		312		646	10:00/48	5:00/61	24.3%	2.9%
Monday	08/29/2005	309		297		606	6:00/47	2:00/51	31.7%	10.7%
Tuesday	08/30/2005	288		289		577	6:00/49	3:00/53	33.7%	12.7%
Wednesday	08/31/2005	191		194		385	7:00/48	3:00/60	25.6%	18.0%
Thursday	09/01/2005	299		289		588	6:00/45	4:00/50	19.0%	22.5%
Friday	09/02/2005	354		380		734	6:00/48	4:00/74	20.5%	22.0%
Saturday	09/03/2005	296		353		649	11:00/48	1:00/50	10.5%	12.1%
Sunday	09/04/2005	331		323		654	10:00/61	12:00/49	6.0%	9.2%
Monday	09/05/2005	324		347		671	8:00/37	3:00/61	12.0%	14.1%
Tuesday	09/06/2005	307		335		642	6:00/48	3:00/55	20.8%	23.0%
Wednesday	09/07/2005	313		306		619	6:00/56	3:00/57	19.5%	22.5%
Thursday	09/08/2005	309		332		641	6:00/60	3:00/56	24.3%	23.7%
Friday	09/09/2005	299		365		664	11:00/37	3:00/60	22.4%	20.0%
Saturday	09/10/2005	314		336		650	8:00/50	5:00/49	11.4%	13.7%
Sunday	09/11/2005	372		337		709	11:00/61	12:00/72	7.8%	12.2%
Monday	09/12/2005	242		266		508	6:00/41	2:00/37	17.8%	23.4%
Tuesday	09/13/2005	308		291		599	7:00/46	4:00/64	22.2%	25.7%
Wednesday	09/14/2005	368		346		714	7:00/56	4:00/61	25.2%	33.6%
Thursday	09/15/2005	375		375		750	9:00/55	2:00/73	23.8%	35.6%
Friday	09/16/2005	410		445		855	9:00/54	3:00/84	28.3%	32.7%
Saturday	09/17/2005	415		464		879	9:00/81	2:00/64	17.5%	18.5%
Sunday	09/18/2005	373		360		733	11:00/57	4:00/71	11.3%	13.3%
Monday	09/19/2005	337		177		514	7:00/53	12:00/36	25.9%	32.2%

Tuesday	09/20/2005	339		243		582	9:00/47	2:00/55	19.5%	25.2%
Wednesday	09/21/2005	325		330		655	6:00/50	3:00/59	23.0%	25.1%
Thursday	09/22/2005	301		317		618	6:00/45	3:00/52	18.9%	24.9%
Friday	09/23/2005	332		345		677	6:00/42	4:00/67	17.4%	22.0%
Saturday	09/24/2005	329		298		627	11:00/43	3:00/52	9.1%	14.7%
Sunday	09/25/2005	314		362		676	11:00/60	4:00/66	5.7%	12.4%
Monday	09/26/2005	330		302		632	8:00/46	2:00/50	19.3%	25.1%
Tuesday	09/27/2005	335		316		651	7:00/50	3:00/52	20.1%	21.2%
Wednesday	09/28/2005	362		324		686	6:00/56	4:00/62	20.7%	26.4%
Thursday	09/29/2005	343		343		686	6:00/52	4:00/67	26.4%	27.4%
Friday	09/30/2005	404		352		756	6:00/48	5:00/68	22.0%	27.3%
Saturday	10/01/2005	357		355		712	11:00/47	4:00/52	14.7%	19.4%
Sunday	10/02/2005	293		337		630	11:00/50	4:00/62	7.9%	14.6%
Monday	10/03/2005	335		341		676	6:00/53	3:00/49	25.8%	31.7%
Tuesday	10/04/2005	339		314		653	7:00/67	3:00/65	21.3%	29.0%
Wednesday	10/05/2005	181		163		344	6:00/54	12:00/37	19.3%	29.4%
TOTALS		13691		13568		27259			20.1%	20.4%

AVERAGE # OF VEHICLES = 649 AVERAGE % TRUCKS = 20.3%

**Average % of Trucks is calculated using Class 4 through Class 13

E16 - East End

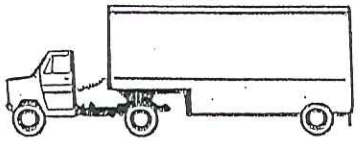
DAY	DATE	EB	SB	WB	NB	TOTAL	PEAK AM/ VOLUME	PEAK PM/ VOLUME	EB % TRUCKS	WB % TRUCKS
Thursday	08/25/2005	394		398		792	8:00/58	5:00/87	18.8%	15.2%
Friday	08/26/2005	514		507		1021	7:00/66	3:00/70	22.8%	17.0%
Saturday	08/27/2005	435		425		860	11:00/72	12:00/61	12.1%	6.7%
Sunday	08/28/2005	417		373		790	10:00/53	5:00/69	9.1%	6.4%
Monday	08/29/2005	401		329		730	7:00/74	3:00/62	32.0%	20.8%
Tuesday	08/30/2005	286		18		304	9:00/32	5:00/24	75.1%	16.7%
Wednesday	08/31/2005	231		211		442	7:00/59	4:00/79	20.3%	23.7%
Thursday	09/01/2005	432		413		845	7:00/62	4:00/78	18.8%	32.6%
Friday	09/02/2005	486		504		990	7:00/68	5:00/92	18.8%	27.9%
Saturday	09/03/2005	418		451		869	11:00/69	2:00/63	8.1%	19.5%
Sunday	09/04/2005	453		409		862	11:00/78	12:00/70	4.3%	14.4%
Monday	09/05/2005	408		409		817	11:00/49	4:00/82	6.7%	18.8%
Tuesday	09/06/2005	440		476		916	7:00/76	4:00/86	19.3%	29.6%
Wednesday	09/07/2005	423		407		830	7:00/80	4:00/68	19.2%	26.6%
Thursday	09/08/2005	445		444		889	7:00/82	4:00/68	21.6%	32.1%
Friday	09/09/2005	447		505		952	8:00/59	5:00/88	17.8%	26.4%
Saturday	09/10/2005	436		418		854	10:00/62	6:00/72	8.5%	19.5%
Sunday	09/11/2005	484		426		910	9:00/67	12:00/81	9.0%	18.8%
Monday	09/12/2005	387		412		799	7:00/66	3:00/64	18.4%	28.8%
Tuesday	09/13/2005	461		420		881	8:00/74	4:00/83	20.9%	31.1%
Wednesday	09/14/2005	477		457		934	7:00/68	4:00/80	23.3%	35.3%
Thursday	09/15/2005	506		460		966	7:00/77	4:00/80	22.4%	37.9%
Friday	09/16/2005	544		563		1107	8:00/71	4:00/98	25.1%	35.3%
Saturday	09/17/2005	533		607		1140	10:00/105	12:00/84	10.6%	20.9%
Sunday	09/18/2005	514		469		983	11:00/78	5:00/92	8.2%	19.9%
Monday	09/19/2005	478		493		971	7:00/74	5:00/80	24.4%	37.4%

Tuesday	09/20/2005	499		473		972	7:00/73	2:00/81	21.6%	34.7%
Wednesday	09/21/2005	490		499		989	7:00/80	5:00/87	24.4%	35.9%
Thursday	09/22/2005	433		457		890	7:00/69	5:00/75	19.6%	31.7%
Friday	09/23/2005	477		481		958	7:00/65	5:00/84	18.1%	31.9%
Saturday	09/24/2005	435		393		828	10:00/62	3:00/65	9.0%	23.4%
Sunday	09/25/2005	394		435		829	10:00/62	5:00/76	4.7%	17.5%
Monday	09/26/2005	455		418		873	9:00/67	3:00/70	18.7%	24.9%
Tuesday	09/27/2005	478		448		926	8:00/72	4:00/73	17.8%	32.8%
Wednesday	09/28/2005	491		456		947	7:00/79	5:00/84	20.1%	29.6%
Thursday	09/29/2005	481		475		956	7:00/77	3:00/86	23.8%	35.0%
Friday	09/30/2005	554		518		1072	7:00/80	5:00/100	20.2%	37.1%
Saturday	10/01/2005	483		484		967	11:00/58	7:00/79	13.8%	28.3%
Sunday	10/02/2005	395		441		836	11:00/51	6:00/75	8.2%	22.9%
Monday	10/03/2005	451		461		912	7:00/74	5:00/75	22.4%	39.7%
Tuesday	10/04/2005	455		448		903	8:00/85	4:00/70	20.3%	36.1%
Wednesday	10/05/2005	225		231		456	7:00/74	12:00/56	20.4%	36.4%
TOTAL:		18646		18122		36768			18.5%	26.6%

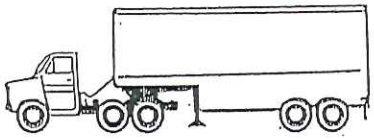
AVERAGE # OF VEHICLES = 875 AVERAGE % TRUCKS = 22.6%

**Average % of Trucks is calculated using Class 4 through Class 13

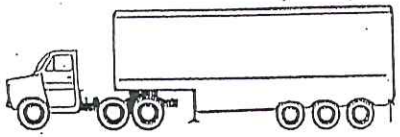
Class 8



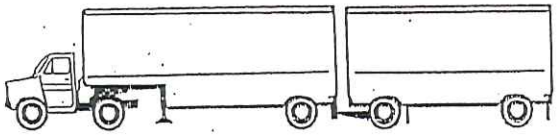
Class 9



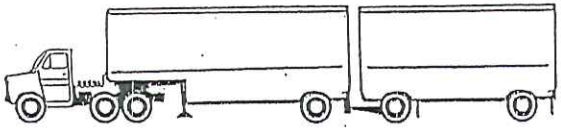
Class 10



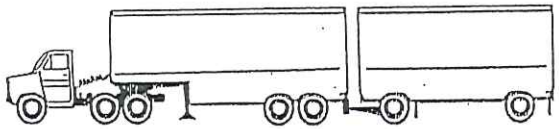
Class 11



Class 12



Class 13

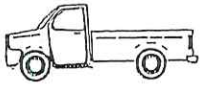


Classification Illustrations

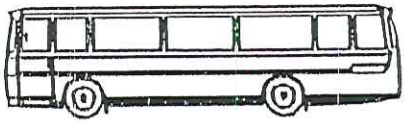
Class 1

Class 2

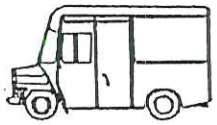
Class 3



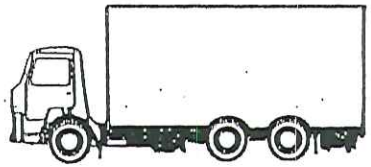
Class 4



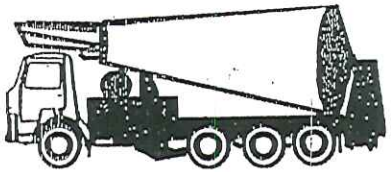
Class 5



Class 6



Class 7



Rev. 8/09

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Crawford Prepared by: Paul J. Assman Date Prepared: Aug 2, 2012

Location: County Rd. E16 from 1/4 mile west of U.S. Hwy 59 west approx 6 3/4 miles to the intersection with Co. Rd

Improvement

Proposed Improvement(s): 4' HMA Base Widening in conjunction with a 5" HMA overlay including milled shoulder rumble strips and safety edge.

$1,297,524	Estimated Improvement Cost, **EC**	20	Est. Improvement 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, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	**$ 1,297,524**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT traffic maps 2008 Date of traffic count

Length (mi.)	Two-way veh/day	Description
6.75	820	
6.75	miles total	

4.0% Projected Traffic Growth (0%-10%), **G**

5,535 Current Vehicle Miles / Day, **VM**

12,128 End of Life Veh. Miles / Day

2,020,275 Current Veh. Miles / Year, **AM**

60,159,908 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

2001 First full year --> 2010 Last full year 10.0 years, Time Period, **T**

0 Additional months values as of Dec. 2007

1	Fatal Crashes	1	Fatalities @	$3,500,000	$	3,500,000
		2	Major Injuries @	$240,000	$	480,000
3	Injury Crashes	0	Minor Injuries @	$48,000	$	-
		1	Possible Injuries @	$25,000	$	25,000
17	Property Damage Only		(assumed cost per crash)	$2,700	$	56,700
			-OR- enter all Property Costs of all crashes:			
21	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	4,061,700

2.10	Current Crashes / Year, **AA** = TA / T	**103.9**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 193,414	Cost per Crash, **AVCR** = LOSS / TA	**$ 2,968,165**	Present Value of Avoided Crashes, **BENEFIT**
62.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.80	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 154,345	Crash Costs Avoided in First Year, AAR x AVCR		
23.8	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 = $2,968,165 : $1,297,524 = **2.29** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Cedar Street in Muscatine IA / High School Traffic Signal

Applicant: City of Muscatine

Contact Person: Jon Lutz Title: City Engineer

Complete Mailing Address: City of Muscatine - Public Works Department
Muscatine, IA 52761

Phone: 563-263-8933 (Area Code) E-Mail: jlutz@muscatineiowa.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:

Application Type

- Site Specific [X]
- Traffic Control Device [ ]
- Safety Study [ ]

Funding Amount

Total Project Cost $ 138,000.00

Safety Funds Requested $ 138,000.00

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Muscatine, IA

Signed: _____ 8/14/2012
Signature Date Signed

Jonathan Lutz
Typed Name

Attest: _____ 8/14/12
Signature Date Signed

_____
Typed Name

A

MUSCATINE

City Hall, 215 Sycamore St.
Muscatine, IA 52761-3840
(563) 264-1550
Fax (563) 264-0750

MAYOR

August 12, 2012

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

To Whom It May Concern:

To the best of my knowledge and belief, all information included in this application is true and accurate, including the commitment of all physical and financial resources. This application has been duly authorized by the participating local authority. I understand the attached OFFICIAL ENDORSEMENT(S) binds the participating local governments to assume responsibility for adequate maintenance of any new or improved facilities.

If TSIP funding assistance is approved for the project described in this application, I understand that an executed contract between the applicant and the Iowa Department of Transportation is required before such funding assistance can be authorized for use in implementing the project.

Sincerely,

DeWayne M. Hopkins,
Mayor

"I remember Muscatine for its sunsets. I have never seen any on either side of the ocean that equaled them" — Mark Twain

NARRATIVE

Existing Conditions: Traffic accidents and congestion are common at the south entrance to Muscatine High School on Cedar Street. Speed limit is posted as 35 MPH. Stop signs are rolled out onto the Cedar Street every school day during arrival and dismissal. Traffic backs up in both directions on Cedar Street and on the school entrance. Typically, traffic will back up 1,175 feet from the High School entrance to the next traffic signal at Houser Street. This condition happens every school day. The following photo shows morning conditions. The Houser signals can be seen in the background.

B

Proposed Concept: The City of Muscatine is reconstructing Cedar Street from a 2 lane to a 3 lane roadway in 2013. Left and right turn lanes into the high school will be provided as part of the city project. Traffic signals are also proposed to further reduce accidents and decrease congestion. This application is for installation of the signals. All Cedar Street paving improvements are paid for by local and Federal funding. Other entrance paving improvements into the High School are funded by the Muscatine School District. Congestion will be decreased on Cedar Street by allowing qued left turning vehicles entering the high school to proceed and dump under a green arrow. School busses also leave onto Cedar Street. Signals will replace a traffic guard who actually stops all other traffic allowing busses to dismiss sequentially.

Signals will operate on different programs for different periods of day. For instance, during periods of minimal school traffic, signals will be green on Cedar and only interrupted for exiting traffic.

C

ITEMIZED BREAKDOWN OF COST

Muscatine Power and Water
PROJECT SUMMARY FORM—EXPENDITURE REQUEST

Project Title: Install new traffic signals at Muscatine High School	**Project Number:**	**Approval Requested:** ☒ With Operating Budget
	Revision Number: 0	☐ Immediately
Department: Technical Services **Project Leader:** Andy Kurriger	**Start Date:** 3/1/13 **Completion Date:** 8/30/13	

Copies: General Manager, Manager, Strategic Sourcing, Tim Reed, Andy Kurriger, Sandy Goodale

Project Description:
Install traffic signals at Muscatine High School at the Cedar Street entrance. The cost of this project will be shared equally between City of Muscatine, Muscatine Community Schools and MP&W.

Primary Purpose of Project: (Written justification should be attached)
Category: Capital ☒ Maintenance ☐ Operating ☐
Subcategory: Regulatory ☐ Cost Reduction ☐ Maintain Efficiency ☒ Health/Safety ☐

Estimated Costs:				Utility Labor & Fringe*	Stores Issues & Loading	Direct Purchases & Services	Consulting Engineer	Other Costs	Totals
Expenditure Schedule									
2nd	Qtr.	2013	Yr.			$ 25,000			$ 25,000
3rd	Qtr.	2013	Yr.	$ 28,500	$ 19,500	$ 30,000			$ 78,000
	Qtr.		Yr.						
	Qtr.		Yr.						
Future Periods									
Subtotal				$ 28,500	$ 19,500	$ 55,000			$ 103,000
* Include fringe on capital projects only.								Contingency	$ 10,000
								Total Amount	$ 113,000

Cedar Street and High School Signal Subtotal	$113,000.00
Cedar Street and Houser Street Signal*	
Controller Upgrade and Communication Equipment	$20,000.00
Installation and Operation Manual	$25,000.00
TOTAL PROJECT COST	$138,000.00

*Required for sequencing signals.

