Traffic Safety Improvement Program

Applications for
Site Specific
FY 2016

Received August 15, 2014

Site Specific
FY 2016

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
1	City of Fort Dodge	East Region Public Improvements – S 29th St.	$2,645,040	$400,000
25	Iowa DOT- District 1	U.S. 30 WB @ Snedden Dr. (Airport Rd.)	$200,000	$200,000
35	Iowa DOT, Office of Traffic & Safety	Low Cost Safety Improvement Funds Programs	$500,000	$500,000
39	City of Hampton	New Traffic Signals at Hwy 3/1st ST SW & Hwy 3/Hwy 65	$375,000	$375,000
71	Jones County	Co. Rd X-44/PCC Overlay	$2,500,000	$331,000
101	City of Marion	35th Street and 29th Avenue, Marion, Iowa	$164,220	$164,220
119	Polk County Public Works	At Intersection of NE 56th Street and NE 78th Avenue	$30,000	$30,000
135	Polk County Public Works	At intersection of NE 64th Street and NE 27th Avenue	$30,000	$30,000
151	City of Dubuque	Grandview/Delhi/Grace Intersection Roundabout	$632,148.4	$500,000
167	Harrison County	Paved Shoulders, Rumble Strips, & Edgelines along L-20 (Loess Hills Trail) South of Missouri Valley	$480,407	$480,407
193	Winneshiek County	Old Stage Rd. Shouldering and Rumble Strips From Hwy 9 to Wellington Place	$307,610	$307,610
201	City of Des Moines	Martin Luther King JR Parkway and Prospect Rd Signal	$200,000	$100,000
239	Polk County Public Works	At intersection of NE 55th Street and NE 62nd Avenue	$30,000	$30,000
255	Montgomery County	H34 West Pavement Widening	$591,706	$500,000

Continued on next page

Site Specific
(Continued)

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
265	Dallas County Road Department	F31 Curve Realignment	$507,456	$500,000
291	Fayette County	Golden Road (B64) Pavement Rehab, US 18 to W51	$2,956,000	$500,000
299	Iowa DOT – District 5	Bloomfield / US 63 4 Lane to 3 Lane Conversion	$45,000	$45,000
311	Montgomery County	H34 East Pavement Widening	$695,644	$400,000
321	City of Waukee	Hickman Rd & Dartmoor Dr. Intersection Improvements	$413,000	$325,000
347	Plymouth County	C-60 Reconstruction – From C-66 West 3.25 Miles	$1,450,000	$500,000
377	City of Perry	1100 Willis Ave. and First Ave Intersection Improvements	$380,000	$380,000
399	City of Des Moines	E. 42nd Street and Hubell Avenue Intersection Improvements	$2,500,000	$500,000
427	City of Clinton	8th Avenue South and South 4th Street	$35,000	$35,000
441	City of Iowa City	First Avenue 3-Lane Conversion and Grade Separation	$1,588,448	$500,000
501	City of Burlington	Agency & Walgreens / Kmart Intersection	$630,402.50	$75,000
521	City of Waterloo	Intersection of Dubuque Road and Osage Avenue	$288,000	$288,000

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Site Specific
(Continued)

Page No.	Applicant	Title/Subject	$ $ $	
			Project	Request
539	City of Iowa City	Mormon Trek Boulevard 3-Lane Conversion	$748,431	$500,000
573	City of Burlington	Agency Street & Columbus Drive Intersection	$930,775.40	$500,000
595	City of Ames	2015/16 West Lincoln Way Intersection Improvements	$1,019,000	$500,000
633	Cerro Gordo County	B35 Roadway Improvement Project	$3,864,135	$500,000
685	Iowa DOT, District 5	Bloomfield / US 63 4 Lane to 3 Lane Conversion	$45,000	$45,000
697	Henry County	PCC Pavement, Paved Shoulders & Rumble Strips	$500,000	$500,000
711	Polk County	Iowa Highway 415 / NW 2nd Avenue	$514,000	$320,000
769	City of Des Moines	Citywide Fixed – Time Signal Upgrade Project – Phase 2	$660,000	$120,000
815	Marion County Road Department	Highway G28 Shoulder Widening Project	$893,787.90	$500,000
841	Polk County	Iowa Highway 415 / NW 2nd Avenue	$514,000	$320,000
899	Buena Vista County	Reconstruction of South Fulton St & IA 7 Intersection	$450,000	$450,000
909	Buchanan County	Shoulder Paving and Rumbles, Jesup to Frost Ave.	$549,687	$300,000
	Totals	**38 Projects**	**$30,450,898.20**	**$12,551,237**

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project East Region Public Improvements - S 29th Street

Applicant City of Fort Dodge

Contact Person Chad Schaeffer Title City Engineer

Complete Mailing Address Municipal Building - Room Engineering, 819 1st Avenue S
Fort Dodge, Iowa 5051

Phone (515) 576-3601 (Area Code) E-Mail cshaeffer@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 $ 2,645,040

Safety Funds Requested $ 400,000

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: _____ 8/12/14
Signature Date Signed

Chad Schaeffer
Typed Name

Attest: _____ 8/13/14
Signature Date Signed

Anthony Trotter
Typed Name

RESOLUTION NO. 14-08-210

A RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR EAST REGION PHASE THREE PROJECT WHICH INCLUDES ADDING RIGHT TURN LANES AT ALL APPROACHES AND REPLACEMENT OF TRAFFIC SIGNALS TO THE INTERSECTION OF SOUTH 29TH STREET AND 1ST AVENUE SOUTH, REPLACEMENT OF TRAFFIC SIGNAL AND REMOVAL OF FIVE DRIVEWAYS TO CONSOLIDATE AND IMPROVE ACCESSS.

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

WHEREAS, the South 29th Street and 1st Avenue South intersection has been identified as a location where vehicular safety and traffic flow could be improved and funded by TSIP.

WHEREAS, the improvements, including the addition of right turn lanes and the installation of a new traffic signals, will help reduce crashes in this area and improve traffic operations.

NOW, THEREFORE, BE IT RESOLVED by the City Council of Fort Dodge, Iowa, as follows:

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, Iowa this 11th day of August, 2014.

Ayes: Flattery, Halter, Wilson, Fritz, Alstott, Moehnke and Hill

Nays: None

Other: None

City of Fort Dodge, Iowa

David Flattery, Mayor Pro Tem

ATTEST:

Jeff Nemmers, City Clerk

Narrative

First Avenue South and South 29th Street are located in the east portion of Fort Dodge, Iowa. 1st Avenue S connects the eastern commercial region of Fort Dodge to the downtown region. The only grade separated railroad crossing (Veterans Bridge) connecting the commercial region to the downtown region is located on 1st Avenue S at approximately S 22nd Street. S 29th Street is a north/south minor arterial street with several large commercial businesses and connects a residential region of Fort Dodge to the commercial region.

1st Avenue S is a three-lane 39 feet wide minor arterial with a two-way left turn lane east and west of S 29th Avenue. Several commercial driveways are located along 1st Avenue S with no consistent spacing or alignment with driveways located on opposite sides of 1st Avenue South. The posted speed limit is 25 MPH along 1st Avenue South throughout the project limits.

S 29th Street is a three-lane 39 feet wide minor arterial with a two-way left turn lane north and south of 1st Avenue S. Several commercial driveways are located along S 29th Street with no consistent spacing or alignment with driveways located on opposite sides of S 29th Street. The posted speed limit is 25 MPH along 1st Avenue S throughout the project limits.

Commercial properties along both streets are retail in nature including a shopping mall, large discount center, grocery supermarkets, and other small retail shops. Overhead utility lines located on the north side of 1st Avenue S and west side of S 29th Street has wood poles located approximately 3 feet from the back of curb or less. Trees are also located within 10 feet of the roadway along both streets.

The intersection of 1st Avenue S & S 29th Street is controlled by a traffic signal. The center two-way left turn-lane on each approach becomes an exclusive left turn-lane at the intersection. The traffic signal phasing includes protected only left turn movements for each approach. However, the left turn circular red and yellow signal indications are not compliant with current MUTCD. The sign supplementing these movements is a left turn only sign (R3-5L). Traffic signal coordination timings were implemented at this and the adjacent intersection of 1st Avenue S and S 29th St in November 2010.

According to the Iowa DOT 2011 traffic count data, 1st Avenue S carries 9,200 Average Annual Daily Traffic (AADT) at the intersection with S 29th Street. S 29th Street carries 6,200 AADT south of the intersection and 4,800 AADT to the north. Both traffic and City population history show minimal to no growth in traffic and City size over the last 10 years. Additional traffic data is provided in Section J of this application.

Crash History

During the five and half year period from January 1, 2009 through May 31, 2014, the project region experienced 74 crashes. These crashes included one major injury crash, one minor injury crash, ten possible/unknown injury crashes, and 62 property damage only crashes. In total, there were 14 injuries, including one major and one minor injury. The resulting crash rate for this corridor is 1,179 crashes per hundred million vehicle miles traveled (HMVMT). This rate is

nearly three times higher than the average statewide crash rate for a similar city street of 402 crashes per HMVMT (based on 2008 – 2011 crash data).

As is typical with urban roadways, crashes tend to be located at driveways. Crashes along both streets are clustered at commercial driveways and at the intersection of 1st Avenue S with S 29th Street. Most crashes were rear-end or right-angle collisions. Right angle collisions are caused in fact by driveway spacing not consistent and driveways located offset from one another, drivers leaving commercial properties have difficulty in selecting appreciate gaps in traffic as the number of conflicting traffic direction vary at each driveway location. Rear-end crashes occur when drivers on the either 1st Avenue S or S 29th Street have traffic unexpectedly stopping for a turning vehicle and also occurring at vehicle queues on the approaches of the intersection of 1st Avenue S & S 29th Street.

Crashes involving vehicles striking a fixed object are minimal with only two crashes reported striking a fixed object. Both crashes were single vehicle crashes resulting in property damage only. One crash was caused by weather conditions and the second crash involved a northbound semi tractor-trailer striking a pole while turning from 29th Street to eastbound 1st Avenue.

Proposed Improvement

Phase 3 of the East Region Project in Fort Dodge includes pavement replacement from 100 feet west of S 27th Street to 400 feet east of S 29th Street along 1st Avenue S and 300 feet north to 1,000 feet south of 1st Avenue S along S 29th Street. Commercial driveway will be consolidated within the project limits reducing the number of driveways from 16 to 11 and aligning driveways directly across from one another where driveways exist on both sides of the public roadway. Right turn lanes will be constructed on all approaches at the intersection of 1st Avenue S & S 29th Street. All overhead utilities will be relocated to the alley ways behind the properties along 1st Avenue South and South 29th Street. Trees located along the two streets will either be removed or trimmed back based on sight distance from the proposed commercial driveways reducing the potential for fixed object crashes.

The traffic signal will be replaced at the intersection of 1st Avenue South and South 29th Street. The proposed traffic signal pole locations will increase the clear zone at the intersection. Also the left turn lane vehicle signal indications will be compliant with the current MUTCD and possible implementation of permissive left turn signal indication via flashing yellow hour during low traffic volume hours.

Consolidating and reducing the number of driveway accesses is expected to reduce the potential for crashes by reducing the number of conflict points along both streets. Realignment of the driveways should also reduce difficulty of gap selection by drivers entering or exiting the driveways. Construction of the right turn lanes at the intersection of 1st Avenue S and S 29th Street is expected to reduce the potential of a rear-end collisions at the intersection as the right turning traffic will be removed from the through lane while slowing to make a right turn.

Order of Magnitude
Opinion of Probable Cost
East Region Public Improvements Phase 3
Fort Dodge, Iowa

ITEM DESCRIPTION	TOTAL QUANTITY	UNIT	UNIT COST	TOTAL COST
Storm Sewer				
Storm Sewer, Trenched, Class III, 15" dia.	469	LF	$60	$28,140
Storm Sewer, Trenched, Class III, 18" dia.	370	LF	$65	$24,050
Storm Sewer, Trenched, Class III, 24" dia.	389	LF	$75	$29,175
Storm Sewer, Trenched, Class III, 48" dia.	254	LF	$145	$36,830
Storm Sewer Removal	319	LF	$10	$3,190
SW-401, Small	4	EA	$3,500	$14,000
SW-401, Large	1	EA	$6,000	$6,000
SW-501	8	EA	$3,000	$24,000
SW-503	4	EA	$5,000	$20,000
SW-505	3	EA	$5,000	$15,000
SW-506	1	EA	$7,000	$7,000
Structure Removal	12	EA	$500	$6,000
Topsoil Furnish and Place, 4"	1,100	CY	$20	$22,000
Conventional Seeding, Fertilizing, and Mulching	3	AC	$5,000	$15,000
Landscaping	1	LS	$12,000	$12,000
Sanitary Sewer				
Manhole Casting/Chimney Seal	1	EA	$500	$500
Water Main				
Water Main Adjustments	1	LS	$25,000	$25,000
Pavement				
Pavement Removal	8,526	SY	$10	$85,260
Excavation, Class 10	7,400	CY	$15	$111,000
Modified Subbase, 12"	10,270	SY	$13	$133,510
Subgrade Preparation	8,560	SY	$3	$25,680
Subdrain, 6" Perforated	2,079	LF	$15	$31,185
PCC Pavement, 8" (includes driveways)	9,495	SY	$50	$474,750
Pavement Patching, Full Depth	376	SY	$100	$37,600
Curb and Gutter	276	LF	$25	$6,900
PCC Pavement Rehab and Diamond Grinding	4,560	SY	$6	$27,360
Sidewalk, 4"-6"	618	SY	$40	$24,720
Detectable Warning Device	2	EA	$500	$1,000
Lighting, Signals, & Amenities				

Light Pole	6	EA	$7,500	$45,000
Trees	35	EA	$260	$9,100
Traffic Signals	1	EA	$170,000	$170,000
Intersection Streetscaping	1	LS	$75,000	$75,000
Sign Relocation	5	EA	$10,000	$50,000
Misc.				
Mobilization	1	LS	$100,000	$150,000
Traffic Control	1	LS	$50,000	$50,000
			Subtotal	**$1,795,950**
			Contingencies	**$269,395**
			Construction Subtotal	**$2,065,345**

ROW Acquisition - Roadway	21,430	SF	$8	$160,725
Temporary Construction Easement Acquisition - Roadway	103,961	SF	$1	$77,970
			Subtotal	**$238,695**
			Contingencies	**$35,805**
			ROW and Easement Acquisition Subtotal	**$274,500**

Engineering, Admin., Legal	**$305,195**
Project Grand Total	**$2,645,040**

Proposed Funding Sources
East Region Public Improvements Phase 3
Fort Dodge, Iowa

SOURCE	AMOUNT
Storm Water Utility	$1,375,000
Local Option Sales Tax	$870,040
Traffic Safety Improvement Program	$400,000
PROJECT TOTAL	**$2,645,040**

Proposed Project Schedule

TSIP Application	August 15, 2014
TSIP Funding Award	January 2015
Preliminary Project Design	August 2014 - October 2014
Environmental Clearances	September 2014 - October 2014
Right-of-Way Acquisitions	November 2014 - January 2015
Final Design	November 2014 - January 2015
Contracts Turn-in to Iowa DOT	February 2015
Project Letting	April 2015
Project Construction	June 2015 - December 2015

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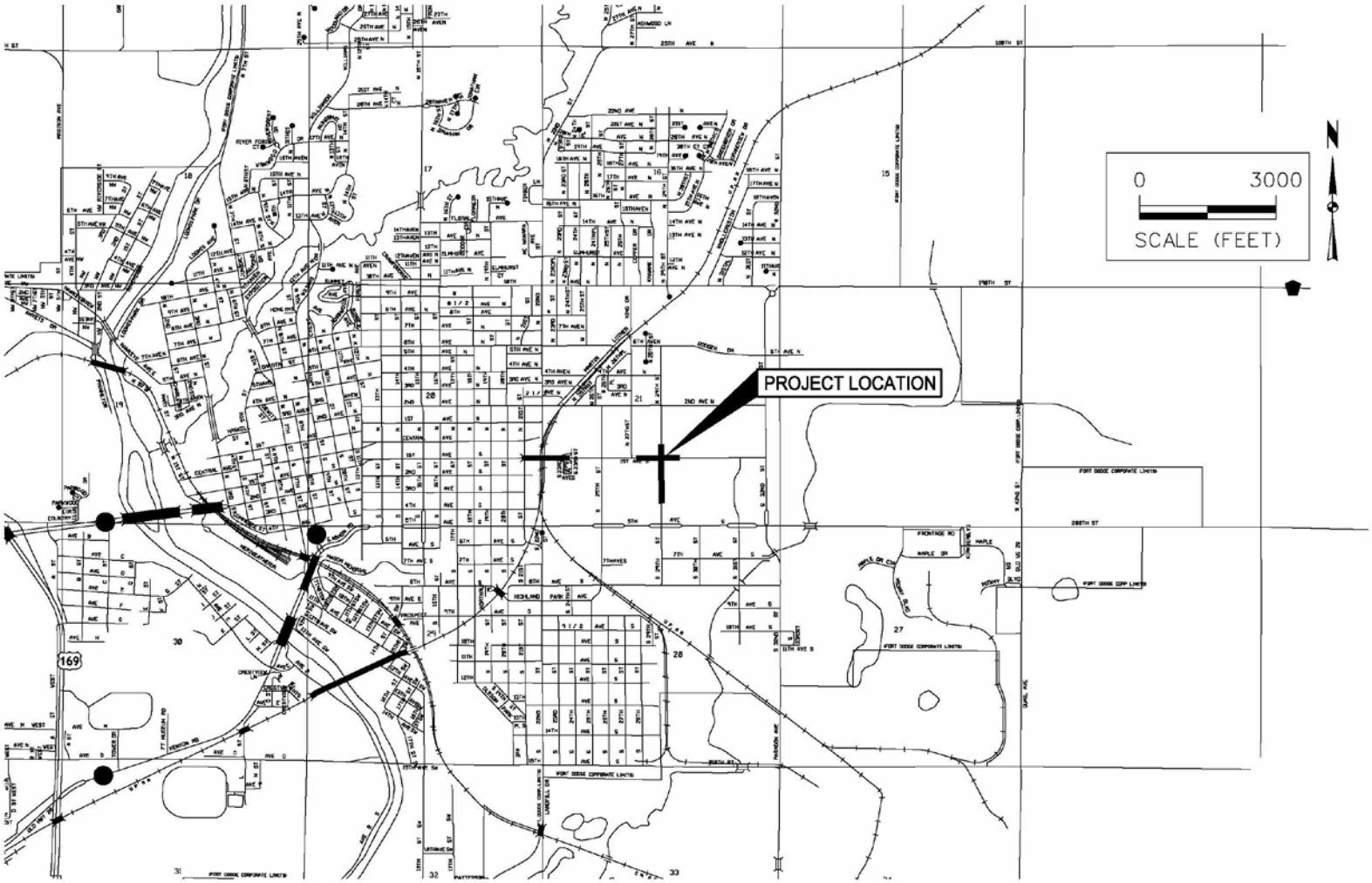


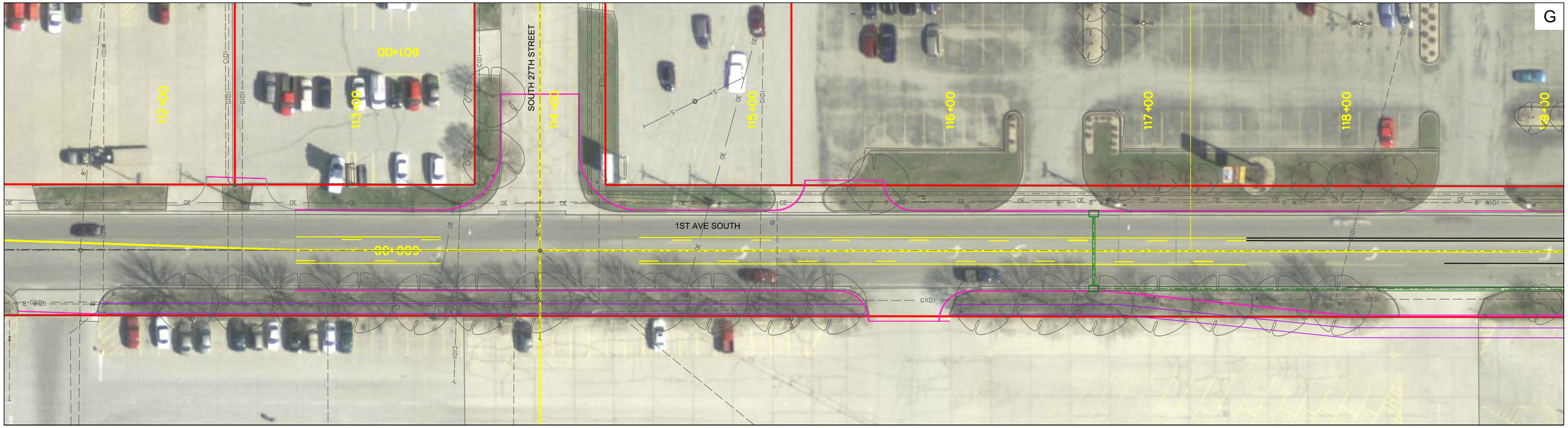
LOCATION MAP
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
EAST REGION PUBLIC IMPROVEMENTS PHASE 3
1ST AVENUE SOUTH AND SOUTH 29TH STREET
FORT DODGE, IOWA

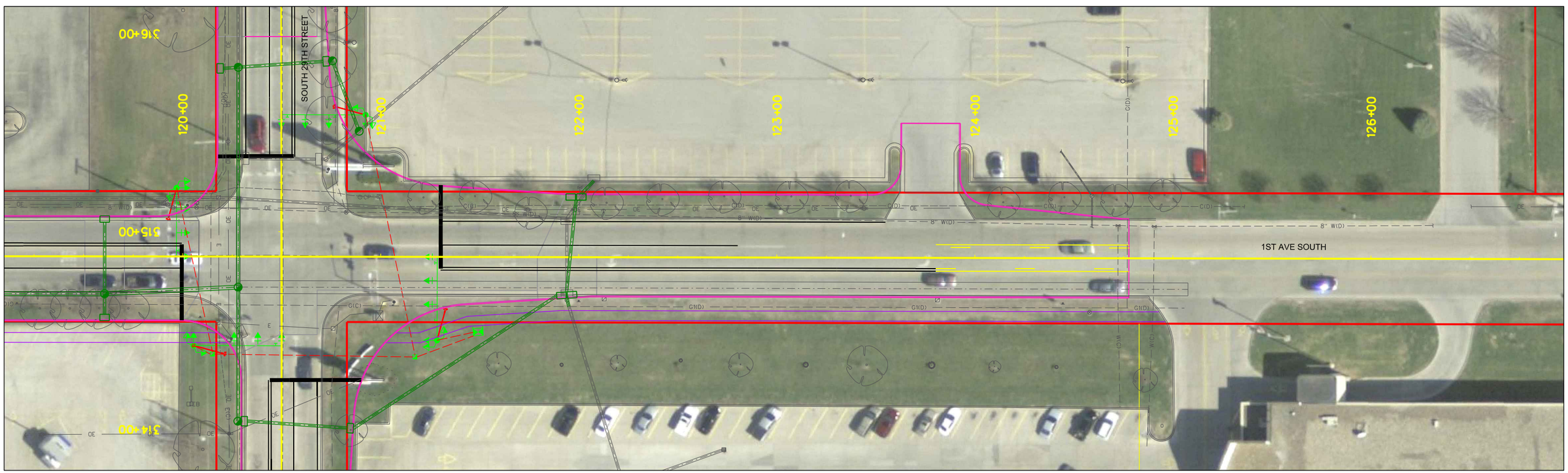
Photo 1: 1st Avenue S looking east from near S 27th Street

Photo 2: 1st Avenue S looking east from near S 27th Street

Photo 3: S 29th Street looking south from 1st Avenue S

Photo 4: S 29th Street looking north from 1st Avenue S





Snyder & Associates
Engineers and Planners

PLAN VIEW 1ST AVENUE SOUTH
TRAFFIC SAFETY IMPROVEMENT APPLICATION
EAST REGION PUBLIC IMPROVEMENTS PHASE 3
1ST AVENUE SOUTH AND SOUTH 29TH STREET
FORT DODGE, IOWA

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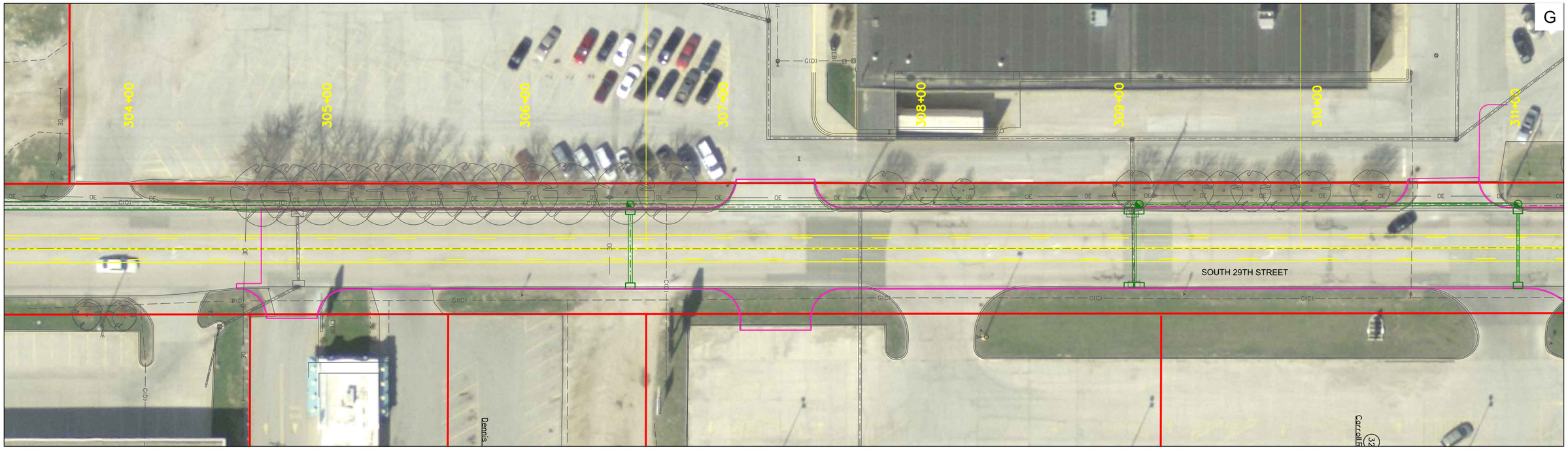

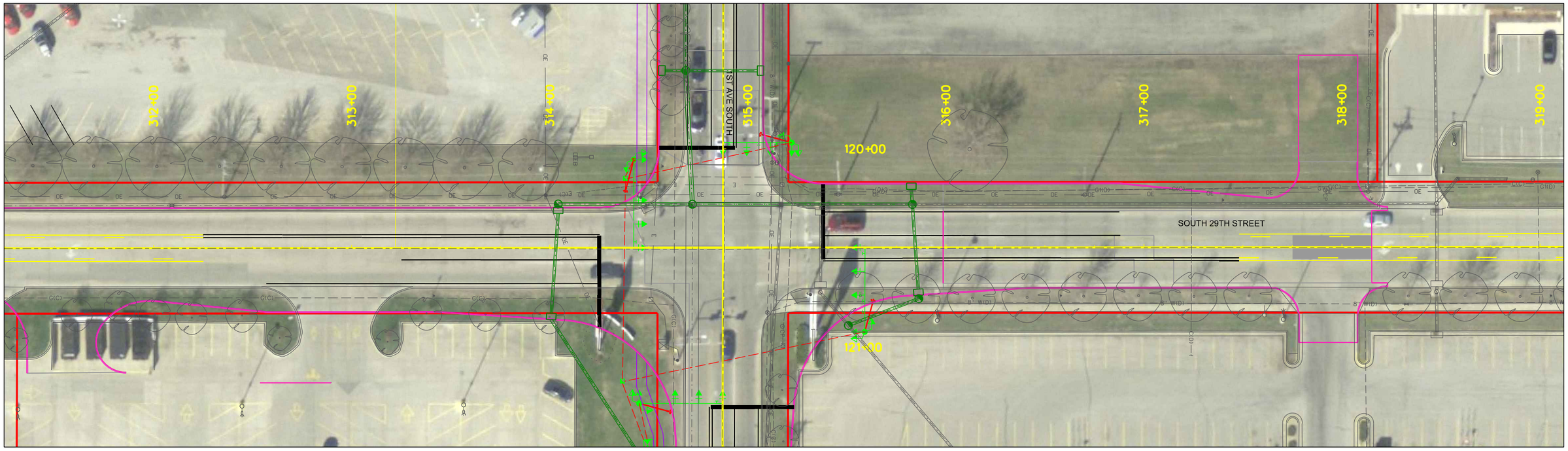

SNYDER & ASSOCIATES
Engineers and Planners

PLAN VIEW SOUTH 29TH STREET
TRAFFIC SAFETY IMPROVEMENT APPLICATION
EAST REGION PUBLIC IMPROVEMENTS PHASE 3
1ST AVENUE SOUTH AND SOUTH 29TH STREET
FORT DODGE, IOWA

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SCALE (FEET)

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AERIAL LOCATION
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
EAST REGION PUBLIC IMPROVEMENTS PHASE 3
1ST AVENUE S AND S 29TH STREET
FORT DODGE, IOWA

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SCALE (FEET)

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Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

94433841099

Count Date:

Thursday, April 07, 2011

County:

Webster

Location Description:

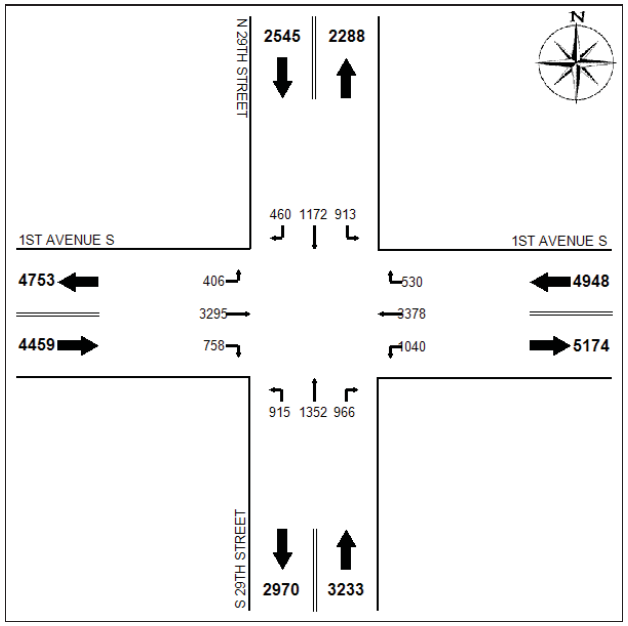
1st Ave S & S 29th St

Volume Factor: 1.730

Pass Class Factor: 1.733

SU Class Factor: 1.546

Combo Class Factor: 1.621



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
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07:15	6	11	4	3	31	2	4	4	3	1	16	8
07:30	5	15	3	5	49	2	5	5	4	0	34	9
07:45	8	23	4	2	56	6	7	15	7	2	39	17
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15:15	27	35	12	22	77	19	28	34	21	12	68	17
15:30	33	30	10	15	93	14	18	36	12	15	93	17

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	20	25	12	28	92	18	27	21	33	13	103	15
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16:30	22	27	18	34	94	16	27	65	28	9	102	29
16:45	22	26	12	66	66	15	23	41	23	8	67	22
17:00	25	29	9	28	89	15	24	44	25	7	100	14
17:15	21	24	11	31	86	15	25	44	31	11	92	17
17:30	25	28	2	22	70	11	21	40	15	9	59	13
17:45	23	27	8	30	65	14	20	35	32	13	52	13

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

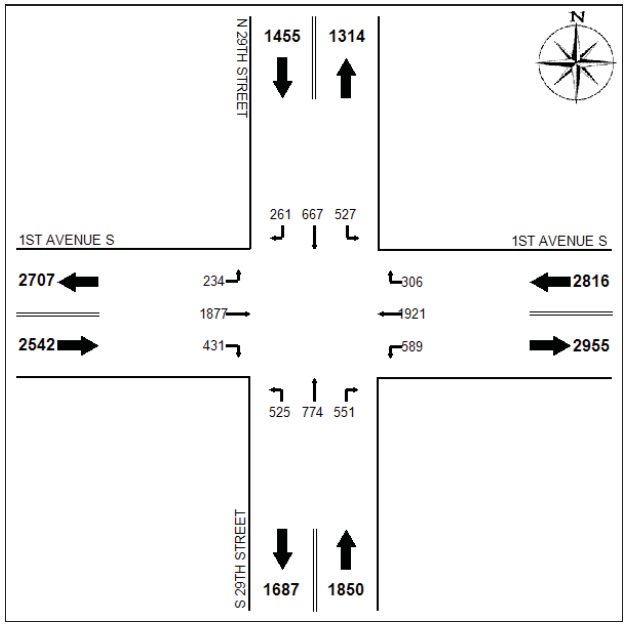
Station Number:
94433841099

Count Date:
Thursday, April 07, 2011

County:
Webster

Location Description:
1st Ave S & S 29th St

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		
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07:15	6	11	4	3	30	2	4	4	3	1	14	8
07:30	5	14	3	2	47	2	5	5	2	0	34	8
07:45	8	23	3	2	55	6	7	15	7	2	38	17
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12:15	29	18	10	29	88	14	34	35	23	13	80	14
12:30	22	27	14	27	72	10	26	40	31	14	78	23
12:45	33	15	15	32	68	11	32	32	36	7	76	11
15:00	14	22	13	18	97	14	21	28	28	11	95	13
15:15	27	33	12	22	76	19	28	34	21	12	68	17
15:30	33	30	10	15	91	14	17	36	12	15	92	17

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	20	24	12	26	91	18	27	21	33	13	103	15
16:00	17	27	14	30	94	15	25	37	17	17	94	11
16:15	23	32	9	30	87	24	16	25	20	9	82	13
16:30	22	27	18	34	94	16	27	65	28	9	101	29
16:45	22	26	12	66	64	15	23	41	23	8	67	22
17:00	25	29	9	27	88	15	24	44	25	7	97	13
17:15	21	23	11	31	86	15	25	44	31	11	91	17
17:30	25	28	2	22	70	11	21	40	15	9	59	13
17:45	23	27	8	30	65	14	20	35	32	13	51	13

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

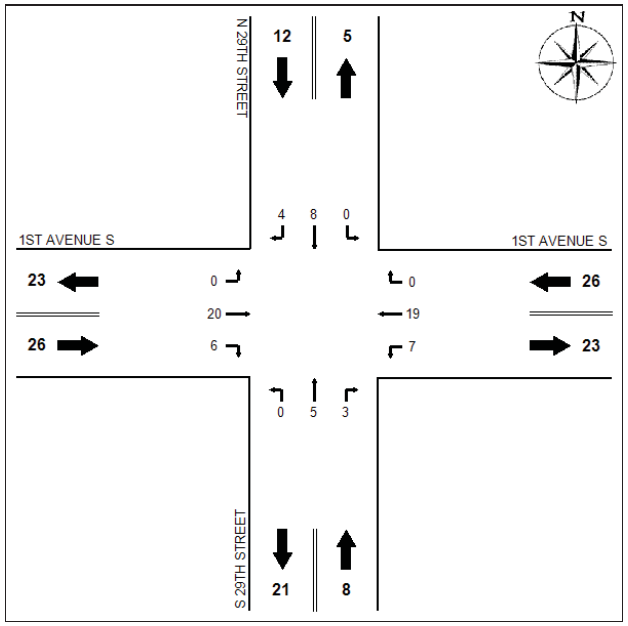
Station Number:
94433841099

Count Date:
Thursday, April 07, 2011

County:
Webster

Location Description:
1st Ave S & S 29th 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:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	0	0	0	0	2	0	0	1	0	0	2	0
07:15	0	0	0	0	0	0	0	0	0	0	1	0
07:30	0	1	0	1	0	0	0	0	1	0	0	1
07:45	0	0	0	0	1	0	0	0	0	0	1	0
08:00	0	1	0	0	0	0	0	0	0	0	1	0
08:15	0	0	1	1	0	0	0	0	0	0	1	1
08:30	0	0	1	0	2	0	0	1	0	0	1	1
08:45	0	0	0	0	2	0	0	0	0	0	4	0
11:00	0	0	1	0	0	0	0	0	0	0	0	0
11:15	0	1	0	1	0	0	0	1	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	2	0	0	0	1	0	1	0
12:00	0	0	0	0	0	0	0	1	0	0	0	0
12:15	0	1	1	0	1	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	1	0	0	0	1
12:45	0	0	0	0	2	0	0	0	1	0	0	0
15:00	0	0	0	0	1	0	0	0	0	0	0	0
15:15	0	2	0	0	1	0	0	0	0	0	0	0
15:30	0	0	0	0	2	0	0	0	0	0	0	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	1	0	2	0	0	0	0	0	0	0	0
16:00	0	0	0	1	0	0	0	0	0	0	2	0
16:15	0	1	0	0	1	0	0	0	0	0	1	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	2	0	0	0	0	0	0	0
17:00	0	0	0	1	0	0	0	0	0	0	2	1
17:15	0	0	0	0	0	0	0	0	0	0	1	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	1	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

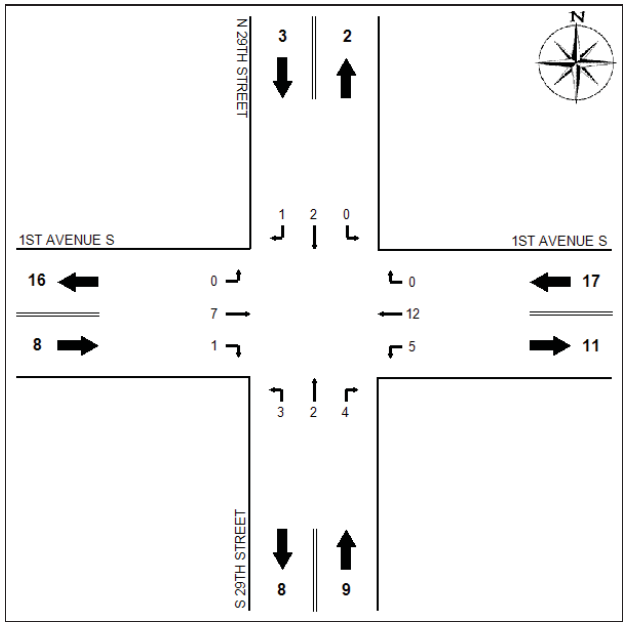
Station Number:
94433841099

Count Date:
Thursday, April 07, 2011

County:
Webster

Location Description:
1st Ave S & S 29th St

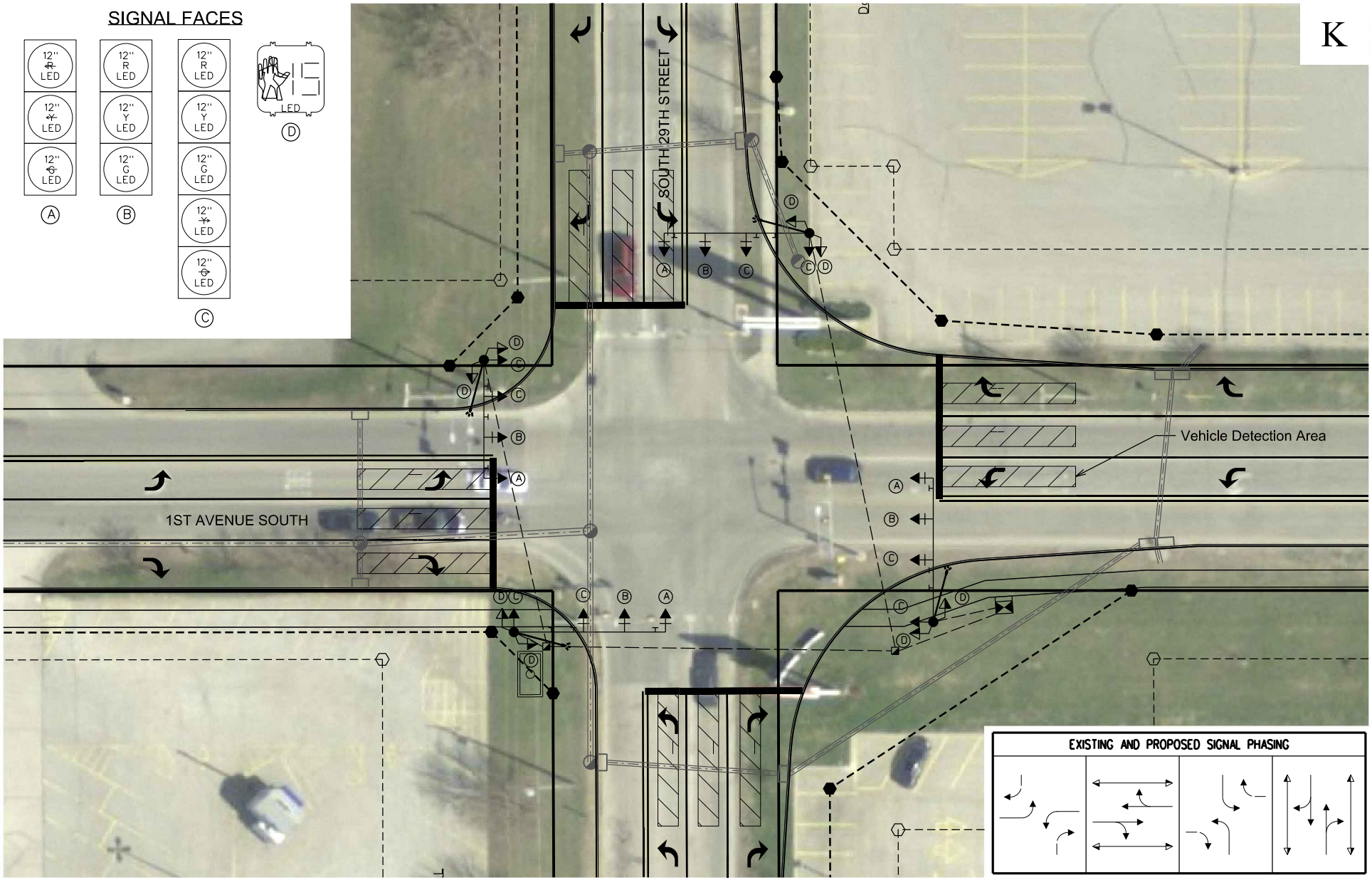
Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A



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	0	0	0	0	1	0	1	0	0	0	1	0
07:15	0	0	0	0	1	0	0	0	0	0	1	0
07:30	0	0	0	2	2	0	0	0	1	0	0	0
07:45	0	0	1	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	1	0	0	0
08:15	0	0	0	1	1	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	1	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	1	1	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	2	0	0	1	0	0	0	0
11:45	0	0	0	0	1	0	0	0	1	0	0	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	1	0	0	0	0	0	0	1	0
12:30	0	0	0	0	1	0	0	1	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	1	0	0	0	1	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	0	0	0	1	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	1	0	0	0	0	0	0	1	0	1	0
16:30	0	0	0	0	0	0	0	0	0	0	1	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	1	0	0	0	0	0	1	0
17:15	0	1	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0



TRAFFIC SIGNAL LAYOUT
TRAFFIC SAFETY IMPROVEMENT PROGRAM APPLICATION
EAST REGION PUBLIC IMPROVEMENTS PHASE 3
1ST AVENUE S AND S 29TH STREET
FORT DODGE, IOWA

0 20
SCALE (FEET)

N

Benefit/Cost Ratio Calculations

The assumptions applied to the Benefit/Cost Calculations were based on recommended information provided by the Iowa DOT Office of Traffic and Safety and previous application history:

- Service Life: 20 years – based on the right turn lane installation and driveway consolidation
- Crash Reduction Factor: 19% - a conservative estimate for the combination of improvements. Right turn lane installation at 1st Avenue South and South 29th Street – 15% (range from 8% to 41%). Driveway consolidation – 5% (reduction of 5 driveways, equation estimation crash reduction factor). Improved clear zone was not included in the crash reduction factor due to the small percentage crashes involving a struck fixed object. Data from the http://www.cmfclearinghouse.org/ website.

  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 could be contributed to potentially a vehicle slowing at the traffic signal to turn right, entering/exiting a driveway, and narrow lanes.

- Growth: According to the Iowa DOT Traffic Count Data, traffic levels along this corridor have not changed on 1st Avenue S from 1999 to 2011. There was some fluctuation in 2003 (decrease of 30%) and no counts were taken in 2007. However, for the potential re-development and growth of the commercial area, a growth rate of 1% per year was assumed over the service life of the improvements.

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Webster | Prepared by: City of Fort Dodge | Date Prepared: Jul 18, 2014

Location: 1st Ave S from 750' west to 400' east of S 29th St & S 29th St from 300' north to 1,000' south of 1st Ave S

Improvement

Proposed Improvement(s): 1st Avenue South & South 29th St Reconstruction (driveway consolidation, increase clear zone, signalization @ 1st Ave & 29th St)

$ 400,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	19	Crash Reduction Factor (integer), **CRI**
$ -	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 | 2011 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.14	10,122	1st Ave S
0.08	9,211	1st Ave S
0.06	4,833	S 29th St
0.19	6,200	S 29th St
0.47	miles total	

3,603	Current Vehicle Miles / Day, **VM**
4,396	End of Life Veh. Miles / Day
1,314,940	Current Veh. Miles / Year, **AM**
28,953,680	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

2009 First full year --> 2013 Last full year — 5.5 years, Time Period, **T**

6 Additional months — values as of Dec. 2007

	Fatal Crashes →		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
12	Injury Crashes →	1	Minor Injuries @	$65,000	$ 65,000
		12	Possible Injuries @	$35,000	$ 420,000
62	Property Damage Only		(assumed cost per crash)	$7,400	$ 547,600
			-OR- enter all Property Costs of all crashes:		
74	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,357,600

13.45	Current Crashes / Year, **AA** = TA / T	**1,023.2**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 18,346	Cost per Crash, **AVCR** = LOSS / TA	**$692,730**	Present Value of Avoided Crashes, **BENEFIT**
296.3	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
2.56	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 46,899	Crash Costs Avoided in First Year, AAR x AVCR		
56.3	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 = $692,730 : $400,000 = **1.73** : 1

Iowa Department of Transportation

Major Cause Summary

Ft Dodge East Region Phase 3

Report Version 1.1 Jan 2005

Analysis Years: 2009 [17], 2010 [16], 2011 [9], 2012 [8], 2013 [18], 2014 [6]

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible/Unknown	10
PDO	62
Total Crashes	74

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible	11
Unknown	1
Total Injuries	14

TOT Property Damage: $277,215

AVG Property Damage: $3,746

Surface Condition Summary:

Dry	42
Wet	13
Ice	4
Snow	7
Slush	5
Sand/Dirt/Oil/Gravel	-
Water	-
Other	1
Unknown	2
Not Reported	-
Total Crashes	74

Major Cause Summary:

	Animal
1	Ran Traffic Signal
1	Ran Stop Sign
5	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
2	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
5	FTYROW: Making Left Turn
9	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
2	Made Improper Turn
	Improper Lane Change
6	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
2	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
2	Lost Control
1	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
1	Inattentive/Distracted By: Fallen Object
1	Inattentive/Distracted By: Fatigued/Asleep
2	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
22	Other: Other Improper Action
6	Unknown
3	Other: No Improper Action
	None Indicated

Selection Filter:

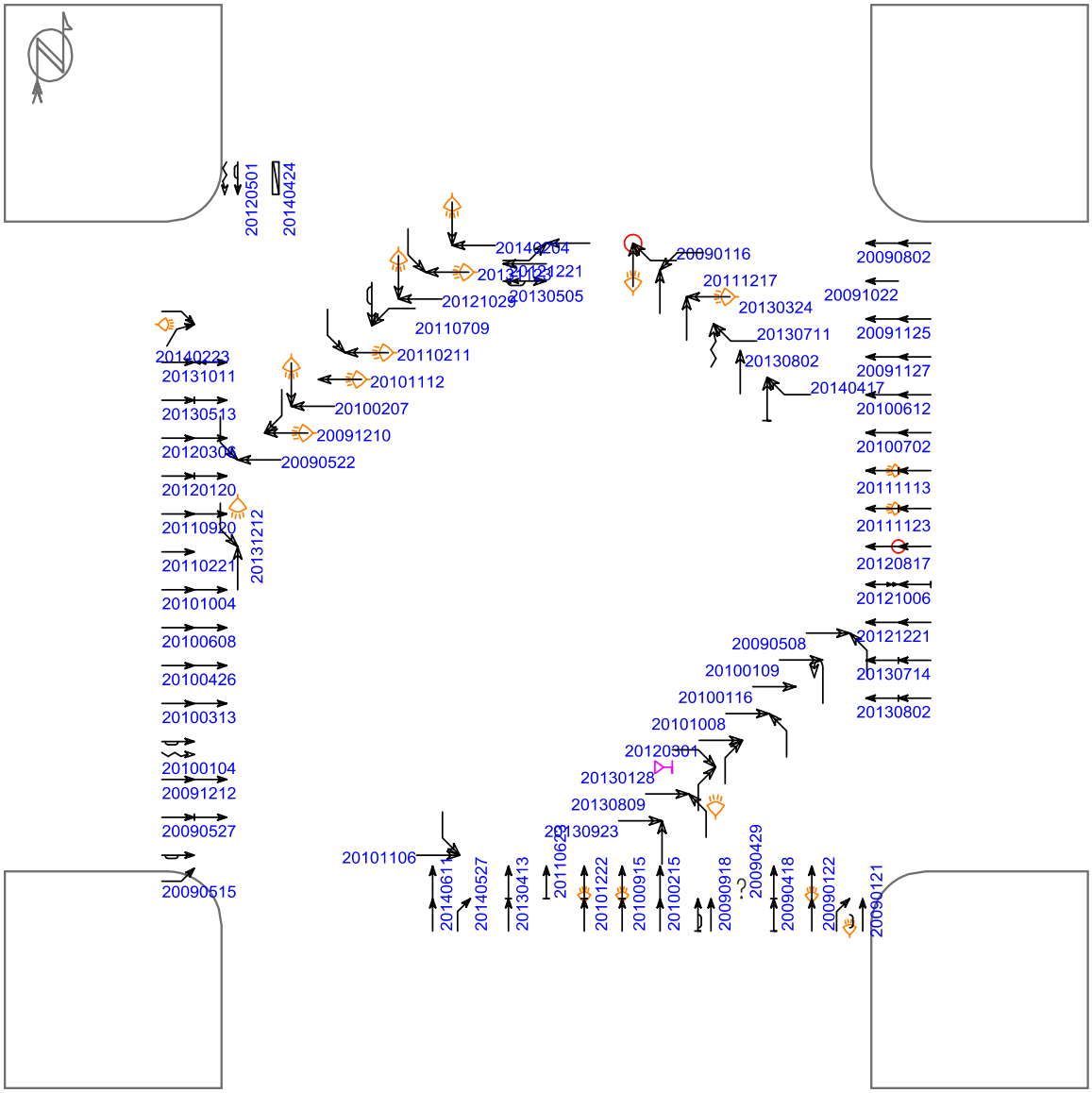
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

Ft Dodge East Region Phase 3

2009 - May 2014 Reportable Crashes



(1) 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. 07/04/2014

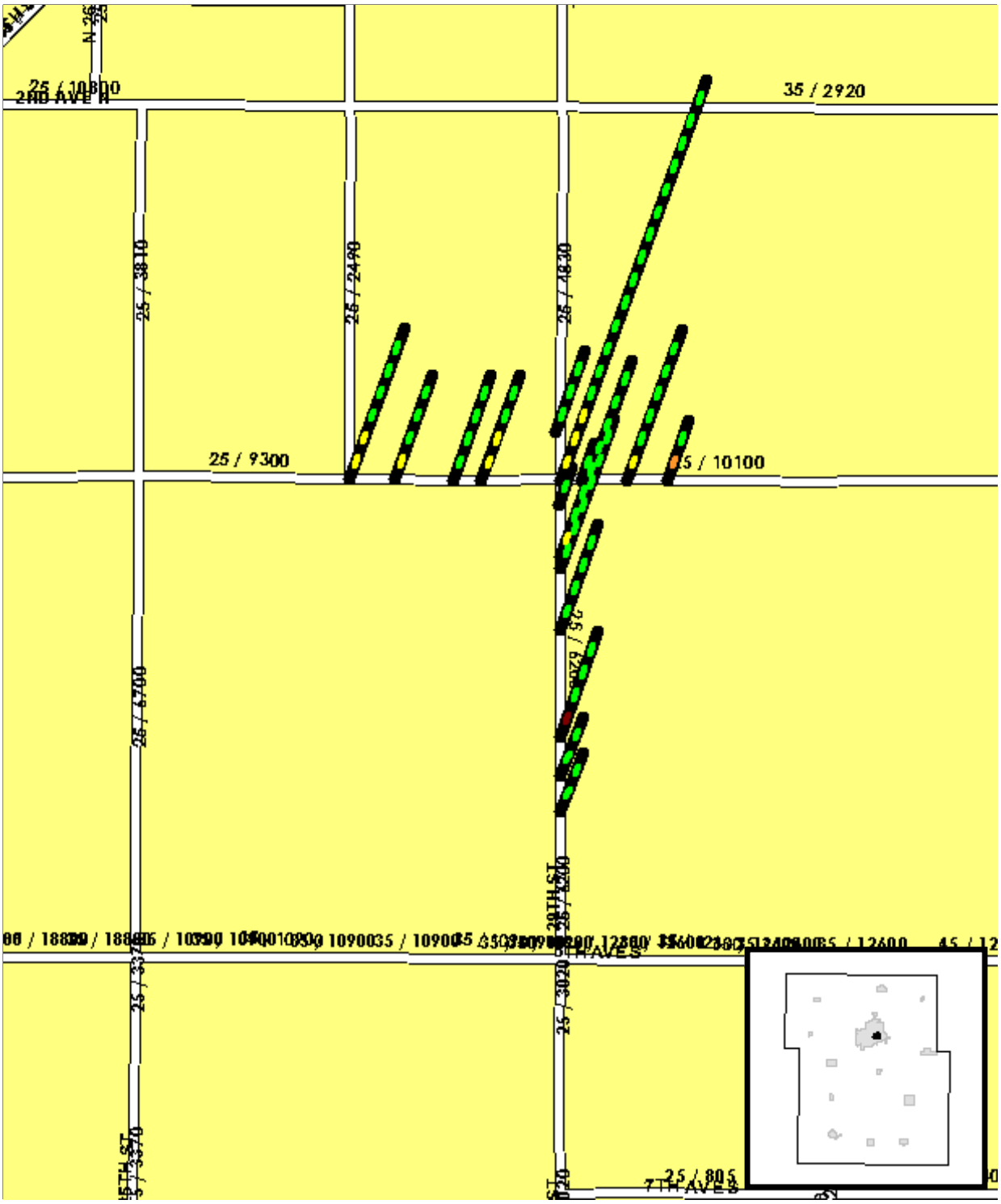
Iowa Department of Transportation

Location Map

Ft Dodge East Region Ph 3

Incidents: 74

Report Version 1.1 Mar 2005



Analyst:	Notes:

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project U.S. 30 WB @ Snedden Dr (Airport Rd)

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 $ 200,000.00

Safety Funds Requested $ 200,000.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the _____

Signed: _____

Signature Date Signed

_____

Typed Name

Attest: _____

Signature Date Signed

_____

Typed Name

1. Existing Conditions

U.S. 30 WB has an existing 500'+- right turn lane built in 2010. *Figure 1* shows the location map of the study intersection.

2. Proposed Concept

Based on the review of existing conditions and accidents, the following intersection specific improvement of offsetting the right turn lane is recommended to enhance safety.

3. Justification

This expressway intersection has been on the District 1 Top Ten list for most dangerous intersections for the last several years. By offsetting this turn lane it will open the sight triangle for much better visibility to help reduce accidents.

4. Cost Estimate and Proposed Funding Sources

The cost of the proposed improvements is estimated at $200,000.00. *Refer to Figure 3.* It is proposed to fund 100% of the cost of the project with TSIP funds.

Actual costs of the improvements may vary as detailed plans are prepared, and costs shown represent current dollars as of the report date. The most likely funding source for the recommended improvements is TSF funds or Traffic Safety Improvement Program (TSIP). Further information on potential funding sources is available on the Iowa DOT website at http://www.iowadot.gov/fundguid.htm.

5. Proposed Schedule

The project is proposed for letting in year 2015 with construction to be completed by end of 2016.

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

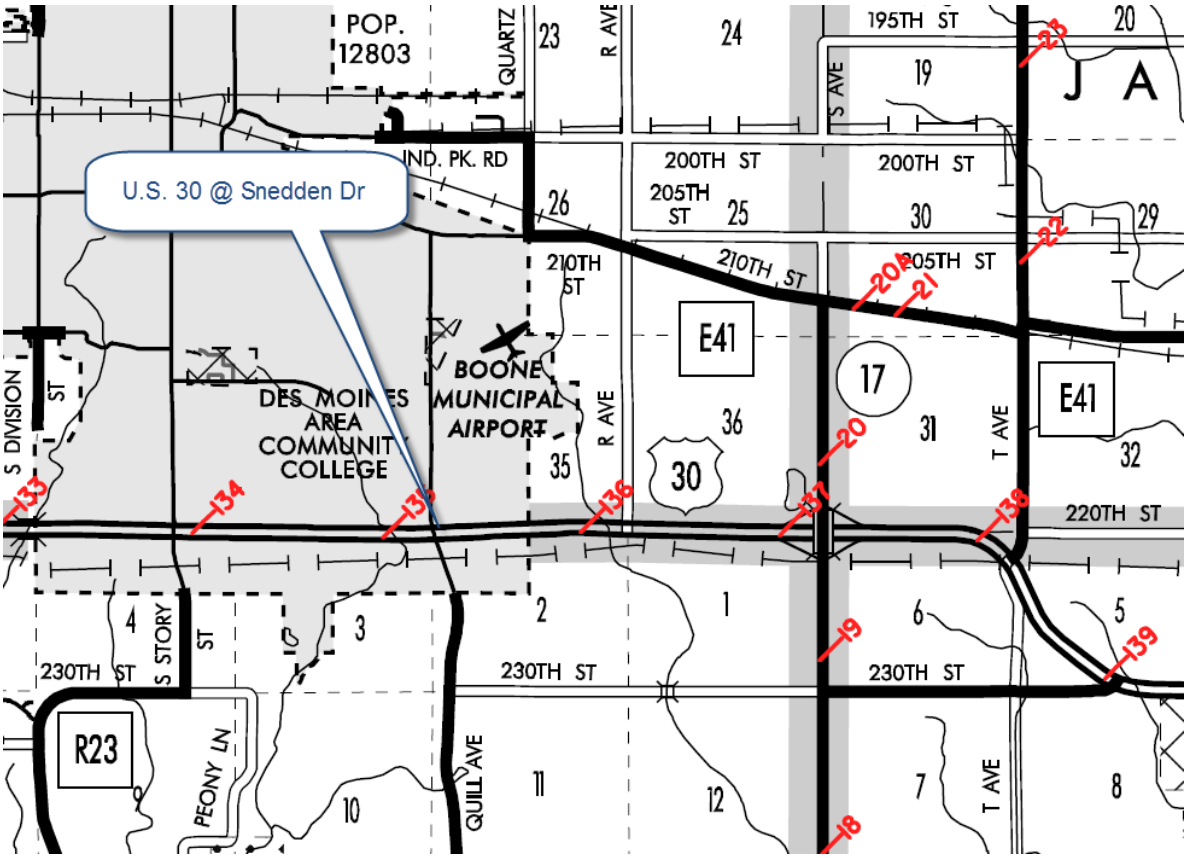


Figure 2: <u>5-Year Crash Summary</u>

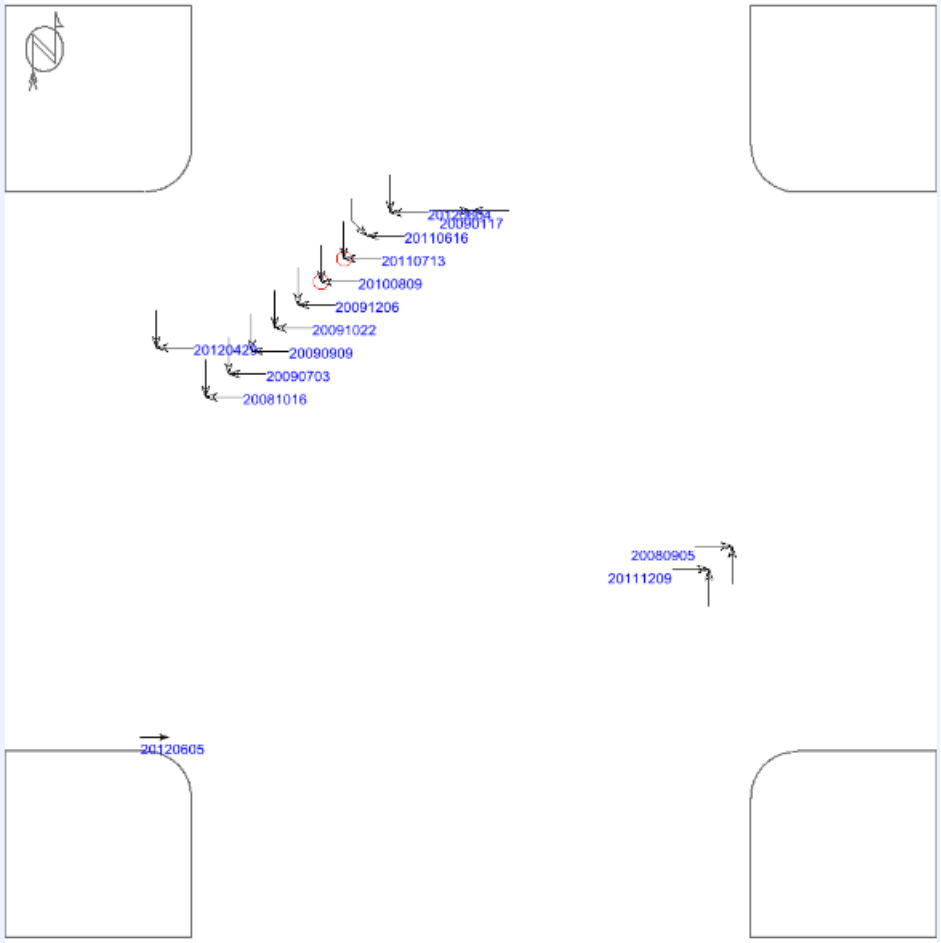
Crash reports for a five year period from January 2008 through December 2012 were reviewed. Crash history was gathered from the Iowa DOT's crash database. *CMAT* and *SAVER* crash analysis software were used to analyze crash data. Table 1 below summarizes the crash history at the intersection and shows the crash diagram. The calculated crash rates are based on the 2012 traffic count data. Summaries of crash history and collision diagrams of the intersections are included in the appendix.

The crash rate is 0.68 crashes per million entering vehicles (MEV). The state average of similar facilities is 0.9 crashes per MEV. Of the 16 crashes, 11 crashes were caused by failure to yield vehicles. This intersection has been on the SICL list for quite a few years.

Major Cause of Crashes at US-30 and Snedden Dr. 2008-2012						
Major Cause	**2008**	**2009**	**2010**	**2011**	**2012**	**Grand Total**
Animal	1			1		**2**
Ran Stop Sign		1				**1**
FTYROW: From stop sign	2	3	1	3	2	**11**
Swerving/Evasive Action		1				**1**
Other (explain in narrative): Other improper action					1	**1**
Grand Total	**3**	**5**	**1**	**4**	**3**	**16**

US-30 and Snedden Dr.

2008 - 2012 Reportable Crashes



(2) crashes could not be placed in this schematic

Straight
Stopped
Unknown
Backing
Overtaking
Sideswipe

Parked
Erratic
Out of control
Right turn
Left turn
U-turn

Pedestrian
Bicycle
Injury
Fatality
Nighttime
DUI

Fixed objects:
General
Signal
Tree
Pole
Curb
Animal

3rd vehicle
Extra data

Pd' Programming, Inc. 01/23/2014

Figure 3: <u>Cost Estimate</u>

Item Number	Cat	Description	Units	Quantity	Unit Price	Cost
1	01	10” PCC	SY	1,500	$50.00	$75,000.00
2	01	MOD-SUB-BASE	CY	375	$40.00	$15,000.00
3	01	CLASS 10 EXCAVATION	CY	3,000	$15.00	$45,000.00
4	01	MOBILIZATION	LS	1	$00.00	$10,000.00
5	01	GRANULAR TYPE ‘A’ SHOULDERS	TON	200	$25.00	$5,000.00
6	01	CULVERT REPAIRS	EA	1	$10,000	$10,000.00
7	01	RIGHT OF WAY	AC	0.5	$10,000	$10,000.00
		SUBTOTAL				$170,000.00
		MISC. & CONT.			15%	$30,00.00
		TOTAL				**$200,000.00**

Figure 4: <u>Aerial View of Project Location</u>

Figure 5: <u>U.S. 30 Looking West</u>

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Boone Prepared by: Kurt Shackelford Date Prepared: Mar 3, 2014

Intersection: U.S. 30 WB @ Snedden Dr (Airport Rd)

Improvement

Proposed Improvement(s): Offest Right Turn Lane

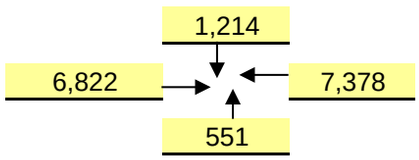
$ 200,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	20	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 200,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa Department of Transportation 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



5,827,225 Current Annual Entering Veh., **AEV** = DEV * 365

24,873 veh / day, Final Year DEV, **FDEV**

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

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

3.0% Projected Traffic Growth (0%-10%), **G**

15,965 Current Daily Entering Vehicles, **DEV**

Crash Data

2008 First full year --> 2012 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	$	-
		6	Major Injuries @	$240,000	$	1,440,000
7	Injury Crashes	3	Minor Injuries @	$48,000	$	144,000
		12	Possible Injuries @	$25,000	$	300,000
9	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	97,100
16	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,981,100

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

$ 123,819 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 79,244 Crash Costs Avoided in First Year, AAR x AVC

11.9 Total Avoided Crashes, TECR x CRF/ 100

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

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

$ 1,069,128 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 = $1,069,128 : $200,000 = **5.35** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Low Cost Safety Improvement Funds Program

Applicant: Iowa DOT, Office of Traffic & Safety

Contact Person: Jan Laaser-Webb Title: State Safety 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. Analysis of Iowa's crash data indicates that a high portion of fatal/serious crashes occur on two-lane rural roadways and at rural intersections. Research indicates these crashes may be mitigated through the application of low cost safety improvements such as rumble strips or destination lighting. 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 supplement a low cost safety improvement program for appropriate locations on Iowa's public roadways. Appropriate locations will be selected based using crash data, roadway characteristics, and other factors.

   The Office of Traffic & Safety will engage District and County jurisdiction representatives in identifying areas that would benefit with the application of low cost safety improvements.

   Sites to be determined.

C. $500,000
   (Past bids indicate a price per mile can be expected to be from $2500 to $6000.)

D. FY 2016

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

Example -Low Cost Safety Improvement 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

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: New Traffic Signals at Hwy 3/1st St. SW & Hwy 3/Hwy 65

Applicant: City of Hampton

Contact Person: Doug Tarr Title: Public Works Director

Complete Mailing Address: 122 1st Ave. NW
Hampton, Iowa 50441

Phone: 641-456-4853 (Area Code) E-Mail: dtarr@hamptonia.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 $ $375,000

Safety Funds Requested $ $375,000

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 Hampton

Signed: _____ 8-15-14
Signature Date Signed

Doug Tarr
Typed Name

Attest: _____ 08/15/14
Signature Date Signed

Robbi Stevens
Typed Name

COPY

RESOLUTION 2014-04

"RESOLUTION ENDORSING THE APPLICATION BY THE CITY OF HAMPTON FOR GRANT FUNDING FROM THE IOWA DEPARTMENT OF TRANSPORTATION'S TRAFFIC SAFETY IMPROVEMENT PROGRAM FOR REPLACEMENT OF TRAFFIC SIGNAL DEVICES."

WHEREAS, the Hampton City Council recognizes the importance of traffic safety measures within the city limits of Hampton; and,

WHEREAS, the existing traffic control devices located at the intersections of Highway 3 and 1st Street W and Highway 3 and Highway 65 are either currently or prone to malfunction, due to the age of the equipment exceeding projected longevity, with replacement vital parts for proper function no longer available; and,

WHEREAS, the Hampton City Council desires to replace these traffic control devices with new and properly functioning devices, for which replacement parts are readily available if needed, in an effort to provide safe and efficient traffic flow for local, thru and pedestrian traffic at these locations; and,

WHEREAS, the investment in the purchase and installation of such equipment is cost prohibitive to the City's current budget and limited revenue resources; and,

WHEREAS, with adequate grant funding to the City of Hampton for this proposed upgrade would allow prompt action for this valuable public safety improvement; and,

WHEREAS, the City of Hampton assures the commitment to adequately maintain proper function of said new traffic control devices upon installation.

NOW, THEREFORE, BE IT RESOLVED that the Hampton City Council approves adopts Resolution 2014-04, for the authorization of application for grant funding from the Iowa Department of Transportation's Traffic Safety Improvement Program (TSIP) for the replacement of two sets of traffic control devices at the intersections of Highway 3 and 1st Street W and Highway 3 and Highway 65, Hampton, Iowa.

PASSED AND ADOPTED THIS 27TH. DAY OF FEBRUARY, 2014.

ATTEST:

Ron Dunt, City Manager

Dyanne Pralle, mayor pro tem

Mayor Pro Tem Dyanne Pralle

TRAFFIC SAFETY IMPROVEMENTS PROGRAM
TRAFFIC SIGNAL REPLACEMENT
HIGHWAY 3 / 1ST ST. SW & HIGHWAY 3 / HIGHWAY 65 INTERSECTIONS
HAMPTON, IOWA

The City of Hampton, Iowa is applying for Traffic Safety Improvement Program (TSIP) funding for safety improvements at two (2) intersections within the corporate limits along State Highway 3. The proposed improvements will include replacement of the existing, non-functioning signals, pedestrian walk signals (with countdown timers), ADA compliant curb ramps, and other related appurtenances as shown on the attached drawings. Attached to this application in an aerial photograph of the intersections, conceptual signal drawings, traffic data for each intersection from 2013 traffic counts, and photos of each intersection.

The first intersection is located at Highway 3 and 1st Street SW. Highway 3 is a 4-lane, principal arterial street carrying an average annual daily traffic (AADT) of over 6,000 vehicles per day at this intersection. 1st Street SW is a 2-lane, local roadway carrying an AADT of over 1,200 vehicles per day at this location. The existing traffic signals are not functioning and are severely outdated. The company contracted to maintain the signals has informed the City that parts are becoming harder to find, and in some instances, are not available due to their age. The City has installed 4-way stop signs at this intersection and "yield to pedestrian" vertical panels to provide some measure of safety.

The second intersection is located at Highway 3 and State Highway 65. Highway 3 has the same geometrical makeup at this location and carries an AADT of over 6,000 vehicles per day. Highway 65 is also a 4-lane, principal arterial roadway that also carries over 6,000 vehicles per day. These traffic signals are functioning; however they are the same age as the signals at 1st St. SW and have sustained extensive damage. For instance, several of the signal heads have re-mounted on the mast arms in order to provide additional clearance for agriculture vehicles. As with 1st St. SW, maintenance of these signals is becoming more challenging and the City is concerned that turning this intersection into a 4-way stop controlled situation will greatly affect the efficiency of both roadways. Additionally, this intersection does not have pedestrian actuation so pedestrian safety is a growing concern for the community.

Collision History

Analysis of the Iowa DOT's Crash Mapping Analysis Tool (CMAT) shows that at Highway 3 and 1st St. SW, there have been 10 incidents between 2009 and 2013. Of those 10 incidents, 3 were classified as Minor Injury and 7 were classified as Property Damage Only. Those 10 incidents resulted in over $300,000 in loss. At Highway 3 and Highway 65, there have been 17 incidents reported over the same time period. Of those 17 incidents, 2 were Minor Injury, and 15 were Property Damage Only. Those 17 resulted in over $230,000 in loss.

Although these incidents give amounts of loss to the private parties involved, they don't reflect the cost to the City for contractor call-outs and repairs to the systems. Since 2003, the City has

over 18 calls to their on-call contractor to make repairs to these signals from either collisions or equipment/system failures. These 18 calls resulted in thousands of dollars spent on a failing piece of infrastructure.

Improvements

To improve the safety and operation of both these locations, the City of Hampton wishes to replace the existing signals and controls, and make pedestrian upgrades. The proposed traffic signals will be fully actuated and will provide permissive left turn phases in all directions. The existing traffic loops in the pavement are in good working order, so those will be re-used with these new signals. The traffic signal placement will meet the clear zone requirements from back of curb. These new signals will assist in assigning right-of-way to users and create gaps in traffic resulting in greater efficiency and operations of the roadway network.

City of Hampton, Iowa
Highway 3 / 1st St. SW and Highway 3 / Highway 65
Traffic Signal Replacement
TSIP Application

		Engineer's Estimate			
		Unit	Qty.	Unit Price	Total
1	Traffic Signals @ 1st St. SW	1	LS	$155,000.00	$155,000.00
2	Traffic Signals @ Hwy 65	1	LS	$175,000.00	$175,000.00
3	ADA Curb Ramps @ 1st St. SW	1	LS	$20,000.00	$20,000.00
4	ADA Curb Ramps @ Hwy 65	1	LS	$25,000.00	$25,000.00
	Total				**$375,000.00**
	TSIP Grant Request				**$375,000.00**

City of Hampton, Iowa
Highway 3 / 1st St. SW and Highway 3 / Highway 65
Traffic Signal Replacement
TSIP Application

Project Schedule

Notification of Funding Award	December '14/January '15
Traffic Signal Design	February - March '15
Project Bidding	May '15
Begin Construction	July '15
End Construction	August '15

PROJECT LOCATIONS - Hampton, Iowa

New traffic signals at Highway 3 / 1st Street NW, and Highway 3 / Highway 65

City of Hampton, Iowa
Highway 3 / 1st St. SW and Highway 3 / Highway 65
Traffic Signal Replacement
TSIP Application - Project Pictures

Highway 3 & 1st St. SW

Item F

Item F

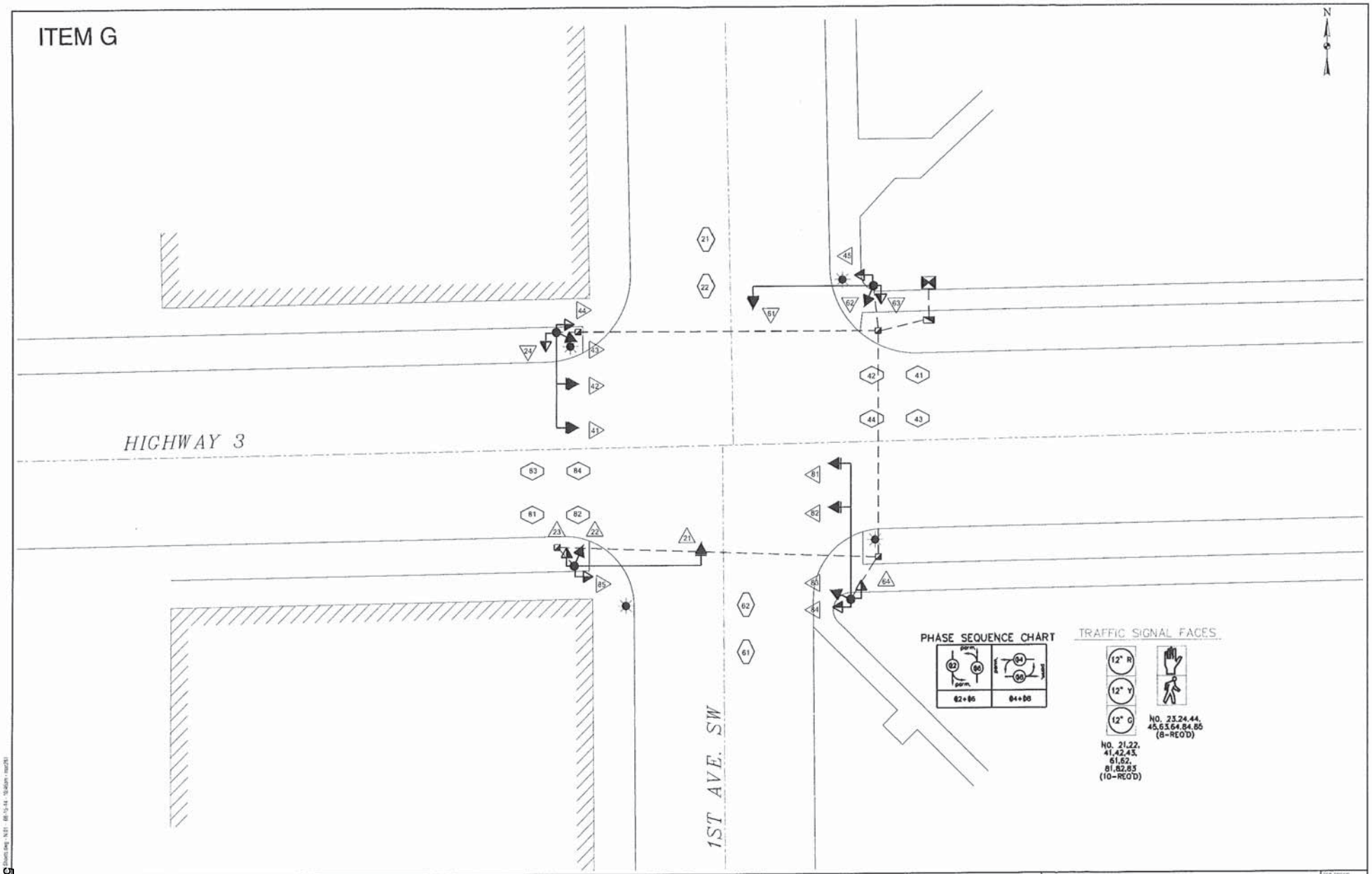
Highway 3 & Highway 65

08/11/2014 16:12

08/11/2014 16:11

Item F

ITEM G



GRAPHIC SCALE
0 150 300 450

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

CGA
Clapsadle-Gaffner Associates, Inc.
1523 S. Bell Ave. Suite 101
Ames, Iowa 50010
Ph 515-233-1384
www.cgaconsulting.com

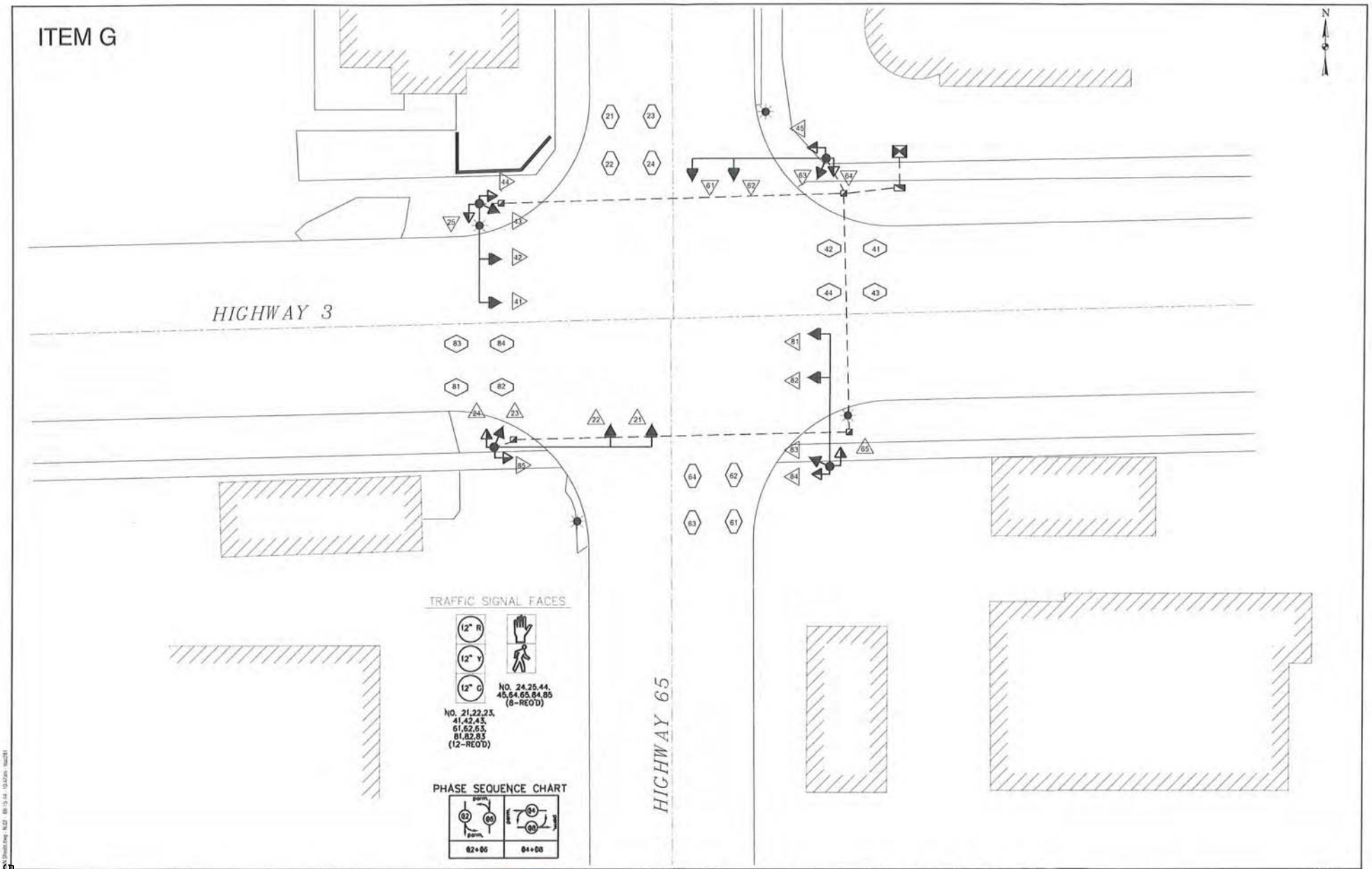
DESIGNED: SCB DATE:
DRAWN: BLB DATE:
CHECKED: MSC DATE:
APPROVED: MSC DATE:

Highway 3 Traffic Signals
Hampton, Iowa

PLAN

PROJECT NO. 1643.04
SHEET NO. 11.01

ITEM G



GRAPHIC SCALE

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

CGA

Clapsaddle-Garber Associates Inc
1503 S. Bell Ave. Suite 101
Ames, Iowa 50010
Ph 515-232-1394
www.cgaconsultants.com

DESIGNED: K.S. DATE:
DRAWN: K.S. DATE:
CHECKED: MJC DATE:
APPROVED: MJC DATE:

Highway 3 Traffic Signals

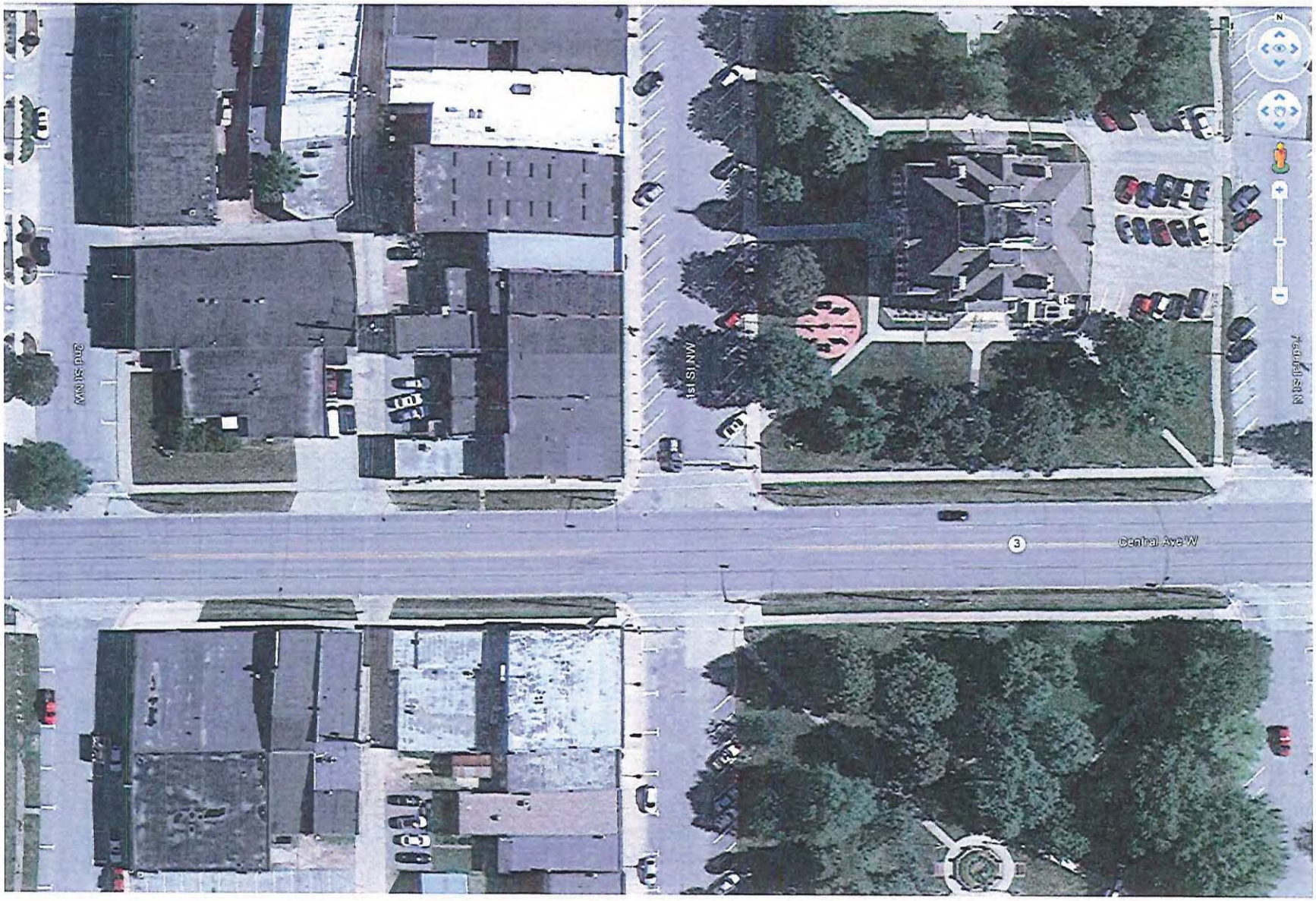
Hampton, Iowa

PLAN

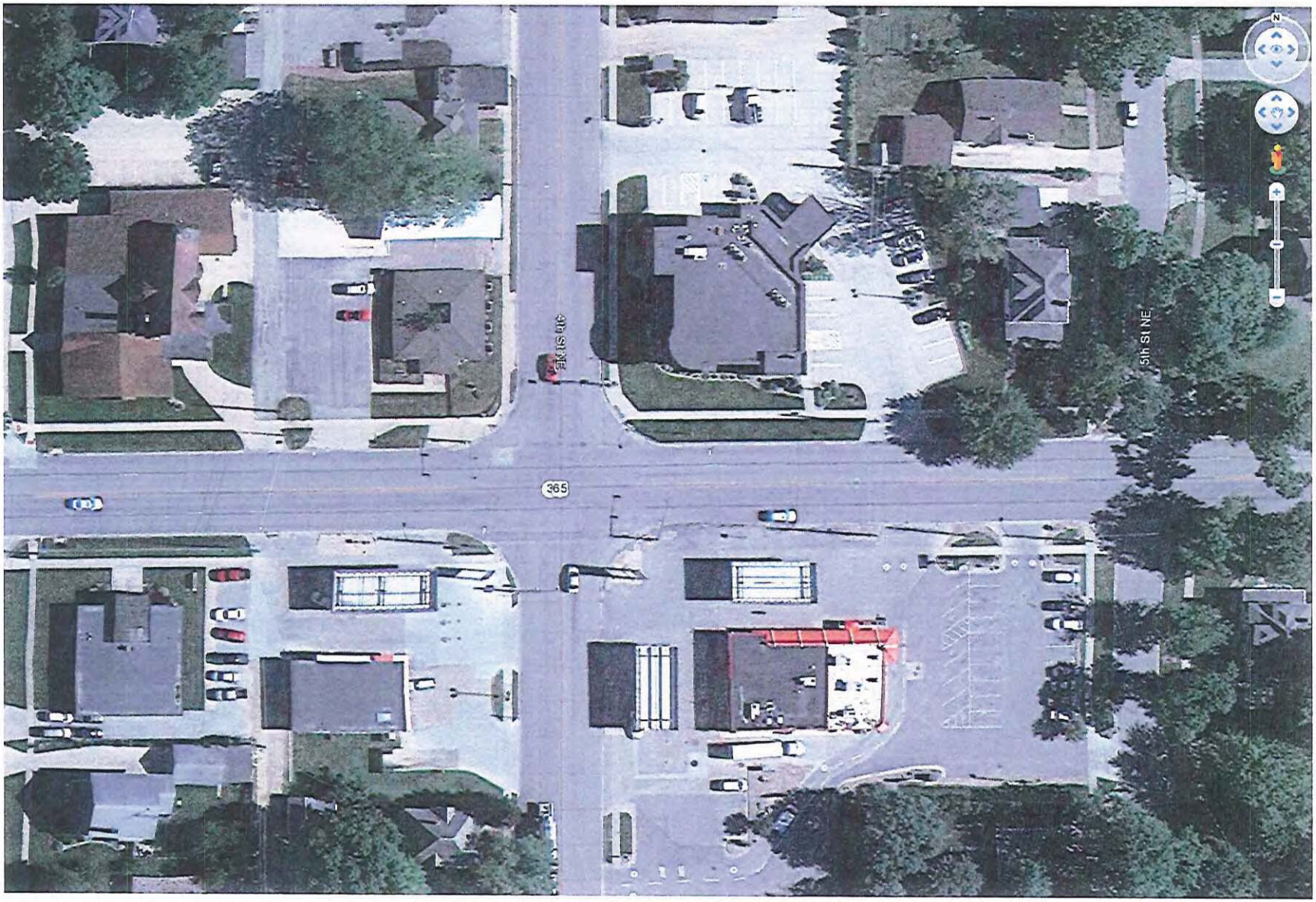
PROJECT NO. 1643.04

SHEET NO. N.02

Item H



Item H



Iowa Department of Transportation

Major Cause Summary

2009-2013 IA 3 & 1st St. NW Intersection in Hampton

Analysis Years: 2009 [2], 2010 [1], 2011 [2], 2013 [5]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	3
Possible/Unknown	-
PDO	7
Total Crashes	10

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	3
Possible	1
Unknown	-
Total Injuries	4

TOT Property Damage: $51,370

AVG Property Damage: $5,137

Surface Condition Summary:

Dry	7
Wet	2
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	10

Major Cause Summary:

	Animal
2	Ran Traffic Signal
1	Ran Stop Sign
	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
2	FTYROW: Making Left Turn
	FTYROW: From Driveway
2	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
	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
	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
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
1	Other: Other Improper Action
	Unknown
1	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst:

Notes:

Intersection / Spot Location Crash Rate

name:	IA 3 & 1st Street Northwest			
location:	Hampton, Iowa			
Traffic (two-way)				
north AADT	1,923	vehicles/day		
east AADT	6,308	vehicles/day		
south AADT	702	vehicles/day		
west AADT	6,187	vehicles/day	**7,560**	daily entering vehicles
Crash history				
Time period				
start date	1/1/2009			
end date	12/31/2013		**5.00**	years
Crashes				
	10	crashes	**0.72**	crashes / million entering vehicles
2013 AADT				

Iowa Department of Transportation

Major Cause Summary

2009-2013 US 65 & IA 3 Intersection in Hampton

Analysis Years: 2009 [5], 2010 [5], 2011 [5], 2012 [5], 2013 [5]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	2
PDO	15
Total Crashes	17

Injury Summary:

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

TOT Property Damage: $88,950

AVG Property Damage: $5,232

Surface Condition Summary:

Dry	15
Wet	1
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	17

Major Cause Summary:

	Animal
2	Ran Traffic Signal
	Ran Stop Sign
	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
4	FTYROW: Making Left Turn
1	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
2	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
1	Driving Too Fast for Conditions
	Exceeded Authorized Speed
2	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
	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
1	Other: Other Improper Action
1	Unknown
1	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst:

Notes:

Intersection / Spot Location Crash Rate

name:	IA 3 & 1st Street Northwest			
location:	Hampton, Iowa			
Traffic (two-way)				
north AADT	1,923	vehicles/day		
east AADT	6,308	vehicles/day		
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west AADT	6,187	vehicles/day	**7,560**	daily entering vehicles
Crash history				
Time period				
start date	1/1/2009			
end date	12/31/2013		**5.00**	years
Crashes				
	10	crashes	**0.72**	crashes / million entering vehicles
2013 AADT				

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

35331344099

Count Date:

Wednesday, June 05, 2013

County:

Franklin

Location Description:

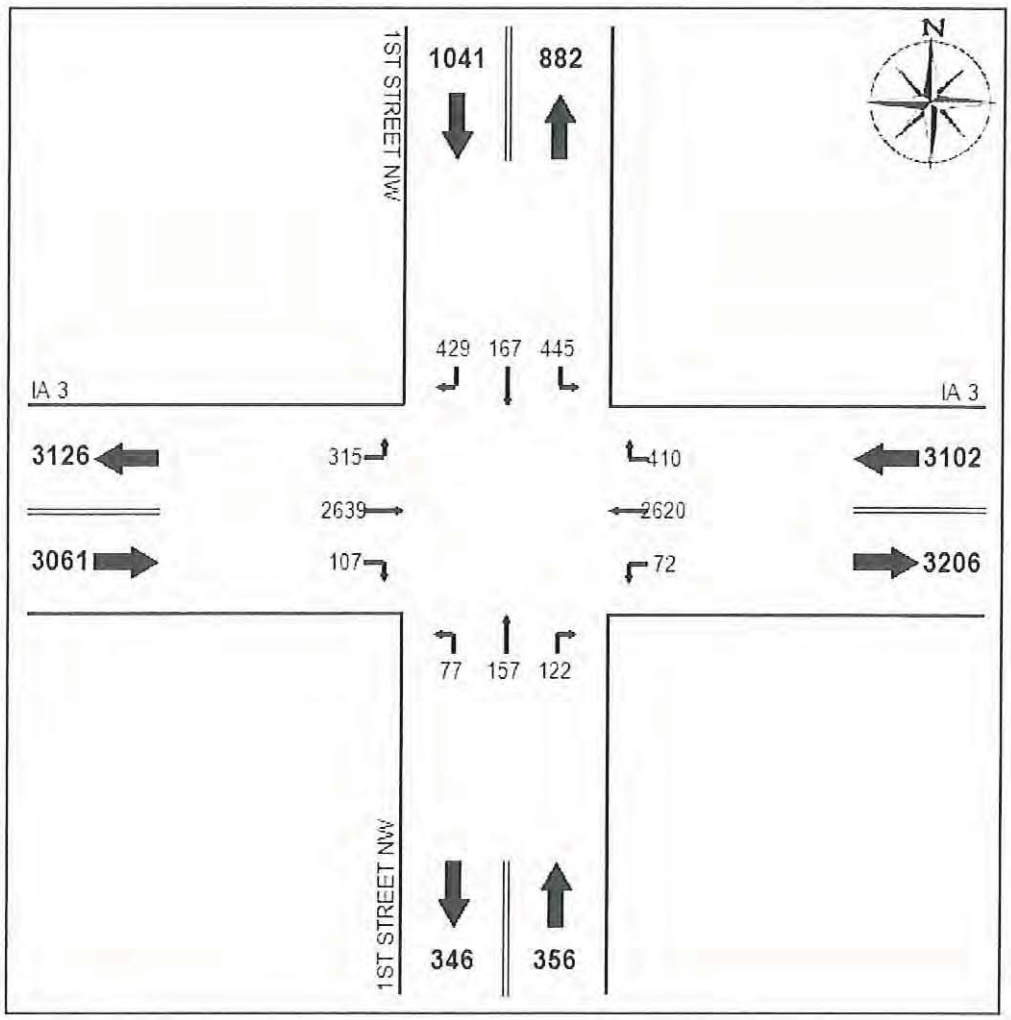
IA 3 & 1ST STREET NW

Volume Factor: 1.841

Pass Class Factor: 1.866

SU Class Factor: 1.579

Combo Class Factor: 1.538



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	9	5	23	4	142	14	0	5	5	9	116	1
08:00	28	10	20	4	210	25	2	9	8	27	193	5
11:00	36	22	27	8	223	49	8	15	13	29	212	11
12:00	52	15	47	10	239	38	13	22	12	26	254	13
15:00	30	14	45	6	188	38	10	11	10	25	202	11
16:00	42	12	39	5	209	28	3	9	9	21	225	8
17:00	42	12	30	2	207	28	5	13	9	32	226	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

Station Number:

35331344099

Count Date:

Wednesday, June 05, 2013

County:

Franklin

Location Description:

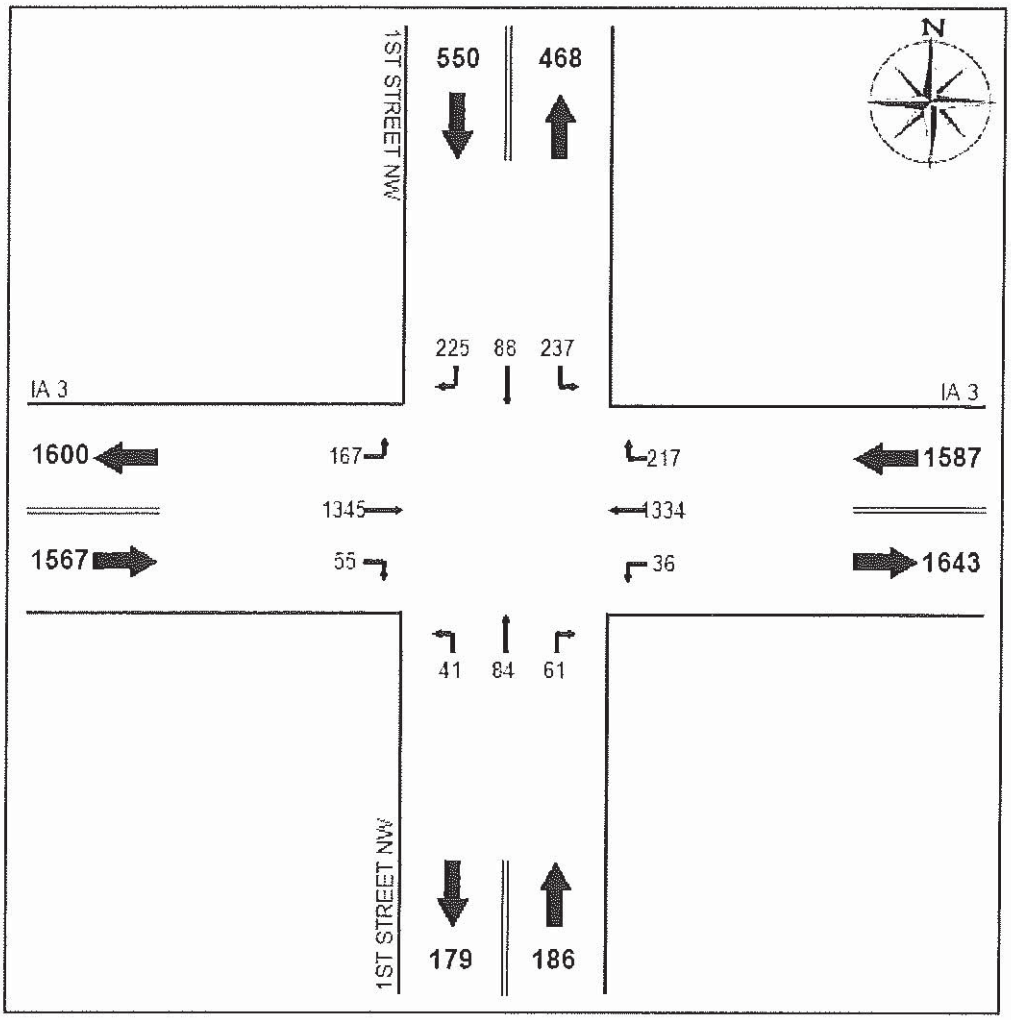
IA 3 & 1ST STREET NW

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	8	4	22	4	132	14	0	5	2	7	105	1
08:00	28	9	18	4	192	25	2	9	7	27	181	5
11:00	36	22	26	7	203	48	8	15	12	29	192	11
12:00	51	15	46	8	227	37	13	22	12	26	239	12
15:00	30	14	44	6	180	37	10	11	10	25	191	10
16:00	42	12	39	5	199	28	3	9	9	21	219	7
17:00	42	12	30	2	201	28	5	13	9	32	218	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