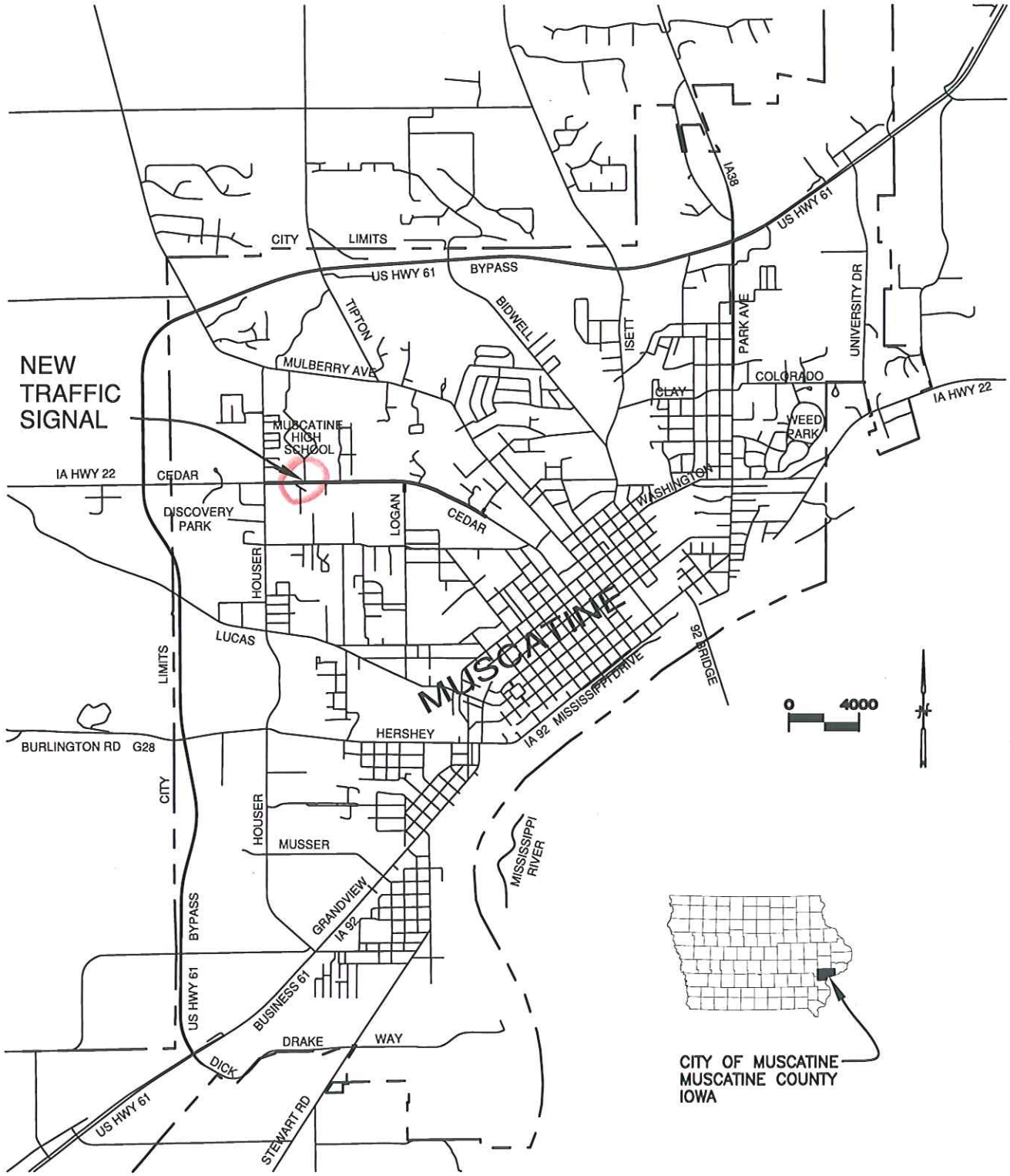
D

TIME SCHEDULE

	Begin	Complete
Signal design	July 1, 2012	October 31, 2012
Construction	March 15, 2013	August 1, 2013

Street and intersection paving on Cedar Street at the school intersection must be performed during the 2013 summer break while school is not in session. The signals will be constructed during the same period. Project completion will be August 1, 2013.

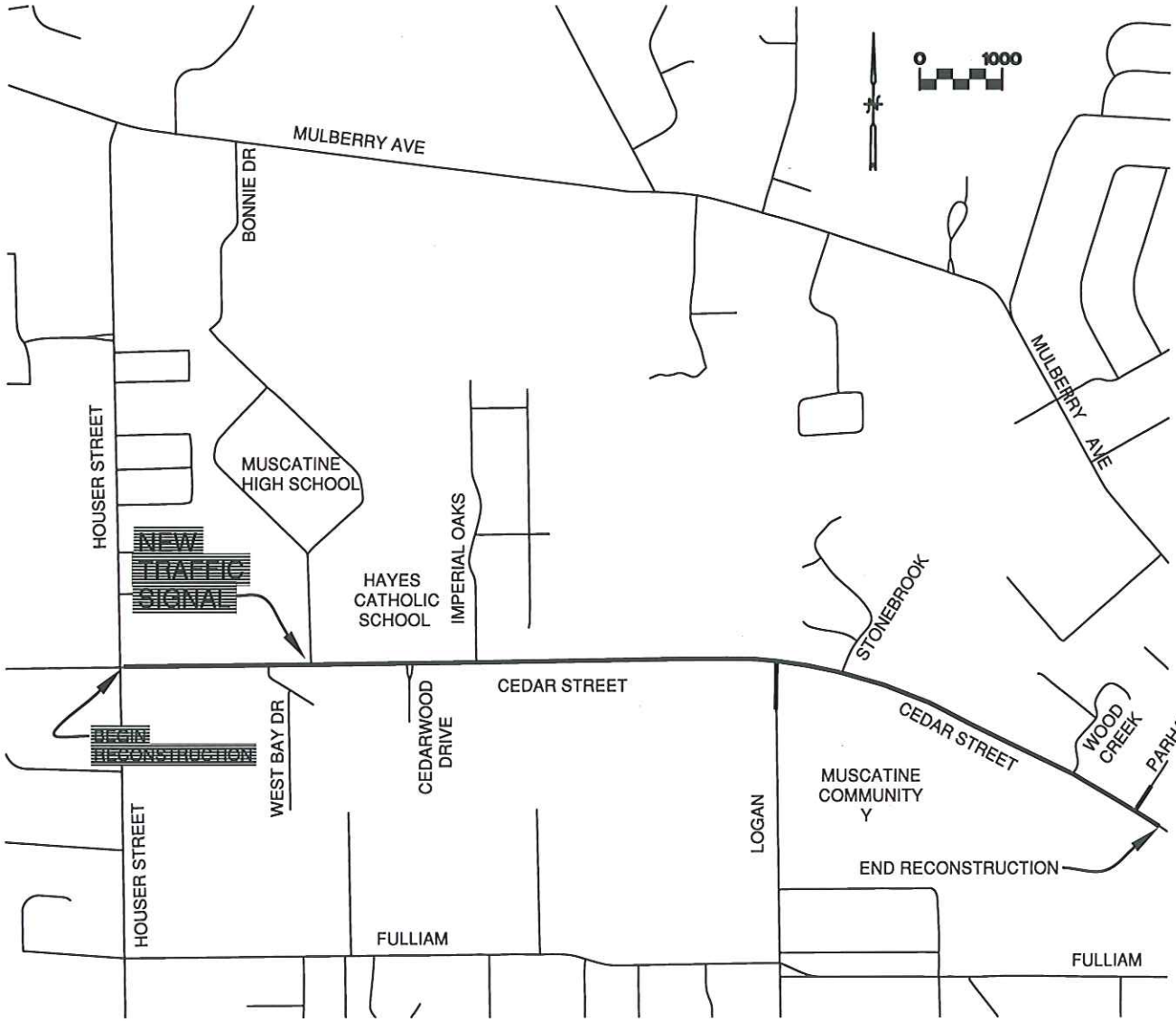
E



LOCATION MAP 1

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

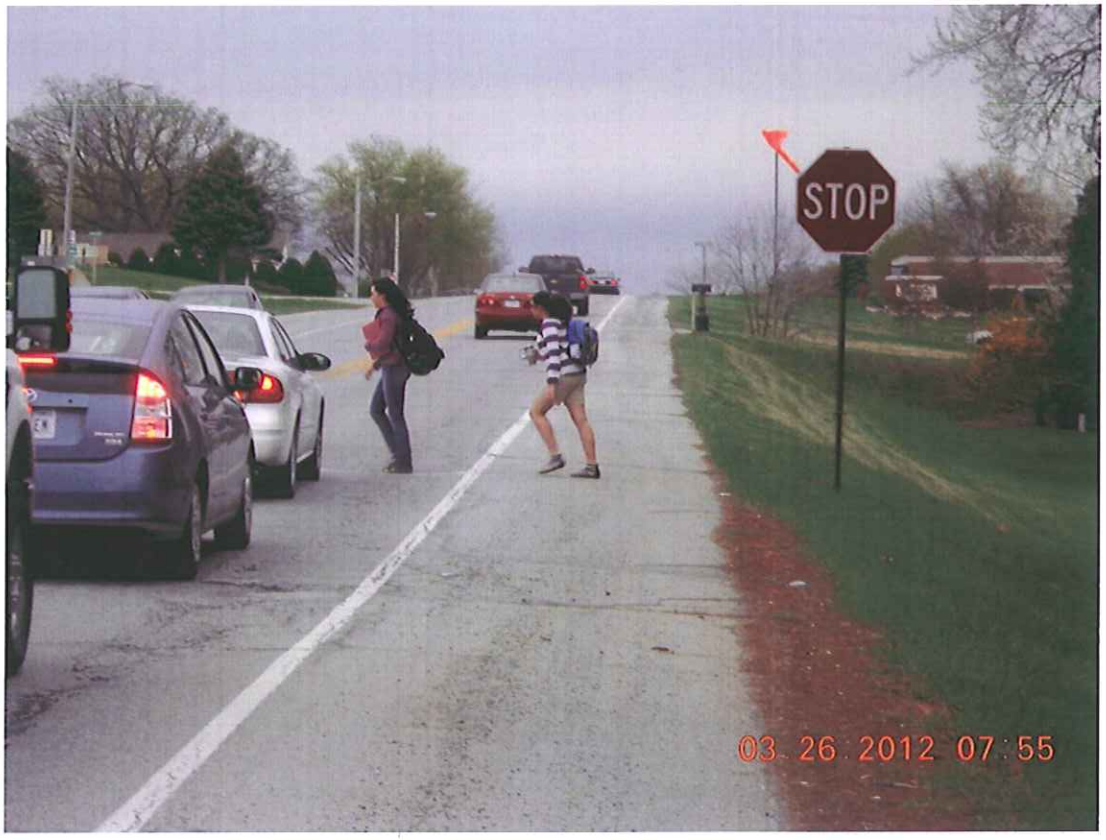
E



LOCATION MAP 2

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

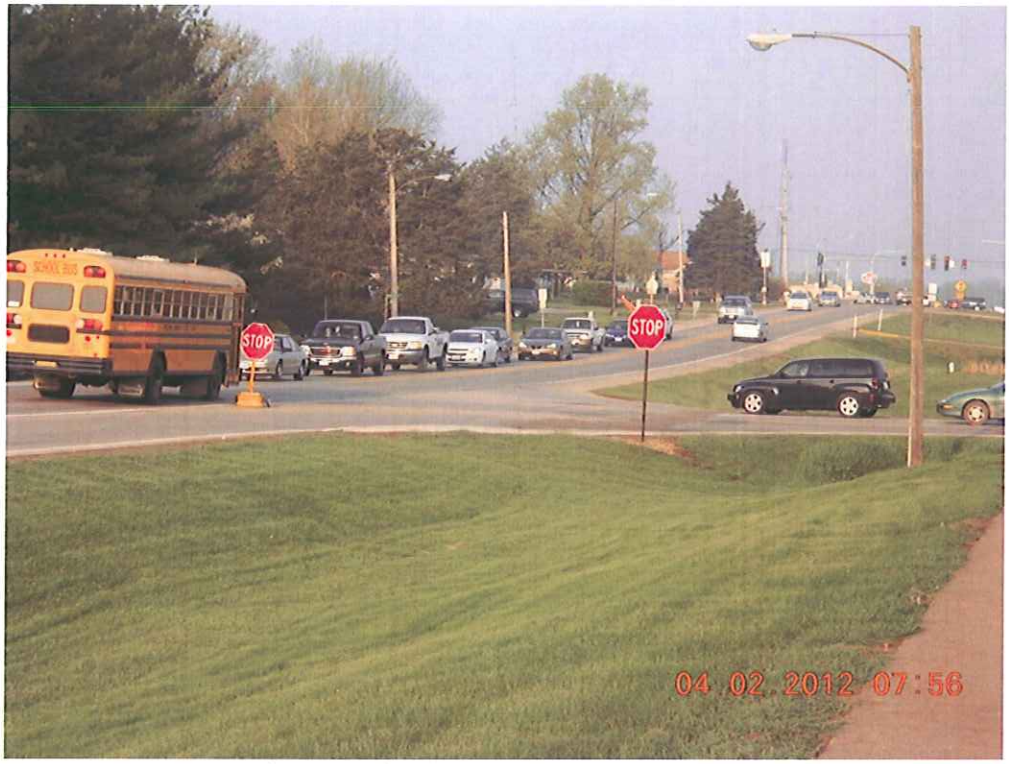
F



Students crossing Cedar Street at the Muscatine High School at 7:55 a.m.

F

Students using Cedar Street leaving the Muscatine High School.



Business commuters on Cedar Street headed for downtown are backed up due to student, parent drop off, and bus traffic.

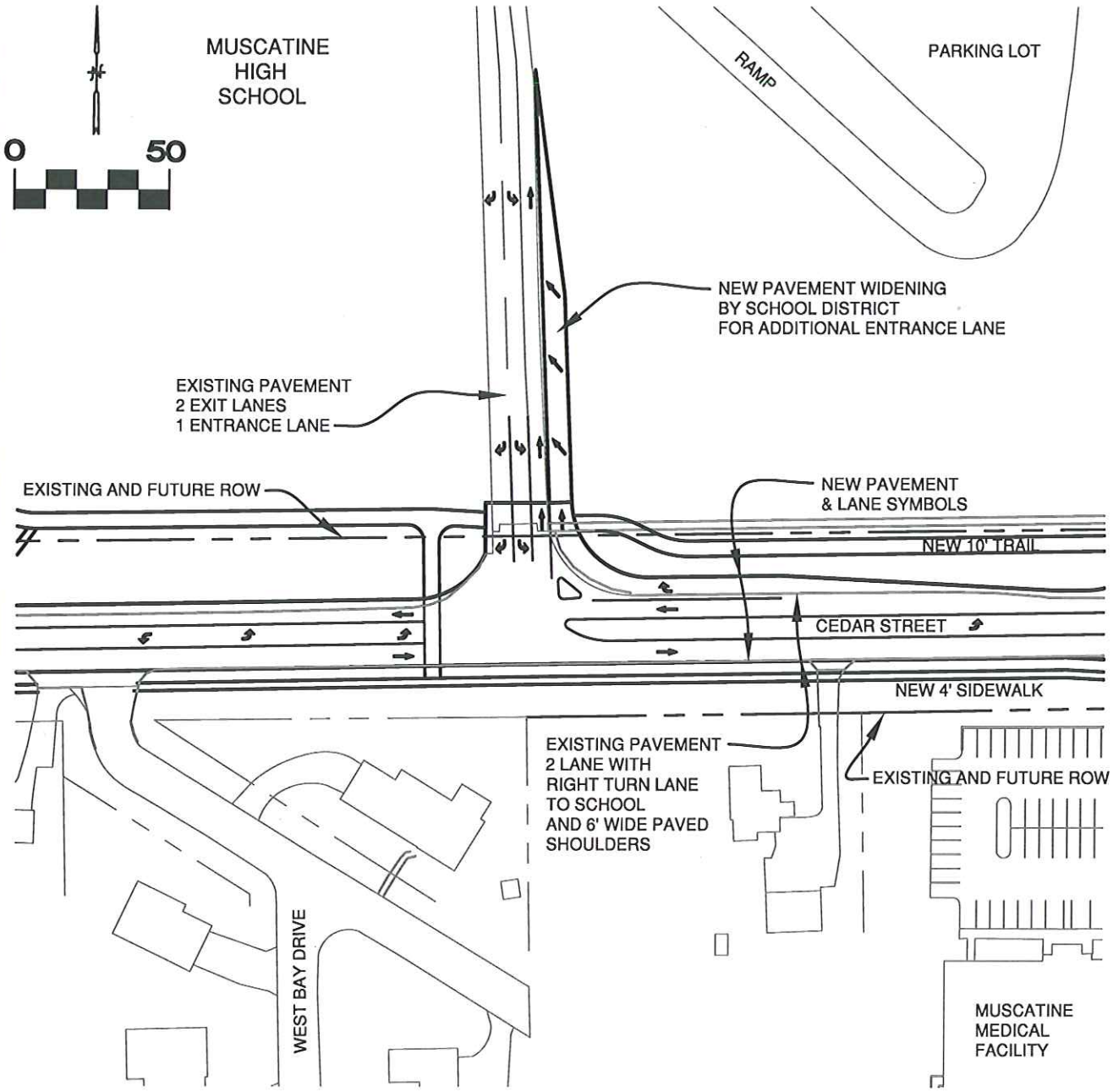
Other City funded improvements will include crosswalks, sidewalks, and a 10' trail.

F

Traffic congestion on Cedar Street.

Traffic congestion on Cedar Street.

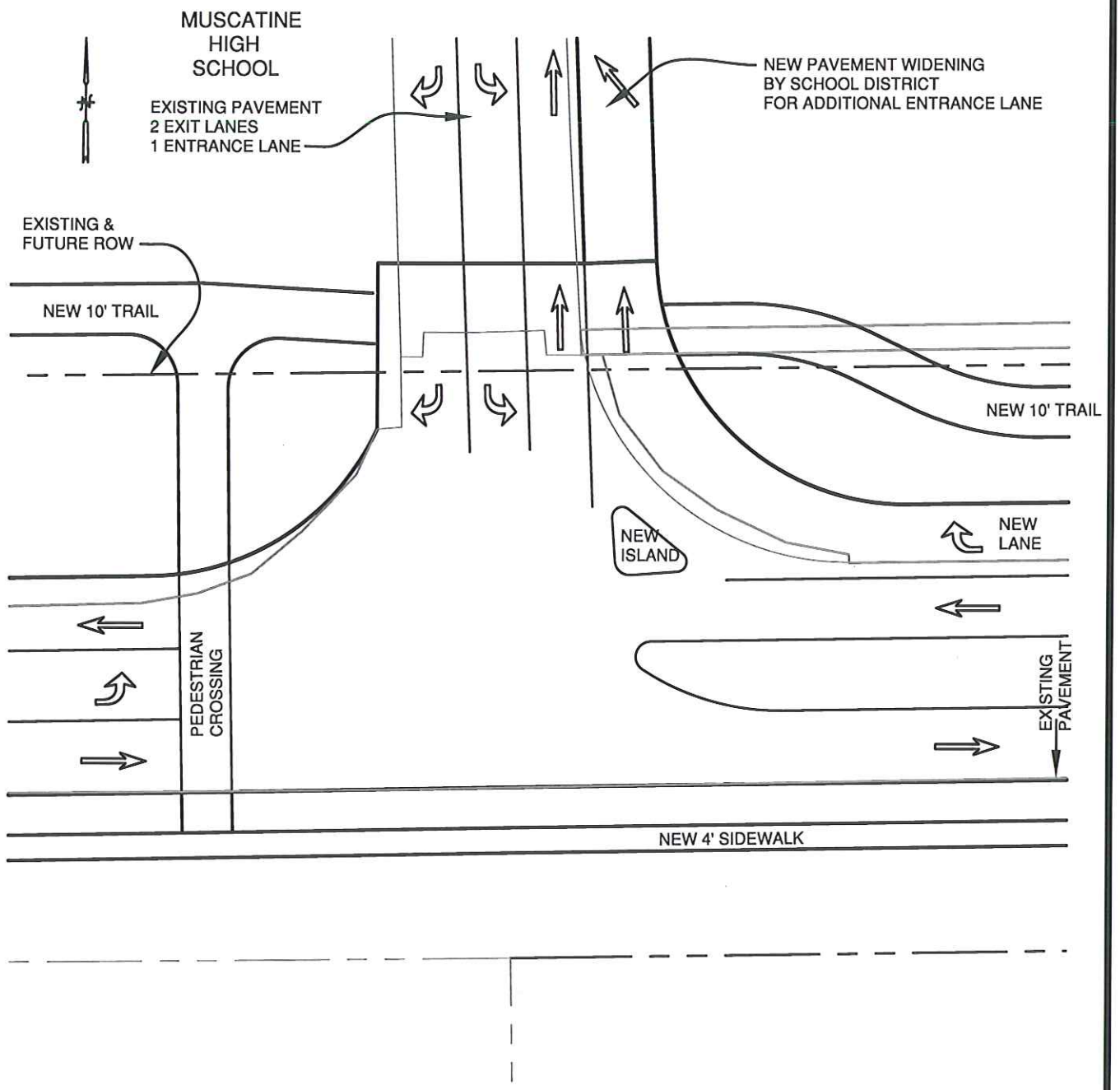
G



PLAN VIEW

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

G



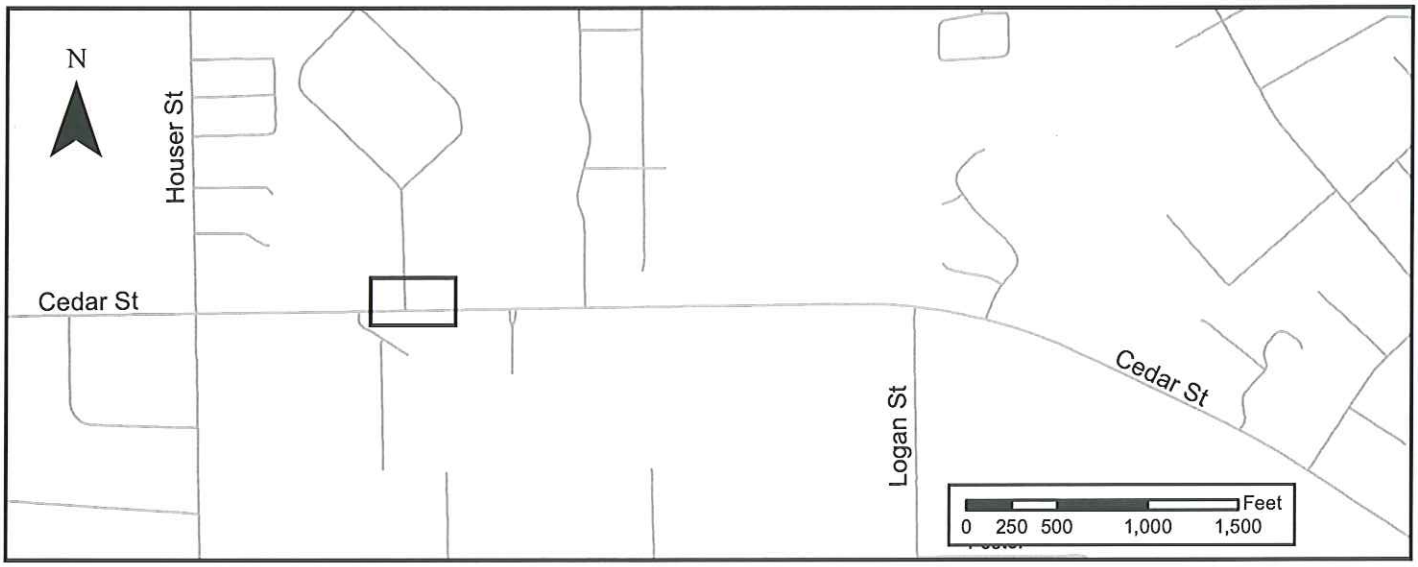
PLAN VIEW 2

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

Cedar Street at Logan Street and High School

Average Daily Traffic Map

Muscatine, IA



Legend	
1	Counter Number & Location
### Vehicles	Average Daily Traffic
## mph	Average Daily Speed

Map Created By

Bi-State Regional Commission

July, 2012

Average daily traffic counts were taken over a three day period in October 2010.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Muscatine
Street: Cedar St (Location # 6)

A study of vehicle traffic was conducted with HI-STAR unit number 3301. The study was done in the WB Right lane on Cedar St (Location # 6) in Muscatine, IA in Muscatine county. The study began on 09/28/2010 at 11:00 AM and concluded on 10/01/2010 at 11:00 AM, lasting a total of 72 hours. Data was recorded in 15 minute time periods. The total recorded volume of traffic showed 2,458 vehicles passed through the location with a peak volume of 142 on 09/29/2010 at 07:45 AM and a minimum volume of 0 on 09/28/2010 at 08:30 PM. The AADT Count for this study was 819.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin.

Chart 1

0 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 >
0	98	411	993	647	136	77	10	4	2	4	0	1	0	1

At least half of the vehicles were traveling in the 20 - 24 mph range or a lower speed. The average speed for all classified vehicles was 24 mph with 4.15 percent exceeding the posted speed of 35 mph. The HI-STAR found 0.25 percent of the total vehicles were traveling in excess of 55 mph. The mode speed for this traffic study was 20 mph and the 85th percentile was 29.05 mph.

CLASSIFICATION

Chart 2 lists the values of the eight classification bins and the total traffic volume accumulated for each bin.

Chart 2

0 to 20	21 to 27	28 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 >
2264	73	35	5	6	1	0	0

Most of the vehicles classified during the study were Passenger Cars. The number of Passenger Cars in the study was 2,337 which represents 98.00 percent of the total classified vehicles. The number of Small Trucks in the study was 35 which represents 1.50 percent of the total classified vehicles. The number of Trucks/Buses in the study was 5 which represents 0.20 percent of the total classified vehicles. The number of Tractor Trailers in the study was 7 which represents 0.30 percent of the total classified vehicles.

HEADWAY

During the peak time period, on 09/29/2010 at 07:45 AM the average headway between the vehicles was 6.29 seconds. The slowest traffic period was on 09/28/2010 at 08:30 PM. During this slowest period, the average headway was 900.0 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 52 and 113 degrees Fahrenheit. The HI-STAR determined that the roadway surface was Dry 100.00 percent of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Muscatine
Street: Cedar St (Location # 7)

A study of vehicle traffic was conducted with HI-STAR unit number 3350. The study was done in the WB lane on Cedar St (Location # 7) in Muscatine, IA in Muscatine county. The study began on 09/28/2010 at 11:00 AM and concluded on 10/01/2010 at 11:00 AM, lasting a total of 72 hours. Data was recorded in 15 minute time periods. The total recorded volume of traffic showed 12,104 vehicles passed through the location with a peak volume of 114 on 09/30/2010 at 03:30 PM and a minimum volume of 0 on 09/29/2010 at 01:45 AM. The AADT Count for this study was 4,035.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin.

Chart 1

0 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 >
0	183	494	510	740	3393	4505	1775	314	55	13	3	2	2	3

At least half of the vehicles were traveling in the 35 - 39 mph range or a lower speed. The average speed for all classified vehicles was 35 mph with 55.6 percent exceeding the posted speed of 35 mph. The HI-STAR found 0.19 percent of the total vehicles were traveling in excess of 55 mph. The mode speed for this traffic study was 35 mph and the 85th percentile was 41.04 mph.

CLASSIFICATION

Chart 2 lists the values of the eight classification bins and the total traffic volume accumulated for each bin.

Chart 2

0 to 20	21 to 27	28 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 >
11505	280	135	30	25	12	4	1

Most of the vehicles classified during the study were Passenger Cars. The number of Passenger Cars in the study was 11,785 which represents 98.30 percent of the total classified vehicles. The number of Small Trucks in the study was 135 which represents 1.10 percent of the total classified vehicles. The number of Trucks/Buses in the study was 30 which represents 0.30 percent of the total classified vehicles. The number of Tractor Trailers in the study was 42 which represents 0.40 percent of the total classified vehicles.

HEADWAY

During the peak time period, on 09/30/2010 at 03:30 PM the average headway between the vehicles was 7.83 seconds. The slowest traffic period was on 09/29/2010 at 01:45 AM. During this slowest period, the average headway was 900.0 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 52 and 107 degrees Fahrenheit. The HI-STAR determined that the roadway surface was Dry 100.00 percent of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Muscatine
Street: Cedar St (Location # 8)

A study of vehicle traffic was conducted with HI-STAR unit number 3343. The study was done in the SB Left lane on Cedar St (Location # 8) in Muscatine, IA in Muscatine county. The study began on 09/28/2010 at 11:00 AM and concluded on 10/01/2010 at 11:00 AM, lasting a total of 72 hours. Data was recorded in 15 minute time periods. The total recorded volume of traffic showed 2,305 vehicles passed through the location with a peak volume of 87 on 09/29/2010 at 03:15 PM and a minimum volume of 0 on 09/28/2010 at 09:30 PM. The AADT Count for this study was 768.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin.

Chart 1

0 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 >
0	147	813	911	257	51	7	26	12	2	3	1	1	1	0

At least half of the vehicles were traveling in the 20 - 24 mph range or a lower speed. The average speed for all classified vehicles was 21 mph with 16.1 percent exceeding the posted speed of 25 mph. The HI-STAR found 0.27 percent of the total vehicles were traveling in excess of 55 mph. The mode speed for this traffic study was 20 mph and the 85th percentile was 25.51 mph.

CLASSIFICATION

Chart 2 lists the values of the eight classification bins and the total traffic volume accumulated for each bin.

Chart 2

0 to 20	21 to 27	28 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 >
2117	55	38	16	3	0	1	2

Most of the vehicles classified during the study were Passenger Cars. The number of Passenger Cars in the study was 2,172 which represents 97.30 percent of the total classified vehicles. The number of Small Trucks in the study was 38 which represents 1.70 percent of the total classified vehicles. The number of Trucks/Buses in the study was 16 which represents 0.70 percent of the total classified vehicles. The number of Tractor Trailers in the study was 6 which represents 0.30 percent of the total classified vehicles.

HEADWAY

During the peak time period, on 09/29/2010 at 03:15 PM the average headway between the vehicles was 10.23 seconds. The slowest traffic period was on 09/28/2010 at 09:30 PM. During this slowest period, the average headway was 900.0 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 52 and 111 degrees Fahrenheit. The HI-STAR determined that the roadway surface was Dry 100.00 percent of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Muscatine
Street: Cedar St (Location # 9)

A study of vehicle traffic was conducted with HI-STAR unit number 3300. The study was done in the SB Right lane on Cedar St (Location # 9) in Muscatine, IA in Muscatine county. The study began on 09/28/2010 at 11:00 AM and concluded on 10/01/2010 at 11:00 AM, lasting a total of 72 hours. Data was recorded in 15 minute time periods. The total recorded volume of traffic showed 2,362 vehicles passed through the location with a peak volume of 83 on 09/29/2010 at 03:15 PM and a minimum volume of 0 on 09/28/2010 at 09:45 PM. The AADT Count for this study was 787.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin.

Chart 1

0 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 >
0	137	693	1054	285	62	18	5	11	6	1	2	0	0	2

At least half of the vehicles were traveling in the 20 - 24 mph range or a lower speed. The average speed for all classified vehicles was 22 mph with 17.2 percent exceeding the posted speed of 25 mph. The HI-STAR found 0.22 percent of the total vehicles were traveling in excess of 55 mph. The mode speed for this traffic study was 20 mph and the 85th percentile was 25.89 mph.

CLASSIFICATION

Chart 2 lists the values of the eight classification bins and the total traffic volume accumulated for each bin.

Chart 2

0 to 20	21 to 27	28 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 >
2142	103	21	8	1	1	0	0

Most of the vehicles classified during the study were Passenger Cars. The number of Passenger Cars in the study was 2,245 which represents 98.60 percent of the total classified vehicles. The number of Small Trucks in the study was 21 which represents 0.90 percent of the total classified vehicles. The number of Trucks/Buses in the study was 8 which represents 0.40 percent of the total classified vehicles. The number of Tractor Trailers in the study was 2 which represents 0.10 percent of the total classified vehicles.

HEADWAY

During the peak time period, on 09/29/2010 at 03:15 PM the average headway between the vehicles was 10.71 seconds. The slowest traffic period was on 09/28/2010 at 09:45 PM. During this slowest period, the average headway was 900.0 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 52 and 117 degrees Fahrenheit. The HI-STAR determined that the roadway surface was Dry 100.00 percent of the time.

Date/Time/Volume/Average Speed/Temperature Report

H

HI-Star ID: 3301

Begin: 09/28/2010 11:00 AM End: 10/01/2010 11:00 AM

Street: Cedar St (Location # 6)

State: IA
City: Muscatine
County: Muscatine

Lane: WB Right
Oper: LP
Posted: 35
AADT Factor: 1

Hours: 72:00
Period: 60
Raw Count: 2458
AADT Count: 819

NC97 Date & Time Range	Count	Avg Speed	Temp	Wet/Dry
09/28/2010				
[11:00 AM-12:00 PM]	27	25 mph	93 F	Dry
[12:00 PM-01:00 PM]	37	25 mph	91 F	Dry
[01:00 PM-02:00 PM]	26	25 mph	97 F	Dry
[02:00 PM-03:00 PM]	38	23 mph	101 F	Dry
[03:00 PM-04:00 PM]	**109**	21 mph	103 F	Dry
[04:00 PM-05:00 PM]	94	26 mph	97 F	Dry
[05:00 PM-06:00 PM]	**107**	26 mph	89 F	Dry
[06:00 PM-07:00 PM]	67	26 mph	78 F	Dry
[07:00 PM-08:00 PM]	43	26 mph	72 F	Dry
[08:00 PM-09:00 PM]	9	30 mph	68 F	Dry
[09:00 PM-10:00 PM]	4	24 mph	66 F	Dry
[10:00 PM-11:00 PM]	4	28 mph	62 F	Dry
[11:00 PM-12:00 AM]	1	28 mph	62 F	Dry
09/29/2010				
[12:00 AM-01:00 AM]	0	0 mph	58 F	Dry
[01:00 AM-02:00 AM]	1	28 mph	58 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	56 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	54 F	Dry
[04:00 AM-05:00 AM]	1	28 mph	54 F	Dry
[05:00 AM-06:00 AM]	5	27 mph	54 F	Dry
[06:00 AM-07:00 AM]	36	26 mph	54 F	Dry
[07:00 AM-08:00 AM]	**243**	24 mph	56 F	Dry
[08:00 AM-09:00 AM]	117	20 mph	66 F	Dry
[09:00 AM-10:00 AM]	30	25 mph	76 F	Dry
[10:00 AM-11:00 AM]	23	28 mph	87 F	Dry
[11:00 AM-12:00 PM]	35	25 mph	97 F	Dry
[12:00 PM-01:00 PM]	36	26 mph	105 F	Dry
[01:00 PM-02:00 PM]	21	26 mph	109 F	Dry
[02:00 PM-03:00 PM]	40	23 mph	111 F	Dry
[03:00 PM-04:00 PM]	**102**	21 mph	109 F	Dry
[04:00 PM-05:00 PM]	30	25 mph	101 F	Dry
[05:00 PM-06:00 PM]	51	25 mph	93 F	Dry
[06:00 PM-07:00 PM]	36	26 mph	83 F	Dry
[07:00 PM-08:00 PM]	14	26 mph	76 F	Dry
[08:00 PM-09:00 PM]	7	26 mph	74 F	Dry
[09:00 PM-10:00 PM]	2	22 mph	72 F	Dry
[10:00 PM-11:00 PM]	2	20 mph	70 F	Dry
[11:00 PM-12:00 AM]	0	0 mph	68 F	Dry
09/30/2010				
[12:00 AM-01:00 AM]	0	0 mph	68 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	64 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	62 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	60 F	Dry
[04:00 AM-05:00 AM]	0	0 mph	58 F	Dry
[05:00 AM-06:00 AM]	2	22 mph	58 F	Dry
[06:00 AM-07:00 AM]	43	25 mph	56 F	Dry
[07:00 AM-08:00 AM]	**241**	21 mph	58 F	Dry
[08:00 AM-09:00 AM]	93	21 mph	66 F	Dry

[09:00 AM-10:00 AM]	19	25 mph	74 F	Dry
[10:00 AM-11:00 AM]	30	24 mph	83 F	Dry
[11:00 AM-12:00 PM]	28	25 mph	93 F	Dry
[12:00 PM-01:00 PM]	35	27 mph	97 F	Dry
[01:00 PM-02:00 PM]	18	26 mph	101 F	Dry
[02:00 PM-03:00 PM]	48	24 mph	101 F	Dry
[03:00 PM-04:00 PM]	93	22 mph	99 F	Dry
[04:00 PM-05:00 PM]	84	25 mph	95 F	Dry
[05:00 PM-06:00 PM]	**113**	25 mph	87 F	Dry
[06:00 PM-07:00 PM]	74	25 mph	78 F	Dry
[07:00 PM-08:00 PM]	23	24 mph	70 F	Dry
[08:00 PM-09:00 PM]	9	28 mph	66 F	Dry
[09:00 PM-10:00 PM]	5	27 mph	62 F	Dry
[10:00 PM-11:00 PM]	4	26 mph	60 F	Dry
[11:00 PM-12:00 AM]	3	34 mph	58 F	Dry
10/01/2010				
[12:00 AM-01:00 AM]	0	0 mph	56 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	54 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	54 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	52 F	Dry
[04:00 AM-05:00 AM]	1	23 mph	52 F	Dry
[05:00 AM-06:00 AM]	3	23 mph	52 F	Dry
[06:00 AM-07:00 AM]	5	28 mph	52 F	Dry
[07:00 AM-08:00 AM]	41	26 mph	52 F	Dry
[08:00 AM-09:00 AM]	10	26 mph	62 F	Dry
[09:00 AM-10:00 AM]	19	26 mph	74 F	Dry
[10:00 AM-11:00 AM]	16	29 mph	85 F	Dry

Date/Time/Volume/Average Speed/Temperature Report

H

HI-Star ID: 3350

Begin: 09/28/2010 11:00 AM End: 10/01/2010 11:00 AM

Street: Cedar St (Location # 7)