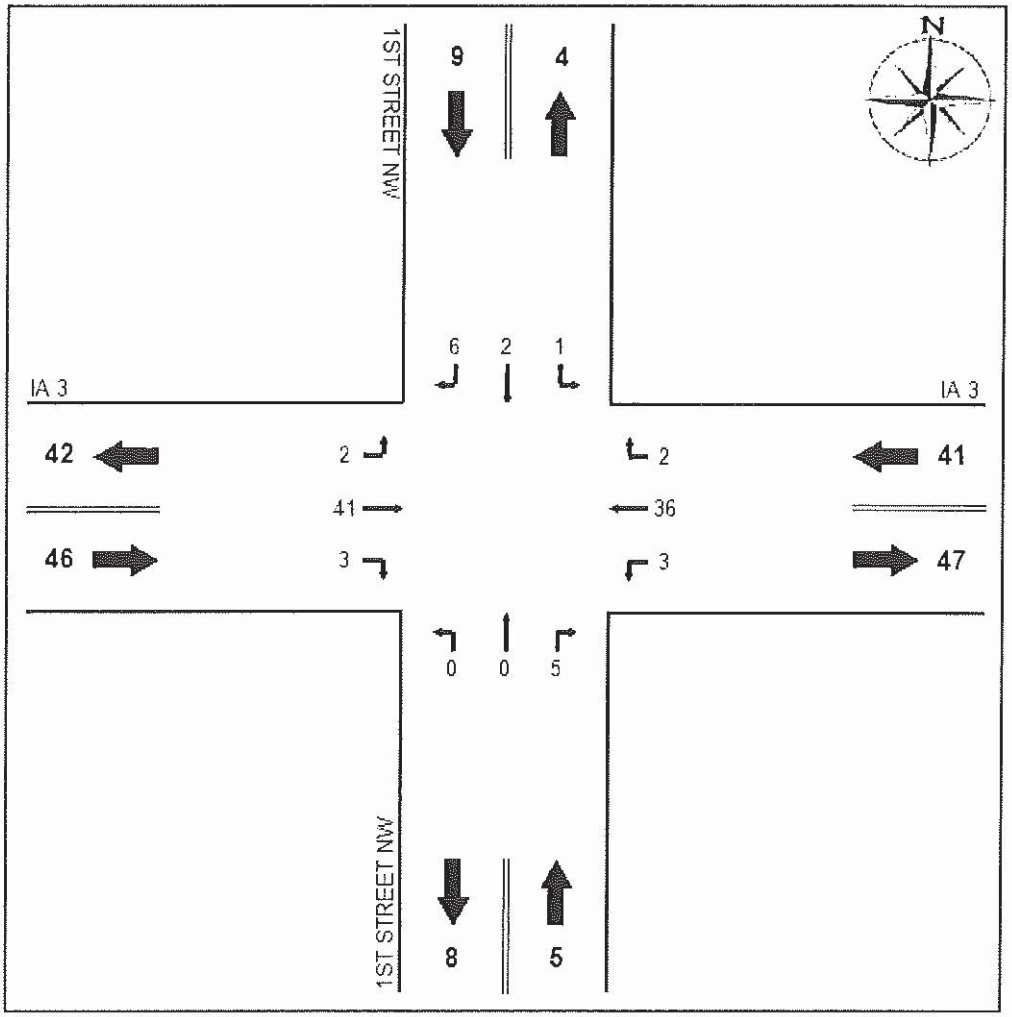
Station Number:
35331344099

Count Date:
Wednesday, June 05, 2013

County:
Franklin

Location Description:
IA 3 & 1ST STREET NW

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	0	1	1	0	5	0	0	0	3	2	4	0
08:00	0	1	2	0	7	0	0	0	1	0	7	0
11:00	0	0	1	1	9	1	0	0	1	0	12	0
12:00	1	0	1	2	7	1	0	0	0	0	6	1
15:00	0	0	1	0	3	0	0	0	0	0	5	1
16:00	0	0	0	0	3	0	0	0	0	0	4	1
17:00	0	0	0	0	2	0	0	0	0	0	3	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

Station Number:

35331344099

Count Date:

Wednesday, June 05, 2013

County:

Franklin

Location Description:

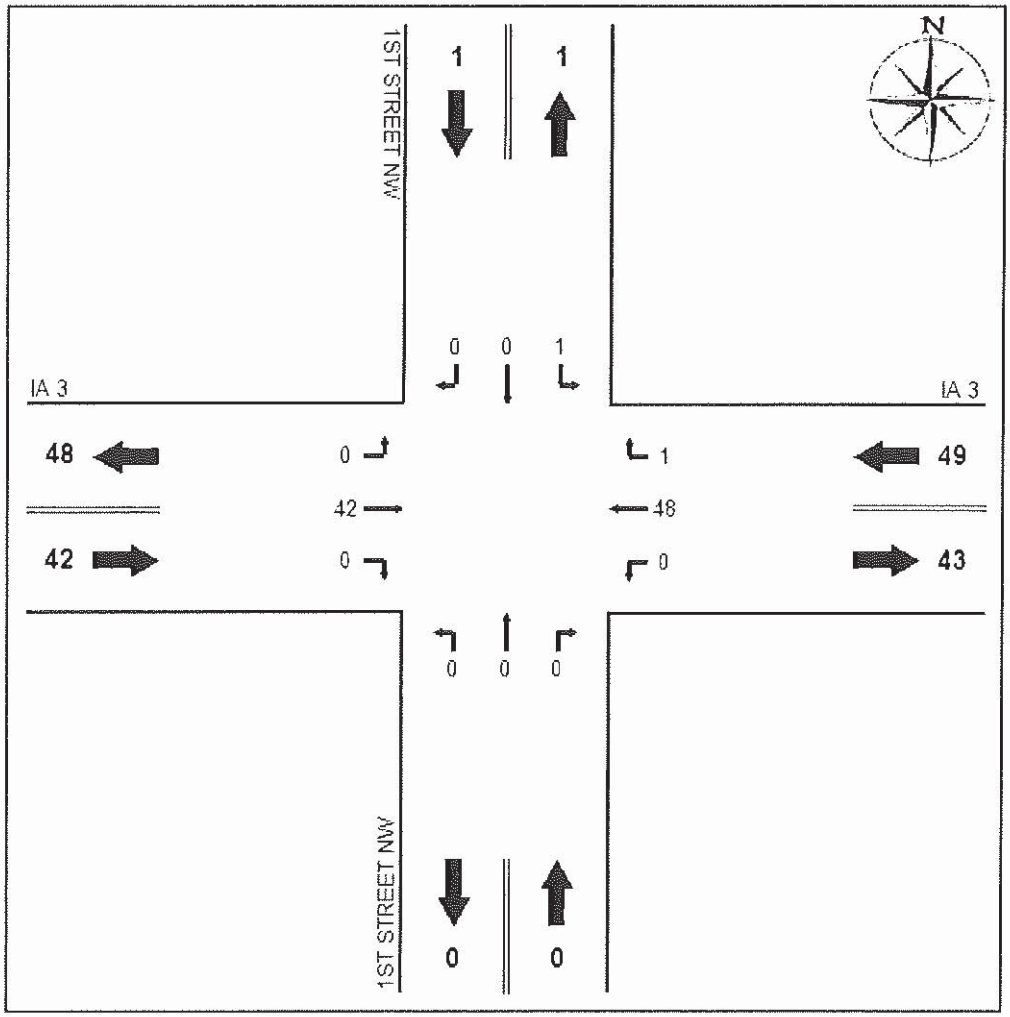
IA 3 & 1ST STREET NW

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	1	0	0	0	5	0	0	0	0	0	7	0
08:00	0	0	0	0	11	0	0	0	0	0	5	0
11:00	0	0	0	0	11	0	0	0	0	0	8	0
12:00	0	0	0	0	5	0	0	0	0	0	9	0
15:00	0	0	0	0	5	1	0	0	0	0	6	0
16:00	0	0	0	0	7	0	0	0	0	0	2	0
17:00	0	0	0	0	4	0	0	0	0	0	5	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

35331349099

Count Date:

Monday, July 22, 2013

County:

Franklin

Location Description:

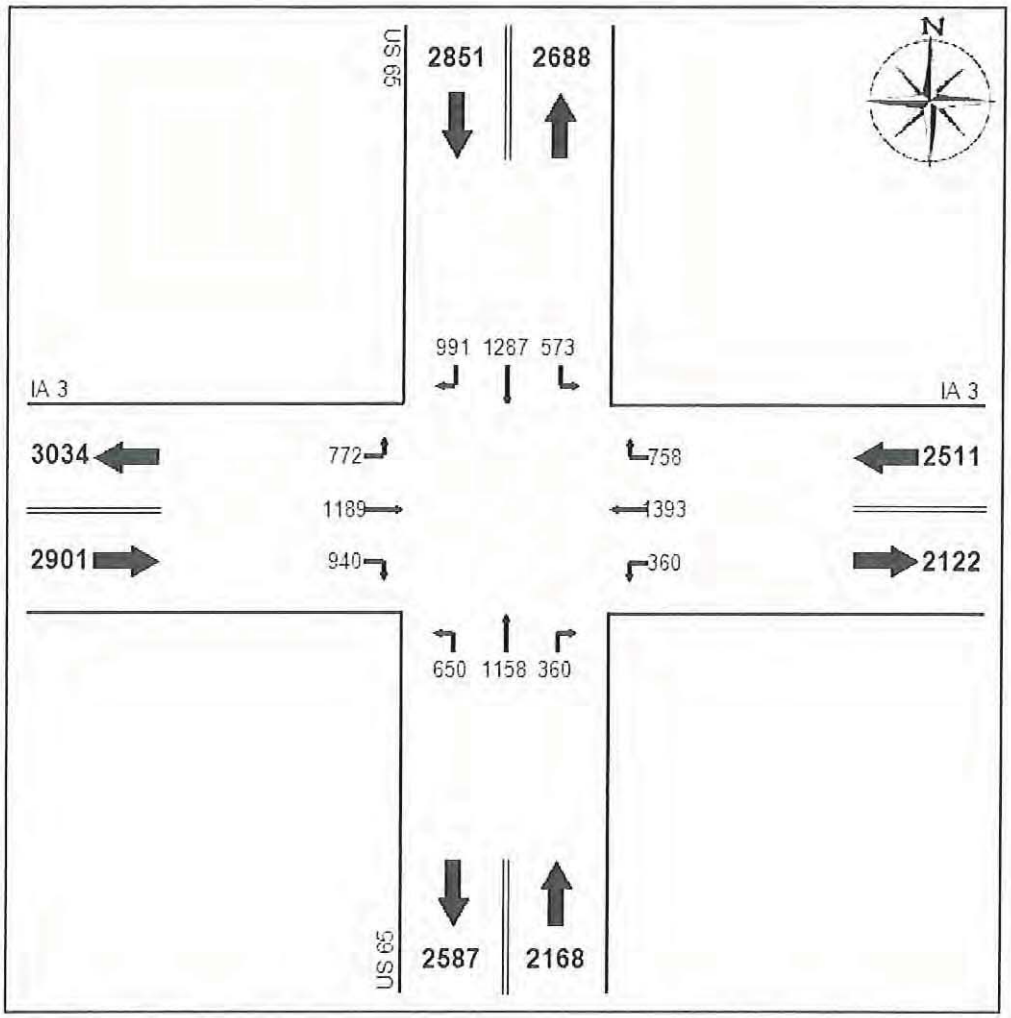
IA 65 & IA 3

Volume Factor: 1.967

Pass Class Factor: 1.979

SU Class Factor: 1.538

Combo Class Factor: 1.663



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	35	85	47	18	81	51	30	69	18	31	60	32
08:00	44	72	67	21	101	48	40	66	26	35	71	44
11:00	48	89	82	34	113	56	62	77	34	58	70	74
12:00	49	131	100	41	137	74	77	112	29	70	104	94
15:00	42	99	77	32	106	65	44	92	30	69	111	97
16:00	47	116	87	27	111	62	49	108	24	76	116	84
17:00	28	69	51	13	63	30	29	71	27	58	77	53

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

Station Number:

35331349099

Count Date:

Monday, July 22, 2013

County:

Franklin

Location Description:

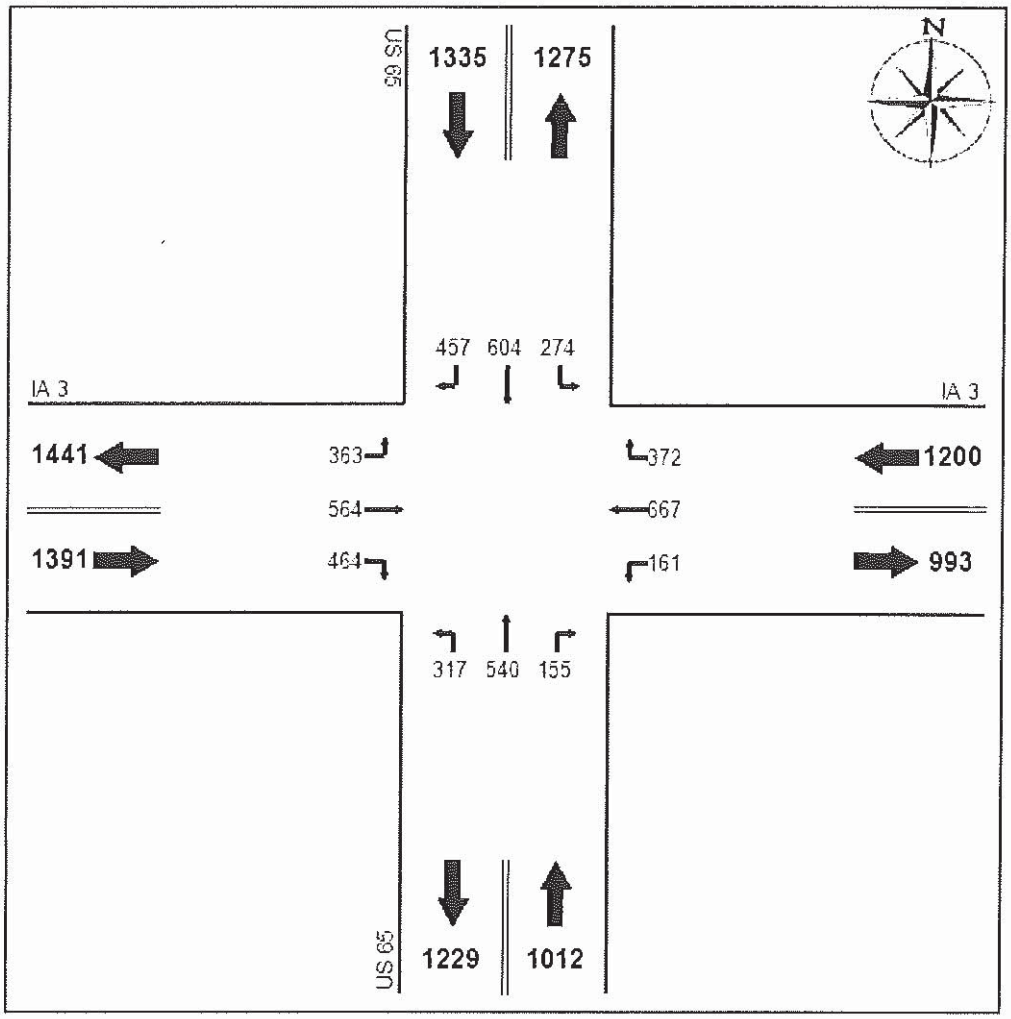
IA 65 & IA 3

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	35	79	40	16	78	51	28	63	14	30	51	28
08:00	42	62	60	20	95	43	38	54	18	31	64	37
11:00	39	84	70	30	107	54	59	68	26	51	63	73
12:00	45	120	91	36	127	73	73	106	25	63	98	94
15:00	40	83	68	25	96	63	42	78	27	63	104	97
16:00	45	109	81	23	104	58	48	104	20	69	111	82
17:00	28	67	47	11	60	30	29	67	25	56	73	53

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Single-Unit Trucks

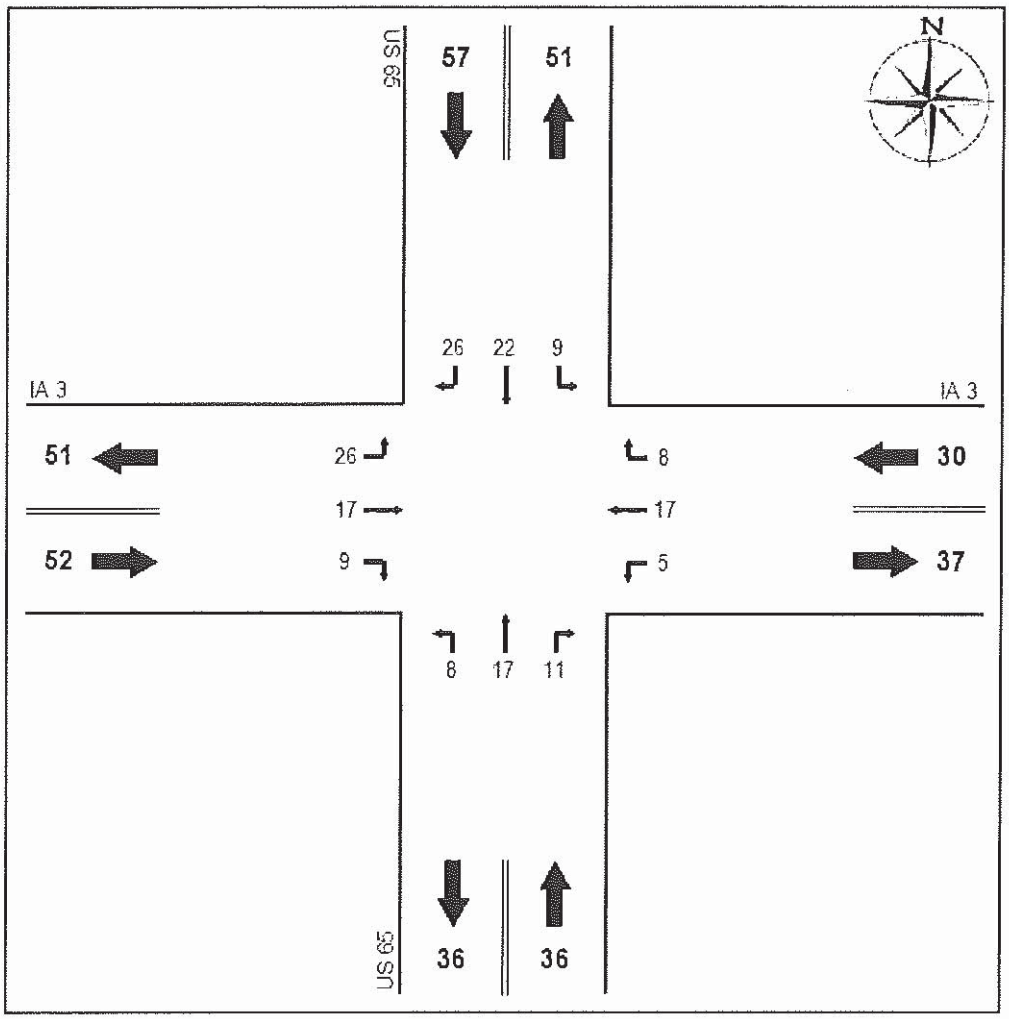
Station Number:
35331349099

Count Date:
Monday, July 22, 2013

County:
Franklin

Location Description:
IA 65 & IA 3

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	0	1	1	0	2	0	2	2	0	0	4	2
08:00	2	6	4	0	1	4	2	3	4	3	3	5
11:00	3	2	6	2	1	1	1	2	3	5	2	1
12:00	3	3	4	2	4	1	2	4	2	6	2	0
15:00	1	5	6	0	7	1	1	4	1	5	4	0
16:00	0	5	4	1	2	1	0	1	1	5	2	1
17:00	0	0	1	0	0	0	0	1	0	2	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

Station Number:

35331349099

Count Date:

Monday, July 22, 2013

County:

Franklin

Location Description:

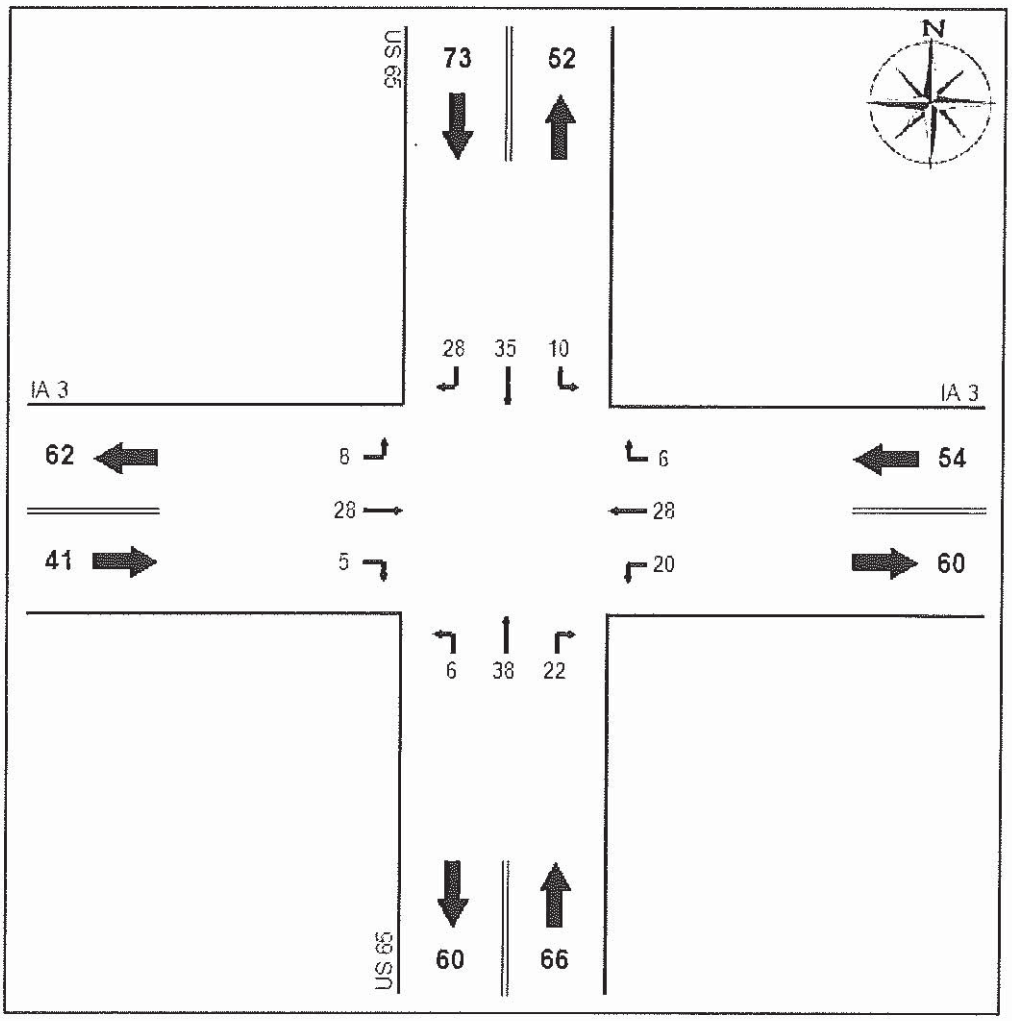
IA 65 & IA 3

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	0	5	6	2	1	0	0	4	4	1	5	2
08:00	0	4	3	1	5	1	0	9	4	1	4	2
11:00	6	3	6	2	5	1	2	7	5	2	5	0
12:00	1	8	5	3	6	0	2	2	2	1	4	0
15:00	1	11	3	7	3	1	1	10	2	1	3	0
16:00	2	2	2	3	5	3	1	3	3	2	3	1
17:00	0	2	3	2	3	0	0	3	2	0	4	0

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Franklin Co. Prepared by: Parker Ridgway Date Prepared: Aug 11, 2014

Intersection: IA 3 & 1st St. NW

Improvement

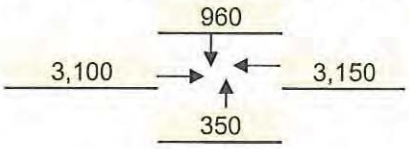
Proposed Improvement(s): Installation of new mast arms and signal heads, including LEDs, at the intersection of IA 3 & 1st St. NW in Hampton

$ 175,000	Estimated Improvement Cost, **EC**	15	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**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 175,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT - Hampton AADT 2013 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



2,759,400	Current Annual Entering Veh., **AEV** = DEV * 365
8,777	veh / day, Final Year DEV, **FDEV**
44.42	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
7,560	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009	First full year -->	2013	Last full year	5.0 years, Time Period, **T**		
0	Additional months			values as of May 2014		
0	Fatal Crashes		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
3	Injury Crashes	3	Minor Injuries @	$65,000	$	195,000
		1	Possible Injuries @	$35,000	$	35,000
7	Property Damage Only		(assumed cost per crash)	$7,400	$	74,000
			-OR- enter all Property Costs of all crashes:			
10	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	304,000

2.00	Current Crashes / Year, **AA** = TA / T	0.72	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 30,400	Cost per Crash, **AVC** = LOSS / TA	$ 280,873	Present Value of Avoided Crashes, **BENEFIT**
32.2	Total Expected Crashes, **TECR** = CR x TMEV		
0.78	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 23,712	Crash Costs Avoided in First Year, AAR x AVC		
12.6	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 = $280,873 : $175,000 = **1.60** : 1

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Franklin Co. Prepared by: Parker Ridgway Date Prepared: Aug 11, 2014

Intersection: US 65 & IA 3

Improvement

Proposed Improvement(s): Installation of new mast arms and signal heads, including LEDs, at the intersection of US 65 & IA 3

$ 200,000	Estimated Improvement Cost, **EC**	15	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**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 200,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT - Hampton AADT 2013 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

2,750

2,950 → ✦ ← 2,315

2,380

3,794,175	Current Annual Entering Veh., **AEV** = DEV * 365
12,068	veh / day, Final Year DEV, **FDEV**
61.07	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
10,395	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009	First full year -->	2013	Last full year	5.0 years, Time Period, **T**		
0	Additional months			values as of May 2014		
0	Fatal Crashes →		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
2	Injury Crashes →		Minor Injuries @	$65,000	$	-
		3	Possible Injuries @	$35,000	$	105,000
15	Property Damage Only		(assumed cost per crash)	$7,400	$	125,800
			-OR- enter all Property Costs of all crashes:			
17	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	230,800

3.40	Current Crashes / Year, **AA** = TA / T	0.90	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 13,576	Cost per Crash, **AVC** = LOSS / TA	$ 213,242	Present Value of Avoided Crashes, **BENEFIT**
54.7	Total Expected Crashes, **TECR** = CR x TMEV		
1.33	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 18,002	Crash Costs Avoided in First Year, AAR x AVC		
21.3	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 = $213,242 : $200,000 = **1.07** : 1

A

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Co. Rd. X-44/PCC Overlay

Applicant: Jones County

Contact Person: Derek Snead Title: County Engineer

Complete Mailing Address: 19501 Hwy 64, P.O. Box 368
Anamosa, IA 52205

Phone: (319) 462-3785 (Area Code) E-Mail: engineer@co.jones.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): City of Monticello

Contact Person: Doug Herman Title: City Administrator

Complete Mailing Address: 200 E 1st St
Monticello, IA 52310

Phone: (319) 465-3577 (Area Code) E-Mail: dherman@ci.monticello.ia.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 2,500,000.00

Safety Funds Requested $ 331,000.00

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 Jones

Signed: NED ROHWEDDER 7-29-14

Signature Date Signed

Ned Rohwedder, Chairman, BOS

Typed Name

Attest: 7-29-14

Signature Date Signed

Janine Sulzner, Jones County Auditor

Typed Name

Traffic Safety Improvement Program Narrative

Jones County intends to overlay County Road X-44 with six inches of Portland Cement Concrete in the spring of 2015. This project was designated with the following number:

- ***FM-CO53(77)—55-53***

The location of the proposed project is described as follows:

- ***On X-44, from E-23 North 5.0 Miles to 0.2 Miles North of City of Monticello Corporation Limits***

The proposed overlay is Phase II of a goal to enhance the safety of the X-44 corridor (550 – 850 2013 Annual Average Daily Traffic) from Amber to the City of Monticello. Phase I included flattening foreslopes and widening the road top. Construction on Phase I began at the start of June 2014 with construction to be complete in the fall of 2014. Prior to construction in 2014, the X-44 roadtop had eleven foot lanes, six foot shoulders and 2:1 foreslopes. When both Phases of construction are complete the finished product will have 11 foot lanes, two foot of paved shoulder with safety edge (See Standard Road Plan, PV-3), eight additional feet of non-paved shoulder and 3:1 foreslopes.

At one time, this road was listed as one of Iowa's High Risk Rural Roads. With this in mind, in conjunction with the road surface rapidly deteriorating, we added a paving project to the Secondary Road Five Year Construction Program. When reviewing the crash history along this roadway we found a number of crashes. Some included vehicles that ran off the road and also included a fatality within the last ten years. One area we wanted to improve with the new paving was increasing our clear-zone distance to keep vehicles that did travel off the roadway on their wheels. We were able to increase the Clear-zone distance by four feet which should dramatically decrease the likelihood errant vehicles will roll over. Another safety factor added to this project that should lead to less roll overs is the implementation of the safety edge. The safety edge gives the driver a smooth transition from the paved surface to the granular shoulder.

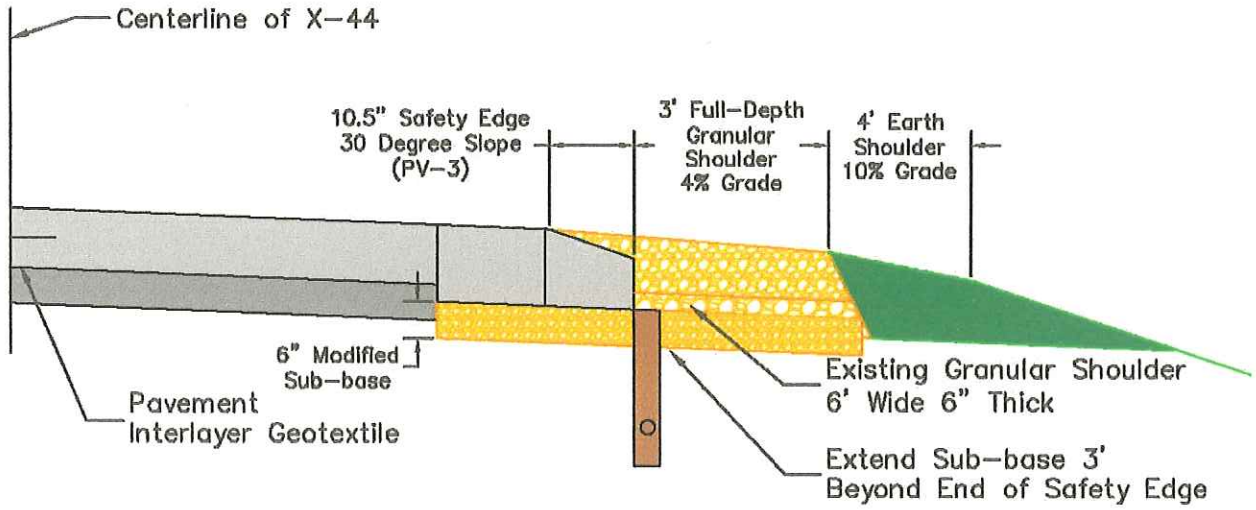
Phase II is currently being developed with an Iowa DOT letting of January 21, 2015. We would likely have a late start date of mid-April with the completion of the project near the end of July 2015. Accompanying this Narrative you will also find the following:

- ***Itemized Breakdown of all costs;***
- ***Preliminary plans for the project;***
- ***Color pictures of the project site;***
- ***Officer Reports of motor vehicle accidents and***
- ***Benefit/Cost ratio worksheet.***

Total Project Cost Estimate									
Item No.	Item Code	Item	Unit	Division 1	Division 2	Total	Unit Cost	Total Cost	Funding Source
1	2102-2713070	EXCAVATION, CLASS 13, ROADWAY AND BORROW	CY	7402.96	360.30	7763.26	4.75	36875.49	TSIP
2	2115-0100000	MODIFIED SUBBASE	CY	5552.22	270.22	5822.44	25.00	145561.00	TSIP
3	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	9145.01	437.13	9582.14	15.00	143732.10	FM
4	2213-7100400	RELOCATION OF MAIL BOXES	EACH	13.00	2.00	15.00	100.00	1500.00	FM
5	2301-9091000	RUMBLE STRIP PANEL (PCC SURFACE)	EACH	3.00	0.00	3.00	250.00	750.00	FM
6	2310-5151040	PORTLAND CEMENT CONCRETE OVERLAY, FURNISH ONLY	CY	17788.05	858.72	18646.77	70.00	1305273.90	TSIP/FM
7	2310-5151251	PORTLAND CEMENT CONCRETE OVERLAY, PLACEMENT ONLY (UNBONDED)	SY	78405.78	3783.11	82188.89	5.00	410944.45	TSIP/FM
8	2310-8300550	PAVEMENT INTERLAYER GEOTEXTILE	SY	61749.11	2972.44	64721.55	2.25	145623.49	FM
9	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	505.22	24.32	529.54	135.00	71487.90	FM
10	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	24994.00	1256.00	26250.00	5.00	131250.00	FM
11	2502-8220196	SUBDRAIN OUTLET, RF-19E	EACH	101.00	5.00	106.00	100.00	10600.00	FM
12	2510-6745850	REMOVAL OF PAVEMENT	SY	919.11	488.89	1408.00	7.00	9856.00	FM
13	2515-2475006	DRIVEWAY, P.C. CONCRETE, 6 IN.	SY	61.96	0.00	61.96	50.00	3098.00	FM
14	2526-8285000	CONSTRUCTION SURVEY	LS	0.95	0.05	1.00	20000.00	20000.00	FM
15	2528-8445110	TRAFFIC CONTROL	LS	0.95	0.05	1.00	10000.00	10000.00	FM
16	2533-4980005	MOBILIZATION	LS	0.95	0.05	1.00	50000.00	50000.00	FM
			Total Project Cost:					2496552.3	

SAFETY EDGE ESTIMATE OF QUANTITIES

ITEM	DIVISION 1	DIVISION 2	UNIT COST	TOTAL COST
PCC PLACE ONLY (S.Y.)	5552.22	270.22	3.85	22416.39
PCC FURNISH ONLY (C.Y.)	1388.06	67.56	68.87	100248.55
CLASS 13 EXCAVATION (C.Y.)	7402.96	360.3	3.54	27481.94
MODIFIED SUBBASE (C.Y.)	5552.22	270.22	31.01	180553.86
				330700.75



E

Letting Date 12/16/2014

JONES COUNTY

UNBONDED PCC OVERLAY WITH SAFETY EDGE

FM-C053(77)--55-53

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

UTILITIES:

POWER (OVERHEAD)	Alliant Energy	Anamosa:	(319) 462-6338
POWER (OVERHEAD)	ITC Midwest	Cedar Rapids:	(319) 297-6802
TELEPHONE (BURIED)	CenturyLink	Cedar Rapids:	(319) 399-7600
GAS (BURIED)	Kinder Morgan	Charles City:	1-800-265-6000
GAS (BURIED)	Alliance	Maquoketa:	1-800-884-8811
GAS (BURIED)	Buckeye Partners	Houston, Tx:	1-800-331-4115

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2012, plus General Supplemental Specifications; and applicable Supplemental Specifications, Developmental Specifications, and Special Provisions, shall apply to this project.

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

FARM-TO-MARKET SYSTEM

JONES COUNTY

UNBONDED PCC OVERLAY w/ SAFETY EDGE

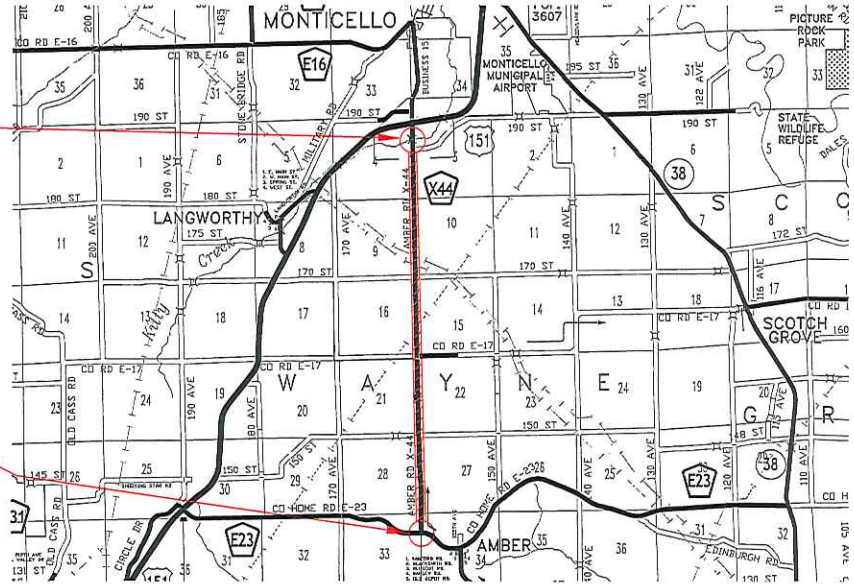
On X44 From E23 to U.S. 151

DIVISION 1 JONES COUNTY

DIVISION 2 CITY OF MONTICELLO

END PROJECT STATION 263+95

BEGIN PROJECT STATION 0+00



REVISIONS	TOTAL 10
	PROJECT NUMBER
	FM-C053(77)--55-53
	TPMS NUMBER
	24813
	BRIDGE NUMBER LOCAL
	BRIDGE NUMBER FHWA

INDEX OF SHEETS

No.	Description
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
A.1	Title Sheet
	Cross-Sections Available, Jones County Engineer's Office

MILEAGE SUMMARY

Div.	Location	Feet	Miles
1	Sta. 0+00 to 251+44	25,144	4.76
2	Sta. 251+44 to 263+95	1,251	0.24
	Total	26,395	5.00

Approved By: The Jones County Board of Supervisors

Annual Average Daily Traffic

2009, Traffic Count = 550 V.P.D.

FIELD NOTES

Survey Field Book

DEREK G. SNEAD LICENSED 20862 IOWA PROFESSIONAL ENGINEER

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.

Signed: Date:

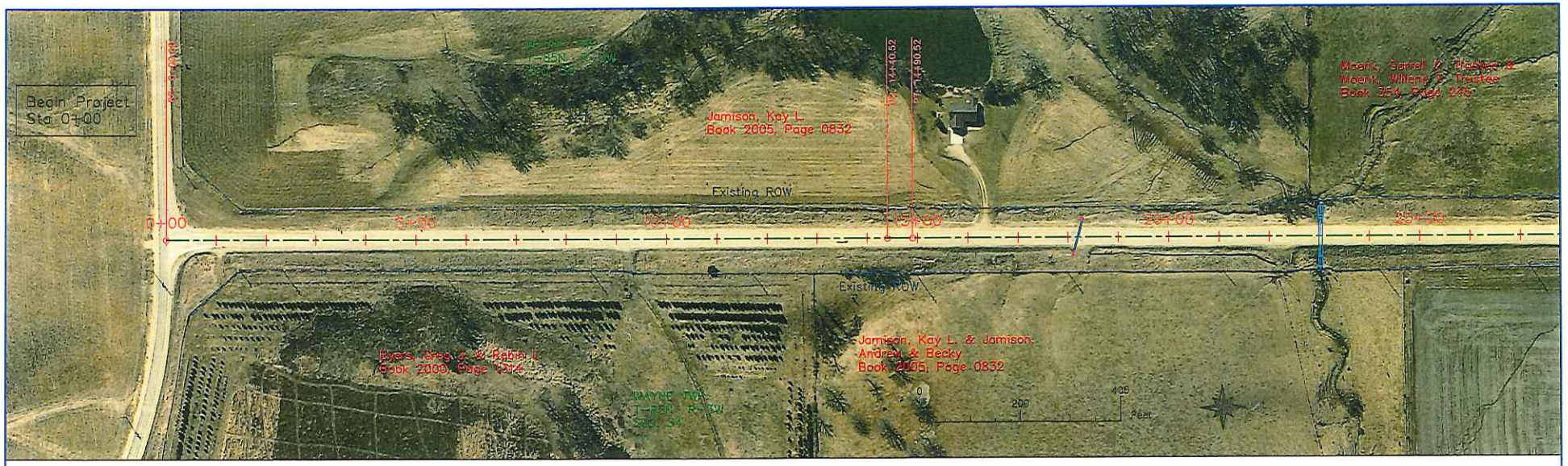
Derek G. Snead, P.E., No. 20862

My license renewal date is December 31, 2015.

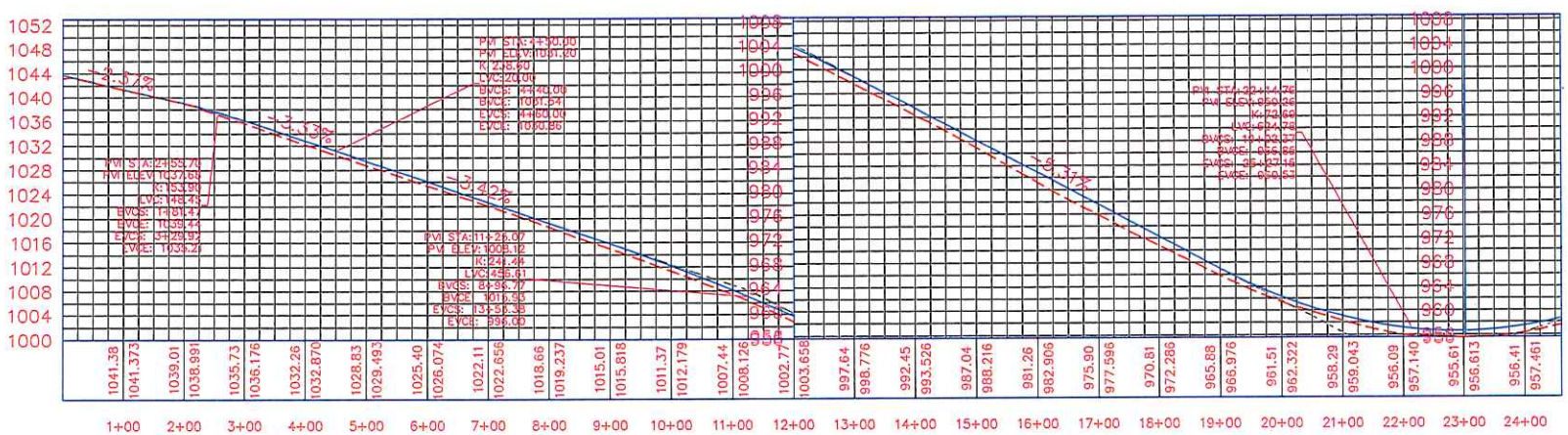
Pages or sheets covered by this seal: (Entire submission unless specified here)

ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	A.1

F/H/G

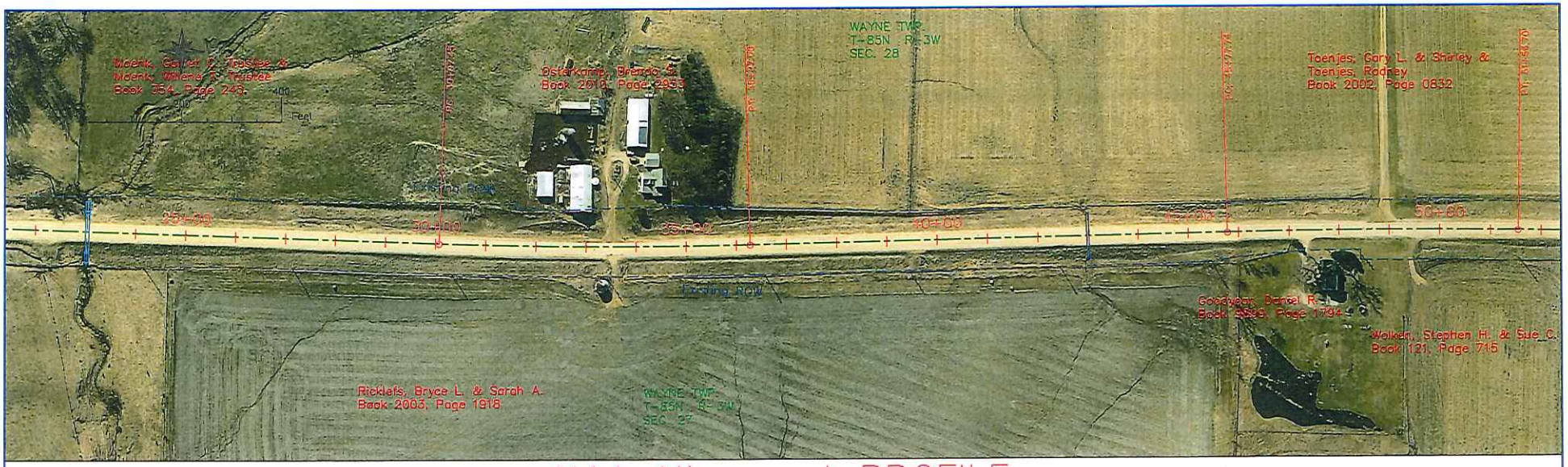


X44 Alignment PROFILE

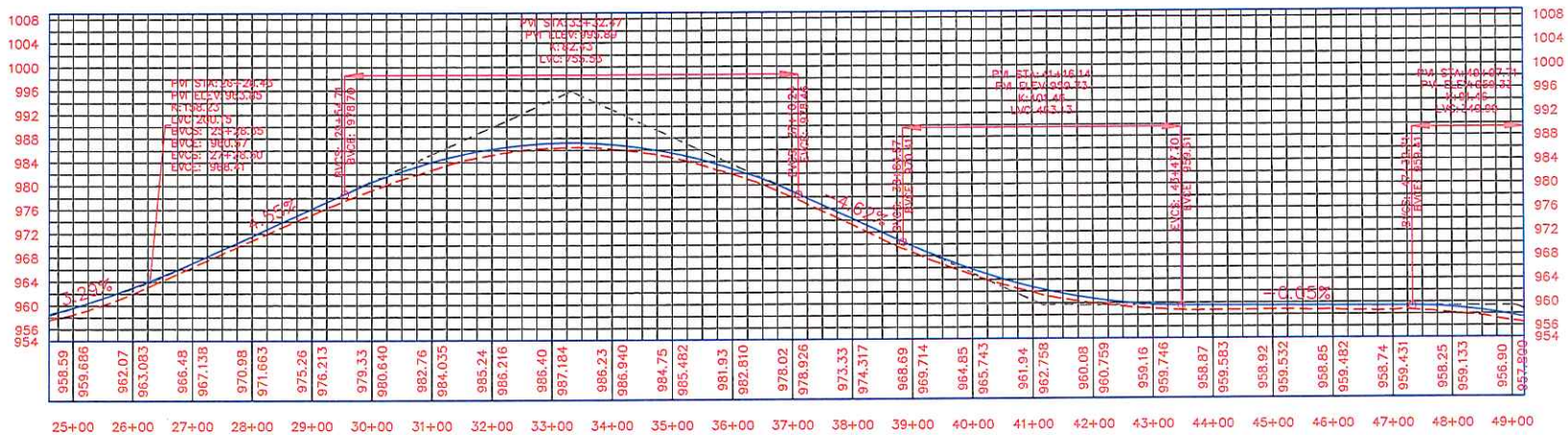


ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.1

F/H/G

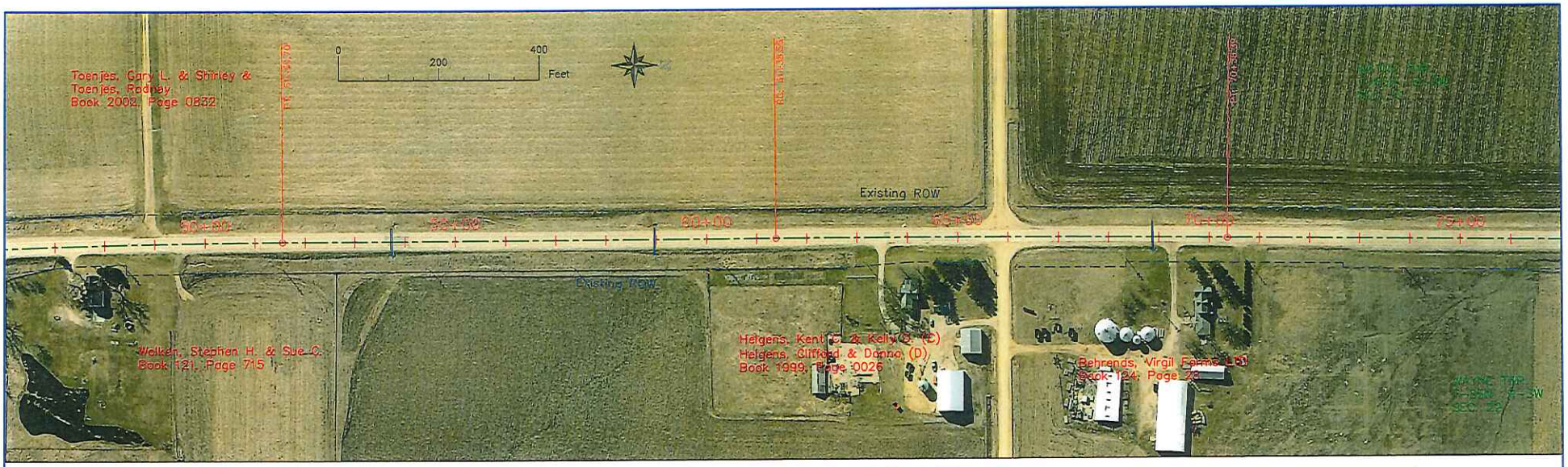


X44 Alignment PROFILE

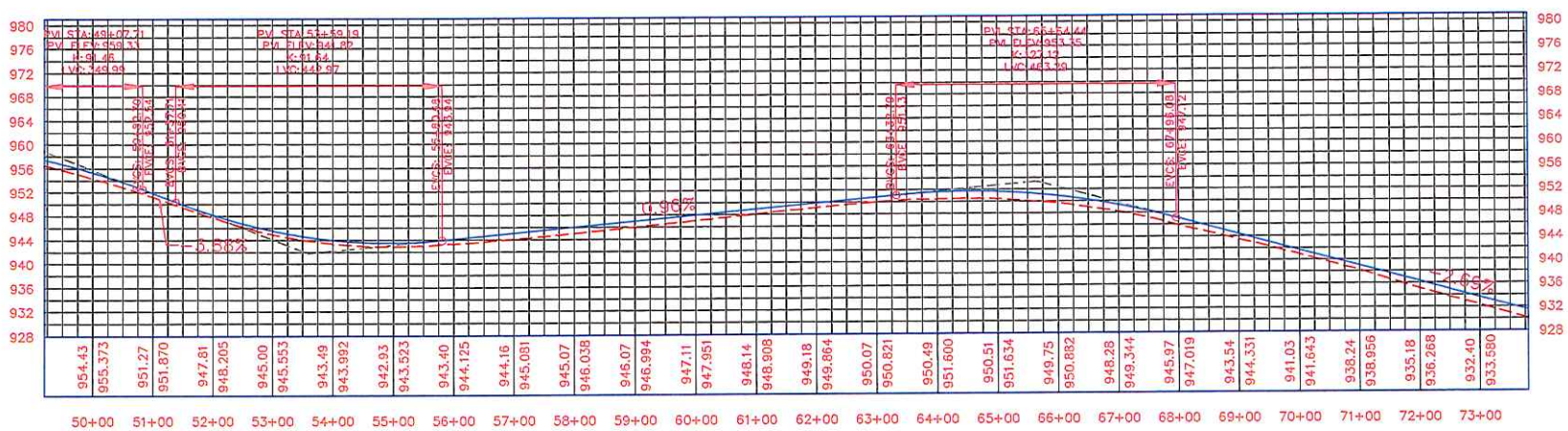


ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER FM-C053(77)--55-53	SHEET NUMBER D.2

F/H/G

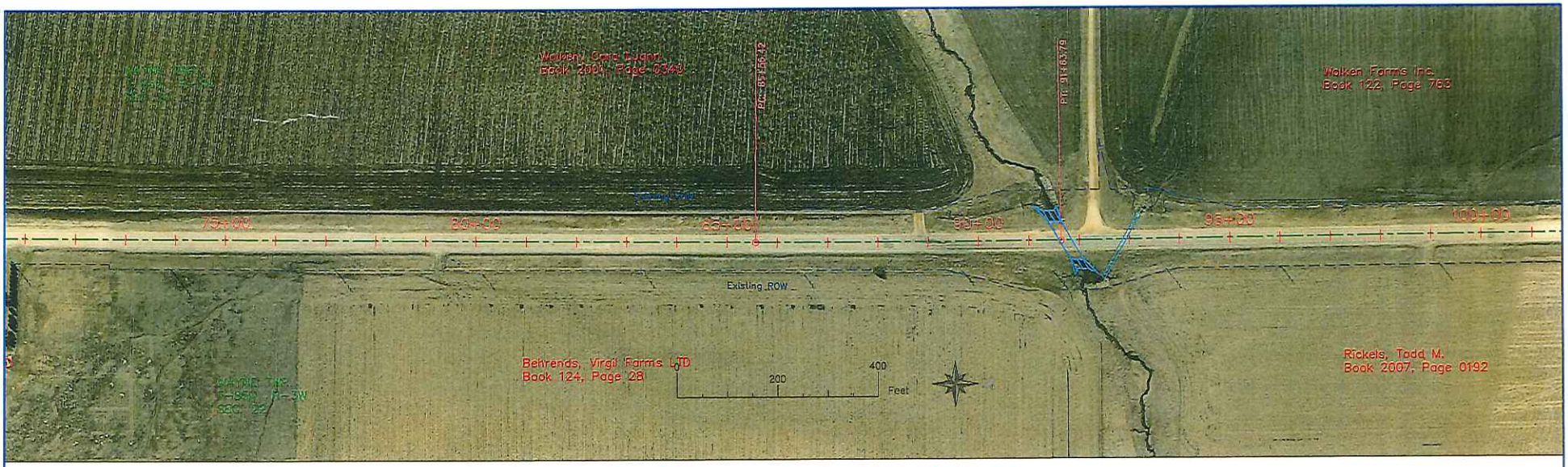


X44 Alignment PROFILE

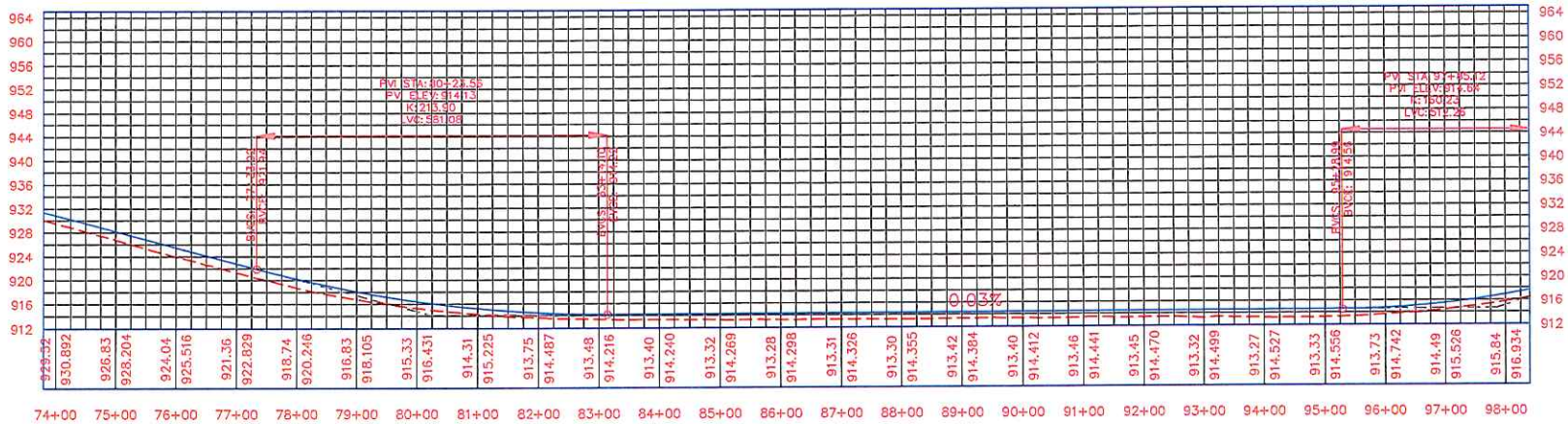


ENGLISH	JCED	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.3

F/H/G

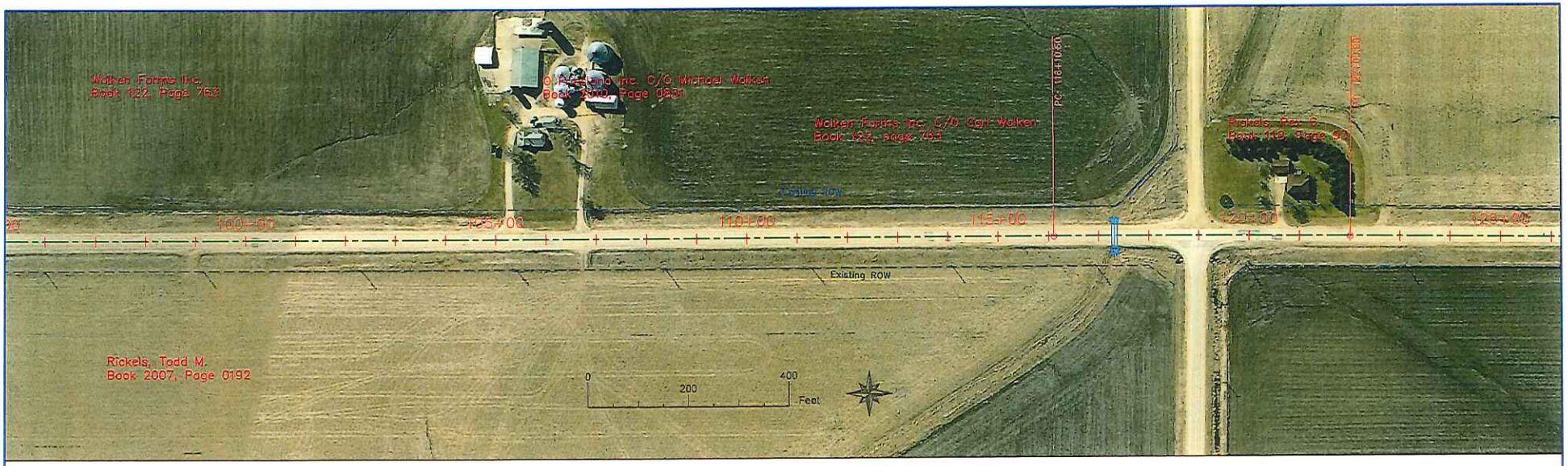


X44 Alignment PROFILE

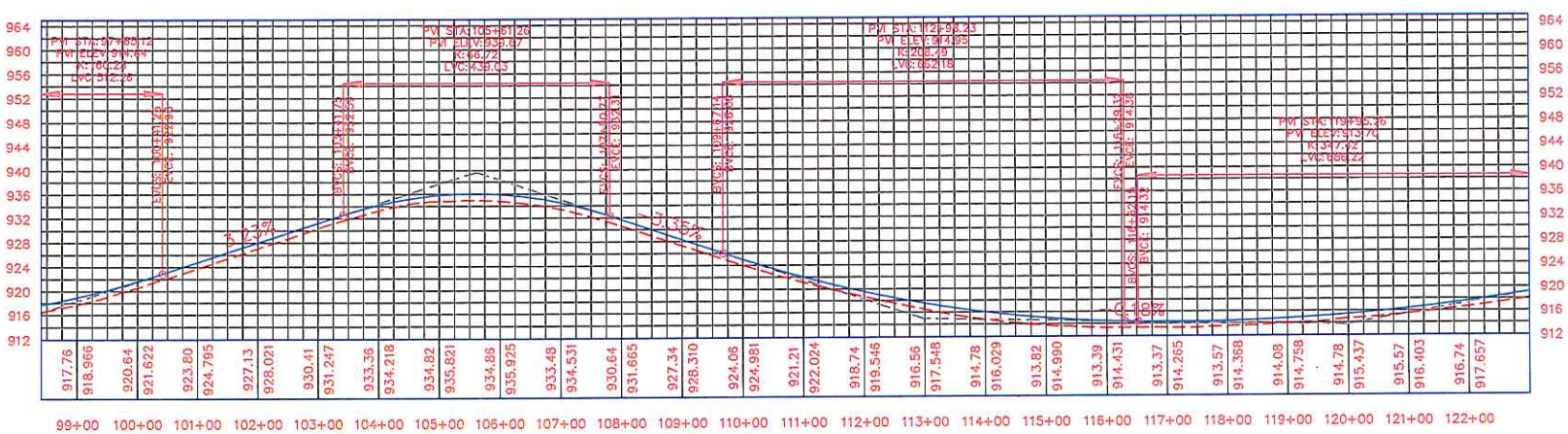


ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.4

F/H/G

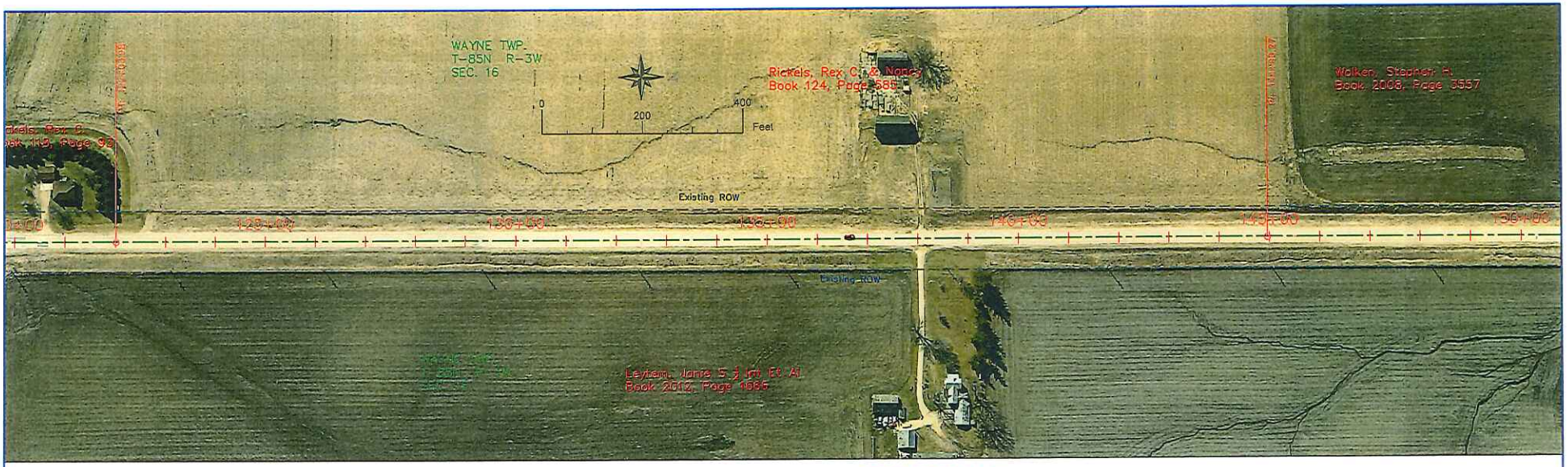


X44 Alignment PROFILE

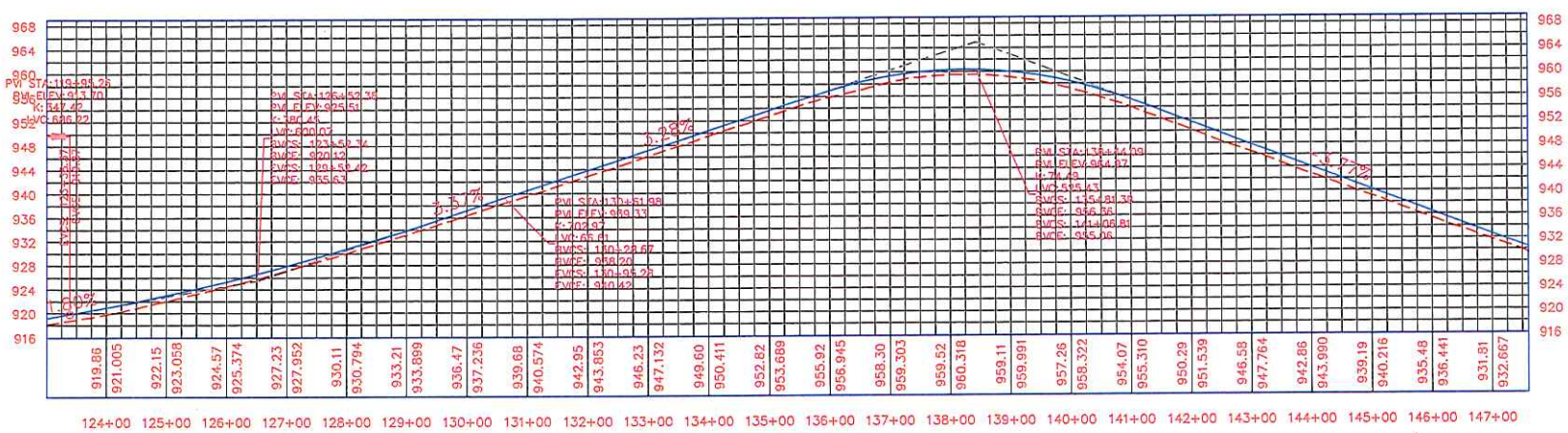


ENGLISH	JCED	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.5

F/H/G

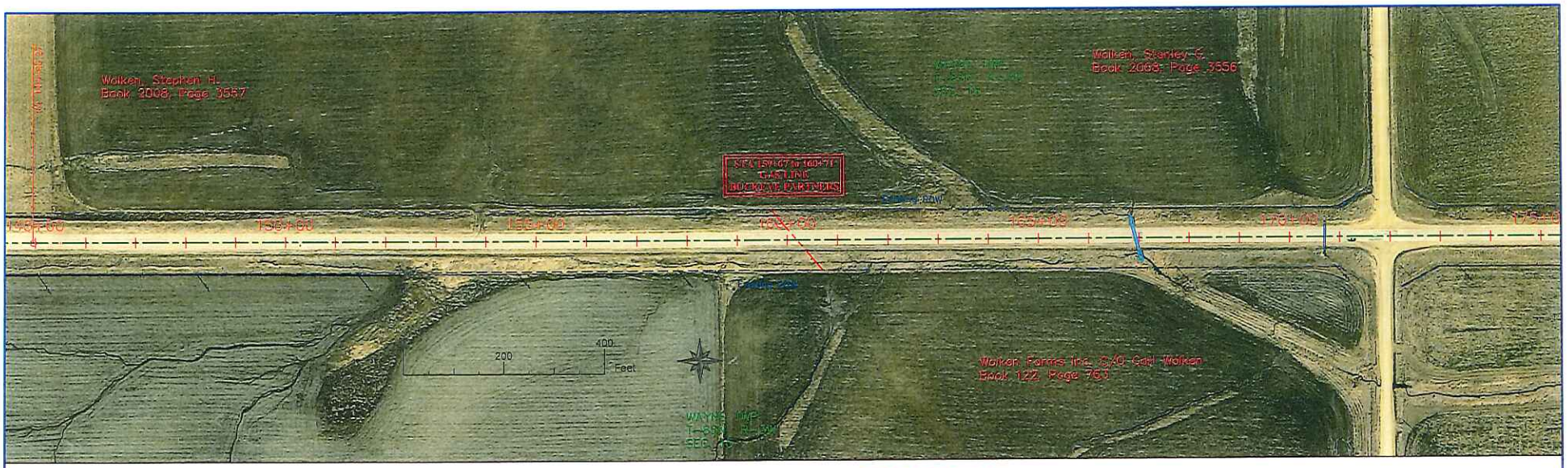


X44 Alignment PROFILE

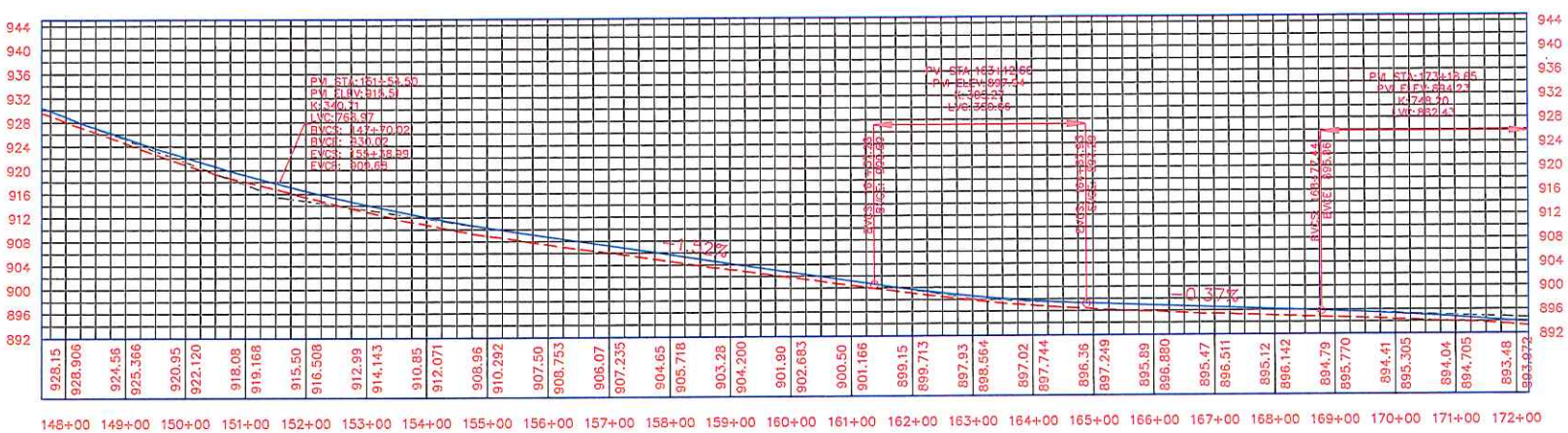


ENGLISH	JCED	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.6

F/H/G

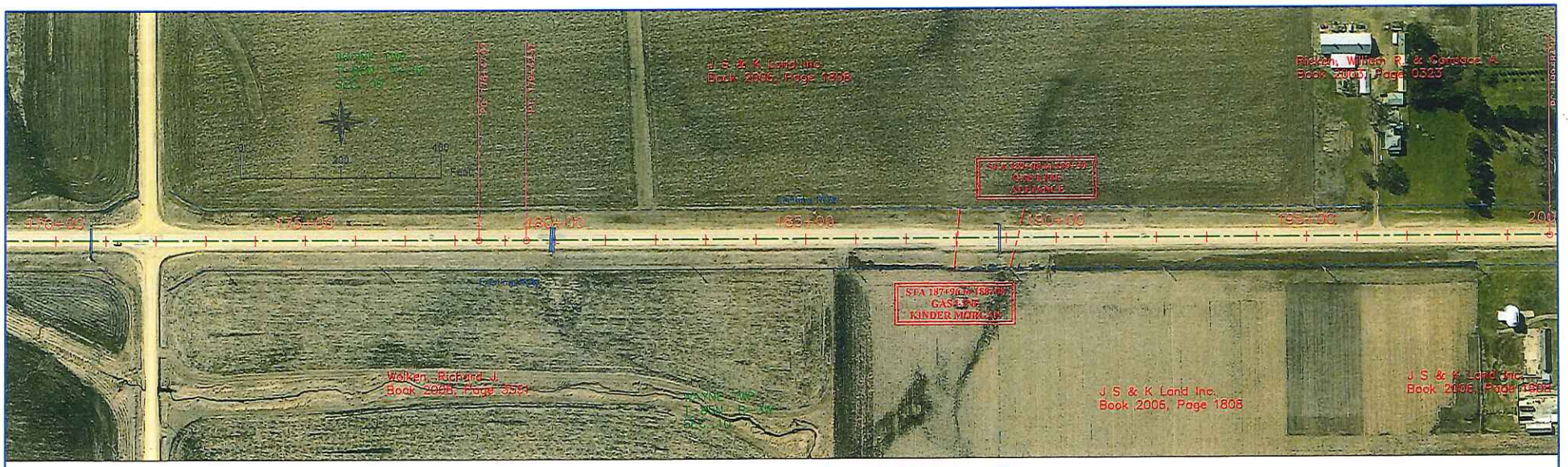


X44 Alignment PROFILE

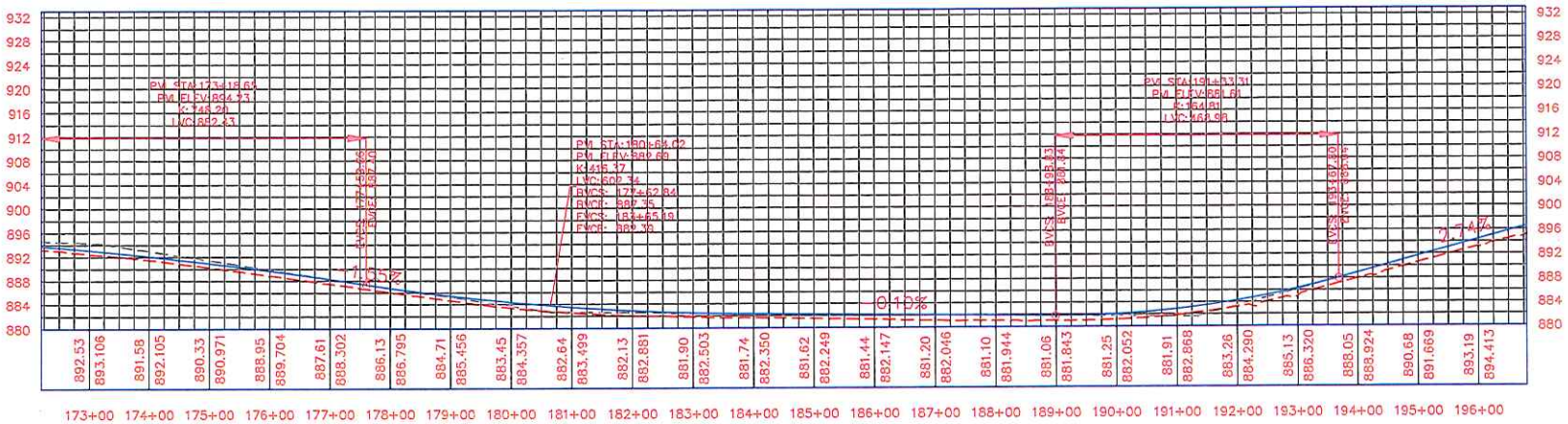


ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.7

F/H/G

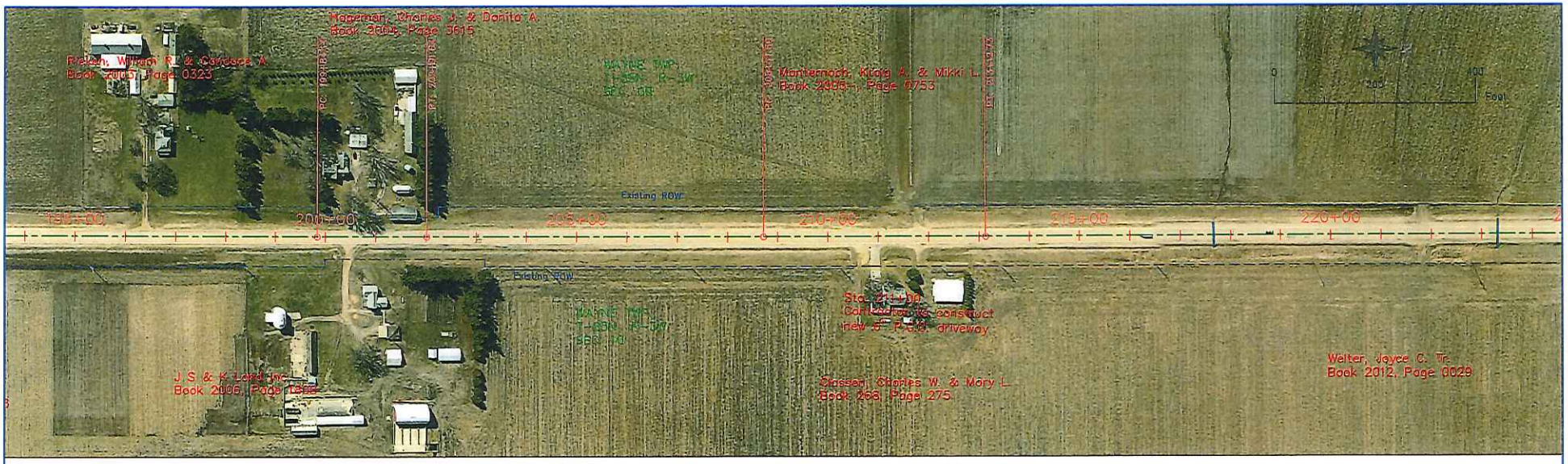


X44 Alignment PROFILE

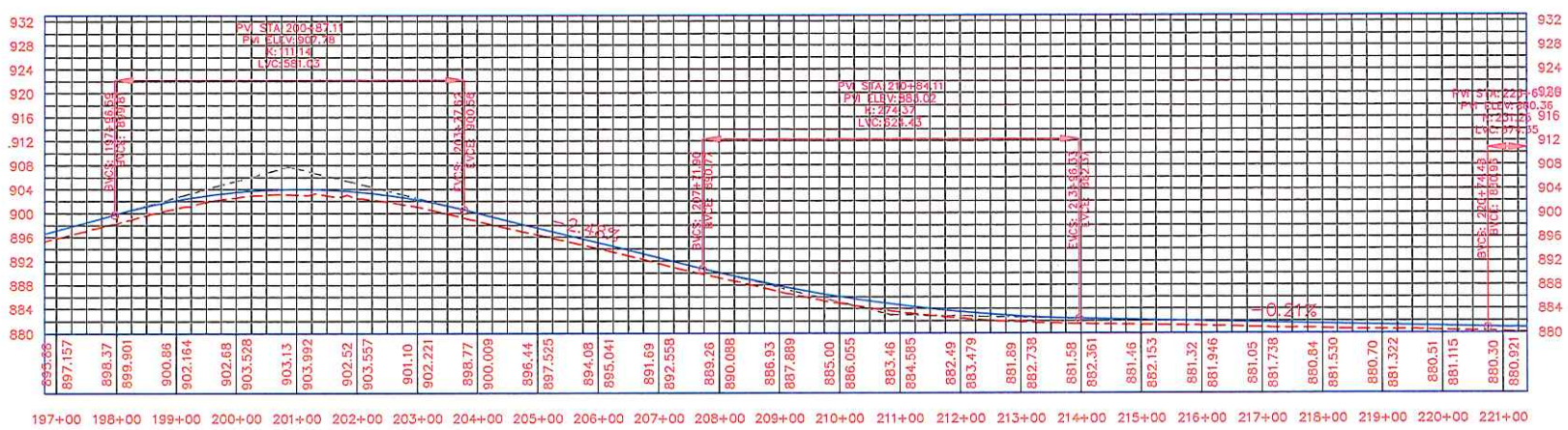


ENGLISH	JCED	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.8

F/H/G



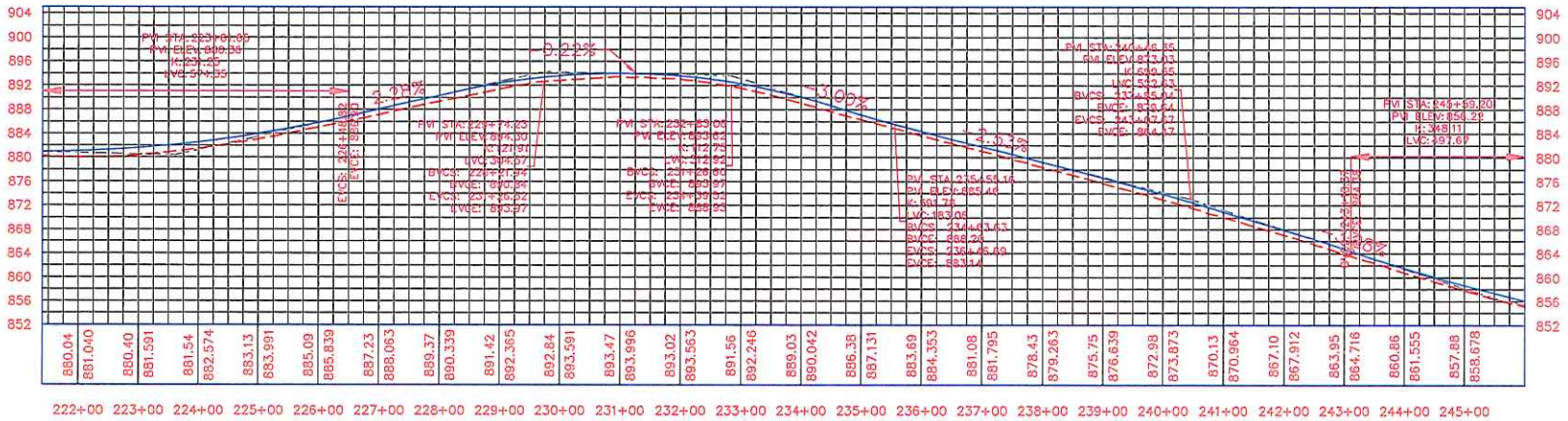
X44 Alignment PROFILE



ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.9

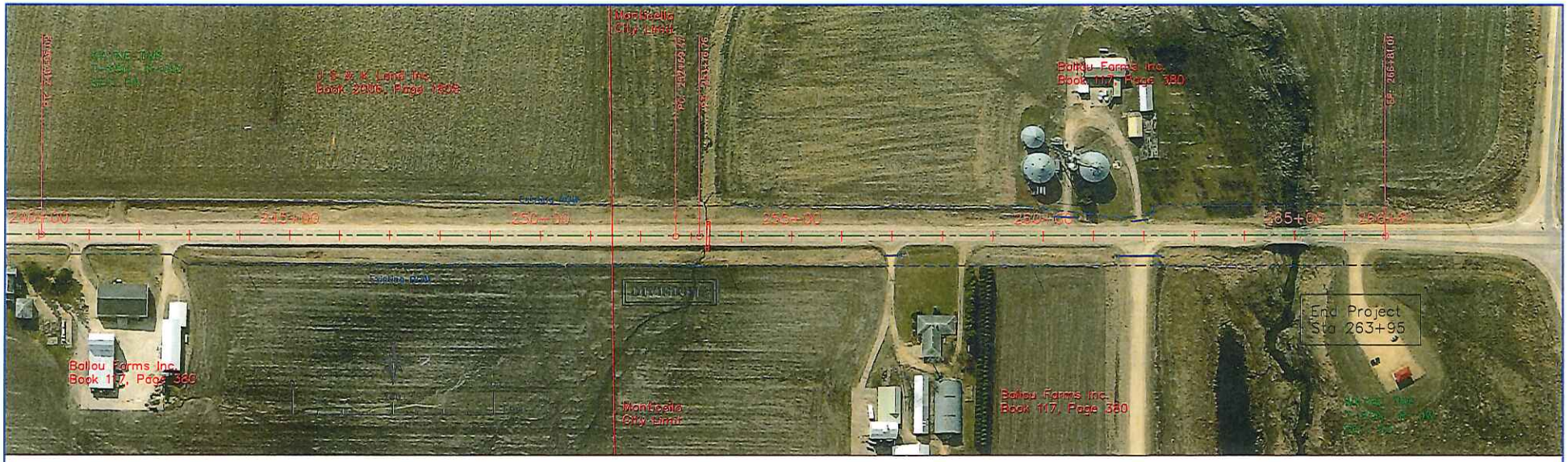
F/H/G

X44 Alignment PROFILE

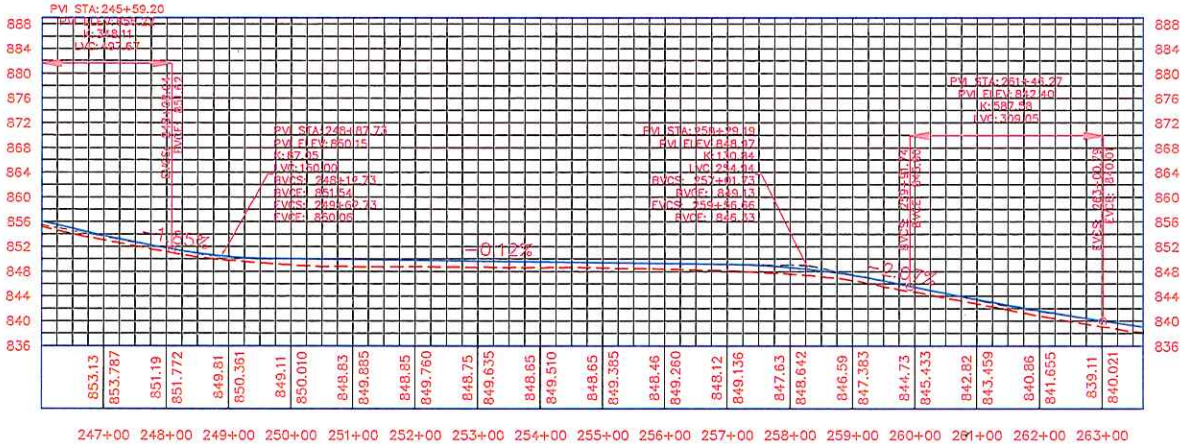


ENGLISH	JCED	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.10

F/H/G



X44 Alignment PROFILE



ENGLISH	JCEO	DESIGN TEAM	Snead/Postel	JONES COUNTY	PROJECT NUMBER	FM-C053(77)--55-53	SHEET NUMBER	D.11

I

JONES CO SHERIFFS DEPT

Call#: 53645860 Agency: 53
Type: 10-50 -ACCIDENT

Incident#: 1403060211
Date: 03/06/2014

Caller: KOOB,STEVE DOB: 00/00/0000
Address:
MONTICELLO

Time Rcvd: 02:11
Time Disp: 02:11
Time Arrv: 02:20
Time Clrd: 02:55

Call-to: CO RD X44
Landmark:
Loc #: WAYNE
Grid#:
Dist#: Alarm: How Received: P Mutual Aid: N

Call Dispo:
Prim Off #: 5308
#Units Assign: 2

Contact	DOB	Contact Type

Officer		Disp	Arrv	Clrd
5308	MARTENSEN,TREVOR	02:11	02:20	02:55
5310	JACOBS, DAN	02:11	02:20	02:55

State	Plate #	Tp	Yr	Make	Model	Style	Colors	Wrecker
IA	590SMB	PC	06	CHEVROLET	IMPALA	4D	SIL	

KOOB REC'D CALL FROM DRIVER WILLIAM MCLAUGHLIN WHO ADV HE WAS IN AN ACCIDENT. HIS WIFE PICKED HIM AND HE IS NOT INJURED. REQ KOOBS TO TOW THE VEH

27/ MCLAUGHLIN,WILLIAM LAWRENCE DOB/ 1956-10-18 OLN/ 888ZZ6977

DRIVER WAS NEG 10-55 AND ACCIDENT REPORT ISSUED

Time	From	To	Message	Initials

I

JONES CO SHERIFFS DEPT

Call#: 53642388 Agency: 53
Type: 10-50 -ACCIDENT / 2 CAR PI

Incident#: 1303141540
Date: 03/14/2013

Caller: NONAME DOB: 00/00/0000
Address:

319-432-4058

Time Rcvd: 15:40
Time Disp: 15:40
Time Arrv: 15:46
Time Clrd: 00:00

Call-to: CO RD X44 / 170TH ST
Landmark:
Loc #: WAYNE
Grid#:
Dist#: Alarm: How Received 9 Mutual Aid: N

Call Dispo:
Prim Off #: A27
#Units Assign: 9

Contact	DOB	Contact Type

Officer		Disp	Arrv	Clrd
5301	GRAVER,GREG	15:40	15:46	00:00
5303	SULLIVAN,CJ	15:40	15:46	00:00
5305	ECKHARDT,BRIAN	15:40	15:46	00:00
5320	KLEIN,JOHN	15:40	15:46	00:00
A27	MONTI AMB	15:40	15:46	00:00
A28	MONTICELLO	15:40	15:46	00:00
AIRC	AIR CARE IOWA CITY	15:40	15:46	00:00
MFD	MONTICELLO FIRE DEPT	15:40	15:46	00:00
MP1	SMITH,BRITT	15:40	15:46	00:00

State	Plate #	Tp	Yr	Make	Model	Style	Colors	Wrecker
IA	297ZEP	VN	97	PLYMOUTH	VOYAGER	VN	WHI	KOOBS
IA	561TPR	TK	05	CHEV	SLV	2500	BLU	KOOBS

10-50 PD INVOLVING TWO VEHICLES AT THE INTERSECTION OF 170TH ST AND AMBER RD X44.

A27, A28, MONTI FIRE, AIR CARE, MP1, 5301, 5303, 5305, 5320 RESPONDED.

A28 TRANSPORTED ONE FEMALE EMERGENT TO JRMC (VEH #1 DRIVER, EJECTED FROM VEH)
A27 RETURNED TO BASE.
AIR CARE LANDED AT THE SCENE WITH ASSISTANCE OF MONTI FIRE
AIR CARE TRANSPORTED 1 INFANT TO THE UNIVERSITY (PASSENGER OF VEH #1)

2 VEHICLES TOWED TO KOOBS, MONTI

VEH #1: 297ZEP DRIVER: ALLI M GRACEY 5-19-88 710YY1166
VEH #2: 561TPR DRIVER: LAUREN VONBEHREN 12-25-98 656AH5435
PASSENGER: JAMES VONBEHREN 4-4-72 608YY7684

PRESS RELEASE ISSUED PER 5305.