State: IA
City: Muscatine
County: Muscatine

Lane: WB
Oper: LP
Posted: 35
AADT Factor: 1

Hours: 72:00
Period: 60
Raw Count: 12104
AADT Count: 4035

NC97 Date & Time Range	Count	Avg Speed	Temp	Wet/Dry
09/28/2010				
[11:00 AM-12:00 PM]	305	37 mph	89 F	Dry
[12:00 PM-01:00 PM]	325	37 mph	87 F	Dry
[01:00 PM-02:00 PM]	272	35 mph	91 F	Dry
[02:00 PM-03:00 PM]	271	33 mph	97 F	Dry
[03:00 PM-04:00 PM]	**345**	27 mph	97 F	Dry
[04:00 PM-05:00 PM]	**351**	37 mph	93 F	Dry
[05:00 PM-06:00 PM]	328	38 mph	85 F	Dry
[06:00 PM-07:00 PM]	203	37 mph	78 F	Dry
[07:00 PM-08:00 PM]	149	37 mph	70 F	Dry
[08:00 PM-09:00 PM]	131	37 mph	66 F	Dry
[09:00 PM-10:00 PM]	60	38 mph	66 F	Dry
[10:00 PM-11:00 PM]	47	39 mph	62 F	Dry
[11:00 PM-12:00 AM]	14	37 mph	62 F	Dry
09/29/2010				
[12:00 AM-01:00 AM]	14	40 mph	58 F	Dry
[01:00 AM-02:00 AM]	11	41 mph	58 F	Dry
[02:00 AM-03:00 AM]	4	39 mph	56 F	Dry
[03:00 AM-04:00 AM]	12	38 mph	54 F	Dry
[04:00 AM-05:00 AM]	23	39 mph	54 F	Dry
[05:00 AM-06:00 AM]	42	37 mph	54 F	Dry
[06:00 AM-07:00 AM]	142	37 mph	54 F	Dry
[07:00 AM-08:00 AM]	182	24 mph	56 F	Dry
[08:00 AM-09:00 AM]	232	21 mph	64 F	Dry
[09:00 AM-10:00 AM]	245	37 mph	74 F	Dry
[10:00 AM-11:00 AM]	270	36 mph	85 F	Dry
[11:00 AM-12:00 PM]	288	37 mph	93 F	Dry
[12:00 PM-01:00 PM]	331	37 mph	99 F	Dry
[01:00 PM-02:00 PM]	246	35 mph	105 F	Dry
[02:00 PM-03:00 PM]	255	31 mph	107 F	Dry
[03:00 PM-04:00 PM]	**365**	27 mph	103 F	Dry
[04:00 PM-05:00 PM]	329	37 mph	99 F	Dry
[05:00 PM-06:00 PM]	341	38 mph	91 F	Dry
[06:00 PM-07:00 PM]	275	36 mph	82 F	Dry
[07:00 PM-08:00 PM]	193	35 mph	76 F	Dry
[08:00 PM-09:00 PM]	133	37 mph	74 F	Dry
[09:00 PM-10:00 PM]	63	36 mph	70 F	Dry
[10:00 PM-11:00 PM]	35	38 mph	70 F	Dry
[11:00 PM-12:00 AM]	29	35 mph	68 F	Dry
09/30/2010				
[12:00 AM-01:00 AM]	10	37 mph	68 F	Dry
[01:00 AM-02:00 AM]	11	38 mph	66 F	Dry
[02:00 AM-03:00 AM]	7	35 mph	62 F	Dry
[03:00 AM-04:00 AM]	13	39 mph	62 F	Dry
[04:00 AM-05:00 AM]	31	37 mph	58 F	Dry
[05:00 AM-06:00 AM]	59	38 mph	58 F	Dry
[06:00 AM-07:00 AM]	148	37 mph	58 F	Dry
[07:00 AM-08:00 AM]	191	26 mph	58 F	Dry
[08:00 AM-09:00 AM]	230	20 mph	66 F	Dry
[09:00 AM-10:00 AM]	194	37 mph	74 F	Dry

[10:00 AM-11:00 AM]	204	37 mph	82 F	Dry
[11:00 AM-12:00 PM]	322	36 mph	89 F	Dry
[12:00 PM-01:00 PM]	339	37 mph	95 F	Dry
[01:00 PM-02:00 PM]	262	34 mph	97 F	Dry
[02:00 PM-03:00 PM]	281	34 mph	99 F	Dry
[03:00 PM-04:00 PM]	**383**	32 mph	97 F	Dry
[04:00 PM-05:00 PM]	371	37 mph	93 F	Dry
[05:00 PM-06:00 PM]	361	37 mph	85 F	Dry
[06:00 PM-07:00 PM]	255	37 mph	76 F	Dry
[07:00 PM-08:00 PM]	174	37 mph	70 F	Dry
[08:00 PM-09:00 PM]	113	37 mph	66 F	Dry
[09:00 PM-10:00 PM]	63	38 mph	64 F	Dry
[10:00 PM-11:00 PM]	43	38 mph	62 F	Dry
[11:00 PM-12:00 AM]	28	40 mph	58 F	Dry
10/01/2010				
[12:00 AM-01:00 AM]	16	39 mph	58 F	Dry
[01:00 AM-02:00 AM]	9	36 mph	56 F	Dry
[02:00 AM-03:00 AM]	1	43 mph	54 F	Dry
[03:00 AM-04:00 AM]	11	38 mph	54 F	Dry
[04:00 AM-05:00 AM]	31	38 mph	52 F	Dry
[05:00 AM-06:00 AM]	54	38 mph	52 F	Dry
[06:00 AM-07:00 AM]	133	37 mph	52 F	Dry
[07:00 AM-08:00 AM]	163	35 mph	52 F	Dry
[08:00 AM-09:00 AM]	189	36 mph	62 F	Dry
[09:00 AM-10:00 AM]	276	36 mph	72 F	Dry
[10:00 AM-11:00 AM]	267	37 mph	82 F	Dry

Date/Time/Volume/Average Speed/Temperature Report

H

HI-Star ID: 3343

Begin: 09/28/2010 11:00 AM End: 10/01/2010 11:00 AM

Street: Cedar St (Location # 8)

State: IA
City: Muscatine
County: Muscatine

Lane: SB Left
Oper: LP
Posted: 25
AADT Factor: 1

Hours: 72:00
Period: 60
Raw Count: 2305
AADT Count: 768

NC97 Date & Time Range	Count	Avg Speed	Temp	Wet/Dry
09/28/2010				
[11:00 AM-12:00 PM]	48	22 mph	95 F	Dry
[12:00 PM-01:00 PM]	22	21 mph	91 F	Dry
[01:00 PM-02:00 PM]	38	21 mph	97 F	Dry
[02:00 PM-03:00 PM]	41	21 mph	101 F	Dry
[03:00 PM-04:00 PM]	**146**	19 mph	101 F	Dry
[04:00 PM-05:00 PM]	37	23 mph	97 F	Dry
[05:00 PM-06:00 PM]	47	21 mph	89 F	Dry
[06:00 PM-07:00 PM]	56	22 mph	80 F	Dry
[07:00 PM-08:00 PM]	89	20 mph	72 F	Dry
[08:00 PM-09:00 PM]	68	21 mph	66 F	Dry
[09:00 PM-10:00 PM]	7	23 mph	66 F	Dry
[10:00 PM-11:00 PM]	12	21 mph	64 F	Dry
[11:00 PM-12:00 AM]	1	28 mph	62 F	Dry
09/29/2010				
[12:00 AM-01:00 AM]	0	0 mph	58 F	Dry
[01:00 AM-02:00 AM]	2	22 mph	58 F	Dry
[02:00 AM-03:00 AM]	1	28 mph	56 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	56 F	Dry
[04:00 AM-05:00 AM]	2	20 mph	54 F	Dry
[05:00 AM-06:00 AM]	3	24 mph	54 F	Dry
[06:00 AM-07:00 AM]	15	23 mph	54 F	Dry
[07:00 AM-08:00 AM]	81	19 mph	56 F	Dry
[08:00 AM-09:00 AM]	69	20 mph	66 F	Dry
[09:00 AM-10:00 AM]	21	22 mph	78 F	Dry
[10:00 AM-11:00 AM]	25	22 mph	89 F	Dry
[11:00 AM-12:00 PM]	54	21 mph	97 F	Dry
[12:00 PM-01:00 PM]	18	23 mph	105 F	Dry
[01:00 PM-02:00 PM]	33	21 mph	109 F	Dry
[02:00 PM-03:00 PM]	70	21 mph	111 F	Dry
[03:00 PM-04:00 PM]	**164**	28 mph	107 F	Dry
[04:00 PM-05:00 PM]	41	22 mph	101 F	Dry
[05:00 PM-06:00 PM]	60	20 mph	93 F	Dry
[06:00 PM-07:00 PM]	43	21 mph	85 F	Dry
[07:00 PM-08:00 PM]	28	20 mph	76 F	Dry
[08:00 PM-09:00 PM]	13	24 mph	74 F	Dry
[09:00 PM-10:00 PM]	1	23 mph	72 F	Dry
[10:00 PM-11:00 PM]	6	23 mph	70 F	Dry
[11:00 PM-12:00 AM]	1	23 mph	68 F	Dry
09/30/2010				
[12:00 AM-01:00 AM]	0	0 mph	70 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	66 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	62 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	62 F	Dry
[04:00 AM-05:00 AM]	2	20 mph	58 F	Dry
[05:00 AM-06:00 AM]	0	0 mph	58 F	Dry
[06:00 AM-07:00 AM]	15	21 mph	58 F	Dry
[07:00 AM-08:00 AM]	94	21 mph	58 F	Dry
[08:00 AM-09:00 AM]	61	20 mph	66 F	Dry
[09:00 AM-10:00 AM]	14	23 mph	78 F	Dry

[10:00 AM-11:00 AM]	29	23 mph	87 F	Dry
[11:00 AM-12:00 PM]	41	22 mph	95 F	Dry
[12:00 PM-01:00 PM]	14	23 mph	99 F	Dry
[01:00 PM-02:00 PM]	26	23 mph	103 F	Dry
[02:00 PM-03:00 PM]	50	20 mph	105 F	Dry
[03:00 PM-04:00 PM]	**141**	20 mph	101 F	Dry
[04:00 PM-05:00 PM]	46	22 mph	97 F	Dry
[05:00 PM-06:00 PM]	100	20 mph	91 F	Dry
[06:00 PM-07:00 PM]	100	19 mph	80 F	Dry
[07:00 PM-08:00 PM]	78	21 mph	74 F	Dry
[08:00 PM-09:00 PM]	43	23 mph	68 F	Dry
[09:00 PM-10:00 PM]	1	23 mph	64 F	Dry
[10:00 PM-11:00 PM]	2	26 mph	62 F	Dry
[11:00 PM-12:00 AM]	3	23 mph	60 F	Dry
10/01/2010				
[12:00 AM-01:00 AM]	0	0 mph	58 F	Dry
[01:00 AM-02:00 AM]	1	23 mph	56 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	54 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	54 F	Dry
[04:00 AM-05:00 AM]	1	18 mph	52 F	Dry
[05:00 AM-06:00 AM]	0	0 mph	52 F	Dry
[06:00 AM-07:00 AM]	5	21 mph	52 F	Dry
[07:00 AM-08:00 AM]	14	20 mph	54 F	Dry
[08:00 AM-09:00 AM]	20	22 mph	64 F	Dry
[09:00 AM-10:00 AM]	21	23 mph	76 F	Dry
[10:00 AM-11:00 AM]	20	23 mph	87 F	Dry

Date/Time/Volume/Average Speed/Temperature Report

H

HI-Star ID: 3300

Begin: 09/28/2010 11:00 AM End: 10/01/2010 11:00 AM

Street: Cedar St (Location # 9)

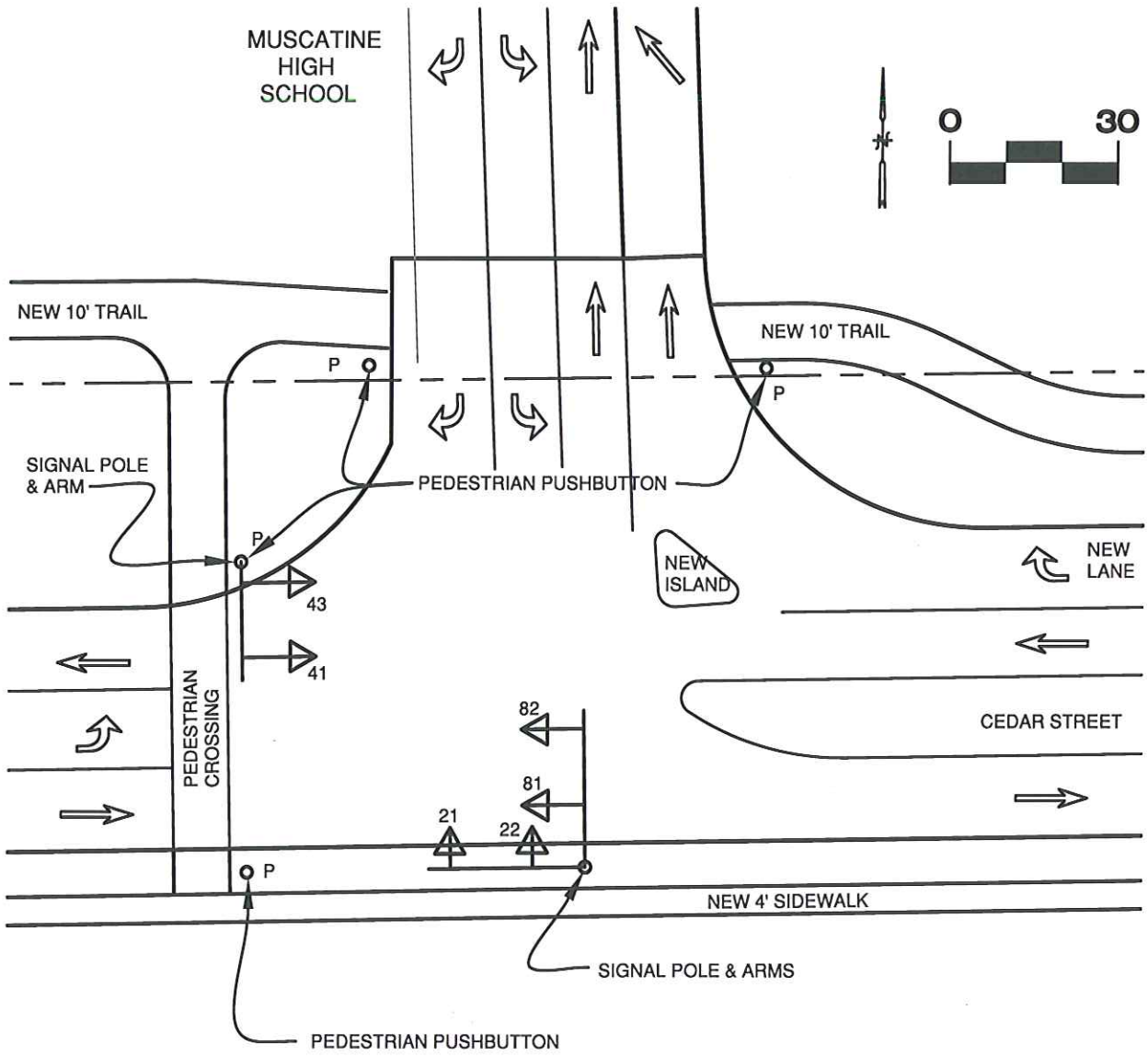
State: IA
City: Muscatine
County: Muscatine

Lane: SB Right
Oper: LP
Posted: 25
AADT Factor: 1

Hours: 72:00
Period: 60
Raw Count: 2362
AADT Count: 787

NC97 Date & Time Range	Count	Avg Speed	Temp	Wet/Dry
09/28/2010				
[11:00 AM-12:00 PM]	71	22 mph	95 F	Dry
[12:00 PM-01:00 PM]	42	24 mph	95 F	Dry
[01:00 PM-02:00 PM]	55	21 mph	97 F	Dry
[02:00 PM-03:00 PM]	51	21 mph	105 F	Dry
[03:00 PM-04:00 PM]	**175**	19 mph	105 F	Dry
[04:00 PM-05:00 PM]	31	26 mph	99 F	Dry
[05:00 PM-06:00 PM]	63	22 mph	91 F	Dry
[06:00 PM-07:00 PM]	31	29 mph	80 F	Dry
[07:00 PM-08:00 PM]	80	21 mph	72 F	Dry
[08:00 PM-09:00 PM]	90	21 mph	68 F	Dry
[09:00 PM-10:00 PM]	10	22 mph	66 F	Dry
[10:00 PM-11:00 PM]	8	20 mph	64 F	Dry
[11:00 PM-12:00 AM]	1	28 mph	62 F	Dry
09/29/2010				
[12:00 AM-01:00 AM]	0	0 mph	60 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	58 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	56 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	56 F	Dry
[04:00 AM-05:00 AM]	1	33 mph	54 F	Dry
[05:00 AM-06:00 AM]	0	0 mph	54 F	Dry
[06:00 AM-07:00 AM]	19	22 mph	54 F	Dry
[07:00 AM-08:00 AM]	62	21 mph	56 F	Dry
[08:00 AM-09:00 AM]	47	23 mph	66 F	Dry
[09:00 AM-10:00 AM]	30	22 mph	78 F	Dry
[10:00 AM-11:00 AM]	40	23 mph	91 F	Dry
[11:00 AM-12:00 PM]	58	23 mph	101 F	Dry
[12:00 PM-01:00 PM]	50	23 mph	109 F	Dry
[01:00 PM-02:00 PM]	50	22 mph	115 F	Dry
[02:00 PM-03:00 PM]	46	24 mph	115 F	Dry
[03:00 PM-04:00 PM]	**154**	20 mph	109 F	Dry
[04:00 PM-05:00 PM]	40	22 mph	105 F	Dry
[05:00 PM-06:00 PM]	46	22 mph	95 F	Dry
[06:00 PM-07:00 PM]	26	23 mph	83 F	Dry
[07:00 PM-08:00 PM]	24	19 mph	76 F	Dry
[08:00 PM-09:00 PM]	8	21 mph	74 F	Dry
[09:00 PM-10:00 PM]	4	22 mph	72 F	Dry
[10:00 PM-11:00 PM]	1	23 mph	70 F	Dry
[11:00 PM-12:00 AM]	2	22 mph	68 F	Dry
09/30/2010				
[12:00 AM-01:00 AM]	0	0 mph	68 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	66 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	62 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	62 F	Dry
[04:00 AM-05:00 AM]	0	0 mph	58 F	Dry
[05:00 AM-06:00 AM]	0	0 mph	58 F	Dry
[06:00 AM-07:00 AM]	17	21 mph	56 F	Dry
[07:00 AM-08:00 AM]	69	21 mph	58 F	Dry
[08:00 AM-09:00 AM]	57	21 mph	68 F	Dry
[09:00 AM-10:00 AM]	31	22 mph	78 F	Dry

[10:00 AM-11:00 AM]	37	23 mph	89 F	Dry
[11:00 AM-12:00 PM]	72	22 mph	97 F	Dry
[12:00 PM-01:00 PM]	53	25 mph	105 F	Dry
[01:00 PM-02:00 PM]	47	22 mph	107 F	Dry
[02:00 PM-03:00 PM]	49	22 mph	109 F	Dry
[03:00 PM-04:00 PM]	**155**	19 mph	105 F	Dry
[04:00 PM-05:00 PM]	47	21 mph	99 F	Dry
[05:00 PM-06:00 PM]	94	22 mph	91 F	Dry
[06:00 PM-07:00 PM]	18	26 mph	78 F	Dry
[07:00 PM-08:00 PM]	33	21 mph	70 F	Dry
[08:00 PM-09:00 PM]	60	21 mph	66 F	Dry
[09:00 PM-10:00 PM]	0	0 mph	64 F	Dry
[10:00 PM-11:00 PM]	2	16 mph	62 F	Dry
[11:00 PM-12:00 AM]	4	32 mph	58 F	Dry
10/01/2010				
[12:00 AM-01:00 AM]	1	18 mph	58 F	Dry
[01:00 AM-02:00 AM]	0	0 mph	56 F	Dry
[02:00 AM-03:00 AM]	0	0 mph	54 F	Dry
[03:00 AM-04:00 AM]	0	0 mph	54 F	Dry
[04:00 AM-05:00 AM]	1	33 mph	52 F	Dry
[05:00 AM-06:00 AM]	1	18 mph	52 F	Dry
[06:00 AM-07:00 AM]	4	24 mph	52 F	Dry
[07:00 AM-08:00 AM]	23	22 mph	54 F	Dry
[08:00 AM-09:00 AM]	27	23 mph	66 F	Dry
[09:00 AM-10:00 AM]	18	23 mph	78 F	Dry
[10:00 AM-11:00 AM]	26	21 mph	89 F	Dry