Time	From	To	Message	Initials

I

JONES CO SHERIFFS DEPT

Call#: 53636084 Agency: 53
Type: 10-50 -ACCIDENT MOTORCYCLE

Incident#: 1105221051
Date: 05/22/2011

Caller: TAPKEN,KYLE ARNOLD DOB: 06/11/1958
Address: 15102 130TH ST
ANAMOSA 319-540-5896

Time Rcvd: 10:51
Time Disp: 10:51
Time Arrv: 10:55
Time Clrd: 00:00

Call-to: CO HOME RD E 23 & X44
Landmark:
Loc #: WAYNE
Grid#:
Dist#: Alarm: How Received 9 Mutual Aid: N

Call Dispo:
Prim Off #: 5313
#Units Assign: 1

Contact	DOB	Contact Type

Officer		Disp	Arrv	Clrd
5313	MARTINSEN,TREVOR	10:51	10:55	00:00

State	Plate #	Tp	Yr	Make	Model	Style	Colors	Wrecker
IA	5129MN	MC	99	KAWASAKI	VN1500-G	MC	RED	

CALLER ADV OF A MOTORCYCLE ACCIDENT AT THE ABOVE INTERSECTION

ADV FEMALE WITH POSS LEG INJURY

13 ADV CAN 10-22 AMB SHE IS WALKING AND ADV WILL GO BY PRIVATE VEHICLE

DRIVER/ RIES,DAVID JOSEPH 19560306
PASSENGER / RIES,TINA MARIE 19660905

Time	From	To	Message	Initials

I

Iowa Department of Transportation

Crash Detail Report

X44

Report Version 1 3 Aug 2008

2011629285 05/02/2011 11:45 CR - X 44, 1 MILE S OF HWY 151
County: 53 City:

Major Cause: FTY making left turn
Roadway Type: Non-intersection: Farm/residential drive
Severity: Minor
Manner of Crash: Angle, oncoming left turn
Fatalities: 0
Surface Conditions: Dry
Major Injuries: 0
Light Conditions: Daylight
Minor Injuries: 1
Weather Conditions: Clear
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $7000
Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	South	South	0
Veh Action:	Turning left	Overtaking/passing	0
Configuration:	Farm vehicle/equipment	3+ axle SU truck	0
Driver Age:	34	63	0
Driver Gender:	M	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	FTY making left turn	Swerved to avoid	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

I

Iowa Department of Transportation

Crash Detail Report

X44

Report Version: 13 Aug 2004

2010572503 02/02/2010 18:24
County: 53 City: Monticello

X044 / AMBER RD X-44 measuring 2 Miles South from X044 / AMBER RD

Major Cause: Driving too fast for conditions
Roadway Type: Non-intersection: No special feature

Severity: PDO	**Manner of Crash:** Non-collision		
Fatalities: 0	**Surface Conditions:** Snow		
Major Injuries: 0	**Light Conditions:** Dark - roadway lighted		
Minor Injuries: 0	**Weather Conditions:** unknown		
Possible Injuries: 0	**Drug/Alc Involved:** none indicated		
Unknown Injuries: 0	**Property Damage:** $2500	**Number of Vehicles:** 1	

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	15	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Too fast for conditions	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2010606333 11/24/2010 14:08
County: 53 City:

X44 NORTH 170TH STREET

Major Cause: Ran off road - left
Roadway Type: Non-intersection: No special feature

Severity: Poss/Unk	**Manner of Crash:** Non-collision		
Fatalities: 0	**Surface Conditions:** Ice		
Major Injuries: 0	**Light Conditions:** Daylight		
Minor Injuries: 0	**Weather Conditions:** Sleet/hail/freezing rain		
Possible Injuries: 1	**Drug/Alc Involved:** none indicated		
Unknown Injuries: 0	**Property Damage:** $5000	**Number of Vehicles:** 1	

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	South	0	0
Veh Action:	Essentially straight	0	0
Configuration:	4-tire light truck	0	0
Driver Age:	59	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

I

Iowa Department of Transportation

Crash Detail Report

X44

Report Version 1.2 Aug 2006

2009572498 12/28/2009 09:02 E017 / CO RD E-17 and X044 / AMBER RD X-44
County: 53 City:

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Snow
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$9000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	15	0	0
Driver Gender:	F		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2010561708 01/21/2010 22:23 X044 / AMBER RD X-44 and E023 / CO HOME RD E-23
County: 53 City:

Major Cause: unknown
Roadway Type: Intersection: T - intersection

Severity:	PDO	**Manner of Crash:**	unknown
Fatalities:	0	**Surface Conditions:**	Ice
Major Injuries:	0	**Light Conditions:**	Dark - roadway lighted
Minor Injuries:	0	**Weather Conditions:**	Sleet/hail/freezing rain
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$1038

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Slowing/stopping	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	22	0	0
Driver Gender:	F		
Driver Cond:	Normal	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

I

Iowa Department of Transportation

Crash Detail Report

X44

Report Version 1.3 Aug 2006

2009528917 10/04/2009 18:58
County: 53 City:

X044 / AMBER RD X-44 measuring 0.25 Miles South from X044 / AMBER RD X-44 and 150 ST

Major Cause: Animal
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Dusk
Minor Injuries:	0	**Weather Conditions:**	Partly cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$2200

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	23	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2009572494 10/19/2009 19:01
County: 53 City: Monticello

X044 / AMBER RD X-44 measuring 4.9 Miles South from X044 / AMBER RD

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	**Manner of Crash:**	not reported
Fatalities:	0	**Surface Conditions:**	not reported
Major Injuries:	0	**Light Conditions:**	not reported
Minor Injuries:	0	**Weather Conditions:**	not reported
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$2000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Not reported	0	0
Driver Age:	56	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

X44

Report Version 13 Aug 2008

2008443183 05/09/2008 03:23
County: 53 City:

X044 / AMBER RD X-44 measuring 1 Miles South from US 0151 / SW X44B RAMP and X044 / AMBER RD

Major Cause: Animal
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Dark - roadway not lighted
Minor Injuries:	0	**Weather Conditions:**	Cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$2071

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	53	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2009572383 04/05/2009 16:32
County: 53 City: Monticello

X044 / AMBER RD X-44 measuring 1 Miles South from US 0151 / SW X44B RAMP and X044 / AMBER RD

Major Cause: Ran off road - left
Roadway Type: Non-intersection: No special feature

Severity:	Major	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Slush
Major Injuries:	1	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Snow
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$7300

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	0	0
Veh Action:	Essentially straight	0	0
Configuration:	4-tire light truck	0	0
Driver Age:	32	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Other fixed object	0	0

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Iowa Department of Transportation

Crash Detail Report

X44

Report Version 1.3 Aug 2009

2005266522 11/27/2005 02:44
County: 53 City:

X044 / AMBER RD X-44 MEASURING 3.8 MILES SOUTH FROM US 0151 / HWY 151

Major Cause: Swerving/evasive action
Roadway Type: Non-intersection: No special feature
Severity: Fatal
Manner of Crash: Non-collision
Fatalities: 1
Surface Conditions: Dry
Major Injuries: 0
Light Conditions: Dark - roadway not lighted
Minor Injuries: 1
Weather Conditions: Clear
Possible Injuries: 0
Drug/Alc Involved: Drug/Alcohol: Statutory
Unknown Injuries: 0
Property Damage: $19000
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	47	0	0
Driver Gender:	M		
Driver Cond:	Infl by alc/drugs/meds	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2006227550 07/02/2006 21:38
County: 53 City:

X044 / AMBER RD X-44 measuring 0.52 Miles South from US 0151 / NW X44C Ramp and X044 / AMBER RD X-44

Major Cause: Animal
Roadway Type: Non-intersection: No special feature
Severity: PDO
Manner of Crash: Non-collision
Fatalities: 0
Surface Conditions: Dry
Major Injuries: 0
Light Conditions: Dark - roadway not lighted
Minor Injuries: 0
Weather Conditions: Partly cloudy
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $1800
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	60	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

I

Iowa Department of Transportation

Crash Detail Report

X44

Report Version 1.3 Aug 2008

2003029926 05/15/2003 07:54 X044 / AMBER RD X-44 and 170 ST
County: 53 City:

Major Cause: Ran stop sign
Roadway Type: Intersection: Four-way intersection

Severity:	Major	**Manner of Crash:**	Broadside
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	1	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Partly cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$14500

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	not reported	0
Veh Action:	Essentially straight	Essentially straight	0
Configuration:	Sport utility vehicle	Passenger car	0
Driver Age:	25	56	0
Driver Gender:	M	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	Ran stop sign	none	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	Sign post	0

2005253862 10/04/2005 18:43 X044 / AMBER RD X-44 AND 150 ST
County: 53 City:

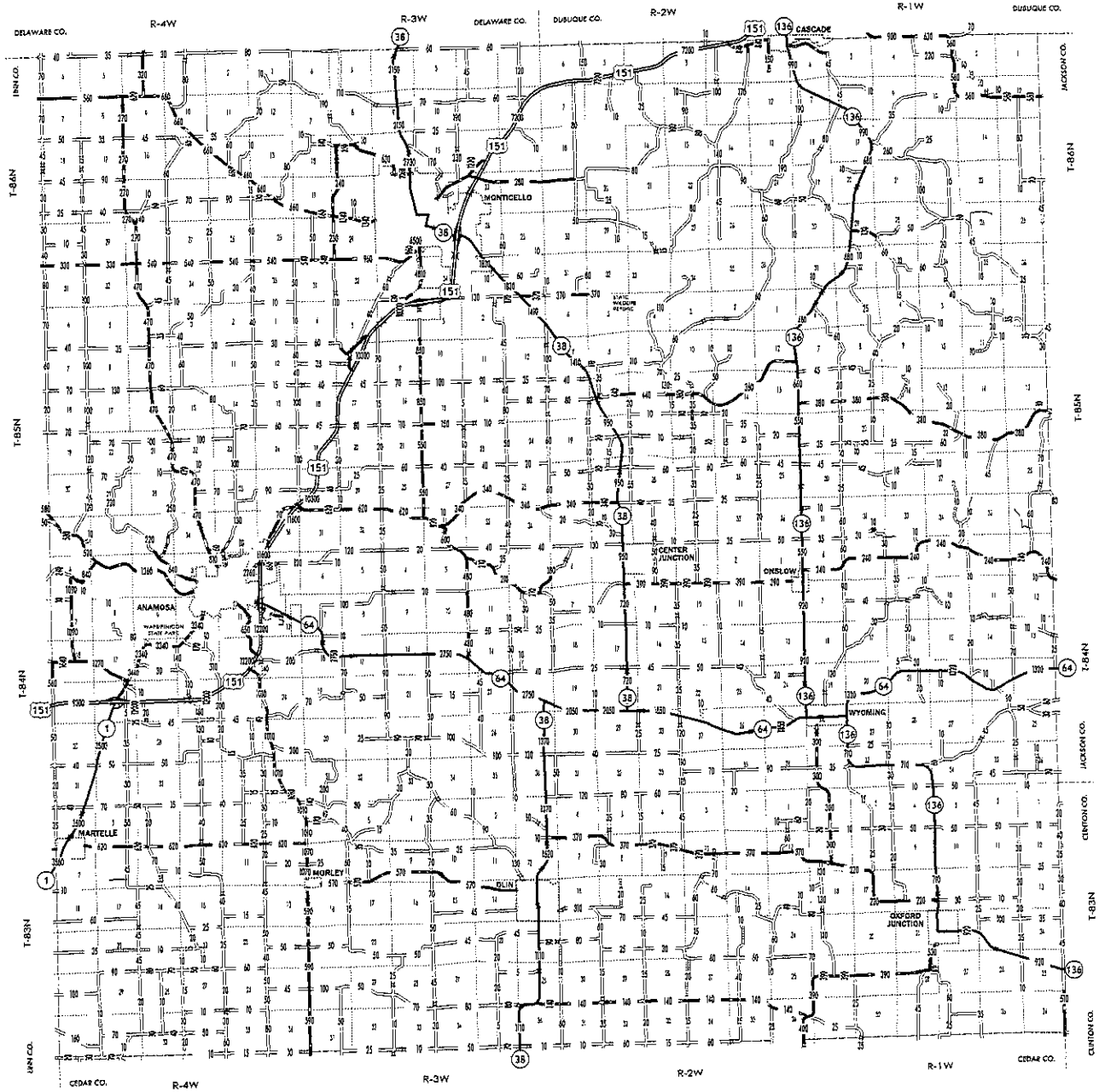
Major Cause: Ran stop sign
Roadway Type: Intersection: Four-way intersection

Severity:	Poss/Unk	**Manner of Crash:**	Broadside
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Dark - roadway lighted
Minor Injuries:	0	**Weather Conditions:**	Clear
Possible Injuries:	1	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$12600

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	North	0
Veh Action:	Slowing/stopping	Essentially straight	0
Configuration:	Passenger car	Farm vehicle/equipment	0
Driver Age:	16	69	0
Driver Gender:	M	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	Ran stop sign	none	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

2013 ANNUAL AVERAGE DAILY TRAFFIC



TRAFFIC FLOW MAP OF
JONES 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, 2013

MILES 0 1 2 3 4
KILOMETERS 0 1 2 3 4 5 6

6 - 1 - 12

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD
LOCAL NOT OPEN ROAD

2013

53

L

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Jones | Prepared by: Derek Snead, PE | Date Prepared: Jul 22, 2014

Location: Co. Rd. X-44, from E-23 North 5.0 Miles to 0.2 Miles North of City of Monticello Corporation Limits

Improvement

Proposed Improvement(s): Add safety edge to proposed overlay

$ 330,000	Estimated Improvement Cost, **EC**	40	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	25	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 330,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Count Map/data | 2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
2.25	550	From E-23 to E-17
2.75	850	From E-17 Hwy 151
5.00	miles total	

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

3,575 Current Vehicle Miles / Day, **VM**
7,894 End of Life Veh. Miles / Day
1,304,875 Current Veh. Miles / Year, **AM**
78,817,038 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

2003 First full year --> 2012 Last full year | 10.0 years, Time Period, **T**

Additional months | values as of Dec. 2007

1	Fatal Crashes		Fatalities @	$3,500,000	$ -
		4	Major Injuries @	$240,000	$ 960,000
6	Injury Crashes	1	Minor Injuries @	$48,000	$ 48,000
		2	Possible Injuries @	$25,000	$ 50,000
7	Property Damage Only		(assumed cost per crash)	$2,700	$ 37,800
			-OR- enter all Property Costs of all crashes:		
14	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,095,800

1.40	Current Crashes / Year, **AA** = TA / T	107.3	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 78,271	Cost per Crash, **AVCR** = LOSS / TA	$ 739,788	Present Value of Avoided Crashes, **BENEFIT**
84.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.35	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 27,395	Crash Costs Avoided in First Year, AAR x AVCR		
21.1	Total Avoided Crashes, TCR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $739,788 : $330,000 = **2.24** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project 35th Street and 29th Avenue, Marion, Iowa

Applicant City of Marion

Contact Person Dan Whitlow Title City Engineer

Complete Mailing Address 1225 6th Avenue, Suite 200
Marion, Iowa 52302

Phone (319) 743-6340 (Area Code) E-Mail DWhitlow@cityofmarion.org

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 164,220

Safety Funds Requested $ 164,220

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 Marion

Signed: _____ 8/14/14
Signature — Date Signed

Dan Whitlow
Typed Name

Attest: Wesley A. Nelson 8-14-14
Signature — Date Signed

WESLEY A. NELSON
Typed Name

RESOLUTION NO. 23985

RESOLUTION AUTHORIZING THE SUBMITTAL OF AN APPLICATION FOR TRAFFIC SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDING FOR THE INTERSECTION OF 35TH STREET AND 29TH AVENUE TO CONVERT THE 2-WAY STOP CONTROLLED INTERSECTION TO A MINI ROUNDABOUT.

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

WHEREAS, the 35th Street and 29th Avenue intersection has been identified as a location where vehicular safety could be improved and funded by TSIP.

WHEREAS, the improvements installing a mini roundabout will help reduce crashes and improve traffic operations.

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

1. The City Council supports the application for TSIP funding.
2. The City Council hereby commits the additional City funds necessary for construction of the project beyond any TSIP funding, and;
3. The City Council hereby commits to accepting and maintaining these improvements.

Passed and approved this 12th day of August, 2014.

Snooks Bouska, Mayor

ATTEST:

Wesley A. Nelson, City Clerk

Background

The City of Marion is planning to make enhancements to the intersection of 35th Street and 29th Avenue to address a visibility issue and safety concerns for both vehicles and pedestrians. This intersection is included in the City's Comprehensive Transportation Plan and has been identified as needing improvements.

29th Avenue is a three-lane major arterial roadway with opposing left-turn lanes and a posted speed of 30 MPH. 29th Avenue has dedicated bike lanes on both sides of the street and on street parking on the north side. 35th Street also a major arterial with left-turn lanes and bike lanes on both side of the street. 35th Street is STOP controlled and has a posted speed of 35 MPH. The most frequent crash type is a failure of the 35th Street motorists to yield to the vehicles on 29th Avenue. 29th Avenue is 49 feet wide which makes some motorists impatient for picking the appropriate gap in traffic to cross safely. See **Exhibit H** for existing conditions.

In 2011 the City of Marion extended 35th Avenue which increased the ADT from 3,174 to 4,048 in 2014 (27.5% increase). The land use in this area is primarily residential and truck-turning traffic is minimal. Trucks (WB-50 and above) have alternative routes which makes the design vehicle for this intersection single unit trucks and school buses. Traffic signals were evaluated for this intersection and none of the eight warrants were met as required by MUTCD.

Proposed Improvements

The proposed intersection improvements include constructing a mini roundabout which will address the gap acceptance issue and will also serve as a traffic calming measure. Splitter islands will be raised to allow for pedestrian refuges and additional raised medians will be added to reduce crosswalk lengths. The central island will be fully traversable and constructed with HMA to provide a contrast in color. The central island will be raised to deter motorists from traveling through the island. Pavement markings will be modified in the vicinity of the intersection to guide motorists and cyclists through the intersection and also reduce the on-street parking closest to the intersection. Included in the improvements is intersection lighting to illuminate the approaches and pedestrian crossings. The lighting will be cut-off to reduce the impact to adjacent property owners. Refer to **Section G** for proposed improvements.

Crash history for this intersection was collected from Iowa DOT CMAT software, and City of Marion Police Department, and has been evaluated from 2004 to 2013 to identify trends and safety issues with the current geometry. In the past 10 years 30 crashes have been reported at this location resulting in one major and one minor injury. 20 of the 30 crashes (67%) were attributed to running the stop sign on 35th Street or failing to yield to vehicles on 29th Avenue. As noted above, 29th Avenue is a wide urban street making it challenging for drivers to choose the correct gap. During peak hours, queuing on the side street is an issue, which also causes drivers to become inpatient. Refer to **Section I** for crash history summaries.

The proposed improvements will provide users with an intersection that will reduce speeds, provide accommodations for pedestrians and bicyclists, and will aid in providing acceptable gaps. The proposed improvements are expected to result in a safer intersection and reduce the number of injury crashes per year.

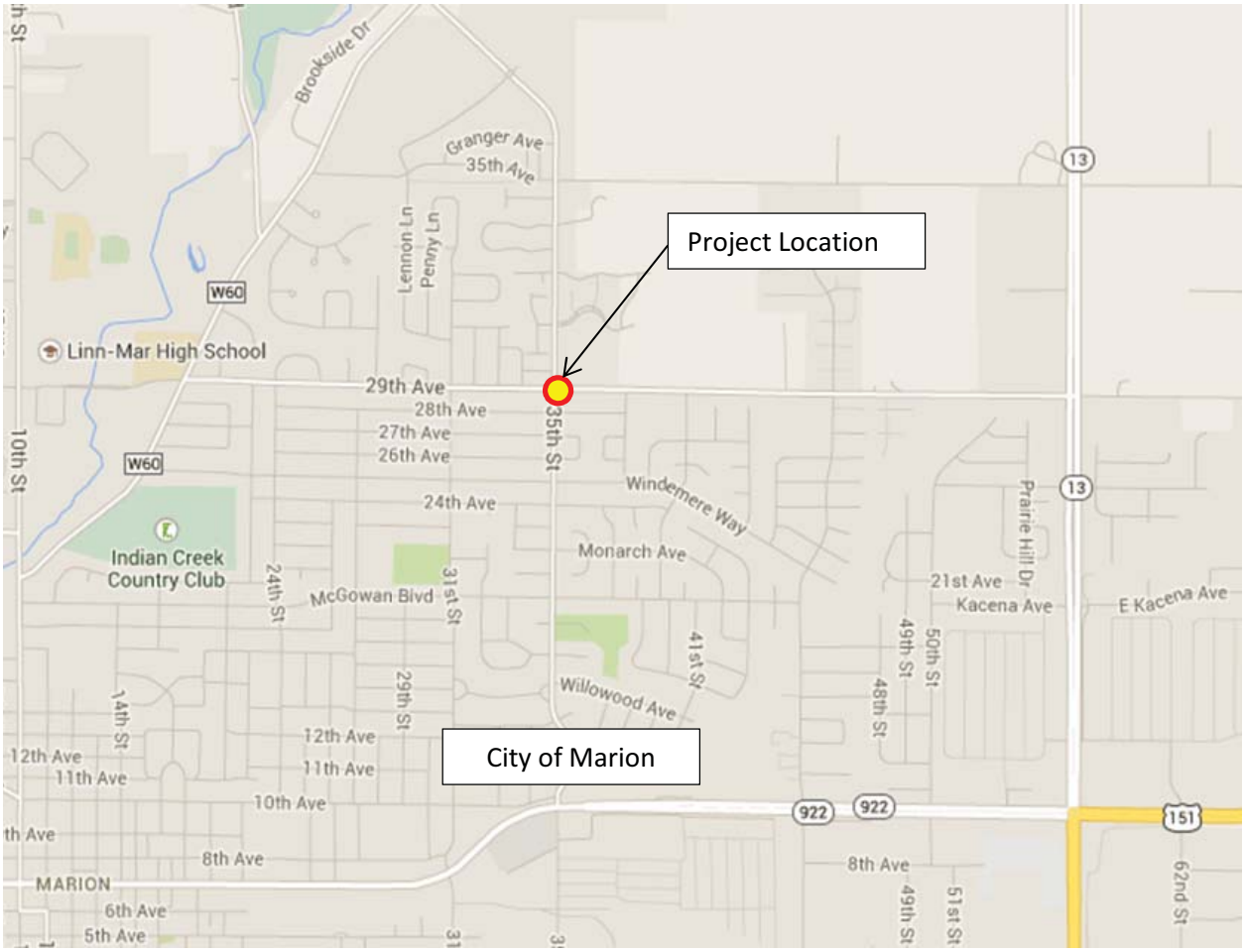
SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Proposed Public Improvements - Mini Roundabout
35th Street and 29th Avenue
Marion, Iowa
Engineer's Rough Order Magnitude of Cost
Estimate of Quantities - August 15, 2014

Item No	Description	Unit	Unit Price	Quantity	Cost
1	Removal of Pavement	SY	$ 12	205	$ 2,460
2	Removal of Light Poles	EA	$ 1,000	1	$ 1,000
3	Removal of Signs	EA	$ 50	5	$ 250
4	Removal of Sidewalk	SY	$ 5	175	$ 875
5	Sidewalk, PCC, 4 in	SY	$ 30	230	$ 6,900
6	HMA, 6 in	SY	$ 35	161	$ 5,635
7	PCC, 7 In	SY	$ 40	300	$ 12,000
8	Dowelled Median, Colored PCC	SY	$ 120	380	$ 45,600
9	Aluminum Signs	EA	$ 200	20	$ 4,000
10	Sodding	LS	$ 1	1,500	$ 1,500
12	Lighting (wiring and handholes)	EA	$ 14,000	4	$ 56,000
13	Pavement Markings + Symbols	LS	$ 3,500	1	$ 3,500
14	Mobilization	LS	$ 10,000	1	$ 10,000
15	Traffic Control	LS	$ 10,000	1	$ 10,000
16	Construction Survey	LS	$ 4,500	1	$ 4,500
	Rough Order of Magnitude Construction Cost				$ 164,220

Improvements to the 35th Street and 29th Avenue Intersection which are to be funded through Traffic Safety Improvement Fund. The schedule proposed for the safety improvements is as follows:

- **August 2014** – Submit for 2015 TSIP Funds
- **October - February** – Proceed with design of improvements
- **December 2014** – TSIP Funds are awarded
- **February 2015** –Let intersection project
- **June 2015** – Construction begins
- **July 2015** –TSIP funds are awarded for the 35th Street and 29th Avenue Intersection Improvements
- **August 2015** – Construction complete for mini roundabout.


Project Location
City of Marion
Brookside Dr
Granger Ave
35th Ave
Lennon Ln
Penny Ln
W60
Linn-Mar High School
29th Ave
28th Ave
27th Ave
26th Ave
35th St
24th Ave
Windemere Way
Monarch Ave
Indian Creek
Country Club
24th St
McGowan Blvd
31st St
41st St
Willowood Ave
29th St
14th St
12th Ave
11th Ave
10th Ave
8th Ave
MARION
6th Ave
5th Ave
10th St
13
Prairie Hill Dr
21st Ave
Kacena Ave
E Kacena Ave
49th St
50th St
48th St
51st St
62nd St
922
151

Looking West from 35th Street NB Approach*

Looking East from 35th Street NB Approach*

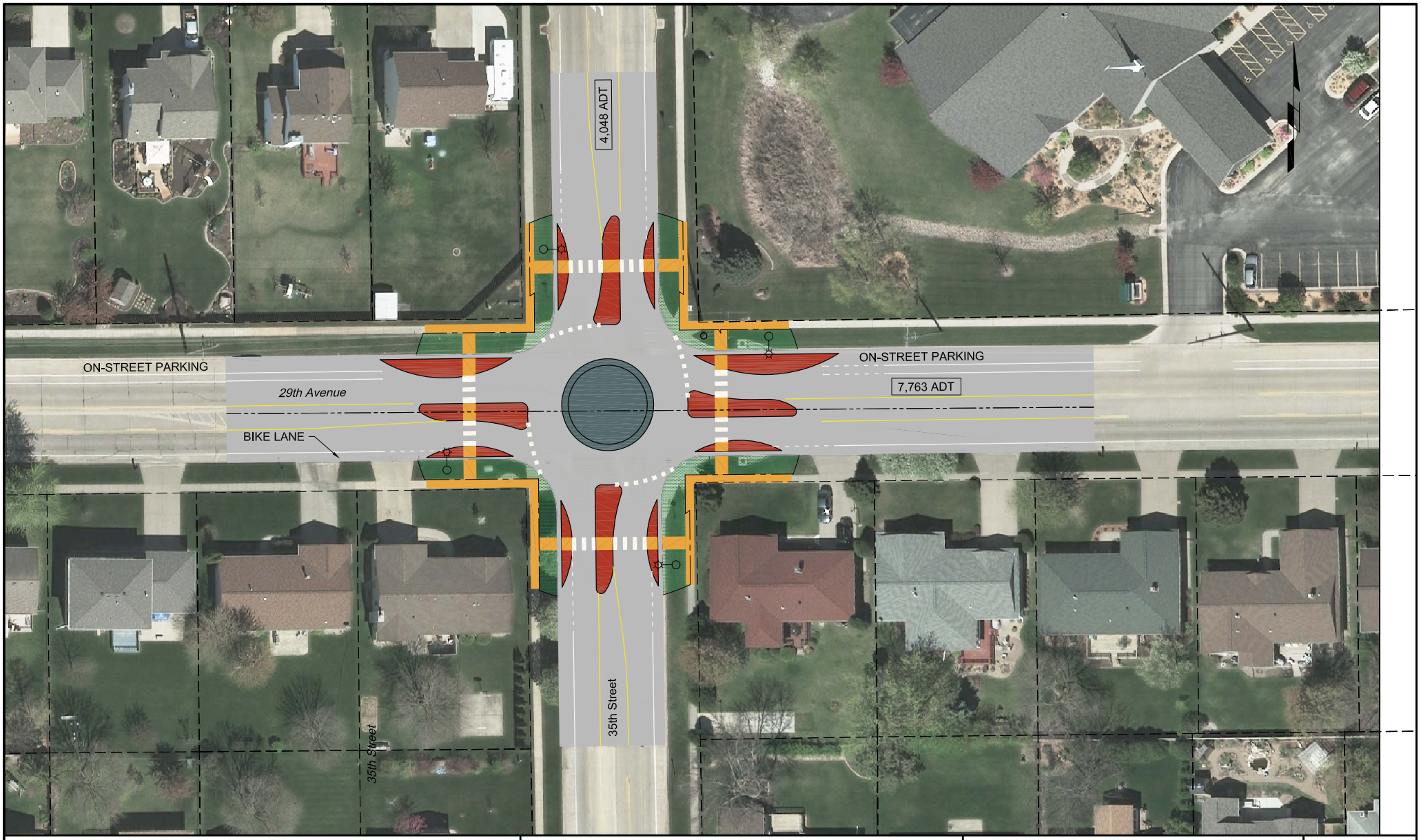
Looking West on 29th Avenue*

Looking East from 35th Street SB Approach*

Looking West from 35th Street SB Approach*

Looking East on 29th Avenue*

*Source: Google®



SHIVEHATTERY
ARCHITECTURE + ENGINEERING

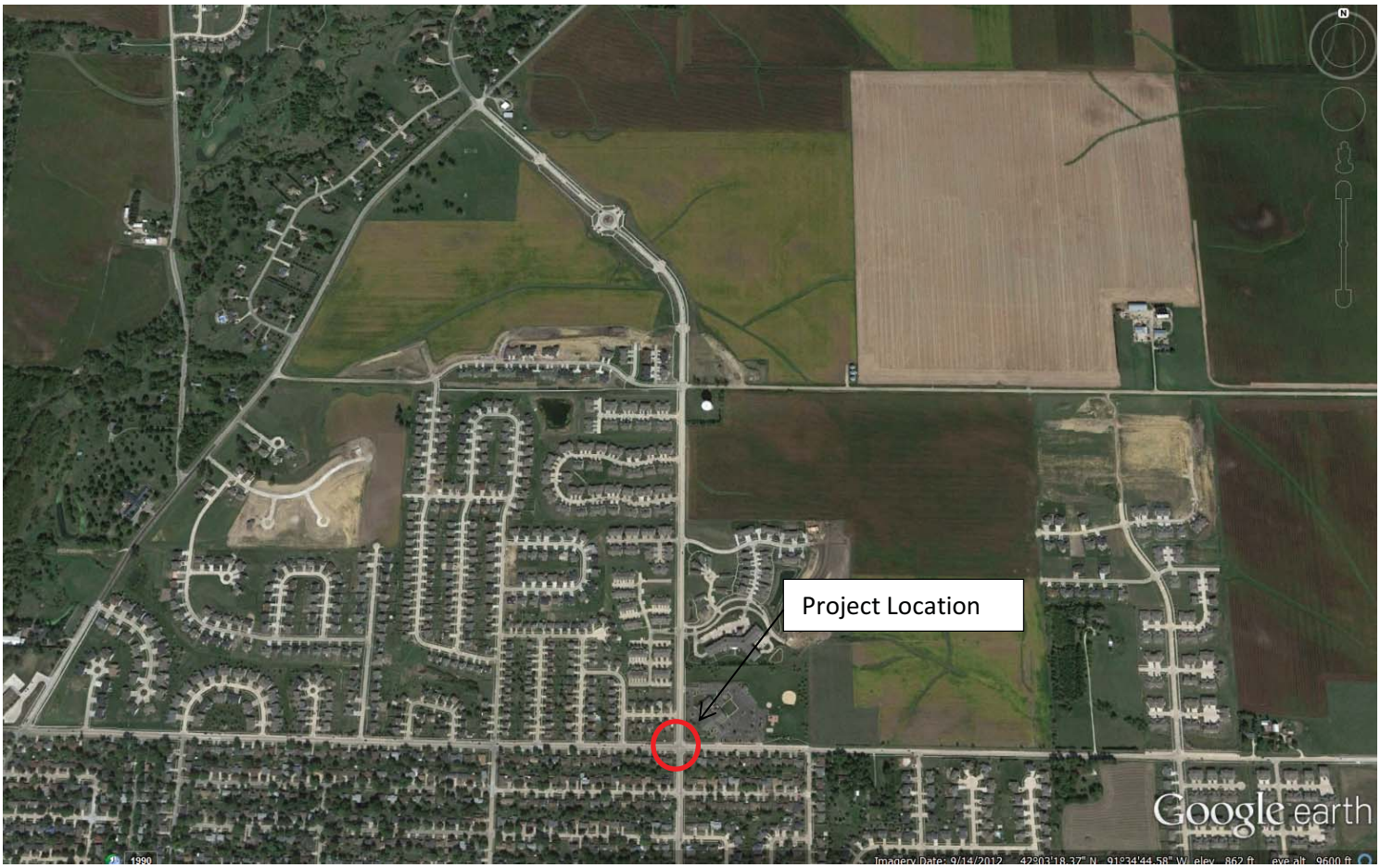
8.15.2014

29th Avenue and 35th Street
MARION, IOWA

Site Plan

SCALE
0 20 40 80
SCALE IN FEET

EXHIBIT: G


Project Location
Google earth

Iowa Department of Transportation

Abbreviated Crash Report

Intersection of 29th Avenue and 35th Street MARION,

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
02/19/2004	2004208883	04003242	Marion	Poss/Unk	29TH AVE AND 35TH AVE
11/04/2004	2004252313	04022175	Marion	Major	29TH AVE AND 35TH AVE
07/13/2006	2006229507	06014993	Marion	PDO	35TH ST AND 29TH AVE
11/21/2006	2006253033	06025025	Marion	PDO	35TH ST AND 29TH AVE
05/06/2007	2007370802		Marion	PDO	35TH ST and 29TH AVE
06/28/2007	2007379326	07013540	Marion	Minor	35TH ST/29TH AVE
02/12/2008	2008425168	08003254	Marion	PDO	35TH ST AND 29TH AVE
02/26/2008	2008429040	08004249	Marion	PDO	35TH ST and 29TH AVE
06/05/2008	2008444753	08012306	Marion	PDO	29TH AVE and 35TH ST
01/22/2010	2010551273	10001915	Marion	PDO	35TH ST and 29TH AVE
07/16/2010	2010581830	10014902	Marion	PDO	35TH ST and 29TH AVE
08/11/2010	2010585313	10017016	Marion	PDO	35TH ST and 29TH AVE
12/22/2010	2010608177	10025974	Marion	PDO	29TH AV/35TH ST
12/28/2010	2010609427	10026288	Marion	PDO	29TH AV/ 35TH ST
05/21/2011	2011632216	2011029561	Marion	PDO	35TH ST and 29TH AVE
06/28/2011	2011636081	11013488	Marion	PDO	29TH AV/35TH ST
08/01/2011	2011641190	11016009	Marion	PDO	29TH AV/35TH ST
09/16/2011	2011647633	11019521	Marion	Poss/Unk	29TH AV/35TH ST
11/04/2011	2011655521	11023380	Marion	PDO	29TH AV/35TH ST
03/27/2012	2012679019	12006184	Marion	PDO	29TH AV/35TH ST
11/19/2012	2012712485	12024383	Marion	PDO	29TH AV/ 35TH ST
02/17/2013	2013726334	13003281	Marion	PDO	29TH AV/35TH ST
06/28/2013	2013746413	13013191	Marion	PDO	29TH AV/35TH ST
10/29/2013	2013764157	13022835	Marion	PDO	29TH AV/35TH ST
11/25/2013	2013780771	13024700	Marion	PDO	29TH AV/35TH ST
12/24/2013	2013775650	13026685	Marion	PDO	29TH AV/ 35TH ST
02/08/2014	2014784341	14002707	Marion	Poss/Unk	29TH AV/35TH ST
03/31/2014	2014792930	14006486	Marion	PDO	29TH AV/ 35TH ST
05/12/2014	2014798602	14009556	Marion	PDO	29TH AV/35TH ST
05/18/2014	2014799247	14010028	Marion	PDO	29TH AV/35TH ST
06/11/2014	2014802772	14012025	Marion	PDO	29TH AV/ 35TH ST

Iowa Department of Transportation

Major Cause Summary

Intersection of 29th Avenue and 35th Street MARION,

Report Version 1.1 Jan 2005

Analysis Years: 2004 [2], 2006 [2], 2007 [2], 2008 [3], 2010 [5], 2011 [5], 2012 [2], 2013 [5], 2014 [5]

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible/Unknown	3
PDO	26
Total Crashes	31

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible	4
Unknown	-
Total Injuries	6

Surface Condition Summary:

Dry	20
Wet	6
Ice	1
Snow	2
Slush	2
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	31

TOT Property Damage: $214,350

AVG Property Damage: $6,915

Major Cause Summary:

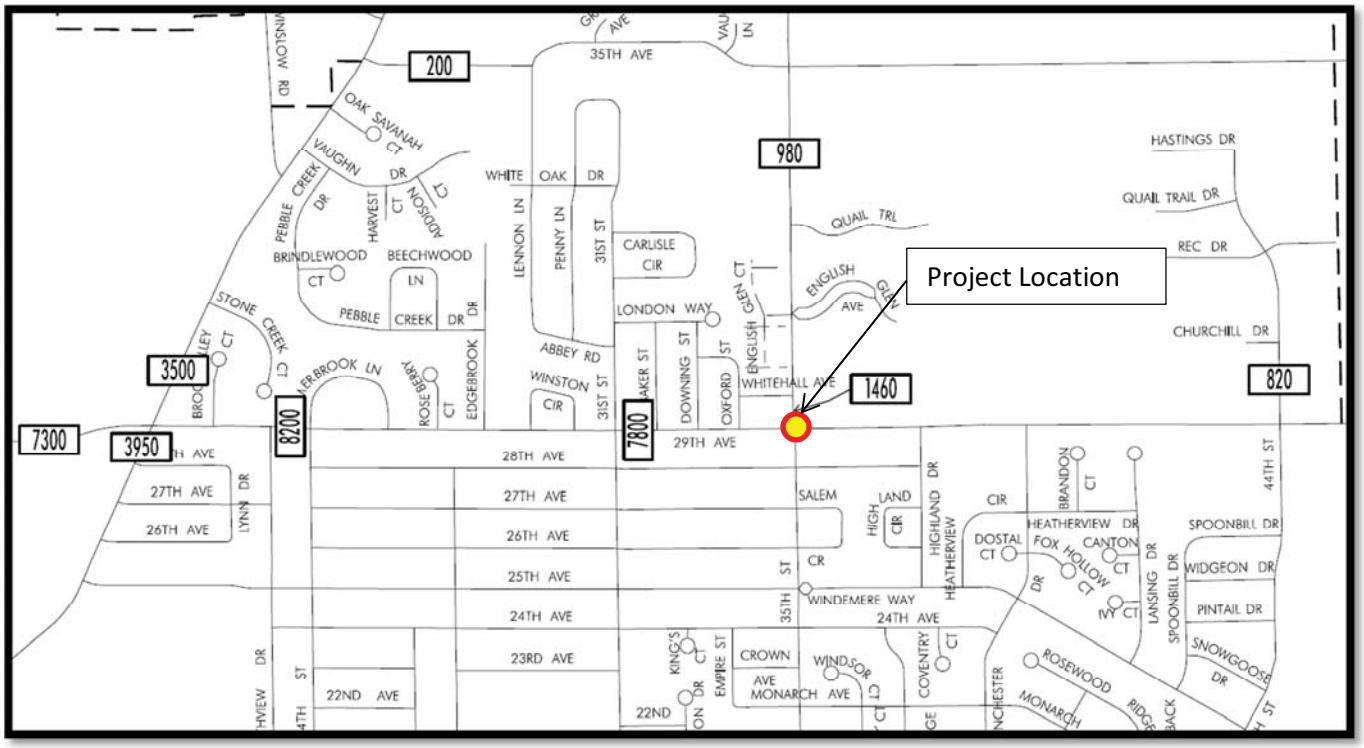
	Animal		Improper Backing
	Ran Traffic Signal		Illegally Parked/Unattended
11	Ran Stop Sign		Swerving/Evasive Action
	Crossed Centerline		Over-Correcting/Over-Steering
	FTYROW: At Uncontrolled Intersection		Downhill Runaway
	FTYROW: Making Right Turn on Red Signal		Equipment Failure
13	FTYROW: From Stop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

Selection Filter:

None

Analyst: Dennis Kleen

Notes:



2013 Iowa DOT Traffic Map

Road Name	November 2011 ADT*	2013 ADT	May 2014 ADT*
35th Street	6,488	1460	7,763
29th Avenue	3,174	7800	4,048

*Volumes provided by City of Marion

Rev. 7/10

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Linn | Prepared by: Shive-Hattery | Date Prepared: Aug 15, 2014

Intersection: 35th Street and 29th Avenue - Marion, Iowa

Improvement

Proposed Improvement(s): Conversion to Mini Roundabout

Existing 2-Way stop with left-turn lanes on 4 approaches

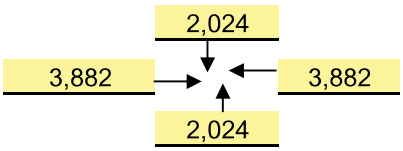
$ 164,220	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	50	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 164,220	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: City of Marion | 2014 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



4,311,015 Current Annual Entering Veh., **AEV** = DEV * 365

25,879 veh / day, Final Year DEV, **FDEV**

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

4.0% Projected Traffic Growth (0%-10%), **G**

11,811 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

	Fatal Crashes →		Fatalities @	$3,500,000	$ -
		1	Major Injuries @	$240,000	$ 240,000
6	Injury Crashes →	1	Minor Injuries @	$48,000	$ 48,000
		6	Possible Injuries @	$25,000	$ 150,000
24	Property Damage Only		(assumed cost per crash)	$2,700	$ 81,000
		-OR-	enter all Property Costs of all crashes:		
30	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 519,000

3.00	Current Crashes / Year, **AA** = TA / T	0.70	Crashes / MEV, Crash Rate, **CR**
$ 17,300	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
89.3	Total Expected Crashes, **TECR** = CR x TMEV	$ 499,038	Present Value of Avoided
1.50	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 25,950	Crash Costs Avoided in First Year, AAR x AVC		
44.7	Total Avoided Crashes, TECR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $499,038 : $164,220 = **3.04** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: At intersection of NE 56th Street and NE 78th Avenue.

Applicant: Polk County Public Works

Contact Person: Kurt D. Bailey, P.E. Title: County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: (515)286-3705 (Area Code) E-Mail: Kurt.Bailey@polkcountyiowa.gov

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 30,000

Safety Funds Requested $ 30,000

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 Polk

Signed: John F Mauro 8/12/14

Signature Date Signed

John F. Mauro, Chair, Polk County Board of Supervisors

Typed Name

Attest: Becky Dewey 8/12/14

Signature Date Signed

Becky Dewey, Chief Asst County Clerk

Typed Name

Res. No. 147-14
August 12, 2014

RESOLUTION

Moved by Hockensmith, Seconded by Connolly 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 78th Avenue and NE 56th Street; 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 certification 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:

John F. Mauro
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Request: $30,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

Steve Van Oort	Yea	Nay
Robert Brownell	Yea	Nay
Tom Hockensmith	Yea	Nay
Angela Connolly	Yea	Nay
John F. Mauro	Yea	Nay

AUG 12 2014

ALLOWED BY VOTE OF BOARD Yea 5 Nay 0

Above tabulation made by BD

John F. Mauro
CHAIRPERSON

#10

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 56th Street and NE 78th Avenue.

While we added oversized Stop signs with red flags, and double Stop Ahead signs with flags in 2003, and an overhead flashing beacon in 2000, we continue to see accidents involving a driver either running a stop sign or failing to yield to through traffic on NE 78th Avenue. Traffic volume or accident rates do not warrant an all-way stop condition at this time.

This intersection is located 2.5 miles north of Altoona, one mile west of Bondurant, and 2.5 miles east of Ankeny. NE 78th Avenue is a two-lane roadway with a Major Collector federal functional classification, and a posted speed limit of 55 mph. This route serves as a major commuter route for residents in Altoona, Bondurant, Ankeny, and eastern Polk County.

NE 56th Street is a 24' wide HMA roadway and is classified as a Major Collector. This road serves as the main north/south access road to Altoona's new Facebook Data Center, the Bass Pro Shop retail store, and its associated development 3 miles south, and Altoona's principal retail outlets on 8th Street SW just 4 miles south of this intersection.

Even though there is plenty of sight distance from the stop condition, motorists are still failing to either see or acknowledge the stop condition or yield to on-coming traffic. In addition, after reviewing the accident reports, it is apparent that some are confusing the overhead flashing beacon as an indication that the intersection is an all-way stop condition. 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 post mounted yellow flashing beacons and intersection warning signs on NE 56th Street and red flashing beacons on the NE 62nd Avenue stop signs to give additional warning to motorists, especially those on NE 78th Avenue that traffic may be entering unexpectedly. We believe the addition of these beacons and removal of the overhead beacon 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 8:1 using just the accidents involving drivers who thought it was an all way stop condition.

C

ENGINEER'S ESTIMATE NE 56th Street and NE 78th Avenue Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 57.50	$ 115.00
2	TYPE A SIGNS, SHEET ALLUMINUM	SF	50.00	$ 37.00	$ 1,850.00
3	TRAFFIC CONTROL	LS	1.00	$ 1,000.00	$ 1,000.00
4	FLAGGERS	EA	3.00	$ 345.00	$ 1,035.00
5	MOBILIZATION	LS	1.00	$ 2,000.00	$ 2,000.00
6	(RED) CONTINUOUS OPERATING, SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
7	(YELLOW) CONTINUOUS OPERATING, SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
				TOTAL ESTIMATED CONSTRUCTION COST	**$ 30,000.00**

*County to remove and salvage overhead flashing beacon.

D

PROJECT TIME SCHEDULE

Proposed N.E. 56th Street and NE 78th Avenue Advanced Signing with Solar Powered Beacons

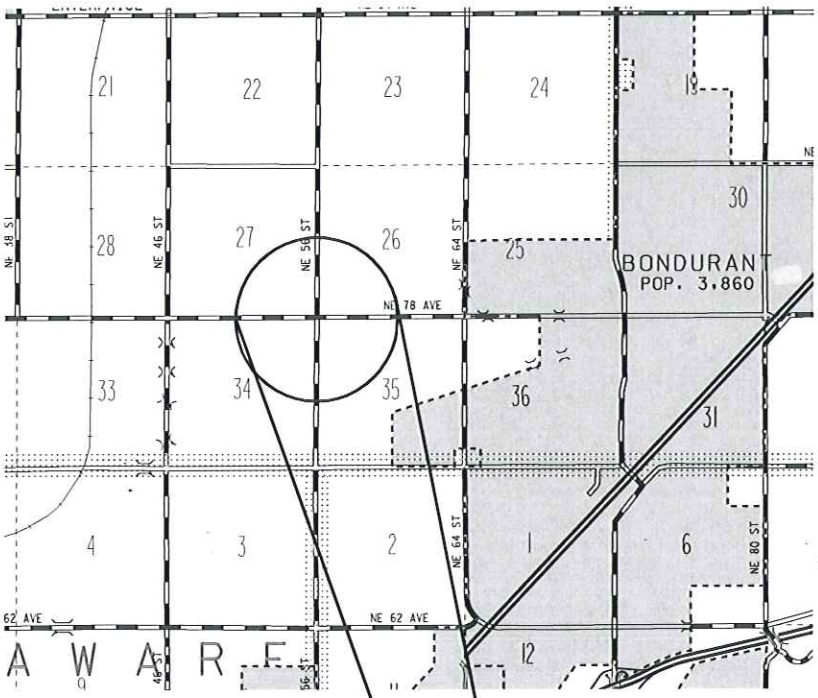
IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

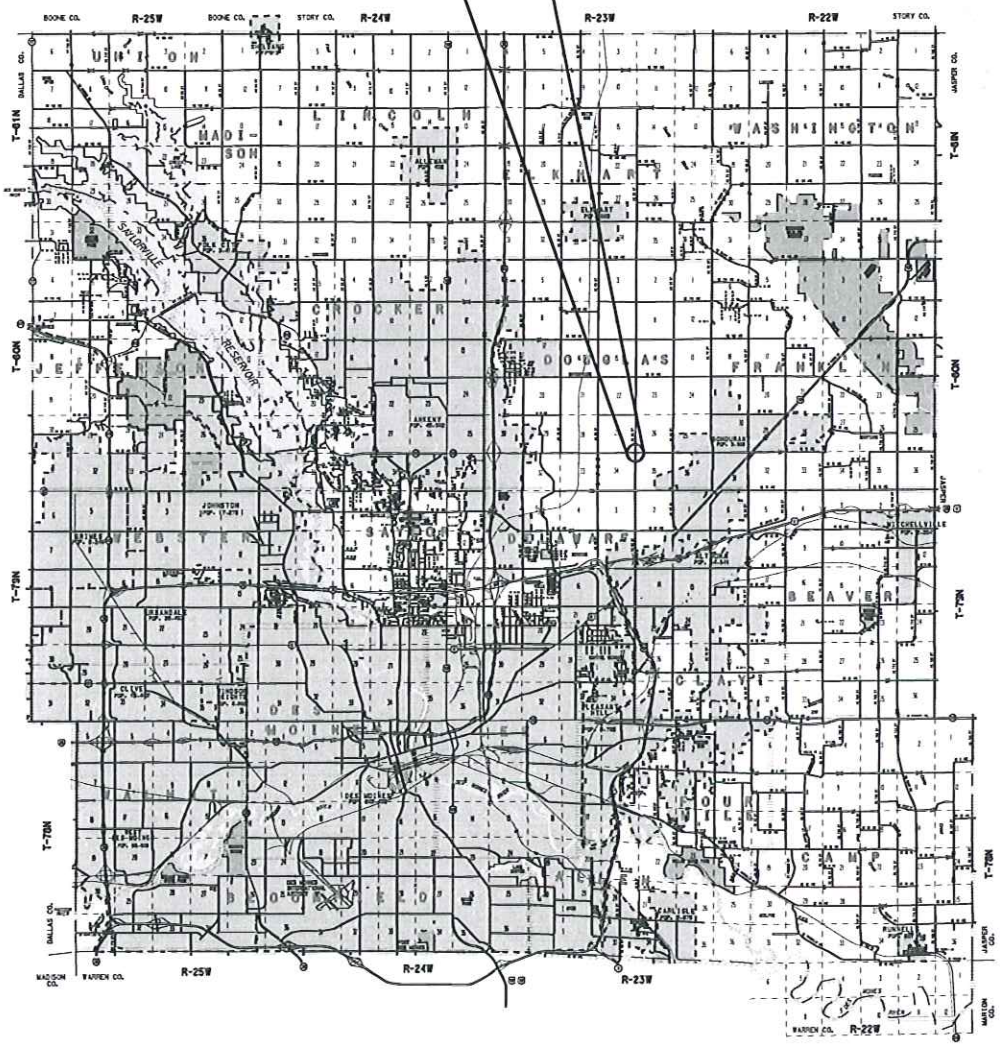
Polk County, Iowa

PROJECT PHASE	2015											
(YEAR 2015)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement												
Project Design and Project Plan Approvals												
Iowa DOT Bid Letting												
Project Construction/Pole Manufacture time												
Project Closeout												

DO NOT SCALE

E





File Name and Data
Plotted By

F

Figure 1 Northbound NE 56 Street Approaching Intersection.

Figure 2 Southbound NE 56th Street Approaching Intersection.

Figure 3 Eastbound NE 78th Avenue Approaching Intersection.

Figure 4 Westbound NE 78th Avenue Approaching Intersection.

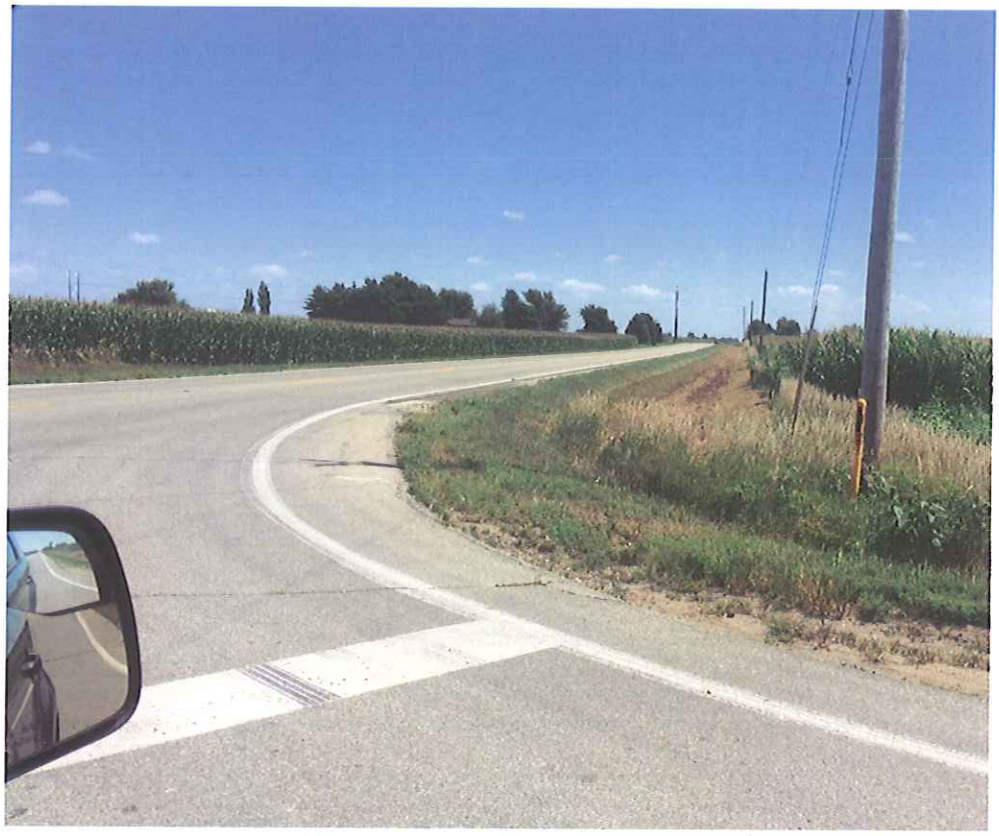
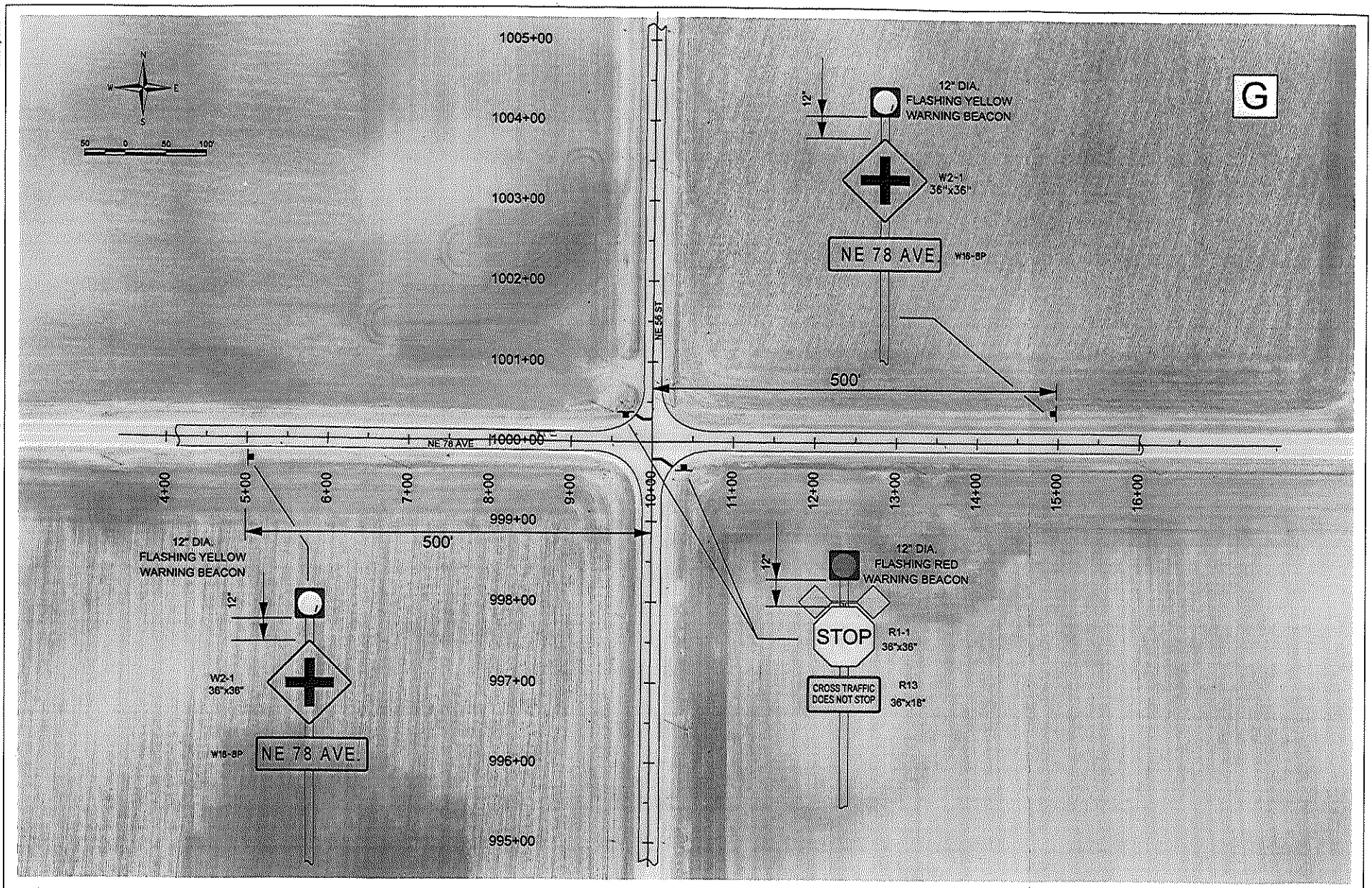


Figure 5 Looking East from Northbound Stop Condition- NE 56th Street

Figure 6 Looking West from Northbound Stop Condition- NE 56th Street

Figure 7 Looking East from Southbound Stop Condition- NE 56th Street

Figure 8 Looking West from Southbound Stop Condition- NE 56th Street



STATE OF IOWA	FHWA REGION 7	FISCAL YEAR 2013/2014	POLK COUNTY	PROJECT NUMBER	NE 58 ST @ NE 78 AVE.	SHEET NUMBER	L.01

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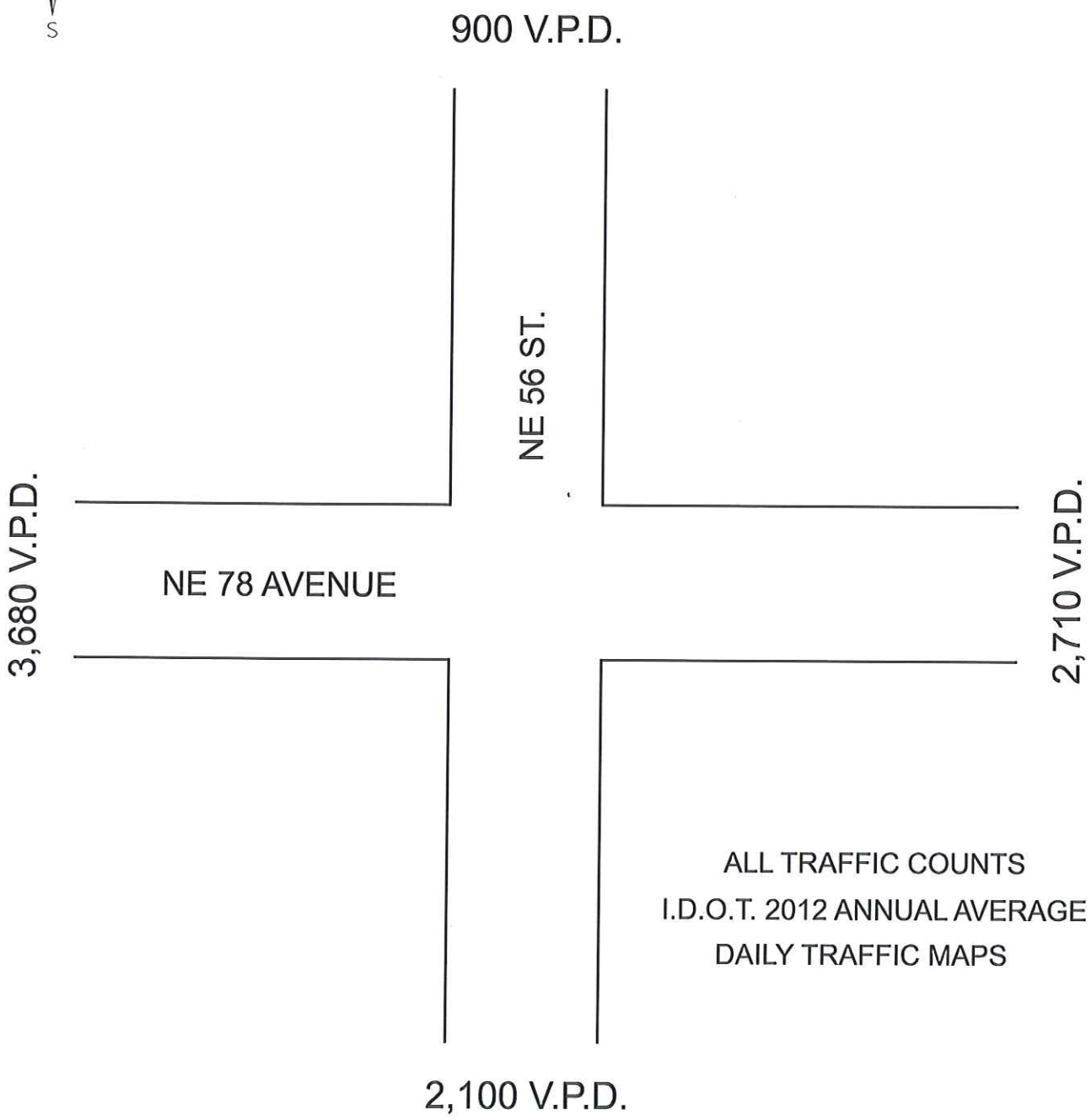
Plotted by DWR

TRAFFIC VOLUME INFORMATION

H

NE 56 STREET AT NE 78 AVENUE
NODE NUMBER : 33-1765



ALL TRAFFIC COUNTS
I.D.O.T. 2012 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

TRAFFIC COUNTS AT INTERSECTION
OF NE 56 STREET AND NE 78 AVENUE

File Name and Date
Plotted By

I

ACCIDENT HISTORY

NE 78th Avenue and NE 56th Street

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	33-1765	11/20/2009	PI	2-Minor	$ 21,500	Failure to Yield from Stop
2	33-1765	8/27/2010	PI	1 possible	$ 20,000	Failure to Yield from Stop
3	33-1765	11/15/2010	PDO		$ 2,500	Failure to Yield from Stop
4	33-1765	6/6/2011	PDO		$ 2,000	Rear End - NB
5	33-1765	11/28/2011	PDO		$ 29,800	Failure to Yield from Stop - SB
6	33-1765	12/3/2011	PDO		$ 9,000	Failure to Yield from Stop - SB
7	33-1765	11/26/2012	PI	2-Major	$ 20,000	Failure to Yield from Stop - SB
8	33-1765	11/21/2013	PDO		$ 4,000	Failure to Yield from Stop - NB
9	33-1765	3/11/2014	PI	1 minor	$ 14,000	Failure to Yield from Stop - NB
9		**Total Accidents Past 5 Years**		**0 fatality 2 major 3 minor 1 possible**	**$ 122,800**	**Total Property Damage**

SUMMARY

0	Fatalities @	$ 4,500,000		$ -
2	Major @	$ 325,000		$ 650,000
3	Minor @	$ 65,000		$ 195,000
1	Possible @	$ 35,000		$ 35,000
	Property Damage			$ 122,800

TOTAL DAMAGE $ 1,002,800

NE 78th Avenue and NE 56th Street

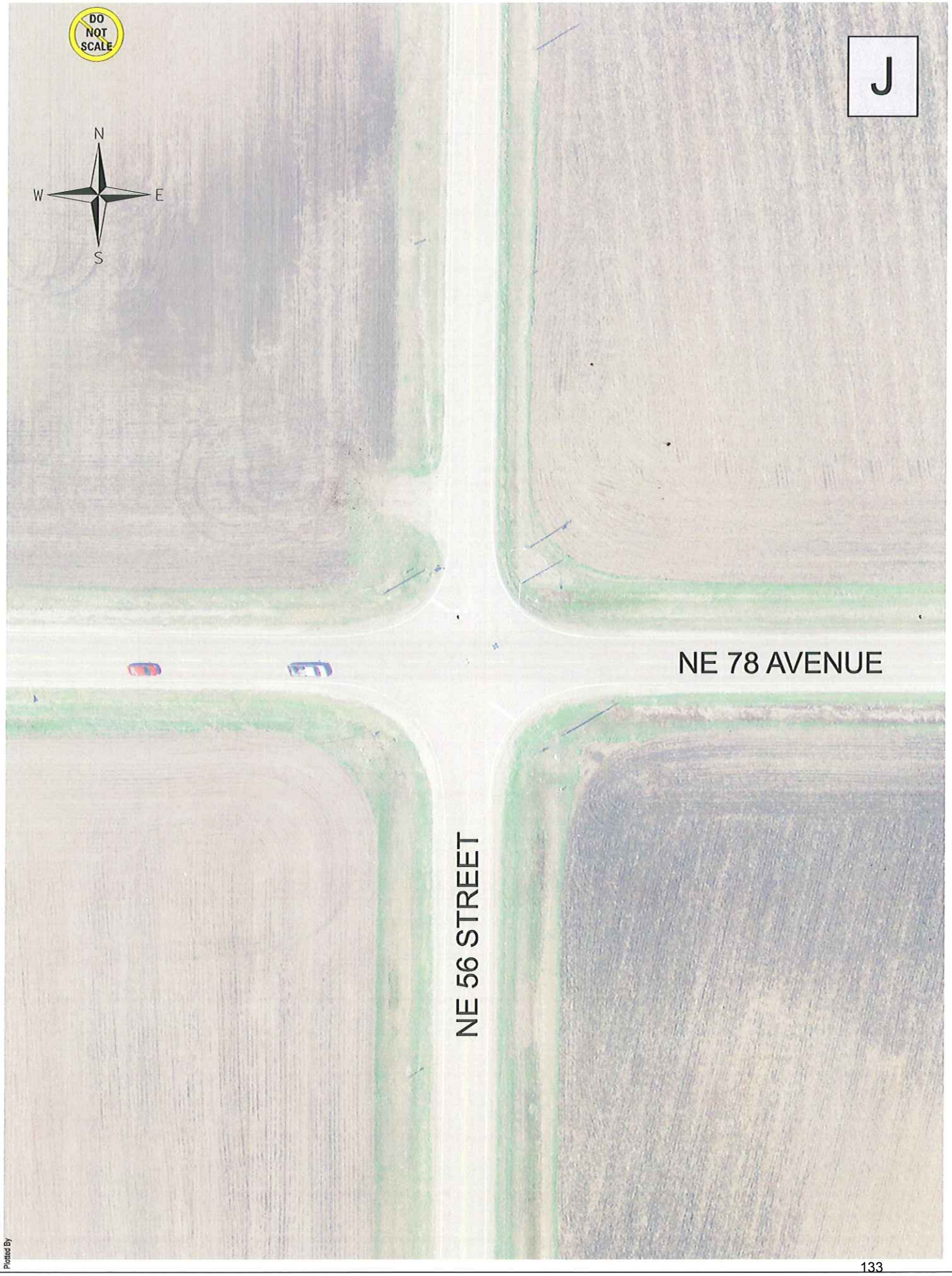
ONLY THOSE ACCIDENTS WHERE DRIVER AT VAULT THOUGHT IT WAS A 4-WAY STOP CONDITION

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	33-1765	11/20/2009	PI	2-Minor	$ 21,500	Failure to Yield from Stop
2	33-1765	11/28/2011	PDO		$ 29,800	Failure to Yield from Stop - SB
3	33-1765	3/11/2014	PI	1 minor	$ 14,000	Failure to Yield from Stop - NB
9		**Total Accidents Past 5 Years**		**0 fatality 0 major 3 minor 0 possible**	**$ 65,300**	**Total Property Damage**

SUMMARY

0	Fatalities @	$ 4,500,000		$ -
0	Major @	$ 325,000		$ -
3	Minor @	$ 65,000		$ 195,000
0	Possible @	$ 35,000		$ -
	Property Damage			$ 65,300

TOTAL DAMAGE $ 260,300



File Name and Date
Plotted By

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Kurt D. Bailey Date Prepared: Aug 4, 2014

Intersection: NE 78th Avenue and NE 56th Street

Improvement

Proposed Improvement(s): Add Red Flashing Beacons above new Stop signs on NE 56 Street and add yellow flashing beacons on approaches to intersection on NE 78 Ave. - remove overhead flashing beacon.

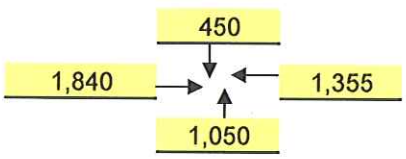
$ 30,000	Estimated Improvement Cost, **EC**	10	Est. Improvement Life, years, **Y**
$ 500	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 4,055	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 34,055	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT Traffic Count 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,713,675 Current Annual Entering Veh., **AEV** = DEV * 365

5,723 veh / day, Final Year DEV, **FDEV**

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

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

4,695 Current Daily Entering Vehicles, **DEV**

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

Crash Data

7/1/2009 First full year --> 7/1/2014 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
2	Injury Crashes	3	Minor Injuries @	$65,000	$ 195,000
		0	Possible Injuries @	$35,000	$ -
1	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 65,300
3	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 260,300

0.60	Current Crashes / Year, **AA** = TA / T	0.35	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 86,767	Cost per Crash, **AVC** = LOSS / TA		
6.6	Total Expected Crashes, **TECR** = CR x TMEV	$ 284,832	Present Value of Avoided Crashes, **BENEFIT**
0.37	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 32,277	Crash Costs Avoided in First Year, AAR x AVC		
4.1	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 = $284,832 : $34,055 = **8.36** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project At intersection of NE 64th Street and NE 27th Avenue.

Applicant Polk County Public Works

Contact Person Kurt D. Bailey, P.E. Title County Engineer

Complete Mailing Address 5885 NE 14th Street

Des Moines, IA 50313

Phone (515)286-3705 (Area Code) E-Mail Kurt.Bailey@polkcountyiowa.gov

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 30,000

Safety Funds Requested $ 30,000

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 Polk

Signed: John F. Mauro 8/12/14

Signature Date Signed

John F. Mauro, Chair, Polk County Board of Supervisors

Typed Name

Attest: Becky Dewey 8/12/14

Signature Date Signed

Becky Dewey, Chief Asst County Clerk

Typed Name

Res. No. 149-14
August 12, 2014

RESOLUTION

Moved by Hockensmith, Seconded by Connolly 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 27th Avenue and NE 64th Street; 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 certification 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:

John F. Mauro
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Request: $30,000
No Matching Funds Required.

ROLL CALL FOR ALLOWANCE

Steve Van Oort	Yea	Nay
Robert Brownell	Yea	Nay
Tom Hockensmith	Yea	Nay
Angela Connolly	Yea	Nay
John F. Mauro	Yea	Nay

AUG 12 2014

ALLOWED BY VOTE OF BOARD

Yea 5 Nay 0

Above tabulation made by: BJ

John F. Mauro
CHAIRPERSON

#12

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 64th Street and NE 27th Avenue.

While we added oversized Stop signs with red flags, and double Stop Ahead signs with flags in 2002, we continue to see accidents involving a driver on NE 27th Avenue failing to yield to through traffic on NE 64th Street. Traffic volume or accident rates do not warrant an all-way stop condition at this time.

This intersection is located 1.25 miles south of Altoona, 0.5 miles east of Des Moines, and 0.75 miles north of Pleasant Hill. NE 27th Avenue is a two-lane roadway with a Major Collector federal functional classification west of NE 64th St., and a Minor Collector east of NE 64th St. with a posted speed limit of 45 mph. This roadway serves as commuter route for residents in Altoona and the residential areas south of Altoona in the unincorporated area.

NE 64th Street is a 24' wide HMA roadway and is classified as a Major Collector. This roadway serves as a north/south commuter route, and connector road between the retail areas of Altoona two miles to the north, and to Iowa Hwy 163/University Ave. and associated development on along this roadway in Pleasant Hill.

Even though there is plenty of sight distance from the stop condition, motorists are still failing to either see on-coming traffic, or distracted and not yielding to on-coming traffic. Based on the 5-year accident history, we believe this intersection warrants traffic safety improvements.

As you can see in Section G, we propose to install yellow flashing beacons and intersection warning signs on NE 64th Street and red flashing beacons on the NE 27th Avenue stop signs to give additional warning to motorists, especially those on NE 64th Street that traffic may be entering unexpectedly. We believe the addition of these beacons will not only reduce the number of accidents, but also reduce the severity of the accidents. A detailed cost estimate for these improvements can be found in Section C. The relatively low cost of these improvements results in a high Benefit/Cost ratio over 17:1.

C

ENGINEER'S ESTIMATE NE 64th Street and NE 27th Avenue Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 57.50	$ 115.00
2	TYPE A SIGNS, SHEET ALLUMINUM	SF	50.00	$ 37.00	$ 1,850.00
3	TRAFFIC CONTROL	LS	1.00	$ 1,000.00	$ 1,000.00
4	FLAGGERS	EA	3.00	$ 345.00	$ 1,035.00
5	MOBILIZATION	LS	1.00	$ 2,000.00	$ 2,000.00
6	(RED) CONTINUOUS OPERATING, SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
7	(YELLOW) CONTINUOUS OPERATING; SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
				TOTAL ESTIMATED CONSTRUCTION COST	**$ 30,000.00**

D

PROJECT TIME SCHEDULE

Proposed N.E. 64th Street and NE 27th Avenue Advanced Signing with Solar Powered Beacons

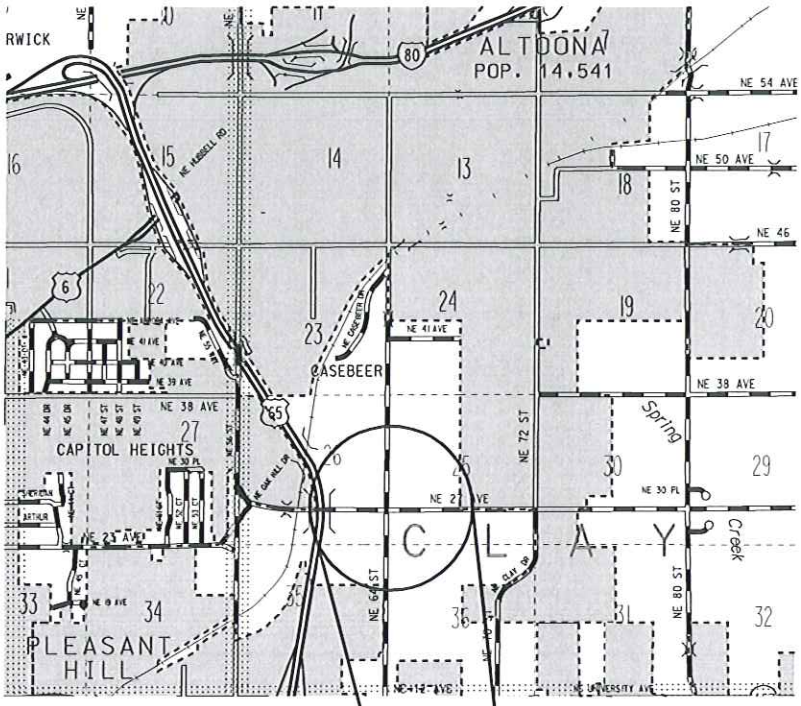
IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

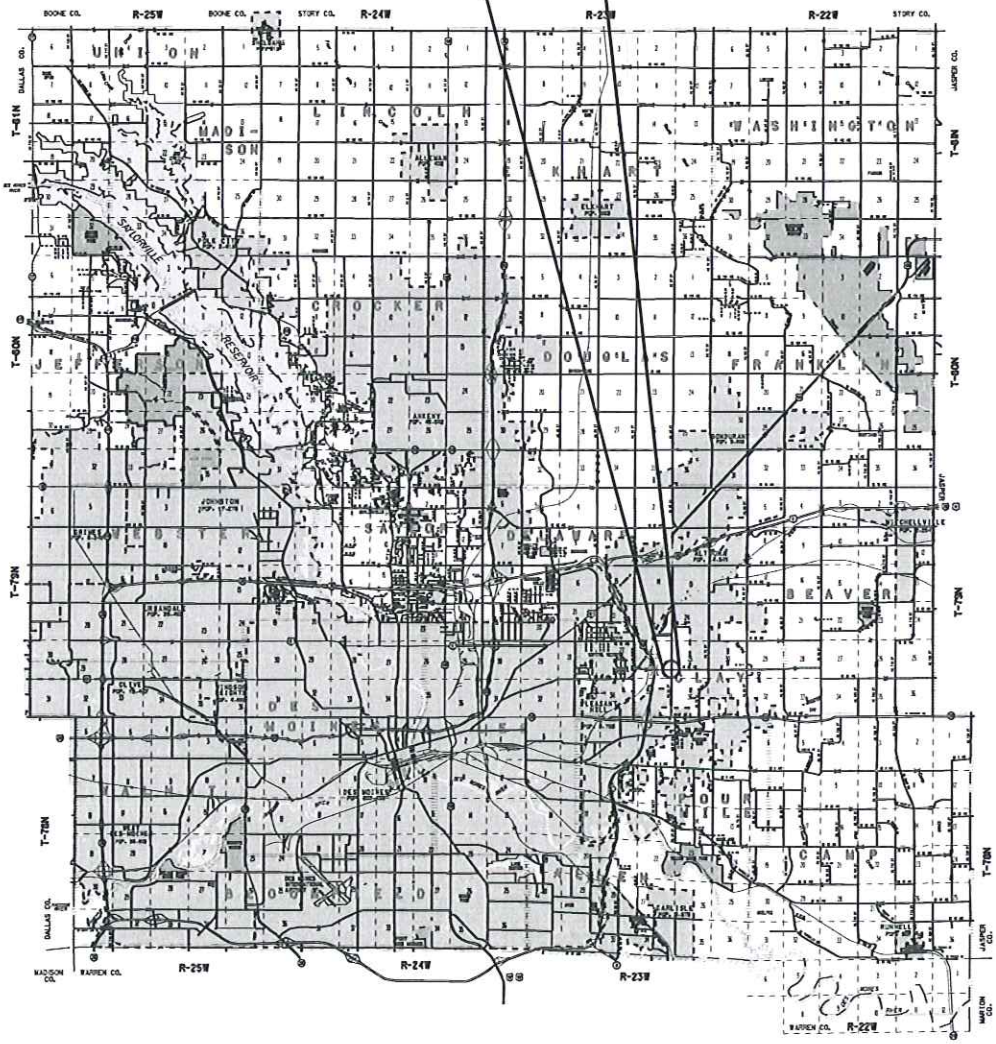
Polk County, Iowa

PROJECT PHASE	2015											
(YEAR 2015)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement												
Project Design and Project Plan Approvals												
Iowa DOT Bid Letting												
Project Construction/Pole Manufacture time												
Project Closeout												

DO NOT SCALE

E





File Name and Date
Plotted By

F

Figure 1 Eastbound NE 27 Avenue Approaching Intersection.

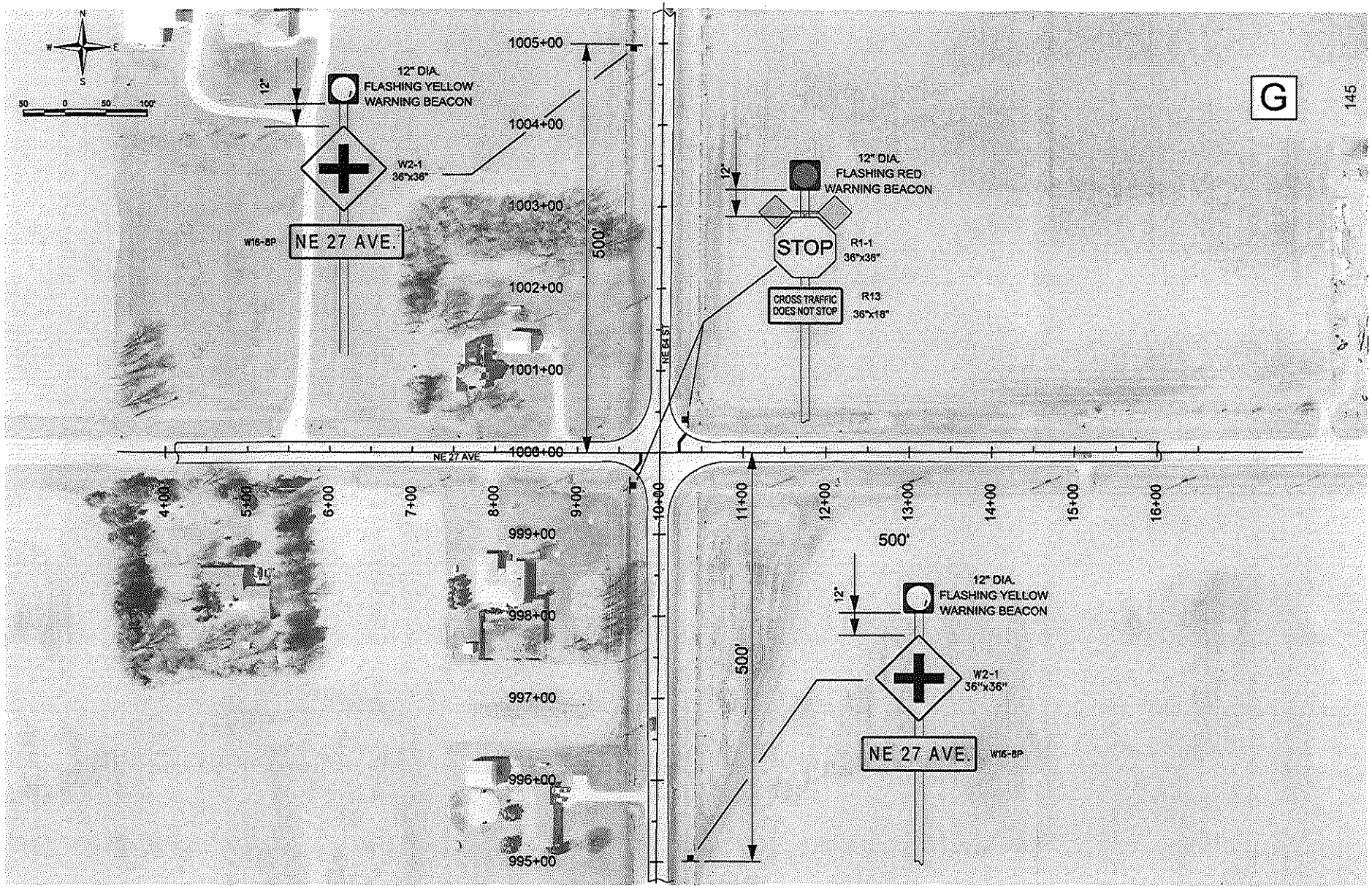
Figure 2 Westbound NE 27 Avenue Approaching Intersection.

Figure 3 Looking North from Eastbound Stop Condition- NE 27 Avenue.

Figure 4 Looking South from Eastbound Stop Condition- NE 27 Avenue

Figure 5 Looking South from Westbound Stop Condition- NE 27 Avenue

Figure 6 Looking North from Westbound Stop Condition- NE 27 Avenue



STATE OF IOWA	FHWA REGION 7	FISCAL YEAR 2013/2014	POLK COUNTY	PROJECT NUMBER	NE 64 ST. AT NE 27 AVE.	SHEET NUMBER	L.01

Plotted by DKR

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TRAFFIC VOLUME INFORMATION

H

NE 64 STREET AT NE 27 AVENUE
NODE NUMBER : 23-2181

1,120 V.P.D.

NE 64 ST.

2,450 V.P.D.

NE 27 AVENUE

1,450 V.P.D.

ALL TRAFFIC COUNTS
I.D.O.T. 2012 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

1,740 V.P.D.

TRAFFIC COUNTS AT INTERSECTION
OF NE 64 STREET AND NE 27 AVENUE

File Name and Date
Plotted By

I

ACCIDENT HISTORY

NE 64 Street and NE 27 Avenue

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description
1	23-2181	6/15/2010	PI	4-minor	$ 20,000	FTY FROM STOP - WB
2	23-2181	3/2/2011	PDO		$ 2,000	FTY FROM STOP - EB
3	23-2181	5/6/2011	PDO		$ 4,000	Fail to Maintain Control
4	23-2181	3/23/2012	PI	1 - poss.	$ 2,250	REAR END - WB
5	23-2181	4/13/2012	PI	1 - poss.	$ 5,000	FTY FROM STOP - WB
6	23-2181	12/21/2012	PDO		$ 4,500	FTY FROM STOP - WB
7	23-2181	8/25/2013	PDO		$ 15,000	FTY FROM STOP - WB
8	23-2181	4/9/2014	PDO		$ 5,500	STOPPING ON HIGHWAY - EB
9	23-2181	6/2/2014	PI	2-minor	$ 17,000	FTY FROM STOP - EB
9		**Total Accidents**		**0 fatality 0 major 6 minor 2 possible**	**$ 75,250**	**Total Property Damage**

SUMMARY

0	Fatalities @	$ 4,500,000		$ -
0	Major @	$ 325,000		$ -
6	Minor @	$ 65,000		$ 390,000
2	Possible @	$ 35,000		$ 70,000
	Property Damage			$ 75,250

TOTAL DAMAGE $ 535,250

File Name and Date
Plotted By

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Kurt D. Bailey Date Prepared: Aug 4, 2014

Intersection: NE 64th Street and NE 27th Avenue

Improvement

Proposed Improvement(s): Add Red Flashing Beacons above new Stop signs on NE 27 Ave. and add yellow flashing beacons on approaches to intersection on NE 64 St.

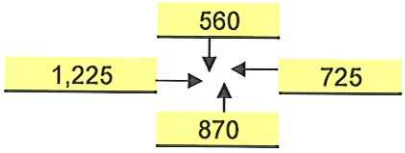
$ 30,000	Estimated Improvement Cost, **EC**	10	Est. Improvement Life, years, **Y**
$ 500	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 4,055	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 34,055	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT Traffic Count 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,233,700 Current Annual Entering Veh., **AEV** = DEV * 365

4,120 veh / day, Final Year DEV, **FDEV**

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

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

3,380 Current Daily Entering Vehicles, **DEV**

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

Crash Data

7/1/2009 First full year --> 7/1/2014 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
		0	Major Injuries @	$325,000	$ -
4	Injury Crashes	6	Minor Injuries @	$65,000	$ 390,000
		2	Possible Injuries @	$35,000	$ 70,000
5	Property Damage Only		(assumed cost per crash)	$7,400	$ -
			-OR- enter all Property Costs of all crashes:		$ 75,250
9	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 535,250

1.80	Current Crashes / Year, **AA** = TA / T	1.46	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 59,472	Cost per Crash, **AVC** = LOSS / TA	$ 585,694	Present Value of Avoided Crashes, **BENEFIT**
19.7	Total Expected Crashes, **TECR** = CR x TMEV		
1.12	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 66,371	Crash Costs Avoided in First Year, AAR x AVC		
12.2	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 = $585,694 : $34,055 = **17.20** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Grandview/Delhi/Grace Intersection Roundabout

Applicant: City of Dubuque

Contact Person: Bob Schisel Title: Assistant City Engineer

Complete Mailing Address: 50 West 13th St
Dubuque, IA 52001

Phone: 563.589.4270 (Area Code) E-Mail: bschiesl@cityofdubuque.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 $ 632,148.40

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 Dubuque, Iowa

Signed: [signature] August 15, 2014

Signature Date Signed

Gus Psihoyos, City Engineer

Typed Name

Attest: [signature] August 15, 2014

Signature Date Signed

Trish Gleason, Assistant City Clerk

Typed Name

A. Resolution

RESOLUTION NO. 241-14

RESOLUTION AUTHORIZING THE FILING OF A GRANT APPLICATION WITH THE IOWA DEPARTMENT OF TRANSPORTATION FOR TRAFFIC SAFETY IMPROVEMENTS FUNDING FOR THE CITY OF DUBUQUE NORTH GRANDVIEW AVENUE AND DELHI STREET ROUNDABOUT INTERSECTION IMPROVEMENT

Whereas, the increasing growth of traffic volumes, along with operational and safety concerns, at North Grandview Avenue, Delhi Street and Grace Street in the City of Dubuque could be improved by a roundabout; and

Whereas, the City of Dubuque has determined that improvements to this intersection, as recommended by the Iowa Department of Transportation office of Traffic Safety, will improve traffic flow; and

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

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

Section 1. The City files this grant application for funds through the Traffic Safety Improvement Program to fund North Grandview Avenue and Delhi Street Roundabout Intersection Improvement.

Passed, approved and adopted this 4th day of August, 2014.

Roy D. Buol, Mayor

Attest:

Kevin S. Firnstahl, CMC, City Clerk

B. NARRATIVE

Purpose

The City of Dubuque seeks to provide safe and efficient transportation within the City. With this project the City is proposing to address one of the city's primary safety concerns by constructing a roundabout at the intersection of Grandview Avenue, Delhi Street, and Grace Street.

Existing Conditions

The project location is a five-legged all-way stop-controled intersection near the center of the City of Dubuque. Area surrounding the intersection is primarily commercial with some residential near by. The Finley Hospital campus is located to the adjacent to he south east corner of the intersection.

Currently this intersection is a five-way stop and has operational delays during peak travel times. Grandview Avenue is a minor arterial that runs north-south and has an AADT of 13,000 near the project site. Delhi Street is a minor arterial with and AADT of 14,000 near the project site. Grace Street is a local street with a AADT of around 400 near the project site.

Project Concept

The City of Dubuque is proposing construction of a roundabout at the Grandview/Delhi/Grace intersection. A conceptual roundabout design was designed by the City's consulting engineer to minimize the impact to adjacent property owners (Section G). The roundabout concept was developed to accommodate various trucks, provide adequate sight distance, and provide natural vehicle paths.

The City feels that the roundabout design will improve safety at the intersection while minimizing vehicular delay. The roundabout will improve vehicular safety by reducing conflict points and encouraging vehicles to pass through the intersection and speeds slower than in a traditional intersection. The slower speeds and directional circulation offer safety benefits including less severe crashes. Right-angle crashes are eliminated and the crashes that do occur are sideswipes that result in fewer fatalities and serious injuries. Additionally, the slower speeds and single direction circulation make it easier for younger and elderly drivers to enter the traffic stream and appropriately judge adequate gapes in the circulating traffic.

Not only will the roundabout improve safety for drivers, but it will also improve safety for pedestrian and bicycle traffic. The current configuration of the intersection requires pedestrians to cross several lanes to get across the street creating a dangerous situation. Two of the accident reports in Section I describe accidents involving a pedestrian and a bicyclist. The roundabout design will use divider islands to reduce the crossing distance and improve safety for pedestrians. Bicyclists can dismount and cross as pedestrians or enter the roundabout as non-motorized vehicles.

The City of Dubuque is seeking $500,000 from Traffic Safety Improvement Funds. With secured funding, the City anticipates that the projected could begin in April 2015, with completion in November 2016.

Project Justification

The safety challenges presented by the Grandview Ave/Delhi St/Grace St intersection have proved to be very costly for the community. Accident reports provided by the Iowa DOT shows there have been 38 crashes at the intersection between 2004 and 2013. The accidents resulted one major injury, in three minor injuries, eight possible injuries, and $281,200 in property damage. The Benefit/Cost Safety Analysis (Section L) estimates the total loss resulting from the crashes at both intersections at $1,016,200. With a projected annual traffic increase of 2%, the cost of future crashes at this intersection is expected to increase.

C. ITEMIZED BREAKDOWN OF ALL COSTS

City of Dubuque - Engineering Division
Project Cost Estimate

ENGINEERS ESTIMATE

DATE: July 17, 2014
REVISED:

PROJECT NAME: North Grandview Avenue/Delhi Street/Grace Street - Roundabout
Conceptual Cost Estimate - Full Reconstruct

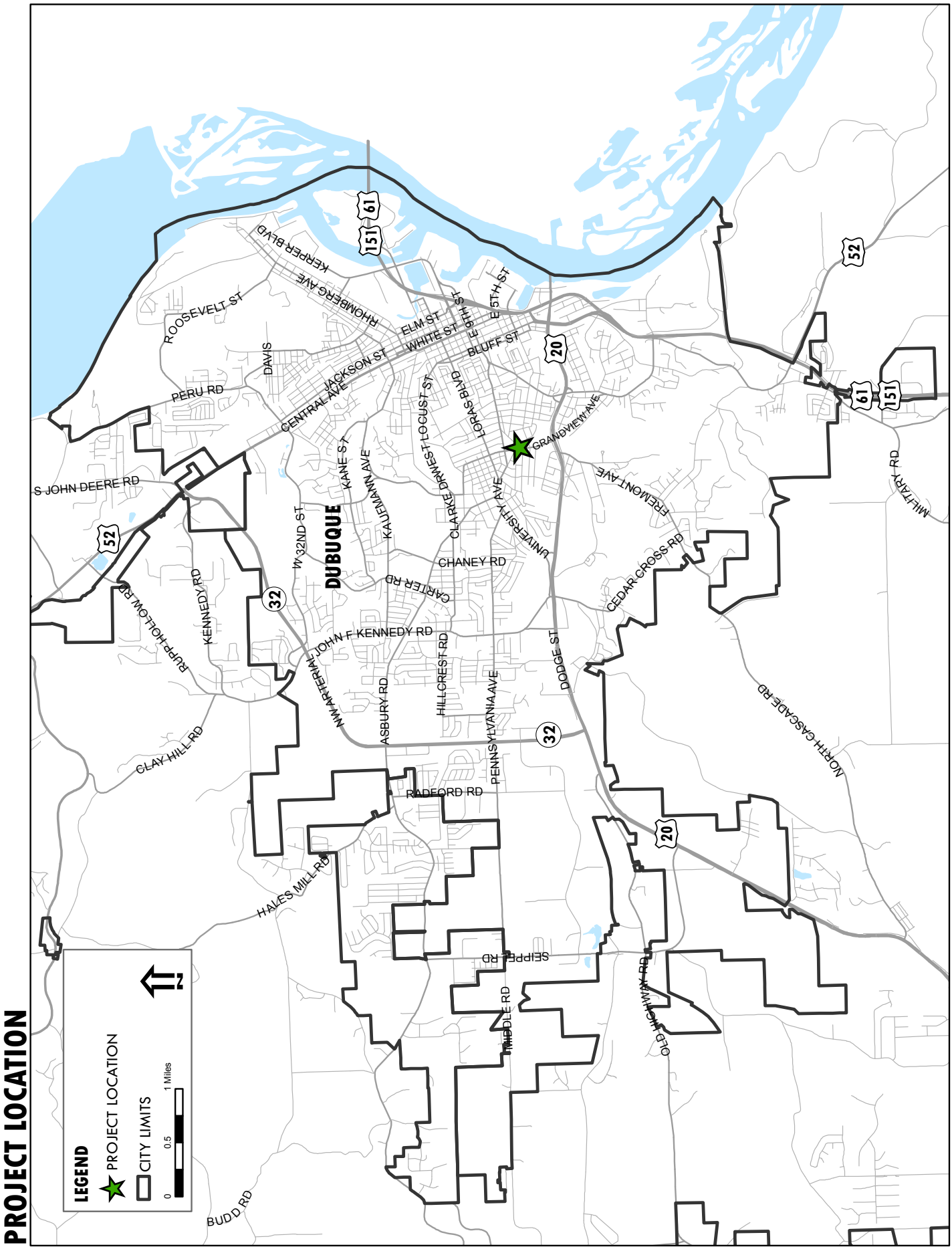
LETTING DATE:

	BID ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY	ESTIMATE UNIT COST	ESTIMATE COST
1	**NEW PAVEMENT**				
	Remove Concrete Pavement	SY	2,600	$ 5.50	$ 14,300.00
	Remove Curb & Gutter	LF	1,800	$ 3.50	$ 6,300.00
	Remove Sidewalk	SY	460	$ 3.50	$ 1,610.00
2	**EARTHWORK**				
	Excavation, Unclassified	CY	1,600	$ 8.00	$ 12,800.00
	Graded Stone Base	TON	1,600	$ 15.00	$ 24,000.00
3	**ROADWAY ITEMS**				
	PC Concrete Pavement, (9") w/Integral Curb, Class "C", w/CD Baskets	SY	3,610	$ 50.00	$ 180,500.00
	PC Concrete Sidewalk and Driveway, 5", Construct	SF	4,700	$ 4.50	$ 21,150.00
	PC Concrete Curb & Gutter, 2.5', Construct	LF	600	$ 18.00	$ 10,800.00
	PC Concrete Access Ramp, Detectable	EACH	24	$ 200.00	$ 4,800.00
	Sawcut, Concrete, Full-Depth	LF	220	$ 4.00	$ 880.00
	Colored Concrete Sidewalk 4-Inch, Splitter Islands	SF	960	$ 7.00	$ 6,720.00
	Concrete Roundabout Truck Apron 8-Inch	SY	275	$ 70.00	$ 19,250.00
4	**SUBTOTAL ROADWAY COSTS**				**$ 314,870.00**
5	**DRAINAGE**	LS	1	$ 30,000.00	$ 30,000.00
6	**EROSION CONTROL**	LS	1	$ 10,000.00	$ 10,000.00
7	**LIGHTING**	EACH	4	$ 9,000.00	$ 36,000.00
8	**SIGNING / MARKINGS**	LS	1	$ 15,000.00	$ 15,000.00
9	**CONSTRUCTION STAGING / TRAFFIC CONTROL**	LS	1	$ 20,000.00	$ 20,000.00
10	**TOTAL ROADWAY COSTS**				**$ 425,870.00**
11	**20% CONTINGENCY**	LS	20% of Item 10	NA	$ 85,174.00
12	**ESTIMATED CONTRACT LET AMOUNT**				**$ 511,044.00**
13	**DESIGN ENGINEERING**	LS	1	$ 50,000.00	$ 50,000.00
14	**CONSTRUCTION ENGINEERING / INSPECTION**	LS	10% of Item 12	NA	$ 51,104.40
15	**REAL ESTATE**				$ 20,000.00
16	**TOTAL DESIGN ENGINEERING / CONSTRUCTION COSTS**				**$ 632,148.40**

D. TIME SCHEDULE

DESCRIPTION	DATE
Grant Application	August 2014
Notice of Funding	December 2014
Approval of Agreement	July 2015
Construction Plan Preparation	September 2014 - April 2015
Plans Approval	May 2015
Advertise for Bids	October 2015
Open Bid and Award Contract	November 2015
Notice to Proceed	December 2015
Construction	April 2016 - November 2016
Project Closeout	December 2016

E. PROJECT LOCATION MAP



F. PICTURES

Grandview Ave/Delhi St/Grace St Intersection Looking Southeast

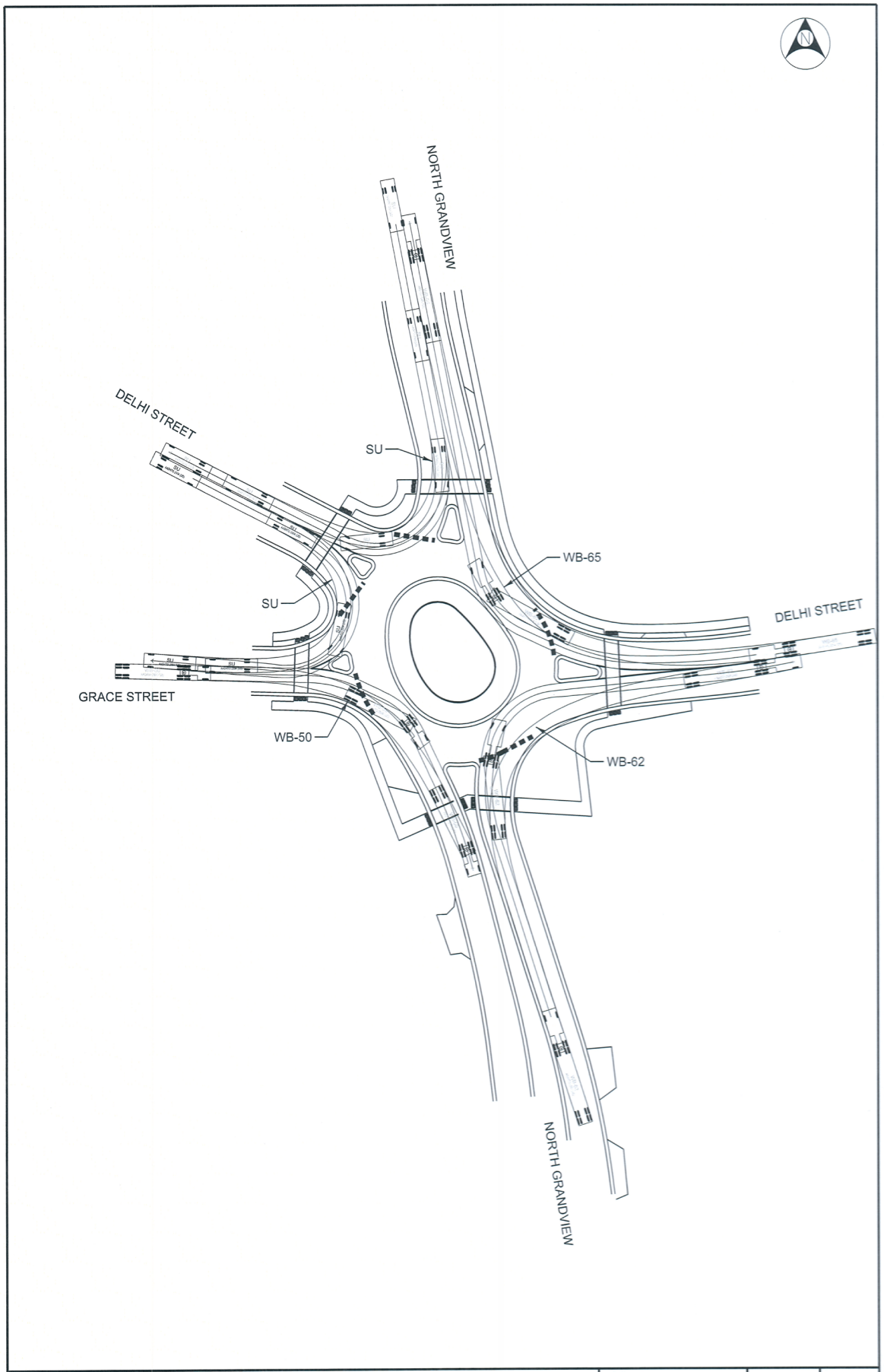
Grandview Ave/Delhi St/Grace St Intersection Looking East

F. PICTURES

Grandview Ave/Delhi St/Grace St Intersection Looking West

Grandview Ave/Delhi St/Grace St Intersection Looking Northwest

G. PLAN VIEW



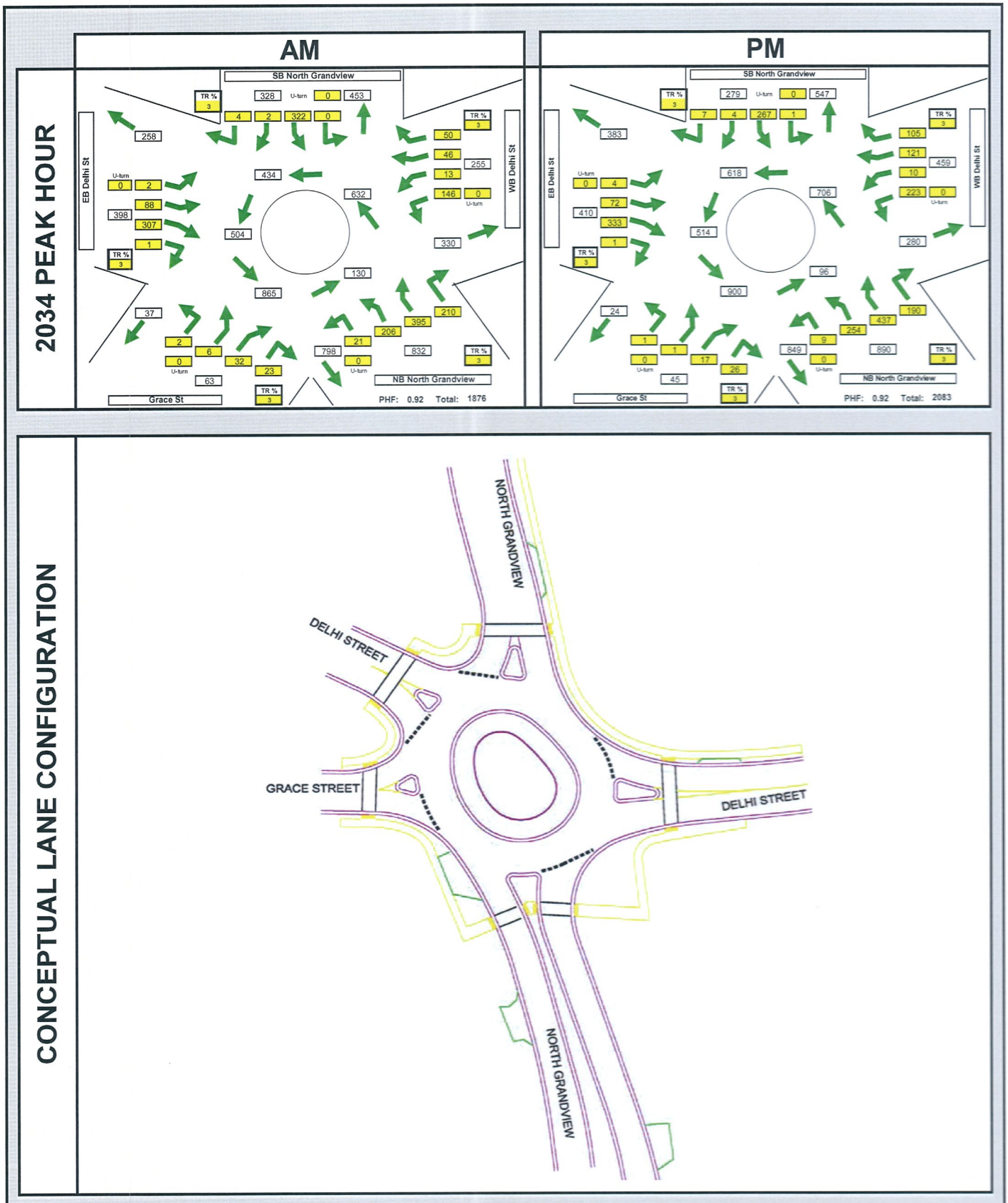
RIGHT TURN TRUCK MOVEMENTS
NORTH GRANDVIEW AVENUE/DELHI STREET/GRACE STREET
CITY OF DUBUQUE, IA

GHD, Inc.
5325 Wall Street, Suite 2305
T 608 249 4545 F 608 249 4402
E madison@ghd.com W www.ghd.com

DATE	PROJECT No.
JUNE 2014	-
SCALE	FIGURE No.
1"= 50'	3.0

FILE NAME: G:\86\8616772 Grace Delhi Grandview - Dubuque IA\CADD\Truck Turning Exhibit.dgn
PLOT DATE: 6/27/2014
PLOT SCALE: 50.0000 sf / in.

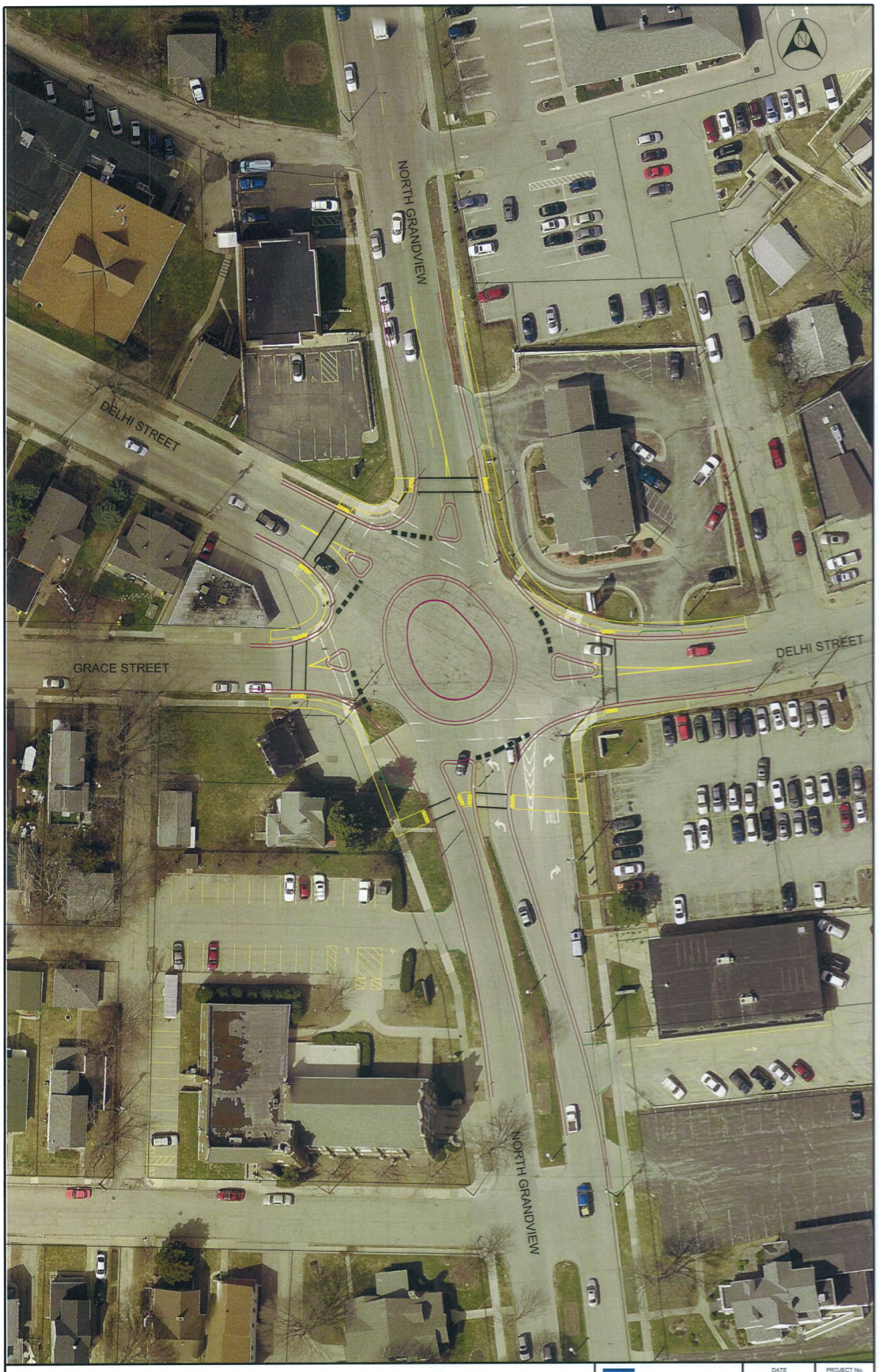
G. PLAN VIEW



North Grandview Avenue/Delhi Street/Grace Street Intersection
City of Dubuque, Iowa
CONCEPTUAL LANE CONFIGURATION

FIGURE: 1.0

H. AERIAL PHOTOGRAPH



NORTH GRANDVIEW AVENUE/DELHI STREET/GRACE STREET
CITY OF DUBUQUE, IA

GHD, Inc.,
5325 Wall Street, Suite 2305
T 608 249 4545 F 608 249 4402
E madison@ghd.com W www.ghd.com

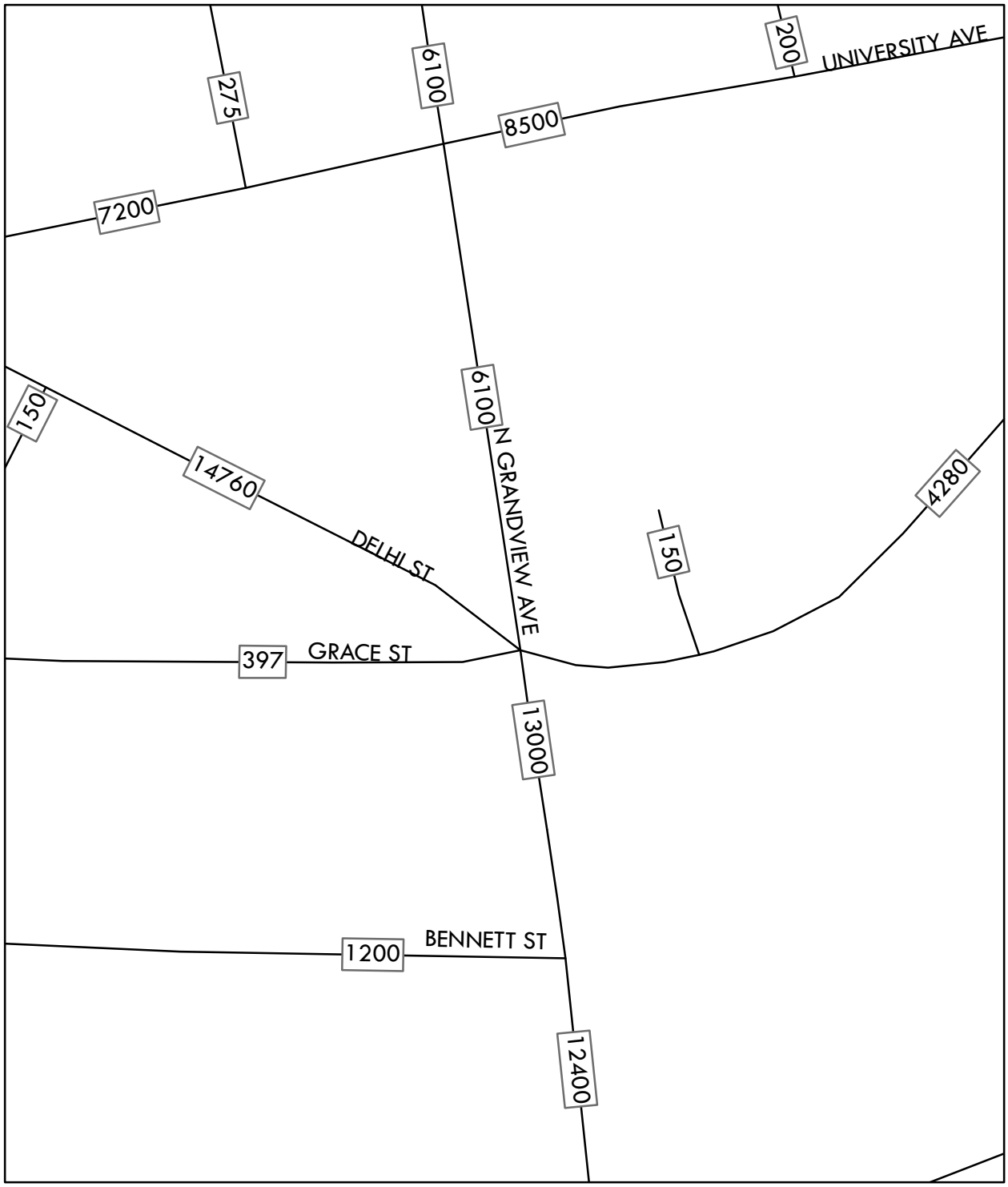
DATE	PROJECT No.
JUNE 2014	-
SCALE	FIGURE No.
1"= 50'	2.0

FILE NAME: G:\86\8616772 Grace Delhi Grandview - Dubuque IA\CADD\RAB Exhibit.dgn PLOT DATE: 6/27/2014 PLOT SCALE: 50.0000 sf / in.

J. TRAFFIC VOLUME

TRAFFIC VOLUME

ANNUAL AVERAGE DAILY TRAFFIC



0 100 200 300 400 Feet

DATA SOURCE: IOWA DOT

Count Year
Grandview Ave, 2005
Delhi St, 1989
Grace St, 1975

L. BENEFIT/COST WORKSHEET

Assumptions

Est. Improvement Life: 30 Years

Crash Reduction Factor: CMF ID: 206, Conversion of stop-controlled intersection into a single-lane roundabout. http://www.cmfclearinghouse.org/detail.cfm?facid=206

Traffic Volume Data: Iowa DOT Traffic Data 2005, 1975, 1989.

Projected Traffic Growth: 2% - DMATS Travel Demand Forecast Model

Crash Data: Used Iowa DOT CMAT Data 2004-2014.

L. BENEFIT/COST WORKSHEET

Rev. 5/14

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Dubuque Prepared by: ECIA Date Prepared: Aug 1, 2014

Intersection: Grandview Ave / Delhi St / Grace St

Improvement

Proposed Improvement(s): Construct Roundabout

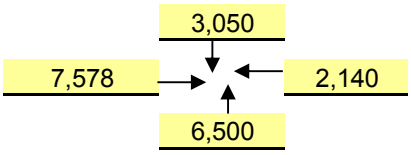
$ 500,000	Estimated Improvement Cost, **EC**	30	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	72	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 500,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 1975, 1981, 1989, 2 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



7,032,820 Current Annual Entering Veh., **AEV** = DEV * 365

34,901 veh / day, Final Year DEV, **FDEV**

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

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

19,268 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004 First full year --> 2013 Last full year 10.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes		Fatalities @	$4,500,000	$	-
		1	Major Injuries @	$325,000	$	325,000
9	Injury Crashes	2	Minor Injuries @	$65,000	$	130,000
		8	Possible Injuries @	$35,000	$	280,000
29	Property Damage Only		(assumed cost per crash)	$7,400	$	281,200
		-OR-	enter all Property Costs of all crashes:			
38	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,016,200

3.62	Current Crashes / Year, **AA** = TA / T	**0.51**	Crashes / MEV, Crash Rate, **CR**
$ 26,742	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
146.8	Total Expected Crashes, **TECR** = CR x TMEV	**$ 1,538,318**	Present Value of Avoided
2.61	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 69,682	Crash Costs Avoided in First Year, AAR x AVC		
105.7	Total Avoided Crashes, TECR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $1,538,318 : $500,000 = **3.08** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Paved Shoulders, Rumble Strips, & Edgelines along L-20 (Loess Hills Trail) S. of Missouri Valley

Applicant: Harrison County

Contact Person: Steven Struble Title: County Engineer

Complete Mailing Address: 301 N. 6th Avenue
Logan, IA 51546

Phone: 712-644-3140 (Area Code) E-Mail: sstruble@harrisoncountyia.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 $ 480,407

Safety Funds Requested $ 480,407

A

HARRISON COUNTY BOARD OF SUPERVISORS

211 NORTH 2ND AVENUE
Phone 712-644-3123

2nd FLOOR COURTHOUSE

LOGAN, IA 51546
Fax 712-644-2643

ROBERT V. SMITH — CHAIRMAN
WALTER UTMAN — MEMBER
F. GAYLORD PITT — MEMBER

RESOLUTION

WHEREAS: It is to the benefit of Harrison County to apply for Traffic Safety Funds for improvements at various locations on the secondary road system and;

WHEREAS: The Board of Supervisors of Harrison County is empowered to make such application for said funds and;

WHEREAS: The Board of Supervisors authorizes such application for 2015/2016 Traffic Safety Funds;

THEREFORE: Be it resolved by the Harrison County Board of Supervisors to authorize the Chairman to execute said application upon completion by the county engineer.

Resolved this 7 th day of August, 2014

Motion by: Utman

Second by: Smith

		AYE	NAY
ROLL CALL VOTE	UTMAN	✓	
	SMITH	✓	
	PITT	Absent	

RESOLVED:

Robert V. Smith

Robert V. Smith, Chairman

ATTEST:

Susan Bonham

Susan E. Bonham, Auditor

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 Harrison County Board of Supervisors

Signed: Robert V. Smith 8-14-14

Signature Date Signed

Robert V. Smith, Chairman 08/14/14

Typed Name

Attest: Susan Bonham 8-14-14

Signature Date Signed

Susan E. Bonham, County Auditor 08/14/14

Typed Name

B

1. Existing Conditions

The proposed project is located on County highway L-20 and runs 3.1 miles from the South corporate limit of Missouri Valley to the Pottawattamie County line. This section of L-20 was the primary route from Sioux City to Omaha prior to construction of I-29 and continues to carry heavy local traffic to the Omaha/Council Bluffs metro area from Missouri Valley and areas along Hwy 30 NE of Missouri Valley and to the Missouri Valley airport. The (2008) IDOT traffic count was 1520 VPD. This stretch of L-20 has irregular 4' to 6' earth shoulders with 2' to 3' granular surface. A 24' x 12' – 5" high railroad underpass tunnel is located approximately 6000' from the south end of the project. Thirteen of the 91 crashes reported in 10 years were collisions with the underpass or bridge rail of the north of two bridges on the project.

The subject section of roadway is fairly level and the posted speed is 55 mph except for the tunnel approaches which include two short horizontal curves (R=350' to 400' +-) that are posted for 35 mph at 1200 feet in advance of the tunnel entrance for SB traffic and at 920' in advance for NB traffic. There are compliant advance warning devices in place including pavement marking legend 'SLOW' with painted arrow symbol at approximately 500' in advance of tunnel each direction. The north bridge approaches are posted approximately 560' in advance for NB and 1260' in advance for SB traffic at 45 mph. The horizontal curve north of the north bridge is delineated properly with W1-8 chevrons at approximately 90' spacing. There are no non-crashworthy obstacles in the clear zone besides the underpass tunnel. All three bridges on the subject roadway section are recently constructed 36' width with barrier rail and four-corner guardrail. Horizontal curve warning and speed limit warning signs are properly placed according to MUTCD guidelines.

2. Proposed Concept

Harrison County proposes to build paved shoulders with rumble strips along this 3.1 mile long stretch of L-20. The proposed paved shoulder width will vary from 3' in the tangent sections (where adjacent drainage ditch restricts wider shoulder construction) to 4' width in the areas adjacent to and through the horizontal curves where the most serious accidents have occurred. Traveled way plus shoulders will measure a consistent 30' in width. The entire 3.1 mile corridor will receive new pavement edgeline striping at 11' from roadway centerline to delineate a consistent pavement width.

3. Justification

Heavy traffic counts and relatively high speed traffic coupled with roadway departures in the curved bridge approach and tunnel approach sections have resulted in numerous accidents and several deaths. The 2004 to 2013 CMAT results show 4 fatal, 4 major injury, 10 minor injury, 18 unkn, and 55 PDO's. Two of the four fatal accidents were run-off-the-road type and the other two were swerving or evasive action type accidents. County snow-plow operator reports numerous accidents at bridge approach and tunnel approach after snowstorms. These were reportedly due to driver over-correcting in curves when edge rut is felt by driver.

B/D

Average annual crashes per mile = 91 / (10*3.1 miles) = 2.93 crashes per mile / year.

Those 91 total crashes in 10 years compute to 529 crashes per Hundred Million Vehicle Miles as follows: 91*100,000,000/(1520*10*3.1*365)=529.1 / HMVMT

The Roadway Departure Crash Rate was 135.7 per Hundred Million Vehicle Miles Traveled, computed from the 14 roadway departure crashes (including swerving) occurring during the past 6 years as follows:

RDCR= 14*100,000,000/(1520*6*3.1*365)=135.7 / HMVMT

Fatal crash rate was 23.3 fatal crashes per HMVMT as follows:

FCR= 4*100,000,000/(1520*10*365*3.1) = 23.3 deaths per HMVMT

According to the Manual for Selecting Safety Improvements on High Risk Rural Roads, the addition of a paved shoulder to an existing higher volume road with narrow conditions is a PROVEN method recommended by NCHRP 500 to help to reduce run-off-road crashes. Crash Modification Factor (CMF) is 0.86. Benefit to cost ratio for these mitigation measures is approximately 24:1. According to the Manual, B/C ratio could expected to be as high as 4.5:1 for HRRR without paved shoulders such as the Harrison County L-20 section regardless of pavement width or road alinement. Since the accident rate is high along the entire 3.1 mile route, we have determined that adding a 3' paved shoulder to the tangent sections where pavement width is 24' and adding a 4' paved shoulder to sections within and adjacent to horizontal curve sections is the preferred construction option.

4. Additional measures:

Harrison County will be putting additional safety measures in place immediately to mitigate the poor alinement and width issues at the overpass tunnel. To better delineate the horizontal curves, five W1-8 chevrons will be installed in the curves at each tunnel approach with device spacing of approximately 60'. 'TUNNEL AHEAD' warning signs will be installed in advance of the horizontal curves at approximately 500' and 680' in advance of the tunnel.

5. Cost Estimate and Proposed Funding Sources:

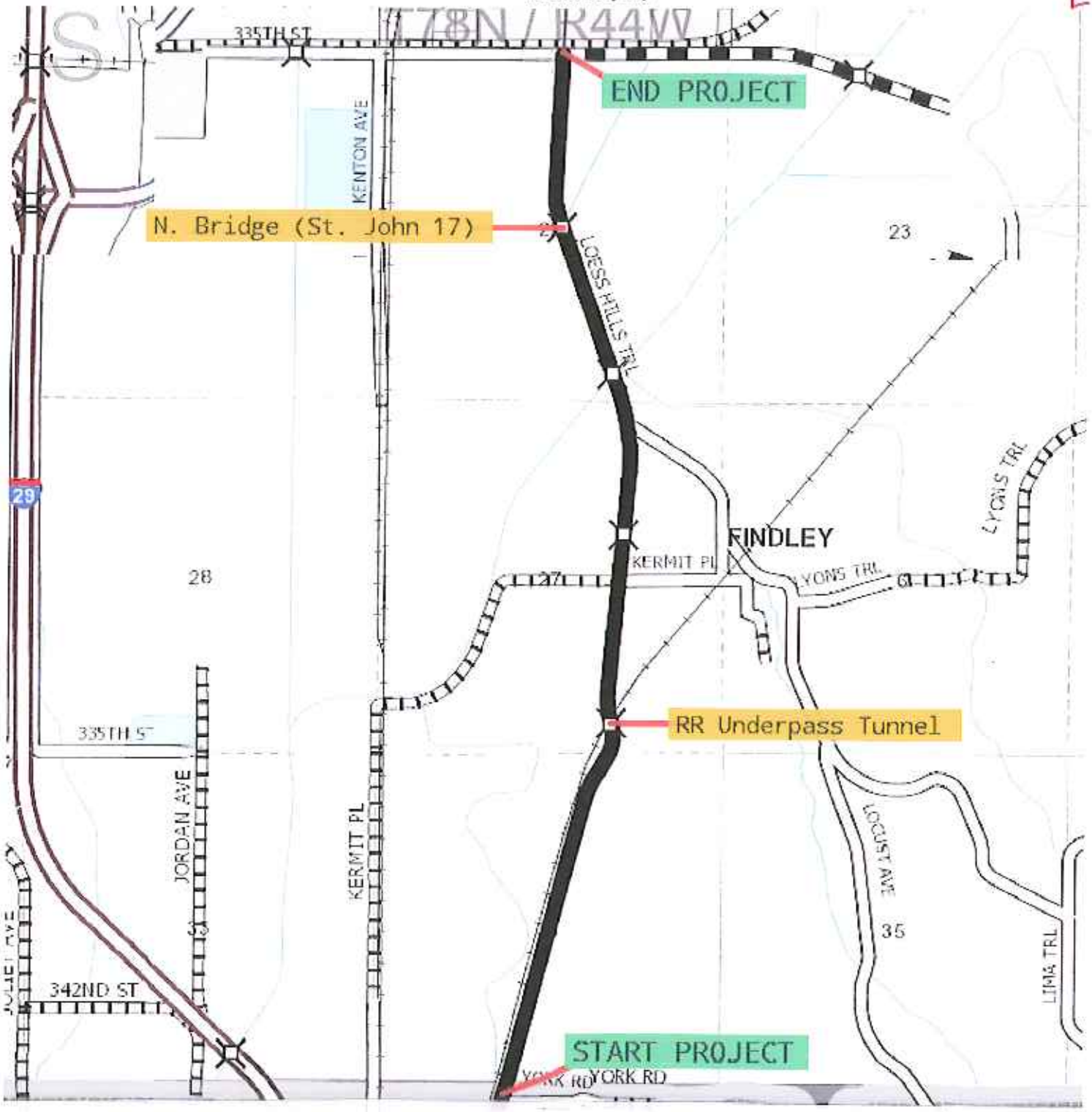
The total estimated cost of the proposed improvements is estimated to be $480,407. Please see detailed items and cost data on attached estimate sheet. The project is proposed to be funded 100% with TSIP funds. If construction bids are over the approved TSIP funding level and the project estimate, Harrison County intends to provide funding from other sources to enable the project to be completed.

6. Proposed Project Schedule:

Letting is proposed by July 2015 at IDOT in Ames and construction by November 2015.

C

HARRISON COUNTY L20 PROPOSED ACC SHOULDERS: Estimate of Quantities					
Item No.	**Description**	**Units**	**Quantity**	**Unit Price**	**Cost**
1	HMA BASE COURSE	TONS	4,094	$ 55.00	$ 225,170.00
2	HMB BINDER	TONS	215	$ 600.00	$ 129,000.00
3	CLASS 13 EXCAVATION	CY	2,322	$ 17.00	$ 39,474.00
4	MOBILIZATION	LS	1	$ 10,000.00	$ 10,000.00
5	MILLED RUMBLE STRIPS	STA	313	$ 35.00	$ 10,955.00
6	PAVEMENT MARKINGS EDGELINE	STA	327	$ 10.00	$ 3,270.00
	SUBTOTAL				$ 417,869.00
	MISC. & CONTINGENCY	LS	$ 0.15	$ 416,921.00	$ 62,538.15
	TOTAL				**$ 480,407.15**


T78N / R44W
335TH ST
END PROJECT
KENTON AVE
N. Bridge (St. John 17)
23
LOESS HILLS TRL
29
FINDLEY
KERMIT PL
LYONS TRL
28
27
LYONS TRL
RR Underpass Tunnel
335TH ST
JORDAN AVE
KERMIT PL
LOCUST AVE
35
LIMA TRL
342ND ST
START PROJECT
YORK RD
YORK RD

#1
F

#2

F

F

#4 F

#5

S. Bound @ Tunnel
TUNNEL

#7

T1

#8

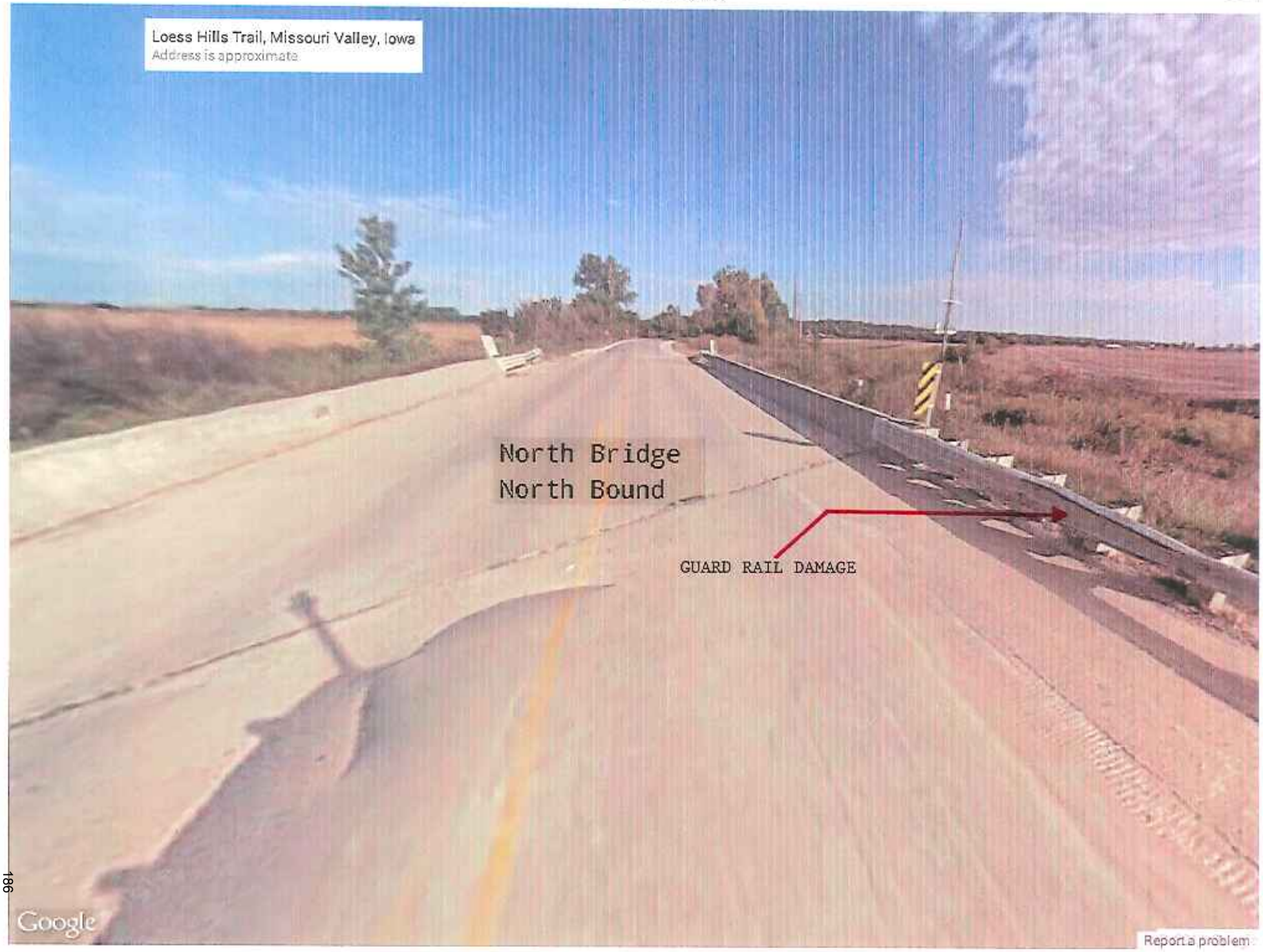
#9

#10

#11

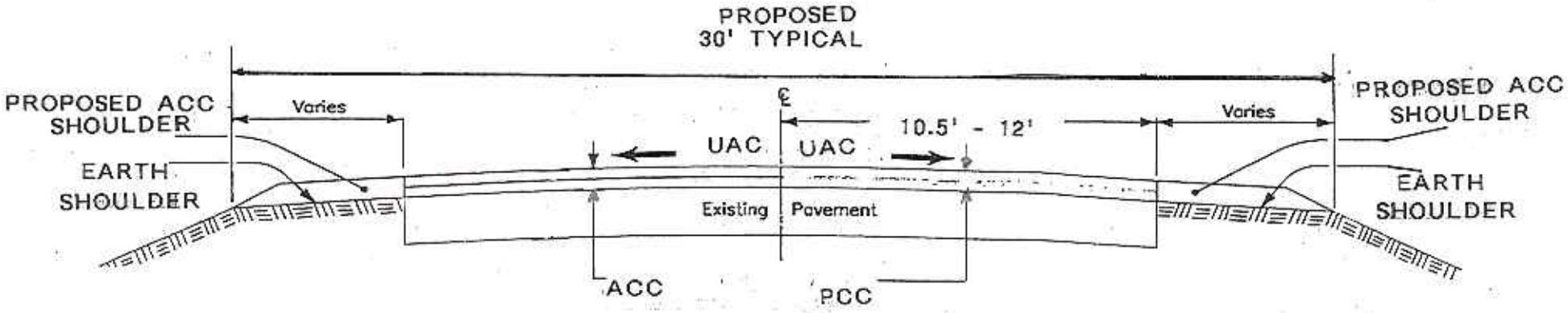
E

Loess Hills Trail, Missouri Valley, Iowa
Address is approximate
GUARD RAIL DAMAGE
North Bridge
South Bound
Google
Report a problem


Loess Hills Trail, Missouri Valley, Iowa
Address is approximate
North Bridge
North Bound
GUARD RAIL DAMAGE
Google
Report a problem

HARRISON COUNTY L20

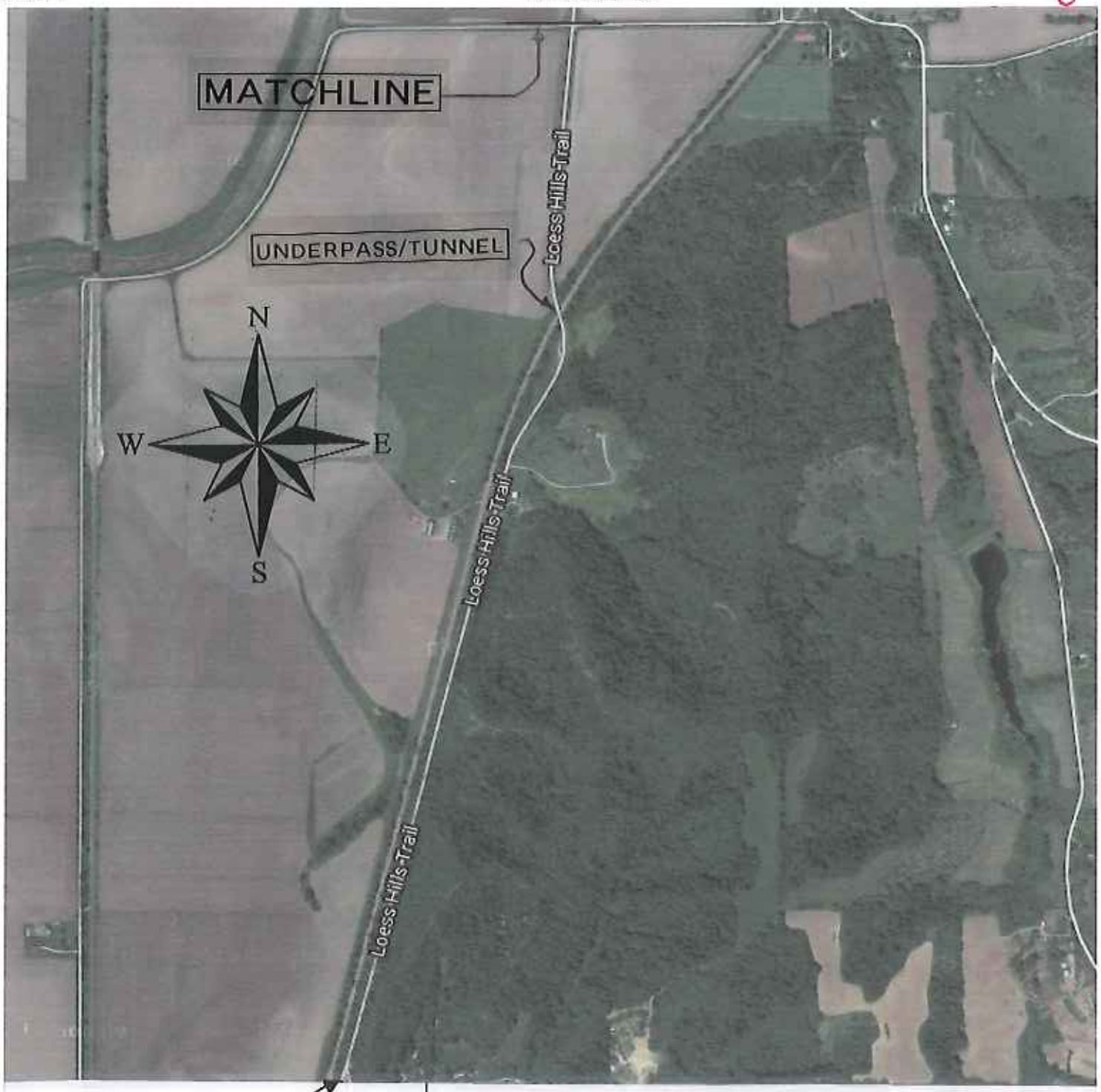
PROPOSED ACC SHOULDERS



NOTE: The ACC surfaced segment has a typical roadway width of 21.5 feet. The PCC segment has a typical roadway width of 24 feet. The proposed ACC shoulder width will vary to produce a uniform typical roadway and shoulder section of 30 feet.

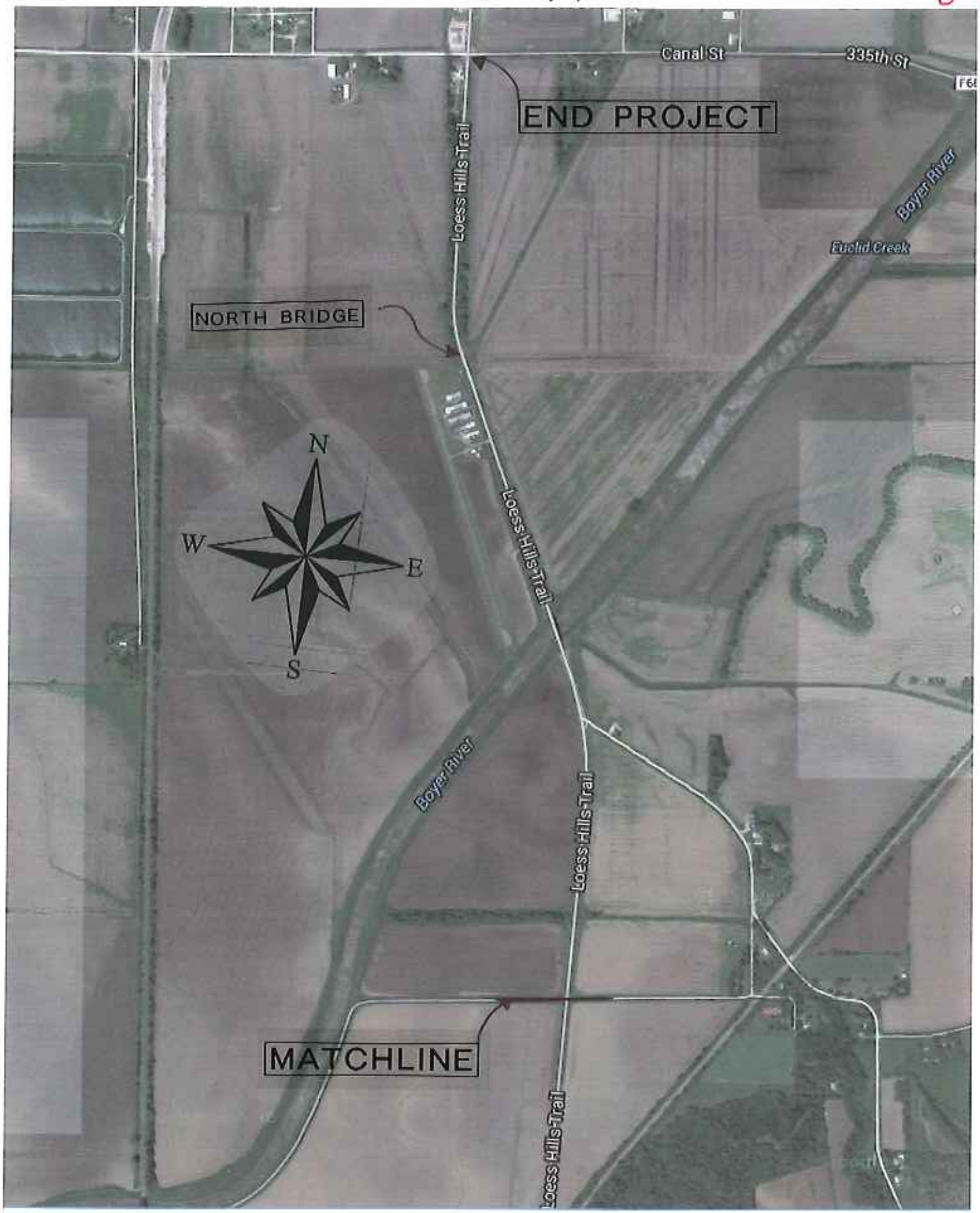
G

G H



BEGIN PROJECT

G H



Google Untitled project - Harrison - ICEASB Easy Map 200 m Report a map error

I

2003 - 2013
Co Rd L20
Harrison Co
Iowa

		Crashes						Injuries					
Year	**County**	**Crashes**	**Fatal**	**Major**	**Minor**	**Poss/Unk**	**PDO**	**Injuries**	**Fatalities**	**Major**	**Minor**	**Possible**	**Unknown**
2004	Harrison	17	0	0	0	4	13	5	0	0	0	2	3
2005	Harrison	10	1	1	0	1	7	4	1	1	1	1	0
2006	Harrison	5	0	0	3	2	0	5	0	0	3	2	0
2007	Harrison	11	0	1	2	3	5	7	0	1	3	3	0
2008	Harrison	9	1	0	1	2	5	6	1	1	1	3	0
2009	Harrison	6	0	0	1	2	3	3	0	0	1	2	0
2010	Harrison	10	0	0	2	1	7	3	0	0	2	1	0
2011	Harrison	11	0	1	1	1	8	4	0	1	1	2	0
2012	Harrison	6	2	0	0	0	4	2	2	0	0	0	0
2013	Harrison	6	0	1	0	2	3	3	0	1	0	2	0
Totals:		91	4	4	10	18	55	42	4	5	12	21	

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

Feature Count Report (Friday, August 8, 2014 8:24:16 AM Central Daylight Time)
produced using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)
by:

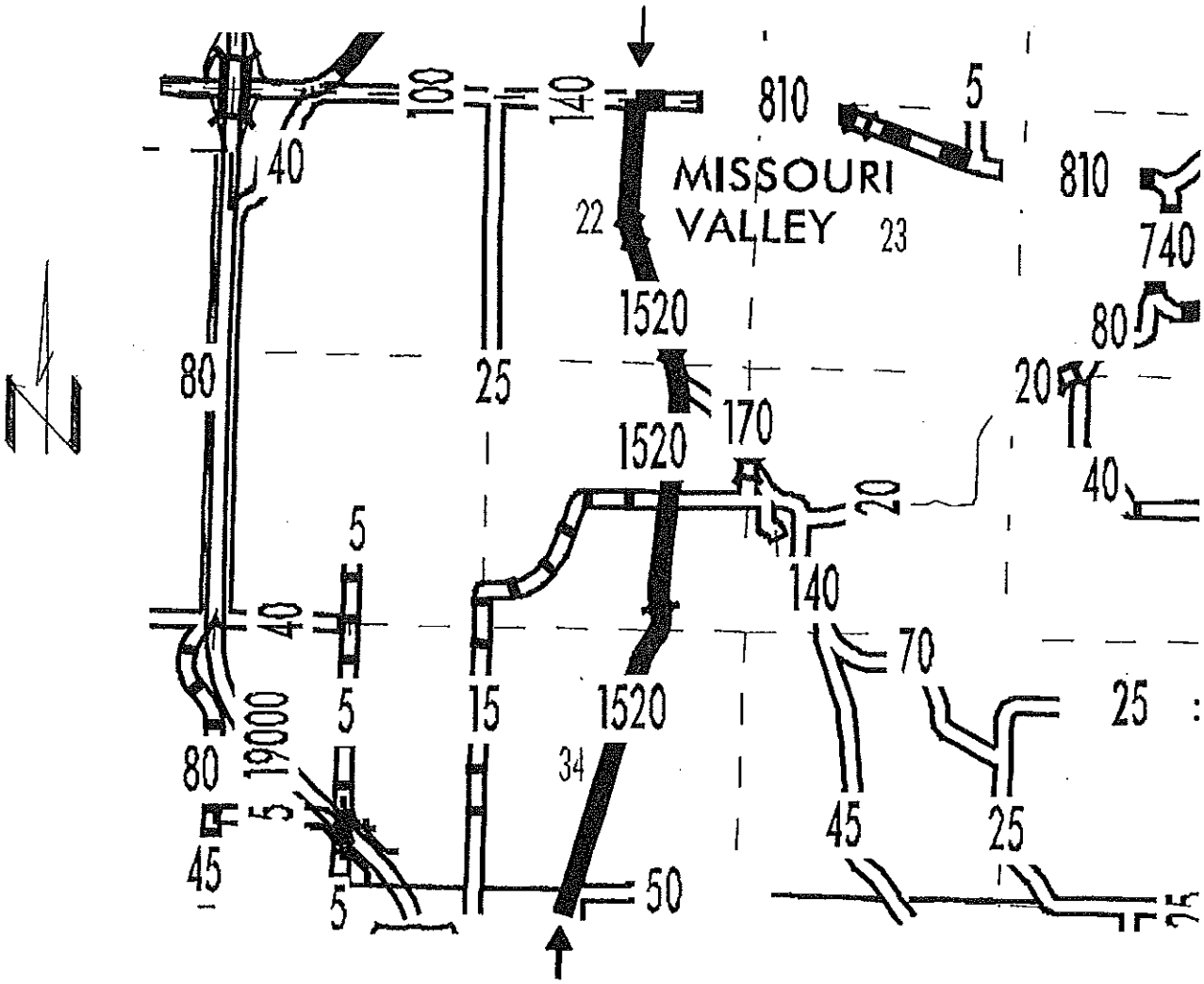
copy version

J

HARRISON COUNTY L20/LOESS HILLS TRAIL

2008 ANNUAL AVERAGE DAILY TRAFFIC

POTTAWATTAMIE COUNTY LINE TO 335TH STREET



L

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: HARRISON Prepared by: STEVEN STRUBLE Date Prepared: Aug 13, 2014

Location: L20 (LOESS HILLS TRAIL) FROM POTTAWATTAMIE COUNTY LINE TO SCL OF MISSOURI VALLEY

Improvement

Proposed Improvement(s): ADDITION OF 3' TO 4' ACC SHOULDERS WITH RUMBLE STRIPS AND EDGE LINE

$ 480,407	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ 2,000	Other Annual Cost (after initial year), **AC**	37	Crash Reduction Factor (integer), **CRF**
$ 27,181	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 507,588	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: IDOT ANNUAL AVERAGE DAILY TRAFFIC 2008 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.10	1,520	ENTIRE SEGMENT
3.10	miles total	

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

4,712 Current Vehicle Miles / Day, **VM**

5,750 End of Life Veh. Miles / Day

1,719,880 Current Veh. Miles / Year, **AM**

37,870,045 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

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

Additional months values as of May 2014

4	Fatal Crashes →	4	Fatalities @	$4,500,000	$ 18,000,000
		5	Major Injuries @	$325,000	$ 1,625,000
32	Injury Crashes →	12	Minor Injuries @	$65,000	$ 780,000
		21	Possible Injuries @	$35,000	$ 735,000
55	Property Damage Only		(assumed cost per crash)	$7,400	$ 673,400
			-OR- enter all Property Costs of all crashes:		
91	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 21,813,400

9.10	Current Crashes / Year, **AA** = TA / T	529.1	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 239,708	Cost per Crash, **AVCR** = LOSS / TA	$ 11,921,375	Present Value of Avoided Crashes, **BENEFIT**
200.4	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
3.37	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 807,096	Crash Costs Avoided in First Year, AAR x AVCR		
74.1	Total Avoided Crashes, TCR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $11,921,375 : $507,588 = **23.49** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Old Stage Rd. Shouldering and rumble strips from St Hwy 9 to Wellington Pl

Applicant: Winneshiek County

Contact Person: Lee J. Bjerke, P.E. Title: County Engineer

Complete Mailing Address: 201 W Main
Decorah, IA 52101

Phone: 563-382-2951 (Area Code) E-Mail: lbjerke@co.winneshiek.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): City of Decorah

Contact Person: Chad Bird Title: City Administrator

Complete Mailing Address: 400 Claiborne Dr.
Decorah, IA 52101

Phone: 563-382- 3651 (Area Code) E-Mail: citymanager@decorahia.org

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 307,610

Safety Funds Requested $ 307,610

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 Winneshiek.

Signed: _____ 8-6-14
Signature Date Signed

Lee J. Bjerke, P.E.
Typed Name

Attest: _____ 8·6·14
Signature Date Signed

Benjamin D. Steines
Typed Name

ENGINEER'S OFFICE

WINNESHIEK COUNTY

201 WEST MAIN STREET
DECORAH, IA 52101

PHONE (563)382-2951
FAX (563) 387-3906

LEE BJERKE, P.E.
County Engineer

MICHAEL J. SHIMAK, PLS
County Surveyor &
Assistant to the Engineer

July 16, 2014

Terry Ostendorf
Safety Programs Administrator
800 Lincoln Way
Ames, IA 50010

RE: TSIP Funding Application

Terry:

Enclosed are the resolutions, Engineer's Estimate, C/B analysis and maps of the project site as part of the application submitted from the City of Decorah and Winneshiek County for a proposed TSIP project for Co. Rd. A52/A6W.

The project would be for 8' PCC shoulders with rumble strips and wide edge line. Current 2009 AADT on the road is 9800 VPD. The road is access to Wal-Mart, the Winneshiek County Industrial Park, Oneota Golf Club and the Village of Freeport along with some agricultural access. This mixture of land use has created a unique mixture of pedestrian and vehicle usage. Therefore we feel this shoulder paving project would be a great safety project for TSIP funding. We are using two CRF for this project. The first is CRF=37 for Installation of Paved Shoulders. The second is CRF=23 Rumble Stripes & Wider Markings.

If you have any questions please do not hesitate to contact me.

Sincerely,

Lee J. Bjerke, P.E.
Winneshiek County Engineer

Visit Exciting Winneshiek County

Project: TSIP-CO96(??)--??-96 Co. Rd. A52 - Co. Rd. A6W Paved Shoulders
County: Winneshiek
Designer: Lee Bjerke, P.E.

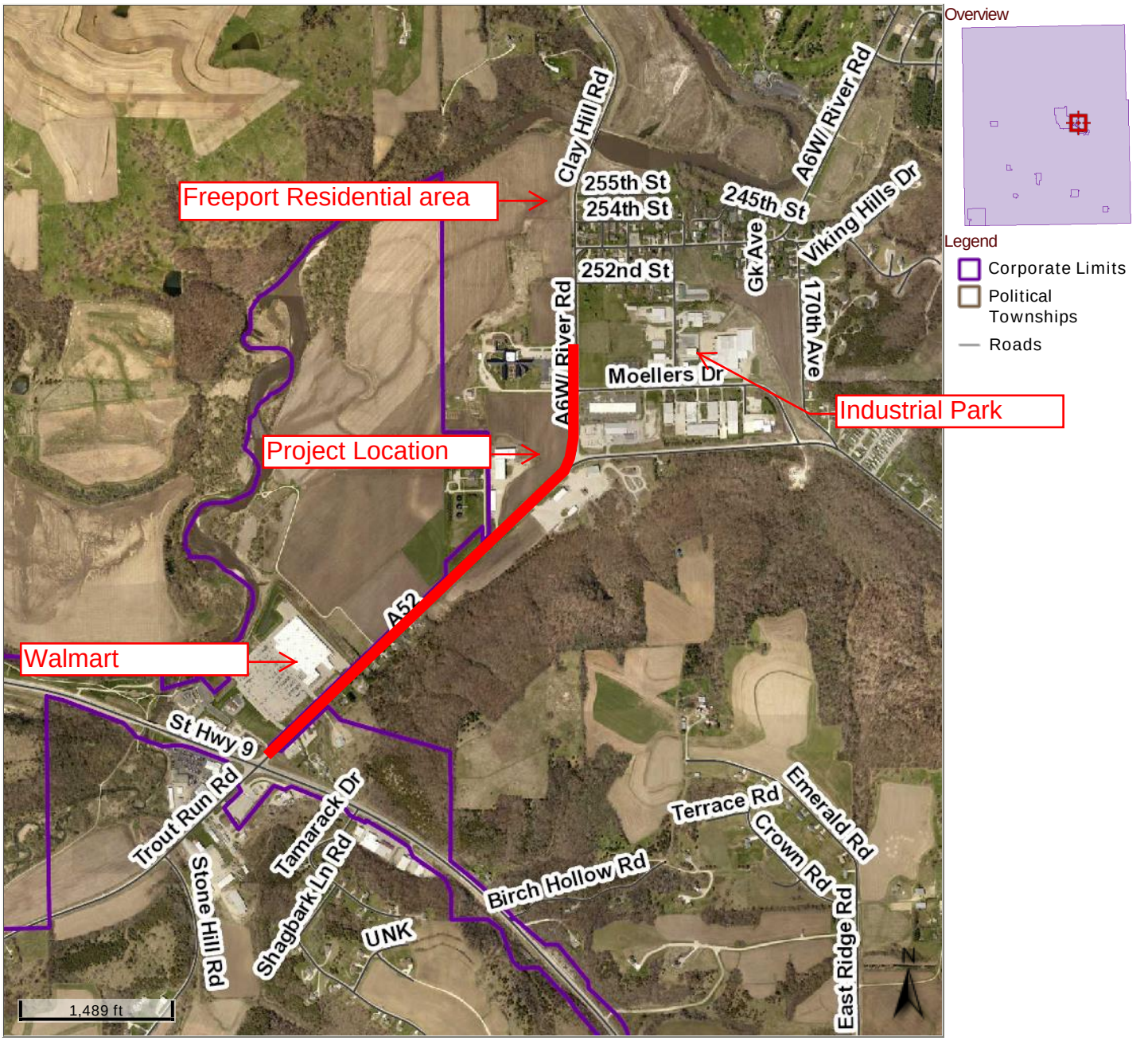
Number	Bid Item Number	Description	Units	Estimated Quantity		Unit Price		Total
01	2123-7450020	Shoulder Finish, Earth	STA	58.00	$	10.00	$	580.00
02	2214-7450050	Blading and Shaping Shoulder Material	STA	58.00	$	15.00	$	870.00
03	2122-5190008	Paved Shoulder, PCC, 8 Inch	SY	7150.00	$	38.00	$	271,700.00
04	2301-6911722	PCC Pavement Samples	LS	1.00	$	1,500.00	$	1,500.00
05	2315-8275025	Surfacing, Driveway, Class A Crushed Stone	TON	300.00	$	17.00	$	5,100.00
06	2518-6910000	Safety Closure	EA	6.00	$	120.00	$	720.00
07	2527-9263117	Painted Pavement Markings, Durable	STA	50.00	$	40.00	$	2,000.00
08	2528-8445110	Traffic Control	LS	1.00	$	7,000.00	$	7,000.00
09	2528-8445113	Flagger	EA	20.00	$	325.00	$	6,500.00
10	2528-8445115	Pilot Car	EA	10.00	$	490.00	$	4,900.00
11	2533-4980005	Mobilization	LS	1.00	$	5,000.00	$	5,000.00
12	2548-0000200	Milled Shoulder Rumble Strip, PCC Surface	STA	58.00	$	30.00	$	1,740.00
						Project Total	$	307,610.00

Winneshiek County, IA

beacon™

TSIP Shoulder Project

Date Created: 8/25/2014



Last Data Upload: 8/23/2014 10:35:22 PM

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The Schneider Corporation
www.schneidercorp.com

WINNESHIEK 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, 2013

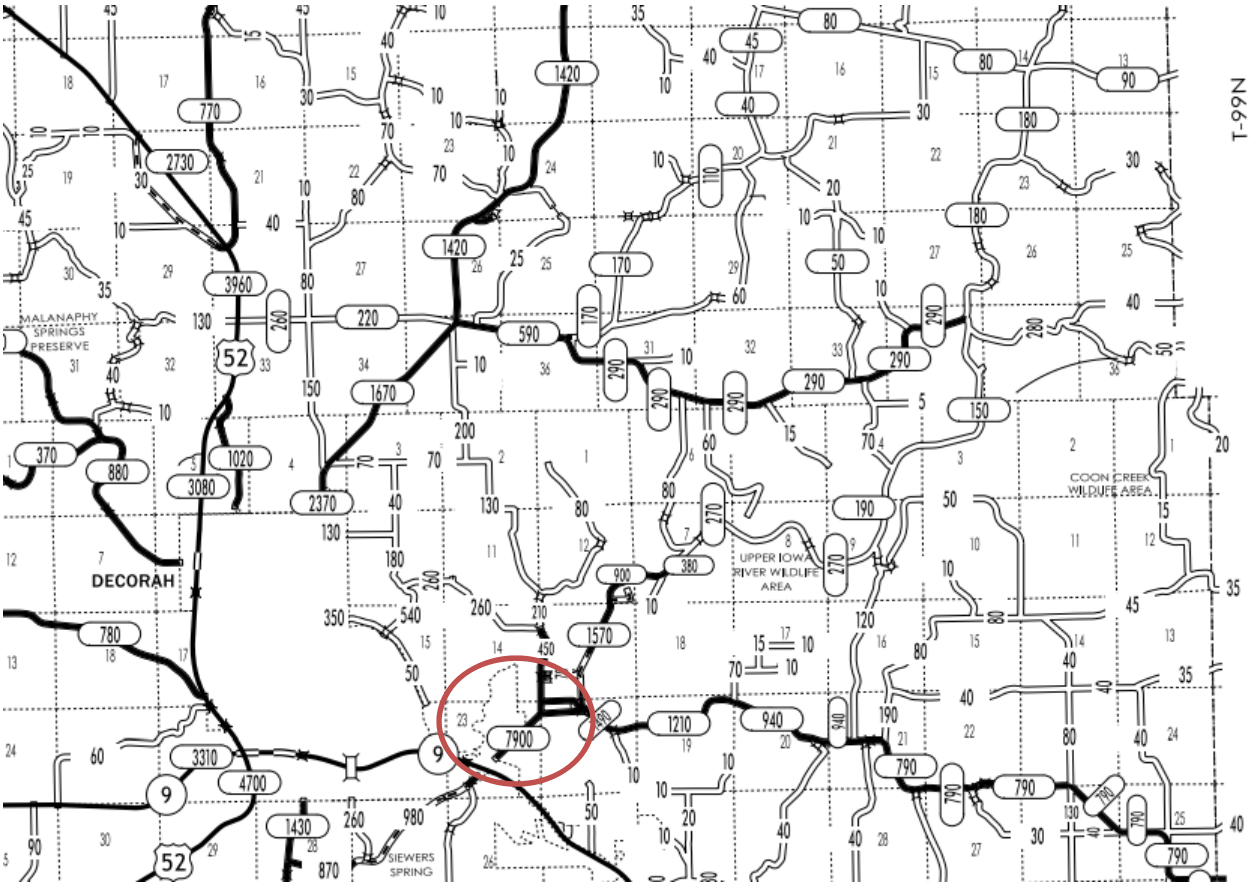
MILES 0 1 2 3 4
KILOMETERS 0 1 2 3 4 5 6

6 - 1 - 12

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD
LEGAL NOT OPEN ROAD

(2013) ANNUAL AVERAGE DAILY TRAFFIC
2009 ANNUAL AVERAGE DAILY TRAFFIC



Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Winneshiek Prepared by: Lee J. Bjerke, P.E. Date Prepared: Jun 30, 2014

Location: Co. Rd. A52 (Old Stage Rd.) & A6W (River Rd.) - Intersection of St. Hwy 9 to intersection of Moellers Dr.

Improvement

Proposed Improvement(s): PCC paved shoulders with rumble stripes and wider painted edgeline

$ 310,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ 5,000	Other Annual Cost (after initial year), **AC**	51	Crash Reduction Factor (integer), **CRF**
$ 67,952	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
		$ 377,952	Present Value All Costs, **COST** = EC + OC

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

Traffic Volume Data

Source: IDOT 2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.71	7,900	Co. Rd A52/A6W
0.71	miles total	

5,609 Current Vehicle Miles / Day, **VM**

6,844 End of Life Veh. Miles / Day

2,047,285 Current Veh. Miles / Year, **AM**

45,079,177 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

2003 First full year --> 2012 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
13	Injury Crashes →	3	Minor Injuries @	$65,000	$ 195,000
		9	Possible Injuries @	$35,000	$ 315,000
34	Property Damage Only		(assumed cost per crash)	$7,400	$ 347,800
			-OR- enter all Property Costs of all crashes:		
47	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,182,800

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

$ 25,166 Cost per Crash, **AVCR** = LOSS / TA

103.5 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 60,902 Crash Costs Avoided in First Year, AAR x AVCR

53.3 Total Avoided Crashes, TCR x CRF/ 100

229.6 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 899,571 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 = $899,571 : $377,952 = **2.38** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Martin Luther King Jr Parkway and Prospect Rd Signal

Applicant: City of Des Moines

Contact Person: Calvin Miller Title: Civil Engineer I

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

Phone: 515-283-4748 (Area Code) E-Mail: cbmiller@dmgov.org

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

Co-Applicant(s): N/A

Contact Person: _____ Title: _____

Complete Mailing Address: _____

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost: $ 200,000

Safety Funds Requested: $ 100,000

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 8-13-14
Signature Date Signed

T.M. Franklin Cownie, Mayor
Typed Name

Attest: Laura L. Baumgartner 8-13-14
Signature Date Signed

Laura L. Baumgartner, Chief Deputy City Clerk
Typed Name

★ **Roll Call Number** 14-1206

Agenda Item Number 9

Date August 11, 2014

APPROVING FISCAL YEAR 2016 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. East 42nd Street and Hubbell Avenue Intersection Widening and Signalization
2. Martin Luther King Jr. Parkway and Prospect Road Traffic Signal Installation
3. Citywide Fixed-Time Signal Upgrade Project – Phase 2

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 14-400 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GATTO	✓			
GRAY	✓			
HENSLEY	✓			
MAHAFFEY	✓			
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

Martin Luther King Jr. Parkway and Prospect Road Intersection Signalization

Project Description:

The proposed improvement includes the installation of a traffic signal at the intersection of Martin Luther King Jr. Parkway (MLK Parkway) and Prospect Road. Pedestrian crossings would be provided at the intersection. A 10' clear zone will be established within the limits of the project.

New traffic signals with backplates and detection for fully-actuated operation would be installed. This signal will include pedestrian countdown heads and phasing, along with left turn phasing on MLK Parkway. The signals would be interconnected to the existing traffic signals along Martin Luther King Jr Parkway.

The total project cost is estimated to be $200,000. A total of $100,000 is being requested from State Traffic Safety Improvement Program funds.

Existing Conditions:

MLK Parkway is classified as a Principal Arterial Roadway. In this area it has a four lane cross-section with two-through lanes in each direction. Designated left-turn lanes are provided northbound and southbound at Prospect Road. The posted speed limit on this section of MLK Parkway is 35-MPH. Travel speeds show the 85th percentile speed on MLK Parkway as 38 MPH with a 10-mph pace speed of 32-41 MPH.

Prospect Road is a two-lane neighborhood street providing access to the Prospect Park Neighborhood. Prospect Road provides a direct connection from Hickman Road to MLK Parkway with access through Prospect Park which provides boating, playground, picnicking, and other amenities. The speed limit on this section of Prospect Road is 25 MPH.

The Des Moines Area Regional Transit (DART) has bus service along this section of MLK Parkway. There is a DART stop at this intersection creating pedestrian crossing traffic at this intersection.

A 48 hour weekday traffic count was collected by the City of Des Moines in May 2014 at this intersection. The approach traffic volume recorded on MLK Parkway was 21,890 vehicles per day in the area by Prospect Road. The approach traffic volume recorded on Prospect Road at MLK Parkway was 1,450 vehicles per day.

Project Justification:

A traffic study dated July 12, 2014, prepared by the City of Des Moines, is included in the application.

Traffic signals are warranted at this location based on Warrant No. 3B (Peak Hour Volume) and No. 6 (Coordinated Signal System).

Traffic signal warrants have been added in Exhibit J.

Of the eight reported crashes, there were three personal injury crashes. The majority of the crashes were right angle, left turn, and rear-end. Left-turning and right angle types would generally be considered correctible by the improvements planned as part of this project.

Based on current IDOT value factors, the total estimated loss from crashes during the described five-year period is $230,372 (See Exhibit "J"). Assuming an overall crash reduction factor of 30 percent and an estimated project life of 20 years, the request for $100,000 of Traffic Safety relates to a benefit-cost factor of **2.30:1.**

TRAFFIC AND TRANSPORTATION DIVISION MEMORANDUM

DATE: July 9, 2014

FROM: Jennifer McCoy, City Traffic Engineer

SUBJECT: Signal Warrant Study – Prospect Rd and Martin Luther King Parkway

RECOMMENDATION:
The installation of a traffic signal at the intersection of Martin Luther King Parkway and Prospect Road is recommended.

STUDY:

Introduction
Traffic signals are valuable devices for the control of vehicle and pedestrian traffic. After extensive study and analysis, the Federal Highway Administration developed the eight traffic signal warrants contained within the MUTCD that define the minimum conditions under which the installation of a traffic control signal might be justified. The MUTCD states that traffic signals should not be installed unless one or more of the signal warrants are satisfied

Purpose
A petition was submitted by the residents in the Prospect Park Neighborhood Association on the west side of Martin Luther King Parkway (MLK Parkway) and Prospect Road intersection along with staff from the Des Moines Public Schools Bus Garage located to the east of the intersection stating that they wish to have this location examined for the installation of a signal. Letters of support for this signal and for the city to conduct a study were received from Des Moines Public Schools, Prospect Park Neighborhood Association, Chautauqua Park Neighborhood Association, former Des Moines Mayor Preston Daniels, and current Councilman Bill Gray.

Roadway Elements
Martin Luther King Parkway (MLK Parkway) is a Principal Arterial Roadway. In this area it has a four lane cross-section with two-through lanes in each direction. Designated left-turn lanes are provided northbound and southbound at Prospect Road. The posted speed limit on this section of MLK Parkway is 35-MPH. Travel speeds show an 85th percentile speed on MLK Parkway as 38 MPH with a 10-mph paco speed of 32-41 MPH.

Prospect Road is a two-lane neighborhood street providing access to the Prospect Park Neighborhood. Figure 1 shows the current intersection layout and surrounding land uses. Prospect Road provides a direct connection from Hickman Road to MLK Parkway with access through Prospect Park which includes boating, playground, picnicking, and other amenities. The posted speed limit on this section of Prospect Road by MLK Parkway is 25 MPH.

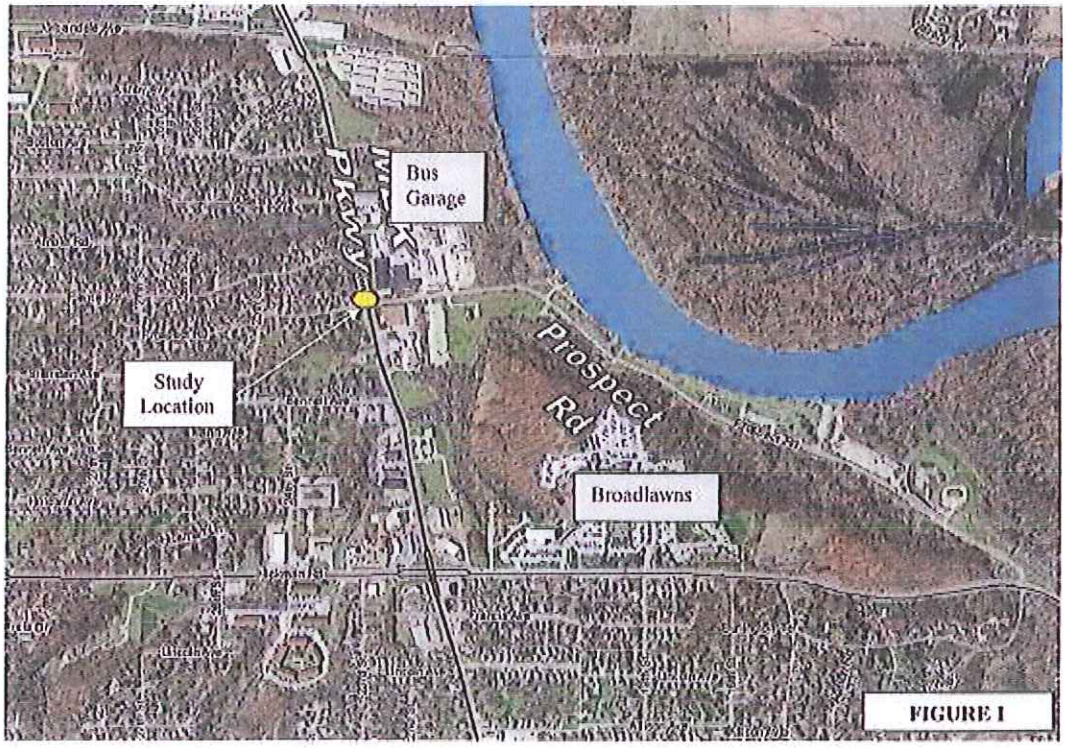
The nearest adjacent traffic signals are approximately 1/3 mile to the south at Hickman Road and 1/3 mile to the north at Urbandale Avenue.

Traffic Counts
A 48 hour weekday traffic count collected in May 2014 at this intersection was used for this study. The approach traffic volume measured on MLK Parkway was 21,890 vehicles per day in the area by Prospect Road. The approach traffic volume measured on Prospect Road at MLK Parkway was 1,450 vehicles per day.

The existing peak hour volumes for the MLK and Prospect intersection are shown below in **table 1**:

Table 1 –Existing Peak Hour Approach Volumes

Roadway	Movement	A.M. Peak Hour (vph)	P.M. Peak Hour (vph)
MLK	NB	513	1009
	SB	1211	931
Prospect	EB	21	18
	WB	104	155



Bus Routing

The Des Moines Public School Bus Transportation Facility is located in the northeast quadrant of this intersection, with access drives onto both MLK Parkway and Prospect Road. Currently, their bus drivers are not allowed to make a westbound left turn from Prospect Road onto MLK Parkway. Those drivers wishing to go south or west from the facility must make a right hand turn at the intersection of MLK and Prospect or travel south east on Prospect to Hickman Road and make a right turn. The alternative route detours were provided by drivers of the district's buses. These three different detours require that buses travel up to 16 blocks out of their way through a park or through a narrow residential street, Payne Road. Figures 2-4 show the location of these current detours. The school district has approximately 104 buses daily that leave the bus garage. If a signal were installed at MLK and Prospect Road, it could be assumed that at least 40 buses per day would turn left at the new

signal instead of using the detour routes they are currently taking. The school district estimates that these detours cost them approximately $10,000 per year in extra fuel costs.

FIGURE 2 – Detour 1

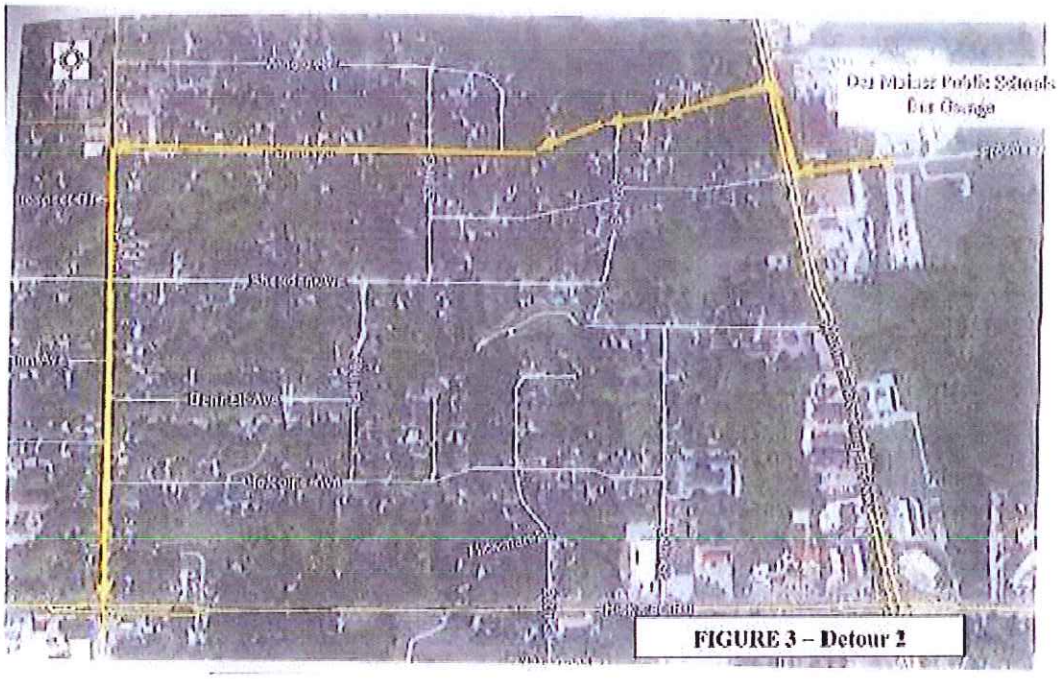


FIGURE 3 – Detour 2

Signal Warrant Study– MLK & Prospect
Page 3

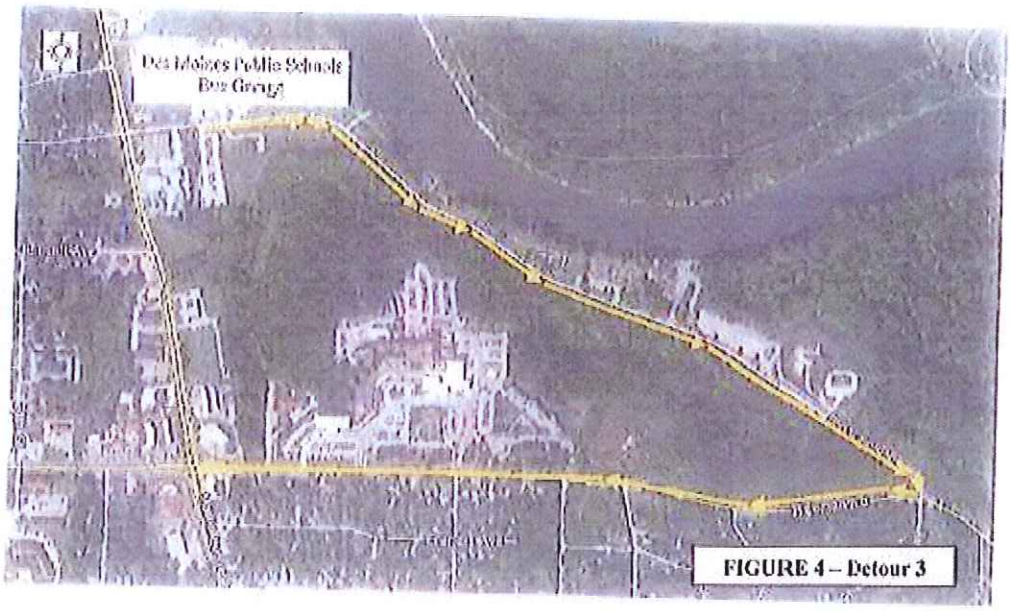


FIGURE 4 – Detour 3

Warrant Analysis

The warrant study analysis was based on the signal warrants given in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD). Typically, a percentage of the vehicles turning right from the minor street (Prospect Road) are not considered in the signal warrant analysis because these vehicles experience very little delay and marginally benefit from the traffic signal. The analysis of the intersection conditions of MLK & Prospect measured against the signal warrants indicates that the four-hour and peak hour warrant were met with no reduction for right turns.

However, based upon field observations and the understanding that buses now taking a right turn will likely take a left turn if a traffic signal were present, a 40% reduction for right turns was applied. This resulted in this location meeting one warrant, the peak hour warrant, as shown below in **table 2**:

Table 2 – Signal Warrant Analysis Results

Warrant #	Description	Satisfied?
1A	Eight-Hour Vehicular Volume – Condition A	No
1B	Eight-Hour Vehicular Volume – Condition B	No
2	Four-Hour Vehicular Volume	No
3	Peak Hour	Yes
4	Pedestrian Volume	N/A
5	School Crossing	N/A
6	Coordinated Signal System	Yes
7	Crash Experience	No
8	Roadway Network	Not Needed

Note: Warrant Study worksheets are contained in Appendix A.

There are three scenarios for which Warrant 1 could be satisfied: the traffic volumes at the intersection could satisfy the Minimum Vehicular Volume criteria for a minimum of 8 hours – or – the traffic volumes at the intersection could satisfy the Interruption of Continuous Traffic criteria for a minimum of 8 hours – or – the Minimum Vehicular Volume criteria and the Interruption of Continuous Traffic criteria could

be satisfied to 80% of the requirements for a minimum of 8 hours each. In this study, the Minimum Vehicular Volume criterion, Condition A and the Interruption of Continuous Traffic criterion, Condition B, were not satisfied for any hours.

Warrant 2 requires that for a minimum of four hours the plotted points representing the total volume on the major street and the corresponding volume on the higher volume minor street approach fall above the curve specified in Figure 4C-1 in the 2009 MUTCD. In this study, the Four Hour Vehicular Volume Warrant was not satisfied for any hour, therefore not satisfying Warrant 2.

There are two scenarios for satisfying Warrant 3: the measured delay, side street volume, and total intersection volume exceed the values specified in the MUTCD during the peak hour at the intersection – or – for a minimum of one hour the plotted point representing the total volume on the major street and the corresponding volume on the higher volume minor street approach falls above the curve specified in the MUTCD corresponding to the appropriate lane configuration and speed. The actual delay was not measured. Scenario B - the peak hour volume plotted point was met. Therefore, Warrant 3 was satisfied.

Warrant 4, the Pedestrian Volume warrant, was not evaluated at this intersection. There are pedestrian crosswalks at the intersection however observations of the intersection did not identify any significant amount of pedestrian activity. Warrant 5, the School Crossing warrant, was not evaluated at this intersection because this intersection is not a school crossing location. Warrant 6, the Coordinated Signal System warrant, and Warrant 8, the Roadway Network warrant, are not applicable to this intersection because the traffic signal is not needed to provide proper platooning of vehicles.

Warrant 6, Coordinated Signal System, allows for a traffic signal to be installed where the existing traffic control signals do not provide the necessary degree of vehicular platooning, and the proposed signals would provide good traffic signal progression. Because the existing signals are approximately 3,700 feet apart, there is poor platooning of vehicles. New traffic signals at Prospect Road, which is midway between the two existing signals, would allow for good platooning of traffic flow through this corridor.

Warrant 7, the Crash Experience warrant, requires that there have been five collisions of the type potentially preventable by signal installation in a recent 12 month-period at the intersection. Collision reports were reviewed for the intersection for the years 2004 - 2012. During this eight-year time period, there were 19 total collisions at the intersection. These crashes resulted in 21 injuries. There were not five or more crashes in a one-year period that could be prevented by installation of a traffic signal at this location therefore; the Crash Experience warrant is not satisfied.

SUMMARY:
The 2009 Manual on Uniform Traffic Control Devices (MUTCD) outlines eight traffic signal warrants contained within the MUTCD that define the minimum conditions under which the installation of a traffic control signal might be justified.

The installation of the traffic signal at Martin Luther King Parkway and Prospect Road is recommended for the following reasons:

- The Peak Hour warrant and the Coordinated Signal System warrant are met
- Crashes are not excessive, but over half of the crashes that occurred have resulted in major or minor injuries
- A signal at this location would allow for more direct routing of large school buses instead of alternative routing through narrow residential streets and a city park

Exhibit C

COST ESTIMATE

SIGNAL INSTALLATION

COSTS	
Traffic Signal	**$150,000**
Interconnect	**$ 50,000**
TOTAL PROJECT COST:	**$ 200,000**
TSF FUNDS REQUESTED:	**$100,000**

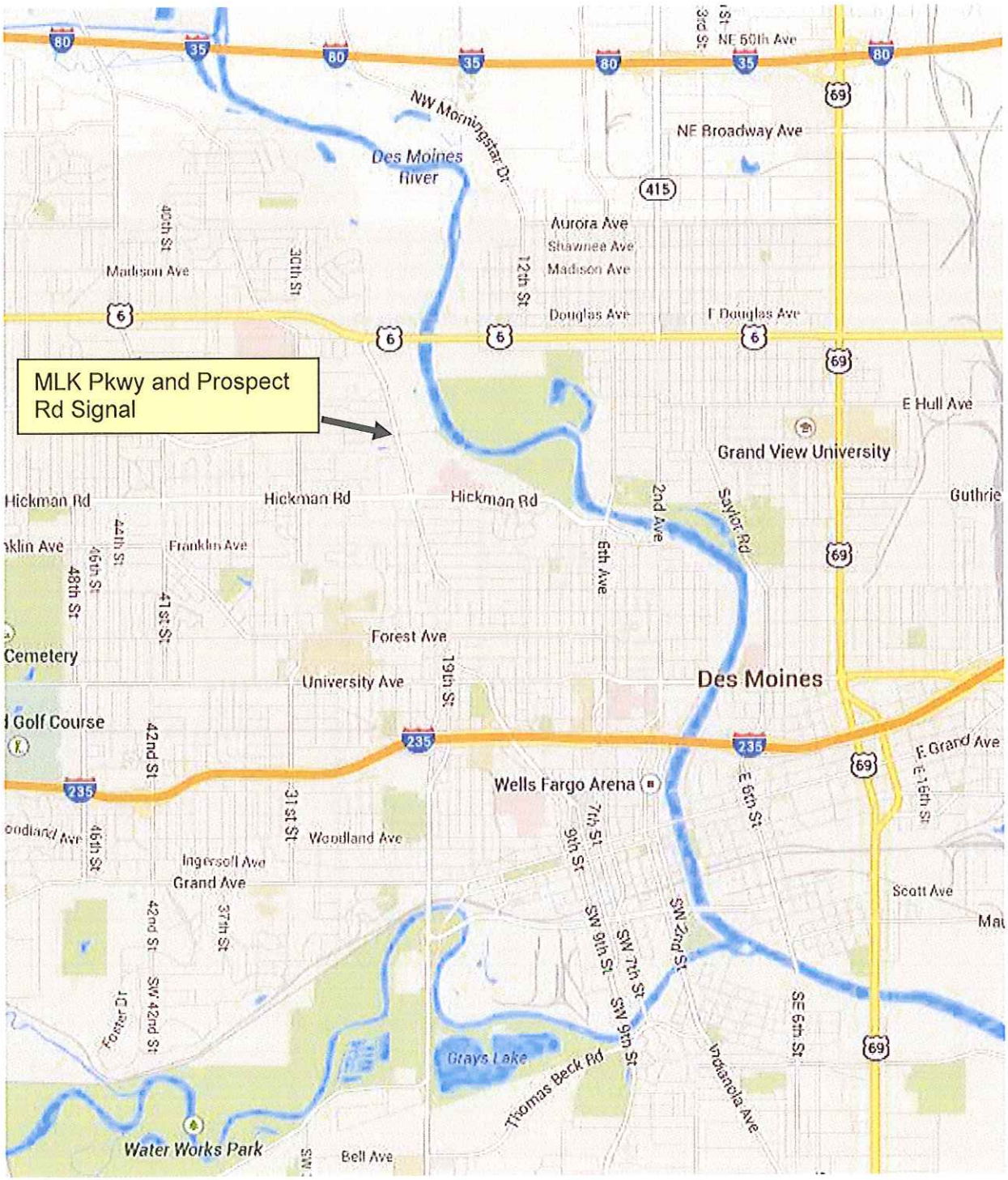
TIME SCHEDULE

MARTIN LUTHER KING JR PKWY AND PROSPECT RD TRAFFIC SIGNAL INSTALLATION

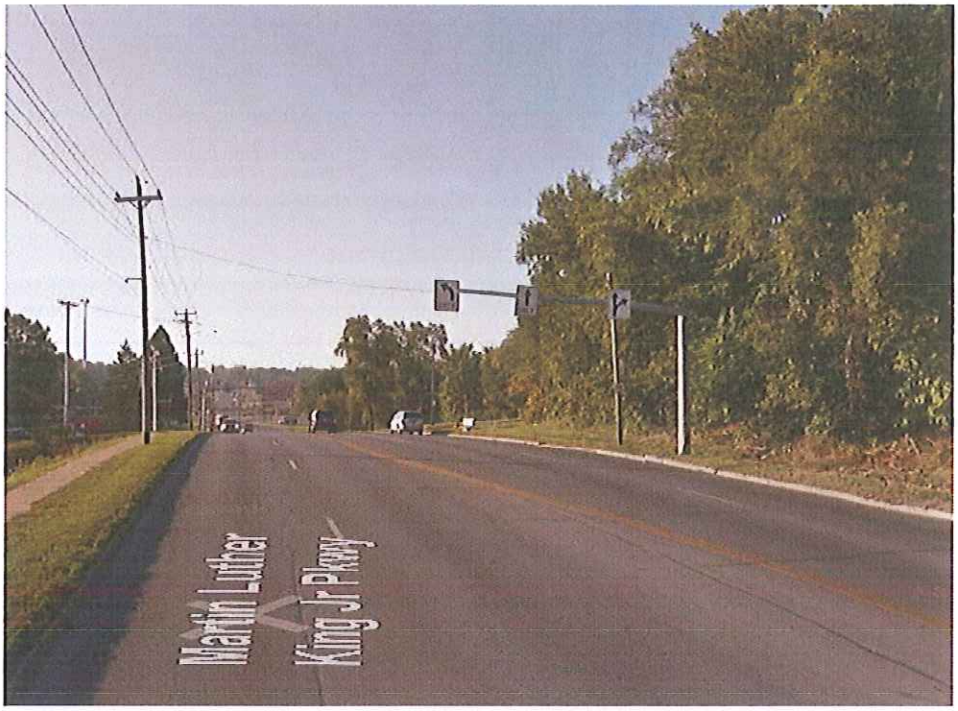
Project Approval:	**December, 2014**
Agreement Signed:	**April, 2015**
Project bid:	**March, 2016**
Construction completed:	**October, 2016**
Project Closeout:	**June, 2017**

Exhibit E

VICINITY MAP



APPROACH PHOTOGRAPHS



MLK Parkway looking South at Prospect Road

Prospect Rd looking West at MLK Parkway

MLK Parkway looking North at Prospect Road

Prospect Road looking East at MLK Parkway

Exhibit G

EXISTING AND PROPOSED CONDITIONS

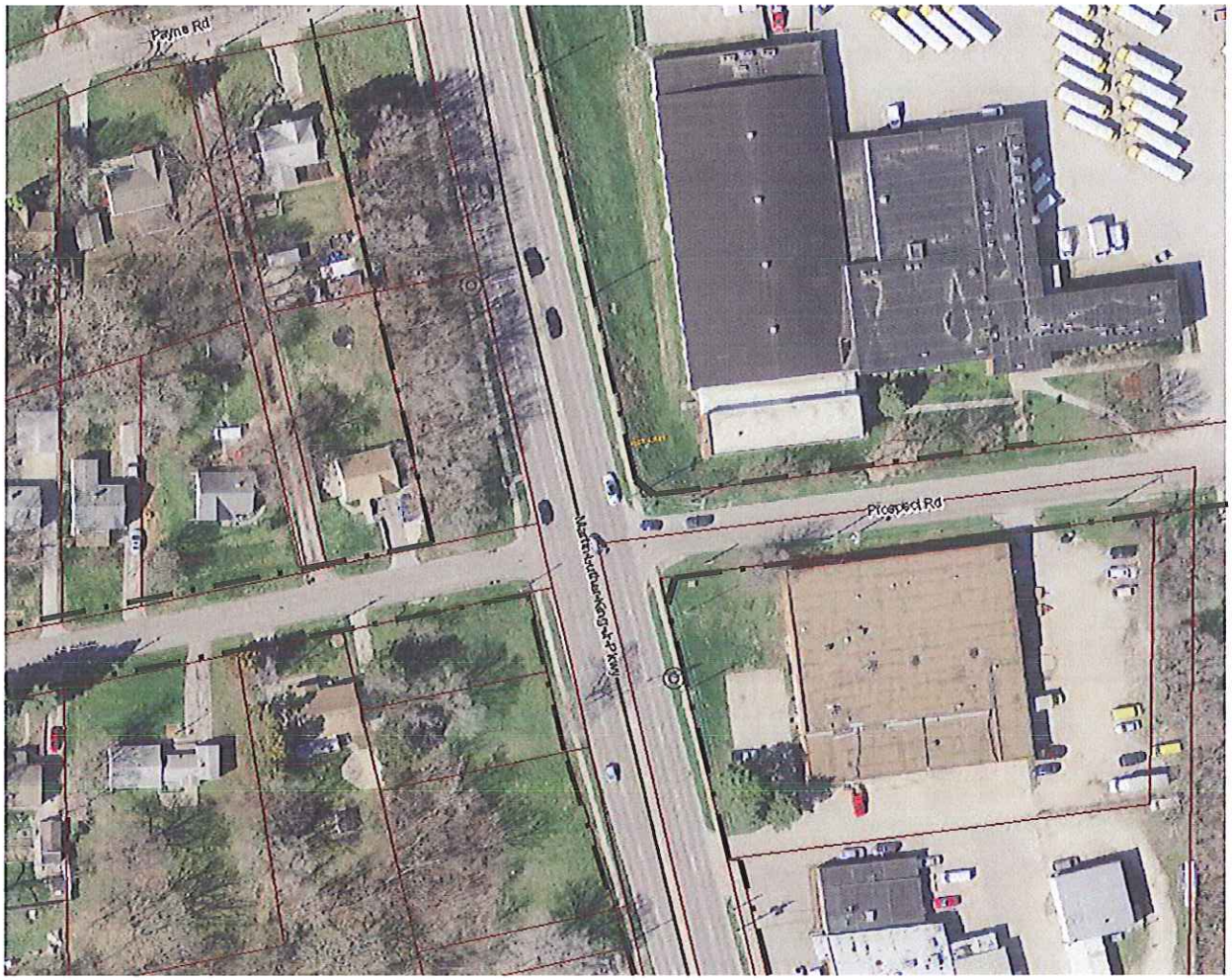
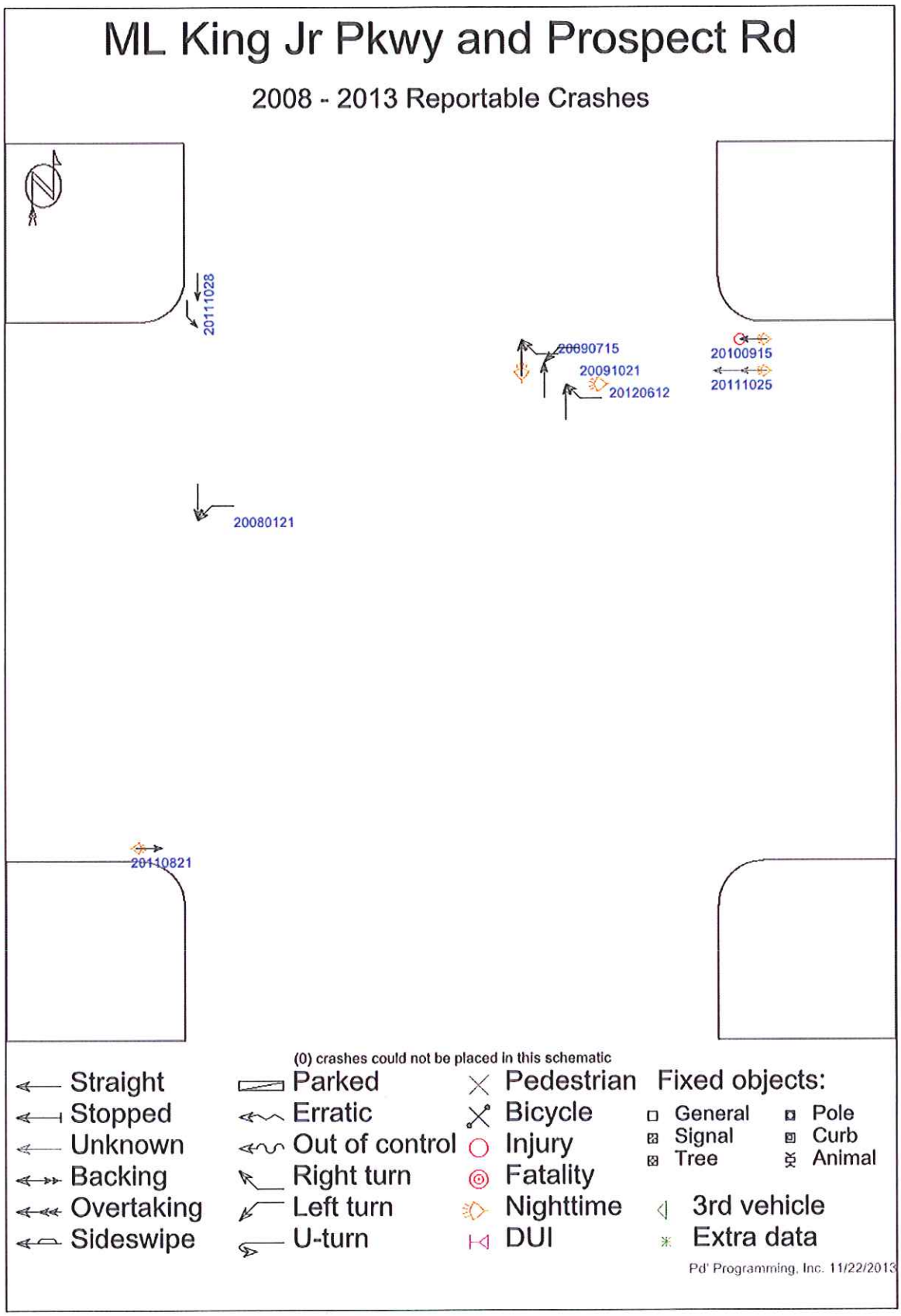


Exhibit H

AERIAL PHOTOGRAPH

CRASH DIAGRAM (2008-2013)



City Of Des Moines

400 Robert D. Ray Dr.
Des Moines, IA. 50309
(515) 283-4973

Site Code: #23
Station ID:
M.L. King Jr. Pkwy.-North of Prospect Rd
Southbound Traffic
Latitude: 0° 0.0000 Undefined

Start Time	Mon 12-May-14	Tue 13-May-14	Wed 14-May-14	Thu 15-May-14	Fri 16-May-14	Average Day	Sat 17-May-14	Sun 18-May-14	Week Average
12:00 AM	*	82	98	99	100	95	*	*	95
01:00	*	67	46	66	64	61	*	*	61
02:00	*	24	36	36	35	33	*	*	33
03:00	*	29	39	37	27	33	*	*	33
04:00	*	90	81	78	94	86	*	*	86
05:00	*	204	231	229	221	221	*	*	221
06:00	*	625	683	707	667	670	*	*	670
07:00	*	**1119**	**1250**	**1211**	**1198**	**1194**	*	*	**1194**
08:00	*	815	852	882	837	846	*	*	846
09:00	*	583	558	552	625	582	*	*	582
10:00	*	583	618	601	*	601	*	*	601
11:00	*	653	606	634	*	631	*	*	631
12:00 PM	707	632	645	734	*	680	*	*	680
01:00	660	640	725	674	*	675	*	*	675
02:00	714	733	713	762	*	730	*	*	730
03:00	760	764	730	929	*	796	*	*	796
04:00	**824**	**821**	**803**	**931**	*	**845**	*	*	**845**
05:00	648	748	711	825	*	733	*	*	733
06:00	569	584	664	626	*	611	*	*	611
07:00	462	473	496	474	*	476	*	*	476
08:00	351	415	471	507	*	436	*	*	436
09:00	315	347	346	338	*	336	*	*	336
10:00	214	234	258	249	*	239	*	*	239
11:00	100	142	147	168	*	139	*	*	139
Day Total	6324	11407	11807	12359	3868	11749	0	0	11749
% Avg. WkDay	53.8%	97.1%	100.5%	105.2%	32.9%				
% Avg. Week	53.8%	97.1%	100.5%	105.2%	32.9%	100.0%	0.0%	0.0%	
AM Peak	-	07:00	07:00	07:00	07:00	07:00	-	-	07:00
Vol.	-	1119	1250	1211	1198	1194	-	-	1194
PM Peak	16:00	16:00	16:00	16:00	-	16:00	-	-	16:00
Vol.	824	821	803	931	-	845	-	-	845
Grand Total	6324	11407	11807	12359	3868	11749	0	0	11749

ADT ADT 11,749 AADT 11,749

City Of Des Moines

400 Robert D. Ray Dr.
Des Moines, IA. 50309
(515) 283-4973

Site Code: #22
Station ID:
M.L. King Jr. Pkwy.-South of Prospect Rd
Northbound Traffic
Latitude: 0° 0.0000 Undefined

Start Time	Mon 12-May-14	Tue 13-May-14	Wed 14-May-14	Thu 15-May-14	Fri 16-May-14		Average Day		Sat 17-May-14	Sun 18-May-14		Week Average		
12:00 AM	*	77	75	92	101		86		*	*		86		
01:00	*	47	60	54	59		55		*	*		55		
02:00	*	26	35	28	34		31		*	*		31		
03:00	*	28	25	21	12		22		*	*		22		
04:00	*	60	44	51	54		52		*	*		52		
05:00	*	169	192	193	169		181		*	*		181		
06:00	*	335	345	373	373		356		*	*		356		
07:00	*	503	490	497	496		496		*	*		496		
08:00	*	489	498	513	**559**		515		*	*		515		
09:00	*	448	510	515	532		501		*	*		501		
10:00	*	465	508	533	*		502		*	*		502		
11:00	**584**	**598**	**575**	**578**	*		**584**		*	*		**584**		
12:00 PM	627	593	674	616	*		628		*	*		628		
01:00	576	611	610	616	*		603		*	*		603		
02:00	660	675	686	663	*		671		*	*		671		
03:00	760	804	757	836	*		789		*	*		789		
04:00	**1017**	**1056**	**989**	**1009**	*		**1018**		*	*		**1018**		
05:00	945	971	933	866	*		929		*	*		929		
06:00	553	593	612	576	*		584		*	*		584		
07:00	438	500	510	489	*		484		*	*		484		
08:00	333	430	432	371	*		392		*	*		392		
09:00	286	274	292	357	*		302		*	*		302		
10:00	214	213	221	228	*		219		*	*		219		
11:00	148	140	148	131	*		142		*	*		142		
Day Total	7141	10105	10221	10206	2389		10142		0	0		10142		
% Avg. WkDay	70.4%	99.6%	100.8%	100.6%	23.6%									
% Avg. Week	70.4%	99.6%	100.8%	100.6%	23.6%		100.0%		0.0%	0.0%				
AM Peak	11:00	11:00	11:00	11:00	08:00	-	11:00	-	-	-	-	11:00	-	-
Vol.	584	598	575	578	559	-	584	-	-	-	-	584	-	-
PM Peak	16:00	16:00	16:00	16:00	-	-	16:00	-	-	-	-	16:00	-	-
Vol.	1017	1056	989	1009	-	-	1018	-	-	-	-	1018	-	-
Grand Total	7141	10105	10221	10206	2389		10142		0	0		10142		

ADT ADT 10,141 AADT 10,141

City Of Des Moines

400 Robert D. Ray Dr.
Des Moines, IA. 50309
(515) 283-4973

Site Code: #24
Station ID:
Prospect Rd.-West of M.L. King Jr. Pkwy.

Latitude: 0° 0.0000 Undefined

Start Time	12-May-14 EB	12-May-14 WB	13-May-14 EB	13-May-14 WB	14-May-14 EB	14-May-14 WB	15-May-14 EB	15-May-14 WB	16-May-14 EB	16-May-14 WB	17-May-14 EB	17-May-14 WB	18-May-14 EB	18-May-14 WB	Week Average EB	Week Average WB
12:00 AM	*	*	3	2	6	2	4	3	2	2	*	*	*	*	4	2
01:00	*	*	1	0	5	2	1	0	1	0	*	*	*	*	2	0
02:00	*	*	1	1	1	2	2	3	0	0	*	*	*	*	1	2
03:00	*	*	0	1	4	4	2	1	0	3	*	*	*	*	2	2
04:00	*	*	3	4	0	1	1	2	2	0	*	*	*	*	2	2
05:00	*	*	2	6	6	8	4	7	6	7	*	*	*	*	4	7
06:00	*	*	4	23	3	21	4	19	5	22	*	*	*	*	4	21
07:00	*	*	6	22	4	20	3	18	5	14	*	*	*	*	4	18
08:00	*	*	5	12	8	12	8	10	6	10	*	*	*	*	7	11
09:00	*	*	5	7	9	10	11	17	3	11	*	*	*	*	7	11
10:00	*	*	7	15	6	13	10	14	*	*	*	*	*	*	8	14
11:00	*	*	14	9	9	10	12	8	*	*	*	*	*	*	12	9
12:00 PM	16	13	12	5	10	17	15	12	*	*	*	*	*	*	13	12
01:00	13	21	9	17	8	11	12	17	*	*	*	*	*	*	10	16
02:00	17	22	20	19	12	15	14	23	*	*	*	*	*	*	16	20
03:00	13	8	23	16	17	12	10	11	*	*	*	*	*	*	16	12
04:00	17	8	27	14	20	18	23	10	*	*	*	*	*	*	22	12
05:00	24	9	26	15	13	13	14	10	*	*	*	*	*	*	19	12
06:00	23	11	22	16	22	15	13	10	*	*	*	*	*	*	20	13
07:00	11	12	11	15	17	18	13	10	*	*	*	*	*	*	13	14
08:00	10	4	12	4	19	6	16	5	*	*	*	*	*	*	14	5
09:00	8	10	6	13	7	9	13	10	*	*	*	*	*	*	8	10
10:00	11	3	6	2	6	5	9	5	*	*	*	*	*	*	8	4
11:00	6	7	3	3	7	8	5	0	*	*	*	*	*	*	5	4
Total	169	128	228	241	219	252	219	225	30	69	0	0	0	0	221	233
Day	297		469		471		444		99		0		0		454	
AM Peak	-	-	11:00	06:00	09:00	06:00	11:00	06:00	05:00	06:00	-	-	-	-	11:00	06:00
Vol.	-	-	14	23	9	21	12	19	6	22	-	-	-	-	12	21
PM Peak	17:00	14:00	16:00	14:00	18:00	16:00	16:00	14:00	-	-	-	-	-	-	16:00	14:00
Vol.	24	22	27	19	22	18	23	23	-	-	-	-	-	-	22	20

Comb. Total	297	469	471	444	99	0	0	454

ADT ADT 456 AADT 456

City Of Des Moines

400 Robert D. Ray Dr.
Des Moines, IA. 50309
(515) 283-4973

Site Code: #21
Station ID:
Prospect Rd.-East of M.L. King Jr. Pkwy.