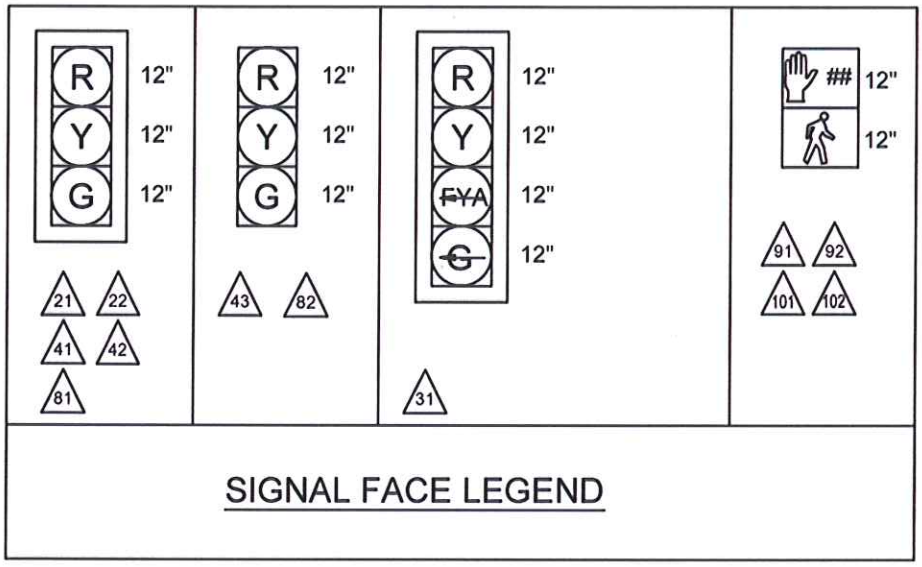


SIGNAL LAYOUT

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

I

TRAFFIC SIGNAL TYPE



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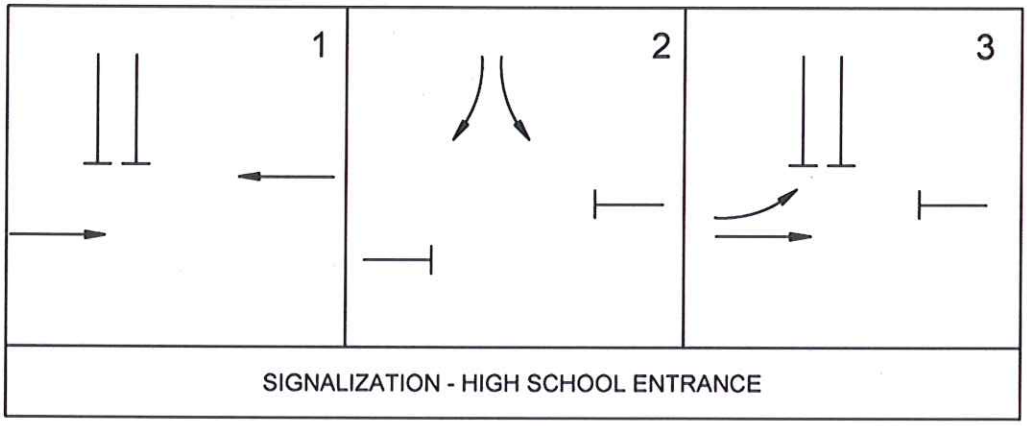
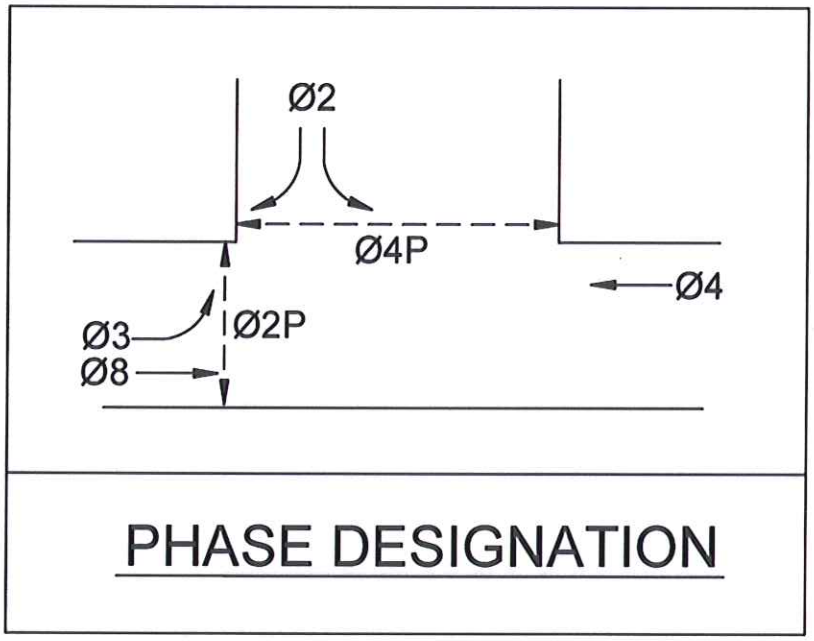
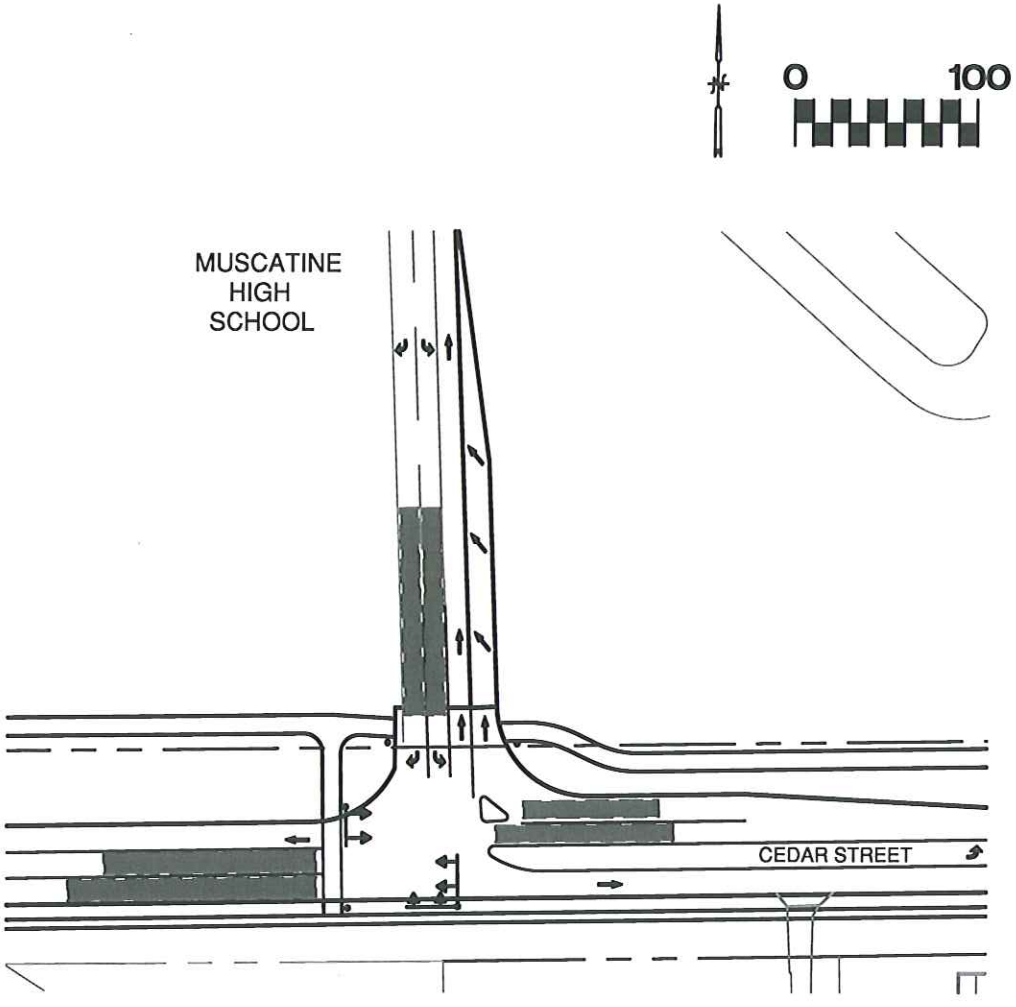
TRAFFIC SIGNAL PROPOSED PHASING







NOTES

1. VEHICLE DETECTION UTILIZES WAVETRONIX SENSORS WITH CUSTOM DETECTION ZONES.
2. THE INTERSECTION WILL HAVE A PROTECTED PERMISSIVE FYA.
3. THE INTERSECTION WILL DWELL GREEN CEDAR STREET 4 & 8 THROUGH MOVEMENT.
4. CABINET WILL BE A CALTRANS 332 TYPE ALUMINUM CABINET.

DETECTOR LOCATIONS

CEDAR STREET TRAFFIC SIGNAL	CITY OF MUSCATINE	DATE: 08/13/12

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 8/09

Iowa DOT Office of Traffic & Safety

County: Muscatine Prepared by: Terry Ostendorf Date Prepared: Aug 15, 2012

Intersection: Cedar Street & Muscatine High School Entrance

Improvement

Proposed Improvement(s): Reconstruct Cedar Street from 2 lane to a 3 lane

Install traffic signals

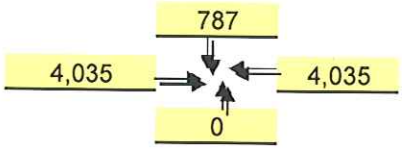
$ 138,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	50	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 138,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2009 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,232,805 Current Annual Entering Veh., **AEV** = DEV * 365

13,161 veh / day, Final Year DEV, **FDEV**

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

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

8,857 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2006 First full year --> 2011 Last full year 6.0 years, Time Period, **T**

Additional months values as of Dec. 2007

	Fatal Crashes		Fatalities @	$3,500,000	$ -
			Major Injuries @	$240,000	$ -
3	Injury Crashes	0	Minor Injuries @	$48,000	$ -
		5	Possible Injuries @	$25,000	$ 125,000
7	Property Damage Only		(assumed cost per crash)	$2,700	$ -
		-OR-	enter all Property Costs of all crashes:		$ 39,100
10	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 164,100

1.67	Current Crashes / Year, **AA** = TA / T	0.52	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 16,410	Cost per Crash, **AVC** = LOSS / TA		
40.5	Total Expected Crashes, **TECR** = CR x TMEV	$ 220,053	Present Value of Avoided Crashes, **BENEFIT**
0.83	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 13,675	Crash Costs Avoided in First Year, AAR x AVC		
20.2	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 = $220,053 : $138,000 = **1.59** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project Quasqueton Diagonal Safety Improvements

Applicant BUCHANAN County Iowa

Contact Person BRIAN KEIERLEBER Title County ENGINEER

Complete Mailing Address 1511 1st St. E,
Independence Iowa 50644

Phone 319-334-6031 (Area Code) E-Mail engineer@

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ $89,307.55

Safety Funds Requested $ 89,307.55

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Buchanan County

Signed: Gary Gissel 8/16/2012

Signature Board of Supervisors Chairman Date Signed

Gary Gissel

Typed Name

Attest: Cindy Gosse 8/16/2012

Signature County Auditor Date Signed

Cindy Gosse

Typed Name

BUCHANAN COUNTY SECONDARY ROAD DEPARTMENT

Brian P. Keierleber PE
County Engineer

Phone: 319-334-6031

1511 1st St E
Independence, IA 50644

Ned A. Johnson
Assistant to the Engineer

Fax: 319-334-9951

Buchanan County is requesting TSIP funds for W35 (Quasqueton Diagonal Blvd) from D22 to the Quasqueton City Limits.

The funding will be utilized to place centerline rumbles and edge line rumble stripes. In addition, two curves have been identified that are particularly dangerous and we are requesting funds to pave 4 foot shoulders on them.

We have identified all curves with a radius less than 1,500 feet and we are in the process of placing chevrons on them. In addition, we have future goals of placing a friction course on these two curves. This road was paved on grade many years ago and the curves and hills lead to substandard conditions. The goals are to reduce the crossovers and the run off the road accidents. These economical measures are well suited to meet these needs. The entire route was posted at 45 MPH but traffic generally does not drive the posted speed. In addition to the reported accidents, it receives a high number of run off the road accidents that are never reported.

As this area develops for residential usage, the accidents will increase unless we take additional preventative measures. The cost benefit ratio of these improvements is very favorable at 18.38 to 1.

This project could have statewide impacts because both of these technologies are very new to the county system. I am unaware of any centerline rumbles on any county roads in Iowa and with the very favorable cost benefit ratios, they may become more commonplace.

W35 TSIP Time Schedule:

May 2012	Develop Plans
Dec 2013	Let Project
June 2014	Allow Construction
Oct 2014	Construction Complete

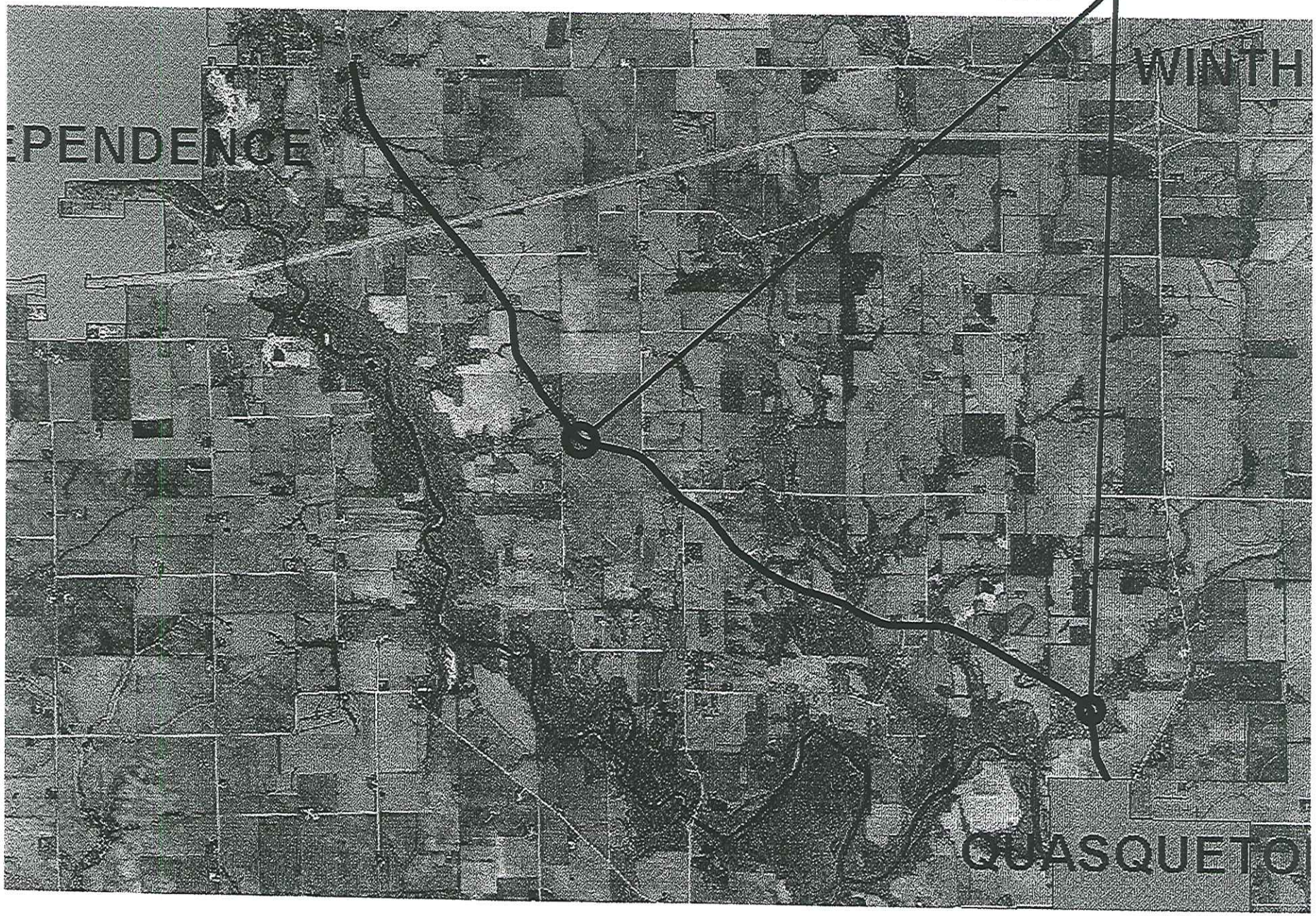
C

Estimated Cost of Construction				
Item	Unit	Unit Price	Amount	Total Cost
TRAFFIC CONTROL	L.S.	$5,976.56	1	$5,976.56
MOBILIZATION	L.S.	$36,511.79	1	$36,511.79
PAVED SHOULDER, P.C. CONCRETE, 6 IN.	S.Y.	$19.88	1283.56	$25,517.17
MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA.	$18.75	733.92	$13,761.00
MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE	STA.	$20.55	366.96	$7,541.03
TOTAL				$89,307.55