Latitude: 0' 0.0000 Undefined

Start	27-May-14		28-May-14		29-May-14		30-May-14		31-May-14		01-Jun-14		02-Jun-14		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	7	9	4	4	9	5	*	*	*	*	*	*	7	6
01:00	*	*	8	2	8	3	8	4	*	*	*	*	*	*	8	3
02:00	*	*	3	2	4	4	5	7	*	*	*	*	*	*	4	4
03:00	*	*	2	2	3	1	6	4	*	*	*	*	*	*	4	2
04:00	*	*	9	4	13	2	6	1	*	*	*	*	*	*	9	2
05:00	*	*	63	13	58	12	60	13	*	*	*	*	*	*	60	13
06:00	*	*	81	59	88	56	73	56	*	*	*	*	*	*	81	57
07:00	*	*	133	36	114	47	121	54	*	*	*	*	*	*	123	46
08:00	*	*	84	55	97	72	77	59	*	*	*	*	*	*	86	62
09:00	*	*	61	86	60	79	75	98	*	*	*	*	*	*	65	88
10:00	*	*	62	92	64	88	73	104	*	*	*	*	*	*	66	95
11:00	*	*	95	82	67	90	*	*	*	*	*	*	*	*	81	86
12:00 PM	*	*	100	111	86	100	*	*	*	*	*	*	*	*	93	106
01:00	*	*	79	102	117	92	*	*	*	*	*	*	*	*	98	97
02:00	87	110	87	109	78	99	*	*	*	*	*	*	*	*	84	106
03:00	87	125	77	164	92	131	*	*	*	*	*	*	*	*	85	140
04:00	85	151	93	131	82	155	*	*	*	*	*	*	*	*	87	146
05:00	86	125	93	111	77	125	*	*	*	*	*	*	*	*	85	120
06:00	69	77	81	91	76	69	*	*	*	*	*	*	*	*	75	79
07:00	57	65	67	71	70	78	*	*	*	*	*	*	*	*	65	71
08:00	46	64	57	67	61	69	*	*	*	*	*	*	*	*	55	67
09:00	42	32	42	37	27	34	*	*	*	*	*	*	*	*	37	34
10:00	13	17	17	21	20	23	*	*	*	*	*	*	*	*	17	20
11:00	10	14	10	14	13	18	*	*	*	*	*	*	*	*	11	15
Total	582	780	1411	1471	1379	1451	513	405	0	0	0	0	0	0	1386	1465
Day	1362		2882		2830		918		0		0		0		2851	
AM Peak	-	-	07:00	10:00	07:00	11:00	07:00	10:00	-	-	-	-	-	-	07:00	10:00
Vol.	-	-	133	92	114	90	121	104	-	-	-	-	-	-	123	95
PM Peak	14:00	16:00	12:00	15:00	13:00	16:00	-	-	-	-	-	-	-	-	13:00	16:00
Vol.	87	151	100	164	117	155	-	-	-	-	-	-	-	-	98	146

Comb. Total	1362	2882	2830	918	0	0	0	2851
ADT	ADT 2,850	AADT 2,850						

SIGNAL WARRANT STUDY
WARRANT SUMMARY

LOCATION:	N/S STREET	E/W STREET	DATE OF COUNT
	MLK Pkwy	Prospect	5/12/2014

APPROACH	# OF LANES	MAJOR or MINOR?
NB THRU LANES	2	MAJOR
SB THRU LANES	2	MAJOR
EB THRU LANES	1	MINOR
WB THRU LANES	1	MINOR

PEAK HOUR:	16:00
85TH %TILE SPEED:	35
PEDESTRIAN SPEED:	4
DISTANCE TO NEXT SIGNAL:	1760
MEDIAN WIDTH:	0

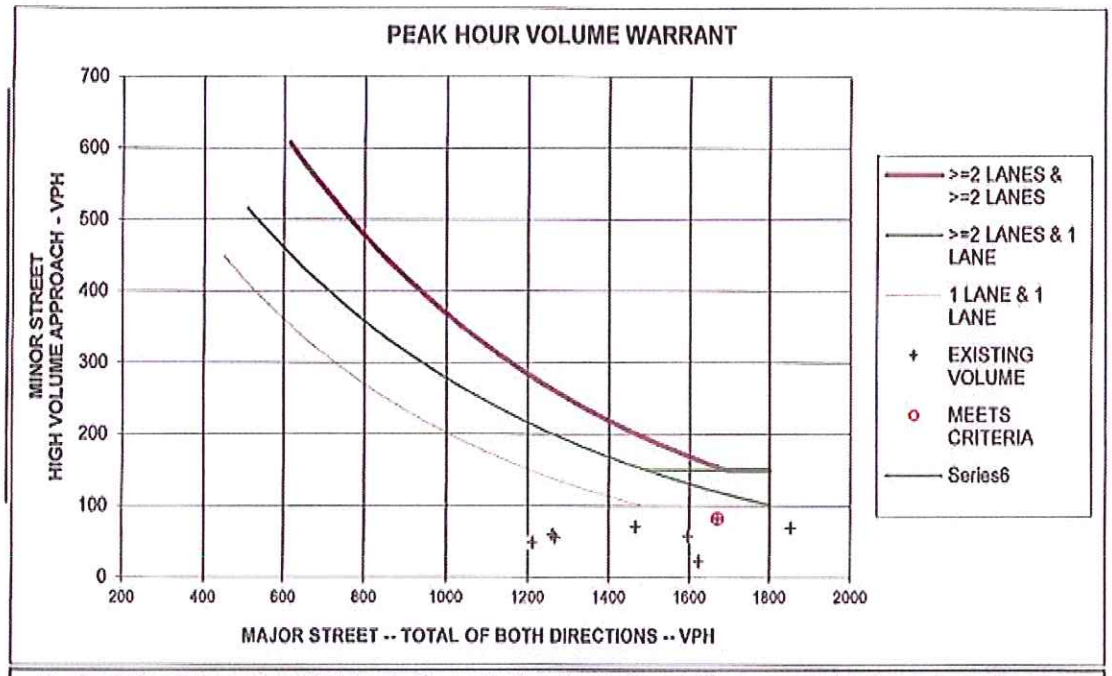
WARRANT	# MET	# REQUIRED	WARRANT MET ?
#1 EIGHT HOUR VEHICULAR VOLUME			**NO**
CONDITION A: MINIMUM VEHICULAR VOLUME			
HOURS	*0*	*8*	*NO*
CONDITION B: INTERRUPTION OF CONTINUOUS TRAFFIC			
HOURS	*1*	*8*	*NO*
CONDITION A + CONDITION B			
CONDITION A HOURS	*0*	*8*	*NO*
CONDITION B HOURS	*3*	*8*	
#2 FOUR HOUR VEHICULAR VOLUME			**NO**
HOURS	1	>4	
#3 PEAK HOUR			**YES**
CONDITION A: DELAY AND VOLUME			*NO*
PART 1. VEHICLE-HOURS DELAY			
VEHICLE-HOURS		*4*	*NO*
PART 2. MINOR STREET VOLUME			
VEHICLES PER HOUR	*89*	*100*	*NO*
PART 3. INTERSECTION VOLUME			
VEHICLES PER HOUR	*1957*	*800*	*YES*
CONDITION B: PLOTTED POINT			
HOURS	*1*	*1*	*YES*
#4 PEDESTRIAN VOLUME			**Not Applicable**
HOURS	0	4 OR 1	
#5 SCHOOL CROSSING			**Not Applicable**
GAPS			
PEDESTRIANS		>10	
#6 COORDINATED SIGNAL SYSTEM			**YES**
#7 CRASH EXPERIENCE			**NO**
CRASHES	1	5	
#8 ROADWAY NETWORK			**NO**

WARRANT #3

Peak Hour Volume: Condition B - Plotted Point

		MLK Pkwy & Prospect	
WARRANT MET?	YES	NUMBER OF HOURS MEETING REQUIRED VOLUMES	1
		REQUIRED NUMBER OF HOURS	1

TIME	MAJOR STREET VOLUME	MINOR APPROACH VOLUME	HIGHER VOLUME MINOR APPROACH	NUMBER OF LANES	TOTAL INTERSECTION VOLUME
10:00	678	11	W	1	689
12:00	812	14	W	1	826
13:00	782	18	W	1	800
16:00	1080	18	W	1	1098
7:00	789	11	W	1	800
14:00	862	16	W	1	878
15:00	1001	13	W	1	1014
16:00	1058	22	W	1	1080



The Peak Hour Volume warrant is intended for application when traffic conditions are such that for one hour of the day minor street traffic suffers undue traffic delay in entering or crossing the major street.

The Peak Hour Volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve *described in the MUTCD corresponding to the appropriate lane configuration and speed.*

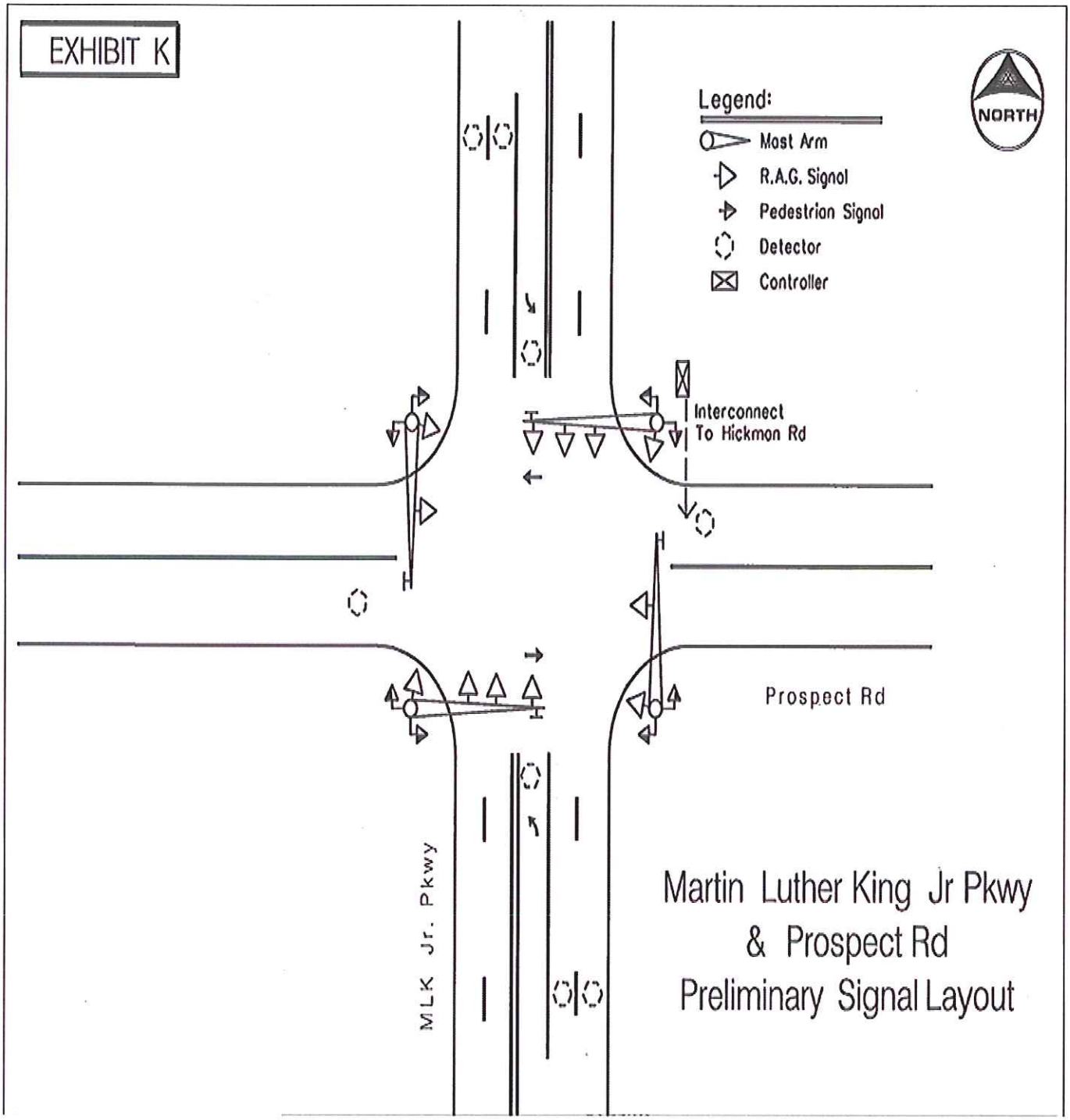


EXHIBIT K
Legend:
Mast Arm
R.A.G. Signal
Pedestrian Signal
Detector
Controller
NORTH
Interconnect
To Hickmon Rd
Prospect Rd
MLK Jr. Pkwy
Martin Luther King Jr Pkwy
& Prospect Rd
Preliminary Signal Layout

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 8/09

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: MPR/JLM | Date Prepared: Aug 5, 2014

Intersection: ML King and Prospect

Improvement

Proposed Improvement(s): Install Traffic Signals

$ 100,000	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**
	$OC = \frac{AC}{INT}\left(1-\frac{1}{(1+INT)^Y}\right)$	$ 100,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: CITY OF DES MOINES | 2014 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

12,000		8,659,625	Current Annual Entering Veh., **AEV** = DEV * 365
225	1,500	31,931	veh / day, Final Year DEV, **FDEV**
10,000		149.75	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**		$TMEV = \frac{AEV}{-G}\left(1-\left(\frac{1+G}{1}\right)^Y\right)\Big/10^6$
23,725	Current Daily Entering Vehicles, **DEV**		

Crash Data

2009	First full year -->	2013	Last full year	5.0	years, Time Period, **T**	
0	Additional months				values as of May 2014	
0	Fatal Crashes	0	Fatalities @	$4,500,000	$	-
		1	Major Injuries @	$325,000	$	325,000
3	Injury Crashes	0	Minor Injuries @	$65,000	$	-
		3	Possible Injuries @	$35,000	$	105,000
5	Property Damage Only		(assumed cost per crash)	$7,400	$	-
			-OR- enter all Property Costs of all crashes:		$	25,845
8	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	455,845

1.60	Current Crashes / Year, **AA** = TA / T	0.18	Crashes / MEV, Crash Rate, **CR**
$ 56,981	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
27.7	Total Expected Crashes, **TECR** = CR x TMEV	$ 230,372	Present Value of Avoided Crashes, **BENEFIT**
0.32	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 18,234	Crash Costs Avoided in First Year, AAR x AVC		
5.5	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 = $230,372 : $100,000 = **2.30** : 1

APPENDIX

ADDITIONAL CRASH INFORMATION

Iowa Department of Transportation

Major Cause Summary

MLK and Prospect

Analysis Years: 2004 (2), 2005 (1), 2006 (2), 2007 (6), 2008 (1), 2009 (2), 2010 (1), 2011 (3), 2012 (1)

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	4
Possible/Unknown	7
PDO	7
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	8
Possible	10
Unknown	2
Total Injuries	21

Surface Condition Summary:

Dry	14
Wet	1
Ice	1
Snow	2
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	1
Total Crashes	19

TOT Property Damage: $95,945

AVG Property Damage: $5,050

Major Cause Summary:

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

Selection Filter:

None

Analyst: HPR

Notes: 2004 - April 2014

CASENUMBER	CSEVERITY	FATALITIES	TOTINJ	MAJ	MIN	POSS	UNK	PROPDMG	CRCOMANNER	WEATHER1	SURF_COND	INJSTATU
2008420419	Property Damage Only	0	0	0	0	0	0	4000	Angle - oncoming left turn	Snow	Snow	
2009516713	Property Damage Only	0	0	0	0	0	0	6000	Broadside	Clear	Dry	
2009531171	Possible/Unknown	0	2	0	0	2	0	6000	Broadside	Partly cloudy	Dry	Possible
2010590351	Major Injury	0	1	1	0	0	0	0	Non-collision	Clear	Dry	Incapacitati
2011645567	Property Damage Only	0	0	0	0	0	0	2500	Non-collision	Clear	Dry	
2011653441	Possible/Unknown	0	1	0	0	1	0	1500	Unknown	Partly cloudy	Dry	Possible
2011654062	Property Damage Only	0	0	0	0	0	0	2845	Rear-end	Clear	Dry	
2012689876	Property Damage Only	0	0	0	0	0	0	7000	Broadside	Partly cloudy	Dry	

MARS 5/03

MAIL REPORTS TO:
Iowa Department of Transportation
Office of Driver Services
P.O. Box 9204
Des Moines, Iowa 50306-9204

Iowa Department of Transportation
INVESTIGATING OFFICERS REPORT OF MOTOR VEHICLE ACCIDENT

Law Enforcement Case Number: 20080033840

Legal Intervention? ☐ Private Property? ☐

LOCATION

Date of Accident	Time of Accident	County	Accident occurred within corporate limits of (city)
10/21/2009	16:20 Hrs.	Polk - 77	Des Moines - 1945

If accident occurred outside of city limits show general vicinity: "N/A" of nearest city "N/A"

On Road, Street, or Highway: "N/A" At Intersection with: "N/A"

Note: Unless accident occurred at an intersection which is completely described above, use the space below to give the exact location from a milepost or definable intersection, bridge, or railroad crossing, using two distances and directions if necessary.

Distance "N/A" Direction "N/A" and Distance "N/A" Direction "N/A" of

Milepost Number "N/A" Or Definable Intersection, bridge, or railroad crossing "N/A"

Location Literal Description: MLK JR PKWY and PROSPECT RD

X-Coordinate: 00446006
Y-Coordinate: 04607782

If Divided Highway, Provide Route (Cardinal) Travel Direction: "N/A"

UNIT 001

Driver's Name - Last: TIGNER | First: MICHELLE | Middle: DIANE | Suffix: | Phone: (515) 256-1264 x

Address: 2912 WATROUS AVENUE | City: DES MOINES | State: IA | Zip: 50321-0000

Date of Birth: 08/17/1970 | Driver's License Number: 939ZZ2174

Gender: Female | State: IA | Class: B | Endorsements: PS | Restrictions: NONE

Alcohol Test Given?: 1 - None | Test Results: | Drug Test Given?: 1 - None | Test Results:

Citation Charge Code 1: DM/114-322 | Citation Charge 1: FTY FROM STOP SIGN
Citation Charge Code 2: | Citation Charge 2:
Citation Charge Code 3: | Citation Charge 3:
Citation Charge Code 4: | Citation Charge 4:

Seating Position 01 | Injury Status 5 | Occupant Protection 2 | Airbag Deployment 5 | Airbag Switch Status 9 | Ejection 1 | Ejection Path 1 | Trapped 1

Transported to: | Transported by:

Owner's Name - Last: TIGNER | First: MICHELLE | Middle: DIANE | Suffix: | Owner Company Name:

Address: 2912 WATROUS AVENUE | City: DES MOINES | State: IA | Zip: 50321-0000

Insurance Co. Name: STATE FARM MUTUAL | Insurance Policy #: G075542B1115I | License Plate #: 675WFT | State: IA | Year: 2009

VIN No.: 1FMFK18527LA16764 | Year: 2007 | Make: Ford - FORD | Model: EPT | Style: SW | Tow #: NO | Approximate Cost to Repair or Replace: $5,000.00 | Private? ☐

Initial Travel Direction 4 | Vehicle Action 02 | Speed Limit 25 | Point of Initial Impact 07 | Most Damaged Area 07 | Extent of Damage 3 | Underride/Override 1

Total Occupants 1 | Traffic Controls 04 | Vehicle Config. 04 | Cargo Body Type 01 | Vehicle Defect 01 | Driver Condition 1 | Vision Obscured 08 | Contributing Circumstances, Driver (up to two) 13

SEQUENCE OF EVENTS | First Event 21 | Second Event | Third Event | Fourth Event | Most Harmful Event (by vehicle) 21

Commercial Trailer License Plate # | Attached to Power Unit: | State | Year | Attached to Trailer Unit: | State | Year | Emergency Vehicle Type 1 | Emergency Status 3

Carrier Name | Address | City | State | Zip

US DOT # or MC # | Number of Axles | Gross Vehicle Weight Rating | Placard # | Hazardous Materials Released?

UNIT 002

Driver's Name - Last: VEITH | First: KENNETH | Middle: FAY | Suffix: | Phone: (515) 243-2664 x

Address: 4000 7TH | City: DSM | State: IA | Zip: 50313

Date of Birth: 08/26/1959 | Driver's License Number: 201UU8879

Gender: Male | State: IA | Class: C | Endorsements: M | Restrictions: NONE

Alcohol Test Given?: 1 - None | Test Results: | Drug Test Given?: 1 - None | Test Results:

Citation Charge Code 1: | Citation Charge 1:
Citation Charge Code 2: | Citation Charge 2:
Citation Charge Code 3: | Citation Charge 3:
Citation Charge Code 4: | Citation Charge 4:

Seating Position 01 | Injury Status 4 | Occupant Protection 1 | Airbag Deployment 6 | Airbag Switch Status 3 | Ejection 4 | Ejection Path 1 | Trapped 1

Transported to: MERCY | Transported by: MEDIC 9

Owner's Name - Last: VEITH | First: KENNETH | Middle: FAY | Suffix: | Owner Company Name:

Address: 4000 7TH | City: DSM | State: IA | Zip: 50313

Insurance Co. Name: PROGRESSIVE CASUALTY | Insurance Policy #: 376385813 | License Plate #: 4510LI | State: IA | Year: 2010

VIN No.: JH2PC21045M600687 | Year: 2005 | Make: Honda - HOND | Model: VT600C | Style: MC | Tow #: YES | Approximate Cost to Repair or Replace: $1,000.00 | Private? ☒

Initial Travel Direction 1 | Vehicle Action 01 | Speed Limit 40 | Point of Initial Impact 01 | Most Damaged Area 01 | Extent of Damage 4 | Underride/Override 1

Total Occupants 2 | Traffic Controls 01 | Vehicle Config. 14 | Cargo Body Type 01 | Vehicle Defect 01 | Driver Condition 1 | Vision Obscured 01 | Contributing Circumstances, Driver (up to two) 28

SEQUENCE OF EVENTS | First Event 21 | Second Event | Third Event | Fourth Event | Most Harmful Event (by vehicle) 21

Commercial Trailer License Plate # | Attached to Power Unit: | State | Year | Attached to Trailer Unit: | State | Year | Emergency Vehicle Type 1 | Emergency Status 3

Carrier Name | Address | City | State | Zip

US DOT # or MC # | Number of Axles | Gross Vehicle Weight Rating | Placard # | Hazardous Materials Released?

2009 OCT 22 AM 4:03

T&T PRESS JP

ACCIDENT ENVIRONMENT				ROADWAY CHARACTERISTICS Major Contributing Circumstances:		WORKZONE RELATED?	SEQUENCE OF EVENTS
Location of First Harmful Event	1	Weather Conditions (up to two)	02	Environment	1	No	First Harmful Event of Crash (use codes 11-42 only) 21
Manner of Crash/Collision	5			Roadway	01	Location	
Light Conditions	1	Surface Conditions	1	Type of Roadway Junction/Feature	01	Type	
						Workers Present?	

PERSON INJURED

Name - Last	First	Middle	Suffix
TERRY	KRISTE		

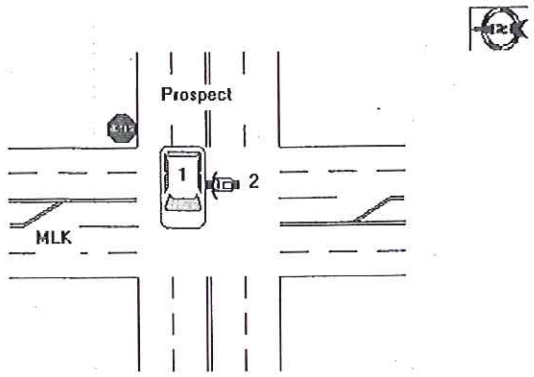
Address	City	State	Zip Code
3023 CORNELL	DSM	IA	

Date of Birth	Sex	Unit No.	Seating Position	Injury Status	Occupant Protection	Airbag Deployment	Airbag Switch Status	Ejection	Ejection Path	Trapped
3/2/1966	Female	002	04	4	1	6	3	4	1	1

Transported to:	Transported by:
MERCY	MEDIC 5

NON-MOTORIST	Type	Location	Action	Condition	Safety Equipment	Contributing Circumstances	Unit No. of Vehicle Striking

DIAGRAM



Not to Scale

NARRATIVE

Describe what happened (refer to vehicles by number)

AFTER SPEAKING WITH ALL THE WITNESSES AND DRIVERS OF UNIT 1 AND 2, UNIT 2 WAS BEHIND A VEHICLE ,IN THE OUTSIDE NORTH BOUND LANE ON MLK AND PULLED INTO THE INSIDE LANE TO PASS THE TRAFFIC, SCHOOL BUSES IN THE OUTSIDE LANE TURNING RIGHT ONTO PROSPECT, AND STRUCK UNIT 1. THE DRIVER OF UNIT 1 WAS STOPPED AT THE STOP SIGH AT THE CORNER OF WESTBOUND PROSPECT AND MLK AND WANTED TO TURN RIGHT, SHE SAID SHE COULD NOT SEE AROUND ALL THE BUSSES AND PULLED INTO TRAFFIC TO TURN LEFT ON TO SOUTHBOUND MLK AND WAS STRUCK BY UNIT 2. MEDICS ARRIVED TO TAKE CARE OF UNIT 2 AND HIS PASSENGER. DRIVER UNIT 1 WAS VERY DISTRAUGHT ABOUT THIS AND WAS TAKEN TO A HOSPITAL BY A PERSON SHE KNEW. THE PASSENGER ON UNIT 2 WAS TAKEN TO MERCY.

WITNESS

Witness Name - Last	First	Middle	Suffix
RHOADS	CHAD		

Address	City	State	Zip Code
4311 43	DSM	IA	50310

Home Phone #	Work Phone #
(515) 334-5598 x	(515) 334-5598 x

WITNESS

Witness Name - Last	First	Middle	Suffix
ADAMS	JANNIE		

Address	City	State	Zip Code
200 S. HICKORY BLVD	PLEASENT HILL	IA	

Home Phone #	Work Phone #
(515) 202-0249 x	(515) 202-0249 x

WITNESS

Witness Name - Last	First	Middle	Suffix
LONG	TERRIE		

Address	City	State	Zip Code
3002 30TH #18	DSM	IA	

Home Phone #	Work Phone #
(515) 633-2138 x	(515) 633-2138 x

Officer SWAGLER RYAN	Badge No. 5041	Time Officer Notified of Accident 16:20 Hrs.	Time Officer Arrived At Scene 16:30 Hrs.
Name of Agency Des Moines Police Department	Date of Report 10/21/2009	Investigation made at scene? Yes	T.I. #
Report Reviewed By: SCHUETT, RICK SGT	Date Reviewed 10/21/2009	Agency Specific DMPD	Other Technical Investigation Agency

MARS 5/03

MAIL REPORTS TO:
Iowa Department of Transportation
Office of Driver Services
P.O. Box 9204
Des Moines, Iowa 50306-9204

Iowa Department of Transportation
INVESTIGATING OFFICERS REPORT OF MOTOR VEHICLE ACCIDENT

Law Enforcement Case Number: 20100029959

Legal Intervention? ☐ Private Property? ☐

LOCATION

Date of Accident	Time of Accident	County	Accident occurred within corporate limits of (city)
09/15/2010	22:30 Hrs.	Polk - 77	Des Moines - 1945

If accident occurred outside of city limits show general vicinity: "N/A" of nearest city "N/A"

On Road, Street, or Highway: "N/A" At Intersection with: "N/A"

Note: Unless accident occurred at an intersection which is completely described above, use the space below to give the exact location from a milepost or definable intersection, bridge, or railroad crossing, using two distances and directions if necessary.

Distance "N/A" Direction "N/A" and Distance "N/A" Direction "N/A" of

Milepost Number "N/A" Or Definable intersection, bridge, or railroad crossing "N/A"

Location Literal Description: MLK JR PKWY and PROSPECT RD measuring 658 Feet West from PROSPECT RD

X-Coordinate: 00446006
Y-Coordinate: 04607782

If Divided Highway, Provide Route (Cardinal) Travel Direction: "N/A"

H&R
PA
MV-PED

UNIT 001

Driver's Name - Last | First | Middle | Suffix | Phone

Address | City | State | Zip

Date of Birth | Driver's License Number | Citation Charge Code 1 | Citation Charge 1

Gender | State | Class | Endorsements NONE | Restrictions NONE | Citation Charge Code 2 | Citation Charge 2

Citation Charge Code 3 | Citation Charge 3

Alcohol Test Given? | Test Results: | Drug Test Given? | Test Results: | Citation Charge Code 4 | Citation Charge 4

Seating Position | Injury Status | Occupant Protection | Airbag Deployment | Airbag Switch Status | Ejection | Ejection Path | Trapped

Transported to: | Transported by:

Owner's Name - Last | First | Middle | Suffix | Owner Company Name

Address | City | State | Zip

Insurance Co. Name | Insurance Policy # | License Plate # | State | Year

VIN No. | Year | Make | Model | Style | Tow # | Approximate Cost to Repair or Replace

Initial Travel Direction 4 | Vehicle Action 01 | Speed Limit 25 | Point of Initial Impact 10 | Most Damaged Area 99 | Extent of Damage 9 | Underride/ Override 1 | Private? ☐

Total Occupants 1 | Traffic Controls 01 | Vehicle Config. 02 | Cargo Body Type 01 | Vehicle Defect 99 | Driver Condition 9 | Vision Obscured 99 | Contributing Circumstances, Driver (up to two) 12

SEQUENCE OF EVENTS | First Event 20 | Second Event 52 | Third Event | Fourth Event | Most Harmful Event (by vehicle) 20

Commercial Trailer License Plate # | Attached to Power Unit: | State | Year | Attached to Trailer Unit: | State | Year | Emergency Vehicle Type 1 | Emergency Status 3

Carrier Name | Address | City | State | Zip

US DOT # or MC # | Number of Axles | Gross Vehicle Weight Rating | Placard # | Hazardous Materials Released?

ACCIDENT ENVIRONMENT		ROADWAY CHARACTERISTICS Major Contributing Circumstances:		WORKZONE RELATED? No	SEQUENCE OF EVENTS
Location of First Harmful Event 1	Weather Conditions (up to two) 01	Environment	1	Location	First Harmful Event of Crash (use codes 11-42 only) 20
Manner of Crash/Collision 1		Roadway	01	Type	
Light Conditions 4	Surface Conditions 1	Type of Roadway Junction/Feature	01	Workers Present?	

TRAFF
Zd 7
9/16

PERSON INJURED

Name - Last: ROSS | First: CHRISTOPHER | Middle: MARK | Suffix

Address: 1421 7TH | City: DES MOINES | State: IA | Zip Code: 50314

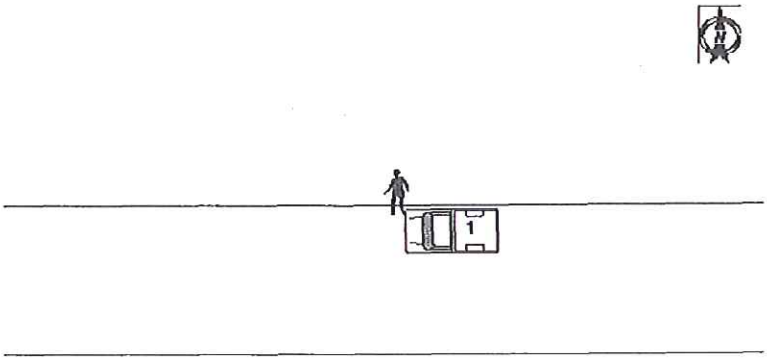
Date of Birth: 7/13/1962 | Sex: Male | Unit No. | Seating Position 15 | Injury Status 2 | Occupant Protection | Airbag Deployment | Airbag Switch Status | Ejection | Ejection Path | Trapped

Transported to: BROADLAWNS | Transported by: GOOD SAMARITAN

NON-MOTORIST | Type 1 | Location 8 | Action 2 | Condition 1 | Safety Equipment 4 | Contributing Circumstances 05 | Unit No. of Vehicle Striking 001

2010 SEP 15 AM 11:38

D I A G R A M



NARRATIVE

Describe what happened (refer to vehicles by number)

ROSS WAS WALKING EASTBOUND ON THE NORTH SIDE OF THE ROAD NEAR THE BUS GARAGE IN THE 2000 BLOCK OF PROSPECT ROAD. HE STATED HE WAS STRUCK BY VEHICLE 1 WHICH WAS DESCRIBED AS A SMALL DARK PICKUP TRUCK. ROSS WAS UNABLE TO GET A GOOD LOOK AT THE VEHICLE LET ALONE A PLATE NUMBER. ROSS BEGAN TRYING TO WALK TO THE HOSPITAL AND WAS GIVEN A RIDE TO BROADLAWNS BY A GOOD SAMARITAN. ROSS SUFFERED A BROKEN LEFT LEG AND ALSO COMPLAINED OF PAIN TO HIS RIGHT KNEE.

Officer	Badge No.	Time Officer Notified of Accident	Time Officer Arrived At Scene
STROOPE THEODORE	5021	23:55 Hrs.	00:05 Hrs.

Name of Agency	Date of Report	Investigation made at scene?	T.I. #
Des Moines Police Department	09/15/2010	No	

Report Reviewed By:	Date Reviewed	Agency Specific	Other Technical Investigation Agency
STILES, ROGER	09/15/2010		

MARS 5/03

MAIL REPORTS TO:
Iowa Department of Transportation
Office of Driver Services
P.O. Box 9204
Des Moines, Iowa 50306-9204

Iowa Department of Transportation
INVESTIGATING OFFICERS REPORT OF MOTOR VEHICLE ACCIDENT

Law Enforcement Case Number: 20110035149

Legal Intervention? ☐ Private Property? ☐

LOCATION

Date of Accident	Time of Accident	County	Accident occurred within corporate limits of (city)
10/25/2011	19:25 Hrs.	Polk - 77	Des Moines - 1945

If accident occurred outside of city limits show general vicinity: "N/A" of nearest city "N/A"

On Road, Street, or Highway: "N/A" At Intersection with: "N/A"

Note: Unless accident occurred at an intersection which is completely described above, use the space below to give the exact location from a milepost or definable intersection, bridge, or railroad crossing, using two distances and directions if necessary.

Distance "N/A" Direction "N/A" and Distance "N/A" Direction "N/A" of

Milepost Number "N/A" Or Definable intersection, bridge, or railroad crossing "N/A"

Location Literal Description: PROSPECT RD and MLK JR PKWY

X-Coordinate: 00446006
Y-Coordinate: 04607782

If Divided Highway, Provide Route (Cardinal) Travel Direction: "N/A"

MU-MU PIA

UNIT 001

Driver's Name - Last: EMERANSE First: SINDIYIHEBURA Middle: Suffix: Phone: (515) 822-6915 x

Address: 1300 34TH ST. #18 City: DES MOINES State: IA Zip: 50311

Date of Birth: 02/13/1984 Driver's License Number: 281AD9643

Gender: Female State: IA Class: C Endorsements: NONE Restrictions: 2

Citation Charge Code 1: DM/114-174 Citation Charge 1: NO DRIVER'S LICENSE
Citation Charge Code 2: Citation Charge 2:
Citation Charge Code 3: Citation Charge 3:
Citation Charge Code 4: Citation Charge 4:

Alcohol Test Given?: 1 - None Test Results: Drug Test Given?: 1 - None Test Results:

Seating Position 01 | Injury Status 5 | Occupant Protection 2 | Airbag Deployment 5 | Airbag Switch Status 9 | Ejection 1 | Ejection Path 1 | Trapped 1

Transported to: REFUSED Transported by:

Owner's Name - Last: EMERANSE First: SINDIYIHEBURA Middle: Suffix: Owner Company Name:

Address: 1300 34TH ST. #18 City: DES MOINES State: IA Zip: 50311

Insurance Co. Name: PROGRESSIVE CASUALTY Insurance Policy #: 38472912-3 License Plate #: 436XJR State: IA Year: 2012

VIN No.: 1HGCG1642WA010803 Year: 1998 Make: Honda - HOND Model: ACC Style: 4D Tow #: NO Approximate Cost to Repair or Replace: $500.00

Private? ☐

Initial Travel Direction 4 | Vehicle Action 99 | Speed Limit 30 | Point of Initial Impact 05 | Most Damaged Area 05 | Extent of Damage 2 | Underride/Override 1

Total Occupants 2 | Traffic Controls 04 | Vehicle Config. 01 | Cargo Body Type 01 | Vehicle Defect 01 | Driver Condition 1 | Vision Obscured 01 | Contributing Circumstances, Driver (up to two) 99

SEQUENCE OF EVENTS: First Event 21 Second Event Third Event Fourth Event Most Harmful Event (by vehicle) 21

Commercial Trailer License Plate # Attached to Power Unit: State Year Attached to Trailer Unit: State Year Emergency Vehicle Type 1 Emergency Status 3

Carrier Name Address City State Zip

US DOT # or MC # Number of Axles Gross Vehicle Weight Rating Placard # Hazardous Materials Released?

UNIT 002

Driver's Name - Last: SAEED First: ABDULQUDUS Middle: Suffix: Phone: (515) 971-4885 x

Address: 4117 47TH ST City: DES MOINES State: IA Zip: 50310-0000

Date of Birth: 12/22/1990 Driver's License Number: 438AF5175

Gender: Male State: IA Class: C Endorsements: NONE Restrictions: NONE

Citation Charge Code 1: Citation Charge 1:
Citation Charge Code 2: Citation Charge 2:
Citation Charge Code 3: Citation Charge 3:
Citation Charge Code 4: Citation Charge 4:

Alcohol Test Given?: 1 - None Test Results: Drug Test Given?: 1 - None Test Results:

Seating Position 01 | Injury Status 5 | Occupant Protection 2 | Airbag Deployment 5 | Airbag Switch Status 9 | Ejection 1 | Ejection Path 1 | Trapped 1

Transported to: REFUSED Transported by:

Owner's Name - Last: ROWLAND First: RONALD Middle: RAY Suffix: Owner Company Name:

Address: 4117 47TH ST City: DES MOINES State: IA Zip: 50310

Insurance Co. Name: STATE FARM MUTUAL Insurance Policy #: 0278754E2415B License Plate #: K6439 State: IA Year: 2012

VIN No.: 1G4HR53L8PH462146 Year: 1993 Make: Buick - BUIC Model: LES Style: 4D Tow #: NO Approximate Cost to Repair or Replace: $1,000.00

Private? ☐

Initial Travel Direction 4 | Vehicle Action 99 | Speed Limit 30 | Point of Initial Impact 01 | Most Damaged Area 01 | Extent of Damage 2 | Underride/Override 1

Total Occupants 1 | Traffic Controls 04 | Vehicle Config. 01 | Cargo Body Type 01 | Vehicle Defect 01 | Driver Condition 1 | Vision Obscured 01 | Contributing Circumstances, Driver (up to two) 99

SEQUENCE OF EVENTS: First Event 21 Second Event Third Event Fourth Event Most Harmful Event (by vehicle) 21

Commercial Trailer License Plate # Attached to Power Unit: State Year Attached to Trailer Unit: State Year Emergency Vehicle Type 1 Emergency Status 3

Carrier Name Address City State Zip

US DOT # or MC # Number of Axles Gross Vehicle Weight Rating Placard # Hazardous Materials Released?

2011 OCT 26 PM 3:09

Tot Press B8

ACCIDENT ENVIRONMENT				ROADWAY CHARACTERISTICS Major Contributing Circumstances:		WORKZONE RELATED?	SEQUENCE OF EVENTS
Location of First Harmful Event	1	Weather Conditions (up to two)	02	Environment	1	No	First Harmful Event of Crash (use codes 11-42 only) 21
Manner of Crash/Collision	9			Roadway	01	Location	
Light Conditions	4	Surface Conditions	1	Type of Roadway Junction/Feature	01	Type	
						Workers Present?	

PERSON INJURED

Name - Last	First	Middle	Suffix
ZEBEDEE	NTUNGWANAYO	O	

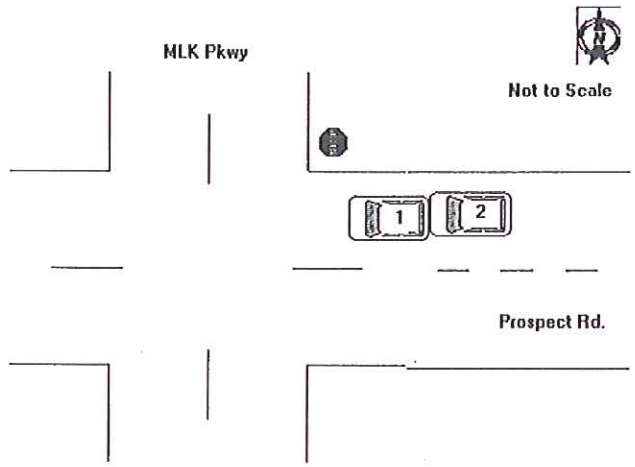
Address	City	State	Zip Code
1300 34TH ST. #18	DES MOINES	IA	50311

Date of Birth	Sex	Unit No.	Seating Position	Injury Status	Occupant Protection	Airbag Deployment	Airbag Switch Status	Ejection	Ejection Path	Trapped
2/13/1984	Male	001	03	4	2	5	9	1	1	1

Transported to:	Transported by:
REFUSED	

NON-MOTORIST	Type	Location	Action	Condition	Safety Equipment	Contributing Circumstances	Unit No. of Vehicle Striking

DIAGRAM



NARRATIVE

Describe what happened (refer to vehicles by number)

UNIT 1 FACING WESTBOUND AT STOP SIGN ON PROSECT RD. FACING MLK PKWY.
UNIT 2 FACING WESTBOUND DIRECTLY BEHIND UNIT 1 FACING MLK PKWY.

ON OR ABOUT 25 OCT 11 AT APPROXIMATELY 1925 UNIT 2 OPERATOR EXPLAINED THAT HE WAS BEHIND UNIT 1 WHILE UNIT 1 WAS STOPPED AT THE STOP SIGN ON PROSPECT RD. UNIT 1 THEN SUDDENLY BACKED UP INTO UNIT 2. UNIT 2 OPERATOR SAID HE WAS UNABLE TO GET OUT OF THE WAY FAST ENOUGH PRIOR TO UNIT 1 HITTING UNIT 2. UNIT 2 OPERATOR THEN OBSERVED A BLACK FEMALE GET OUT OF THE DRIVERS SIDE DOOR AND A BLACK MALE GET OUT OF THE PASSENGER SIDE DOOR OF UNIT 1. THE BLACK MALE EXPLAINED TO UNIT 2 OPERATOR THAT THE BLACK FEMALE WAS PRACTICING HER DRIVING. UNIT 2 OPERATOR EXPLAINED THAT THE BLACK MALE THEN CHANGED HIS STORY AND SAID THAT HE WAS DRIVING.

WHEN I, OFFICER DALLMAN, ARRIVED ON SCENE UNIT 1 WAS PARKED FACING WESTBOUND WITH A BLACK MALE IN THE FRONT DRIVERS SEAT AND A BLACK WOMAN SEATED IN THE PASSENGER SEAT (FRONT). UNIT 2 WAS PARKED BEHIND UNIT 1. I PARKED BEHIND UNIT 2 AND INFORMED UNIT 2 OPERATOR TO RETRIEVE HIS DRIVERS LICENSE, REGISTRATION AND PROOF OF INSURANCE WHILE I TALKED TO UNIT 1 OCCUPANTS (I HAD NOT TALKED TO EITHER AT THIS POINT AND DID NOT KNOW WHO WAS DRIVING WHAT AT THAT POINT). I ASKED THE BLACK MALE SITTING IN THE DRIVERS SEAT WHAT HAD HAPPENED AND HE INFORMED ME THAT HE WAS DRIVING AND UNIT 2 HAD REAR ENDED HIM AS HE SAT AT THE STOP SIGN. HE THEN PROVIDED ME HIS DRIVERS LICENSE, REGISTRATION AND PROOF OF INSURANCE.

I THEN WENT BACK TO UNIT 2 DRIVER AND ASKED HIM WHAT HAD HAPPENED AND HE VERBALLY WALKED ME THROUGH HIS SIDE OF THE STORY (AS LISTED IN FIRST PARAGRAPH). I ASKED HIM TO TELL ME AGAIN WHO WAS DRIVING AND HE AGAIN SAID THAT THE WOMAN WAS IN THE DRIVERS SEAT AT THE TIME OF THE ACCIDENT. I ASKED HIM WHY OCCUPANTS OF UNIT 1 WOULD TELL ME A DIFFERENT STORY AND HE SAID HE HAD NO IDEA.

I THEN WENT BACK TO UNIT 1 AND ASKED IF THE WOMAN HAD BEEN DRIVING AND THE MALE LOOKED AT ME IN WHAT I PERCEIVED AS FEIGNED SHOCK. HE DENIED THAT THEY HAD SWITCHED SEATS. I INFORMED HIM THAT I THOUGHT HE WAS LYING TO ME, BUT HE MAINTAINED HIS ACCOUNT OF THE INCIDENT. HE AGAIN TOLD ME THAT HE WAS WAITING AT THE STOP SIGN WHEN UNIT 2 HIT UNIT 1 FROM BEHIND. I ASKED THE WOMAN IF SHE WAS DRIVING AT THE TIME OF THE ACCIDENT AND SHE LOOKED DOWN AND DID NOT ANSWER (THERE WAS A LANGUAGE BARRIER, BUT NO ATTEMPT WAS

NARRATIVE

Describe what happened (refer to vehicles by number)

MADE BY THE WOMAN TO CLARIFY MY STATEMENT.).

I GATHERED UNIT 1 INFORMATION FROM THE MALE AND FEMALE. I RAN FEMALE THROUGH MDT AS SHE HAD NO DL ON HER PERSON. SHE CAME BACK WITH A VALID DL, BUT WITH A RESTRICTION CODE OF 2 (NON-COMMERCIAL INSTRUCTION PERMIT).

WITH NO UNBIASED WITNESS TO RELY ON, I MADE THE DECISION TO ENTER THE UNIT 1 OPERATOR AS THE FEMALE AS TOLD BY UNIT 2 OPERATOR. IN MY OPINION, UNIT 2 OPERATOR HAD NO REASON TO FALSIFY HIS STATEMENT ABOUT WHO UNIT 1 OPERATOR WAS. THE OCCUPANTS OF UNIT 1 HAD REASON TO FALSIFY THEIR ACCOUNT AS THE WOMAN ONLY HAS AN INSTRUCTION PERMIT AT THE TIME OF THE ACCIDENT. I DID NOT WRITE ANY MOVING VIOLATIONS DUE TO THE CONFLICTING ACCOUNTS OF THE ACCIDENT BY BOTH OCCUPANTS OF THE VEHICLES AND NO UNBIASED WITNESS.

ALL REFUSED RESCUE, ALTHOUGH THE BLACK MALE IN UNIT 1 COMPLAINED OF HAVING CHEST PAIN AFTER HIS COMPANION RECEIVED HER CITATION, BUT REFUSED RESCUE AND SAID HE WOULD GET TO THE HOSPITAL ON HIS OWN.

Officer DALLMAN JON M	Badge No. 5063	Time Officer Notified of Accident 19:50 Hrs.		Time Officer Arrived At Scene 20:00 Hrs.
Name of Agency Des Moines Police Department	Date of Report 10/25/2011	Investigation made at scene? Yes	T.I. #	
Report Reviewed By: WALLACE, RICHARD	Date Reviewed 10/25/2011	Agency Specific DMPD	Other Technical Investigation Agency	

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: At intersection of NE 56th Street and NE 62nd Avenue.

Applicant: Polk County Public Works

Contact Person: Kurt D. Bailey, P.E. Title: County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: (515)286-3705 (Area Code) E-Mail: Kurt.Bailey@polkcountyiowa.gov

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 30,000

Safety Funds Requested $ 30,000

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 Polk

Signed: John F Mauro 8/12/14

Signature Date Signed

John F. Mauro, Chair, Polk County Board of Supervisors

Typed Name

Attest: Becky Dewey 8/12/14

Signature Date Signed

Becky Dewey, Chief Asst County Clerk

Typed Name

Res. No. 148-14
August 12, 2014

RESOLUTION

Moved by Hockensmith, Seconded by Connolly 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 62nd Avenue and NE 56th Street; 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 certification 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:

John F. Mauro
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

FISCAL IMPACT:
TSF Funding Request: $30,000
No Matching Funds Required.

ROLL CALL
ALLOWANCE

AUG 12 2014

Steve Van Oort	~~Yea~~	Nay
Robert Brownell	~~Yea~~	Nay
Tom Hockensmith	~~Yea~~	Nay
Angela Connolly	~~Yea~~	Nay
John F. Mauro	~~Yea~~	Nay

VOTE Yea 5 Nay 0
Above tabulation made by BS

BOARD
CHAIRPERSON

#241

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 56th Street and NE 62nd Avenue.

While we added oversized Stop signs with red flags, and double Stop Ahead signs with flags in 2003, we continue to see accidents involving a driver either running a stop sign or failing to yield to through traffic on NE 56th Street. Traffic volume or accident rates do not warrant an all-way stop condition at this time.

This intersection is located one half mile north of Altoona and one mile west of Bondurant. NE 62nd Avenue is a two-lane roadway with a Minor Arterial federal functional classification, and a posted speed limit of 55 mph. This route serves as freight corridor to the trucking companies concentrated near the I-35/Corporate Woods Drive interchange in Ankeny, and also serves as a major commuter route for residents in Altoona, Bondurant and eastern Polk County to the Ankeny and northern Des Moines Metro area.

NE 56th Street is a 24' wide HMA roadway and is classified as a Major Collector. NE 56th Street serves as the main north/south access road to Altoona's new Facebook Data Center, the Bass Pro Shop retail store, and its associated development, and Altoona's principal retail outlets on 8th Street SW just 2 miles south of this intersection.

Even though there is plenty of sight distance from the stop condition, motorists are still failing to either see or acknowledge the stop condition or yield to on-coming traffic. Based on the 5-year accident history, we believe this intersection warrants traffic safety improvements.

As you can see in Section G, we propose to install yellow flashing beacons and intersection warning signs on NE 56th Street and red flashing beacons on the NE 62nd Avenue stop signs to give additional warning to motorists, especially those on NE 56th Street that traffic may be entering unexpectedly. We believe the addition of these beacons will not only reduce the number of accidents, but also reduce the severity of the accidents. A detailed cost estimate for these improvements can be found in Section C. The relatively low cost of these improvements results in a high Benefit/Cost ratio over 39:1.

C

ENGINEER'S ESTIMATE NE 56th Street and NE 62nd Avenue Advanced Warning Signs with Solar Powered Beacons					
LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	REMOVE AND REINSTALL SIGN AS PER PLAN	EA	2.00	$ 57.50	$ 115.00
2	TYPE A SIGNS, SHEET ALLUMINUM	SF	50.00	$ 37.00	$ 1,850.00
3	TRAFFIC CONTROL	LS	1.00	$ 1,000.00	$ 1,000.00
4	FLAGGERS	EA	3.00	$ 345.00	$ 1,035.00
5	MOBILIZATION	LS	1.00	$ 2,000.00	$ 2,000.00
6	(RED) CONTINUOUS OPERATING, SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
7	(YELLOW) CONTINUOUS OPERATING, SINGLE HEAD SOLAR BEACON ON WARNING SIGN POST	EA	2.00	$ 6,000.00	$ 12,000.00
				TOTAL ESTIMATED CONSTRUCTION COST	**$ 30,000.00**

D

PROJECT TIME SCHEDULE

Proposed N.E. 56th Street and NE 62nd Avenue Advanced Signing with Solar Powered Beacons

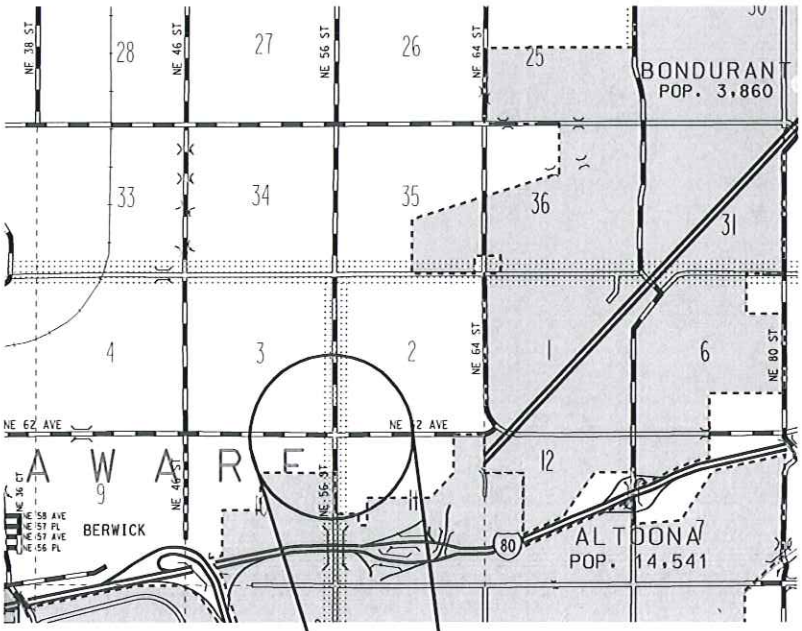
IOWA DOT TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING APPLICATION

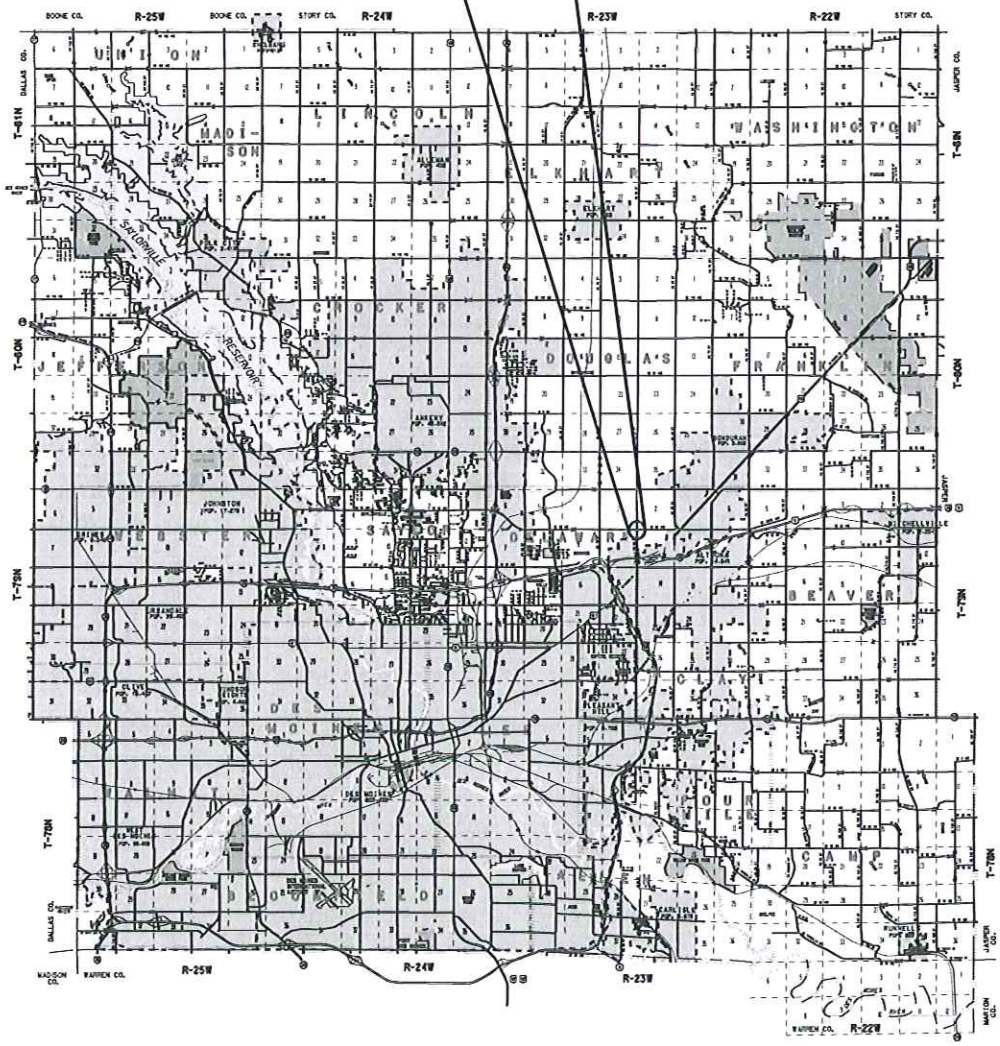
Polk County, Iowa

PROJECT PHASE	2015											
(YEAR 2015)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IDOT Funding Approval/Agreement												
Project Design and Project Plan Approvals												
Iowa DOT Bid Letting												
Project Construction/Pole Manufacture time												
Project Closeout												

DO NOT SCALE

E





File Name and Date
Plotted By

F

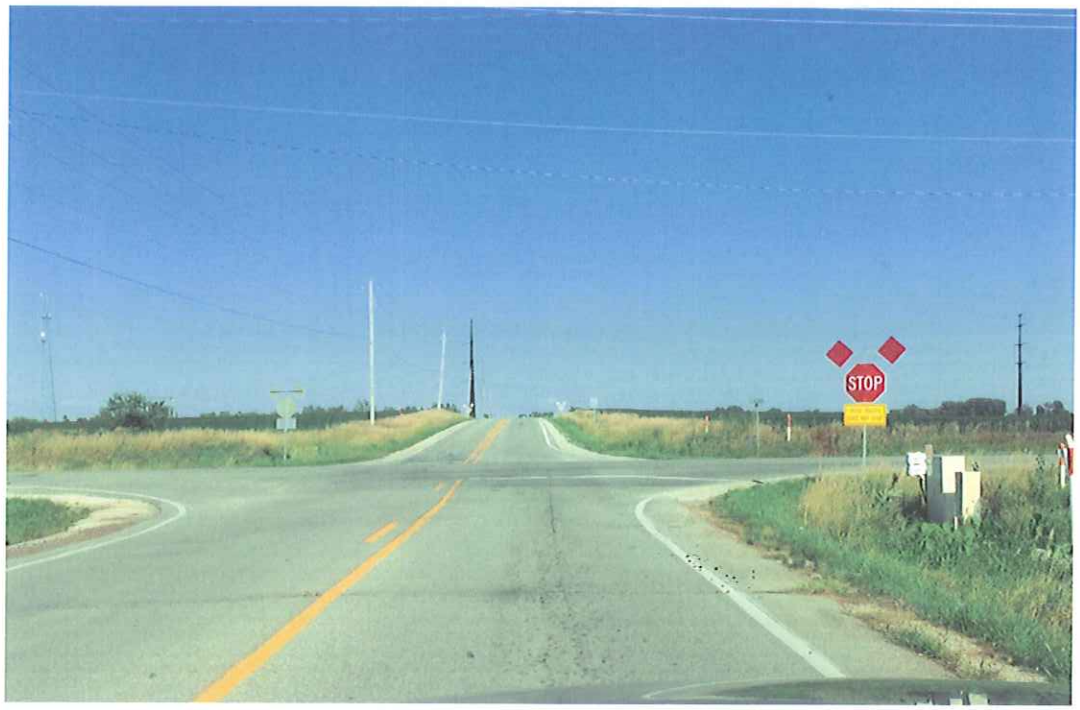


Figure 1 Eastbound NE 62 Avenue Approaching Intersection.

Figure 2 Westbound NE 62nd Avenue Approaching Intersection.

Figure 3 Northbound NE 56 Street Approaching Intersection.

Figure 4 Southbound NE 56 Street Approaching Intersection.

Figure 5 Looking North from Eastbound Stop Condition- NE 62 Avenue.

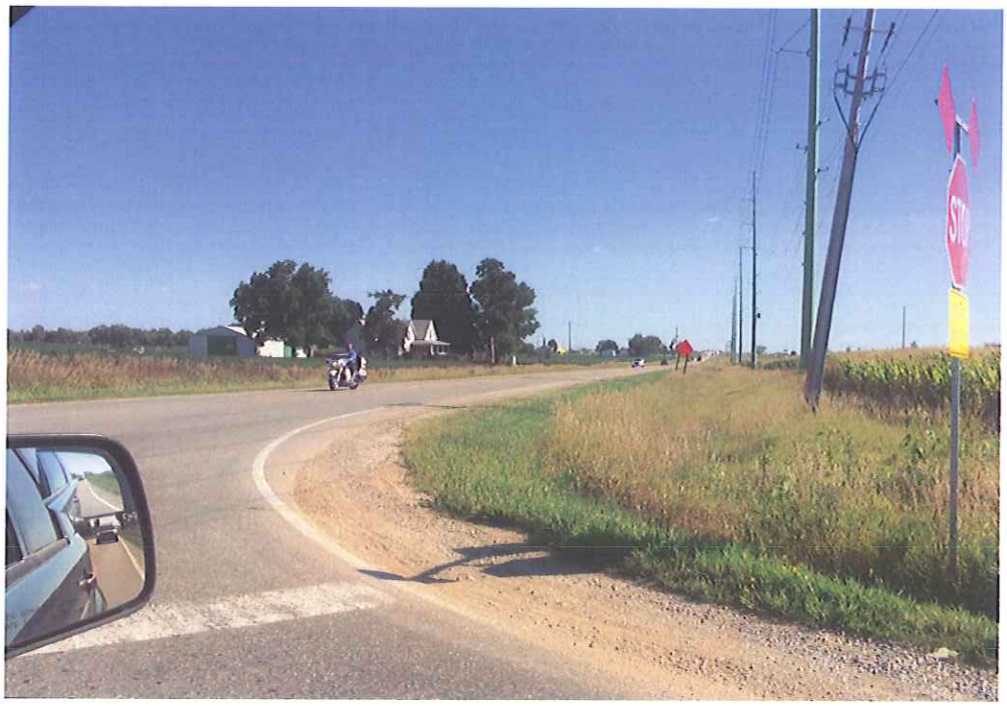
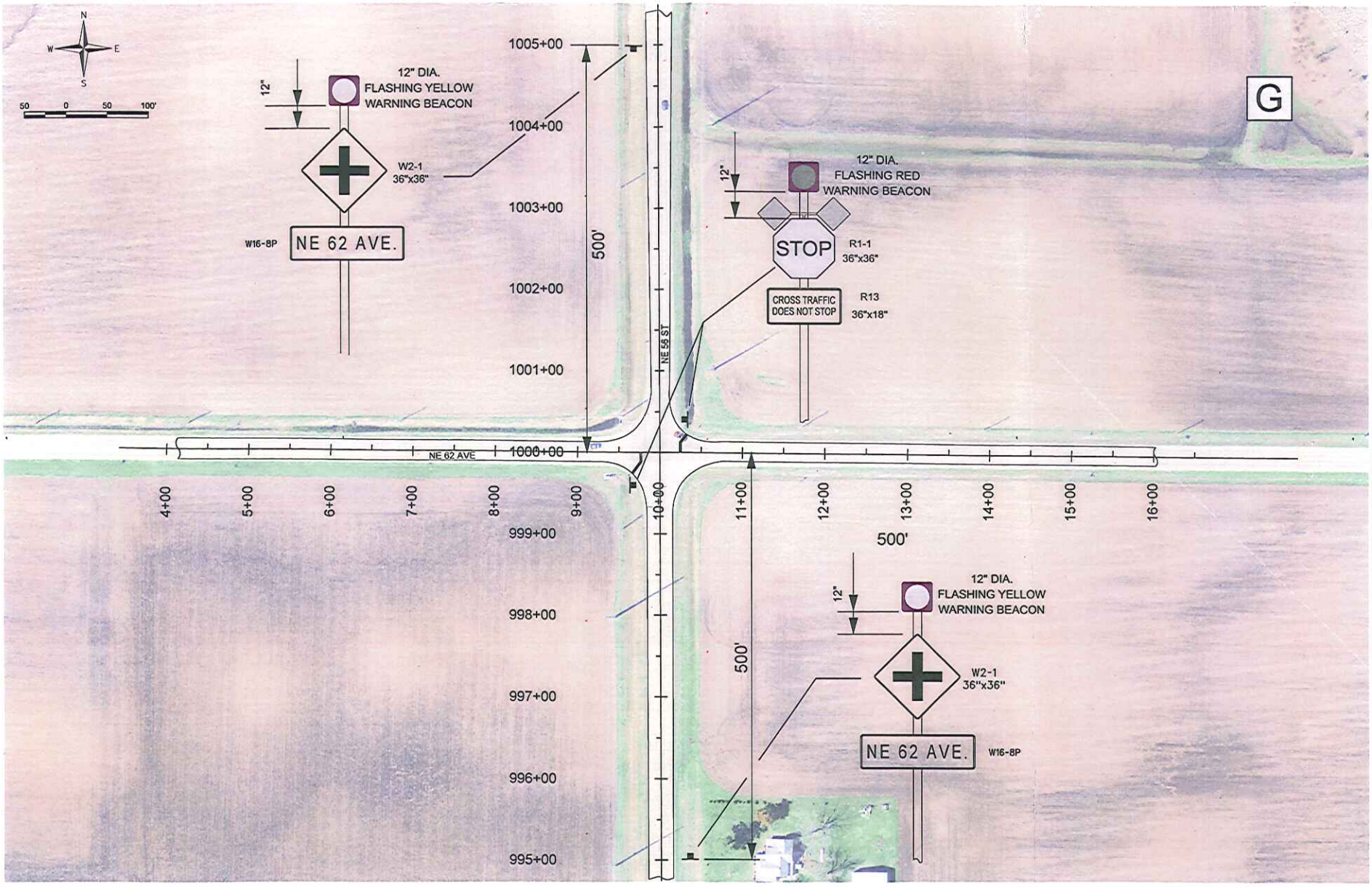


Figure 6 Looking South from Eastbound Stop Condition- NE 62 Avenue

Figure 7 Looking South from Westbound Stop Condition- NE 62 Avenue

Figure 8 Looking North from Westbound Stop Condition- NE 62 Avenue



STATE OF IOWA	FHWA REGION 7	FISCAL YEAR 2013/2014	POLK COUNTY	PROJECT NUMBER	NE 56 ST @ NE 62 AVE.	SHEET NUMBER	L.01

Plotted By

File Name and Date

TRAFFIC VOLUME INFORMATION

H

NE 56 STREET AT NE 62 AVENUE
NODE NUMBER : 33-8165

2,200 V.P.D.

NE 56 ST.

2,420 V.P.D.

NE 62 AVENUE

1,110 V.P.D.

ALL TRAFFIC COUNTS
I.D.O.T. 2012 ANNUAL AVERAGE
DAILY TRAFFIC MAPS

3,280 V.P.D.

TRAFFIC COUNTS AT INTERSECTION
OF NE 56 STREET AND NE 62 AVENUE

File Name and Date
Plotted By

Accidents- 7/2009 to 7/2014

NE 62 AVE NE 56 ST

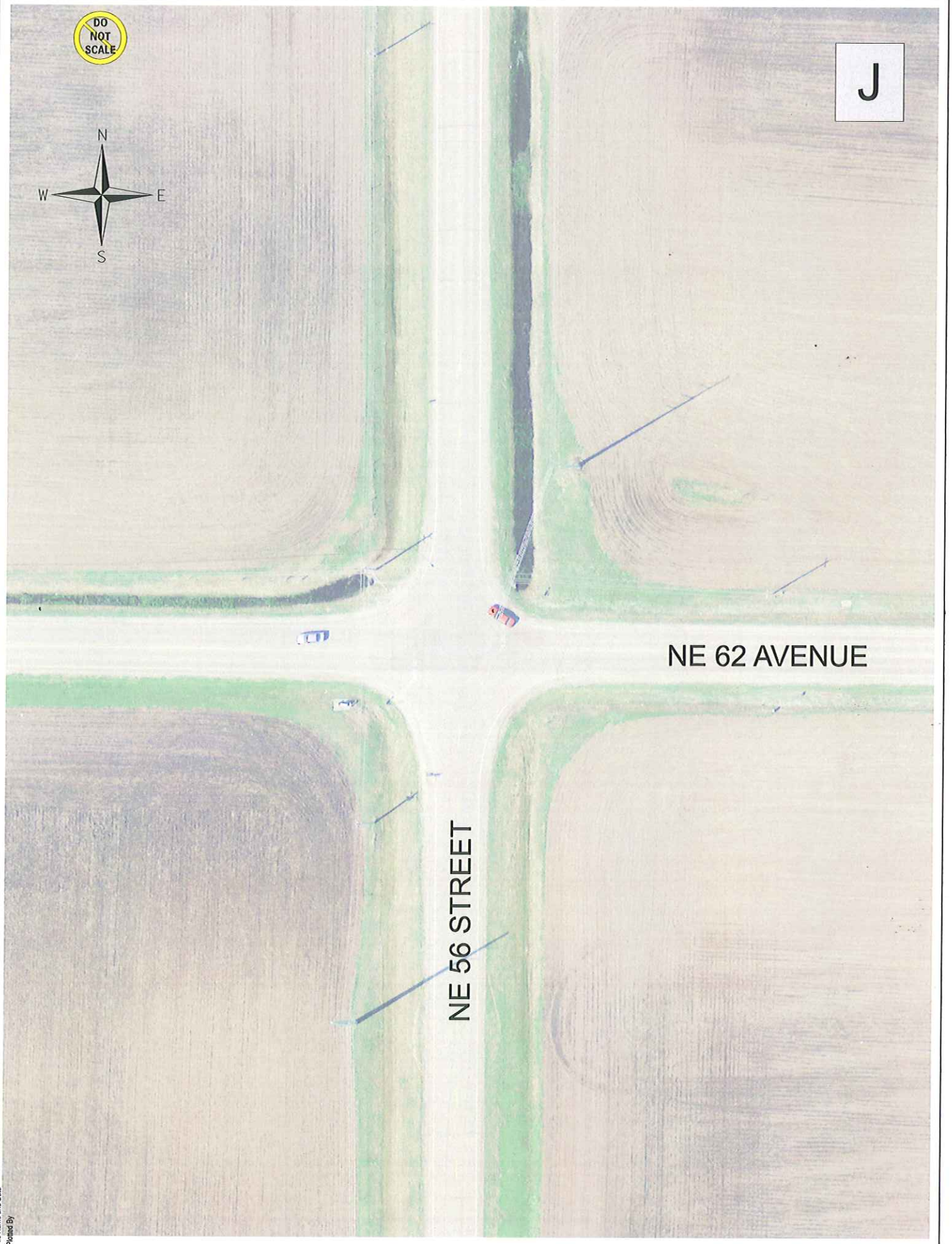
I

Acc. No.	Node No.	Date of Accident	Type of Accident	Type of Injury	Property Damage	Accident Description	Time of Accident	ROAD Conditions	AGE OF DRIVER AT FAULT	AGE OF OTHER DRIVER	Direction of Veh. At Fault	Direction of Other Veh.
1	23-8165	7/20/2009	PI	1 possible	$ 8,500	Failure to yield from stop sign	3:30 PM	Dry, Clear	70	68	EB	SB
2	23-8165	8/1/2009	PI	1-Minor	$ 13,000	**RAN stop sign EB**	10:46 AM	Dry, Clear	20	56	EB	EB
3	23-8165	8/11/2009	PDO		$ 5,500	**RAN stop sign EB**	8:40 AM	Dry, Clear	70	20	EB	SB
4	23-8165	12/5/2009	PI	3 possible	$ 4,000	Failure to yield from stop sign	4:45 PM	Dry, Clear	22	18	EB	NB
5	23-8165	7/28/2010	PI	2-Minor	$ 7,000	**RAN stop sign EB**	2:10 PM	Dry, Clear	24	17	EB	SB
6	23-8165	1/26/2011	PI	1 possible	$ 8,000	Failure to yield from stop sign	3:09 PM	Dry, Clear	28	42	EB	NB
7	23-8165	2/19/2011	PDO		$ 5,500	Failure to yield from stop sign	3:30 PM	Dry, Clear	26	18	EB	NB
8	23-8165	6/6/2011	PDO		$ 2,500	Rear-End - Distracted	2:40 PM	Dry, Clear	17	54	SB	NB
9	23-8165	12/7/2011	PDO		$ 27,000	Failure to yield from stop sign	4:42 PM	Dry, Cloudy	25	29	WB	NB
10	23-8165	2/2/2012	PI	2 possible	$ 6,000	Failure to yield from Left Turn	11:15 AM	Dry, Clear	42	77	NB	SB
11	23-8165	7/11/2012	PDO		$ 5,500	Failure to yield from stop sign	5:14 PM	Dry, Clear	18	76	WB	NB
12	23-8165	7/13/2012	PI	1 Major	$ 7,000	**RAN stop sign EB**	9:19 AM	Dry, Clear	21	68	EB	SB
13	23-8165	1/31/2013	PDO		$ 2,600	Failure to Stop Safe/Sure Distance	1:28 PM	Ice on Road	52	16	EB	EB
14	23-8165	10/3/2013	PI	2-Minor	$ 11,000	**RAN Stop sign**	9:17 PM	Dry, Clear	64	25	EB	WB
15	23-8165	10/30/2013	PI	1 possible	$ 10,000	Failure to yield from stop sign	4:38 PM	Dry, Clear	33	17	WB	NB
16	23-8165	10/31/2013	PDO		$ 19,000	Failure to yield from stop sign	9:20 AM	Dry, Clear	59	22	WB	NB
17	23-8165	11/22/2013	PDO		$ 4,500	Unknown	8:50 AM	Ice on Road	59	23	WB	NB
18	23-8165	2/19/2014	PI	1-Minor	$ 4,000	Failure to yield from stop sign	11:32 AM	Dry, Clear	32	77	EB	NB
19	23-8165	5/1/2014	PI	1-Minor	$ 12,000	Failure to yield from stop sign	10:26 AM	Dry, Coudy	72	23	EB	SB
14		Total Accidents		0 fatality 1 major 7 minor 8 possible	$ 162,600	Total Property Damage						

0	Fatalities @	$ 4,500,000		$ -
1	Major @	$ 325,000		$ 325,000
7	Minor @	$ 65,000		$ 455,000
8	Possible @	$ 35,000		$ 280,000
	Property Damage			$ 162,600

TOTAL DAMAGE $ 1,222,600

252



File Name and Date
Plotted By

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Kurt D. Bailey Date Prepared: Aug 4, 2014

Intersection: NE 56th Street and NE 62nd Avenue

Improvement

Proposed Improvement(s): Add Red Flashing Beacons above Stop signs on NE 62 Ave. and add yellow flashing beacons on approaches to intersection on NE 56 St.

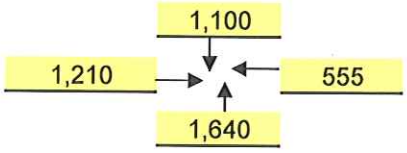
$ 30,000	Estimated Improvement Cost, **EC**	10	Est. Improvement Life, years, **Y**
$ 500	Other Annual Cost (after initial year), **AC**	62	Crash Reduction Factor (integer), **CRF**
$ 4,055	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 34,055	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT Traffic Count 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,644,325 Current Annual Entering Veh., **AEV** = DEV * 365

5,492 veh / day, Final Year DEV, **FDEV**

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

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

4,505 Current Daily Entering Vehicles, **DEV**

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

Crash Data

7/1/2009 First full year --> 7/1/2014 Last full year 5.0 years, Time Period, **T**

Additional months values as of Dec. 2007

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
11	Injury Crashes	7	Minor Injuries @	$65,000	$ 455,000
		8	Possible Injuries @	$35,000	$ 280,000
8	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 162,600
19	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,222,600

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

$ 64,347 Cost per Crash, **AVC** = LOSS / TA

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

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

$ 151,602 Crash Costs Avoided in First Year, AAR x AVC

25.8 Total Avoided Crashes, TECR x CRF/ 100

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

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

$ 1,337,823 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 = $1,337,823 : $34,055 = **39.28** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: H34 West Pavement Widening

Applicant: Montgomery County

Contact Person: Bradley Skinner, PE & PLS Title: County Engineer

Complete Mailing Address: PO Box 95
Red Oak, IA 51566

Phone: 712-623-5197 (Area Code) E-Mail: bskinner@montgomerycoia.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): Mills County

Contact Person: Kevin Mayberry, PE Title: County Engineer

Complete Mailing Address: 403 Railroad Avenue
Glenwood, IA 51534

Phone: 712-527-4873 (Area Code) E-Mail: kmayberry@millscoia.us

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 591,706

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 County of Montgomery

Signed: _____ 8/12/14
Signature Date Signed

Bradley Skinner, County Engineer
Typed Name

Attest: Denise A Manard 8/12/14
Signature Date Signed

Denise Manard, Office Manager
Typed Name

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 Mills

Signed: Kevin D Mayberry — 8/12/14

Signature — Date Signed

Kevin D. Mayberry

Typed Name

Attest: [illegible] — 8/12/14

Signature — Date Signed

Richard L. Parks

Typed Name

Montgomery County Secondary Roads

P.O. Box 95, Red Oak, Iowa 51566

Phone: (712) 623-5197 / Fax: (712) 623-9477

August 12, 2014

2014 TSIP Application Narrative
H34 West Pavement Widening
Montgomery County and Mills County, Iowa

The proposed project entails County Highway H34 (Montgomery County 200th Street), from a previous widened section near the East City Limits of Emerson, easterly to a previously awarded widening project in Montgomery County at the intersection with County Highway M37 (Boxelder Avenue). The existing roadway is comprised of an Iowa Highway Commission built ten-inch PCC slab, originally built 18-feet wide with curbs in 1930. The curbs were removed in 1989 which allows less than an additional foot of width, but does now allow water to drain from the highway. As an integral link between Emerson on US Highway 59 and Red Oak, this highway carries between 400 and 500 vehicles per day including significant truck traffic.

Numerous pavement departures (tires off roadway) occur on the narrow roadway every day, with many documented roadway departure incidents resulting in serious and fatal accidents in recent years. This highway has been a major priority for shoulder maintenance over the years, however, edge ruts develop quickly and hazards frequently develop after rainstorms or just from routine traffic. In short, the roadway is insufficient with safety issues for current traffic demands.

Montgomery and Mills Counties propose to extend the concept of the project awarded last year, on H34 from Montgomery County Highway M37 to Fernwood Avenue, to include the above described corridor for widening of five to six foot to accomplish a 24-foot wide pavement for this heavily traveled Farm-to-Market and Federal Aid route. There is generally adequate existing shoulder width to accomplish said widening and allow for a three foot or greater aggregate shoulder going forward.

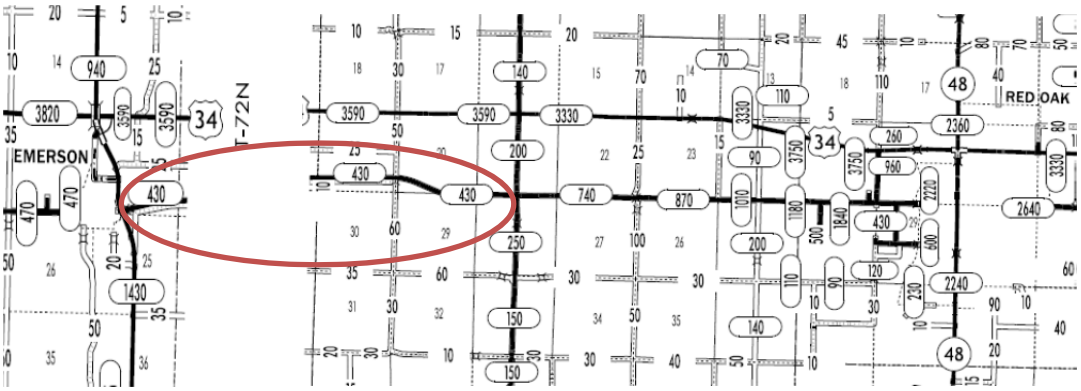
ENGINEERS ESTIMATE - TSIP - EMERSON TO BOXELDER - JOINT APPLICATION

8/12/2014

15005' W/ 3' PCC EACH SIDE		UNIT	QTY	UNIT PRICE	TOTAL
2102-2710070	EXCAVATION CL 10, RDWY & BORROW	CY	2500	$ 4.53	$ 11,325.00
2111-8174200	GRANULAR SUBBASE, PLACE ONLY	SY	10000	$ 2.55	$ 25,500.00
2121-7425011	GRANULAR SHOULDER TYPE A, PLACE ONLY	TON	1575	$ 5.41	$ 8,520.75
2302-1200070	PCC PAVEMENT WIDENING 7 IN	SY	10000	$ 31.88	$ 318,800.00
2518-6910000	SAFETY CLOSURE	EACH	2	$ 149.92	$ 299.84
2528-8445110	TRAFFIC CONTROL	LS	1	$ 4,000.00	$ 4,000.00
2528-8445113	FLAGGERS	EACH	4	$ 348.88	$ 1,395.52
2533-4980005	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
2527-9263117	PAINTED PAVEMENT MARKINGS, DURABLE	STA	600	$ 7.03	$ 4,218.00
2527-9263180	PAVEMENT MARKINGS REMOVED	STA	600	$ 22.42	$ 13,452.00
			TOTAL	PCC	***$ 407,511.11***

Admin/Design/Inspection	10%	$40,751.11
Inflation (2 Yrs to Construction)	10%	$44,826.22
Contingency	20%	$98,617.69
TOTAL PROJECT ESTIMATE		***$ 591,706.13***

E/ J

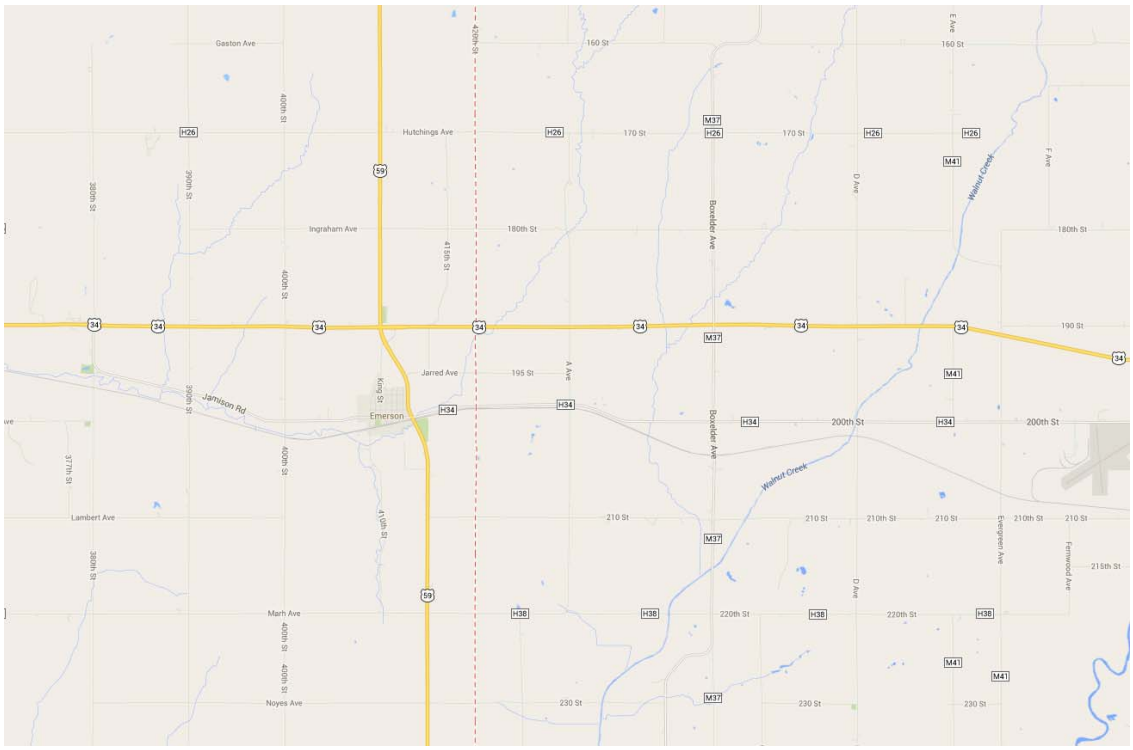


F

198 St

200th St

G


Gaston Ave
Hutchings Ave
Ingraham Ave
Jarred Ave
Jamison Rd
Emerson
Lambert Ave
Marh Ave
Noyes Ave
Boxelder Ave
Walnut Creek
160 St
170 St
180th St
190 St
195 St
200th St
210 St
210th St
220th St
230 St
H26
M37
M41
H34
H38
34
59

H

Iowa Department of Transportation

Major Cause Summary

Analysis Years: 2004 [1], 2005 [3], 2006 [1], 2007 [2], 2008 [1], 2009 [1], 2010 [1], 2011 [1], 2012 [1]

Crash Summary:

Fatal	2
Major Injury	1
Minor Injury	-
Possible/Unknown	2
PDO	7
Total Crashes	12

Injury Summary:

Fatal	3
Major Injury	1
Minor Injury	2
Possible	2
Unknown	-
Total Injuries	8

TOT Property Damage: $73,550

AVG Property Damage: $6,129

Surface Condition Summary:

Dry	7
Wet	-
Ice	1
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	2
Not Reported	1
Total Crashes	12

Major Cause Summary:

3	Animal
	Ran Traffic Signal
	Ran Stop Sign
2	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
2	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
3	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
1	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
	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:

None

Analyst:

Notes: City of Norway in Benton Co. (2004-2014)

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Montgomery/Mills Prepared by: Stephen Bianchetta Date Prepared: Aug 11, 2014

Location: Emerson Corp Lim to Boxelder Ave

Improvement

Proposed Improvement(s): Pavement Widening, 3ft paved Symmetrical

$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	42	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: IDOT 2008 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.10	450	Non-Primary, Secondary, Pave
3.10	miles total	

1,395 Current Vehicle Miles / Day, **VM**

1,702 End of Life Veh. Miles / Day

509,175 Current Veh. Miles / Year, **AM**

11,211,526 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

2003 First full year --> 2012 Last full year 10.0 years, Time Period, **T**

Additional months values as of May 2014

2	Fatal Crashes →	2	Fatalities @	$4,500,000	$ 9,000,000
		2	Major Injuries @	$325,000	$ 650,000
1	Injury Crashes →	2	Minor Injuries @	$65,000	$ 130,000
		1	Possible Injuries @	$35,000	$ 35,000
1	Property Damage Only		(assumed cost per crash)	$7,400	$ 29,600
			-OR- enter all Property Costs of all crashes:		
4	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 9,844,600

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

$2,461,150 Cost per Crash, **AVCR** = LOSS / TA

8.8 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 413,473 Crash Costs Avoided in First Year, AAR x AVCR

3.7 Total Avoided Crashes, TCR x CRF/ 100

78.6 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 6,107,291 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 = $6,107,291 : $500,000 = **12.21** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project F31 Curve Realignment

Applicant Dallas County Road Department

Contact Person Bryan DeJong / Jim George Title Asst. to Eng. / County Eng.

Complete Mailing Address 415 River St.

Adel, IA 50003

Phone 515-993-4289 (Area Code) E-Mail jim.george@co.dallas.is.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 $ 507,456

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 Dallas County Road Dept.

Signed: J George — 8/8/14

Signature — Date Signed

Jim George

Typed Name

Attest: Bryan De Jong — 8/8/14

Signature — Date Signed

Bryan DeJong

Typed Name

A

Motion by Supervisor Hanson and seconded by Supervisor Golightly to approve the following Resolution:

RESOLUTION 2014-009

WHEREAS, a recent Minnesota D.O.T. Risk Assessment of 19,730 curves found that " . . . over 50% of all severe (fatal & serious injury) road departure crashes occurred in horizontal curves whereas curves made up only approximately 5% of the system by mileage" within the state; and

WHEREAS, the Iowa Department of Transportation provides 100% Traffic Safety Improvement Program funding up to $500,000 per award to improve horizontal curves; and

WHEREAS, accidents have occurred along the two 90° curves on F31 at S Avenue and the Road Department recommends the reconstruction of that alignment as shown on the attached sheet labeled 'F31 Realignment' and dated 1/21/14;

NOW THEREFORE BE IT RESOLVED that the Board of Supervisors directs the department to proceed with grant application, road design and right-of-way acquisition for the proposed project.

AYE	**NAY**
Kim Chapman, Chairman	Kim Chapman, Chairman
Brad Golightly, Member	Brad Golightly, Member
Mark A. Hanson, Member	Mark A. Hanson, Member

Dated this 21st day of January, 2014

ATTEST:

Gene Krumm, Dallas County Auditor

DALLAS COUNTY ROAD DEPARTMENT

August 8, 2014

B

Office of Traffic & Safety
Iowa Dept. of Transportation
800 Lincoln Way
Ames, IA 50010

Dear Sir/Madam:

The Dallas County Road Department is applying for Traffic Safety Improvement Program Funds for a one mile stretch of F31. Currently, this portion of F31 contains two short radius 35 mph horizontal curves. Dallas County Road F31 connects the towns of Minburn, Granger, & Dallas Center and has a 2012 Annual Average Daily Traffic count of 400 on the section between R16 & R22 with current traffic primarily made up of area commuters, trucks, and agricultural equipment. Our Department is looking to replace/realign two existing 382' radius curves with two 1,500' curves during the 2015 construction season. Approximately 6.25 miles of deteriorated F31 pavement is scheduled for replacement in Dallas County Construction Program year 2016, therefore it was decided to take a proactive approach and pursue straightening the curves while the window of opportunity exists. Cost savings will be realized by realigning F31 curves prior to pavement replacement and by reducing overall pavement length by nearly ¼ mile for both construction and long term maintenance.

In addition to lengthening/straightening the curves, the road width will be increased from 22' to 24', with an 8' shoulder and 4:1 foreslopes. These improvements will take place within a 100' wide corridor of relocated roadway easement. The new F31 realignment will also provide an opportunity to rebuild a single safer intersection with S Ave. (see Exhibit G for details).

F31 crash history indicates that nearly 40% of the accidents occur in the curves that make up only 3.7% of the 6.25 miles. Crash history also shows all serious injuries occurred in accidents that happened in the curves. In a recent traffic study (7/22/14 through 8/1/14), our department placed a traffic counter in each of the F31 curves. The results indicate 84% of drivers exceeded the 35 mph speed limit in the curves and nearly 15% averaged more than 45 mph through the curves. Excessive speed played a part in all F31 curve related accidents while the tangent section accidents were predominantly weather related, animal avoidance, or driver error resulting mostly in property damage only. These statistics are validated by large studies done in Minnesota & Texas.

According to ISU GIS photos from the 1930's the 'T' intersections at the S Ave. gravel roads had already developed separated directional curves. In 1947-48 grading plans, the current 382' radius curves were designed & constructed for future paving.

In summary, the Dallas County Road Department's is requesting funding to help realign the curves to prepare for upcoming road reconstruction.

We greatly appreciate your consideration of this application and information as you make decisions regarding Traffic Safety Improvement Funds. Please contact us with additional questions or if more information is needed.

Respectfully submitted,

Jim George
Dallas County Engineer

Bryan De Jong
Dallas County Asst. to Engineer

415 River Street * Adel, Iowa 50003 * (515) 993-4289 * Fax (515) 993-3865

C

Dallas County F31 Curve Realignment Grading & Surfacing Cost Estimate

Item Code	Bid Item Description	Quantity		Unit Price	Total
2102 - 2710070	Class 10 Excavation	25500.000	CY	$4.53	$115,515.00
2105 - 8425015	Topsoil, Strip, Salvage, and Spread	14500.000	CY	$4.84	$70,180.00
2312 - 0	Granular Surface - Place Only	3167.990	CY	$3.50	$11,087.97
2312 - 8260051	Granular Surface, Class A Crushed Stone	1219.490	Tons	$23.07	$28,133.63
2401 - 6745650	Removal of Existing Structures	1.000	LS	$15,842.01	$15,842.01
2402 - 425031	Granular Backfill	33.600	Ton	$19.74	$663.26
2402 - 2720000	Class 20 Excavation	740.000	CY	$19.02	$14,074.80
2416 - 100036	Apron, 36	6.000	Each	$1,596.42	$9,578.52
2416 - 1180036	Culvert, RCP, 36	140.000	LF	$124.70	$17,458.00
2417 - 1040024	Culvert, CMP Ent. 24	420.000	LF	$49.53	$20,802.60
2510 - 6750501	Removal and Crushing	15950.709	SY	$6.00	$95,704.25
2518 - 6910000	Safety Closure	4.000	Each	$149.92	$599.68
2526 - 8285000	Construction Survey	1.000	LS	$18,744.45	$18,744.45
2528 - 8445110	Traffic Control	1.000	LS	*$6,000.00*	*$6,000.00*
2533 - 4980005	Mobilization	1.000	LS	*$60,000.00*	*$60,000.00*
2601 - 2636043	Native Grass Seeding	12.951	Acre	$962.66	$12,467.41
2601 - 2636044	Seed+Fertilize (Urban)	0.409	Acre	$1,749.13	$715.39
2602 - 20	Silt Fence	6050.000	LF	$1.47	$8,893.50
2602 - 30	Silt Fence - Ditch Checks	600.000	LF	$1.66	$996.00
		Estimated Total			**$507,456.48**

*Unit Prices are IaDOT BidX average prices except Traffic Control and Mobilization were reduced due to the scope of the project.

Funding Sources:

- Right-of-Way Acquisition & Realignment Grading to be funded by Dallas County local funds and TSIP Grant funds.
- F31 Pavement Replacement to be let as an STP project the following construction year.

D

F31 Curve Realignment Grading Time Schedule
Dallas County Road Department

Grading – TSIP funds

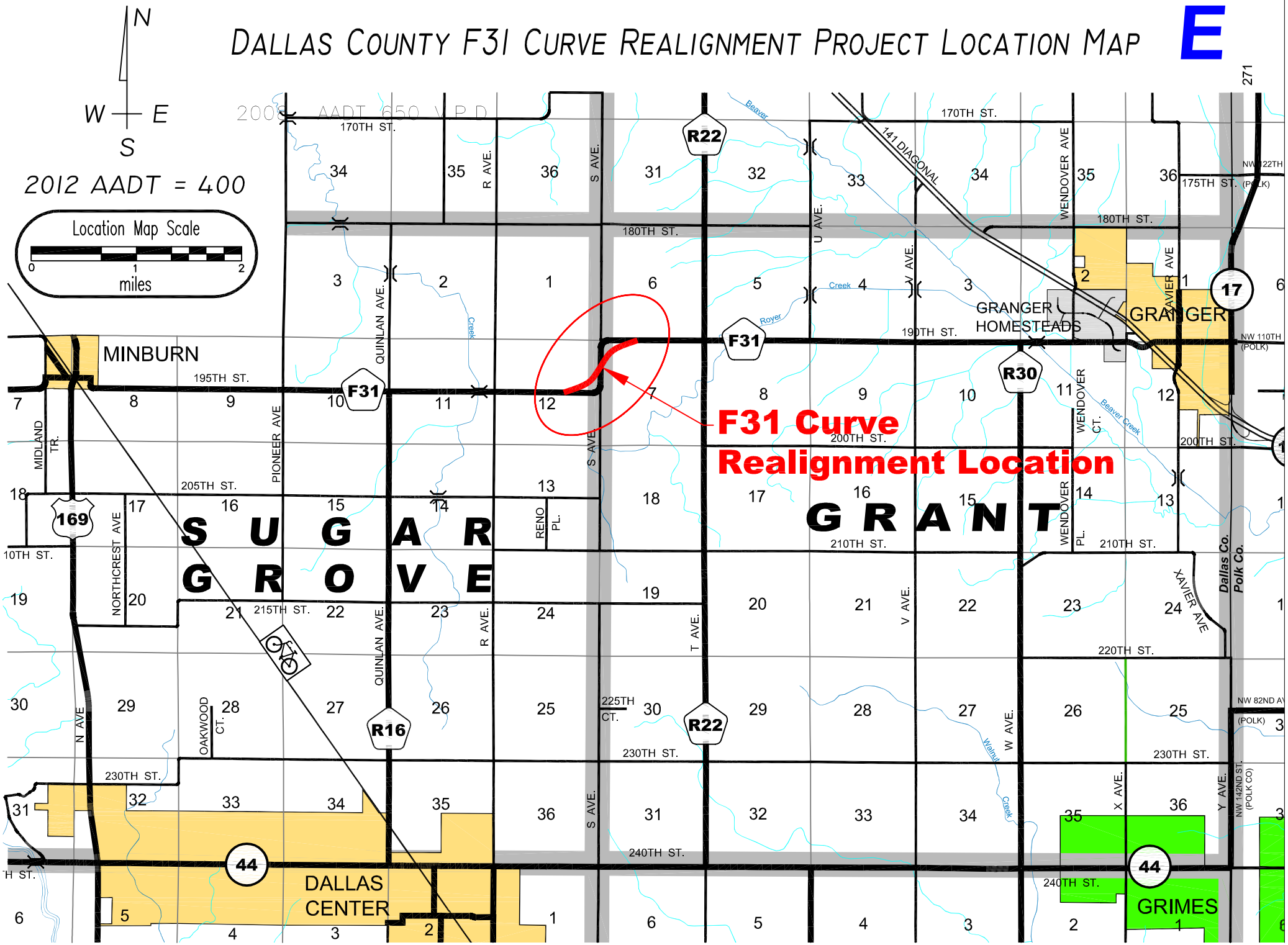
- **Letting** - late winter or early spring 2015.
- **Construction & Aggregate Surface** – summer/fall of 2015

Paving Project - STP funds

- **Letting** – Early 2016
- **Construction/Paving** – 2016 construction season

DALLAS COUNTY F31 CURVE REALIGNMENT PROJECT LOCATION MAP

E



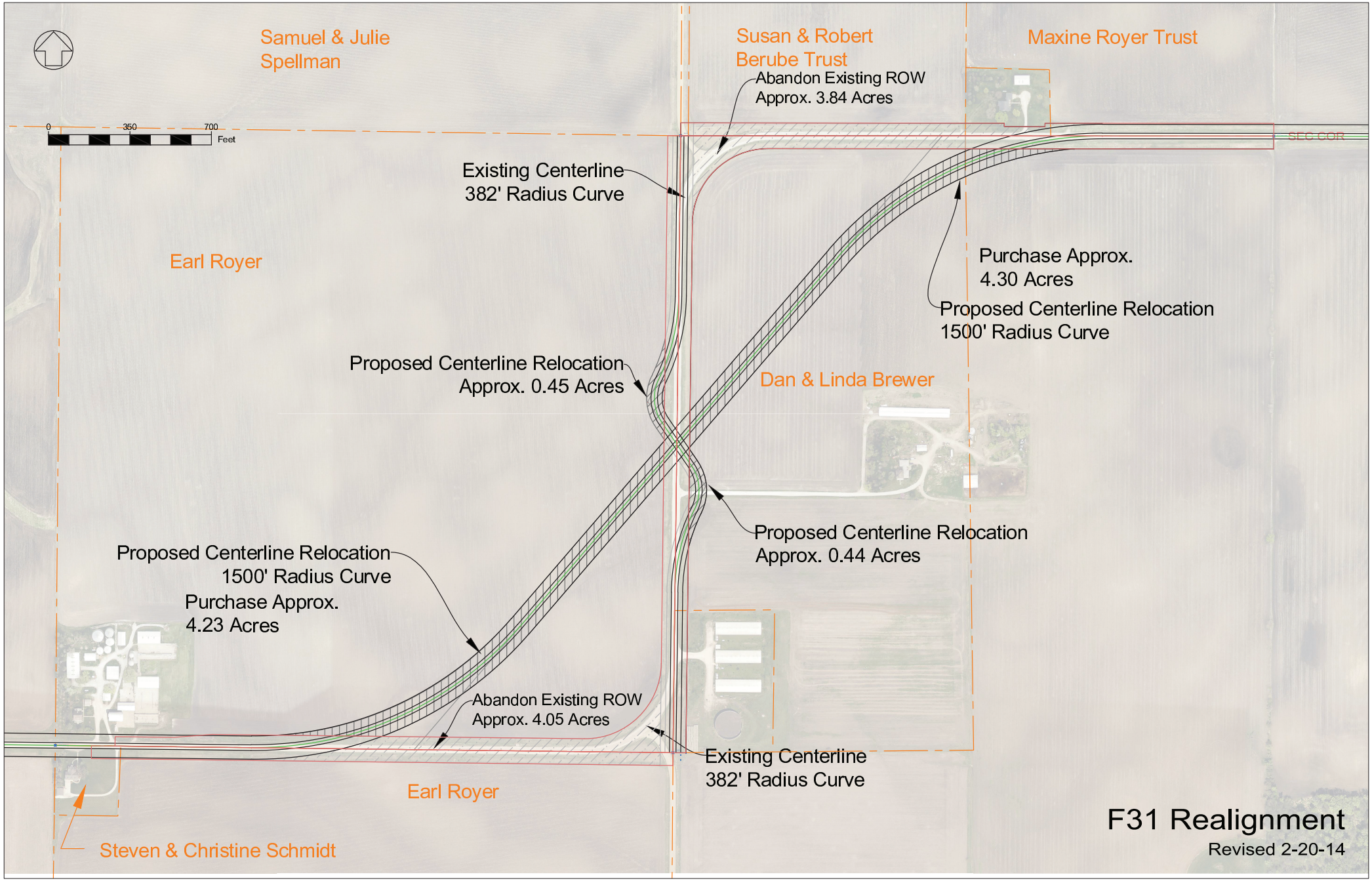
F31 South Curve – East Bound

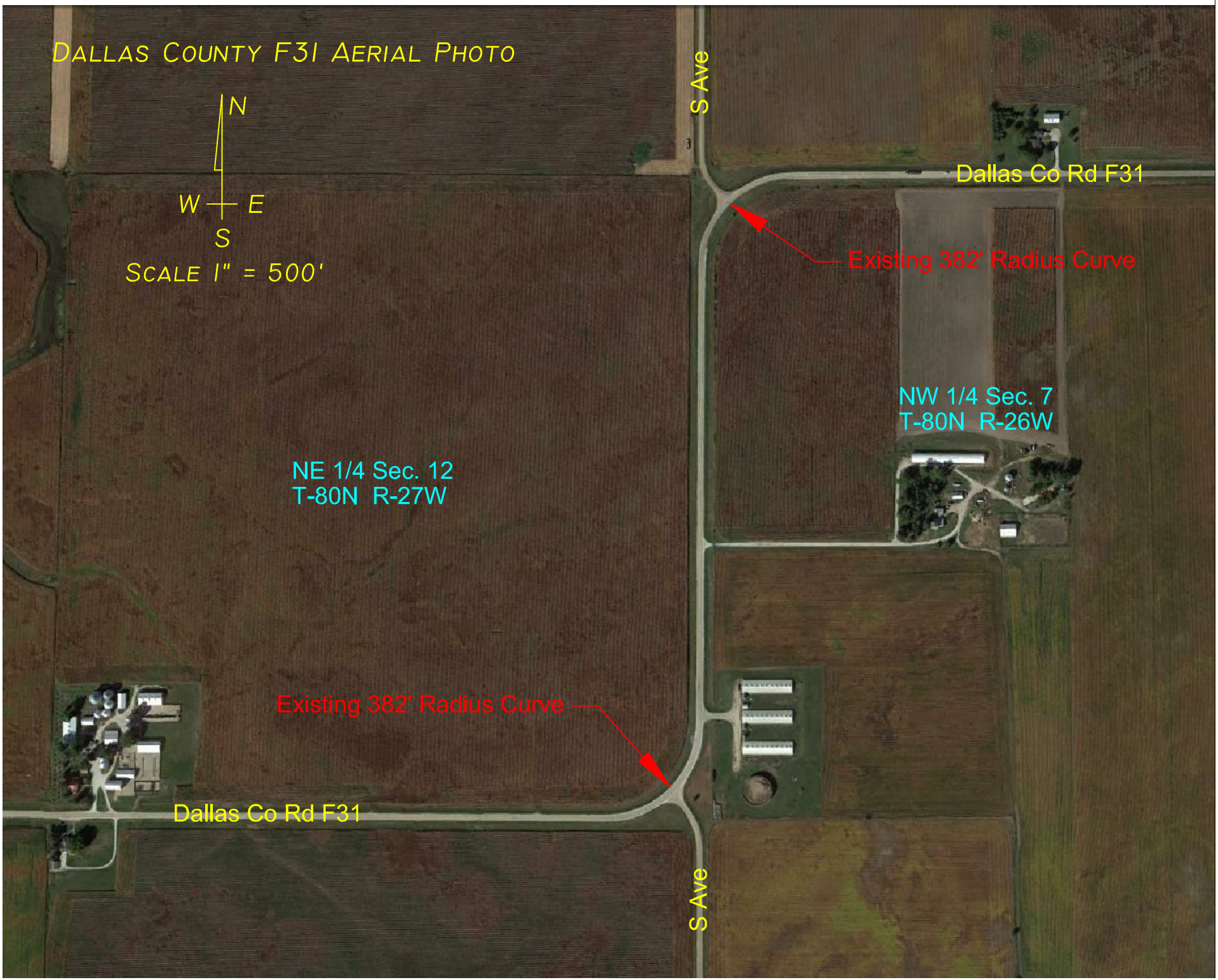
F31 North Curve – North Bound

↑From south S Ave intersection – ↓North S Ave intersection

South bound on F31 creates visual trap to S Ave.