*All prices are sourced from the average bid item cost of the Iowa DOT bidx site

PROJECT LOCATION

PAVED SHOULDER LOCATIONS

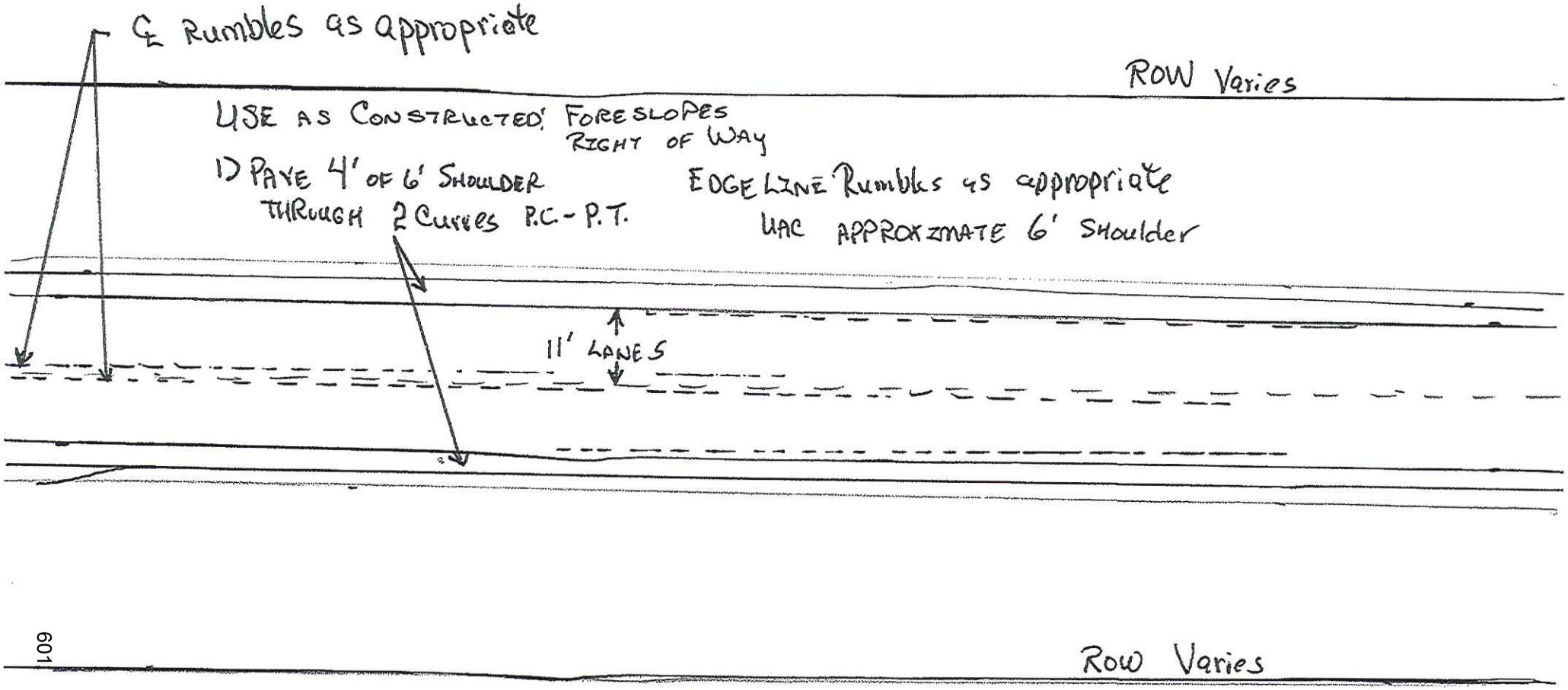


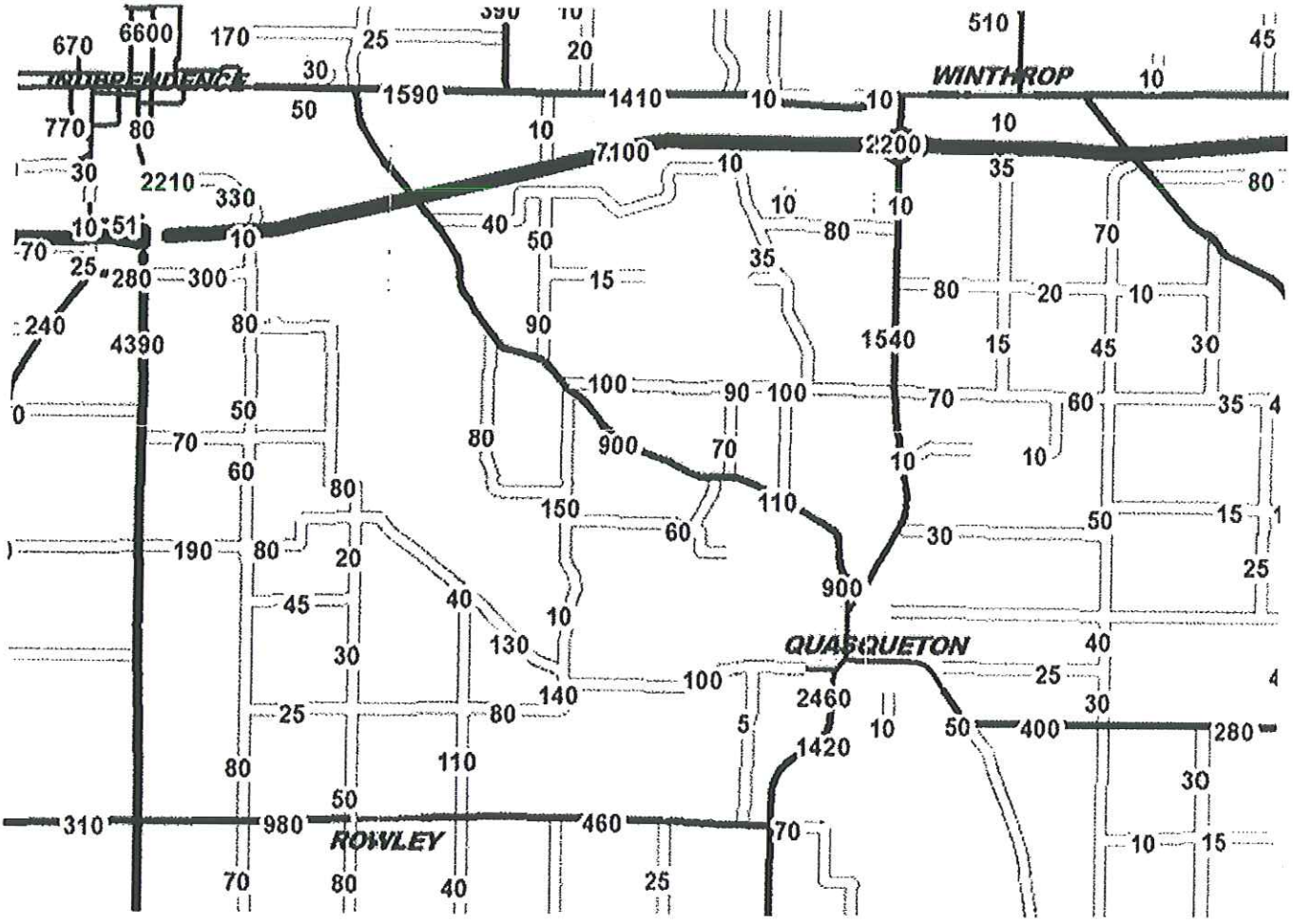
SPEED
LIMIT
45

ITEM 6

W-35
PLAN VIEW

NO NEW ROW





2010 Traffic Counts By The Iowa Dept of Transportation

2 km
2 mi
Google

(L)

Road Segment Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Buchanan Prepared by: _____ Date Prepared: Jul 6, 2012

Location: W35 from D22 to the Quasqueton City Limits

Improvement

Proposed Improvement(s): Placing edge and centerline rumble strips along the length of the pavement as well as paving 4' shoulders on 2 curves along project site.

$ 89,318 Estimated Improvement Cost, **EC**

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

$ - Present Value Other Annual Costs, **OC**

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

20 Est. Improvement Life, years, **Y**

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

4.0% Discount Rate, **INT**

$ 89,318 Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT traffic counts 2009 Date of traffic count

Length (mi.)	Two-way veh/day	Description
6.95	900	
6.95	miles total	

6,255 Current Vehicle Miles / Day, **VM**

7,632 End of Life Veh. Miles / Day

2,283,075 Current Veh. Miles / Year, **AM**

50,271,038 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

2002 First full year --> 2011 Last full year 10.4 years, Time Period, **T**

5 Additional months values as of Dec. 2007

1	Fatal Crashes	0	Fatalities @	$3,500,000	$ -
23	Injury Crashes	5	Major Injuries @	$240,000	$ 1,200,000
		10	Minor Injuries @	$48,000	$ 480,000
		9	Possible Injuries @	$25,000	$ 225,000
29	Property Damage Only		(assumed cost per crash)	$2,700	$ 143,100
			-OR- enter all Property Costs of all crashes:		
53	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 2,048,100

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

$ 38,643 Cost per Crash, **AVCR** = LOSS / TA

112.0 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 101,651 Crash Costs Avoided in First Year, AAR x AVCR

57.9 Total Avoided Crashes, TCR x CRF/ 100

222.9 Crashes / HMVM, Crash Rate, **CR**
CR = TA x 10^8 / (AM x T)

$ 1,501,461 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 = $1,501,461 : $89,318 = **16.81** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project Z-40 (400th Avenue) Horizontal Realignment

Applicant Clinton County

Contact Person Todd Kinney Title County Engineer

Complete Mailing Address 1900 North 3rd Street
Clinton, IA 52733-2957

Phone 563 244 0564 (Area Code) E-Mail tkinney@clintoncounty-ia.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:

Application Type

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

Funding Amount

Total Project Cost $ 71,898.29

Safety Funds Requested $ 71,898.29

Rev. 3/08

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the Clinton County

Signed: Todd Kinney 8/22/11

Signature Date Signed

Todd Kinney, Clinton County Engineer

Typed Name

Attest: 8-22-11

Signature Date Signed

John Staszewski

Typed Name

August 22, 2011

RESOLUTION #2011- 202

BE IT RESOLVED by the Board of Supervisors of Clinton County, Iowa that Todd Kinney, County Engineer of Clinton County, Iowa, be and is hereby designated, authorized, and empowered on behalf of the Board of Supervisors of said County to submit a Traffic Safety Improvement Program Application to the Iowa Department of Transportation for the horizontal re-alignment of 400th Avenue immediately south of its intersection with 140th Street and the installation of a flashing warning beacon on southbound 400th Avenue north of the 140th Street intersection in Clinton County.

BE IT FURTHER RESOLVED by the Board of Supervisors of Clinton County, Iowa that the chairperson be authorized to sign the grant application and should funding be awarded that Clinton County will assume responsibility and ensure proper maintenance of any new or improved installations.

Roll Call:

Davisson: yes

Schmidt: yes

Staszewski: yes

ATTEST:

Eric Van Lancker
County Auditor
County of Clinton
State of Iowa

Chairperson
Clinton County Board of Supervisors

k:\safety\tsf projects\e-50 and 400th ave\tsfgrantauthorization res.doc

REQUEST FOR TRAFFIC SAFETY FUNDS (TSF)
PROJECT NARRATIVE

Location: The project is located on Clinton County Road Z-40 (400th Avenue) in Deep Creek Township. The project would begin just south of E-50 (140th Street) and continue 300 feet south.

Existing Conditions: The existing aggregate roadway section (Z-40) south of E-50 is not aligned across the intersection with the paved portion of Z-40 north of E-50. There is a stop sign for traffic traveling north/south on Z-40, but the centerline of Z-40 on the south side of the intersection is 18 feet east of the centerline of Z-40 on the north side of the intersection. Z-40 is paved to the north of the intersection and is aggregate surfaced south of the intersection. There are two Stop Ahead signs and three rumble strip panels on the south bound lane on Z-40 north of the intersection to warn drivers of the stop controlled intersection. The speed limit on Z-40 is 55 mph. This intersection has a long history of accidents including fatality and injury accidents occurring within the last five years.

Proposed Improvements: The improvement proposed for this section of Z-40 is to align the southern approach with the northern paved approach. The crash data indicates two main problems with the intersection. The first problem is that drivers are not stopping at the stop controlled intersection (or not stopping in time). The second problem is that once the vehicles fail to stop and drive through the intersection, they lose control and run-off the road. Both of the proposed improvements directly address these two main issues. A flashing warning beacon will provide additional warning to the drivers of the stop controlled intersection. The realignment of the road approach south of the intersection will make it easier for drivers to maintain control as they pass through the intersection and lessen the severity of these occurrences. Attached is an email from the landowner who lives directly south of the intersection stating their willingness to cooperate with any need for Right-of-Way (ROW) acquisition for the proposed improvements.

Just south of the intersection with E-50, Z-40 shall be reconstructed so the centerline is aligned through the intersection. This construction shall begin at the southern part of the intersection, 18 feet west of the existing road and continue for 300 feet. The new road alignment will match into the existing road within 300 feet. The new section of road shall be an aggregate surface that is 28 feet wide according to the Rural Collector Design Aid. This includes a 20 foot traveled way and a 4 foot shoulder on each side. The ditches shall be reshaped to have 3:1 slopes and tied back into the existing ditch slope within the limits of the project. One cross road culvert will be replaced as part of the re-grading work required. A flashing warning beacon will also be installed on Z-40 for southbound traffic approaching the intersection.

According to information produced by the IDOT in the "Iowa Comprehensive Highway Safety Plan, One death is Too Many" 15% of all fatal single vehicle run off the road (ROR) type crashes. According to NCHRP Report 500 Volume 5 (A guide for Addressing Unsignalized Intersection Collisions), realignment of intersection approaches to reduce or eliminate intersection skew may be desirable to improve safety at skewed intersections.

Kinney, Todd

From: Hoeft, Emily [Emily.Hoeft@adm.com]
Sent: Monday, August 01, 2011 1:38 PM
To: Engineer; Staszewski, John; 'ccso@gapa911.us'
Cc: 'Dustin Hoeft'; Hoeft, Emily
Subject: Intersection at 400th Ave.

Dear Mr. Kinney, Mr. Staszewski, and Mr. Lincoln,
I apologize for not sending this sooner, but I wanted to let you know that I appreciate you all taking time to discuss the intersection on 400th Ave. with me last week. It was an awful tragedy that occurred there last weekend, and I'm glad to hear that you all are aware of the problem and are working to better the situation.

Even before the accident that occurred last weekend, my husband and I, as one of the homeowners at that intersection, have felt that improvements of any kind, such as adding a flashing red light to the stop sign, reworking the rumble strips, or even realigning the roads is a very worthwhile project. As I expressed to you in our conversations last week, we have lived in our home for nearly four years and have known of 16 cars entering the ditch heading southbound at that intersection. We always try to make a point of reporting those vehicles to either the Law Center or by calling 911. Hopefully, this information is showing up in your data gathering and will help in justifying modifications to the intersection.

I wanted to make you aware as well, and perhaps you already are, that in the days since the accident, I've been approached by many people who were asking about questions and sharing stories about that intersection. And it has become apparent to me that this intersection is well known to those who live in the area as a "thrill ride" where drivers heading south on the blacktop will run the stop sign at a high rate of speed on purpose. If the driver aligns the car correctly, the vehicle will crest the east/west blacktop and "go airborne" landing on our gravel road. As you can imagine, when this dangerous stunt doesn't go as planned, the car ends up in the ditch and has the potential to end up in our front yard. Not only is this dangerous for the driver, but also dangerous for any cross traffic and it is even dangerous for us as homeowners.

This brings up another point that may be useful in your justification of the project- safety of our property. When we moved to our home four years ago, two weeks after moving in, a vehicle went into the ditch in much the same way as the accident last weekend. It wound up missing the trees in our front yard, but hit our driveway where it overturned and caught fire. Luckily, the driver was pulled from the vehicle before it was fully engulfed, but the driver sustained severe burns to his lower half and had to be airlifted from the scene. Since that accident, we have not spent time in our front yard and now with a two-year-old son, don't spend time out there at all and plan to not allow him in the front yard unsupervised when he is older for fear that someone will crash into the same area. The accident last weekend reinforced that idea in a severe and tragic way. I understand that these accidents typically happen late at night and people wouldn't be outside and in the yard, but there's no guarantee of that, and it's not worth the risk from our standpoint. We've also had to repair our livestock fences along that ditch several times because of damage from cars going in the ditch and it definitely makes one very uneasy to be working in that area as cars go by on the blacktop knowing how quickly and frequently accidents happen there.

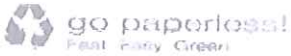
I would also like you to know that whatever the resolution, my husband and I are more than willing to work with the county should there be any concerns regarding right-of-way or private property. I work at ADM, and our safety culture drives everything we do. We learn about the safety pyramid and how safety risks in the work place cause near misses which lead to injuries, and injuries lead to fatalities. I feel like this intersection is a safety risk and it has made its way to the top of that safety risk pyramid. I hope that this intersection can be improved and we can avoid other accidents in the future.

Again, I appreciate all of your efforts in bettering this situation, and should any of you need information or would like to visit our property to better understand the situation, please let me know.

Item B.

Emily Hoeft

Emily Hoeft
ADM Polymer and Cogeneration
(563) 241-4533



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Item C

Engineer's Estimate of Costs for Z40 (400th Avenue) Horizontal Alignment Improvements

Line No.	Item No.	Description	Units	No. Units	Price/Unit	Total
1	2102-2710070	Excavation, Class 10, Roadway and Borrow	CY	4,622.22	7.00	32,355.55
2	2105-8425015	Topsoil, Strip, Salvage and Spread	CY	612.00	4.40	2,692.80
3	2312-8260051	Granular Surfacing on Road, Class A Crushed Stone	TON	294.00	19.35	5,688.90
4	2417-1060024	Culvert, Corrugated Metal Roadway Pipe, 24 inch diameter	LF	80.00	40.00	3,200.00
5	2502-8215804	Subdrain, Tile, 4 inch diameter	LF	40.00	8.93	357.20
6	2518-6910000	Safety Closure	EACH	2.00	500.00	1,000.00
7	2519-3280000	Fence, Field	LF	200.00	4.43	886.00
8	2519-4200140	Removal of Fence, Field	LF	200.00	1.10	220.00
9	2528-8445110	Traffic Control	LS	1.00	8,000.00	8,000.00
10	2533-4980005	Mobilization	LS	1.00	10,000.00	10,000.00
11	2601-2634100	Mulching	ACRE	0.50	1,000.00	495.87
12	2601-2636043	Seeding and Fertilizing (Rural)	ACRE	0.50	1,000.00	495.87
13	2602-0000020	Silt Fence	LF	700.00	1.72	1,204.00
14	NA	Flashing Warning Beacon	EACH	1.00	3,000.00	3,000.00
15	NA	ROW Acquisition	LS	1.00	2,302.11	2,302.11
		Estimate of Costs			Total	$71,898.29

Notes

2010 Summary of Prices and Local Bid Letting Information
Roadway top is 28' and gravel depth is 6"
Ditches have 3:1 slopes and 8' depth
Project length is 300'
Requires ROW acquisition of 0.186 acres with cost of $66,300 for 35 acres.
2011 Factor = 3.46

REQUEST FOR TRAFFIC SAFETY FUNDS
TIME SCHEDULE

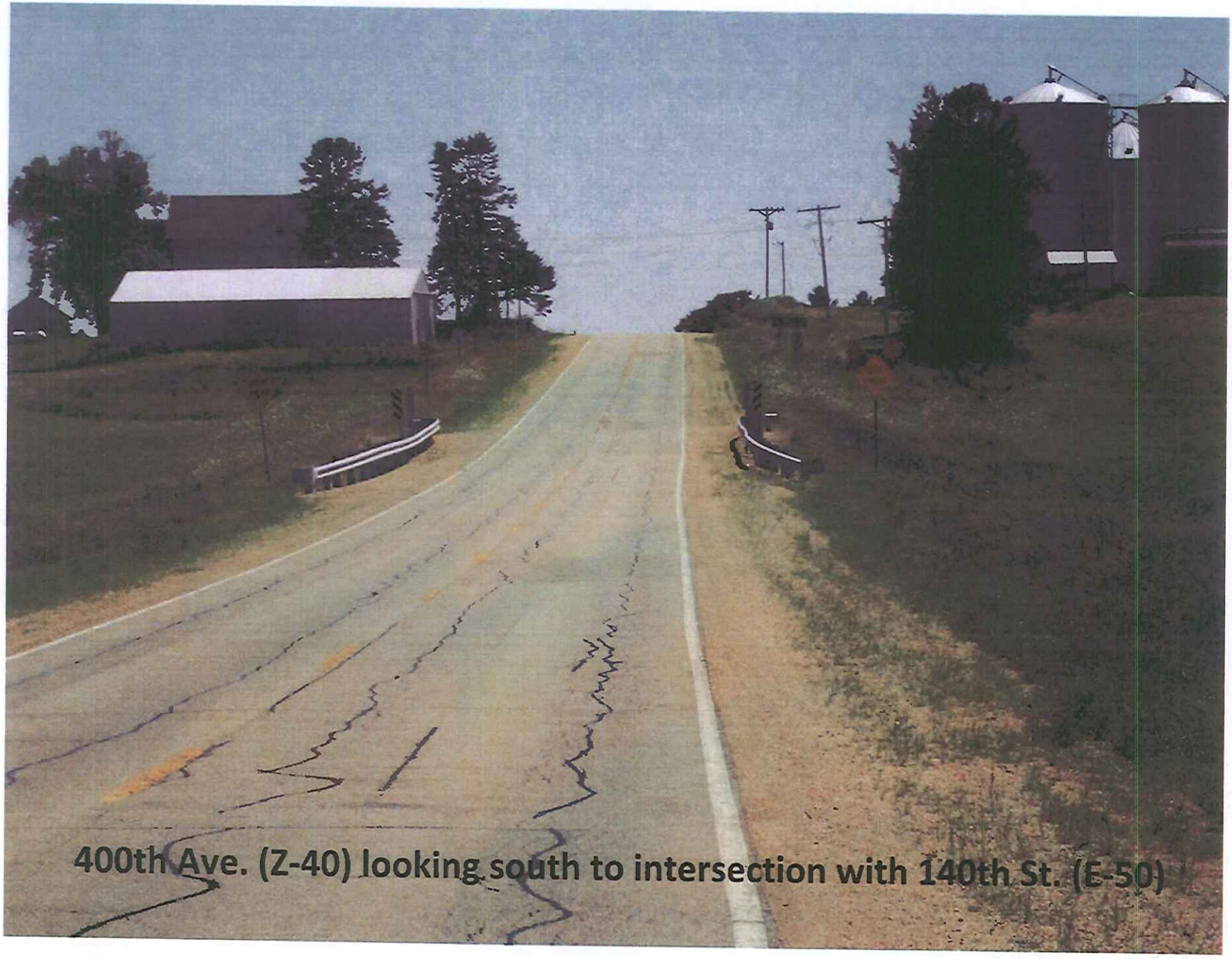
The proposed Z-40 (400th Ave.) realignment project will be added to the Clinton County Secondary Road Program in FY 2014. Design would begin on the project in the spring of 2012 which would include the surveying and purchase of ROW. Construction would most likely occur in the summer of 2013 and be completed by November 2013.

140th Street and 400th Avenue Intersection (Co. Rd. Z40 and Co. Rd. E50)
T83N, R5E, Sec. 25
T83N, R6E, Sec. 30

Location of Project

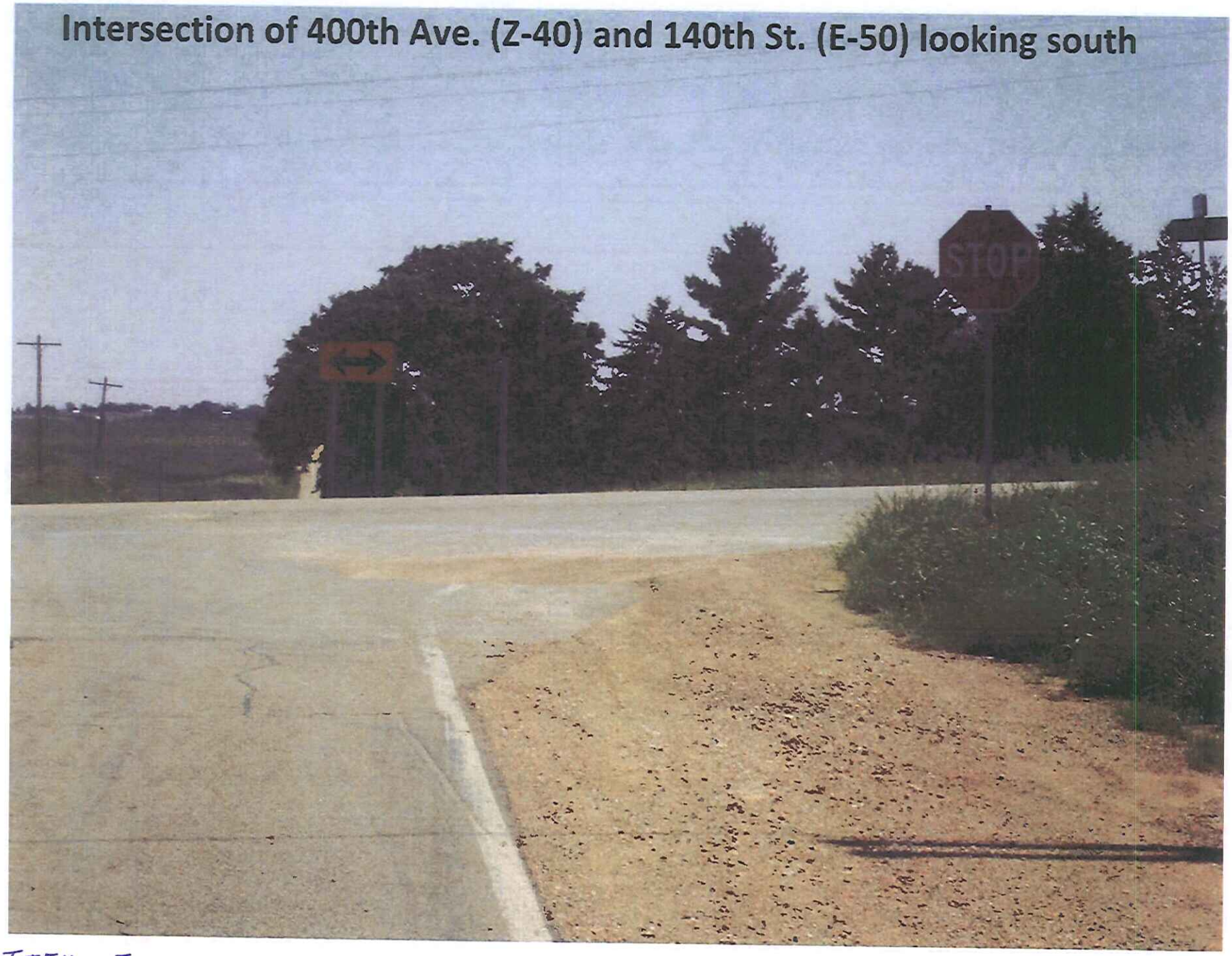
Item E

Item F.


400th Ave. (Z-40) looking south to intersection with 140th St. (E-50)

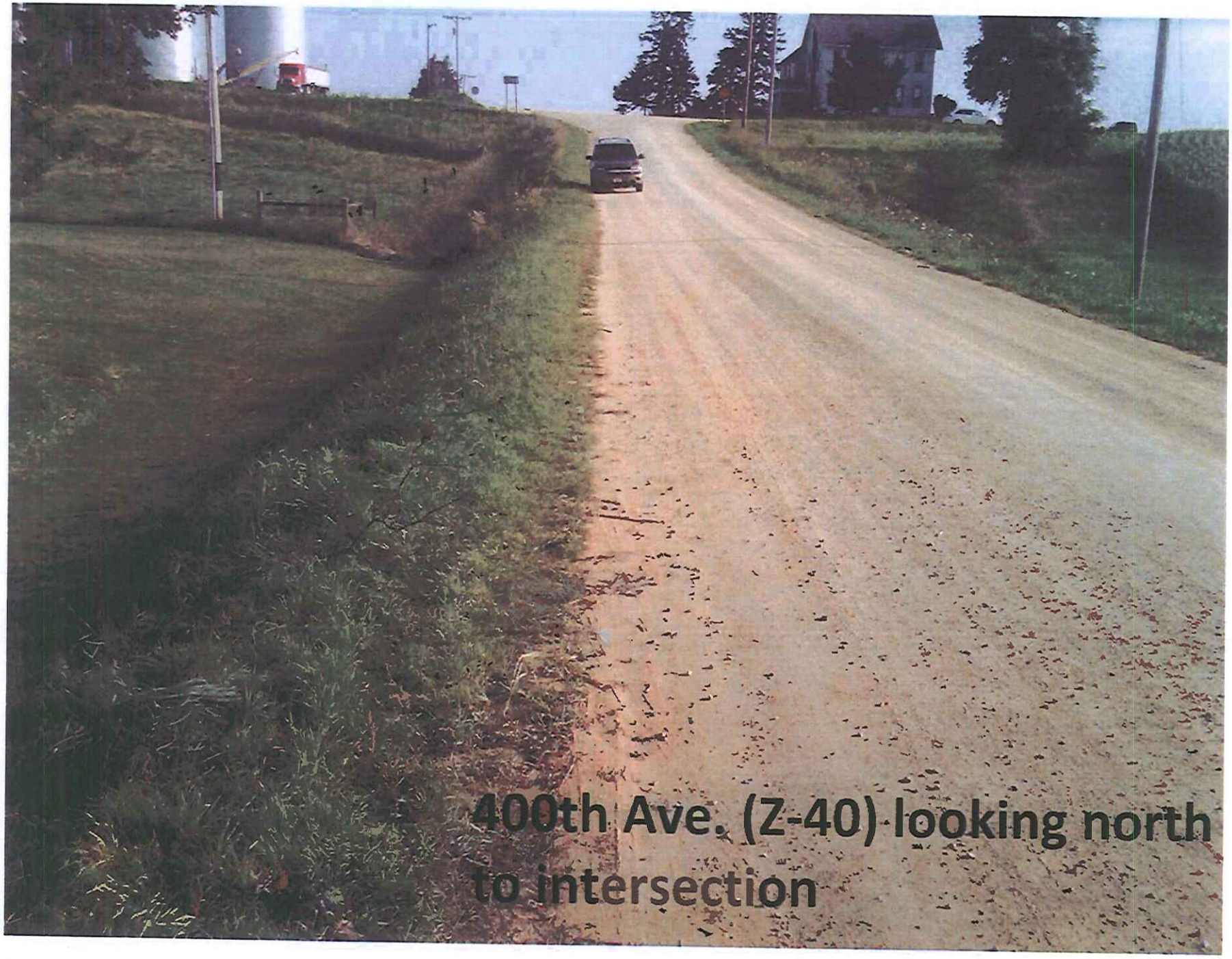
ITEM F.

Item F.


Intersection of 400th Ave. (Z-40) and 140th St. (E-50) looking south
STOP

ITEM F.

Item F.



ITEM F.

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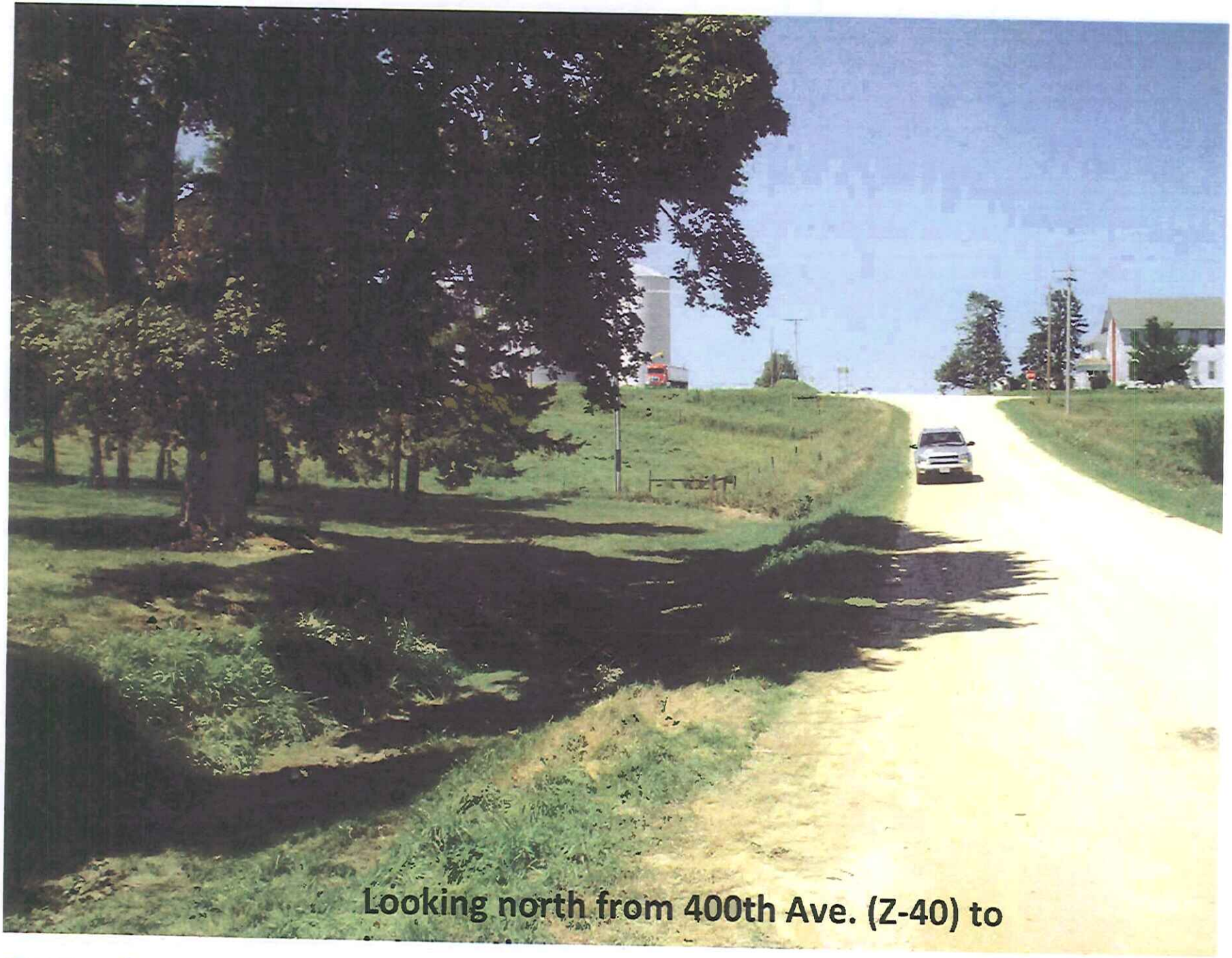
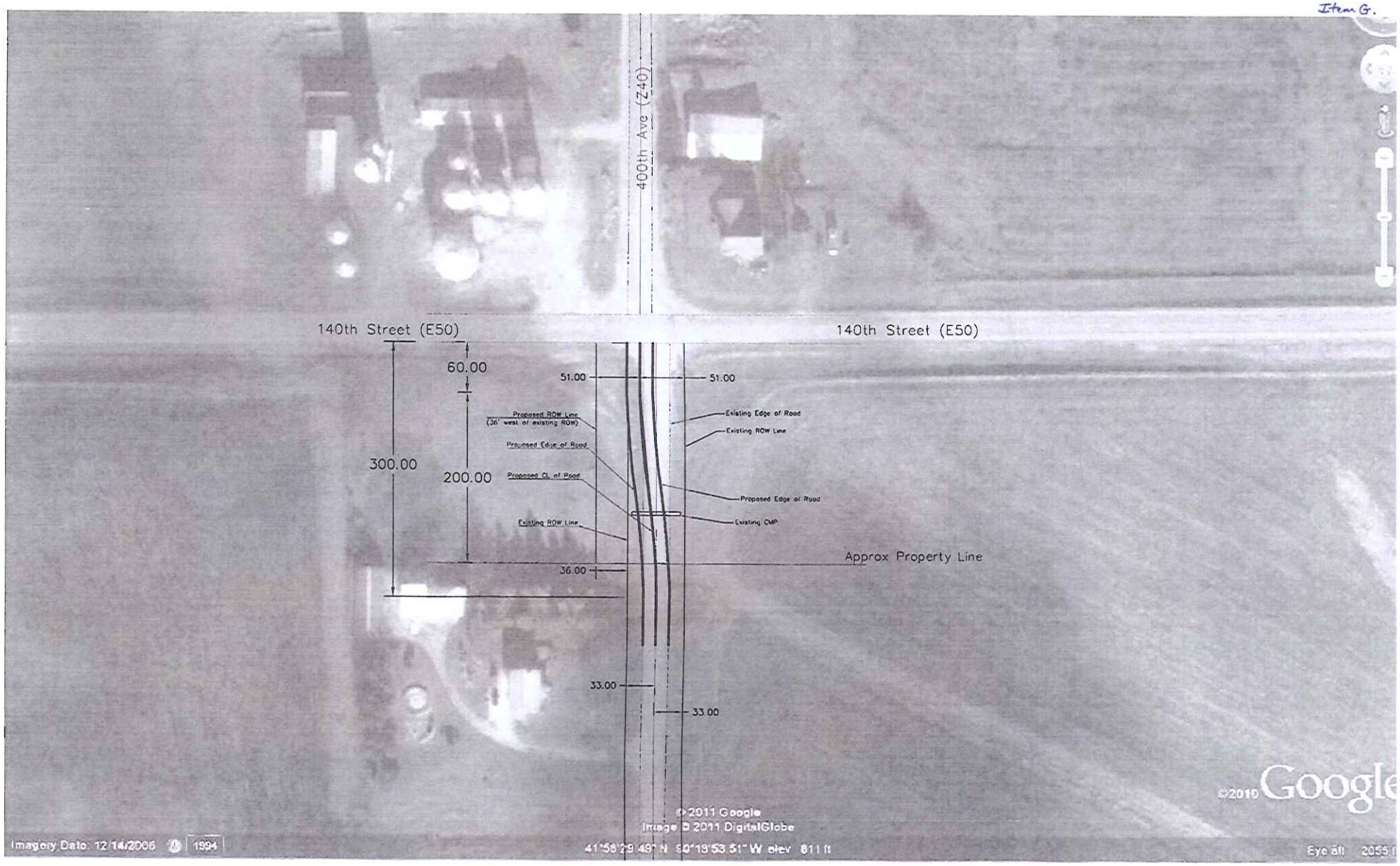


ITEM F.

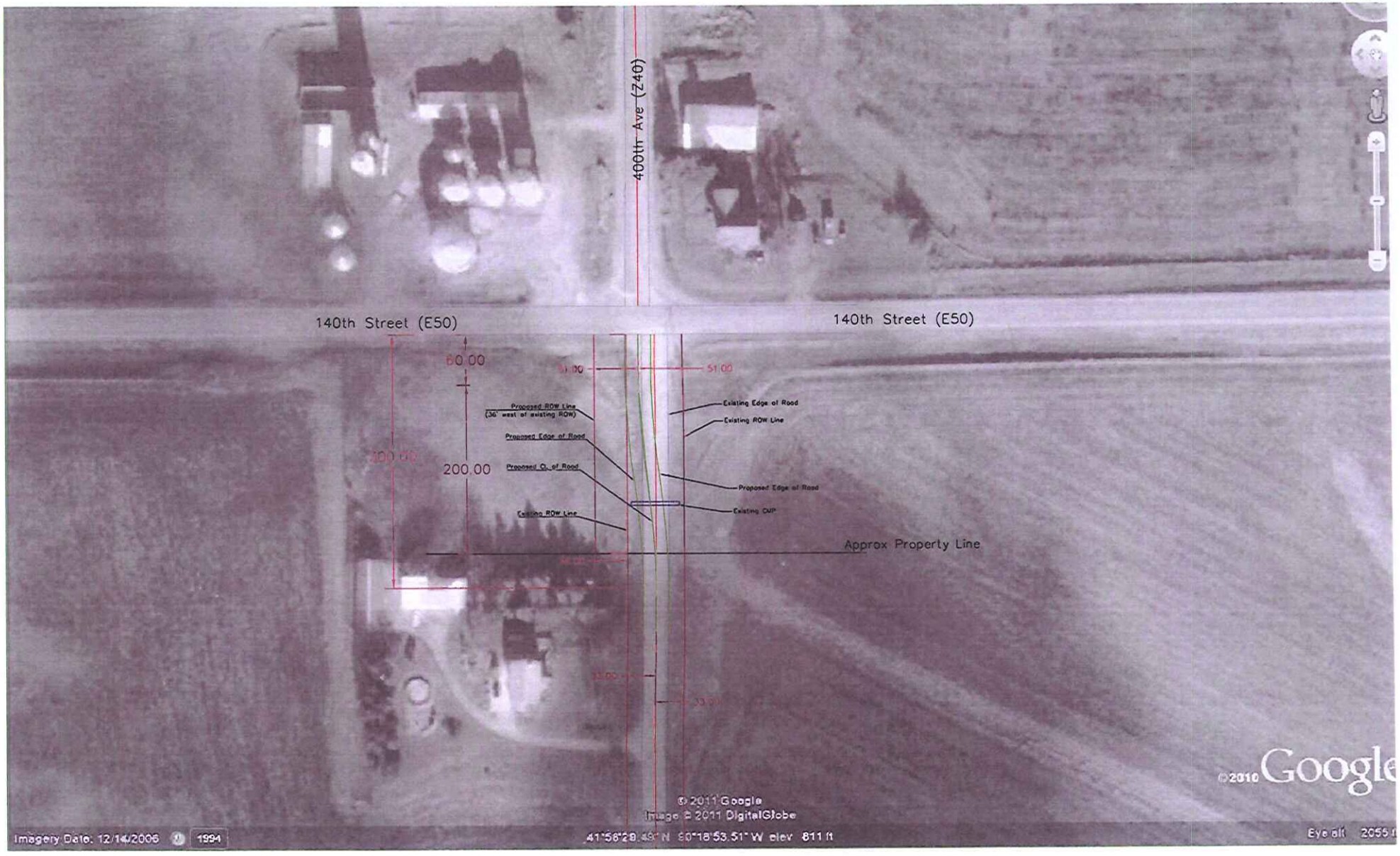
Item G.