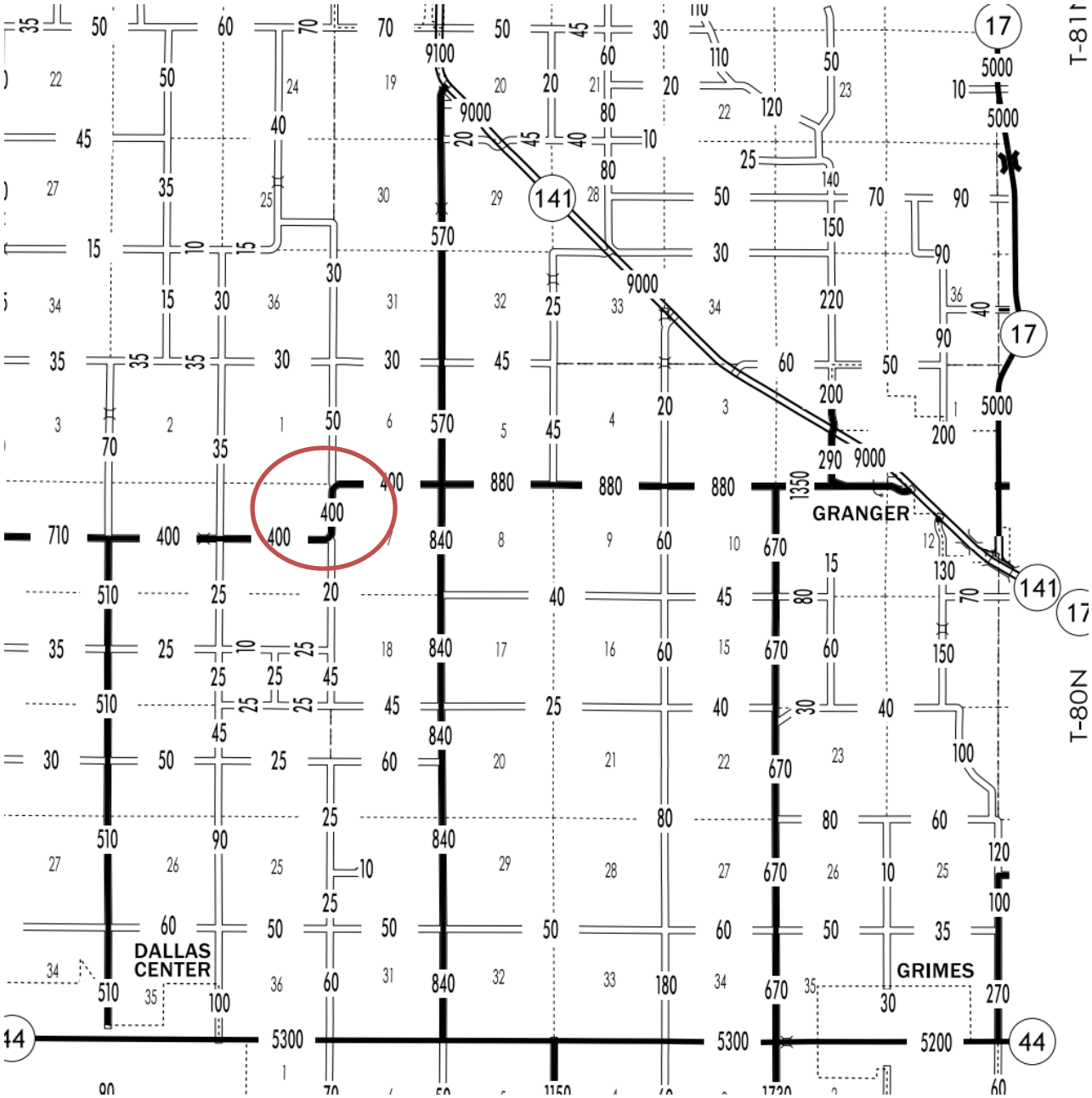
G


Samuel & Julie Spellman
Susan & Robert Berube Trust
Maxine Royer Trust
Abandon Existing ROW Approx. 3.84 Acres
0 350 700 Feet
SEC COR
Existing Centerline 382' Radius Curve
Earl Royer
Purchase Approx. 4.30 Acres
Proposed Centerline Relocation 1500' Radius Curve
Proposed Centerline Relocation Approx. 0.45 Acres
Dan & Linda Brewer
Proposed Centerline Relocation Approx. 0.44 Acres
Proposed Centerline Relocation 1500' Radius Curve
Purchase Approx. 4.23 Acres
Abandon Existing ROW Approx. 4.05 Acres
Existing Centerline 382' Radius Curve
Earl Royer
Steven & Christine Schmidt
F31 Realignment
Revised 2-20-14


DALLAS COUNTY F31 AERIAL PHOTO
N
W
E
S
SCALE 1" = 500'
S Ave
Dallas Co Rd F31
Existing 382' Radius Curve
NW 1/4 Sec. 7
T-80N R-26W
NE 1/4 Sec. 12
T-80N R-27W
Existing 382' Radius Curve
Dallas Co Rd F31
S Ave

H

277


GRANGER
DALLAS CENTER
GRIMES
141
17
44
T-80N

(BCA also submitted in xls format)

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

L

County: Dallas Co | Prepared by: Parker Ridgway | Date Prepared: Aug 7, 2014

Location: Dallas Co. Rd F31 approx. 1 to 1.5 miles West of the Dallas Co. Rd F31/R22 intersection

Improvement

Proposed Improvement(s): Realignment of approx 1 mile of road to replace two existing 382' radius curves with two 1500' radius curves.

$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	41	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 2012 AADT - Dallas Co | 2012 Date of traffic count

Length (mi.)	Two-way veh/day	Description
1.00	400	
1.00	miles total	

400	Current Vehicle Miles / Day, **VM**
488	End of Life Veh. Miles / Day
146,000	Current Veh. Miles / Year, **AM**
3,214,775	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**

0 Additional months | values as of May 2014

0	Fatal Crashes →		Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
2	Injury Crashes →		Minor Injuries @	$65,000	$ -
		1	Possible Injuries @	$35,000	$ 35,000
1	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 14,500
3	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 699,500

0.60	Current Crashes / Year, **AA** = TA / T	**411.0**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 233,167	Cost per Crash, **AVCR** = LOSS / TA	**$ 847,233**	Present Value of Avoided Crashes, **BENEFIT**
13.2	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.25	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 57,359	Crash Costs Avoided in First Year, AAR x AVCR		
5.4	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 = $847,233 : $500,000 = **1.69** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Golden Road (B64) Pavement Rehab, US 18 to W51

Applicant: Fayette County

Contact Person: Alan A. Miller Title: County Engineer

Complete Mailing Address: 114 N. Vine Street
West Union, Iowa

Phone: (563)422-3552 (Area Code) E-Mail: amiller@co.fayette.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 $ 2,956,000

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 Fayette County Board of Supervisors

Signed: Darrel Dolf 3/31/14

Signature Date Signed

Darrel Dolf - Chairperson

Typed Name

Attest: Lori Moellers 3/31/14

Signature Date Signed

Lori Moellers - Fayette County Auditor

Typed Name

C.

Preliminary Cost Opinion and Funding Sources
Fayettte County Project No. STP-S-C033( )--5E-33

No.	Item	Description	Unit	Total	Unit Price	Total
0010	2121-7425020	Granular Shoulders, Type B	Ton	10,300	$10.00	$103,000.00
0020	2210-0475105	Choke Stone Base	Ton	504	$12.00	$6,048.00
0030	2210-0475290	Macadam Stone Base	Ton	470	$15.00	$7,050.00
0070	2310-5151040	Portland Cement Concrete Overlay, Furnish Only	CY	27,590	$70.00	$1,931,300.00
0080	2310-5151551	Portland Cement Concrete Overlay, Placement Only (White Topping)	SY	141,860	$4.20	$595,812.00
0090	2510-6745850	Removal of Pavement	SY	1,600	$15.00	$24,000.00
0100	2518-6910000	Safety Closures	Each	20	$150.00	$3,000.00
0110	2527-9263117	Painted Pavement Markings, Durable	STA	1,500	$30.00	$45,000.00
0130	2525-8445110	Traffic Control	LS	1	$10,000.00	$10,000.00
0140	2528-8445113	Flaggers	Each	20	$350.00	$7,000.00
0150	2533-4980005	Mobilization	LS	1	$27,000.00	$27,000.00
0160	2548-0000200	Milled Shoulder Rumble Strips, PCC Surface	STA	852.00	$25.00	$21,300.00
					10% Contingency	$278,051.00
					Total Estimate Project Cost	$2,955,561.00

Safety Items

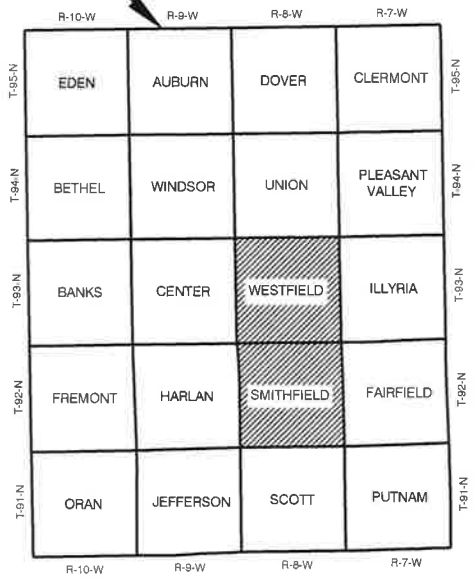
0070	2310-5151040	Portland Cement Concrete Overlay, Furnish Only	CY	5,520	$70.00	$386,400.00
0080	2310-5151551	Portland Cement Concrete Overlay, Placement Only (White Topping)	SY	28,330	$4.20	$118,986.00
0160	2548-0000200	Milled Shoulder Rumble Strips, PCC Surface	STA	852.00	$25.00	$21,300.00
					10% Contingency	$52,669.00
					Total Estimated Safety Item Cost	$579,355.00

Anticipated Funding Sources
Federal STP - Regional = $2,200,000
TSIP / FM = $500,000 + $256,000

E.

Westfield and Smithfield Townships

Fayette County, Iowa



Fayette County, Iowa
Golden Road Reconstruction
Project No. STP-C033( )--5E-33

Begin DIV. I

End DIV. I

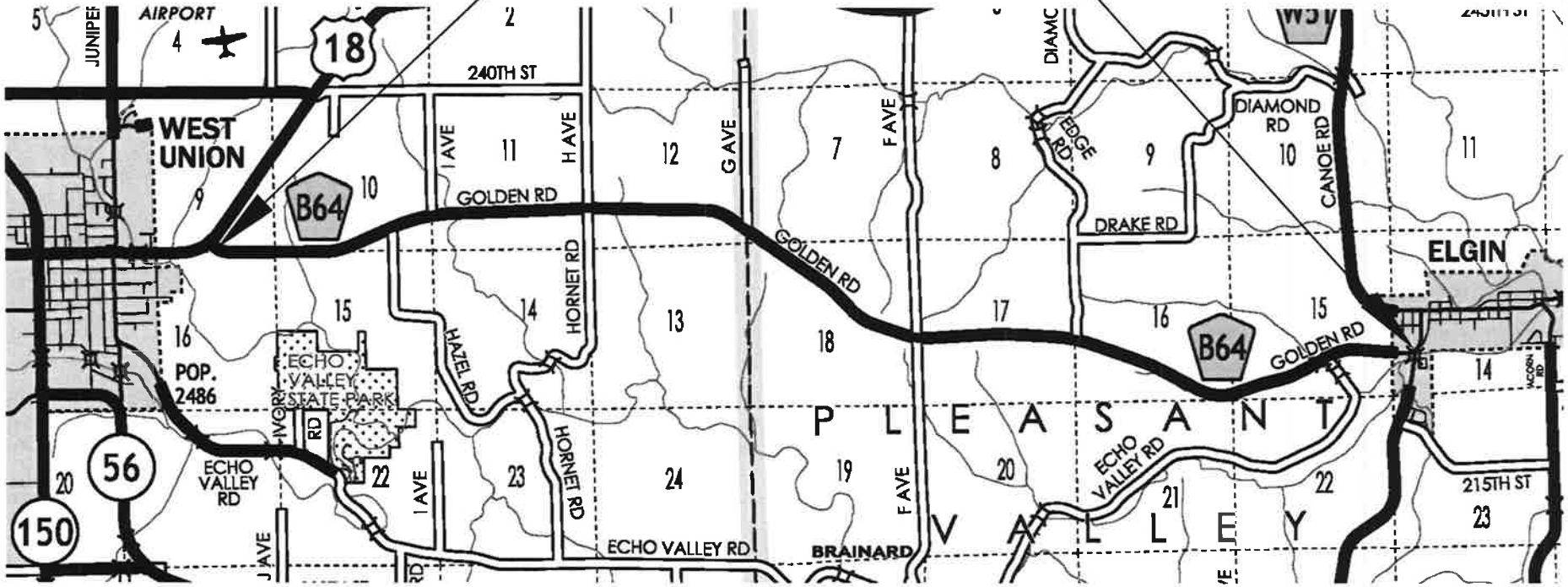


Photo #1 – From US 18 looking east along Golden Road

Photo #2 – Typical Pavement Condition

Photo #3 Looking East – Typical Pavement Condition and Topography

Photo #4 Looking East – Typical Topography

Photo #5 – Typical Edge of Existing HMA Paving

Photo #6 – Typical Topography

Photo #7 – From Cedar Road (W51) near EOP looking West

General Notes

G & H

No.	Revision/Issue	Date

Project Name and Address

STP-S-C033( )--5E-33
TPMS No. 20540
Golden Road (B64)
IA Highway 18 to City of Elgin

Project: Golden Road

Date: 8/14/2014

Scale: 1" = 400'

Sheet: D.01

General Notes

G & H

No.	Revision/Issue	Date

Project Name and Address

STP-S-C033( )--5E-33
TPMS No. 20540
Golden Road (B64)
IA Highway 18 to City of Elgin

Project: Golden Road

Date: 8/14/2014

Scale: 1" = 200'

Sheet: D.02

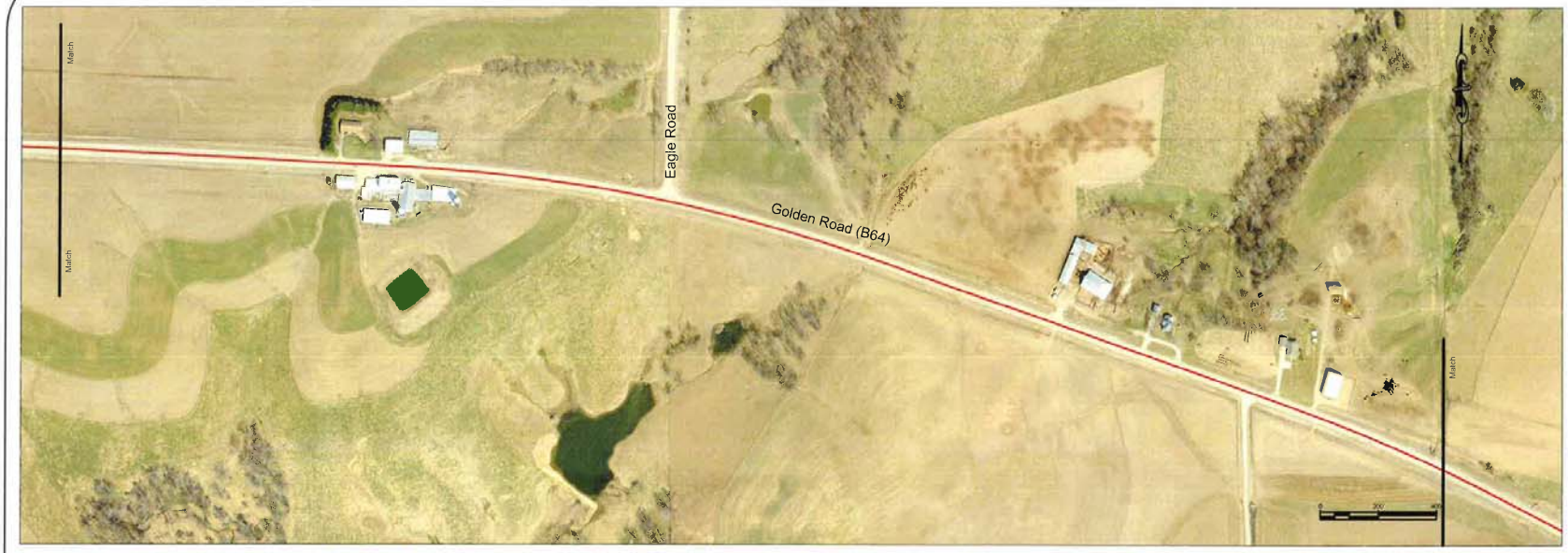
General Notes

G & H

No.	Revision/Issue	Date

Project Name and Address
STP-S-C033( )--5E-33
TPMS No. 20540
Golden Road (B64)
IA Highway 18 to City of Elgin

Project: Golden Road
Date: 8/14/2014
Scale: 1" = 200'
Sheet: D.03



General Notes

G & H

No.	Revision/Issue	Date

Project Name and Address
STP-S-C033( )--5E-33
TPMS No. 20540
Golden Road (B64)
IA Highway 18 to City of Elgin

Project: Golden Road
Date: 8/14/2014
Scale: 1" = 200'
Sheet: D.04

292

Golden Road Grant Application 8-14-14.dwg

3/19/2007

General Notes

G & H

No.	Revision/Issue	Date

Project Name and Address

STP-S-C033( )--5E-33
TPMS No. 20540
Golden Road (B64)
IA Highway 18 to City of Elgin

Project: Golden Road

Date: 8/14/2014

Scale: 1" = 200'

Sheet: D.05

Iowa Department of Transportation

Abbreviated Crash Report

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
01/01/2004	2004200656			Poss/Unk	B064 / GOLDEN RD and EDGE RD measuring 2 Miles West from B064 /
01/16/2004	2004202221			Minor	B064 / GOLDEN RD measuring 1.5 Miles East from US 0018 / BRADFORD ST
05/26/2004	2004224691			PDO	B064 / GOLDEN RD measuring 0.5 Miles West from B064 / GOLDEN RD and W
09/25/2005	2005248765			PDO	B064 / GOLDEN RD measuring 0.5 Miles West from B064 / GOLDEN RD and W
10/03/2005	2005248749			PDO	B064 / GOLDEN RD and I AVE
12/10/2005	2005266370			PDO	B064 / GOLDEN RD measuring 0.5 Miles West from B064 / GOLDEN RD and
12/11/2006	2006256912			Poss/Unk	B064 / GOLDEN RD measuring 1 Miles West from B064 / GOLDEN RD and W
12/24/2006	2006261005			Major	B064 / GOLDEN RD measuring 1 Miles East from EDGE RD and B064 /
01/02/2007	2007200343			PDO	B064 / GOLDEN RD measuring 0.25 Miles East from I AVE and B064 /
04/29/2007	2007374033			PDO	B064 / GOLDEN RD measuring 0.75 Miles West from CEDAR ST and W UNION
07/14/2007	2007389412			PDO	B064 / GOLDEN RD
01/08/2008	2008416397	08000205		PDO	B064 / GOLDEN RD
02/05/2008	2008428644	08000957		Minor	B064 / GOLDEN RD measuring 0.2 Miles East from I AVE and B064 /
03/20/2008	2008435487	16896ISP		Major	GOLDEN RD / .3 MILES EAST OF HAZEL RD
04/19/2008	2008437155	08-003037		PDO	B064 / GOLDEN RD
05/23/2008	2008443215	08-004224		Minor	H AVE and HORNET RD and B064 / GOLDEN RD
08/03/2008	2008454979	08006824		PDO	B064 / GOLDEN RD measuring 87 Feet East from EDGE RD and B064 /
09/09/2008	2008460449			PDO	B064 / GOLDEN RD measuring 2.5 Miles West from W UNION RD and B064 /
10/26/2008	2008469256	08010232		PDO	GOLDEN RDAT 9709 GOLDEN ROAD
10/27/2008	2008468351	08010274		PDO	B064 / GOLDEN RD measuring 0.4 Miles East from US 0018 / HARDING RD
03/02/2009	2009497118	09001935		Fatal	B064 / GOLDEN RD measuring 0.6 Miles East from US 0018 / HARDING RD
05/23/2009	2009508172	09005219		PDO	B064 / GOLDEN RD
09/30/2009	2009528235	09010009		PDO	B064 / GOLDEN RD
12/30/2009	2009545844	09-013238		PDO	B064 / GOLDEN RD
07/26/2010	2010584015	2010043880		Major	GOLDEN RD / WEST OF EDGE RD
09/27/2010	2010592380	10-009861		PDO	B064 / GOLDEN RD
09/28/2010	2010592382	10009883		PDO	B064 / GOLDEN RD
05/16/2011	2011630133	11004228		PDO	B064 / GOLDEN RD
05/23/2011	2011631432	11004500		PDO	B064 / GOLDEN RD WEST OF I AVE.
07/30/2011	2011641905	2011044375		PDO	B064 / GOLDEN RD
11/05/2011	2011655471	11-009989		PDO	B064 / GOLDEN RD
12/19/2011	2011663015	11-011395		PDO	B064 / GOLDEN RD

Iowa Department of Transportation

Abbreviated Crash Report

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
12/30/2011	2011666097	11-011672		Minor	G AVE and B064 / GOLDEN RD
01/13/2012	2012668175	12-000372		Poss/Unk	B064 / GOLDEN RD
02/02/2012	2012670741	12-000989		Minor	B064 / GOLDEN RD
02/02/2012	2012670742	12-000992		Minor	B064 / GOLDEN RD measuring 0.5 Miles Northwest from F AVE and B064 /
02/02/2012	2012670743	12-000988		PDO	B064 / GOLDEN RD measuring 300 Feet West from B064 / GOLDEN RD and I
06/26/2012	2012693156	12-005887		PDO	B064 / GOLDEN RD
09/29/2012	2012705382	12-009421		PDO	B064 / GOLDEN RD
11/18/2012	2012714041	12-011216		PDO	B064 / GOLDEN RD measuring 0.25 Miles West from H AVE and B064 /
12/11/2012	2012716352	12011940		PDO	B064 / GOLDEN RD 1/2 MILE EAST OF HORNET ROAD
01/07/2013	2013720994	13000190		PDO	B064 / GOLDEN RD WEST OF F AVE
03/06/2013	2013729706	13-001842		PDO	B064 / GOLDEN RD
04/03/2013	2013734080			PDO	B064 / GOLDEN RD measuring 200 Feet East from B064 / GOLDEN RD and I
04/14/2013	2013735197	13-002981		PDO	B064 / GOLDEN RD
09/27/2013	2013759386	13-008731		PDO	B064/GOLDEN RD
10/30/2013	2013766135	13-009830	Elgin	PDO	B064/GOLDEN RD

Selection Filter:

None

Analyst: Alan A. Miller

Notes: Golden Road (B64) from US 18 to Cedar Road (W51)

Iowa Department of Transportation

Major Cause Summary

Report Version 1.1 Jan 2005

Analysis Years: 2004 [3], 2005 [3], 2006 [2], 2007 [3], 2008 [9], 2009 [4], 2010 [3], 2011 [6], 2012 [8], 2013 [6]

Crash Summary:

Fatal	1
Major Injury	3
Minor Injury	6
Possible/Unknown	3
PDO	34
Total Crashes	47

Injury Summary:

Fatal	1
Major Injury	4
Minor Injury	6
Possible	5
Unknown	-
Total Injuries	16

TOT Property Damage: $282,800

AVG Property Damage: $6,017

Surface Condition Summary:

Dry	15
Wet	-
Ice	10
Snow	4
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	17
Total Crashes	47

Major Cause Summary:

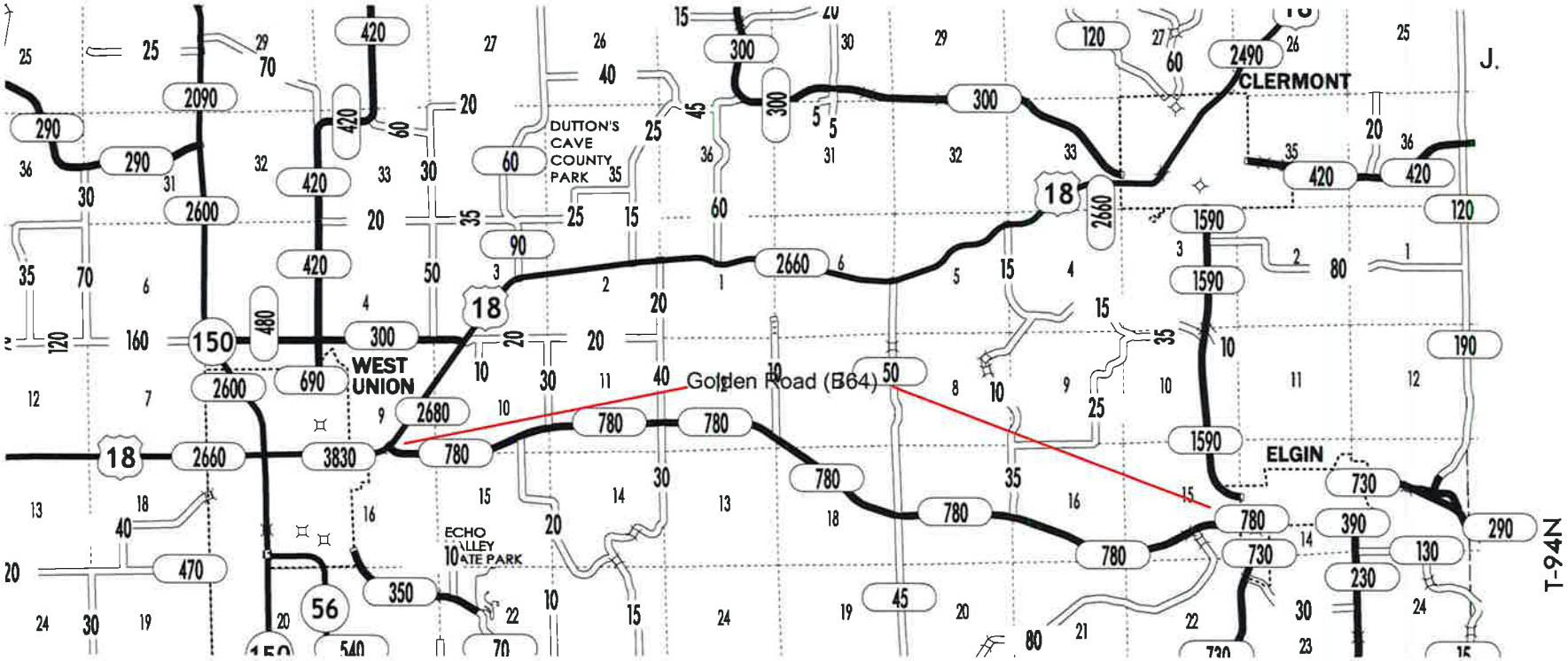
20	Animal
	Ran Traffic Signal
	Ran Stop Sign
1	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
1	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
4	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
6	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
6	Ran Off Road - Right
	Ran Off Road - Straight
6	Ran Off Road - Left
	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
1	Other: Other Improper Action
1	Unknown
1	Other: No Improper Action
	None Indicated

Selection Filter:

None

Analyst: Alan A. Miller

Notes: Golden Road (B64) from US 18 to Cedar Road (W51)


Golden Road (B64)
WEST UNION
CLERMONT
ELGIN
DUTTON'S CAVE COUNTY PARK
ECHO VALLEY STATE PARK
J.
T-94N

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Fayette Prepared by: Alan A. Miller, P.E. Date Prepared: Mar 28, 2014

Location: Golden Road (B64) from US 18 east 8.1 miles to Cedar Road (W51)

Improvement

Proposed Improvement(s): Pave 3' Shoulders, Shoulder Rumbles, Safety Edge

$ 500,000	Estimated Improvement Cost, **EC**	20	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, **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: DOT Traffic Count Data 2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
8.08	780	US 18 East to W51
8.08	miles total	

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

6,302 Current Vehicle Miles / Day, **VM**

7,690 End of Life Veh. Miles / Day

2,300,376 Current Veh. Miles / Year, **AM**

50,651,988 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

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

1	Fatal Crashes	Fatalities @	$3,500,000	$	-
		4 Major Injuries @	$240,000	$	960,000
12	Injury Crashes	6 Minor Injuries @	$48,000	$	288,000
		3 Possible Injuries @	$25,000	$	75,000
35	Property Damage Only	(assumed cost per crash)	$2,700	$	-
		-OR- enter all Property Costs of all crashes:		$	129,700
48	Total Crashes, **TA**	Total $ Loss, **LOSS**		$	1,452,700

4.80	Current Crashes / Year, **AA** = TA / T	**208.7**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 30,265	Cost per Crash, **AVCR** = LOSS / TA	$ 965,583	Present Value of Avoided Crashes, **BENEFIT**
105.7	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
2.16	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 65,372	Crash Costs Avoided in First Year, AAR x AVCR		
47.6	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 = $965,583 : $500,000 = **1.93** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Bloomfield / US 63 4 Lane to 3 Lane Conversion

Applicant: Iowa DOT - District 5

Contact Person: James Armstrong Title: District Engineer

Complete Mailing Address: 307 W. Briggs
Fairfield, IA 52556

Phone: 641-472-4171 (Area Code) E-Mail: James.Armstrong@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): 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 $ 45,000.00

Safety Funds Requested $ 45,000.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the _____

Signed: _____

Signature Date Signed

_____

Typed Name

Attest: _____

Signature Date Signed

_____

Typed Name

District 5 Office
307 W Briggs, PO Box 587 l Fairfield, Iowa 52556-0587
Phone: 641.469.4005 l Email: James.Armstrong@dot.iowa.gov

August 14th, 2014

RE: TSIP Application

Terry Ostendorf
Office of Traffic & Safety
800 Lincoln Way
Ames, Iowa 50010

Mr. Ostendorf:

Please find attached documentation relating to the TSIP application for U.S. 63 in the City of Bloomfield, Iowa. District 5 wishes to convert the existing four lanes of U.S. 63 to three lanes within the City. The City is currently working on Streetscapes project in the downtown area and the District would like to partner with the City on this project.

The following narrative describes the projects intent as outlined in the application instructions.

"A"

The City of Bloomfield is currently working towards sending the District a Resolution stating that this conversion will be in place for at least five years. Once we have received the resolution, the District will send the Office of Traffic and Safety a copy.

"B"

In Bloomfield, Iowa US 63 is a 4-lane undivided highway. The area in question has a speed reduction as you enter the central business district, both northbound and southbound, from 45 to 35 then 25 mph. Three signals control traffic at E. Franklin, W. Jefferson and W. Locust Streets. A roll out school stop sign is used at E. North Ave. during morning and afternoon school traffic.

The Major Cause Summary from CMAT is included showing crashes that could be avoided from the 3-lane environment vs the current 4-lane layout. The crashes that would be reduced are highlighted for your reference.

“C”

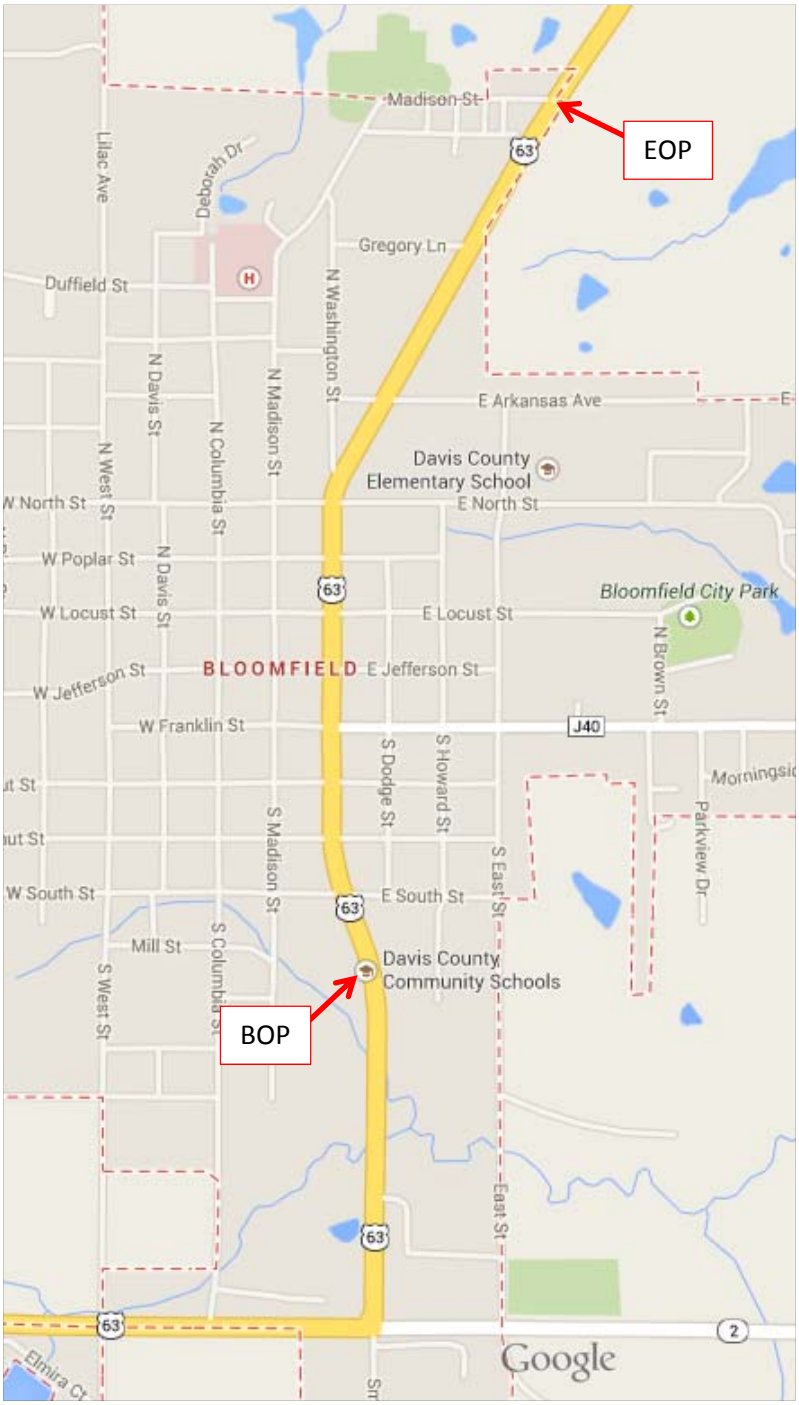
Using the average cost for statewide projects in 2013 the cost to remove paint from the current 4-lane configuration is $11,324.07. The cost to restripe the facility to a 3-lane configuration, including symbols, is $18,995.33. The cost for traffic control, mobilization, and contingency is estimated to be $14,680.60 for a total project cost of $45,000.00. The funds for this project come from the TSIP application or district monies.

“D”

The timeline for removal and restriping this section of US 63 will take place, as weather permits, early in 2015.

"E"

Roughly .5 miles north of the east junction of Iowa 2 / U.S. 63 north to just north of Madison Street. The approximate distance for this project is 1.25 miles.



“F”

South End – NB Transition Area

School Role Out at E. North Avenue

Downtown – 3 Signalized Intersections

North End – SB Transition Area

“G”

Project will be within the existing right of way; Surface Treatment Only

“H” – Spot Locations

South End – Near South Street

Downtown

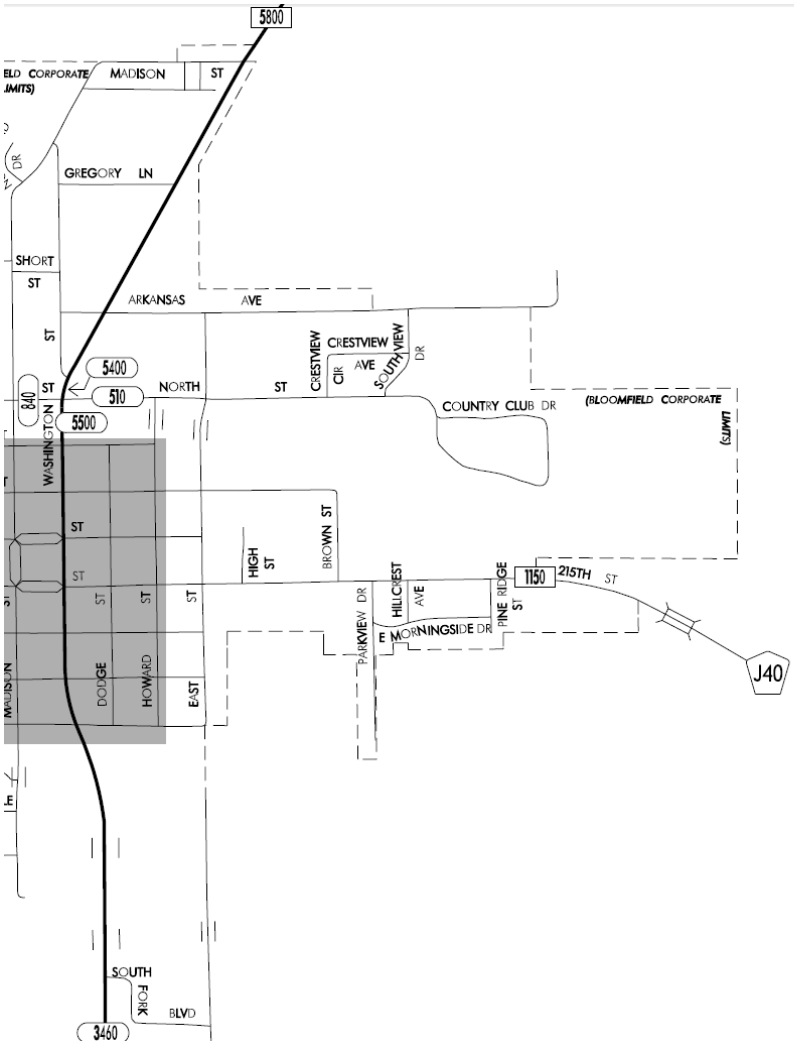
Between Poplar St and North St

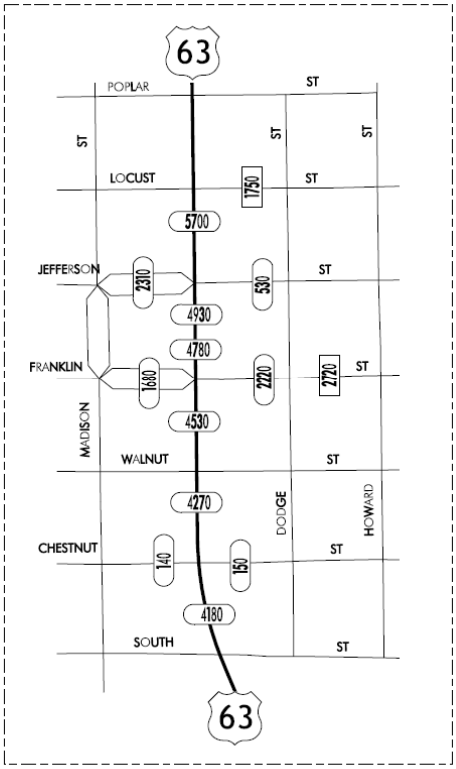
North End – Near Madison

"I" – N / A

"J" – Year 2010 (Actual Count Year)

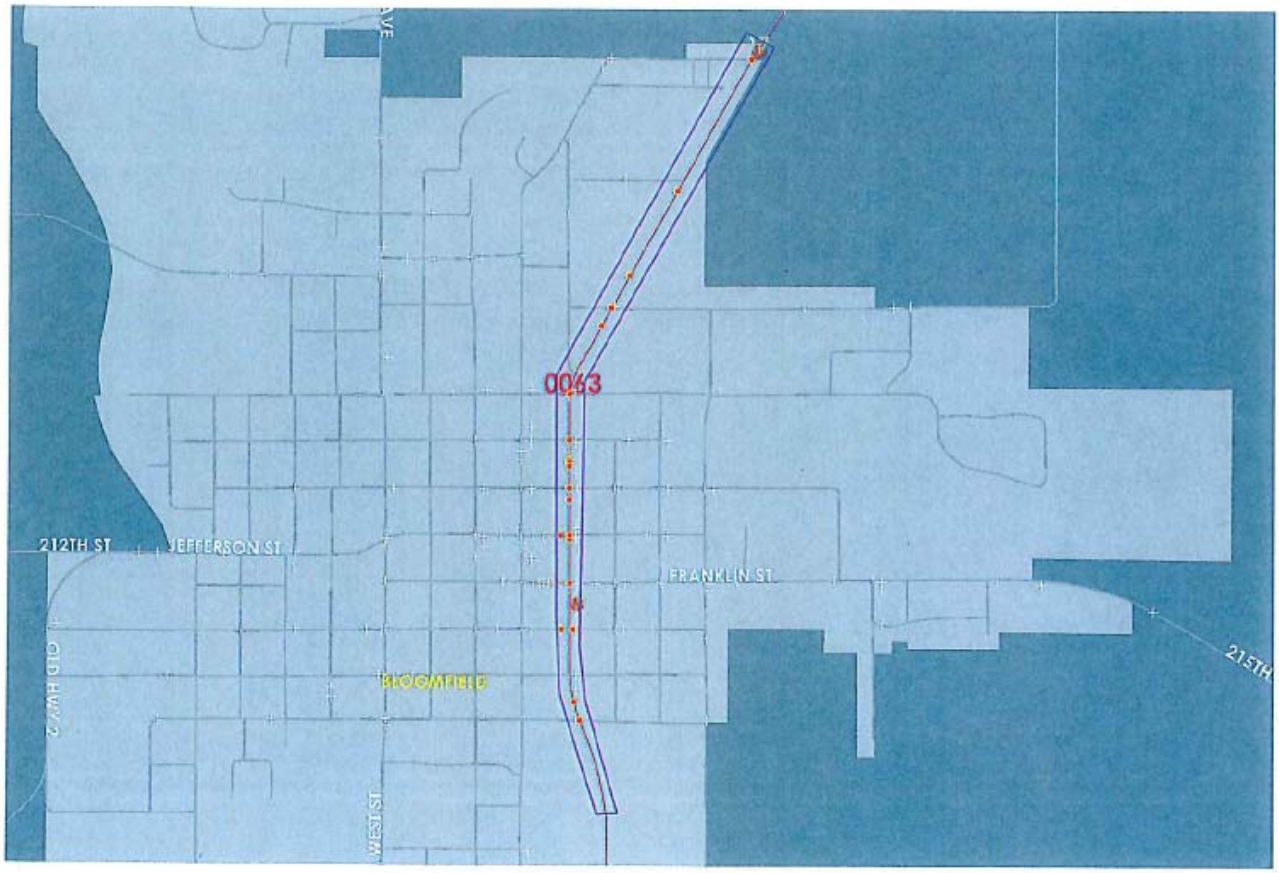
Counts range from 3460 ADT on the south end to to 5800 ADT on the north end.





"K"

Signals will not be modified


0063
212TH ST
JEFFERSON ST
FRANKLIN ST
BLOOMFIELD
WEST ST
215TH

Iowa Department of Transportation

Major Cause Summary

2009-2013 US 63 4-lane in Bloomfield

Analysis Years: 2009 [5], 2010 [3], 2011 [7], 2012 [9], 2013 [9]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	7
PDO	29
Total Crashes	36

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible	11
Unknown	-
Total Injuries	11

Surface Condition Summary:

Dry	32
Wet	1
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	2
Total Crashes	36

TOT Property Damage: $185,883

AVG Property Damage: $5,163

Major Cause Summary:

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

Selection Filter:

((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst:

Notes:

"L"

Rev. 4/08

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County:	Davis	Prepared by: Redeker	Date Prepared: Jul 24, 2014
Location:	US 63 in Bloomfield, 4-lane section		

Improvement

Proposed Improvement(s): Restriping in town from 4-lane to 3-lane

$ 45,000	Estimated Improvement Cost, EC	2	Est. Improvement Life, years, **Y**
$ 5,276	Other Annual Cost (after initial year), AC	37	Crash Reduction Factor, **CRF**
$ 9,950	Present Value Other Annual Costs, OC	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 54,950	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source:	IA DOT	2010	Date of traffic count

Length (mi.)	Two-way veh/day	Description		
1.27	5,500	US 63 @ North St.	6,985	Current Vehicle Miles / Day, **VM**
			7,125	End of Life Veh. Miles / Day
			2,549,525	Current Veh. Miles / Year, **AM**
			5,124,545	Total Projected Veh. Miles Over Life of Project, **TVMT**
1.27	miles total			$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$
1.0%	Projected Traffic Growth (0%-10%), G			

Crash Data

2009	First full year -->	2013	Last full year	5.0	years, Time Period, T	
0	Additional months				values as of Dec. 2007	
0	Fatal Crashes		Fatalities @		$3,500,000	$ -
			Major Injuries @		$240,000	$ -
7	Injury Crashes		Minor Injuries @		$48,000	$ -
		11	Possible Injuries @		$25,000	$ 275,000
29	Property Damage Only		(assumed cost per crash)		$2,700	$ 78,300
			-OR- enter Actual Cost of all property damage:			
36	Total Crashes, **TA**				Total $ Loss, **LOSS**	$ 353,300

7.20	Current Crashes / Year, **AA** = TA / T	282.4	Crashes / HMVM, Crash Rate, **CR**
$ 9,814	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
14.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8	$ 49,552	Present Value of Avoided Crashes, **BENEFIT**
2.66	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 26,144	Crash Costs Avoided in First Year, AAR x AVCR		
5.4	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 =	$49,552	:	$54,950	=	0.90 : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project H34 East Pavement Widening

Applicant Montgomery County

Contact Person Bradley Skinner, PE & PLS Title County Engineer

Complete Mailing Address PO Box 95

Red Oak, IA 51566

Phone 712-623-5197 (Area Code) E-Mail bskinner@montgomerycoia.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 $ 695,644

Safety Funds Requested $ 400,000

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 County of Montgomery

Signed: _____ 8/12/14
Signature Date Signed

Bradley Skinner, County Engineer
Typed Name

Attest: Denise A Manard 8/12/14
Signature Date Signed

Denise Manard, Office Manager
Typed Name

Montgomery County Secondary Roads

P.O. Box 95, Red Oak, Iowa 51566

Phone: (712) 623-5197 / Fax: (712) 623-9477

August 12, 2014

2014 TSIP Application Narrative
H34 Lane Widening East of Red Oak
Montgomery County, Iowa

The proposed project entails County Highway H34 (Montgomery County 200th Street), from the intersection with US Highway 34, four and one-half miles east to the intersection with N Avenue. The existing roadway is comprised of an Iowa Highway Commission built ten inch thick PCC slab, originally built 18-feet wide with curbs in 1930. The pavement was in-filled with asphalt and slurry mixtures over the last fifty years to provide for drainage. As an integral link between Red Oak and US Highway 71, this highway carries over 500 vehicles per day including significant truck traffic.

Numerous pavement departures (tires off roadway) occur on the narrow roadway every day, with many documented roadway departure incidents resulting in serious accidents and fatalities on adjacent sections in recent years. It is nearly impossible for a vehicle to meet an on-coming semi-truck without departing the pavement. This highway has been a major priority for shoulder maintenance over the years, however, edge ruts develop quickly and hazards frequently develop after rainstorms or just from routine traffic. In short, the roadway is insufficient with safety issues for current traffic demands.

Montgomery County proposes to improve the referenced corridor with TSIP funding, to include the above described roadway for widening of five to six foot to accomplish a 24-foot wide pavement for this heavily traveled Farm-to-Market and Federal Aid route. There is generally adequate existing shoulder width to accomplish said widening and allow for a three foot or greater aggregate shoulder going forward.

Montgomery County will continue work on the corridor with an HMA overlay, as appropriate, once the widening has been accomplished.

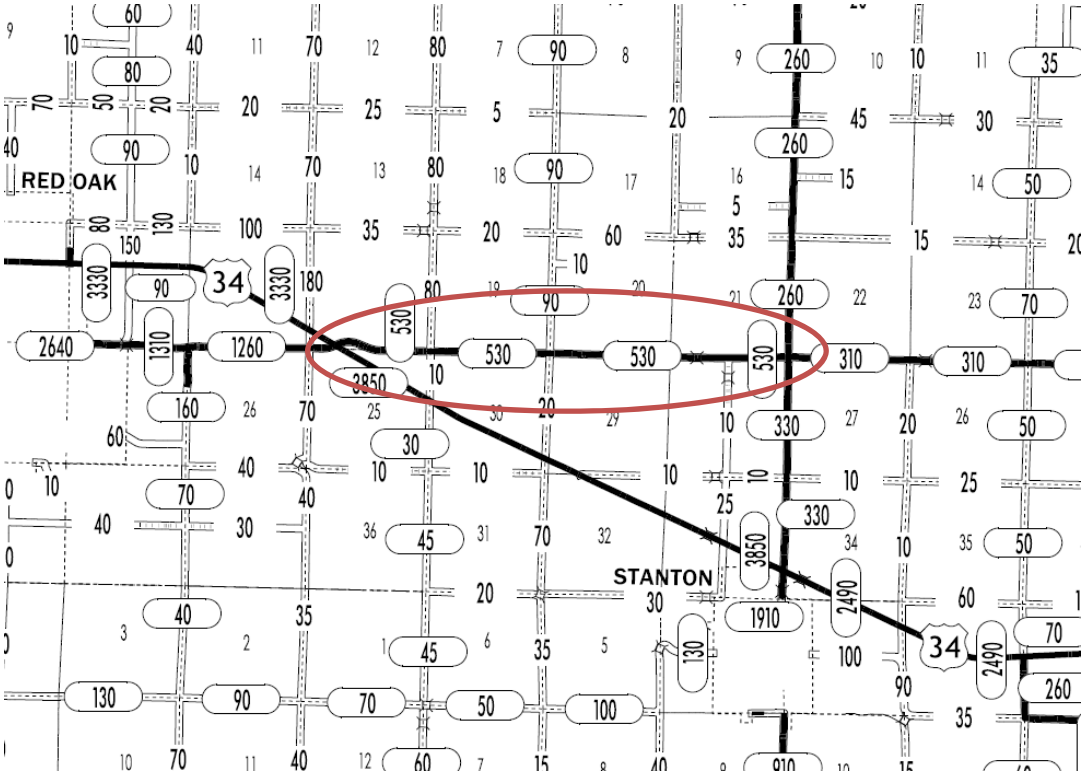
ENGINEERS ESTIMATE - TSIP - Highway 34 TO O Ave - APPLICATION

8/12/2014

18,000' W/ 3' WIDENNING EACH SIDE		UNIT	QTY	UNIT PRICE	TOTAL
2102-2710070	EXCAVATION CL 10, RDWY & BORROW	CY	2230	$ 4.53	$ 10,101.90
2111-8174200	GRANULAR SUBBASE, PLACE ONLY	SY	12010	$ 2.55	$ 30,625.50
2121-7425011	GRANULAR SHOULDER TYPE A, PLACE ONLY	TON	1900	$ 5.41	$ 10,279.00
2302-1200070	PCC PAVEMENT WIDENING 7 IN	SY	12010	$ 31.88	$ 382,878.80
2518-6910000	SAFETY CLOSURE	EACH	7	$ 149.92	$ 1,049.44
2528-8445110	TRAFFIC CONTROL	LS	1	$ 4,000.00	$ 4,000.00
2528-8445113	FLAGGERS	EACH	40	$ 348.88	$ 13,955.20
2533-4980005	MOBILIZATION	LS	1	$ 5,000.00	$ 5,000.00
2527-9263117	PAINTED PAVEMENT MARKINGS, DURABLE	STA	720	$ 7.03	$ 5,061.60
2527-9263180	PAVEMENT MARKINGS REMOVED	STA	720	$ 22.42	$ 16,142.40
			TOTAL	PCC	***$ 479,093.84***

Admin/Design/Inspection	10%	$47,909.38
Inflation (2 Yrs to Construction)	10%	$52,700.32
Contingency	20%	$115,940.71
TOTAL PROJECT ESTIMATE		***$695,644.26***

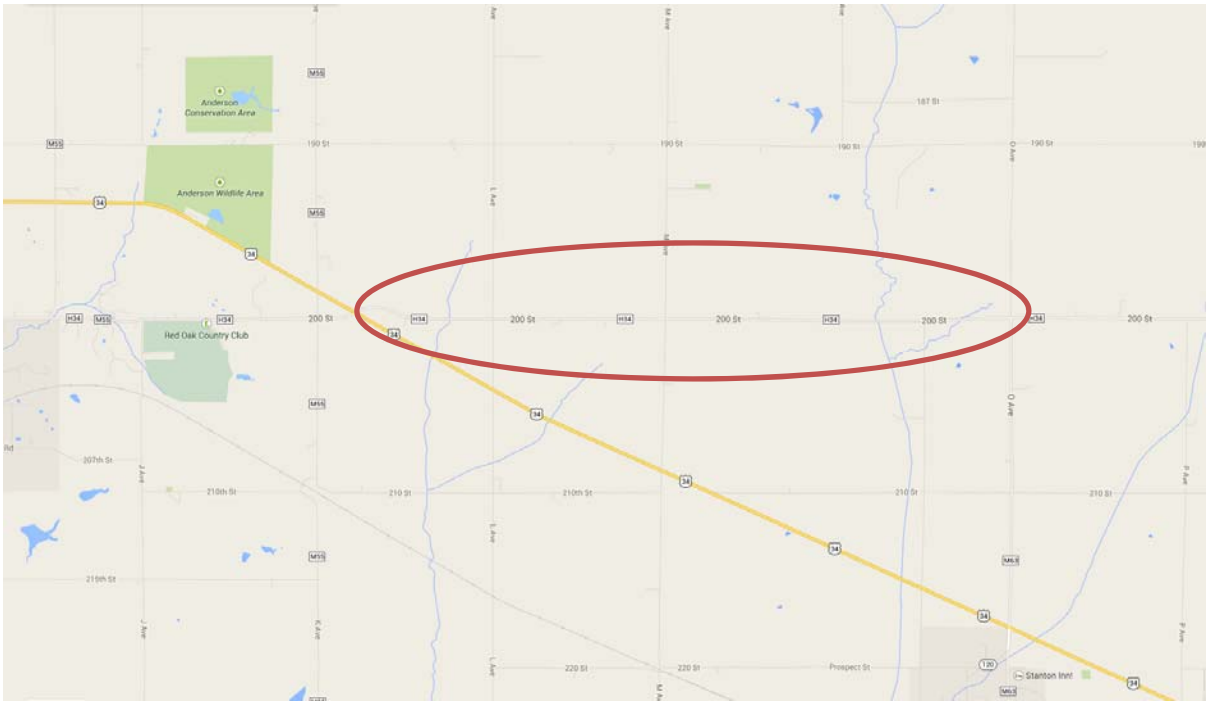
E/ J



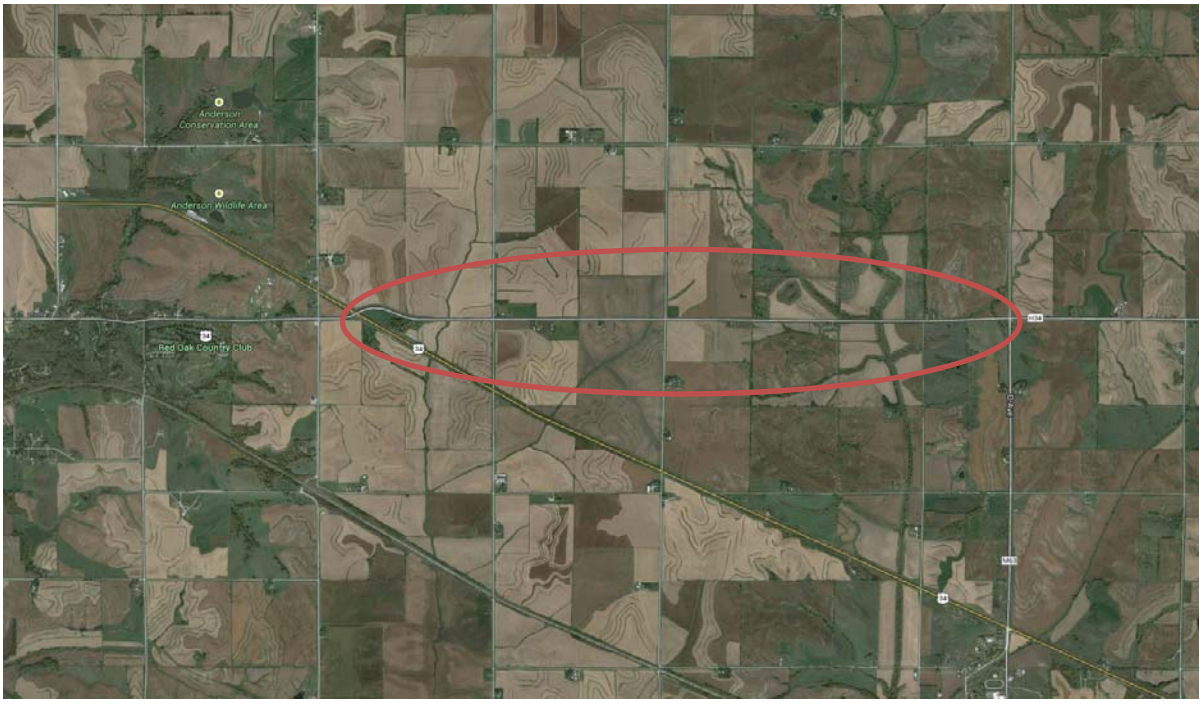
F

200 St

G


Anderson Conservation Area
Anderson Wildlife Area
Red Oak Country Club
200 St
190 St
210 St
220 St
Prospect St
Stanton Intl

H


Anderson Conservation Area
Anderson Wildlife Area
Red Oak Country Club
34
M15

Iowa Department of Transportation

Major Cause Summary

Analysis Years: 2004 [4], 2006 [1], 2008 [2], 2009 [1], 2010 [2], 2011 [3], 2012 [4], 2013 [2]

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	3
Possible/Unknown	3
PDO	12
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	4
Possible	6
Unknown	-
Total Injuries	11

TOT Property Damage: $108,348

AVG Property Damage: $5,703

Surface Condition Summary:

Dry	9
Wet	4
Ice	3
Snow	1
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	1
Total Crashes	19

Major Cause Summary:

6	Animal
	Ran Traffic Signal
	Ran Stop Sign
	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
1	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
7	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
1	Equipment Failure
	Separation of Units
	Ran Off Road - Right
	Ran Off Road - Straight
1	Ran Off Road - Left
	Lost Control
1	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:

None

Analyst:

Notes: City of Norway in Benton Co. (2004-2014)

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Montgomery Prepared by: Stephen Bainchetta Date Prepared: Aug 11, 2004

Location: US 34 to O Ave

Improvement

Proposed Improvement(s): Pavement Wideing, 3 ft Symmetrical

$ 400,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	42	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
		$ 400,000	Present Value All Costs, **COST** = EC + OC

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

Traffic Volume Data

Source: 520 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.80	520	Non-Primary, Secondary, Pave
3.80	miles total	

1,976 Current Vehicle Miles / Day, **VM**

2,411 End of Life Veh. Miles / Day

721,240 Current Veh. Miles / Year, **AM**

15,880,986 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

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

Additional months values as of May 2014

0	Fatal Crashes →	0	Fatalities @	$4,500,000	$	-
		1	Major Injuries @	$325,000	$	325,000
4	Injury Crashes →	4	Minor Injuries @	$65,000	$	260,000
		6	Possible Injuries @	$35,000	$	210,000
14	Property Damage Only		(assumed cost per crash)	$7,400	$	133,200
			-OR- enter all Property Costs of all crashes:			
18	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	928,200

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

$ 51,567 Cost per Crash, **AVCR** = LOSS / TA

39.6 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 38,984 Crash Costs Avoided in First Year, AAR x AVCR

16.6 Total Avoided Crashes, TCR x CRF/ 100

249.6 Crashes / HMVM, Crash Rate, **CR**
CR = TA x 10^8 / (AM x T)

$ 575,827 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 = $575,827 : $400,000 = **1.44** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Hickman Rd & Dartmoor Dr Intersection Improvements

Applicant: City of Waukee

Contact Person: John Gibson Title: Director of Public Works

Complete Mailing Address: 805 University Avenue
Waukee, IA 50263

Phone: (515) 987-4363 (Area Code) E-Mail: jgibson@waukee.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 $ 413,000

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 City of Waukee

Signed: _____ 8-5-14
Signature Date Signed

John Gibson
Typed Name

Attest: _____ 8-5-14
Signature Date Signed

Beth Richardson
Typed Name

City of Waukee
Public Works Office

August 5, 2014

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

Dear Mr. Ostendorf—

The City of Waukee 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 Hickman Road (US Highway 6) and Dartmoor Drive Intersection Improvements Project.

The proposed improvements include traffic signalization of the intersection, installation of a left turn-lane on the north and south approaches of Dartmoor Drive, and increasing the left turn-lane storage length on the east and west approaches of Hickman Road. Increased traffic volumes on Hickman Road, crash history, and vehicle speeds along the Hickman Road corridor have resulted in the need to signalize and increase the safety of the intersection.

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,

John Gibson
Director Public Works
City of Waukee

John R. Gibson
Director of Public Works
Cell: 515.707.5002
jgibson@waukee.org

City of Waukee Public Works
805 University Avenue
Waukee, Iowa 50263
Phone: 515.987.4363
Fax: 515.987.3979
www.waukee.org

Application for
Traffic Safety Improvement Program
Iowa Department of Transportation

Hickman Road (US Highway 6) and Dartmoor Drive Intersection Improvements
Waukee, Iowa
August 15, 2014

THE CITY OF WAUKEE, IOWA

RECEIVED
AUG - 7 2014

RESOLUTION 14-193

AUTHORIZING THE CITY OF WAUKEE, IOWA, TO SUBMIT AN APPLICATION TO THE IOWA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY IMPROVEMENT PROGRAM FUNDING FOR THE HICKMAN ROAD AND DARTMOOR DRIVE INTERSECTION IMPROVEMENTS PROJECT

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

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

WHEREAS, the Iowa Department of Transportation has established the Traffic Safety Improvement Program and provides funding for locations where vehicular safety is a concern and documented; **AND,**

WHEREAS, the intersection of Hickman Road and Dartmoor Drive has been identified as a location where vehicular safety and traffic flow could be improved and funded by Traffic Safety Improvement Program; **AND,**

WHEREAS, the City of Waukee has determined that by providing improvements including traffic signalization and left turn lanes on Dartmoor Drive, will help reduce crashes and improve traffic operations.

NOW THEREFORE BE IT RESOLVED by the City of Waukee City Council in session this 4th day of August, 2014, that:

1. City Council supports and approves the application for Traffic Safety Improvement Program funding.
2. The City Council hereby commits the additional City funds necessary for construction of the project beyond and Traffic Safety Improvement Program funding.
3. The City Council hereby commits to accepting and maintaining these improvements.
4. The Mayor hereby authorized to execute the application on behalf of the City.

Brian Harrison, Mayor Pro Tem

Attest:

Rebecca D. Schuett, City Clerk

ROLL CALL VOTE	AYE	NAY	ABSENT	ABSTAIN
Shane Blanchard	X			
Brian Harrison	X			
Casey L. Harvey	X			
Shelly Hughes	X			
Rick Peterson	X			

NARRATIVE

Existing Conditions
The City of Waukee is applying for Traffic Safety Improvement Program (TSIP) funding for safety improvements to the intersection of Dartmoor Drive and Hickman Road (US Highway 6). The intersection is a four leg intersection with the west and east approaches providing two through lanes with designated left-turn and right-turn lanes and the north and south approaches each having one exiting lane and one entering lane. Sidewalk is provided along the west side of the south approach and along the east and west side of the north approach. Raccoon River Valley Trail crosses the north approach. STOP control is signed for northbound and southbound approaches on Dartmoor Drive. Stop line pavement markings are installed on the north and south approaches of the intersection. The posted speed limits are 55 mph on Hickman Road and 25 mph on Dartmoor Drive.

Recent development in the northwest quadrant of the intersection of Dartmoor Drive and Hickman Road has increased traffic volumes on Dartmoor Drive. Additionally more retail and residential development is proposed just north of the intersection. North of the existing development on Bowman Drive, housing development is proposed along with an elementary school in the southeast quadrant of Dartmoor Drive with Douglas Parkway. Due to the proposed development, the traffic volumes on the north approach of Dartmoor Drive are expected to continue to increase following the same directional volume distribution as existing traffic on the north approach. Also, as development continues in Waukee, the traffic volume on Hickman Road will also continue to increase. A conservative growth rate of 2% per year for traffic volumes was used for analysis.

Traffic Counts
Automated 24-hour traffic counts were conducted n the north and south approaches of Dartmoor Drive to determine the peak periods of traffic on Dartmoor Drive in September of 2013. Manual turning movement traffic counts were conducted during the peak periods in October of 2013 as identified from the 24-hour traffic counts. All traffic was counted on Dartmoor Drive but only turning traffic from Hickman Road was counted. The through traffic on Hickman Road was interpolated based on the turning movement counts conducted at the intersection and from the DOT turning movement counts at the adjacent signalized intersection along Hickman Road at Warrior Lane and at Alice's Road as conducted in 2012. The peak hours on Dartmoor Drive are 7-8 AM, 12-1 PM, and 4:45-5:45 PM. The total peak entering traffic volume (3 total hours) on Dartmoor Drive north approach is 21% of the daily entering traffic volume and the total peak entering traffic volume on the south approach is 20% of the total daily entering traffic. The north approach traffic volume movement distribution is as follows: left 65%, through 2%, and right 33%. The south approach traffic volume movement distribution is as followed: left 2%, through 2%, and right 96%.

The Iowa DOT conducted turning movement counts at the two adjacent signalized intersections on Hickman Road in 2012. The DOT turning movement count at Warrior Lane was conducted in July and count at Alice's Road was conducted in September. The volume on the east leg of Warrior Lane and Hickman Road AADT was 16,100 vpd and the west leg of Alice's Road and Hickman Road was 23,200 vpd. Although there are accesses and side street vehicle interactions between the two signalized intersections, it appears that the difference in volume is likely due to

traffic volumes on Hickman Road are higher while schools are in session as opposed to summer time traffic volumes. Traffic Counts are included in Section J of this application.

Crash History

For the five year period between January 1, 2009 through December 31, 2013, the intersection had 19 reported crashes that had been processed through the Iowa DOT crash database. Of the 19 crashes, 16 crashes were caused by "failure to yield right-of-way" or "ran STOP sign" with 15 crashes occurring at right angles. Table 1 below summarizes the reported crashes at the intersection by severity including injuries by severity. Crash summary and collision diagram are included in the Appendix.

Table 1: Crash (Injury) Severity Dartmoor Drive and Hickman Road, (2009 –2013)

Year	Fatal	Major Injury	Minor Injury	Possible/ Unknown	PDO	Total	Amount of Property Damage
2009	-			1 (1)	5	6 (1)	$26,000
2010	-	1 (1)	-	1 (2)	1	3 (3)	$22,000
2011	-	-	-	1 (2)	4	5 (2)	$40,300
2012	-	-	-	1 (3)	1	2 (3)	$25,200
2013	-	1 (1)	-	1 (1)	1	3 (2)	$31,000
Total	**-**	**2 (2)**	**0**	**5 (9)**	**12**	**19 (11)**	**$144,500**

MUTCD Traffic Signal Warrant Analysis

Traffic signal warrant analysis was performed for the study intersection with existing traffic volumes in October of 2013 with the results shared to Iowa DOT District 4 Office for coordination on the potential intersection improvements. The warrant analysis was conducted according to the *Manual on Uniform Traffic Control Devices* (MUTCD), 2009 Edition, standards. Warrant 5 (School Crossing), Warrant 6 (Coordinated Signal System), Warrant 8 (Roadway Network), and Warrant 9 (Near Grade Crossing) were not considered applicable to the study.

The signal warrant analysis was performed for existing conditions and two scenarios of reduced traffic volume on Dartmoor Drive due to the high percentage of right turning vehicles from Dartmoor Drive. The two scenarios followed methodology from the Ohio Department of Transportation for discounting minor approach volumes as shown in Figure 1, with each hour of traffic volume analyzed for reduction. In Figure 1, R is right turning traffic volume on the minor approach and A is the total approach volume. The first scenario included existing geometry and approach traffic volumes reduction based on the right turn volume on Dartmoor Drive as shown in Line 1 in Figure 1. The second scenario tested the sensitivity of further reduction of right turning traffic volume and was based on existing traffic volumes and the presence of an exclusive right turn-lane. A 75% right turn reduction as shown in line 2 of Figure 1 was based on a hypothetical exclusive right turn lane on both Dartmoor Drive approaches. This reduction is greater due to the small amount of impedance and delay experienced by right turning traffic with a right turn lane. Table 2 summarizes the warrant analysis for existing and reduced traffic

volume conditions and also lists the number of hours that satisfy the warrant conditions. Warrant analysis worksheets are attached.

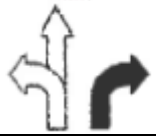
1		IF	R > 0.7A	THEN	Reduce R by 60%
			0.7A ≥ R > 0.35A		Reduce R by 40%
			R ≤ 0.35A		Reduce R by 20%
2		Any configuration with an exclusive right turn lane (usually ≥ to 600 ft. long)		Reduce R by 75% in all classes	

Figure 1: Minor Approach Right Turning Traffic Volume Reduction

Table 2: Existing Traffic Conditions Warrant Analysis (#Hours)

Warrant	No Reduction	Reduction #1	Reduction #2
Warrant 1 -8 Hour Volumes			
1A - Minimum Volume	No (7)	No (2)	No (1)
1B - Interruption of Continuous Traffic	Yes (12)	Yes (12)	Yes (12)
Warrant 2 - 4 Hour Volume	Yes (11)	Yes (11)	Yes (9)
Warrant 3 - Peak Hour			
3A - Peak Hour Delay	No	No	No
3B - Peak Hour Volume	Yes	Yes	Yes
Warrant 4 - Pedestrian Volumes	No	No	No
Warrant 5 - School Crossing	Not Evaluated		
Warrant 6 - Coordinated System	Not Evaluated		
Warrant 7 - Crash Experience	No	No	No
Warrant 8 - Roadway Network	Not Evaluated		
Warrant 9 - At-Grade Crossing	Not Evaluated		

Proposed Improvements

Based on the above intersection safety performance, identified concerns, and satisfaction of MUTCD Signal Warrants, the City of Waukee intends to install a permanent traffic signal and provide northbound and southbound dedicated left turn-lanes on Dartmoor Drive. The traffic signal will be a fully actuated traffic signal with coordination timings and interconnect to the City's existing traffic signal system to ensure traffic flow progression n Hickman Road. Signalization of the intersection should include the following as shown in the proposed layout in Sections G/H/K:

- Protected only left turn phasing for east/west Hickman Rd consistent with adjacent intersections. Potential for flashing yellow arrow operation with time of day protected or permissive left turn phasing.
- Provide pedestrian crossings on the north and west approaches with countdown timer pedestrian signal heads and pedestrian pushbuttons.

The functional geometric improvements to the intersection should include the following:

- Dedicated left-turn lanes on Dartmoor Drive with storage length of 150 feet minimum. This will require roadway widening on each approach of approximately 7 feet for a total width of 41 feet b-b.
- Increase left turn lane storage on Hickman Road approaches to 250 feet to allow left turning vehicles access to the left turn lane while the through lanes are queued during stop conditions or for additional deceleration.

ITEMIZED PROJECT COST BREAKDOWN
HICKMAN RD & DARTMOOR DR INTERSECTION IMPROVEMENTS
WAUKEE, IA

ITEM NO.	ITEM DESCRIPTION	UNIT	Unit Price	QUANTITY	TOTAL
1	REMOVALS				
	Roadway	SY	$ 6.00	623	$ 3,738
	Driveway	SY	$ 5.00	249	$ 1,245
	Sidewalk	SY	$ 5.00	134	$ 670
2	EARTHWORK				
	Class 10 Excavation	CY	$ 10.00	741	$ 7,410
3	SUBGRADE				
	Subgrade Preparation	SY	$ 4.00	2,512	$ 10,048
	Modified Subbase	CY	$ 28.00	419	$ 11,732
4	UTILITIES				
	Intake Removal	EACH	$ 750.00	2	$ 1,500
	Intake, Type SW-501	EACH	$ 4,500.00	2	$ 9,000
	Fire Hydrant Relocation	EACH	$ 5,000.00	1	$ 5,000
	Water Service Adjustment	EACH	$ 1,000.00	2	$ 2,000
5	PROPOSED PAVEMENT				
	10" PCC Pavement	SY	$ 50.00	610	$ 30,500
	7" PCC Pavement	SY	$ 40.00	1,376	$ 55,040
	5" PCC Sidewalk	SY	$ 30.00	116	$ 3,480
6	TRAFFIC SIGNALS	LS	$ 150,000.00	1	$ 150,000
7	TRAFFIC CONTROL	LS	$ 25,000.00	1	$ 25,000
8	MOBILIZATION	LS	$ 15,800.00	1	$ 15,800
				Subtotal	$ 332,163
				Contingency	$ 17,837
				Engineering and Construction Administration	$ 63,000
				Total Project Estimate	**$ 413,000**

PROPOSED FUNDING SOURCES
HICKMAN RD & DARTMOOR DR INTERSECTION IMPROVEMENTS
WAUKEE, IA

SOURCE	AMOUNT
Traffic Safety Improvement Program Funding (TSIP – Traffic Control Device)	$325,000
Local Funds.	$88,000
PROJECT TOTAL	$413,000

PROPOSED PROJECT SCHEDULE
HICKMAN RD & DARTMOOR DR INTERSECTION IMPROVEMENTS
WAUKEE, IA

August 2014	TSIP Application
December 2014	Iowa DOT Approval
January 2015	TSIP Agreement
August 2014 – January 2015	Project Engineering & Plan Development
March 2015	Project Letting
April 2015 – November 2015	Project Construction to Substantial Completion

LOCATON MAP
HICKMAN RD & DARTMOOR DR INTERSECTION IMPROVEMENTS
WAUKEE, IA

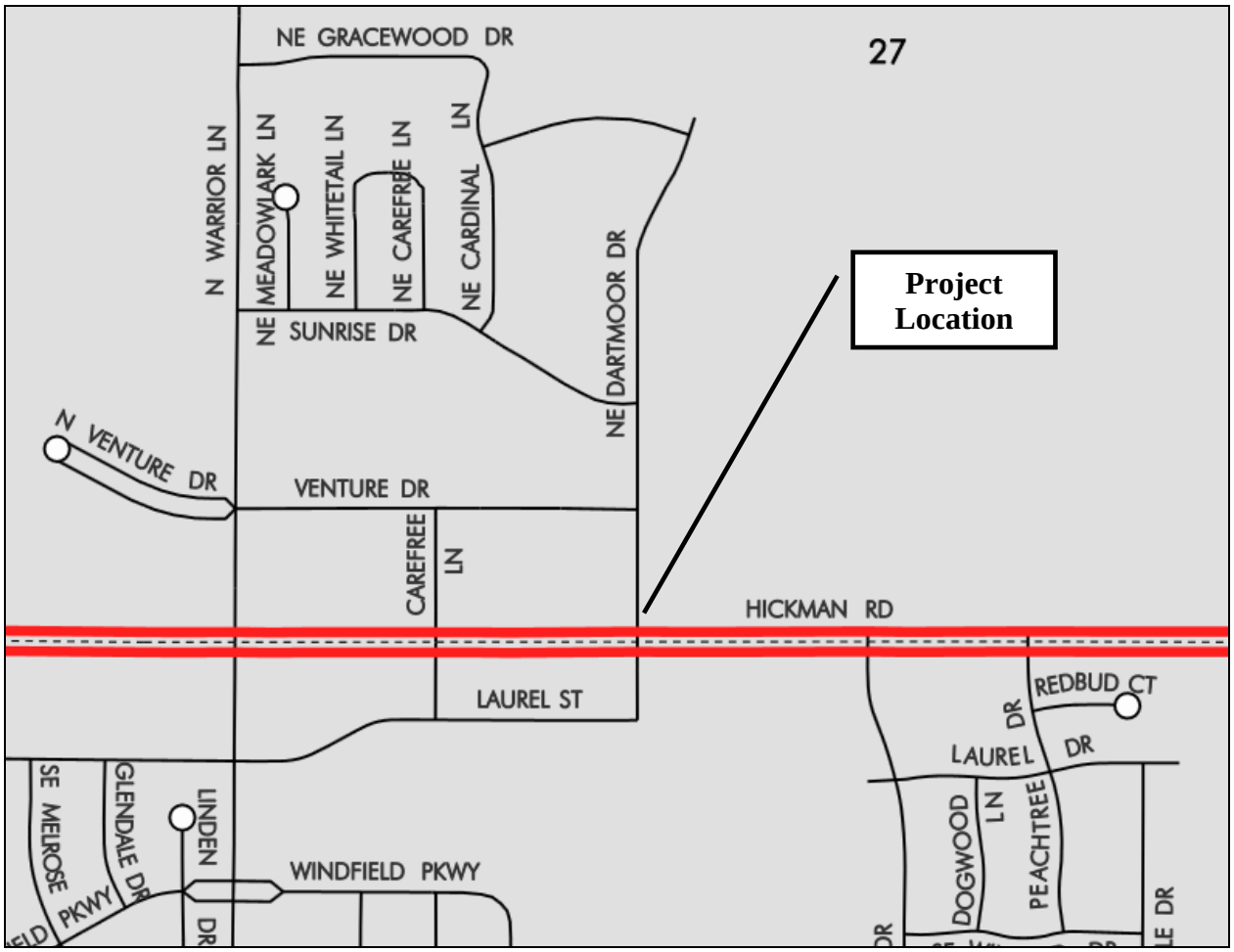


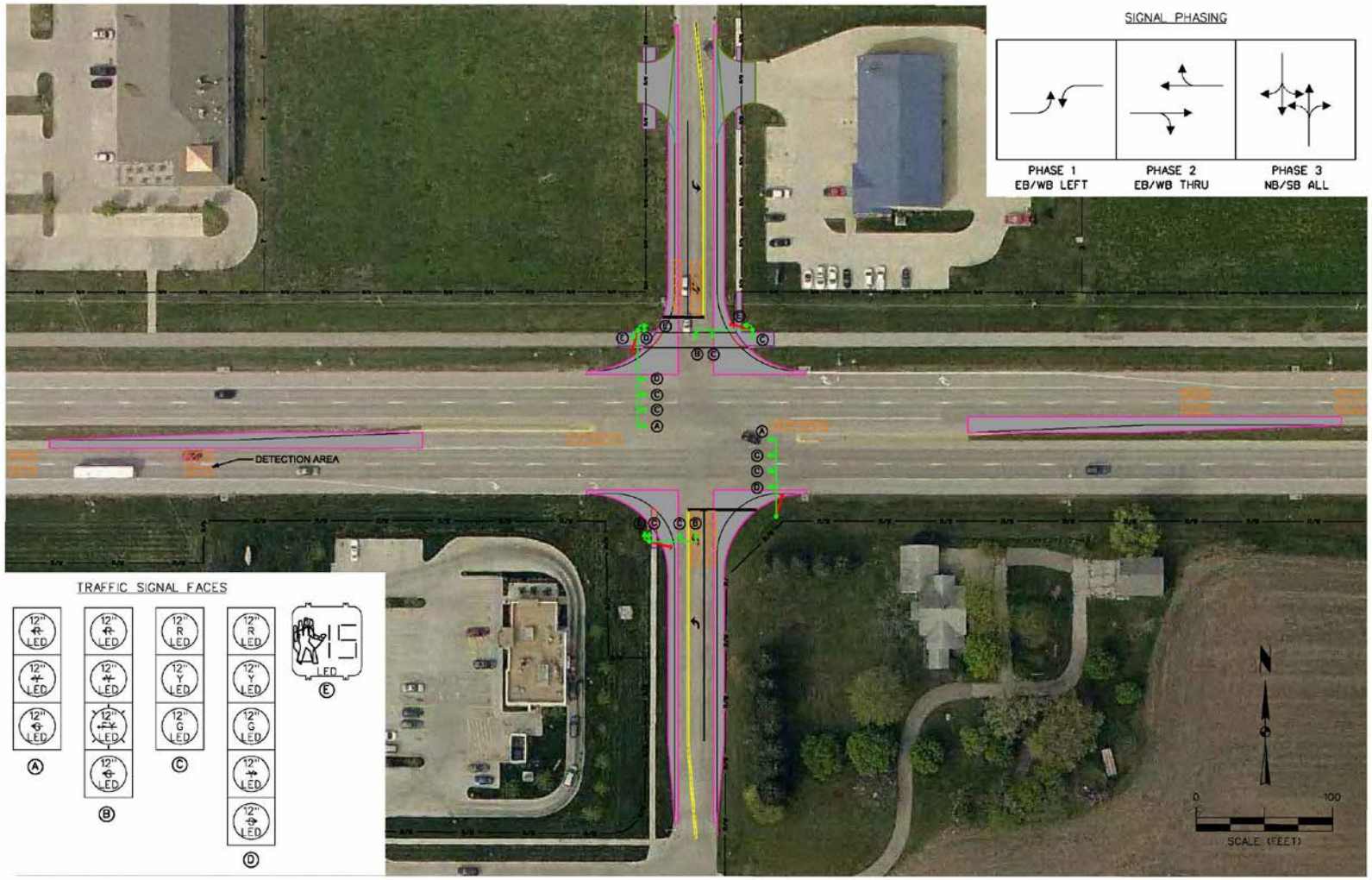
Photo 1: Dartmoor Dr Looking North

Photo 2: Dartmoor Dr at Hickman Rd Looking East

Photo 3: Dartmoor Dr Looking South

Photo 4: Dartmoor Dr at Hickman Rd Looking West

JCJ 7/31/2014 J:\2014_Projects\114.0475\Cadd\Exhibits\1140475_SignalLayout Exhibit.dgn Y:\print_drivers\Color\V8iColorHalfWeightPDF.pltcfg Y:\pen\date.tbl Snyder 1:100



INTERSECTION IMPROVEMENTS
DARTMOOR DRIVE & HICKMAN ROAD
WAUKEE, IOWA

City: Waukee
Project: NE Dartmoor Dr Traffic Signal Warrant Study
Location: Dartmoor Dr - South of Hickman
Site: 1945

Seven Day Volume, per Channel
Channel: Northbound

Interval Begin	Thu 9/5/2013	Fri 9/6/2013	Sat 9/7/2013	Sun 9/8/2013	Mon 9/9/2013	Tue 9/10/2013	Wed 9/11/2013	Mon - Fri Average	Week Average
12:00 AM	-	1	8	2	5	2	-	2.7	3.6
1:00 AM	-	1	2	3	0	5	-	2.0	2.2
2:00 AM	-	2	1	2	3	1	-	2.0	1.8
3:00 AM	-	0	1	1	4	0	-	1.3	1.2
4:00 AM	-	9	6	2	12	6	-	9.0	7.0
5:00 AM	-	19	3	3	19	14	-	17.3	11.6
6:00 AM	-	30	20	8	37	34	-	33.7	25.8
7:00 AM	-	39	14	11	32	32	-	34.3	25.6
8:00 AM	-	34	46	13	45	41	-	40.0	35.8
9:00 AM	-	52	75	40	48	31	-	47.6	51.8
10:00 AM	-	63	123	31	59	-	-	61.0	69.0
11:00 AM	34	90	203	50	94	-	-	87.2	104.7
12:00 PM	72	93	191	72	107	-	-	90.7	107.0
1:00 PM	75	98	211	58	89	-	-	87.3	106.2
2:00 PM	76	107	227	87	73	-	-	85.3	114.0
3:00 PM	99	113	255	67	86	-	-	99.3	124.0
4:00 PM	97	121	226	91	108	-	-	108.7	128.6
5:00 PM	117	135	216	58	120	-	-	124.0	129.2
6:00 PM	102	103	104	70	87	-	-	97.3	93.2
7:00 PM	93	132	92	78	104	-	-	109.7	99.8
8:00 PM	107	97	93	55	98	-	-	100.7	90.0
9:00 PM	37	82	45	30	54	-	-	57.7	49.6
10:00 PM	16	27	28	11	13	-	-	18.7	19.0
11:00 PM	7	17	11	6	7	-	-	10.3	9.6
Totals	932	1465	2201	849	1304	166	-	1327.8	1410.3
Peak Hours									
12:00 AM - 12:00 PM	-	11:00 AM	11:00 AM	11:00 AM	11:00 AM	8:15 AM	-	11:00 AM	11:00 AM
Volume	-	90	203	50	94	49	-	86.7	104.1
Factor	-	0.83	0.83	0.83	0.71	0.77	-	0.79	0.89
12:00 PM - 12:00 AM	5:45 PM	4:45 PM	2:45 PM	6:30 PM	5:00 PM	-	-	5:00 PM	3:45 PM
Volume	118	137	260	94	120	-	-	124.0	131.2
Factor	0.87	0.82	0.93	0.78	0.77	-	-	0.96	0.95

File: J:\2013_Projects\113.0707\Engineering\Traffic\Data\TrafficCounts\Dartmoor - NB Approach - south side.rdf

City: Waukee
Project: NE Dartmoor Traffic Signal Warrant Analysis
Location: Dartmoor Dr - North of Hickman
Site: 1946

Seven Day Volume, per Channel
Channel: Southbound

Interval Begin	Thu 9/5/2013	Fri 9/6/2013	Sat 9/7/2013	Sun 9/8/2013	Mon 9/9/2013	Tue 9/10/2013	Wed 9/11/2013	Mon - Fri Average	Week Average
12:00 AM	-	2	4	3	5	6	-	4.3	4.0
1:00 AM	-	1	1	4	2	0	-	1.0	1.6
2:00 AM	-	1	3	3	3	1	-	1.7	2.2
3:00 AM	-	3	4	3	4	4	-	3.7	3.6
4:00 AM	-	15	15	4	10	8	-	11.0	10.4
5:00 AM	-	28	15	7	24	26	-	26.0	20.0
6:00 AM	-	71	31	18	74	70	-	71.7	52.8
7:00 AM	-	141	36	27	122	151	-	138.0	95.4
8:00 AM	-	106	66	34	99	95	-	100.0	80.0
9:00 AM	-	80	88	52	65	33	-	64.7	66.9
10:00 AM	-	79	72	116	77	-	-	78.0	86.0
11:00 AM	49	99	100	108	84	-	-	84.4	92.6
12:00 PM	59	100	112	131	99	-	-	86.0	100.2
1:00 PM	62	85	89	72	83	-	-	76.7	78.2
2:00 PM	83	109	82	67	74	-	-	88.7	83.0
3:00 PM	77	102	87	91	90	-	-	89.7	89.4
4:00 PM	101	110	68	78	105	-	-	105.3	92.4
5:00 PM	112	100	82	89	91	-	-	101.0	94.8
6:00 PM	73	93	72	81	106	-	-	90.7	85.0
7:00 PM	63	87	78	108	123	-	-	91.0	91.8
8:00 PM	90	77	69	66	83	-	-	83.3	77.0
9:00 PM	60	97	55	31	56	-	-	71.0	59.8
10:00 PM	39	83	48	17	21	-	-	47.7	41.6
11:00 PM	12	31	28	7	7	-	-	16.7	17.0
Totals	880	1700	1305	1217	1507	394	-	1532.1	1425.8
Peak Hours									
12:00 AM - 12:00 PM	-	7:00 AM	11:00 AM	10:15 AM	7:15 AM	7:00 AM	-	7:00 AM	7:00 AM
Volume	-	141	100	129	123	151	-	138.0	95.4
Factor	-	0.84	0.86	0.69	0.93	0.86	-	0.90	0.95
12:00 PM - 12:00 AM	5:00 PM	4:15 PM	12:00 PM	12:00 PM	6:45 PM	-	-	4:00 PM	12:00 PM
Volume	112	115	112	131	128	-	-	105.3	100.2
Factor	0.86	0.96	0.85	0.74	0.89	-	-	0.93	0.89

File: J:\2013_Projects\113.0707\Engineering\Traffic\Data\TrafficCounts\Dartmoor - SB Approach - north side.rdf

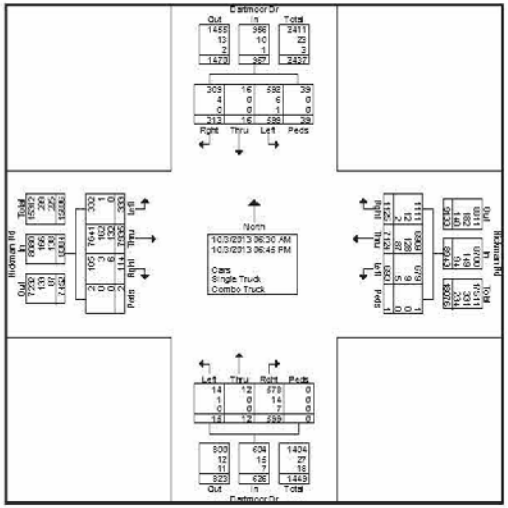
Snyder & Associates, Inc.
Ankeny, Iowa

Hickman Rd & Dartmoor Dr
Waukee, Iowa

File Name : Hickman_Dartmoor_130926
Site Code : 00000000
Start Date : 10/3/2013
Page No : 2

Groups Printed- Cars - Single Truck - Combo Truck

	Dartmoor Dr From North					Hickman Rd From East					Dartmoor Dr From South					Hickman Rd From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
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		
Cars	592	16	309	39	956	579	6909	1111	1	8700	14	12	578	0	604	332	7641	105	2	8080	18340
% Cars	98.8	100	98.7	100	98.9	98	97	98.6	100	97.3	93.3	100	96.5	0	96.5	99.7	96.3	92.1	100	96.4	96.9
Single Truck	5	0	4	0	10	9	128	12	0	149	1	0	14	0	15	1	152	3	0	156	340
% Single Truck	1	0	1.3	0	1	1.3	1.8	1.1	0	1.7	6.7	0	2.3	0	2.4	0.3	2	2.6	0	2	1.8
Combo Truck	1	0	0	0	1	6	67	2	0	94	0	0	7	0	7	0	132	6	0	138	240
% Combo Truck	0.2	0	0	0	0.1	0.7	1.2	0.2	0	1.1	0	0	1.2	0	1.1	0	1.7	5.3	0	1.6	1.3



Snyder & Associates, Inc.
Ankeny, Iowa

Hickman Rd & Dartmoor Dr
Waukee, Iowa

File Name : Hickman_Dartmoor_130926
Site Code : 00000000
Start Date : 10/3/2013
Page No : 1

Groups Printed- Cars - Single Truck - Combo Truck

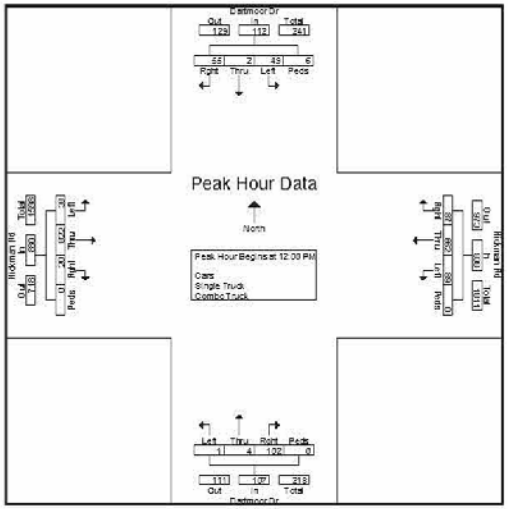
	Dartmoor Dr From North					Hickman Rd From East					Dartmoor Dr From South					Hickman Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	22	1	1	0	24	4	83	9	0	96	2	0	7	0	9	4	196	1	0	201	330
06:45 AM	21	0	4	0	25	5	99	15	0	119	0	1	8	0	9	8	226	2	0	236	389
Total	43	1	5	0	49	9	182	24	0	215	2	1	15	0	18	12	422	3	0	437	719
07:00 AM	22	0	8	0	30	9	113	37	0	159	0	0	9	0	9	17	278	1	0	296	494
07:15 AM	36	1	1	1	39	8	163	32	0	203	0	0	8	0	8	11	275	0	0	286	536
07:30 AM	28	0	5	0	33	8	166	25	0	199	0	0	7	0	7	16	322	2	0	340	579
07:45 AM	24	0	7	0	31	7	174	24	0	205	0	1	10	0	11	11	313	1	0	325	572
Total	110	1	21	1	133	32	616	118	0	766	0	1	34	0	35	55	1188	4	0	1247	2181
08:00 AM	15	0	6	0	22	8	150	24	0	182	0	1	6	0	7	8	222	1	0	231	442
08:15 AM	17	0	8	0	25	8	133	27	0	168	1	0	7	0	8	7	207	2	0	216	417
08:30 AM	23	1	7	0	31	10	141	17	0	168	0	0	9	0	9	3	213	2	0	218	426
08:45 AM	14	0	5	0	19	10	175	21	0	207	0	0	9	0	9	8	211	0	0	219	454
Total	70	1	26	0	97	36	600	89	0	725	1	1	31	0	33	26	853	5	0	884	1739
09:00 AM	21	0	2	2	25	15	142	12	0	169	0	0	7	0	7	4	165	1	0	170	371
09:15 AM	12	0	4	0	15	14	132	33	0	179	0	0	8	0	8	10	167	2	0	179	382
Total	33	0	6	2	41	29	274	45	0	348	0	0	15	0	15	14	332	3	0	349	753
11:00 AM	12	0	5	0	17	19	175	9	0	203	0	0	20	0	20	5	166	2	0	173	414
11:15 AM	18	1	6	0	25	14	192	20	0	226	0	0	17	0	17	9	169	1	0	179	447
11:30 AM	24	1	15	0	40	27	150	14	0	191	0	0	25	0	25	7	210	2	1	220	477
11:45 AM	12	1	8	0	21	25	161	18	0	204	1	1	13	0	15	6	212	4	0	222	462
Total	66	3	34	0	103	85	678	61	0	825	1	1	75	0	78	27	757	9	1	794	1800
12:00 PM	11	0	15	5	31	24	144	22	0	190	1	3	25	0	29	9	207	8	0	224	474
12:15 PM	15	0	11	1	28	25	167	23	0	215	0	0	27	0	27	12	205	4	0	221	491
12:30 PM	15	2	14	0	31	20	177	25	0	222	0	1	31	0	32	9	202	3	0	214	499
12:45 PM	7	0	15	0	22	20	174	17	0	211	0	0	19	0	19	8	208	5	0	221	473
Total	49	2	55	6	112	89	662	87	0	838	1	4	102	0	107	38	822	20	0	880	1937
03:00 PM	8	1	8	0	17	30	198	11	1	240	0	1	19	0	20	5	201	0	0	206	483
03:15 PM	15	0	7	3	25	21	197	22	0	240	1	1	21	0	23	6	193	7	0	206	495
03:30 PM	11	0	6	0	17	27	211	21	0	259	1	1	15	0	18	7	216	3	0	226	522
03:45 PM	11	0	5	1	17	31	253	41	0	325	1	0	24	0	25	9	186	3	0	198	565
Total	45	1	26	4	77	109	859	95	1	1064	3	3	80	0	86	27	796	13	0	836	2065
04:00 PM	21	0	14	0	35	27	268	59	0	352	0	0	24	0	24	12	236	10	0	258	669
04:15 PM	15	0	11	0	27	22	292	41	0	355	1	1	24	0	26	12	204	4	0	220	628
04:30 PM	12	0	8	1	21	18	287	52	0	357	2	0	24	0	26	13	256	6	0	275	679
04:45 PM	14	0	14	0	28	26	346	65	0	439	2	0	17	0	19	16	217	2	0	235	721
Total	63	0	47	1	111	93	1193	217	0	1503	5	1	89	0	95	53	913	22	0	988	2697
05:00 PM	10	1	13	0	24	33	328	51	0	422	1	0	23	0	24	11	241	2	0	254	724
05:15 PM	15	0	11	2	28	22	290	59	0	371	1	0	22	0	23	12	276	10	0	300	722
05:30 PM	19	1	15	0	35	30	336	71	0	437	0	0	20	0	20	14	276	4	0	295	786
05:45 PM	15	1	12	2	31	25	255	58	0	341	0	0	22	0	22	10	201	3	0	214	608
Total	60	3	51	4	118	110	1212	249	0	1571	2	0	87	0	89	47	996	19	0	1064	2842
06:00 PM	19	0	17	3	39	16	254	46	0	316	0	0	24	0	24	5	225	3	1	234	613
06:15 PM	13	0	12	5	30	28	234	32	0	294	0	0	9	0	9	9	221	3	0	233	566
06:30 PM	9	2	4	6	21	31	203	35	0	269	0	0	19	0	19	12	222	4	0	238	547
06:45 PM	18	2	9	7	36	26	158	27	0	209	0	0	18	0	18	8	184	6	0	198	451
Total	59	4	42	21	126	101	847	140	0	1088	0	0	70	0	70	34	852	16	1	903	2187
Grand Total	599	16	313	39	967	693	7124	1125	1	8943	15	12	599	0	626	333	7935	114	2	8384	18920
Approch %	61.9	1.7	32.4	4		7.7	79.7	12.6	0		2.4	1.9	95.7	0		4	94.6	1.4	0		
Total %	3.2	0.1	1.7	0.2	5.1	3.7	37.7	5.9	0	47.3	0.1	0.1	3.2	0	3.3	1.8	41.9	0.6	0	44.3	

Snyder & Associates, Inc.
Ankeny, Iowa

Hickman Rd & Dartmoor Dr
Waukee, Iowa

File Name : Hickman_Dartmoor_130926
Site Code : 00000000
Start Date : 10/3/2013
Page No : 4

	Dartmoor Dr From North					Hickman Rd From East					Dartmoor Dr From South					Hickman Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	11	0	**15**	5	**31**	24	144	22	0	190	**1**	**3**	25	0	29	9	207	8	0	224	474
12:15 PM	**16**	0	11	1	28	**25**	167	23	0	215	0	0	27	0	27	**12**	205	4	0	221	491
12:30 PM	15	2	14	0	31	20	**177**	**25**	0	222	0	1	**31**	0	**32**	9	202	3	0	214	**499**
12:45 PM	7	0	15	0	22	20	174	17	0	211	0	0	19	0	19	9	**208**	5	0	221	473
Total Volume	49	2	55	6	112	89	662	87	0	838	1	4	102	0	107	38	822	20	0	880	1937
% App. Total	43.8	1.8	49.1	5.4		10.6	79	10.4	0		0.9	3.7	95.3	0		4.3	93.4	2.3	0		
PHF	.765	.250	.917	.300	.903	.890	.935	.870	.000	.944	.250	.333	.823	.000	.836	.792	.988	.625	.000	.962	.970

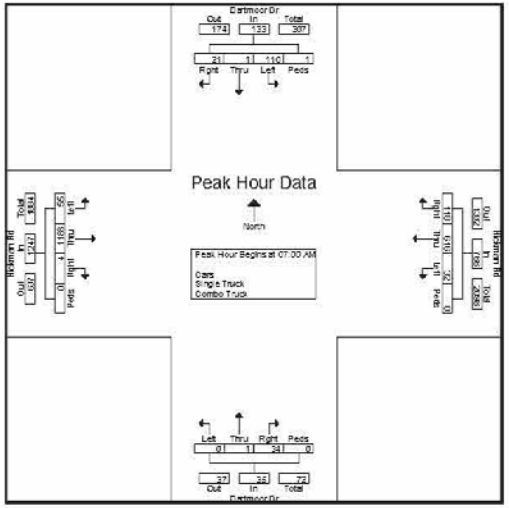


Snyder & Associates, Inc.
Ankeny, Iowa

Hickman Rd & Dartmoor Dr
Waukee, Iowa

File Name : Hickman_Dartmoor_130926
Site Code : 00000000
Start Date : 10/3/2013
Page No : 3

	Dartmoor Dr From North					Hickman Rd From East					Dartmoor Dr From South					Hickman Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 09:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	22	0	**8**	0	30	9	113	**37**	0	159	0	0	9	0	9	**17**	278	1	0	296	494
07:15 AM	**36**	**1**	1	1	**39**	8	163	32	0	203	0	0	8	0	8	11	275	0	0	286	536
07:30 AM	28	0	5	0	33	8	168	25	0	199	0	0	7	0	7	16	**322**	2	0	**340**	**579**
07:45 AM	24	0	7	0	31	7	**174**	24	0	**205**	0	1	**10**	0	**11**	11	313	1	0	325	572
Total Volume	110	1	21	1	133	32	618	118	0	766	0	1	34	0	35	55	1188	4	0	1247	2181
% App. Total	82.7	0.8	15.8	0.8		4.2	80.4	15.4	0		0	2.9	97.1	0		4.4	95.3	0.3	0		
PHF	.764	.250	.656	.250	.853	.889	.885	.797	.000	.934	.000	.250	.850	.000	.795	.809	.922	.500	.000	.917	.942



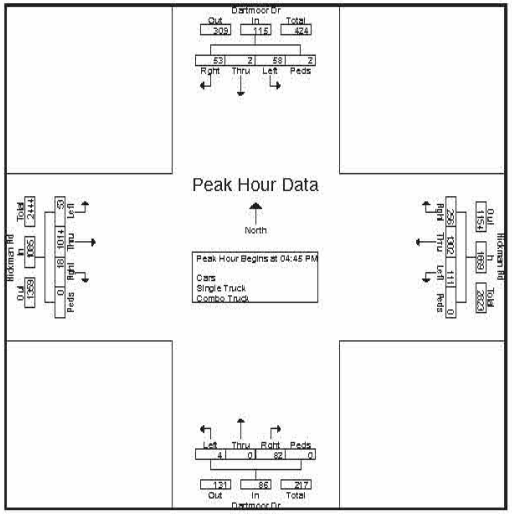
Snyder & Associates, Inc.