Item G

Scale 1"=100'

Item G.



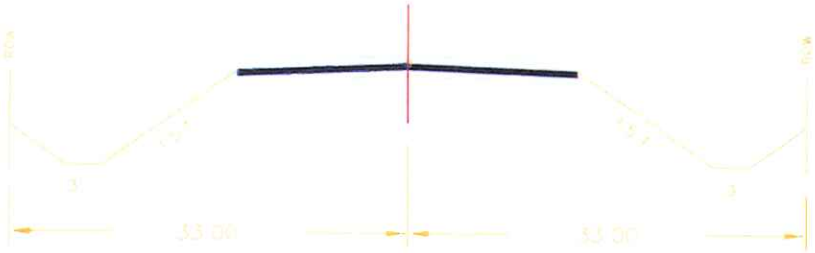
Item G

Scale 1"=100'

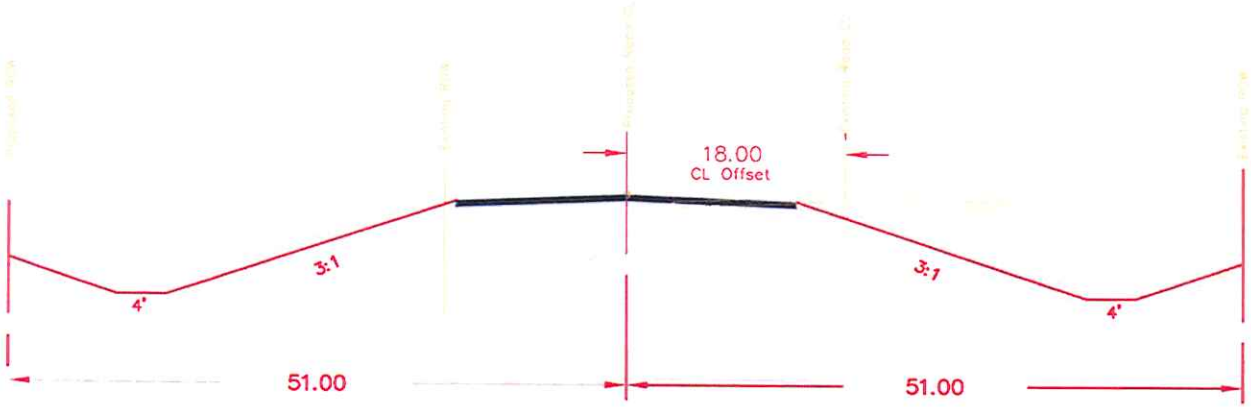
Item G.

Approximate Existing Section at Sta 0+50.00

Scale 1"=10'



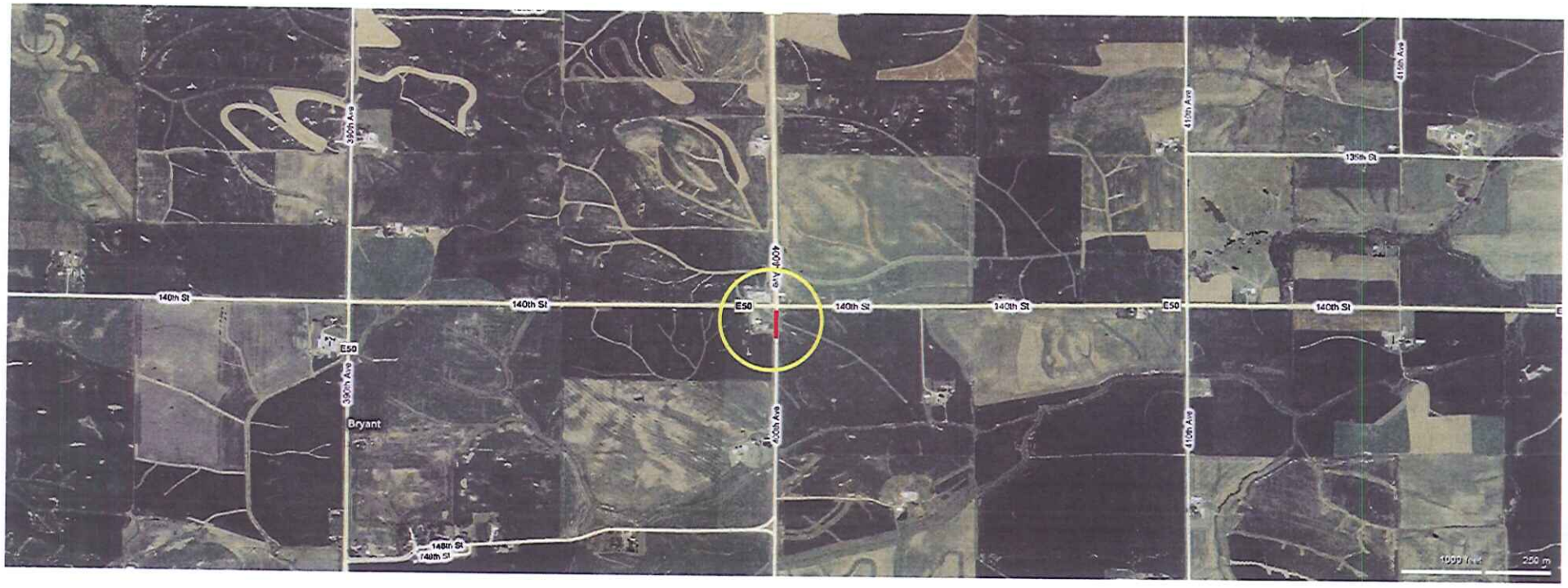
Proposed Section at Sta.0+50.00



140th Street and 400th Avenue Intersection (Co. Rd. Z40 and Co. Rd. E50)
T83N, R5E, Sec. 25
T83N, R6E, Sec. 30

Location of Project

Item H



Item L.

Table 2 (continued)
Geometric Countermeasures at Unsignalized Intersections

Improvement Type/Special User	Cost	Potential Effectiveness (Percentage Reduction)					
		Total Crashes	Right Angle	Left Turn	Rear-end	Sideswipe	Older Driver
OTHER/GEOMETRIC IMPROVEMENTS							
Shoulder Bypass Lanes; Rural Intersections.	Low				●		
Move Intersection Away from Curve.	High	25 [1,7,8]	●		●	●	
Horizontal/Vertical Realignment of Approaches.	High	● [7]					
Raised Medians Near Major Intersections.	Medium-High	25 [6,1,7,8]					
Continuous Two-Way Left-Turn Lanes to Separate Left Turn and Through Traffic	High	30-40 [1,7,8]			●		
Convert 4-Leg to Two, 2-T Intersections	High	57 [5,10]					
Convert Two-T Intersections to One 4-Leg.	High	● [7]					
Close or Relocate High Risk Intersections	Variable	100 [7]					
Full Width Paved Shoulders. No Shoulder Width Less than 8 ft.	Variable	2.8% per ft. of additional shoulder width [7]			●		
Install Splitter Islands on the Minor Road Approach where the Intersection or STOP Sign is not Visible to Motorists.	Medium	NCOE [7]					
Remove Intersection Skew Angle (of less than 80 degrees); Realign Intersection	High	40-50, [1,10]					
Increase Curb Turning/Edge of Pavement Radii	Medium	15-21 [1,7]			●		● [1]
Widen Approaches to Handle Turns	Medium	[7]			●	●	
Roundabouts at Appropriate Locations	High	38, Total Crashes 76, Injuries 90, Fatalities [7]					
Clear Sight Triangle on Stop or Yield Controlled Approaches	Low	● [7]	●				
Clear Sight Triangle in the Medians of Divided Highways Near Intersections	Low	● [7]					

● **Countermeasure/Crash Type identified; however no estimate of effectiveness is provided.**

Table 3:
Signs/Markings/Operational Countermeasures Applicability Noted for Signalized and/or Unsignalized Intersections

Improvement Type	Applicability	Cost	Potential Effectiveness (Percentage Reduction)						
			Total Crashes	Right Angle	Rear End	Side-swipe	Pedestrian	Red-Light Running	Older Adults
SIGNS									
Install SIGNAL AHEAD Sign	Signalized Intersection	Low	3-40 [7,9,11]	35 [9]	●	●		● [2]	
Install LEFT TURN Signal Sign	Signalized Intersection	Low						● [2]	
Install SLIPPERY WHEN WET Sign	Signalized Intersection	Low						● [2]	
Enhanced Signing and Delineation	Unsignalized Intersection	Low	● [7]	●	●				
Supplementary STOP Signs Mounted Over the Roadway	Unsignalized Intersection	Low	● [7]	●					
Install YIELD TO PEDESTRIAN Sign	Undefined	Low					10 [8]		
PAVEMENT MARKINGS/MODIFICATIONS									
Install Raised Pavement Markings	Undefined		6-13 [1] 20-30 (Night) 20-46 (Wet, Night)						●
Use Wider Pavement Markings	Undefined								●
Install Rumble Strips on Intersection Approaches	Undefined		2-44 [1]; NCOE [7]	●					

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

Rev. 8/09

County: Clinton Prepared by: Todd Kinney Date Prepared: Aug 8, 2011

Location: Z40 (400th Avenue) south of E50 (140th Street)

Improvement

Proposed Improvement(s): Z-40 + E-50 Intersection Realignment

$ 71,898 Estimated Improvement Cost, **EC**

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

$ - Present Value Other Annual Costs, **OC**

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

20 Est. Improvement Life, years, **Y**

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

4.0% Discount Rate, **INT**

$ 71,898 Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT

2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.06	90	
0.06	miles total	

4.0% Projected Traffic Growth (0%-10%), **G**

5 Current Vehicle Miles / Day, **VM**

11 End of Life Veh. Miles / Day

1,872 Current Veh. Miles / Year, **AM**

55,758 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

2006 First full year --> 2010 Last full year

5.6 years, Time Period, **T**

7 Additional months

values as of Dec. 2007

1	Fatal Crashes	1	Fatalities @	$3,500,000	$ 3,500,000
		2	Major Injuries @	$240,000	$ 480,000
2	Injury Crashes		Minor Injuries @	$48,000	$ -
		1	Possible Injuries @	$25,000	$ 25,000
3	Property Damage Only		(assumed cost per crash)	$2,700	$ -
			-OR- enter all Property Costs of all crashes:		$ 15,700
6	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 4,020,700

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

$ 670,117 Cost per Crash, **AVCR** = LOSS / TA

32.0 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 288,050 Crash Costs Avoided in First Year, AAR x AVCR

12.8 Total Avoided Crashes, TCR x CRF/ 100

57,391.5 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 5,539,425 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 = $5,539,425 : $71,898 = **77.05** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Edgeline, Centerline County Program

Applicant: Iowa DOT, Office of Traffic & Safety

Contact Person: Jeremey Vortherms Title: State Safety Engineer

Complete Mailing Address: 800 Lincoln Way
Ames, IA 50010

Phone: 515-239-1267 (Area Code) E-Mail: jeremey.vortherms@dot.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:

Application Type

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

Funding Amount

Total Project Cost $ 500,000

Safety Funds Requested $ 500,000

A. Not applicable

B. Local and national research indicates that a high portion of run-off-the-road crashes occur on two lane roadways, and that many of those crashes can be mitigated through the application of Edgeline Rumbles and Centerline Rumbles. These low cost safety applications are specially-designed to increase driver awareness of their location on the roadway without significantly affecting other aspects of the pavement such as ride, quality, or durability.

   These funds will be used by the Iowa DOT's Office of Traffic & Safety to create a County Edgeline-Centerline program for appropriate stretches of roadway and horizontal curve locations. Appropriate locations will be selected based on areas where roadway condition and lane departure crashes overlap.

   County Edgeline-Centerline Rumbles cannot be used in areas with poor pavement.

   The Office of Traffic & Safety will engage District and County jurisdiction representatives in identifying areas that would benefit with the application of Edgeline Rumbles and Centerline Rumbles.

   Sites to be determined.

C. $500,000
   (Past bids indicate a price per mile can be expected to be from $2500 to $6000.)

D. July 1, 2013 through June 30, 2014

E. To Be Determined

F. Not applicable

G. Not applicable

H. Not applicable

I. To Be Determined

J. To Be Determined

K. Not applicable

L. See Attached

Edgeline - Centerline County Program Benefit Cost Sheet

Surface:	*Paved*
Routes:	*Federal Aid*
F(x) Class:	*All*

Cost / Mile	$ 6,000.00
Life (years)	10
CMF	0.85
Traffic Growth	1%
Years of Crash Data	10

County Information *Improvement Information* *Volume Information* *Crash Information* *Injury Information* *Crash Cost Information* *Benefit/Cost Information*

County Information						Benefit/Cost Information		
County	Mileage (miles)	Percent of Total County Mileage (%)	Percent of Total Paved Mileage (%)	Percent of Total Federal Aid Mileage (%)	AADT (veh/day)	Present Value of Avoided Crashes ($)	Present Value of Project Costs ($)	Benefit Cost Ratio
Black Hawk	123.410	15.85%	51.19%	97.72%	1201.2	$ 2,344,092	$ 740,460	3.17
Bremer	96.223	13.46%	70.80%	100.00%	944.6	$ 945,968	$ 577,338	1.64
Buchanan	182.076	19.02%	90.47%	99.30%	796.9	$ 3,323,771	$ 1,092,456	3.04
Butler	138.469	14.36%	67.10%	95.12%	526.1	$ 2,641,127	$ 830,814	3.18
Chickasaw	125.514	14.74%	85.15%	95.30%	603.8	$ 1,938,855	$ 753,084	2.57
Grundy	136.703	16.38%	69.45%	97.83%	745.1	$ 3,287,458	$ 820,218	4.01
6 County Average	133.733	15.63%	72.36%	97.55%	802.9	$2,413,545	$802,395	2.94

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Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: High Friction Surface Treatment at Horizontal Curves – Eastern Portion of State

Applicant: Iowa DOT, Office of Traffic & Safety

Contact Person: Jan Laaser-Webb Title: Engineer

Complete Mailing Address: 800 Lincoln Way
Ames, IA 50010

Phone: 515-239-1349 (Area Code) E-Mail: jan.laaser-webb@dot.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:

Application Type

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

Funding Amount

Total Project Cost $ 500,000

Safety Funds Requested $ 500,000

A. Not applicable

B. Local and national research indicates that a high portion of run-off-the-road crashes occur at horizontal curves, and that many of those crashes can be mitigated through application of a high friction surface treatment. A high friction surface is a specially-designed application of materials to increase the skid resistance of a pavement without significantly affecting other aspects of the pavement such as noise, ride, quality, or durability.

   These funds will be used by the Iowa DOT's Office of Traffic & Safety to create a high friction surface program for appropriate horizontal curve locations. Appropriate locations will be selected based on areas where lower friction and higher wet weather crashes overlap.

   High friction surface cannot be considered a tool to strengthen pavements. It does not replace overlays and cannot be used in areas with poor pavement.

   The Office of Traffic & Safety will engage an on-call contractor to provide high friction surface treatments for high-crash locations on horizontal curves in the eastern portion of Iowa. The on-call contractor will be asked to mobilize once a minimum of 4000 sq yd of area needing high friction surface treatment have been identified.

   Sites to be determined.

C. $500,000
   (Past bids indicate a price per square yard can be expected to be from $22 to $29.)

D. July 1, 2013 through June 30, 2014

E. To Be Determined
F. Not applicable
G. Not applicable
H. Not applicable
I. To Be Determined
J. To Be Determined
K. Not applicable

L. Each jurisdiction that applies for friction surfacing on a curve needs to provide a benefit/cost analysis showing a positive safety benefit for using this treatment.

<u>Applicant</u>

Jan Laaser-Webb
Iowa DOT, Office of Traffic & Safety

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: High Friction Surface Treatment at Horizontal Curves – Western Portion of State

Applicant: Iowa DOT, Office of Traffic & Safety

Contact Person: Jan Laaser-Webb Title: Engineer

Complete Mailing Address: 800 Lincoln Way
Ames, IA 50010

Phone: 515-239-1349 (Area Code) E-Mail: jan.laaser-webb@dot.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:

Application Type

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

Funding Amount

Total Project Cost $ 500,000

Safety Funds Requested $ 500,000

A. Not applicable

B. Local and national research indicates that a high portion of run-off-the-road crashes occur at horizontal curves, and that many of those crashes can be mitigated through application of a high friction surface treatment. A high friction surface is a specially-designed application of materials to increase the skid resistance of a pavement without significantly affecting other aspects of the pavement such as noise, ride, quality, or durability.

   These funds will be used by the Iowa DOT's Office of Traffic & Safety to create a high friction surface program for appropriate horizontal curve locations. Appropriate locations will be selected based on areas where lower friction and higher wet weather crashes overlap.

   High friction surface cannot be considered a tool to strengthen pavements. It does not replace overlays and cannot be used in areas with poor pavement.

   The Office of Traffic & Safety will engage an on-call contractor to provide high friction surface treatments for high-crash locations on horizontal curves in the western portion of Iowa. The on-call contractor will be asked to mobilize once a minimum of 4000 sq yd of area needing high friction surface treatment have been identified.

   Sites to be determined.

C. $500,000
   (Past bids indicate a price per square yard can be expected to be from $22 to $29.)

D. July 1, 2013 through June 30, 2014

E. To Be Determined
F. Not applicable
G. Not applicable
H. Not applicable
I. To Be Determined
J. To Be Determined
K. Not applicable

L. Each jurisdiction that applies for friction surfacing on a curve needs to provide a benefit/cost analysis showing a positive safety benefit for using this treatment.

<u>Applicant</u>

Jan Laaser-Webb
Iowa DOT, Office of Traffic & Safety