Ankeny, Iowa

Hickman Rd & Dartmoor Dr
Waukee, Iowa

File Name : Hickman_Dartmoor_130926
Site Code : 00000000
Start Date : 10/3/2013
Page No : 5

	Dartmoor Dr From North					Hickman Rd From East					Dartmoor Dr From South					Hickman Rd From West					
Start Time	Left	Thru	Rght	Peds	App. Total	Left	Thru	Rght	Peds	App. Total	Left	Thru	Rght	Peds	App. Total	Left	Thru	Rght	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	14	0	14	0	28	26	**348**	65	0	**439**	2	0	17	0	19	**16**	217	2	0	235	721
05:00 PM	10	**1**	13	0	24	**33**	328	61	0	422	1	0	**23**	0	**24**	11	241	2	0	254	724
05:15 PM	15	0	11	**2**	28	22	290	59	0	371	1	0	22	0	23	12	**278**	**10**	0	**300**	722
05:30 PM	**19**	1	**15**	0	**35**	30	336	**71**	0	437	0	0	20	0	20	14	278	4	0	296	**788**
Total Volume	58	2	53	2	115	111	1302	256	0	1669	4	0	82	0	86	53	1014	18	0	1085	2955
% App. Total	50.4	1.7	46.1	1.7		6.7	78	15.3	0		4.7	0	95.3	0		4.9	93.5	1.7	0		
PHF	.763	.500	.883	.250	.821	.841	.935	.901	.000	.950	.500	.000	.891	.000	.896	.828	.912	.450	.000	.904	.938



BENEFIT/COST ANALYSIS
HICKMAN RD & DARTMOOR DR INTERSECTION IMPROVEMENTS
WAUKEE, IA

The Benefit/Cost Calculations were based on Iowa DOT Office of Traffic and Safety recommendations. The crash reduction factor (CRF) was based on review of the *Crash Modification Factors Clearinghouse* website published by the Federal Highway Administration. The following lists the assumptions made in the benefit/cost analysis.

- Service Life – 15 years for traffic signalization
- Crash Reduction Factor: Install traffic signal in an urban location with a crash reduction factor of 23% represents the median published value for reducing all types of crashes.
- Traffic Growth - Due to the recent and planned development north and west of the intersection, a rate of 2% per year was assumed over the service life of the improvements.

The estimated project cost is $413,000. The City is requesting $325,000 in TSIP funding assistance for this project, and the resulting Benefit/Cost ratio is 1.98:1.

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Dallas | Prepared by: J. Jackson | Date Prepared: Jul 11, 2014

Intersection: Hickman Rd & Dartmoor Dr

Improvement

Proposed Improvement(s): Traffic signalization, northbound/southbound left turn lanes increasing storage length of eastbound/westbound turn lanes

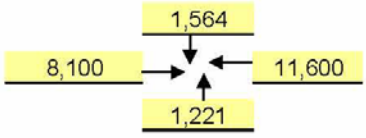
$ 325,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	23	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 325,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Snyder & Associates, Inc. | Oct-13 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



8,207,025	Current Annual Entering Veh., **AEV** = DEV * 365
30,262	veh / day, Final Year DEV, **FDEV**
141.93	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
22,485	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year — 5.0 years, Time Period, **T**

Additional months — values as of Dec. 2007

	Fatal Crashes		Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
7	Injury Crashes		Minor Injuries @	$65,000	$ -
		9	Possible Injuries @	$35,000	$ 315,000
12	Property Damage Only		(assumed cost per crash)	$7,400	$ -
		-OR-	enter all Property Costs of all crashes:		$ 144,500
19	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 1,109,500

3.80	Current Crashes / Year, **AA** = TA / T	0.46	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 58,395	Cost per Crash, **AVC** = LOSS / TA		
65.7	Total Expected Crashes, **TECR** = CR x TMEV	$ 644,820	Present Value of Avoided Crashes, **BENEFIT**
0.87	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 51,037	Crash Costs Avoided in First Year, AAR x AVC		
15.1	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 = $644,820 : $325,000 = **1.98** : 1

Appendix

- Crash Summary (2009-2013)
- Crash Diagram (2009-2013)
- Traffic Signal Warrant Analysis Worksheets

Iowa Department of Transportation

Major Cause Summary

Hickman Rd & Dartmoor Dr

Report Version 1.1 Jan 2005

Analysis Years: 2009 [6], 2010 [3], 2011 [5], 2012 [2], 2013 [3]

Crash Summary:

Fatal	-
Major Injury	2
Minor Injury	-
Possible/Unknown	5
PDO	12
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	2
Minor Injury	-
Possible	9
Unknown	-
Total Injuries	11

TOT Property Damage: $144,500

AVG Property Damage: $7,605

Surface Condition Summary:

Dry	15
Wet	2
Ice	1
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	19

Major Cause Summary:

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

Selection Filter:

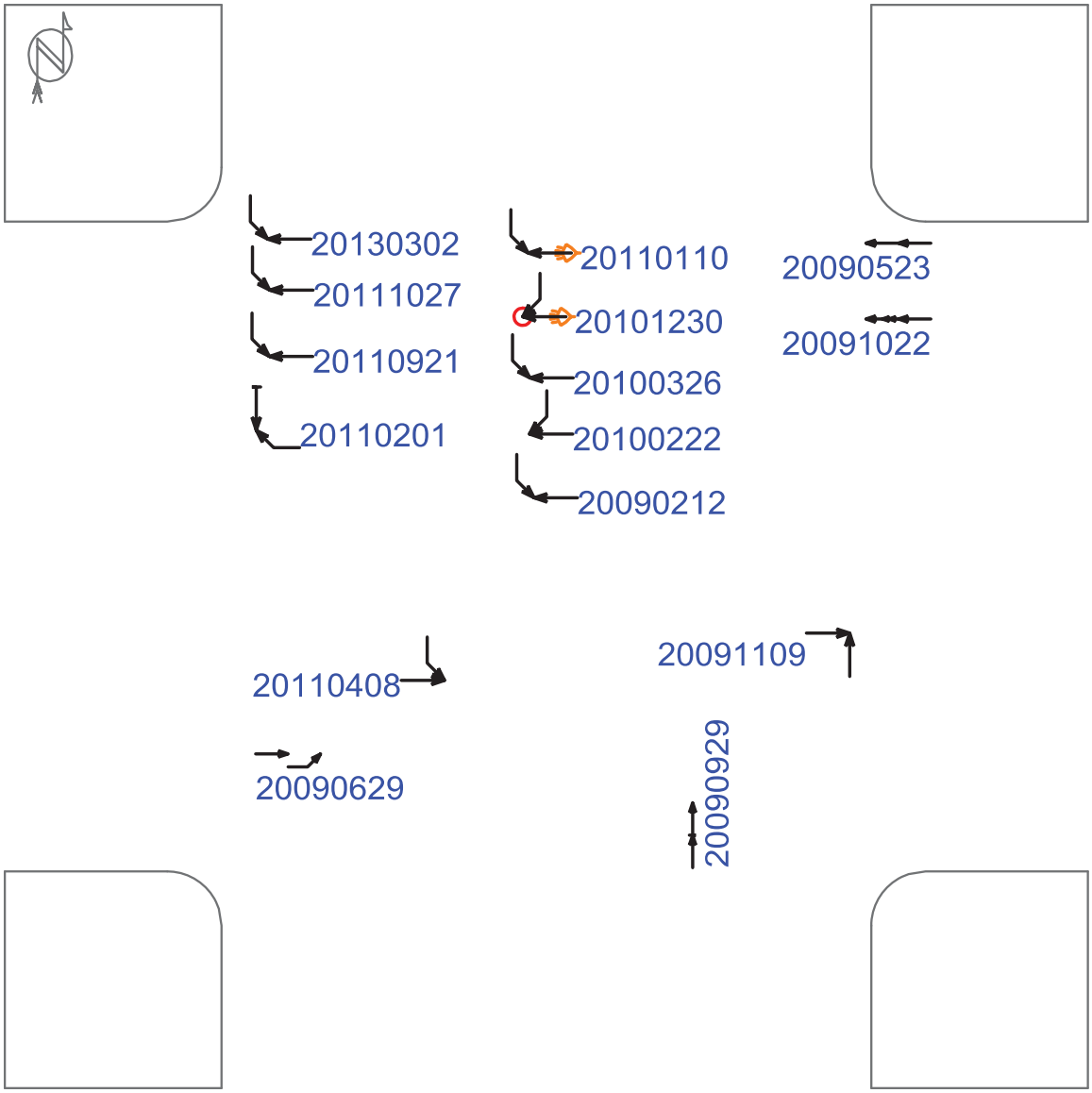
((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst:

Notes:

Dartmoor Dr & Hickman Rd

2009 - 2013 Reportable Crashes



(4) 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. 07/01/2014

Snyder & Associates, Inc.
Ankeny, Iowa

Study Name : **Hickman_dartmoor**
Study Date : **10/02/13**
Page No. : **1**

Signal Warrants - Summary

Major Street Approaches

Eastbound: **Hickman Rd**
Number of Lanes: **2**
85% Speed > 40 MPH.
Total Approach Volume: **8,382**

Westbound: **Hickman Rd**
Number of Lanes: **2**
85% Speed > 40 MPH.
Total Approach Volume: **8,942**

Minor Street Approaches

Northbound: **Dartmoor Dr**
Number of Lanes: **1**
Total Approach Volume: **1,221**

Southbound: **Dartmoor Dr**
Number of Lanes: **1**
Total Approach Volume: **1,564**

Warrant Summary **(Rural values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Not Satisfied**
Required volumes reached for 7 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Satisfied**
Required volumes reached for 10 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (11) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... **Satisfied**
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... **Not Satisfied**
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (2) is less than minimum (5). Volume minimums are met.

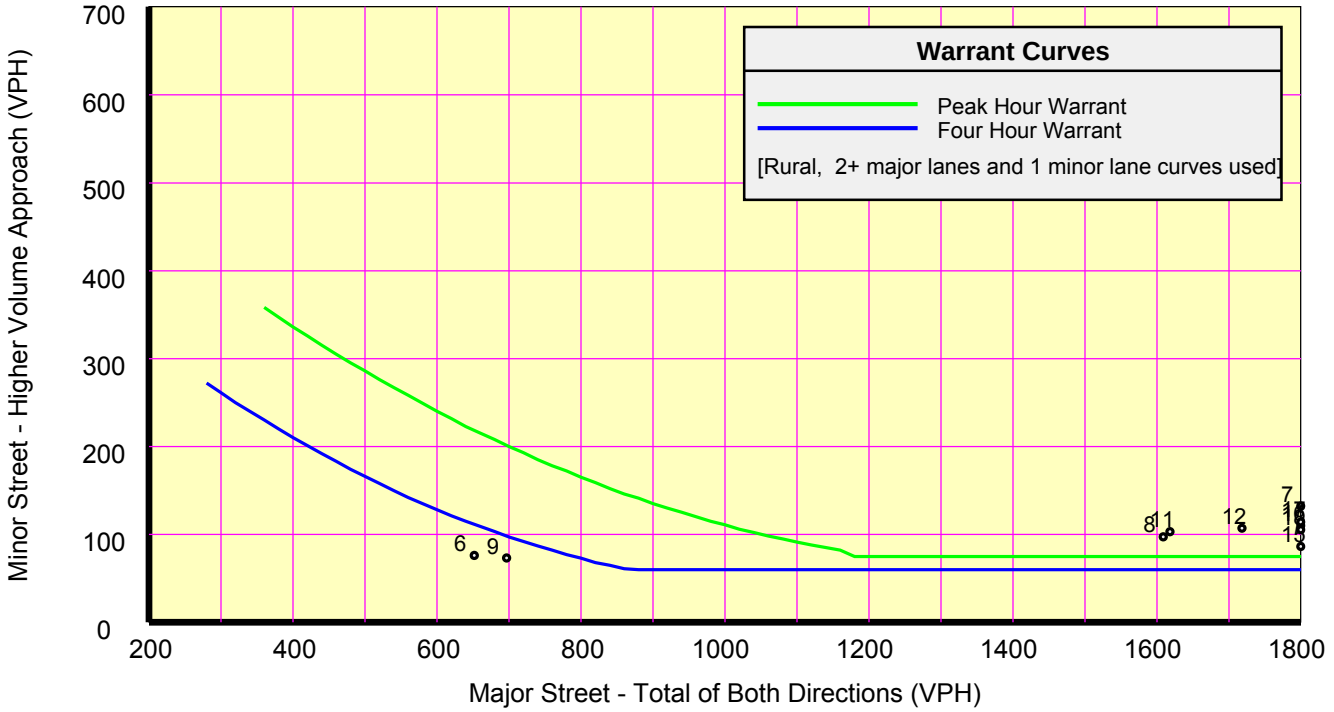
Warrant 8 - Roadway Network ..... **Not Evaluated**

Warrant 9 - Intersection Near a Grade Crossing ..... **Not Evaluated**

Snyder & Associates, Inc.
Ankeny, Iowa

Study Name : **Hickman_dartmoor**
Study Date : **10/02/13**
Page No. : **2**

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

Hour Begin	Major Total	Minor Vol	Minor Dir	Maj 420	Min 105
17:00	2,635	114	SB	Yes	Yes
16:00	2,491	110	SB	Yes	Yes
18:00	1,990	105	SB	Yes	Yes
07:30	1,866	111	SB	Yes	Yes
11:45	1,712	105	SB	Yes	Yes
06:30	1,596	117	SB	Yes	Yes
10:45	1,192	109	SB	Yes	Yes
15:45	2,340	101	NB	Yes	No
15:30	2,195	95	SB	Yes	No
15:15	2,066	91	SB	Yes	No
15:00	1,901	86	NB	Yes	No
08:30	1,509	89	SB	Yes	No
14:45	1,378	79	SB	Yes	No
08:45	1,123	77	SB	Yes	No
06:15	1,107	94	SB	Yes	No
14:30	891	79	SB	Yes	No
10:30	782	87	SB	Yes	No
09:00	697	73	SB	Yes	No
06:00	652	76	SB	Yes	No
14:15	445	75	NB	Yes	No
12:45	432	86	SB	Yes	No
10:15	377	75	SB	No	No
09:15	358	69	SB	No	No
05:45	297	59	SB	No	No

War 1B-Interruption of Traffic

Hour Begin	Major Total	Minor Vol	Minor Dir	Maj 630	Min 53
16:30	2,653	98	SB	Yes	Yes
17:30	2,364	125	SB	Yes	Yes
15:30	2,195	95	SB	Yes	Yes
07:00	2,013	132	SB	Yes	Yes
11:30	1,686	114	SB	Yes	Yes
08:00	1,609	97	SB	Yes	Yes
18:30	914	112	SB	Yes	Yes
14:30	891	79	SB	Yes	Yes
12:30	868	97	SB	Yes	Yes
10:30	782	87	SB	Yes	Yes
09:00	697	73	SB	Yes	Yes
06:00	652	76	SB	Yes	Yes
14:15	445	75	NB	No	Yes
10:15	377	75	SB	No	Yes
05:45	297	59	SB	No	Yes
22:45	0	11	NB	No	No
22:30	0	14	NB	No	No
22:15	0	17	NB	No	No
22:00	0	21	SB	No	No
21:45	0	36	SB	No	No
21:30	0	35	SB	No	No
21:15	0	42	NB	No	No
21:00	0	56	SB	No	Yes
20:45	0	69	NB	No	Yes

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Minor Dir	Maj 504	Min 84
17:00	2,635	114	SB	Yes	Yes
16:00	2,491	110	SB	Yes	Yes
18:00	1,990	105	SB	Yes	Yes
07:15	1,971	124	SB	Yes	Yes
15:00	1,901	86	NB	Yes	Yes
11:30	1,686	114	SB	Yes	Yes
08:15	1,535	98	SB	Yes	Yes
06:15	1,107	94	SB	Yes	Yes
12:30	868	97	SB	Yes	Yes
10:30	782	87	SB	Yes	Yes
14:45	1,378	79	SB	Yes	No
14:30	891	79	SB	Yes	No
06:00	652	76	SB	Yes	No
14:15	445	75	NB	No	No
10:15	377	75	SB	No	No
09:15	358	69	SB	No	No
05:45	297	59	SB	No	No
22:45	0	11	NB	No	No
22:30	0	14	NB	No	No
22:15	0	17	NB	No	No
22:00	0	21	SB	No	No
21:45	0	36	SB	No	No
21:30	0	35	SB	No	No
21:15	0	42	NB	No	No

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project C-60 Reconstruction - From C-66 west 3.25 miles

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) _____

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 $ 1,450,000

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 Plymouth County Board of Supervisors

Signed: Jim Henrich 8-12-14

Signature Date Signed

Jim Henrich

Typed Name

Attest: Stacey Feldman 8-12-14

Signature Date Signed

Stacey Feldman

Typed Name

B. Narrative

C-60 From NW Cor NE1/4 NE1/4 Sec 7-90-44 east 3.25 miles to the NE Cor Sec 10-90-44

This section of roadway was graded in 1950 with a 28 ft. top width and 1 1/2:1 foreslopes. The road was paved in 1952 with a 22 ft. wide asphalt emulsion base and was resurfaced in 1960, 1974, and 1988. The grade line of this road essentially follows the existing topography but in some places will only meet a 35-40 mph design standard for vertical curve lengths. There is also a large deflection at the west end of the project where C-60 intersects with K-64. The deflection at this intersection is just under 3 degrees and with the vertical alignment results in cars going off the edge of the roadway. Chevron signs have been placed in order to alert motorists of the change in direction. The enclosed photo shows this situation.

Many of the accidents along this roadway result in rollovers because of the narrow shoulders and steep foreslopes. It is very difficult to redirect a vehicle back onto the roadway once leaving the pavement surface. The shoulder width along the roadway is 2 ½ to 3 ft. The enclosed photo's should show typical shoulder areas.

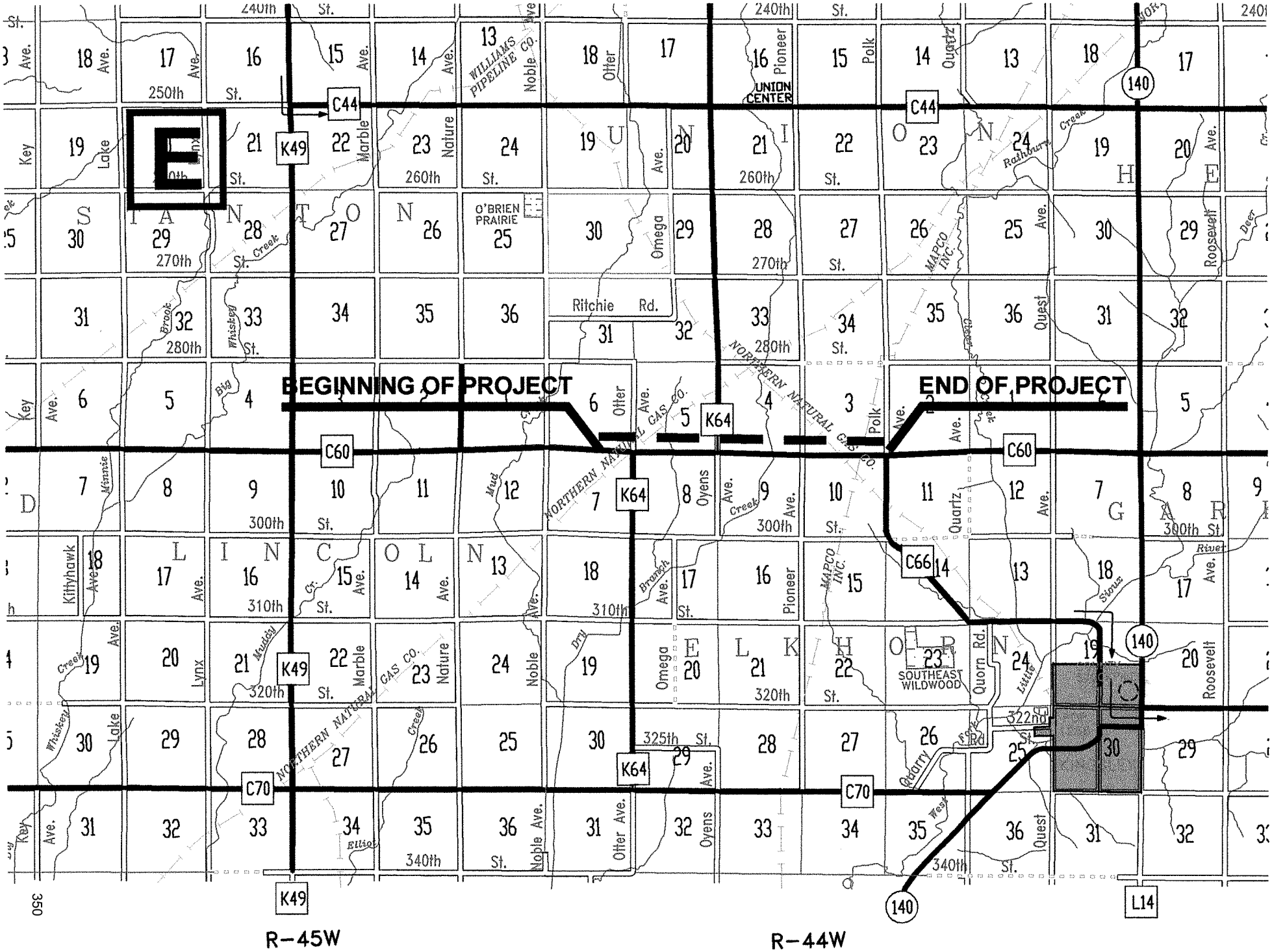
The proposed project will reconstruct this roadway in 2016 to meet current design standards. The shoulder width will be widened to 8 ft. and the foreslopes will be constructed to 3:1 which would allow vehicles leaving the roadway to stay upright and not overturn. The vertical curves will be constructed to a 55 mph design standard to allow adequate sight distance for proper turning and passing maneuvers. The intersection at the west end of the project will be reconstructed with a longer horizontal and vertical curve, correcting the accident prone situation we currently have. We anticipate that approximately one half of this project will be shoulder grading/widening work while the other half will be complete reconstruction.

C. Cost

The cost of this project is estimated at $ 1,450,000. This will include all necessary work to bring the shoulders, foreslopes and gradeline up to current design standards. We do not at this time have our preliminary design completed in order to give a detailed breakdown of quantities. The amount of traffic safety funds we are requesting is $500,000. This project will be paved in 2017 under a separate contract.

D. Time Schedule

This project is scheduled for the 2016 construction season. Preliminary survey work has been completed. Design work will begin in the fall of 2014 and completed in 2015. Right of Way purchase will begin in the fall of 2015.

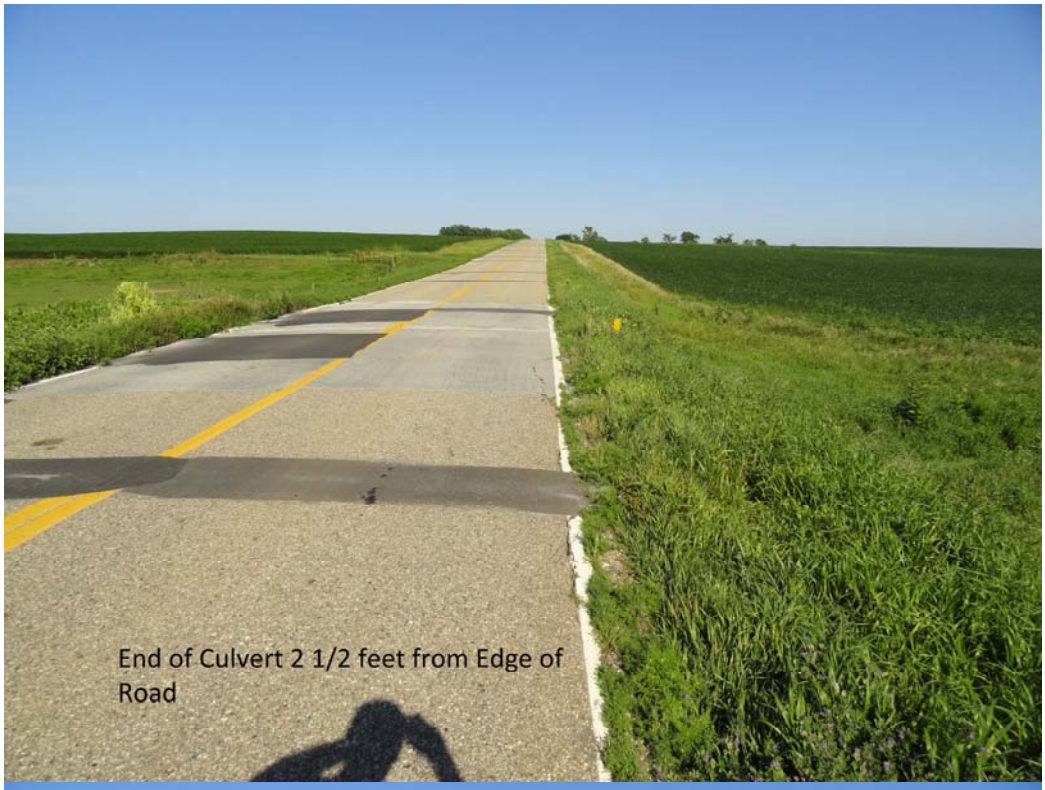

BEGINNING OF PROJECT
END OF PROJECT
E
C44
K49
K64
C60
C66
C70
140
L14
UNION CENTER
O'BRIEN PRAIRIE
SOUTHEAST WILDWOOD
Ritchie Rd.
WILLIAMS PIPELINE CO.
NORTHERN NATURAL GAS CO.
MAPCO INC.
S I A N T O N
L I N C O L N
E L K H O R N
D G A R
250th St.
260th St.
270th St.
280th St.
300th St.
310th St.
320th St.
325th St.
340th St.
322nd Rd.
R-45W
R-44W
350

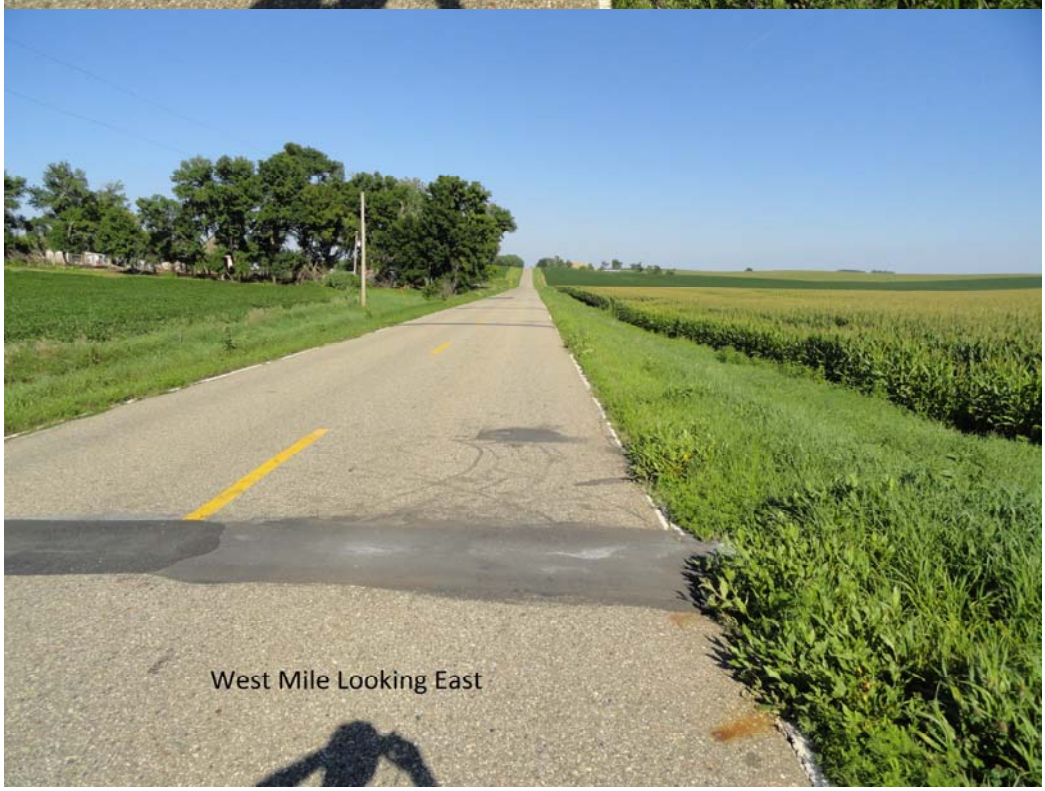
F

Center Mile--East View--Showing 1 1/2 :1 F.S. and 2 1/2 - 3 foot shoulder

East View--2 1/2 - 3 feet of shoulder

F


End of Culvert 2 1/2 feet from Edge of Road


West Mile Looking East

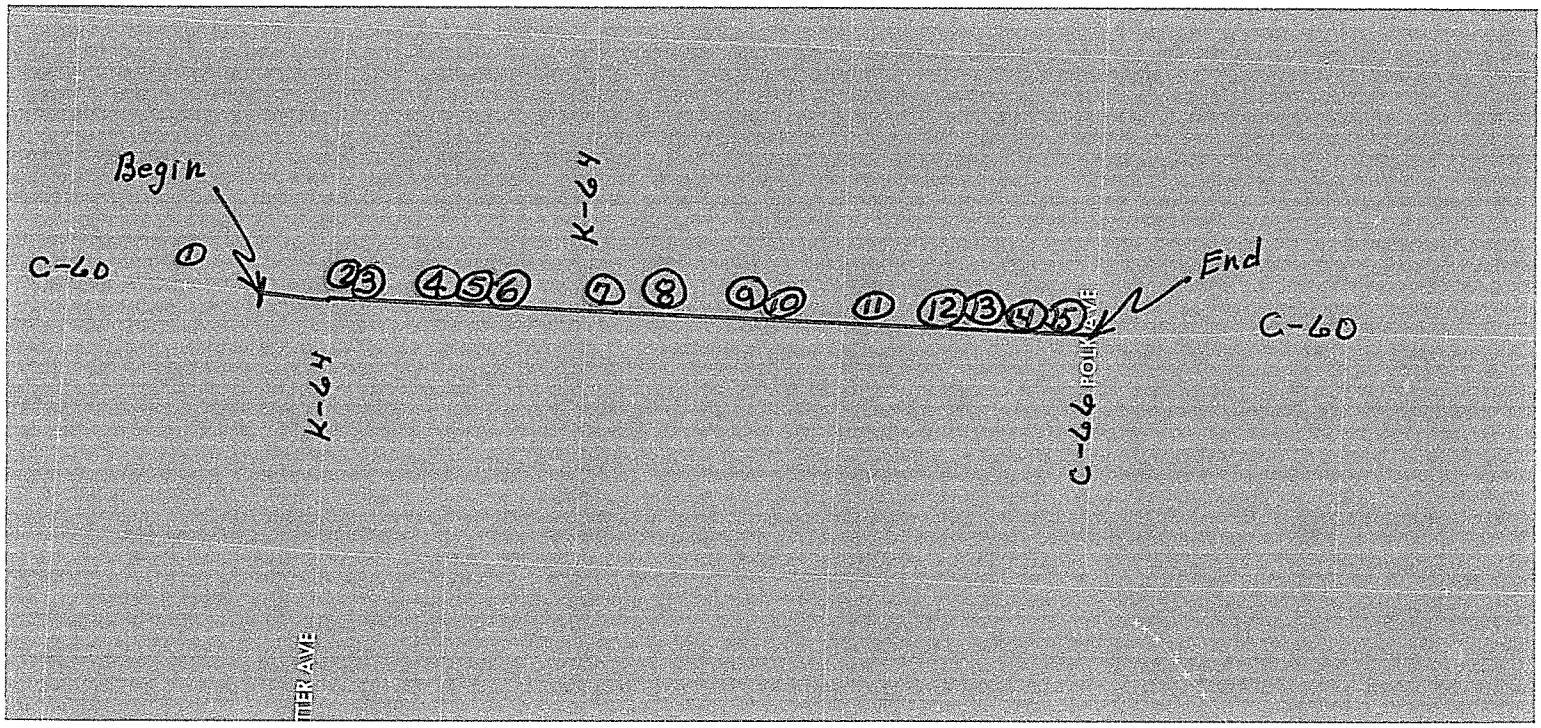
F

C-60/K-64 Intersection
Deflection of 3 degree @ Intersection

East View of shoulder

END PROJECT
C-66
POLK AVE.
PIONEER AVE.
OYENS AVE.
K-64
BEGIN PROJECT
OTTER AVE.
H

I


Begin
C-60
1
2 3
4 5 6
K-64
7
8
9 10
11
12 13 14 15
End
C-60
K-64
C-67
TIER AVE
TIER AVE

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2011658667 11/19/2011 13:00
County: 75 **City:**

C060 / C60 measuring 0.45 Miles East from C060 / C60 and NOBLE AVE

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: Major
Fatalities: 0
Major Injuries: 1
Minor Injuries: 1
Possible Injuries: 1
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Ice
Light Conditions: Daylight
Weather Conditions: Cloudy
Drug/Alc Involved: none indicated
Property Damage: $8500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	40	0	0
Driver Gender:	F		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Ditch/embankment	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2004245756 09/15/2004 13:30 C060 / C60
County: 75 **City:**

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Partly cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$31000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Tractor/semi-trailer	0	0
Driver Age:	50	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

3

3

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2009497860 02/14/2009 11:25
County: 75 **City:**

C060 / C60 measuring 0.1 Miles East from C060 / C60 and OTTER AVE and K064 / OTTER AVE

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: PDO
Manner of Crash: Non-collision
Fatalities: 0
Surface Conditions: Dry
Major Injuries: 0
Light Conditions: Daylight
Minor Injuries: 0
Weather Conditions: Clear
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $11250
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	2-axle 6-tire truck	0	0
Driver Age:	33	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Pole: utility/light/etc	0	0

4 4

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2006229082 07/06/2006 08:06 C060 / C60
County: 75 **City:**

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: PDO
Manner of Crash: Non-collision
Fatalities: 0
Surface Conditions: Dry
Major Injuries: 0
Light Conditions: Daylight
Minor Injuries: 0
Weather Conditions: Clear
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $9050
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	20	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Ditch/embankment	0	0

(5) (5)

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2007378439 06/12/2007 13:55 C060 / C60
County: 75 **City:**

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	Major	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	1	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Partly cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$75100

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Truck/trailer	0	0
Driver Age:	27	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

6

6

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2011632376 05/23/2011 22:30 1/2 WEST OF OYENS AVE ON C60
County: 75 **City:**

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	**Manner of Crash:**	not reported
Fatalities:	0	**Surface Conditions:**	not reported
Major Injuries:	0	**Light Conditions:**	not reported
Minor Injuries:	0	**Weather Conditions:**	not reported
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$2000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Passenger car	0	0
Driver Age:	19	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

7

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2005

2004232279 05/08/2004 17:08 C060 / C60
County: 75 **City:**

Major Cause: Ran off road - left
Roadway Type: Intersection: Four-way intersection

Severity:	Fatal	**Manner of Crash:**	Non-collision
Fatalities:	1	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	2	**Weather Conditions:**	Clear
Possible Injuries:	1	**Drug/Alc Involved:**	Alcohol: Statutory
Unknown Injuries:	0	**Property Damage:**	$5000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	South	0	0
Veh Action:	Turning left	0	0
Configuration:	Passenger car	0	0
Driver Age:	55	0	0
Driver Gender:	M		
Driver Cond:	Infl by alc/drugs/meds	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Ditch/embankment	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2011613704 01/24/2011 05:30
County: 75 **City:**

C060 / C60 measuring 0.3 Miles East from K064 / OYENS AVE and C060 / C60 and OYENS AVE

Major Cause: Ran off road - right

Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Snow
Major Injuries:	0	**Light Conditions:**	Dark - roadway not lighted
Minor Injuries:	0	**Weather Conditions:**	Clear
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$6000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	42	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2006215102 04/11/2006 19:00
County: 75 **City:**

C060 / C60 AND DRY BRANCH MEASURING 0.67 MILES EAST FROM OYENS AVE AND K064 / OYENS AVE AND C060 / C60

Major Cause: Ran off road - left
Roadway Type: Non-intersection: Bridge/overpass/underpass

Severity: Poss/Unk
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 1

Manner of Crash: Non-collision
Surface Conditions: Dry
Light Conditions: Dusk
Weather Conditions: unknown
Drug/Alc Involved: none indicated
Property Damage: $3500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	4-tire light truck	0	0
Driver Age:	53	0	0
Driver Gender:	F		
Driver Cond:	Asleep/fatigued/etc.	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	Fatigued/Asleep	0	0
Fixed Object:	Bridge/bridge	0	0

(10)

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2004261108 12/16/2004 10:00
County: 75 **City:**

C060 / C60 MEASURING 0.7 MILES EAST FROM K064 / OYENS AVE AND C060 / C60 AND OYENS AVE

Major Cause: Ran off road - right

Roadway Type: Non-intersection: No special feature

Severity: Poss/Unk

Manner of Crash: Non-collision

Fatalities: 0

Surface Conditions: Ice

Major Injuries: 0

Light Conditions: Daylight

Minor Injuries: 0

Weather Conditions: Clear

Possible Injuries: 1

Drug/Alc Involved: none indicated

Unknown Injuries: 0

Property Damage: $5000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	83	0	0
Driver Gender:	F		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2012702108 09/08/2012 07:17 C060/C60 MEASURING 681 FEET EAST FROM C060/C60 AND PIONEER AVE
County: 75 **City:** Kingsley

Major Cause: Swerving/evasive action
Roadway Type: Non-intersection: No special feature

Severity:	Minor	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	1	**Weather Conditions:**	Clear
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$8300

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	27	0	0
Driver Gender:	F		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	Other improper action	0	0
Fixed Object:	none	0	0

(12) (12)

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2005

2012695667 07/23/2012 16:00
County: 75 **City:**

C060/C60 MEASURING 2114 FEET EAST FROM PIONEER AVE AND C060/C60

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Clear
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$4200

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	4-tire light truck	0	0
Driver Age:	65	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Pole: utility/light/etc	0	0

(13)

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2009517472 07/25/2009 12:30 C060 / C60
County: 75 **City:**

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Partly cloudy
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$2000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Tractor/semi-trailer	0	0
Driver Age:	40	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

(14)

(14)

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2012671139 02/06/2012 01:38
County: 75 **City:**

C060 / C60 measuring 0.33 Miles West from Off Roadway/Roadway Not Found

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Dark - roadway not lighted
Minor Injuries:	0	**Weather Conditions:**	Fog/smoke
Possible Injuries:	0	**Drug/Alc Involved:**	Alcohol: Statutory
Unknown Injuries:	0	**Property Damage:**	$3000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	18	0	0
Driver Gender:	M		
Driver Cond:	Infl by alc/drugs/meds	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Culvert	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2009489269 01/17/2009 14:55
County: 75 **City:**

C060 / C60 measuring 0.1 Miles West from C066 / POLK AVE and C60 and C060 / C60 and POLK AVE

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

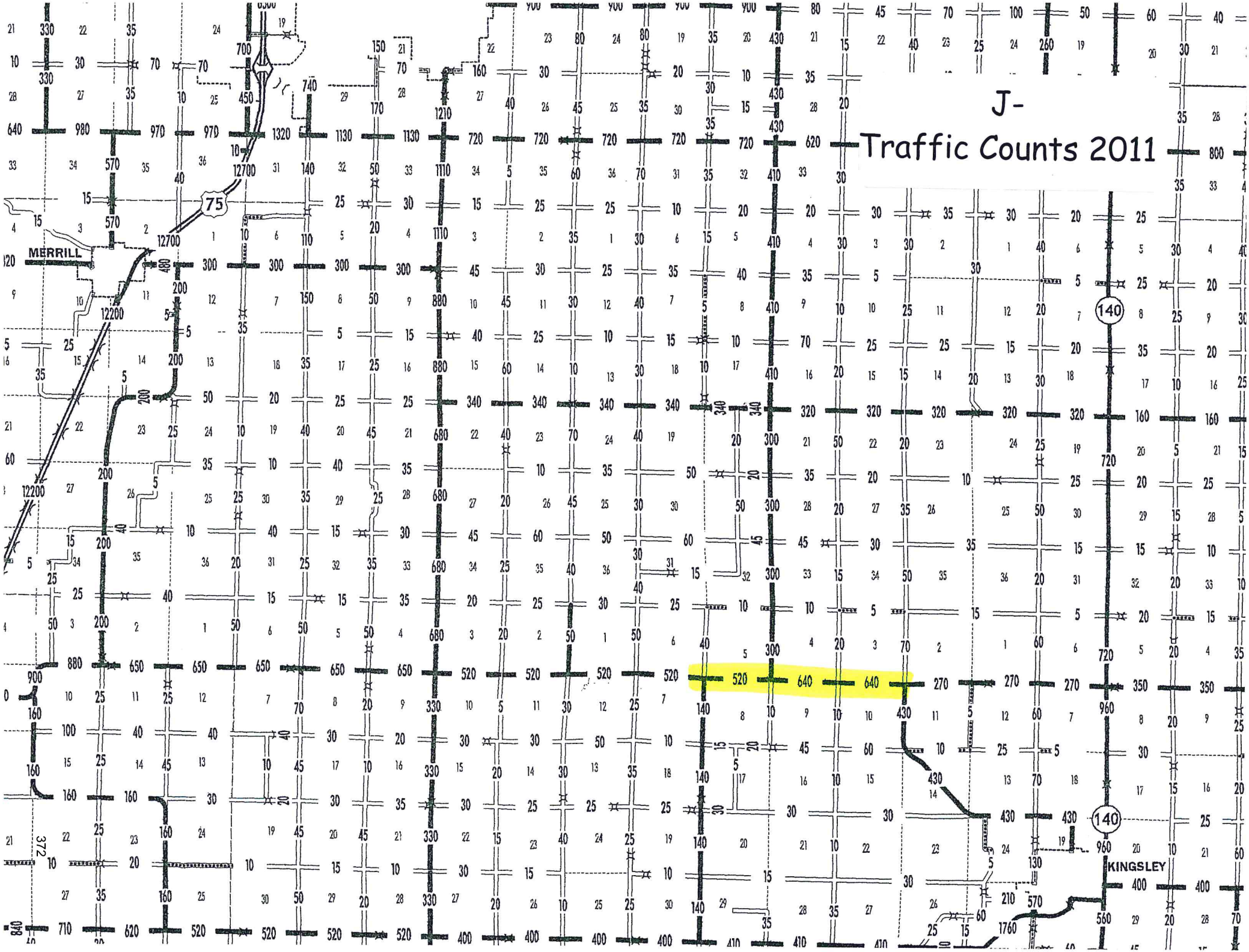
Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Snow
Light Conditions: Daylight
Weather Conditions: Cloudy
Drug/Alc Involved: none indicated
Property Damage: $2500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Van or mini-van	0	0
Driver Age:	18	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

J-
Traffic Counts 2011



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8/13/2014			C-60	Safety Fund Application			
-	-	Injuries					
Accident Yr.	Report #	Fatalities	Major	Minor	Possible	Unknown	P.D.
2011	1						Outside Project
2004	2						31,000
2009	3						11,250
2006	4						9,050
2007	5		1				75,100
2011	6						2,000
2004	7	1		2	1		5,000
2011	8						6,000
2006	9					1	3,500
2004	10				1		5,000
2012	11			1			8,300
2012	12						4,200
2009	13						2,000
2012	14						3,000
2009	15						2,500
						Total	167,900
	ADT	520-640 VPD					
	CRF	Crash Reduction Factors					
		Flatten V.C	Crest	20	Horizontal	67	
		Flatten Foreslope		15			
		Change Shoulder Width		47			
			Cumulative	63.96			

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B/C ANALYSIS INSTRUCTIONS

revised 5/2014
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:	20	15	47		
Cummulative CRF =	63.96				

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

Yearly Worksheet
The "Yearly" worksheet is not part of the analysis, but can be used to check and better understand the results.

Discount Rate
The discount rate of 4% excludes inflation and comes from the St. Louis Federal Reserve Bank. It should not be changed without proper justification and documentation.

August 2009 - Changed Property Cost calculations to include ALL crashes, rather than just PDO crashes.

April 2010 - Changed source for Crash Reduction Factors from Desktop Reference to CMF Clearinghouse web site.

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Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Plymouth Prepared by: Thomas Rohe Date Prepared: Aug 13, 2014

Location: On Plymouth County Road C-60 From NWCor NE1/4 NE1/4 Sec 7-90-44 to NE Cor Sec 10-90-44

Improvement

Proposed Improvement(s): Reconstruction of County Road C-60 which will widen the shoulders, flatten foreslopes, and improve vertical and horizontal curves from the current 35-45 mph design to a current 55 mph design.

$ 500,000	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, **INT**
		$ 500,000	Present Value All Costs, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa Department of Transportation 2011 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.25	640	22 Ft. Wide Asphalt Pav't
3.25	miles total	

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

2,080	Current Vehicle Miles / Day, **VM**
2,538	End of Life Veh. Miles / Day
759,200	Current Veh. Miles / Year, **AM**
16,716,828	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

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

0 Additional months values as of May 2014

1	Fatal Crashes		Fatalities @	$4,500,000	$	-
		2	Major Injuries @	$325,000	$	650,000
3	Injury Crashes	3	Minor Injuries @	$65,000	$	195,000
		2	Possible Injuries @	$35,000	$	70,000
10	Property Damage Only		(assumed cost per crash)	$7,400	$	103,600
			-OR- enter all Property Costs of all crashes:			
14	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,018,600

1.40	Current Crashes / Year, **AA** = TA / T	184.4	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 72,757	Cost per Crash, **AVCR** = LOSS / TA	$ 962,306	Present Value of Avoided Crashes, **BENEFIT**
30.8	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.90	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 65,150	Crash Costs Avoided in First Year, AAR x AVCR		
19.7	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 = $962,306 : $500,000 = **1.92** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project 1100 Willis Ave. and First Ave. Intersection Improvements

Applicant City of Perry

Contact Person Butch Niebuhr Title City Administrator

Complete Mailing Address 1102 Willis Ave.

P.O. Box 545, Perry, IA 40020

Phone 515.465.2481 (Area Code) E-Mail Butch.Niebuhr@perryia.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 $ $380,000.00

Safety Funds Requested $ $380,000.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the City of Perry, Iowa

Signed: _____ 8-13-14
Signature Date Signed

Butch Niebuhr, City Administrator
Typed Name

Attest: _____ 8/14/14
Signature Date Signed

Matthew Ferrier, City Engineer
Typed Name

RESOLUTION NO. 080414I

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

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

THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PERRY, IOWA, authorization is given to the City Mayor to apply for Traffic Safety Improvement Program (TSIP) Funds.

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

PASSED AND APPROVED this 4th day of August, 2014.

Jay P. Pattee, Mayor

ATTEST:

Corey Eastman, City Clerk

B. Narrative:

Introduction and Background

The City of Perry has held discussions with the Iowa DOT District 4 Office in regards to the current lane configuration and safety of Highway 144 through the community. The City of Perry has recently conducted several traffic studies along the Highway 144 corridor, especially where it intersects the Raccoon River Valley Trail. These studies have indicated that a conversion from a four lane section to a three lane section would increase safety along the entire corridor while continuing to serve traffic volumes. This intersection is a focal point to Perry's downtown commercial district and is heavily trafficked by vehicles, pedestrians and bicyclists. With the steady increase of pedestrians and cyclists along the RRVT safety improvements need to be made.

Existing Conditions

Highway 144 and First Avenue is a heavily trafficked four-lane roadway located in the center of Perry. This road is a US numbered route that branches off of Highway 141 and provides access to the downtown, a through route to Rippey and an eventual connection to Highway 30. Both commercial traffic and industrial traffic use this corridor to access the downtown and west industrial area from Highway 141. The access to these areas creates high volumes of varying traffic, including several semi-trucks, delivery trucks, standard vehicular traffic and an extremely high number of pedestrians and bicycles.

This intersection includes a crossing for the Raccoon River Valley Trail, which carries a high volume of pedestrian and bicycle traffic. Trail counts have continued to rise over the past 5 years and are expected to increase as other regional connections are made to this trail corridor. The AADT went from 28 in 2012 to 44 in 2013. It is expected to go over 50 in 2014 with more than 20,000 pedestrians crossing this intersection. The trail crosses the intersection from the Southeast to the Northwest, as the RRVT follows the historic rail line northwest out of town.

Iowa DOT traffic counts for this project area indicate nearly 7,000 vehicles traveled the north leg of this intersection in 2012, including nearly 75 trucks. The AADT has primarily remained consistent for the intersection, with a growing amount of truck traffic and pedestrian influence. Current incoming traffic from north and southbound lanes enter the intersection at 25 MPH. Willis Avenue is a two-lane major collector that has single lanes running eastbound and westbound, with left turn lanes at the intersection. Current incoming traffic from east and westbound lanes are posted at 20 MPH.

The presence of pedestrians and bicyclist traffic is expected to increase as the City of Perry continues to revitalize its downtown area through re-development opportunities. An updated grocery store, development of the land adjacent to the downtown area, the Hotel Pattee and several bicycle friendly establishments are expected. Perry is becoming a predominantly bicycle-friendly community, which places an importance on the use and safety of this key intersection.

In the past five years there have been 24 recorded accidents and one fatality at this intersection.

Proposed Project

The Iowa DOT Traffic Safety Improvement Program funds will assist the City's efforts to improve efficiency and safety at the Willis Ave and Highway 144 intersection. This project proposes reducing the four-lane section of Highway 144 to a safer three-lane section. The project includes improvements to the intersection to accommodate turning truck traffic, safe passage of pedestrians and bicyclists, and efficient movement of daily vehicles.

The three-lane section will include a single northbound and southbound lane and a left turn lane that will be constructed and signalized. Each turning lane will have its own signal; designated arrow signs that will flash yellow when a left turn is allowed and red when that lane of traffic is stopped.
Intersection crosswalks will be redesigned with pedestrian push button stations at each quadrant of the intersection. Crosswalks will include LED Pedestrian Indication Countdown Timers. The Raccoon River Valley Trail crossing will require additional design and width to accommodate higher pedestrian trafficking volumes. This will allow trail users to safely cross the intersection to access the trail, the downtown area and other amenities within the city of Perry.

Crash Analysis/Safety Justification

An evaluation of the crash history for the Willis Avenue and Highway 144 intersection was performed with the most current crash data provided from the city of Perry Police Department (2009-Present). There were found to be 43 separate incidents in the past 5 years, of which there was one fatality, 13 major accidents and 11 minor accidents. The data compiled shows a high rate of left turn accidents such as failure to yield and failure to obey traffic signals.

The crash experience at this intersection appears to be attributed to the existing geometry and the safety issues presented by the four lane section with one designated turn lane. Different modes include semi, vehicle and pedestrian traffic as well as a wide range of users both in age and ability. It should also be noted that the intersection carries heavy traffic during many of the Community's events as well as during shift changes for the industrial area to the west.

The four lane section of the intersection currently presents a complex interaction with roadway users and pedestrians. The majority of the recorded accidents are left turns that cross multiple lanes of traffic. It is difficult for pedestrians to cross four lanes of traffic with no countdown timers or push button stations. Drivers are forced to take dangerous left turns across two lanes of traffic. Often, these turns are blind due to large trucks and semi tractors occupying center lanes.

This analysis took the applicable Crash Reduction Factors (CRF) from the Crash Modification Factors Clearinghouse website based on planned improvements to the roadway. As seen from the Benefit/Cost worksheet (using the provided Iowa DOT Excel template) a cumulative CRF = 37 was used. This CRF resulted in a relatively high B/C ratio of 2.36:1 for the life of the project. This is believed to be a conservative value based upon past and anticipated future growth for the area. The commercial district continues to exceed expected growth and development rates and is highly desirable to tourists and citizens alike with the availability many amenities and attractions located in the area.

Proposed improvements to implement a Road Diet will significantly improve safety by making more efficient use of space by all users, while having the added benefit of helping reduce congestion. The project will also enhance the awareness of bicyclists and pedestrians by providing additional facilities, signs and pavement markings, and improved geometrics. All of these elements are needed improvements to a major roadway that has become a safety hazard for both motorists and pedestrians.

C. Itemized Breakdown of All Costs:

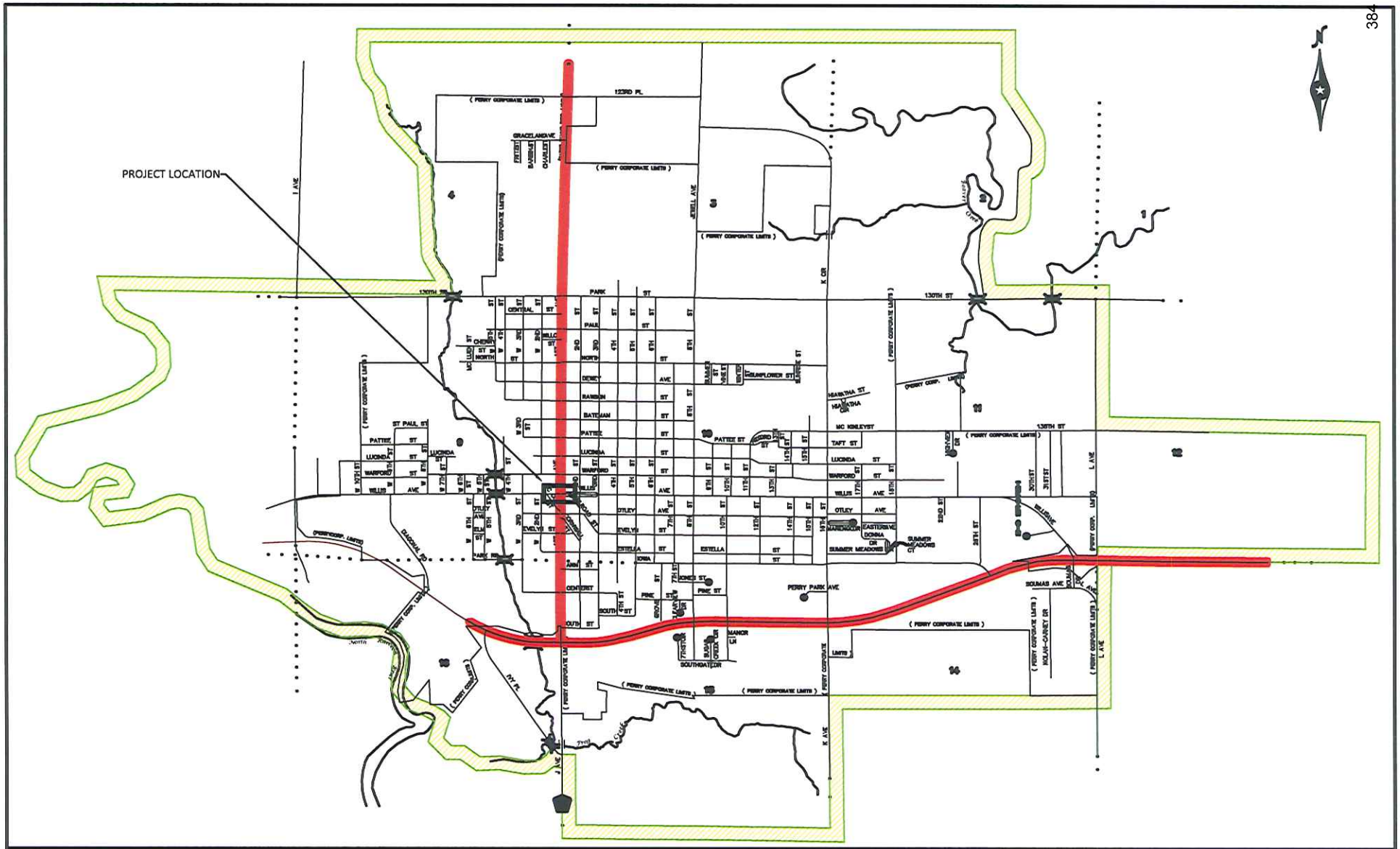
ENGINEER'S ESTIMATE
Hwy 144 at Willis Ave
Perry, IA
TSIP Grant Application

	ENGINEER'S ESTIMATE OF CONSTRUCTION COSTS					
NOTE	ITEM NO.	ITEM	UNIT	UNIT PRICE	QUANTITY	COST
	1	PA85 POLE FOUNDATION	EACH	$2,000.00	1	$2,000.00
	2	PA90 POLE FOUNDATION	EACH	$2,500.00	3	$7,500.00
	3	PA85-A-25-D40-9	EACH	$10,000.00	1	$10,000.00
	4	PA90-A-35	EACH	$12,000.00	1	$12,000.00
	5	PA90-A-35-D40-9	EACH	$12,500.00	1	$12,500.00
	6	PA90-A-40	EACH	$13,000.00	1	$13,000.00
	7	WIRING	LS	$10,000.00	1	$10,000.00
	8	CONDUIT	LS	$5,000.00	1	$5,000.00
	9	SIGNAL SERVICE CABINET WITHOUT BATTERIES	EACH	$4,000.00	1	$4,000.00
	10	CONTROLLER CABINET	EACH	$20,000.00	1	$20,000.00
	11	EQUIPMENT PAD FOUNDATION	EACH	$1,500.00	1	$1,500.00
	12	NMC LOOP DETECTOR 6'X6'	EACH	$1,500.00	26	$39,000.00
	13	HANDHOLE	EACH	$1,000.00	12	$12,000.00
	14	APS PUSH BUTTON	EACH	$400.00	8	$3,200.00
	15	PEDESTRIAN PUSH BUTTON STATION	EACH	$200.00	5	$1,000.00
	16	3-SECTION LED HEAD	EACH	$1,250.00	8	$10,000.00
	17	4-SECTION LED HEAD	EACH	$1,500.00	8	$12,000.00
	18	PEDESTRIAN INDICATION (LED COUNTDOWN)	EACH	$750.00	8	$6,000.00
	19	APS CONTROL BOARD	EACH	$1,000.00	1	$1,000.00
	20	APS CENTROL CONTROL UNIT	EACH	$2,200.00	1	$2,200.00
	21	APS CONFIGURATOR	EACH	$300.00	1	$300.00
	22	LUMINAIRE-LED	EACH	$2,000.00	2	$4,000.00
	23	SIDEWALK, 6"	SY	$60.00	60	$3,600.00
	24	DETECTABLE WARNING	SF	$25.00	72	$1,800.00
	25	PAVEMENT REMOVAL	SY	$20.00	175	$3,500.00
	26	INTAKE / MANHOLE REMOVAL	EACH	$500.00	6	$3,000.00
	27	INSTALL INTAKE / MANHOLE	EACH	$2,500.00	6	$15,000.00
	28	STORM SEWER	LF	$70.00	120	$8,400.00
	29	PAVEMENT, 10" PCC	SY	$80.00	120	$9,600.00
	30	SUBBASE, 6" MODIFIED	SY	$9.00	120	$1,080.00
	31	SUBGRADE PRERPARATION, 12"	SY	$5.00	120	$600.00
	32	PAINT	STA	$80.00	65	$5,200.00
	33	LEFT TURN ARROWS	EACH	$500.00	7	$3,500.00
	34	MOBILIZATION	LS	$25,000.00	1	$25,000.00
	35	TRAFFIC CONTROL	LS	$10,000.00	1	$10,000.00

TOTAL	$278,480.00
ENGINEERING AND ADMIN.	$55,696.00
CONTINGENCY	$41,772.00
SUB TOTAL	$375,948.00
	$380,000.00

D. Time Schedule:

Dates:	Project Activity:
August 2014	Submit TSIP Grant Application
September 2014	Prepare Plans and Specifications
October 2014	Iowa DOT Plan Review
November 2014	Final Plan Revisions
December 2014	Grant Approval from Commission
February 2015	Bid Letting
March 2015	Award Project
May-June 2015	Begin Construction
October-November 2015	Project Completion



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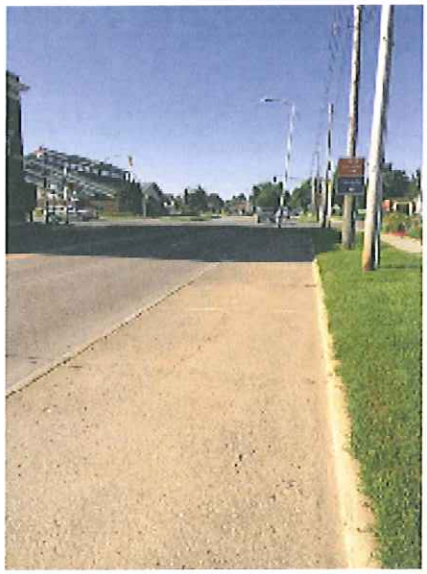
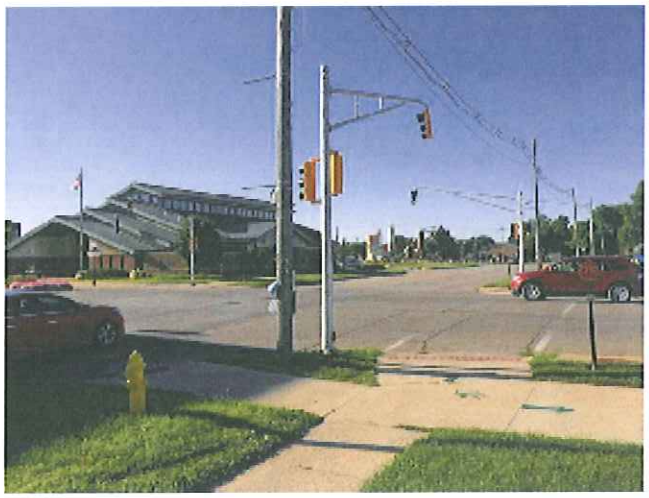
F. Color Pictures:



North of intersection, facing South.



NW Quadrant of intersection, facing South.

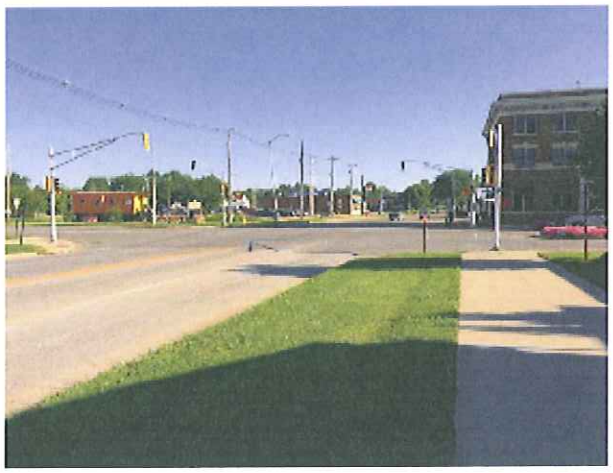
West of intersection, facing East (North Side).

West of intersection, facing East (South side).

South of intersection, facing North (West side).

South of intersection, facing Northeast (West side).

South of intersection, facing North.



South of intersection, facing North (East side).

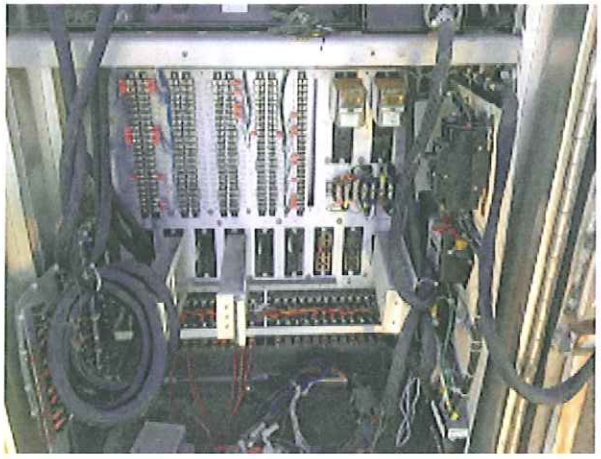
East of intersection, facing West (South side).

East of intersection, facing West (North side).

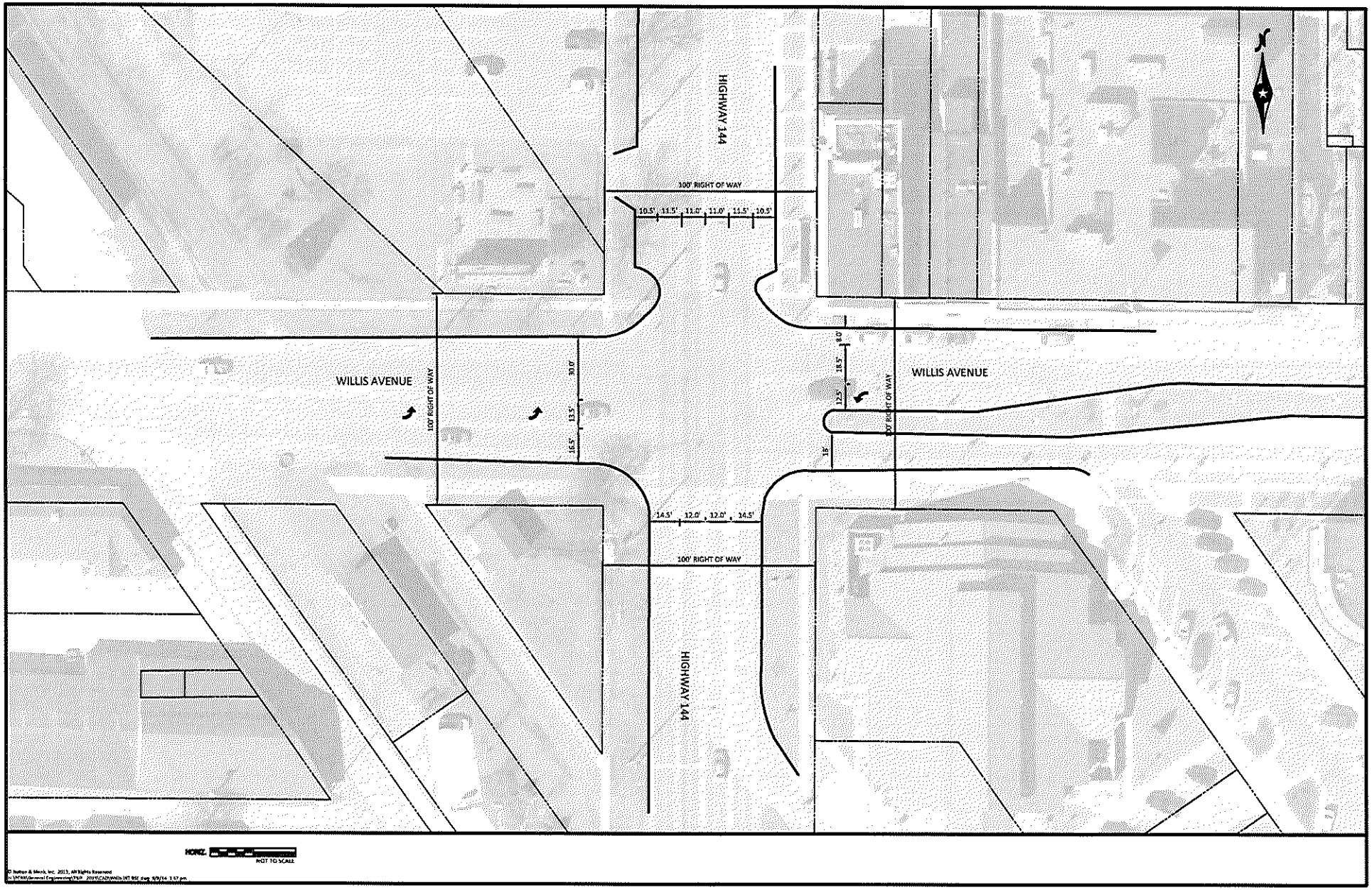
NE quadrant of intersection, facing South.

NE quadrant of intersection, facing West.

Interior of traffic controller box.



Interior of traffic controller box.



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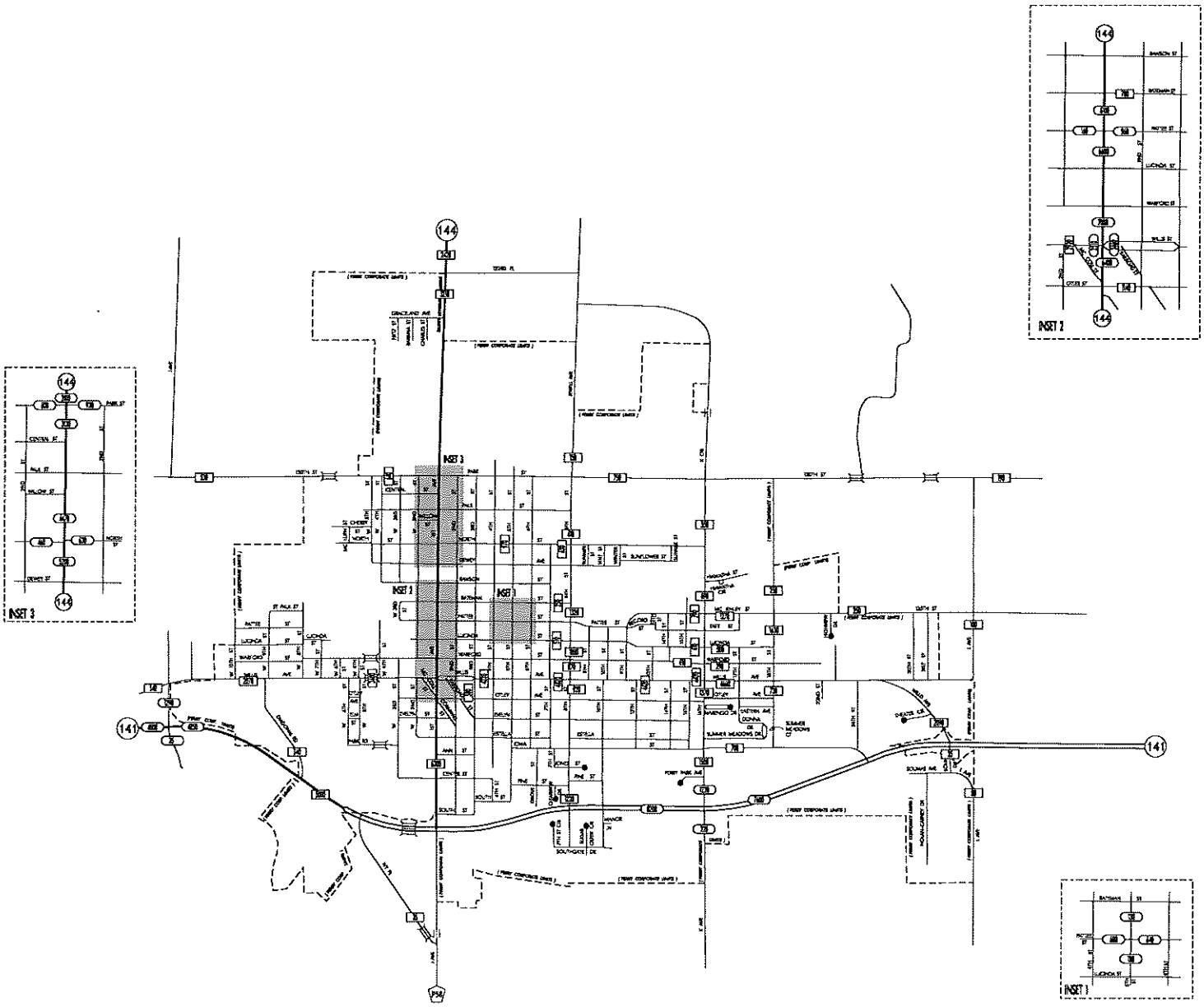
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

PERRY

DALLAS COUNTY

2012 ANNUAL AVERAGE DAILY TRAFFIC



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

LEGEND

RECORDER ONLY

MANUAL COUNT

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

25426949099

Count Date:

Tuesday, June 12, 2012

County:

Dallas

Location Description:

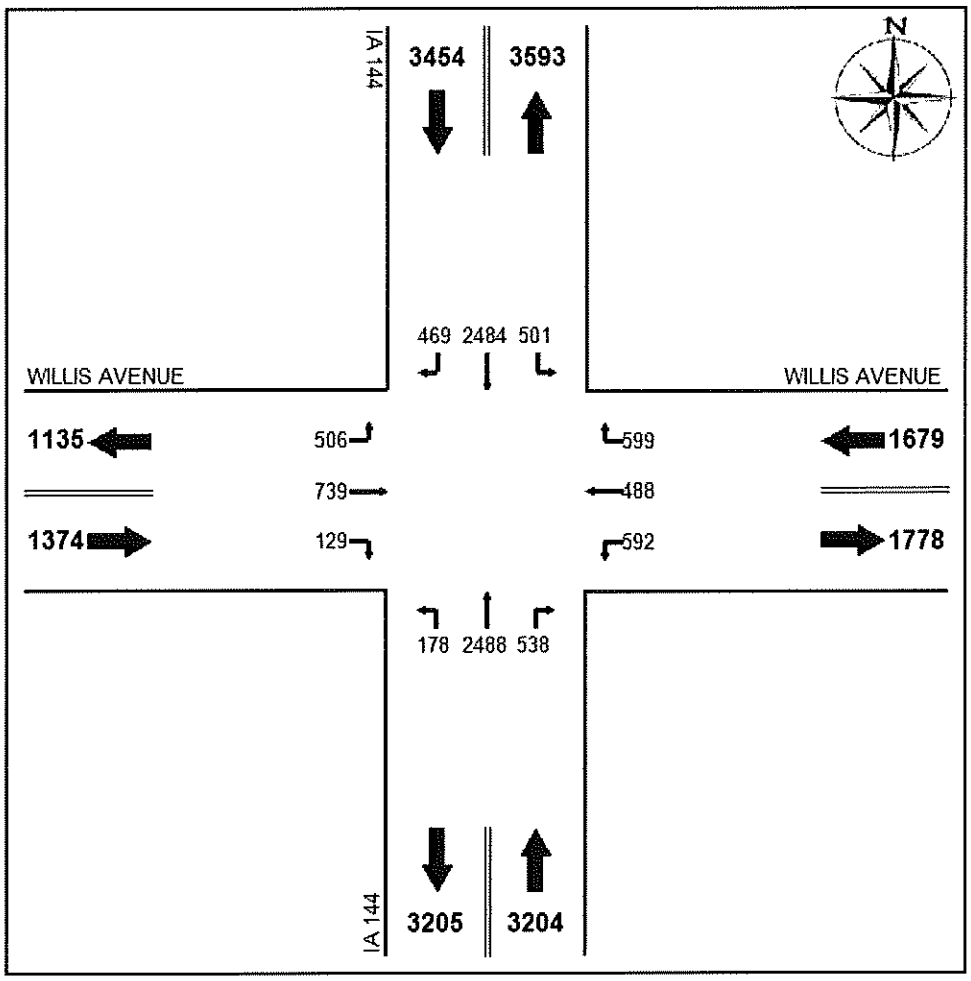
IA 144 & WILLIS AVE

Volume Factor: 1.847

Pass Class Factor: 1.895

SU Class Factor: 1.562

Combo Class Factor: 1.563



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	32	173	46	17	37	24	5	98	7	23	24	4
08:00	26	161	28	21	16	18	7	146	31	30	28	6
11:00	37	174	31	49	28	46	20	156	37	24	40	12
12:00	42	204	34	65	44	36	18	182	61	37	36	15
15:00	44	187	32	46	40	64	16	234	41	75	113	14
16:00	45	201	33	62	43	66	17	244	57	47	81	14
17:00	39	224	45	53	50	63	13	264	50	34	69	4

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

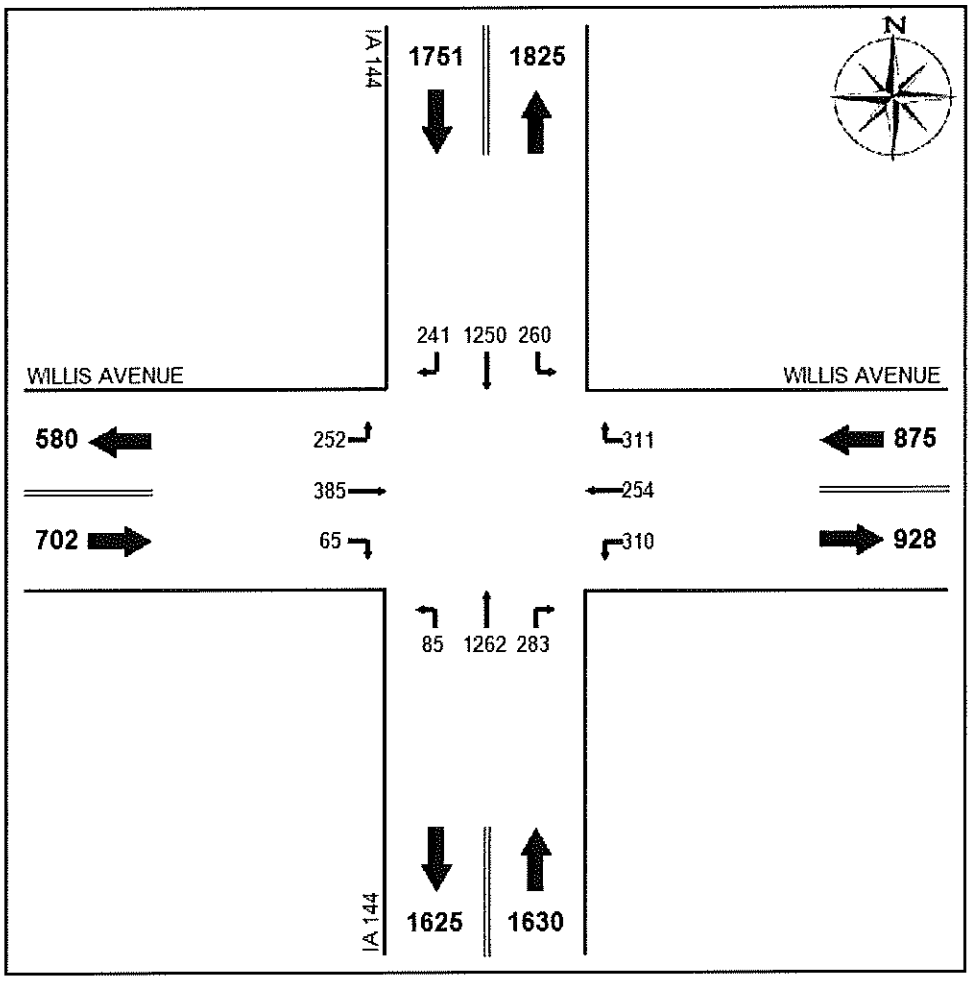
Station Number:
25426949099

Count Date:
Tuesday, June 12, 2012

County:
Dallas

Location Description:
IA 144 & WILLIS AVE

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	31	167	46	17	36	24	4	90	7	23	23	4
08:00	24	146	27	21	15	17	7	135	31	26	28	4
11:00	37	162	29	48	27	45	18	152	37	23	39	12
12:00	42	189	32	64	44	36	17	167	60	29	34	13
15:00	43	178	30	45	39	62	15	225	41	72	113	14
16:00	44	194	33	62	43	65	15	235	57	46	81	14
17:00	39	214	44	53	50	62	9	258	50	33	67	4

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

Station Number:

25426949099

Count Date:

Tuesday, June 12, 2012

County:

Dallas

Location Description:

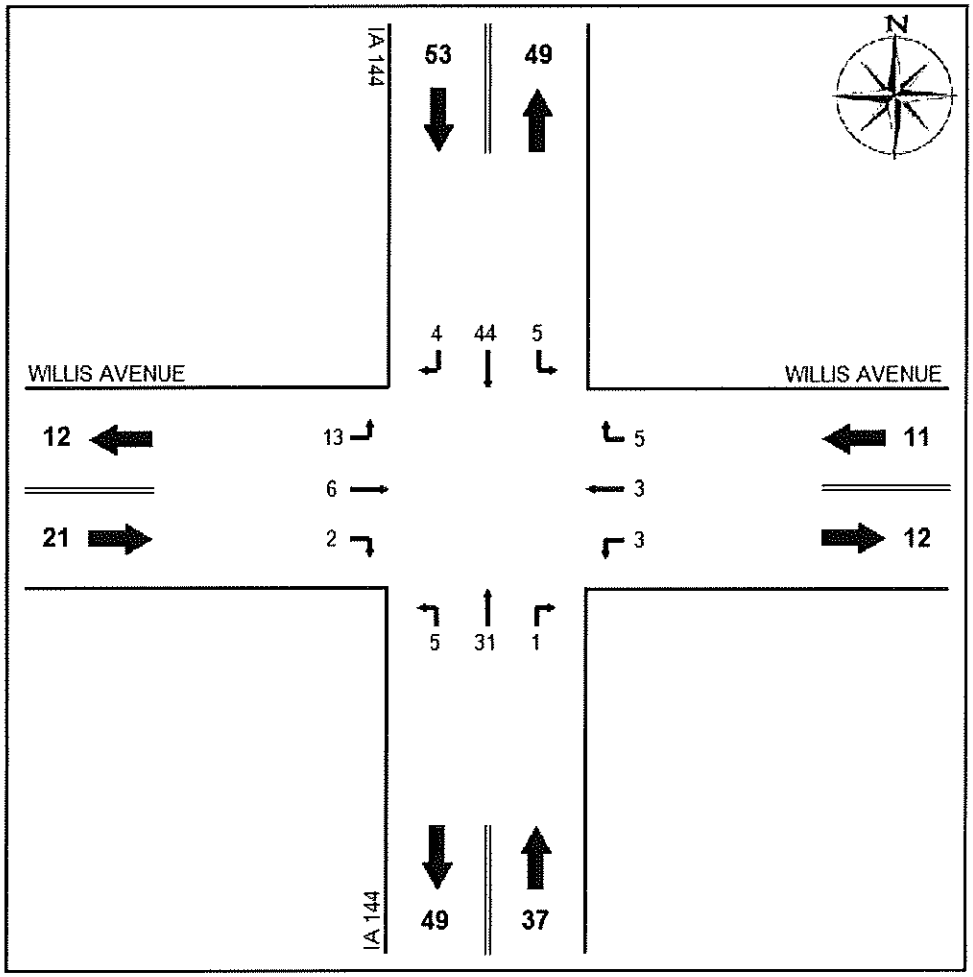
IA 144 & WILLIS AVE

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	2	0	0	0	0	0	5	0	0	1	0
08:00	2	11	1	0	1	1	0	3	0	4	0	0
11:00	0	7	2	1	1	1	1	4	0	1	1	0
12:00	0	11	1	1	0	0	1	7	1	4	2	2
15:00	1	6	0	1	1	2	1	2	0	2	0	0
16:00	1	1	0	0	0	0	0	6	0	1	0	0
17:00	0	6	0	0	0	1	2	4	0	1	2	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

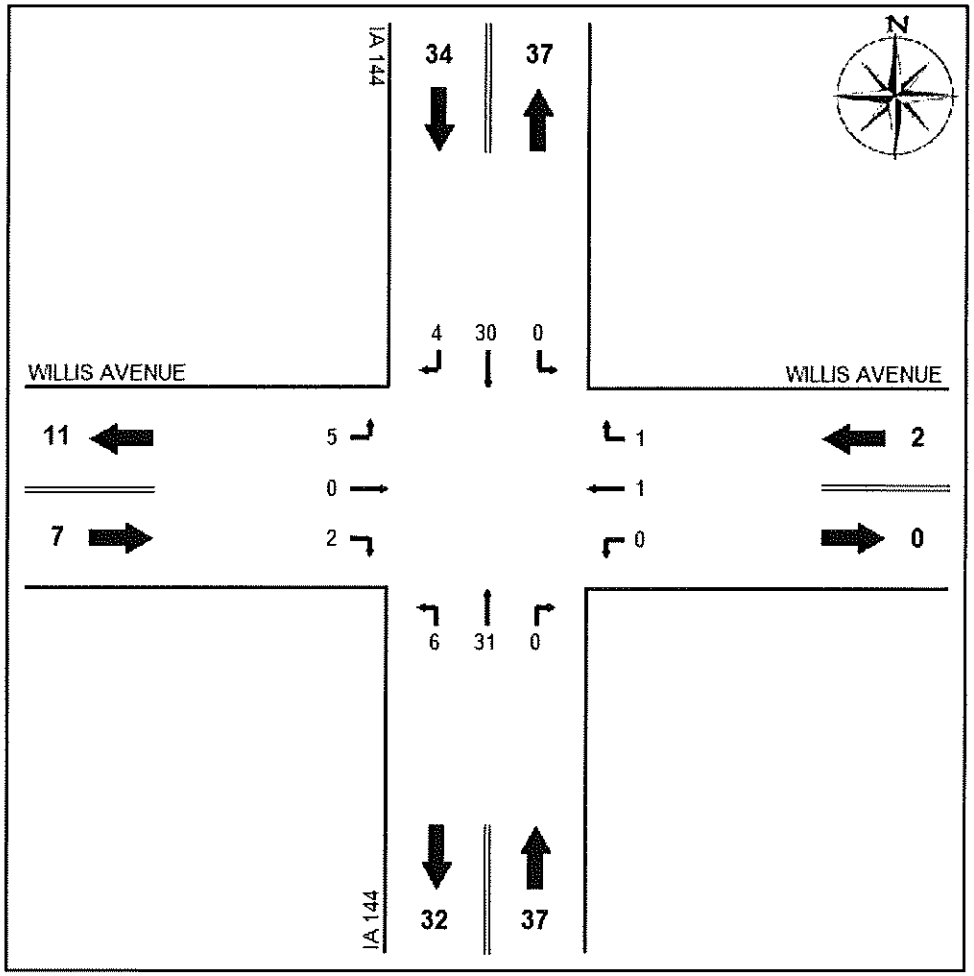
Station Number:
25426949099

Count Date:
Tuesday, June 12, 2012

County:
Dallas

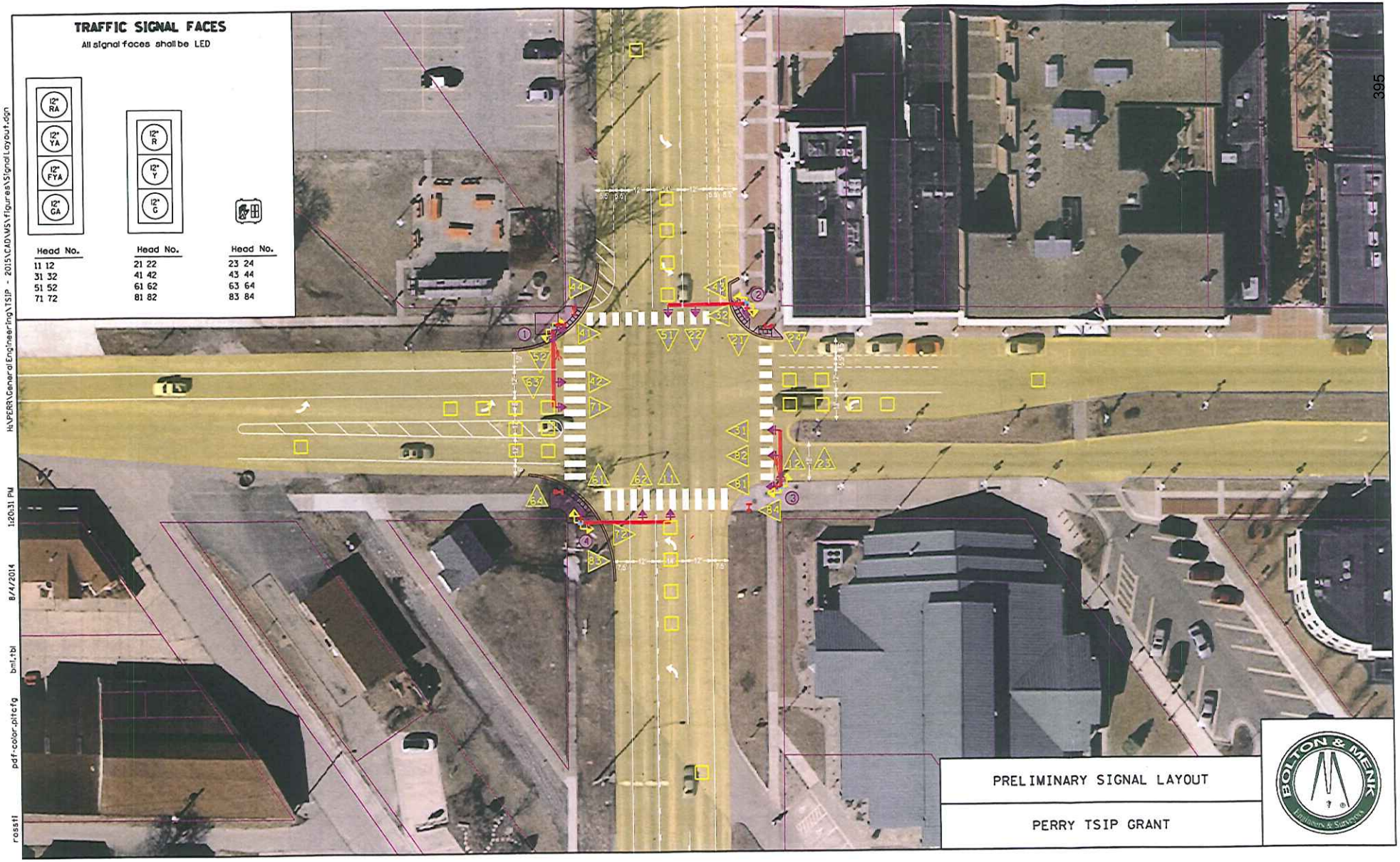
Location Description:
IA 144 & WILLIS AVE

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	0	4	0	0	1	0	1	3	0	0	0	0
08:00	0	4	0	0	0	0	0	8	0	0	0	2
11:00	0	5	0	0	0	0	1	0	0	0	0	0
12:00	0	4	1	0	0	0	0	8	0	4	0	0
15:00	0	3	2	0	0	0	0	7	0	1	0	0
16:00	0	6	0	0	0	1	2	3	0	0	0	0
17:00	0	4	1	0	0	0	2	2	0	0	0	0


TRAFFIC SIGNAL FACES
All signal faces shall be LED
12" RA
12" YA
12" FYA
12" GA
12" R
12" Y
12" G
Head No.
11 12
31 32
51 52
71 72
Head No.
21 22
41 42
61 62
81 82
Head No.
23 24
43 44
63 64
83 84
PRELIMINARY SIGNAL LAYOUT
PERRY TSIP GRANT
BOLTON & MENK
Engineers & Surveyors
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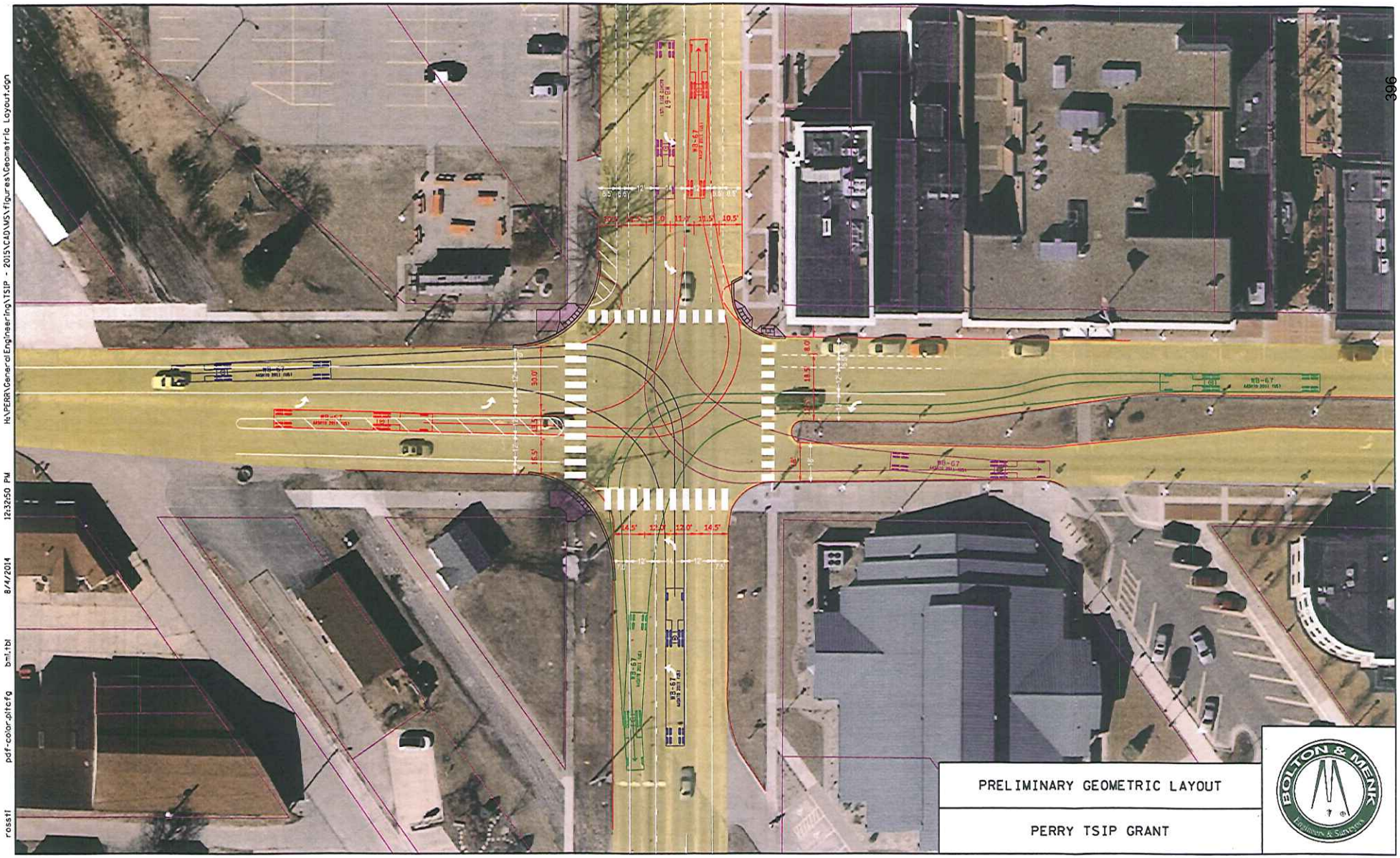

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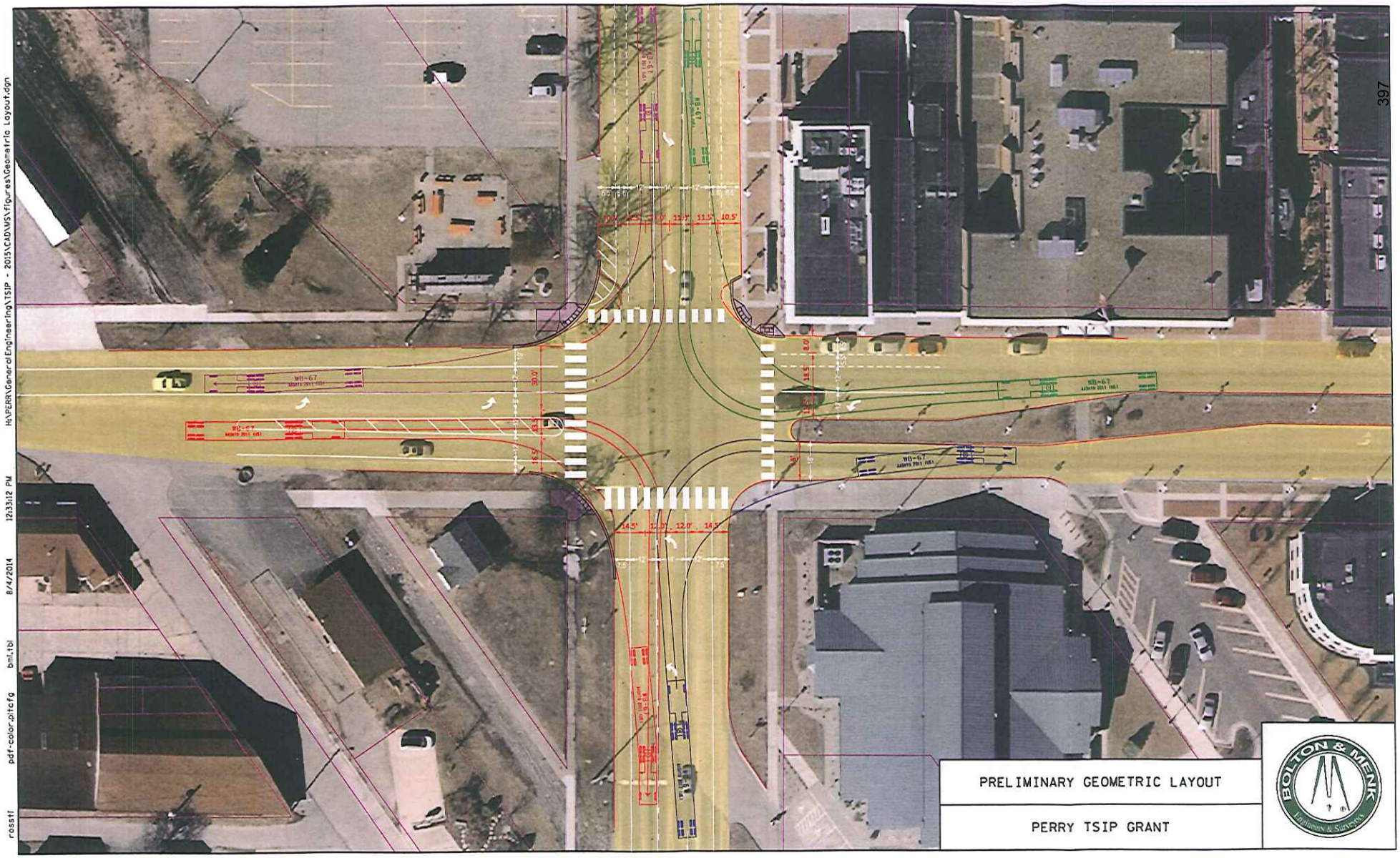
PRELIMINARY GEOMETRIC LAYOUT
PERRY TSIP GRANT
BOLTON & MENK
Engineers & Surveyors
WB-67
SB-67
NB-67
EB-67
30.0'
16.5'
14.5'
12.5'
12.0'
11.5'
10.5'
8.0'
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L. Benefit/Cost:

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Dallas | Prepared by: DJO | Date Prepared: Aug 6, 2014

Intersection: Wilis Ave and Highway 144

Improvement

Proposed Improvement(s): Signalization and geometrics

$ 380,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ 1,000	Other Annual Cost (after initial year), **AC**	37	Crash Reduction Factor (integer), **CRF**
$ 11,118	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 391,118	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT | 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

3,454

1,374 → ← 1,679

3,204

3,544,515	Current Annual Entering Veh., **AEV** = DEV * 365
11,274	veh / day, Final Year DEV, **FDEV**
57.06	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
9,711	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year — 5.5 years, Time Period, **T**

6 Additional months — values as of May 2014

1	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
4	Injury Crashes →	4	Minor Injuries @	$65,000	$ 260,000
		2	Possible Injuries @	$35,000	$ 70,000
19	Property Damage Only		(assumed cost per crash)	$7,400	$ 177,600
		-OR-	enter all Property Costs of all crashes:		
24	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,157,600

4.36	Current Crashes / Year, **AA** = TA / T	1.23	Crashes / MEV, Crash Rate, **CR**
$ 48,233	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
70.2	Total Expected Crashes, **TECR** = CR x TMEV	$ 922,442	Present Value of Avoided Crashes, **BENEFIT**
1.61	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 77,875	Crash Costs Avoided in First Year, AAR x AVC		
26.0	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 = $922,442 : $391,118 = **2.36** : 1

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: E. 42nd Street and Hubbell Avenue Intersection Improvements

Applicant: City of Des Moines

Contact Person: Calvin Miller Title: Civil Engineer I

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

Phone: 515-283-4748 (Area Code) E-Mail: cbmiller@dmgov.org

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

Co-Applicant(s) _____

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 $ 2,500,000

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 Des Moines

Signed: T.M. Franklin Cownie 8-13-14
Signature Date Signed

T.M. Franklin Cownie, Mayor
Typed Name

Attest: Laura L. Baumgartner 8-13-14
Signature Date Signed

Laura L. Baumgartner, Chief Deputy City Clerk
Typed Name

★ **Roll Call Number** 14-1206

Agenda Item Number 9

Date August 11, 2014

APPROVING FISCAL YEAR 2016 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. East 42nd Street and Hubbell Avenue Intersection Widening and Signalization
2. Martin Luther King Jr. Parkway and Prospect Road Traffic Signal Installation
3. Citywide Fixed-Time Signal Upgrade Project – Phase 2

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 14-400 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GATTO	✓			
GRAY	✓			
HENSLEY	✓			
MAHAFFEY	✓			
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

Project Description:

The proposed improvement consists of widening Hubbell Avenue (U.S. 6) to provide left turn lanes at the intersection with East 42nd Street, adding a northbound right turn lane on East 42nd Street, and installing a traffic signal at the intersection. Traffic signals would include pushbutton-activated pedestrian crossings to cross all approaches and left turn phasing for Hubbell Avenue traffic. Signals would be interconnected to the traffic signal at East 33rd Street/Hubbell Avenue. Interconnect to the adjacent intersection at East 46th Street/Hubbell Avenue will occur as part of a separate project which is currently under design.

The total project cost is estimated to be $2,500,000. A total of $500,000 is being requested from Traffic Safety Improvement Program funds. In addition, Iowa DOT U-STEP funding will be requested to share the remaining costs.

Existing Conditions:

Hubbell Avenue (U.S. 6) is a four lane, undivided roadway with an urban cross-section. The posted speed limit is 40 miles per hour and the roadway is classified as a principal arterial. The current roadway width is 49 feet within a 70 feet right-of-way. East 42nd Street is a two lane roadway with an urban cross-section on the south approach and a rural cross-section on the north approach. The speed limit is 30 miles per hour and the roadway is classified as a local road, but operates as a collector for this area. East 42nd Street becomes a collector beginning at E Douglas Avenue, approximately ½ mile south of the intersection with Hubbell Avenue. The north approach is a dead end roadway providing access to three businesses and two homes. Commercial properties occupy three quadrants of the intersection, the fourth is currently a vacant lot. Des Moines Area Regional Transit (DART) stops are located in the NE and SW corners of the intersection.

A traffic count was conducted by the Iowa DOT in July 2012. There were approximately 13,000 vehicles per day (vpd) on Hubbell Avenue. East 42nd Street south of Hubbell Avenue carries approximately 2,400 vpd; there are approximately 200 vpd north of the intersection.

A review of collision data for the five year period between January 1, 2009 and December 31, 2013 showed a total of 43 collisions resulting in 30 injuries and $262,850 in property damage. The collision rate was 1.66 crashes per million entering vehicles (MEV). The average intersection crash rate is approximately 1.0/MEV. This intersection is ranked number 41 on the Statewide Intersection Candidate List (SICL). A breakdown of the collisions by injury classification is shown in Table 1.

Table 1
Five Year Collision Summary by Injury Type

Injury Type	Number of Collisions	Number of Injuries
Fatality	0	0
Major Injury Collisions	2	4
Minor Injury Collisions	9	9
Possible Injury Collisions	9	17
Property Damage Only Collisions	23	N/A

Traffic signal warrant analysis was performed using a 50% reduction factor for northbound right turning traffic and an 85-percentile speed of 42 miles per hour on Hubbell Avenue. The following warrants were met:

- Warrant 1, Eight-Hour Vehicular Volume (Condition B – Interruption of Continuous Traffic)
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 7, Crash Experience

An analysis worksheet is included as part of Exhibit J.

Project Justification

Signalization of the intersection of East 42nd Street and Hubbell Avenue and the addition of left turn lanes on Hubbell Avenue will reduce the overall potential for crashes at the intersection. Left turn and right angle collisions are considered correctable by the type of improvements proposed. During the five year period between January 1, 2009 and December 31, 2013, correctable crashes accounted for over half of the collisions at the intersection; 26% left turn collisions and 28% right angle collisions. A portion of the rear end and sideswipe collisions may also be attributed to left turning traffic stopped in the lanes shared with through traffic. The addition of exclusive left turn lanes would reduce these types of collisions as well. A breakdown of collisions by type during the study period is shown in Table 2 below.

Table 2
Five Year Collision History by Crash Type

Crash Type	Number of Collisions	% of Collisions
Right Angle	12	28%
Rear End	12	28%
Left Turn	11	26%
Head On	4	9%
Sideswipe	4	9%
Totals	**43**	**100%**

Based on current IDOT collision cost factors, the total estimated loss from crashes during the five year period is $2,648,219 as shown in Exhibit L. An estimated project life of 20 years and a crash reduction factor of 30 percent were assumed, resulting in a benefit/cost ratio of 5.30 to 1.

COST ESTIMATE

DEPARTMENT OF ENGINEERING
CITY OF DES MOINES, IA.

DATE: 7-12-14

E. 42nd Street and Hubbell Avenue Intersection Improvements

NO.	DESCRIPTION	UNIT	ESTIMATED UNITS	UNIT PRICE	TOTAL AMOUNT
1	Modified Subbase	CY	960	$40.00	$38,400.00
2	Excavation, Class 10 and Topsoil	LS	1	$40,000.00	$40,000.00
3	Shoulder Finishing, Earth	STA	22	$400.00	$8,800.00
4	Pavement & Pavement Widening, 9" PCC	SY	2,200	$65.00	$143,000.00
5	HMA Overlay	Ton	510	$90.00	$45,900.00
6	Asphalt Binder	Ton	31	$650.00	$20,150.00
7	Patching	LS	1	$10,000.00	$10,000.00
8	Pavment Scarifications	SY	1,590	$5.00	$7,950.00
9	Removal of Pavement	SY	1,100	$10.00	$11,000.00
10	Subdrain, Longitudinal	LF	2,000	$20.00	$40,000.00
11	Storm Sewer Modifications	LS	1	$15,000.00	$15,000.00
12	Sidewalk P.C. Concrete	SY	1,030	$45.00	$46,350.00
13	Drives, P.C. Concrete	SY	1,060	$50.00	$53,000.00
14	Removal of Drives and Sidewalks	SY	2,490	$8.00	$19,920.00
15	Modular Block Wall	LS	1	$10,000.00	$10,000.00
16	Sod	LS	1	$20,000.00	$20,000.00
17	Signal Modifications & Interconnect conduit w fiber	LS	1	$300,000.00	$300,000.00
18	Traffic Control	LS	1	$20,000.00	$20,000.00
19	Environmental Mitigation	LS	1	$20,000.00	$20,000.00
20	Mobilization	LS	1	$50,000.00	$50,000.00
21	Contingencies	LS	1	$194,380.00	$194,380.00
22	HMA Overlay	TON	390	$90.00	$35,100.00
23	Asphalt Binder	TON	23	$650.00	$14,950.00
24	PavEment Scarifications	SY	3220	$5.00	$16,100.00
				Subtotal:	*$1,180,000.00*
				Inflation (3 years at 2.5% per year):	$90,000.00
				TOTAL CONSTRUCTION COST:	**$1,270,000.00**
				INCIDENTALS:	$250,000.00
				ROW:	$980,000.00
				ESTIMATED TOTAL PROJECT COST:	**$2,500,000.00**

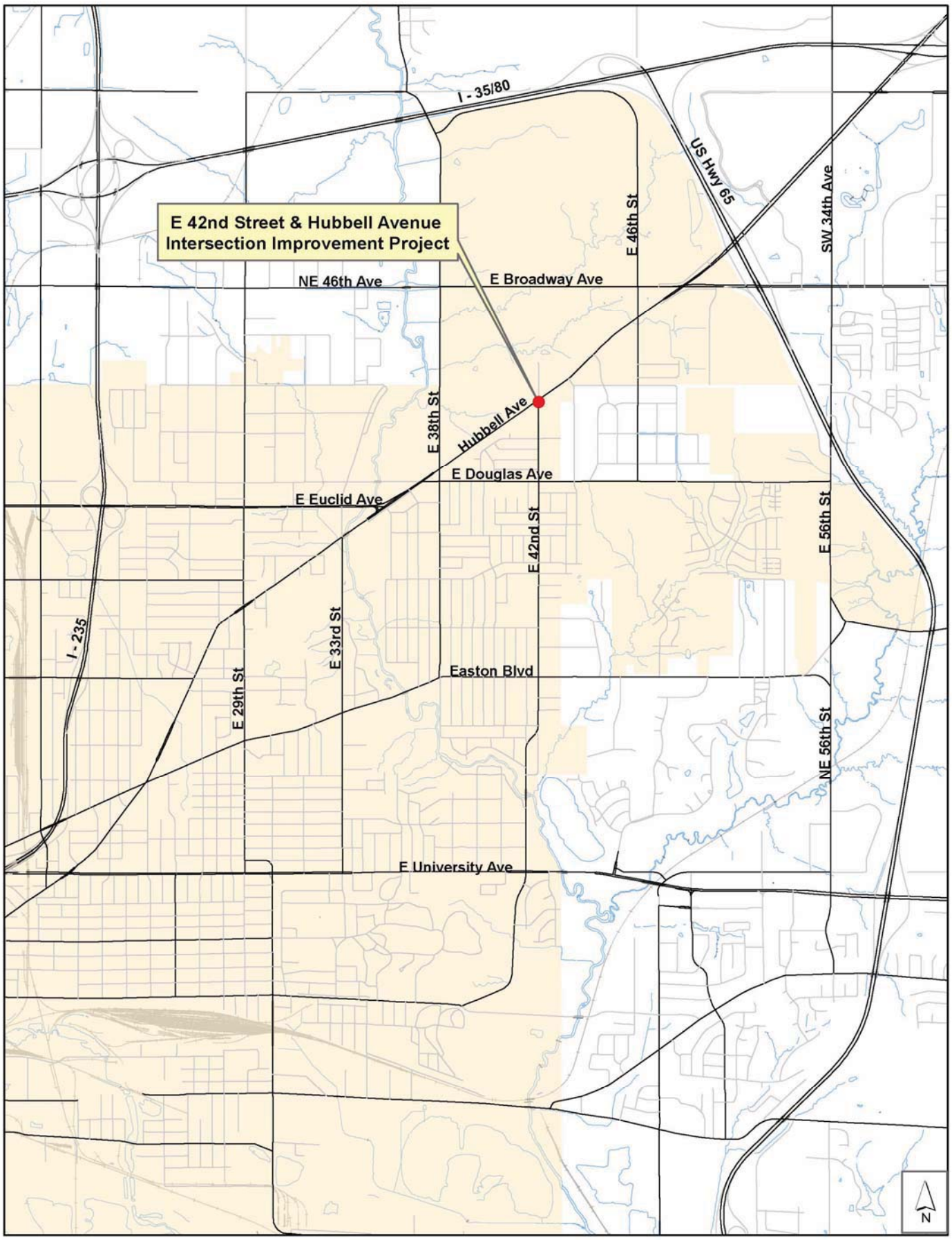
Funding

Anticipated TSIP Funds:	$ 500,000
Anticipated U-STEP Funds:	$1,100,000
Des Moines Capital Improvement Funds:	$900,000

TIME SCHEDULE

Project Approval:	December 2014
Signed Agreement:	April 2015
Project Bid:	March 2017
Construction Completed:	October 2017
Project Closeout:	June 2018

VICINITY MAP



INTERSECTION PHOTOS

Photo 1 - Hubbell Avenue, Looking East at East 42nd Street, approx. 200 feet in advance.

Photo 2 - Hubbell Avenue, Looking East at East 42nd Street, near intersection.

INTERSECTION PHOTOS

Photo 3 - Hubbell Avenue, Looking West at East 42nd Street, approx. 200 feet in advance.

Photo 4 - Hubbell Avenue, Looking West at East 42nd Street, near intersection.

INTERSECTION PHOTOS

Photo 5 – East 42nd Street, Looking North at Hubbell Avenue, approx. 200 feet in advance.

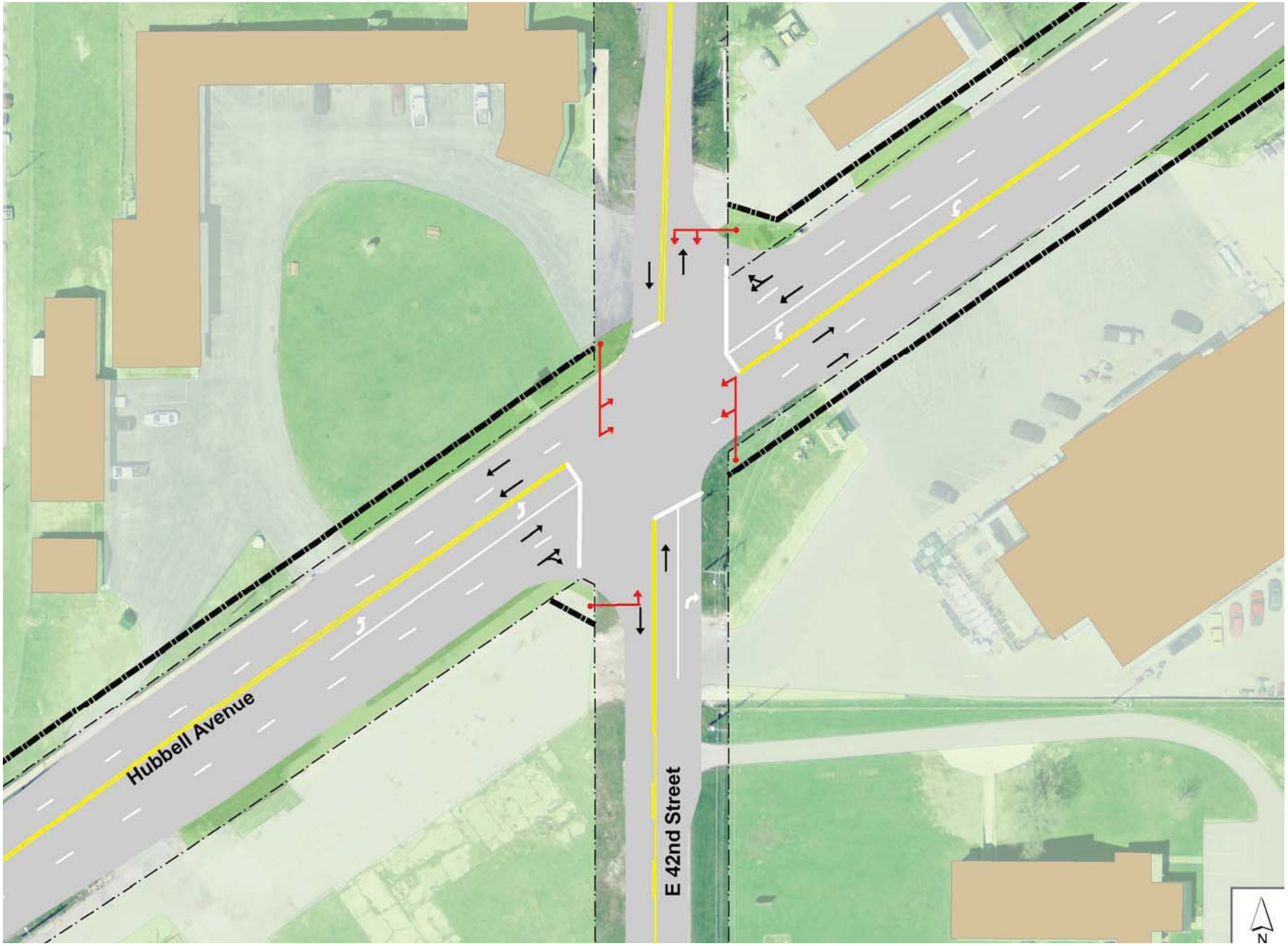
Photo 6 – East 42nd Street, Looking North at Hubbell Avenue, near intersection.

INTERSECTION PHOTOS

Photo 7 – East 42nd Street, Looking Sorth at Hubbell Avenue, approx. 200 feet in advance.

Photo 8 – East 42nd Street, Looking Sorth at Hubbell Avenue, near intersection.

PLAN VIEW OF EXISTING AND PROPOSED CONDITIONS

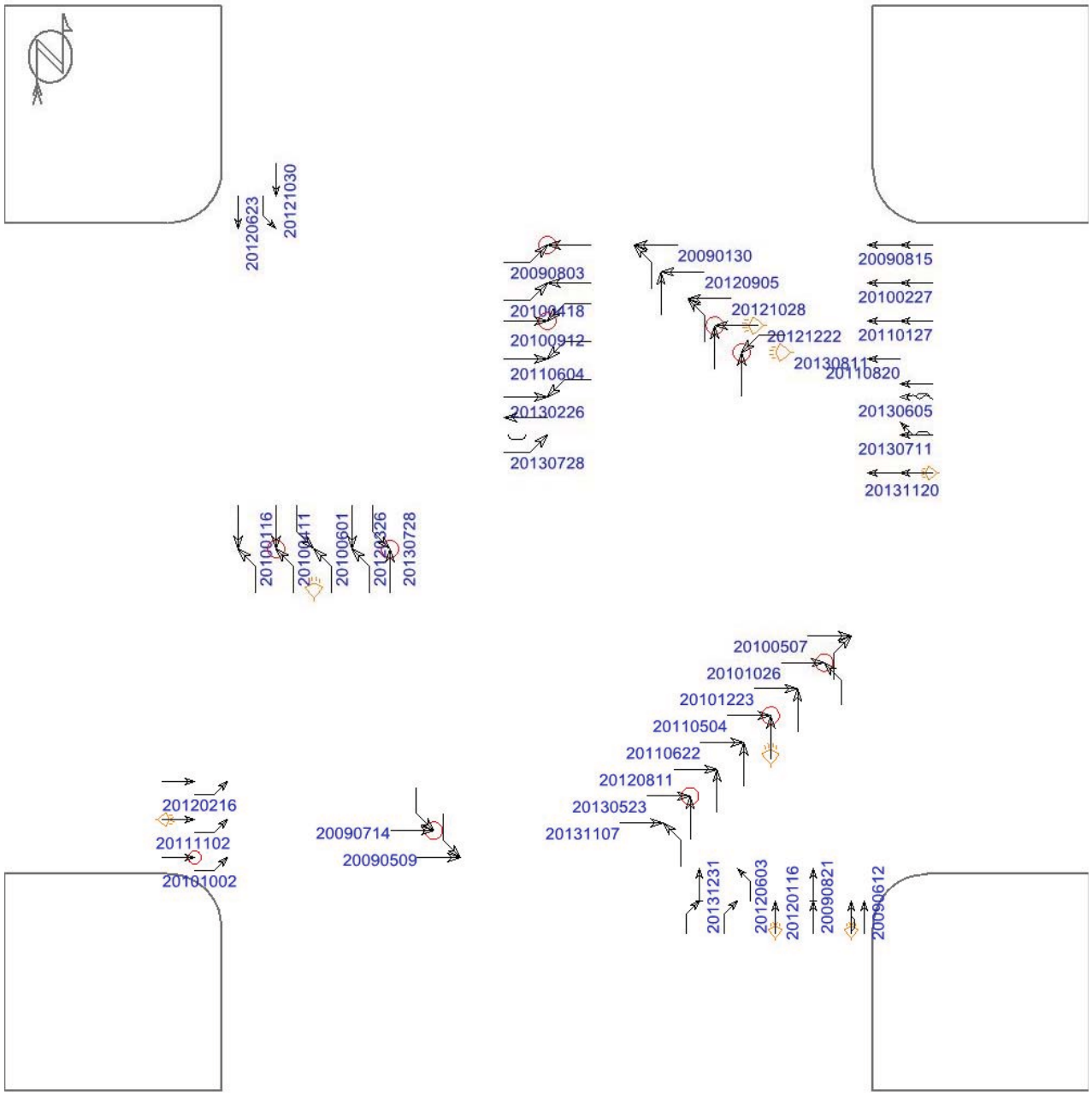


AERIAL PHOTOGRAPH

412

COLLISION DIAGRAM

(January 1, 2009 through December 31, 2014)



(0) crashes could not be placed in this schematic

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

Pd' Programming, Inc. 06/25/2014

Note: Additional Collision Information and Reports in Appendix.

TURNING MOVEMENT COUNTS

(July 2012)

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

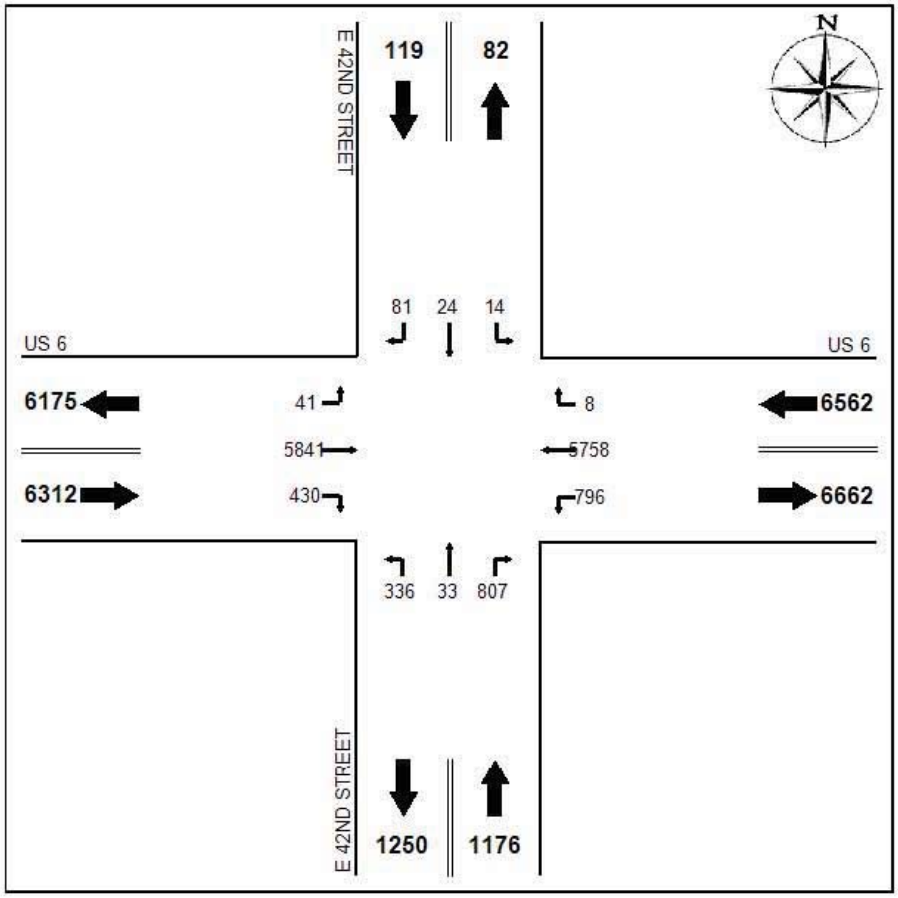
Station Number:
77234041099

Count Date:
Wednesday, July 25, 2012

County:
Polk

Location Description:
US 6 & 42nd St

Volume Factor: 1.942
Pass Class Factor: 1.994
SU Class Factor: 1.560
Combo Class Factor: 1.632



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	2	1	6	30	509	0	30	2	68	7	255	21
08:00	1	1	6	30	330	1	22	4	48	0	298	21
11:00	0	2	5	50	402	1	21	5	46	2	423	27
12:00	2	2	2	51	414	1	25	0	48	3	427	35
15:00	1	2	8	79	442	1	24	2	51	2	470	33
16:00	1	2	1	72	395	0	24	3	70	2	547	48
17:00	0	2	13	89	414	0	23	1	75	5	526	35

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Passenger Vehicles

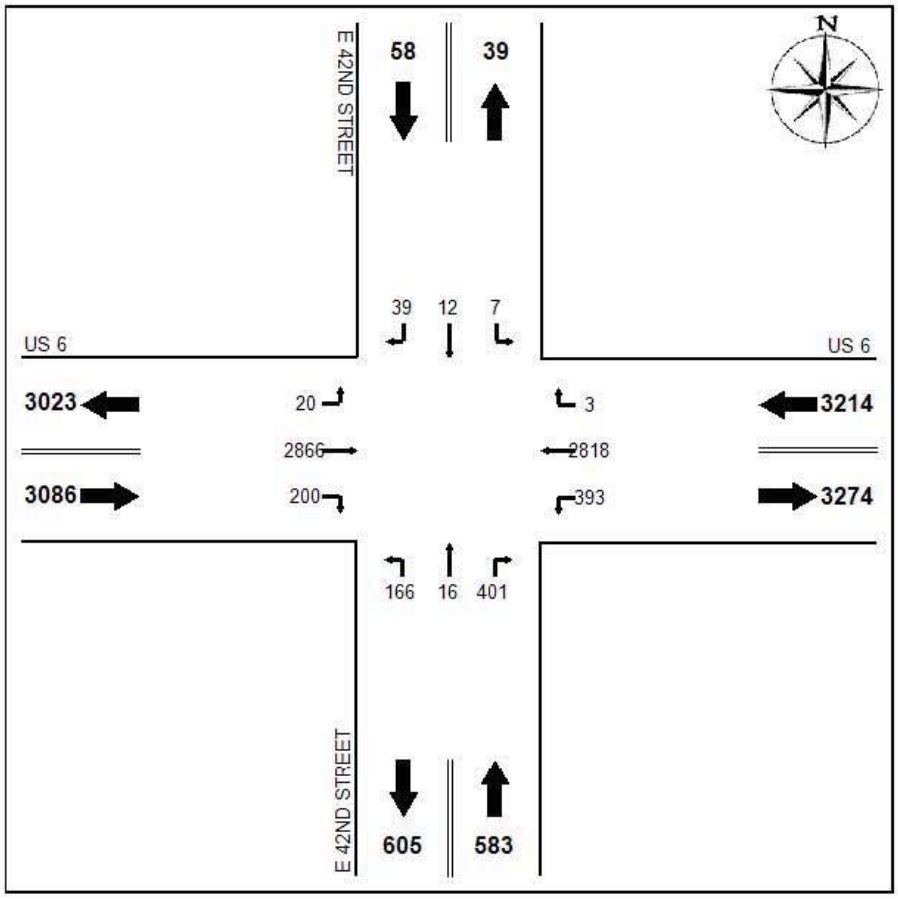
Station Number:
77234041099

Count Date:
Wednesday, July 25, 2012

County:
Polk

Location Description:
US 6 & 42nd St

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	2	1	6	30	495	0	30	2	66	6	243	17
08:00	1	1	6	28	317	1	21	4	48	0	279	19
11:00	0	2	4	49	385	0	21	4	45	2	402	25
12:00	2	2	2	48	394	1	24	0	48	3	416	31
15:00	1	2	8	78	430	1	24	2	50	2	462	31
16:00	1	2	1	71	387	0	23	3	69	2	544	44
17:00	0	2	12	89	410	0	23	1	75	5	520	33

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

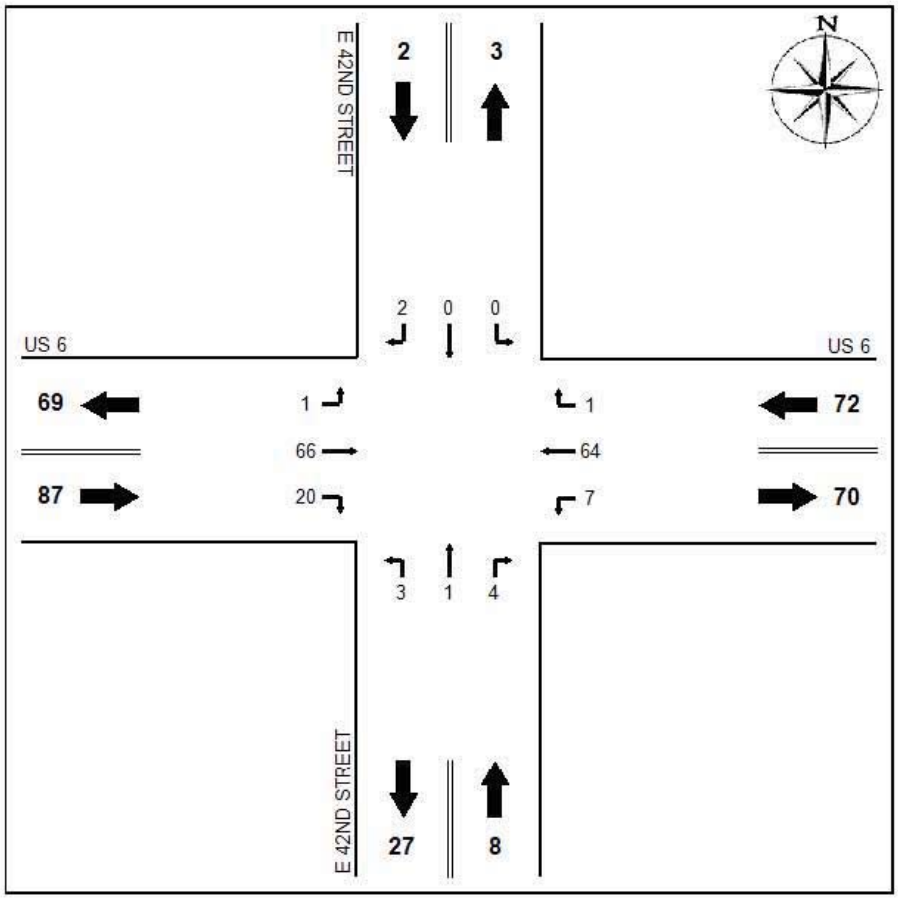
Station Number:
77234041099

Count Date:
Wednesday, July 25, 2012

County:
Polk

Location Description:
US 6 & 42nd 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:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	0	0	0	0	9	0	0	0	2	1	10	4
08:00	0	0	0	2	12	0	1	0	0	0	17	2
11:00	0	0	1	1	14	1	0	1	1	0	15	2
12:00	0	0	0	3	14	0	1	0	0	0	10	4
15:00	0	0	0	0	6	0	0	0	0	0	6	2
16:00	0	0	0	1	6	0	1	0	1	0	3	4
17:00	0	0	1	0	3	0	0	0	0	0	5	2

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

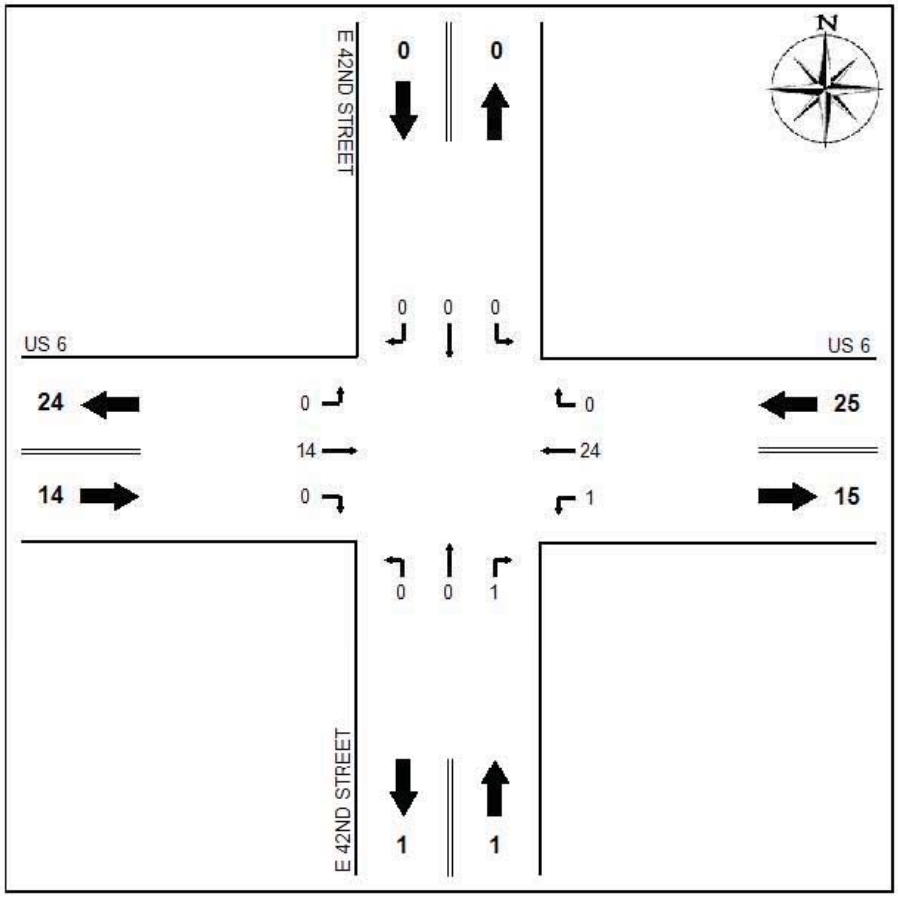
Station Number:
77234041099

Count Date:
Wednesday, July 25, 2012

County:
Polk

Location Description:
US 6 & 42nd St

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	0	0	0	0	5	0	0	0	0	0	2	0
08:00	0	0	0	0	1	0	0	0	0	0	2	0
11:00	0	0	0	0	3	0	0	0	0	0	6	0
12:00	0	0	0	0	6	0	0	0	0	0	1	0
15:00	0	0	0	1	6	0	0	0	1	0	2	0
16:00	0	0	0	0	2	0	0	0	0	0	0	0
17:00	0	0	0	0	1	0	0	0	0	0	1	0

Signal Warrant Analysis (Warrants #1A and #1B)

Please enter the following information:

	Street Name	No. of approach lanes	approach speed
Main Street:	Hubbell Ave	2	42
Side Street:	E 42nd Street	1	30
Other side street approach:		1	30

Your Initials:	MPR
Today's Date:	Jan-14

Signal Warrant Analysis

Location: Hubbell Ave and E 42nd Street

Date: Jan-14

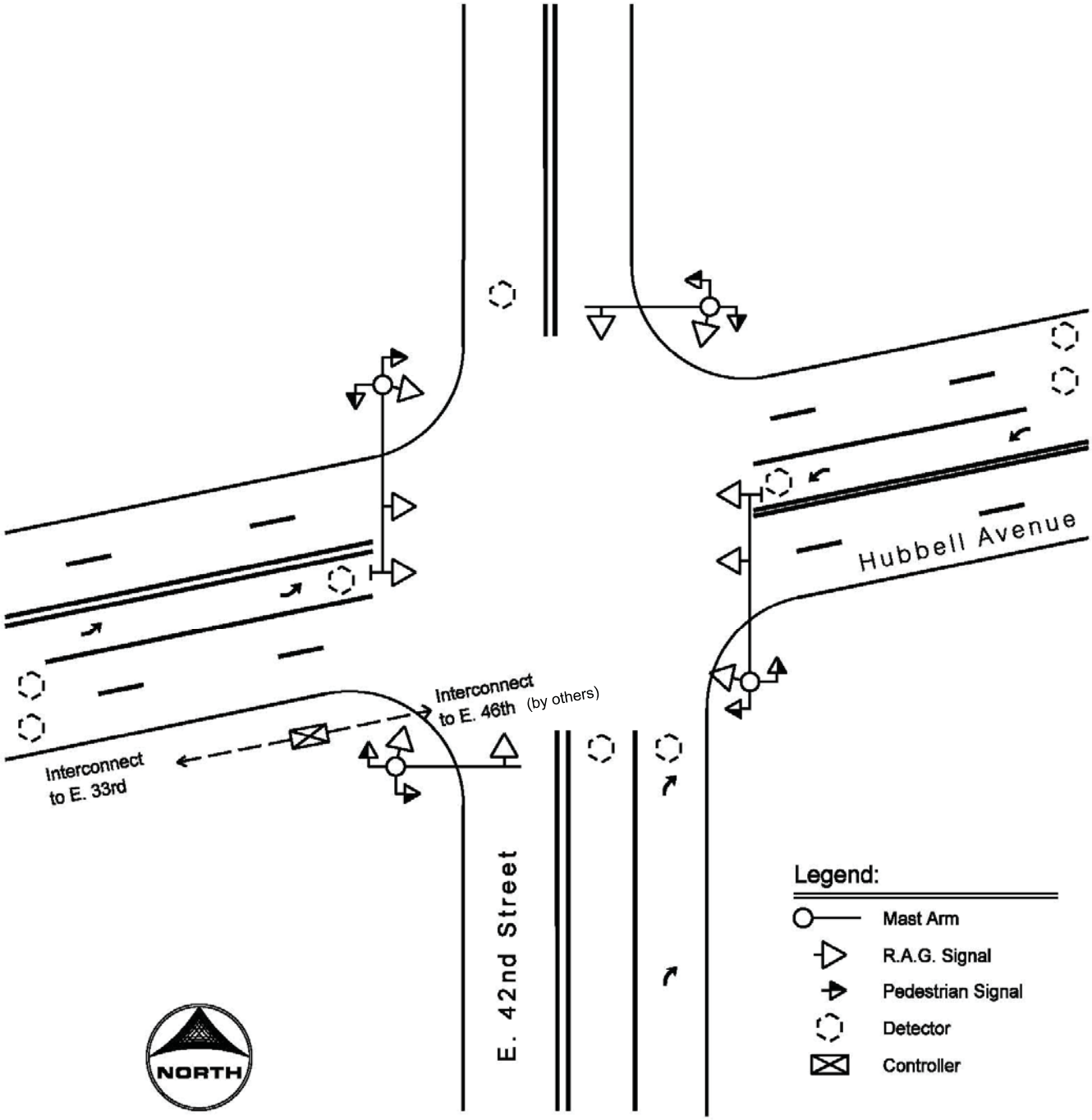
	Main Street	Side Street		Warrant #1A				Warrant #1B			
Street Name=>	**Hubbell Ave**	**E 42nd Street**		100%		80%		100%		80%	
No. of Appr. Lanes=>	2	1	1	Maj	Min	Maj	Min	Maj	Min	Maj	Min
Approach Speed=>	42	30	30								
Time	2-way	1-way	1-way	420	105	336	84	630	53	504	42
12 - 1 am	185	2	9								
1 - 2 am	126	0	9								
2 - 3 am	98	1	5								
3 - 4 am	73	0	4								
4 - 5 am	79	1	7								
5 - 6 am	218	1	13								
6 - 7 am	533	5	51	X		X				X	X
7 - 8 am	822	9	66	X		X		X	X	X	X
8 - 9 am	680	8	49	X		X		X		X	X
9 - 10 am	745	2	63	X		X		X	X	X	X
10 - 11 am	885	1	63	X		X		X	X	X	X
11 - 12 am	905	7	48	X		X		X		X	X
12 - 1 pm	931	6	48	X		X		X		X	X
1 - 2 pm	1061	8	74	X		X		X	X	X	X
2 - 3 pm	1039	6	70	X		X		X	X	X	X
3 - 4 pm	1027	11	51	X		X		X		X	X
4 - 5 pm	1064	4	64	X		X		X	X	X	X
5 - 6 pm	1069	15	65	X		X		X	X	X	X
6 - 7 pm	1000	5	78	X		X		X	X	X	X
7 - 8 pm	809	8	62	X		X		X	X	X	X
8 - 9 pm	735	4	59	X		X		X	X	X	X
9 - 10 pm	584	6	48	X		X				X	X
10 - 11 pm	424	4	32	X		X					
11 - 12 pm	310	2	17								
			Individual Hours Met=>	17	0	17	0	14	10	16	16
			Warrant Hours met=>	0		0		10		16	

Date: 2-Jan-14 Comments: from Iowa DOT counts 2012

By: MPR from City Counts 2002

Includes NB Right Turn reduction of 50%

PRELIMINARY TRAFFIC SIGNAL LAYOUT



Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk | Prepared by: Mike Ring | Date Prepared: Jun 19, 2014

Intersection: E 42nd Street and Hubbell Avenue

Improvement

Proposed Improvement(s): Add turn lanes, signalize intersection

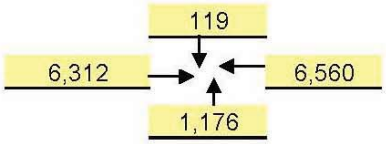
$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	30	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 500,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: IDOT | 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



5,170,955	Current Annual Entering Veh., **AEV** = DEV * 365
21,051	veh / day, Final Year DEV, **FDEV**
125.64	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
14,167	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009	First full year -->	2013	Last full year		5.0 years, Time Period, **T**	
0	Additional months				values as of May 2014	
0	Fatal Crashes	0	Fatalities @	$4,500,000	$	-
		4	Major Injuries @	$325,000	$	1,300,000
20	Injury Crashes	9	Minor Injuries @	$65,000	$	585,000
		17	Possible Injuries @	$35,000	$	595,000
23	Property Damage Only		(assumed cost per crash)	$7,400	$	-
		-OR-	enter all Property Costs of all crashes:		$	262,850
43	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	2,742,850

8.60	Current Crashes / Year, **AA** = TA / T	1.66	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 63,787	Cost per Crash, **AVC** = LOSS / TA		
209.0	Total Expected Crashes, **TECR** = CR x TMEV	$ 2,648,219	Present Value of Avoided Crashes, **BENEFIT**
2.58	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 164,571	Crash Costs Avoided in First Year, AAR x AVC		
62.7	Total Avoided Crashes, TECR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $2,648,219 : $500,000 = **5.30** : 1

APPENDIX

Additional Collision Data

Review of Accident History						
Location:	**E 42nd and Hubbell**					
Dates:	Jan 2009 - Dec 2013					
29-Jul-14						
Date	Type	Fatality	Major	Minor	Possible	PropDam
30-Jan-09	Right Angle					$4,000
9-May-09	Left Turning					$1,500
12-Jun-09	Sideswipe					$1,000
14-Jul-09	Left Turning			1		$9,200
3-Aug-09	Head On			1		$10,000
15-Aug-09	Rear End					$4,500
21-Aug-09	Rear End					$2,300
16-Jan-10	Left Turning				3	$7,000
27-Feb-10	Rear End					$2,200
11-Apr-10	Left Turning		3			$15,000
18-Apr-10	Left Turning				1	$6,000
7-May-10	Right Angle					$4,000
1-Jun-10	Left Turning					$3,000
12-Sep-10	Left Turning			1	2	$7,500
2-Oct-10	Left Turning			1		$8,500
26-Oct-10	Right Angle			1		$3,500
23-Dec-10	Right Angle					$5,500
27-Jan-11	Rear End					$2,100
4-May-11	Right Angle			1		$6,000
4-Jun-11	Left Turning				2	$11,000
22-Jun-11	Right Angle					$1,550
20-Aug-11	Rear End					$11,000
2-Nov-11	Rear End				1	$5,000
16-Jan-12	Head On					$1,500
16-Feb-12	Rear End					$4,700
26-Mar-12	Left Turning				2	$20,000
3-Jun-12	Rear End					$1,500
23-Jun-12	Rear End				1	$13,000
11-Aug-12	Right Angle					$4,000
5-Sep-12	Right Angle					$5,000
28-Oct-12	Right Angle				1	$1,800
30-Oct-12	Rear End					$2,500
22-Dec-12	Right Angle		1			$5,500
26-Feb-13	Left Turning				1	$4,000
23-May-13	Right Angle			1		$12,000
5-Jun-13	Sideswipe					$4,300
11-Jul-13	Sideswipe				2	$13,000
28-Jul-13	Head On			1		$9,000
28-Jul-13	Sideswipe					$8,500
11-Aug-13	Left Turning			1	1	$8,000
7-Nov-13	Right Angle					$7,500
20-Nov-13	Rear End					$2,700
31-Dec-13	Rear End					$3,000
	Totals:	0	4	9	17	$262,850
	Costs:	$0	$1,300,000	$585,000	$595,000	$262,850
Inj Acc=>	23		**Number of years:**			**5.0**
PDO Acc=>	20		**Total Accident Cost:**			**$2,742,850**

Crash Severity	Year					Grand Total
	2009	2010	2011	2012	2013	
Major		1		1		**2**
Minor	2	3	1		3	**9**
Possible / Unknown		2	2	3	2	**9**
Property Damage Only	5	4	3	6	5	**23**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Major Cause	Year					Grand Total
	2009	2010	2011	2012	2013	
Animal				1		**1**
Ran Traffic Signal			1			**1**
FTYROW: From stop sign		3	1	2	2	**8**
FTYROW: Making left turn	2	3	1	2	3	**11**
FTYROW: Other (explain in narrative)					1	**1**
Made improper turn	2	1				**3**
Followed too close			1	3	1	**5**
Swerving/Evasive Action				1		**1**
Lost Control					1	**1**
Inattentive/distracted by: Use of phone or other device	1					**1**
Other (explain in narrative): Vision obstructed	2		1			**3**
Other (explain in narrative): Other improper action		2	1	1	2	**6**
Unknown		1				**1**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Manner of Crash/Collision Impact	Year					Grand Total
	2009	2010	2011	2012	2013	
Head-on	1			2	1	**4**
Rear-end	2	1	3	4	2	**12**
Angle - oncoming left turn	2	6	1		2	**11**
Broadside	1	3	2	4	2	**12**
Sideswipe - same direction	1				2	**3**
Sideswipe - opposite direction					1	**1**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Light Conditions	Year					Grand Total
	2009	2010	2011	2012	2013	
Daylight	6	9	4	8	8	**35**
Dark - roadway lighted	1	1	2	2	2	**8**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Month	Year					Grand Total
	2009	2010	2011	2012	2013	
January	1	1	1	1		**4**
February		1		1	1	**3**
March				1		**1**
April		2				**2**
May	1	1	1		1	**4**
June	1	1	2	2	1	**7**
July	1				3	**4**
August	3		1	1	1	**6**
September		1		1		**2**
October		2		2		**4**
November			1		2	**3**
December		1		1	1	**3**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Time Range	Year					Grand Total
	2009	2010	2011	2012	2013	
2:00 AM to 3:59 AM					1	**1**
4:00 AM to 5:59 AM				1		**1**
6:00 AM to 7:59 AM				2		**2**
8:00 AM to 9:59 AM					3	**3**
10:00 AM to 11:59 AM		3				**3**
12:00 AM to 1:59 PM		2	1	2		**5**
2:00 PM to 3:59 PM	2	3	1		3	**9**
4:00 PM to 5:59 PM	3	1	1	4	3	**12**
6:00 PM to 7:59 PM	1	1	2			**4**
8:00 PM to 9:59 PM						**0**
10:00 PM to 11:59 PM	1		1	1		**3**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Day of Week	Year					Grand Total
	2009	2010	2011	2012	2013	
Sunday		3		2	3	**8**
Monday	1			2		**3**
Tuesday	1	2		1	2	**6**
Wednesday			3	1	2	**6**
Thursday		1	1	1	3	**6**
Friday	3	1				**4**
Saturday	2	3	2	3		**10**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Driver Age	Year					Grand Total
	2009	2010	2011	2012	2013	
14-15				1		**1**
16-17		1		1		**2**
18-20		4	1	2	2	**9**
21-24	1	2	1	3	2	**9**
25-29	2	2	2	1	1	**8**
30-34	2	1	3		3	**9**
35-39		2		1	2	**5**
40-44	2		1	1	2	**6**
45-49	1	1		2	1	**5**
50-54	2		1	1	2	**6**
55-59		1		3	1	**5**
60-64	1	2	2	1		**6**
65-69		1		1	2	**4**
70-74	1		1			**2**
75-79					2	**2**
80-84		2				**2**
Unknown	1					**1**
Grand Total	**13**	**19**	**12**	**18**	**20**	**82**

Surface Conditions	Year					Grand Total
	2009	2010	2011	2012	2013	
Dry	5	8	5	7	9	**34**
Wet	2	2	1	2		**7**
Snow				1	1	**2**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Weather Conditions	Year					Grand Total
	2009	2010	2011	2012	2013	
Clear	3	5	3	6	7	**24**
Partly cloudy		2		2	2	**6**
Cloudy	2	1	2	1		**6**
Rain	2	1	1	1		**5**
Snow		1			1	**2**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

Drug Alcohol Related	Year					Grand Total
	2009	2010	2011	2012	2013	
None Indicated	7	10	6	10	10	**43**
Grand Total	**7**	**10**	**6**	**10**	**10**	**43**

COLLISION SUMMARY
E 42nd STREET HUBBELL AVENUE (U.S. 6)
January 1, 2009 through December 31, 2013

CASENUMBER	LECASENUM	DATE	TIME	LITERAL	CSEVERITY	FATALITIES	TOT INJ	MAJOR	MINOR	POSS	UNK	PROPDMG	CRCOMANNER	WEATHER1	SURF_COND	INJSTATUS
2009490895	20090003228	20090130	1538	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	4000	Broadside	Cloudy	Dry	
2009490895			0			0	0	0	0	0	0	0				
2009505714	20090014355	20090509	1450	E 42ND ST	Property Damage Only	0	0	0	0	0	0	1500	Angle - oncoming left turn	Clear	Dry	
2009505714			0			0	0	0	0	0	0	0				
2009511362		20090612	2352	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	1000	Sideswipe - same direction	Rain	Wet	
2009511362			0			0	0	0	0	0	0	0				
2009516257	20090021999	20090714	1701	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	9200	Angle - oncoming left turn	Clear	Dry	Non-incapacitating
2009516257			0			0	0	0	0	0	0	0				
2009519521	20090024443	20090803	1749	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	10000	Head-on	Clear	Dry	Non-incapacitating
2009519521			0			0	0	0	0	0	0	0				
2009520663	20090026018	20090815	1840	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	4500	Rear-end	Rain	Wet	
2009520663			0			0	0	0	0	0	0	0				
2009522086	20090026733	20090821	1735	E 42ND ST	Property Damage Only	0	0	0	0	0	0	2300	Rear-end	Cloudy	Dry	
2009522086			0			0	0	0	0	0	0	0				
2010549809	20100001743	20100116	1515	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	3	0	0	3	0	7000	Angle - oncoming left turn	Clear	Dry	Possible
2010549809			0			0	0	0	0	0	0	0				Possible
2010549809			0			0	0	0	0	0	0	0				Possible
2010560730		20100227	1545	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	2200	Rear-end	Clear	Dry	
2010560730			0			0	0	0	0	0	0	0				
2010566253	20100010890	20100411	1540	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Major Injury	0	3	3	0	0	0	15000	Angle - oncoming left turn	Partly cloudy	Dry	Incapacitating
2010566253			0			0	0	0	0	0	0	0				Incapacitating
2010566253			0			0	0	0	0	0	0	0				Incapacitating
2010567899	20100011734	20100418	1152	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	1	0	0	1	0	6000	Angle - oncoming left turn	Clear	Dry	Possible
2010567899			0			0	0	0	0	0	0	0				
2010570621	20100014112	20100507	1639	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	4000	Broadside	Cloudy	Dry	
2010570621			0			0	0	0	0	0	0	0				
2010574485	20100017205	20100601	1940	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	3000	Angle - oncoming left turn	Rain	Wet	
2010574485			0			0	0	0	0	0	0	0				
2010590113	20100029654	20100912	1120	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	3	0	1	2	0	7500	Angle - oncoming left turn	Partly cloudy	Dry	Non-incapacitating
2010590113			0			0	0	0	0	0	0	0				Possible
2010590113			0			0	0	0	0	0	0	0				Possible
2010593103	20100032006	20101002	1129	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	8500	Angle - oncoming left turn	Clear	Dry	Non-incapacitating
2010593103			0			0	0	0	0	0	0	0				
2010596896	20100034754	20101026	1308	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	3500	Broadside	Clear	Dry	Non-incapacitating
2010596896			0			0	0	0	0	0	0	0				
2010608258	20100040870	20101223	1322	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	5500	Broadside	Snow	Wet	
2010608258			0			0	0	0	0	0	0	0				
2011615980		20110127	1540	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	2100	Rear-end	Clear	Dry	
2011615980			0			0	0	0	0	0	0	0				
2011628768	20110013596	20110504	2245	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	6000	Broadside	Clear	Dry	Non-incapacitating
2011628768			0			0	0	0	0	0	0	0				
2011632872	20110017442	20110604	1338	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	2	0	0	2	0	11000	Angle - oncoming left turn	Cloudy	Dry	Possible
2011632872			0			0	0	0	0	0	0	0				Possible
2011635695	20110019721	20110622	1710	E 42ND ST	Property Damage Only	0	0	0	0	0	0	1550	Broadside	Rain	Wet	
2011635695			0			0	0	0	0	0	0	0				
2011645967		20110820	1916	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	11000	Rear-end	Clear	Dry	
2011645967			0			0	0	0	0	0	0	0				
2011655171	20110036043	20111102	715	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	1	0	0	1	0	5000	Rear-end	Cloudy	Dry	Possible
2011655171			0			0	0	0	0	0	0	0				
2012669391		20120116	2340	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	1500	Head-on	Partly cloudy	Dry	
2012673725		20120216	752	US 6/FREDERICK M HUBBELL AVE	Property Damage Only	0	0	0	0	0	0	4700	Rear-end	Clear	Wet	
2012673725			0			0	0	0	0	0	0	0				
2012678903	20120008945	20120326	1738	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	2	0	0	2	0	20000	Head-on	Clear	Dry	Possible
2012678903			0			0	0	0	0	0	0	0				Possible
2012688210	20120016793	20120603	1250	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	1500	Rear-end	Cloudy	Dry	
2012688210			0			0	0	0	0	0	0	0				
2012691445	20120019188	20120623	1615	E 42ND ST	Possible/Unknown	0	1	0	0	1	0	13000	Rear-end	Rain	Wet	Possible
2012691445			0			0	0	0	0	0	0	0				
2012698142	20120025041	20120811	1642	E 42ND ST	Property Damage Only	0	0	0	0	0	0	4000	Broadside	Clear	Dry	
2012698142			0			0	0	0	0	0	0	0				

COLLISION SUMMARY
E 42nd STREET HUBBELL AVENUE (U.S. 6)
January 1, 2009 through December 31, 2013

CASENUMBER	LECASENUM	DATE	TIME	LITERAL	CSEVERITY	FATALITIES	TOT INJ	MAJOR	MINOR	POSS	UNK	PROPDMG	CRCOMANNER	WEATHER1	SURF_COND	INJSTATUS
2012702619	20120027942	20120905	1330	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	5000	Broadside	Clear	Dry	
2012702619			0			0	0	0	0	0	0	0				
2012709355	20120034042	20121028	752	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	1	0	0	1	0	1800	Broadside	Clear	Dry	Possible
2012709355			0			0	0	0	0	0	0	0				
2012709704	20120034338	20121030	1701	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	2500	Rear-end	Clear	Dry	
2012709704			0			0	0	0	0	0	0	0				
2012718004	20120039962	20121222	500	E 42ND ST	Major Injury	0	1	1	0	0	0	5500	Broadside	Partly cloudy	Snow	Incapacitating
2012718004			0			0	0	0	0	0	0	0				
2013727755	20130005738	20130226	843	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	1	0	0	1	0	4000	Angle - oncoming left turn	Snow	Snow	Possible
2013727755			0			0	0	0	0	0	0	0				
2013740619	20130015265	20130523	1512	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	12000	Broadside	Clear	Dry	Non-incapacitating
2013740619			0			0	0	0	0	0	0	0				
2013742462	20130016846	20130605	1449	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	4300	Sideswipe - same direction	Partly cloudy	Dry	
2013742462			0			0	0	0	0	0	0	0				
2013748099	20130021166	20130711	925	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Possible/Unknown	0	2	0	0	2	0	13000	Sideswipe - same direction	Clear	Dry	Possible
2013748099			0			0	0	0	0	0	0	0				Possible
2013750258	20130023226	20130728	1613	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	1	0	1	0	0	9000	Head-on	Partly cloudy	Dry	Non-incapacitating
2013750258			0			0	0	0	0	0	0	0				
2013750259	20130023224	20130728	1613	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	8500	Sideswipe - opposite direction	Clear	Dry	
2013750259			0			0	0	0	0	0	0	0				
2013752648	20130024878	20130811	306	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Minor Injury	0	2	0	1	1	0	8000	Angle - oncoming left turn	Clear	Dry	Possible
2013752648			0			0	0	0	0	0	0	0				Non-incapacitating
2013765848	20130035197	20131107	832	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	7500	Broadside	Clear	Dry	
2013765848			0			0	0	0	0	0	0	0				
2013768186	20130036643	20131120	1721	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	2700	Rear-end	Clear	Dry	
2013768186			0			0	0	0	0	0	0	0				
2013776660	20130040604	20131231	1554	US 6/FREDERICK M HUBBELL AVE & E 42ND S	Property Damage Only	0	0	0	0	0	0	3000	Rear-end	Clear	Dry	

Iowa Department of Transportation

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Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project 8th Avenue South and South 4th Street

Applicant City of Clinton

Contact Person Jason Craft Title City Engineer

Complete Mailing Address 611 South 3rd St
Clinton, Iowa 52733

Phone 563.244.3423 (Area Code) E-Mail jasoncraft@ci.clinton.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 $ 35,000

Safety Funds Requested $ 35,000

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 Clinton

Signed: _____ 8/14/2014
Signature Date Signed

Jason Craft
Typed Name

Attest: _____
Signature Date Signed

_____
Typed Name

B. Narrative

Purpose

The City of Clinton strives to provide a safe and efficient transportation system. With this project the City will address one of it primary safety concerns by improving the intersection at 8th Avenue South and South 4th Street.

Existing Conditions

The project location is a four-legged signalized intersection located near downtown Clinton. The surrounding land use is primary commercial with some residential to the west along 8th Ave S. Adjacent uses include a HyVee gas station and grocery store, a Wallgreens drugstore, a gas station, and a children's museum

Three of the four intersection legs are designated as US Highway 30 and US Highway 67. 8th Ave S west of the intersection is a local street. S 4th St is half of a one-way couplet with S 3rd St where S 4th St carries southbound traffic. Traffic approaching the intersection from the north can use two through lanes, a right-turn lane, and a left-turn lane. 8th Ave S accommodates two way traffic. Traffic approaching form the west has the option to use a through lane and a shared through and right turn lane. Approaching the intersection from the east, drivers have the option to use a left turn only lane and a shard through and left turn lane. The dual left turn lanes account for a large number of accidents at this intersection.

As a segment of a US highway, the intersection is heavily used by trucks. Trucks account for approximately 7%-9% of traffic at this intersection. Most of the trucks going though the intersection are traveling west on 8th Ave S (US 30) and turning left to head south on S 4th St (US 30 US 67).

According to Iowa DOT crash data, 117 incidents have occurred at the intersection of 8th Avenue South and South 4th Street since 2004. Of the 117 incidents at the intersection, 44 or 38% of them directly involved two westbound vehicles both making left turns. (the majority of which included at least one tractor trailer).

Project Concept

To improve this situation, the City proposes to do the following:

1. Remove the curb bulb-out on the Southwest corner of the intersection, replace with at-grade concrete paving. This will allow all WB-50 vehicles to turn left from the outside lane of 8th Avenue South into the outside lane of South 4th Street without crossing over the lane delineation line.

2. Place signage on traffic signal arm facing west bound approach to intersection (trucks must use outside lane).

3. Remove existing lane delineation markings on South 4th Street on both sides of the intersection for 150', re-apply so that lane markings allow straight travel through the intersection. The existing markings do not line up for south bound traffic through the intersection.

4. Re-paint the entire intersection and 150' out in each direction with highly durable pavement markings.

B. Narrative

5. Re-time the signals at the intersection to conform with existing Highway Capacity, to allow for LOS A.

The total cost of the improvements is estimated at $35,000.

Project Justification

The safety challenges presented by the 8th Ave S and S 4th St intersection have proved to be very costly for the community. Accident reports provided by the Iowa DOT shows there have been 117 crashes at the intersection between 2004 and June 2014. The accidents resulted in three minor injuries, seventeen possible injuries, and $865,800 in property damage. The Benefit/Cost Safety Analysis (Section L) estimates the total loss resulting from the crashes at both intersections at $1,655,800. With a projected annual traffic increase of 2%, the cost of future crashes at this intersection is expected to increase.

C. Itemized Breakdown of Costs

Intersection Improvements Cost Estimate
TSIP Grant Application - 8th Avenue South & South 4th Street

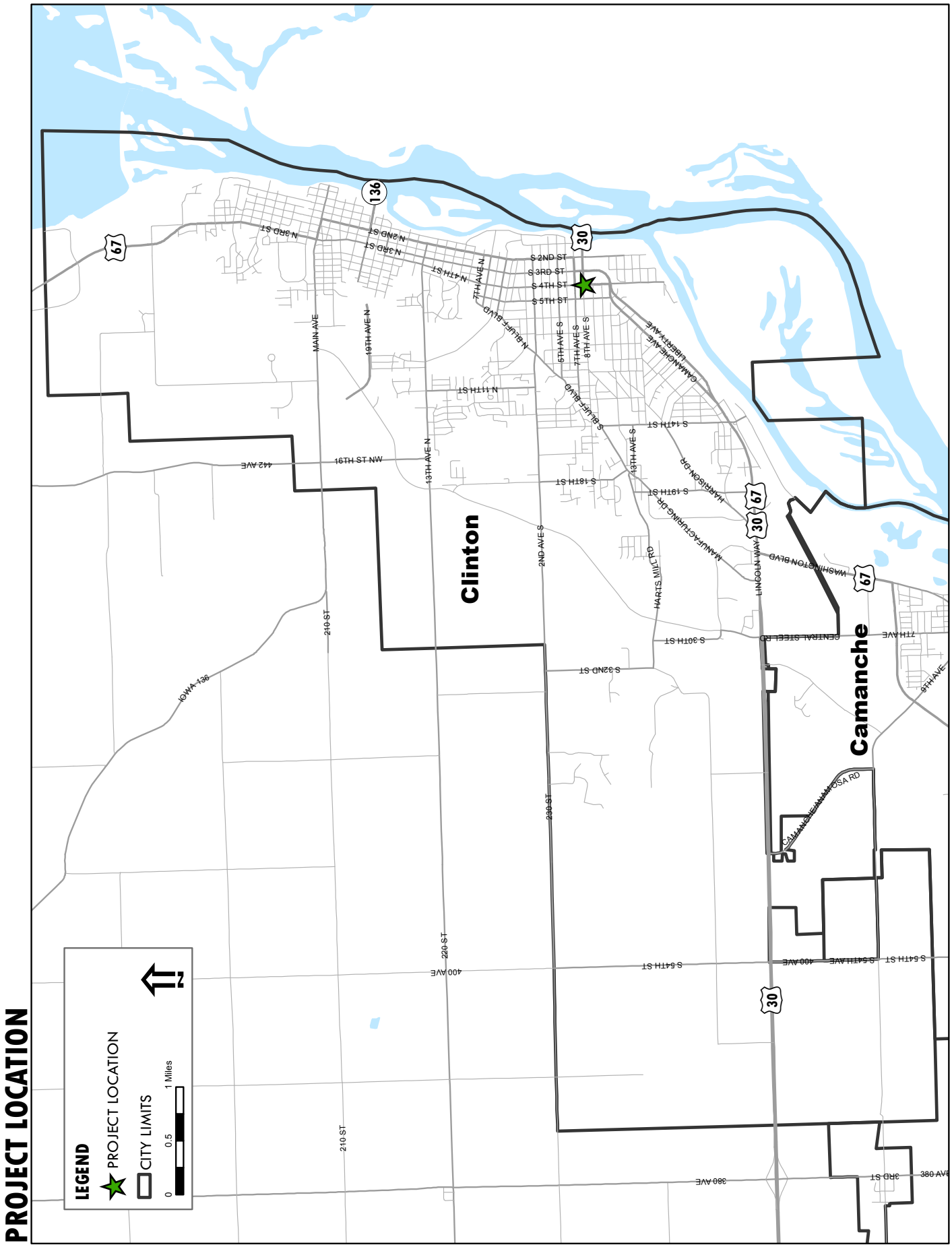
1	ADA Curb Ramps	4	EA	$ 2,500.00	$ 10,000
2	Painted Pavement Markings, Waterborne or Solvent Based	25	STA	$ 200.00	$ 5,000
3	Painted Symbols & Legends, Waterborne or Solvent Based	16	EA	$ 50.00	$ 800
4	Remove & Replace 9” PCC Street	100	SY	$ 100.00	$ 10,000
5	Signage	1	LS	$ 1,000.00	$ 1,000
6	Seeding, Fertilizing, & Mulching	1	LS	$ 400.00	$ 400
7	Topsoil, 4”, Strip, Stockpile, & Respread	1	LS	$ 400.00	$ 400
8	Traffic Control & Barricades, Complete	1	LS	$ 2,000.00	$ 2,000
9	Removal of Existing Pavement Markings	1	LS	$ 400.00	$ 400
10	Mobilization, Demobilization, Contingency	1	LS	$ 5,000.00	$ 5,000

$ 35,000

D. Time Schedule

DESCRIPTION	DATE
Grant Application	August 2014
Notice of Funding	December 2014
Approval of Agreement	July 2015
Construction Plan Preparation	September 2014 - April 2015
Plans Approval	May 2015
Advertise for Bids	October 2015
Open Bid and Award Contract	November 2015
Notice to Proceed	December 2015
Construction	April 2016 - November 2016
Project Closeout	December 2016

E. Map


PROJECT LOCATION
LEGEND
PROJECT LOCATION
CITY LIMITS
0
0.5
1 Miles
N
Clinton
Camanche
67
30
136
N 3RD ST
N 2ND ST
N 4TH ST
7TH AVE N
S 2ND ST
S 3RD ST
S 4TH ST
S 5TH ST
MAIN AVE
19TH AVE N
N BLUFF BLVD
5TH AVE S
7TH AVE S
8TH AVE S
CAMANCHE AVE
LIBERTY AVE
N 11TH ST
S BLUFF BLVD
S 14TH ST
13TH AVE N
13TH AVE S
HARRISON DR
S 19TH ST
S 18TH ST
MANUFACTURING DR
WASHINGTON BLVD
LINCOLN WAY
HARTS MILL RD
2ND AVE S
S 30TH ST
CENTRAL STEEL RD
7TH AVE
9TH AVE
S 32ND ST
210 ST
220 ST
230 ST
CAMANCHE-MAQUOKETA RD
400 AVE
S 64TH ST
380 AVE
3RD ST
412 AVE
MN ST 19TH
IOWA

F. Site Pictures

Intersection of 8th Ave S & S 4th St looking North

Photo Courtesy of Google. Image Date: August 2013.

Intersection of 8th Ave S & S 4th St looking East

Photo Courtesy of Google. Image Date: August 2013.

F. Site Pictures

Intersection of 8th Ave S & S 4th St looking South

Photo Courtesy of Google. Image Date: August 2013.

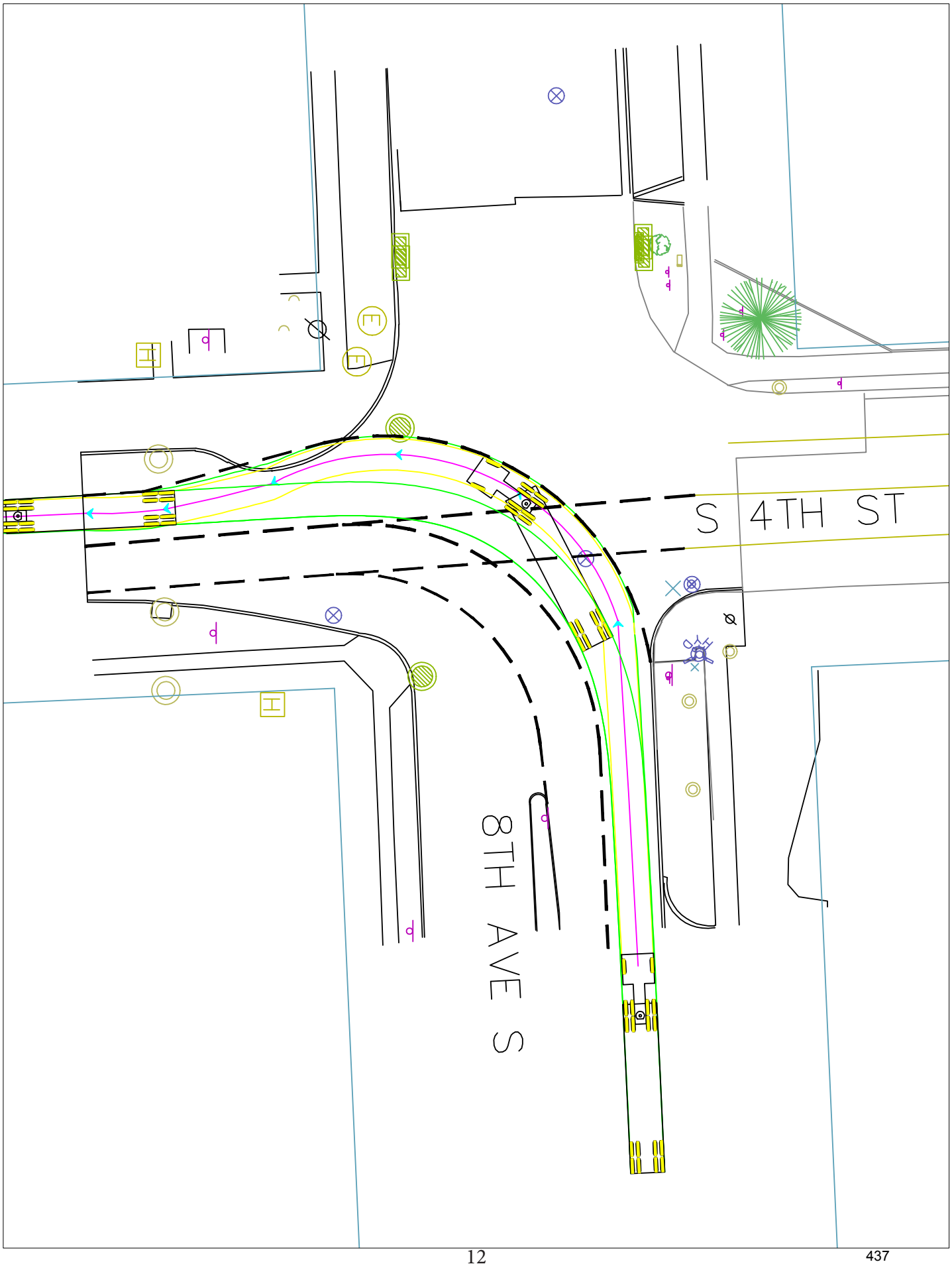
Intersection of 8th Ave S & S 4th St looking West

Photo Courtesy of Google. Image Date: August 2013.

G. Plan View

Create Widened Outside Truck Turn Lane (WB-50)
US 30 8 th AVE S.
US 67 S. 4th ST.
US 30 & 67 S. 4th ST.
Align Lanes
Remove Raised Curb Bulbout
8th AVE S.

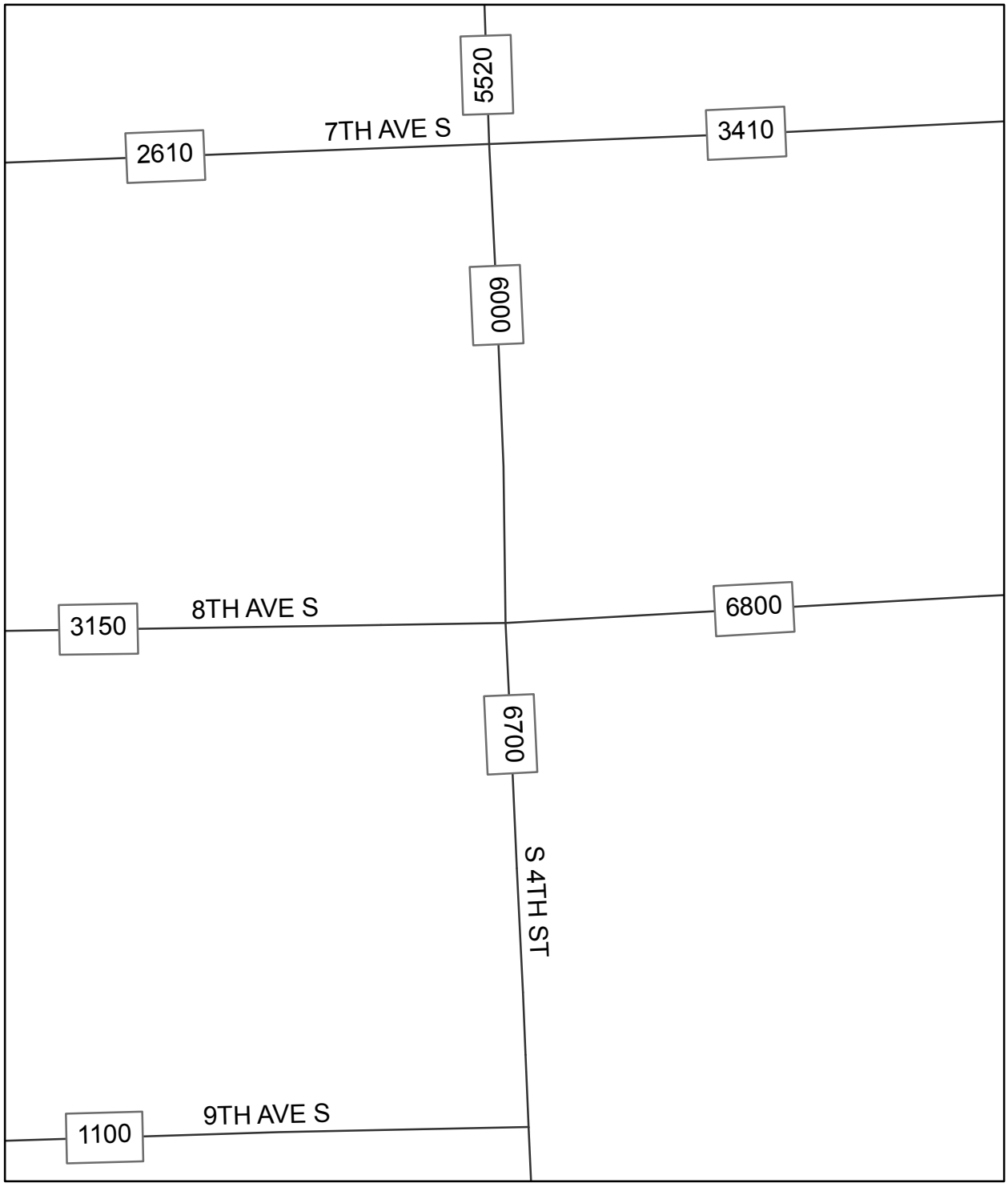
G. Plan View

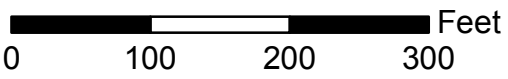


H. Aerial Photograph

TRAFFIC VOLUME

ANNUAL AVERAGE DAILY TRAFFIC





DATA SOURCE: IOWA DOT

Count Year
8th Ave S, 2010, 2013
S 4th St, 2013

L. Benefit Cost Ratio Worksheet

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Clinton Prepared by: ECIA Date Prepared: Aug 12, 2014

Intersection: 8th Ave S & S 4th St

Improvement

Proposed Improvement(s): Remove curb bulb out, add signage, repaing lane delineation markings, and retime signals.

$ 35,000	Estimated Improvement Cost, **EC**	30	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**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 35,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

3,000

1,575 → ← 3,400

3,350

4,133,625	Current Annual Entering Veh., **AEV** = DEV * 365
20,514	veh / day, Final Year DEV, **FDEV**
167.69	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
11,325	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004	First full year -->	2013	Last full year	10.5	years, Time Period, **T**	
6	Additional months				values as of May 2014	
	Fatal Crashes →		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
14	Injury Crashes →	3	Minor Injuries @	$65,000	$	195,000
		17	Possible Injuries @	$35,000	$	595,000
103	Property Damage Only		(assumed cost per crash)	$7,400	$	865,800
		-OR-	enter all Property Costs of all crashes:			
117	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,655,800

11.14	Current Crashes / Year, **AA** = TA / T	2.70	Crashes / MEV, Crash Rate, **CR**
$ 14,152	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
452.0	Total Expected Crashes, **TECR** = CR x TMEV	$ 696,261	Present Value of Avoided Crashes, **BENEFIT**
2.23	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 31,539	Crash Costs Avoided in First Year, AAR x AVC		
90.4	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 = $696,261 : $35,000 = **19.89** : 1

Iowa Department of Transportation

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Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: First Avenue 3-Lane Conversion and Grade Separation

Applicant: City of Iowa City

Contact Person: Ron Knoche Title: City Engineer

Complete Mailing Address: 410 E. Washington Street
Iowa City, IA 52240

Phone: (319) 356-5138 (Area Code) E-Mail: Ron-knoche@iowa-city.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 $ 1,588,448

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 Iowa City

Signed: _____ 8/15/14
Signature Date Signed

Ron Knoche
Typed Name

Attest: Marian K. Karr 8/15/14
Signature Date Signed

Marian Karr
Typed Name

B. NARRATIVE

Existing Conditions

First Avenue is a critical arterial in east Iowa City that provides access to public institutions (e.g. Southeast Junior High School, Tate Alternative High School, Kirkwood Community College), recreation (Mercer Park and Recreation Center), and employment (e.g. Sycamore Mall, Proctor & Gamble, Oral B Laboratories), as well as major local and regional transportation thoroughfares including US Highway 6 and Muscatine Avenue. The First Avenue corridor carries 13,000 vehicles per day with an 85th percentile speed of 31 MPH (25 MPH posted).

Southeast Junior High and Tate High enroll approximately 950 students combined, including students who travel from unincorporated Johnson County, often by way of First Avenue from US Highway 6. Proctor and Gamble employs more than 500 people from the region, and the adjacent commercial businesses provide employment, shopping, and entertainment to Iowa

Citians and other southeastern Iowans. Iowa City also boasts more transit riders than any other transit system in Iowa.

In the early 2000s, the City implemented a three lane cross-section on First Avenue immediately north of this project to improve access near Hy Vee on Muscatine Avenue. At that time, a road diet was not implemented south of Bradford Drive to maintain storage capacity when trains blocked the roadway. The subject of this application eliminates the at-grade crossing and allows for a road diet to reduce collisions.

Project Concept

Traffic operations are complicated by a curvilinear alignment, numerous commercial driveways, and at-grade rail crossing. Collisions are common thru the four-lane segment of First Avenue between Bradford Drive and US Highway 6. Rear end collisions are particularly frequent.

The concept of this project is two-fold:

1) Implement a road diet to improve public safety by reducing conflict points between motorists, cyclists, and pedestrians; and
2) Separate the existing at-grad railroad crossing to eliminate unexpected stoppages that catch motorists off-guard and result in rear-end collisions.
3) Provide reliable access for first responders, reduced vehicle emissions, and improved freight transportation.

In 2005, an engineering consultant determined a grade separation of the railroad tracks was possible using an overpass, which will be accomplished by lowering First Avenue beneath the existing railroad crossing *and* elevating the railroad. By taking advantage of an existing 12-foot difference in the grade of First Avenue, north and south of the railroad tracks, **First Avenue will be lowered 10 feet** while still maintaining proper drainage. To achieve 21 feet of clearance, the railroad will be raised 9 feet.

Figure 1. Three lane road with bike lanes, Ames, Iowa

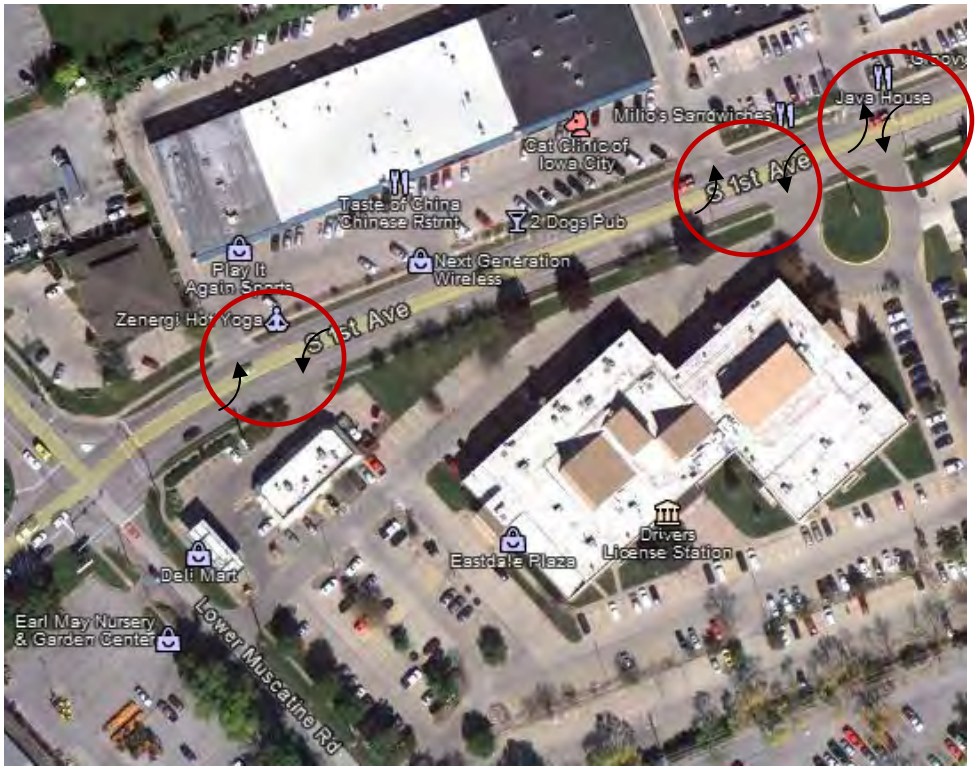
In the past decade a growing body of research and situational evidence has found that converting four-lane undivided roadways to three lanes – one in each direction and a two-way left turn lane (TWLTL) – can improve safety and maintain an acceptable level of

service.

The criteria to evaluate the suitability of road diet candidates are:

- *Traffic volume* – The Iowa Department of Transportation and Institute for Transportation at Iowa State University consider four-lane to three-lane cross section conversions as 'feasible' (with respect to volume only) when a roadway has (or is expected to have) ≤15,000 vehicles per day (vpd) or a peak-hour volume less than 1,500 vehicles. With 13,000 vpd, the First Avenue corridor is suitable for a road diet corridor with respect to volume.
- *Pavement Width* – The conversion from four to three lanes also allows the use of wider lanes or designated bike lanes to better accommodate bicyclists. The current pavement width, back-of-curb to back-of-curb is 45 feet, which provides ample room for three travel lanes, curb and gutter, and *possibly* bike lanes (pending design consideration).
- *Frequent stopping and/or slow-moving vehicles* – The amount of frequent stopping and/or slow-moving traffic (e.g., school bus drop-off/pick-up, mail delivery vehicles, etc.) that occurs along a roadway being considered for a cross section conversion should also be considered. With one thru lane per direction, the number of buses and delivery vehicles can cause delay. City buses account for nearly all stopping and slow-moving vehicles within the corridor. This segment of First Avenue contains two bus stops serviced by two buses every thirty minutes – infrequent enough to be insignificant.
- *Speed and Queues* – The Iowa DOT and Iowa State Institute for Transportation Research found that average vehicle speed and speed variability (i.e., the number of speeding vehicles) usually decrease when an urban four-lane undivided roadway is converted to a three-lane cross section. Anecdotal observations revealed that the inability to change lanes or pass along a three-lane roadway results in more consistent and predictable vehicle speeds than a four-lane undivided roadway. Overall, they found reductions of three to five mph in the 85th percentile speed after the conversion. The traffic calming effect can be minimized (where desired) by, among other things, optimizing and coordinating signals. The low number of signals (two in First Avenue corridor) and separation of signals mean queuing is not expected to be an issue – similar to other 3-lane corridors in Iowa City.
- *Mid-block turning movements* – Heavily used offset minor streets or driveways can produce a situation with overlapping, head-to-head turning movements within the inside

through lanes or the two-way left turn lane. The presence of “high-volume” minor streets (with no stop control for the road diet street) or driveways must be considered when evaluating the feasibility of road diet projects. This project does not produce conflicts as a result of minor street or driveway left-turn traffic.



Motorist safety

The Iowa Interstate (IAIS) Railroad crosses First Avenue between two and four times daily, and at least once at near-peak hours. The train creates unexpected stoppages that catch motorists off-guard and lead to rear-end collisions. Over $200,000 in total property damage resulted from collisions in past five years. The resources expended on these collisions should be invested in our community, not vehicle repairs and personal injuries.

The expected increase in safety that results from a four-lane undivided to three-lane cross section conversion stems from the decrease in the number of conflict points between vehicles, improved sight distance for the major-street left-turn vehicles, and reduced speeding along the roadway. A three-lane cross section removes left-turn vehicles from the through lane. The addition of a TWLTL, therefore, reduces the conflicts between these stopped vehicles and through traffic, and also any related lane changing conflicts that may result.

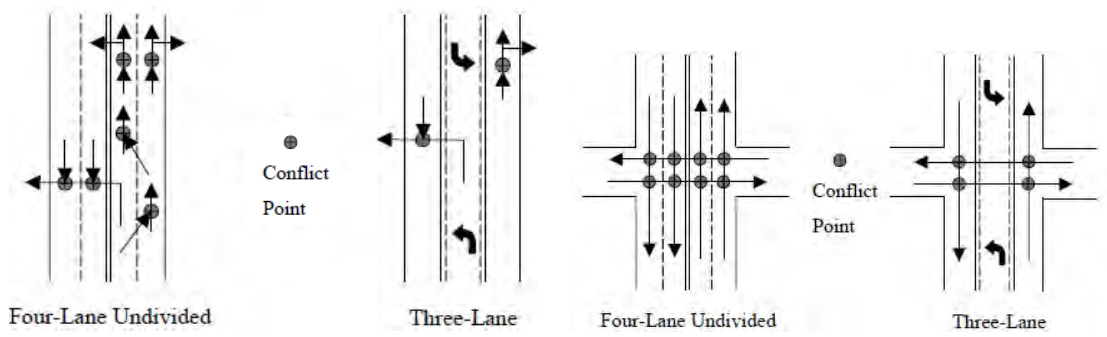


Figure 5. Reduced points of conflict for mid-blocks (left) and minor street intersections (right).

Reduced points of conflict for mid-blocks (left) and minor street intersections (right).

The reduction in conflict points also decreases the complexity of left-turn and crossing maneuvers. As a result, this cross section is safer for all drivers but is especially preferable for areas with a significant percentage of older drivers like Iowa City.

Pedestrian and cyclist safety

Moreover, students and other pedestrians will often jump between rail cars to get to cross the railroad on foot, which is dangerous when train cars may move unpredictably.

As of 2008, one pedestrian injured at the IAIS railroad tracks at First Avenue. A cyclist was involved in a collision just south of the railroad tracks. In just the past five years, 51 motor vehicle collisions have been reported along the corridor. This project will provide the necessary improvements to reduce the number of vehicle, pedestrian, and bicycle collisions. The potential for bike lanes (pending design consideration) would provide cyclists a dedicated right-of-way, separate from motor vehicle traffic. A major cause summary report generated using CMAT is enclosed for reference.

Other safety benefits

Additionally, all emergency first responders – including those at Fire Station #3, just three blocks away – avoid First Avenue because of the potential for trains blocking the crossing, which has led to increased response times. Grade separation proposed by this project will improve response times by eliminating traffic queues during train crossings.

Iowa Department of Transportation

Major Cause Summary

First Ave

Report Version 1.1 Jan 2005

Analysis Years: 2011 [23], 2012 [19], 2013 [17]

Crash Summary:

Fatal	–
Major Injury	1
Minor Injury	3
Possible/Unknown	14
PDO	41
Total Crashes	59

Injury Summary:

Fatal	–
Major Injury	1
Minor Injury	3
Possible	16
Unknown	–
Total Injuries	20

TOT Property Damage: $268,947

AVG Property Damage: $4,558

Surface Condition Summary:

Dry	49
Wet	4
Ice	–
Snow	6
Slush	–
Sand/Dirt/Oil/Gravel	–
Water	–
Other	–
Unknown	–
Not Reported	–
Total Crashes	59

Major Cause Summary:

	Animal
6	Ran Traffic Signal
	Ran Stop Sign
	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
9	FTYROW: Making Left Turn
5	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
2	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
5	Driving Too Fast for Conditions
1	Exceeded Authorized Speed
2	Made Improper Turn
	Improper Lane Change
16	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
2	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
	Ran Off Road - Right
	Ran Off Road - Straight
	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
7	Other: Other Improper Action
3	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

((CRCOMANNER = 3 or CRCOMANNER = 4 or CRCOMANNER = 5 or CRCOMANNER = 6)) AND ((YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst: Ackerson

Notes:

8/15/2014 **Crash Mapping Analysis Tool** **Page:** 1 of 1

Jurisdictional & Stakeholder Collaboration: The following representatives have submitted letters of support for this project:

- Patrick Sheldon, Vice President, Iowa Interstate Railroad, Inc.
- Samuel Hargadine, Chief of Police, City of Iowa City
- Andrew Rocca, Fire Chief, City of Iowa City
- David Dvorsky, Director, Johnson County Emergency Ambulance Service
- Debra Wretman, Principal, Southeast Junior High
- Del Holland, Chair, Project GREEN
- Sue Koch, Administrator, Edward Jones Investments
- David Henn, Principal, Henn Denistry
- Garry Hamdorf, owner, Four Season Car Wash
- John Watson, President, Goodwill Industries
- Bradford Stiles, President, River City Dental Care, Inc.
- L. Coelho, Iowa City resident
- Debra Jensen, Iowa City resident

C. ITEMIZED BREAKDOWN OF COSTS

The engineers estimate for the grade separation project (*without a road diet*) is $8.4 million. For the purposes of this grant application, the estimates on the following page list the TSIP eligible expenses of the grade separation *and* road diet.

City GO Bonds:	$1,058,448
TSIP grant:	$500,000
Total project:	$1,588,448

Engineer's Magnitude Estimate of Probable Construction Cost

First Avenue Grade Separation
City of Iowa City, IA
Traffic Safety Improvement Program Application
Iowa DOT Project Number - STP-U-3715(636)--70-52
Snyder Project Number - 114.0213
8/5/2014

Item No.	Item Code	Item Description	Unit	Total Quantity	Unit Price	Total Costs
1	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	14,250	$ 12	$ 171,000
2	2115-0100000	MODIFIED SUBBASE	CY	800	$ 40	$ 32,000
3	2301-1033090	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 9 IN.	SY	4,200	$ 55	$ 231,000
4	2435-	MANHOLE, STORM SEWER	EACH	1	$ 4,000	$ 4,000
5	2435-	INTAKE	EACH	8	$ 4,000	$ 32,000
6	2502-	SUBDRAIN, LONGITUDINAL	LF	740	$ 12	$ 8,880
7	2503-	STORM SEWER GRAVITY MAIN	LF	200	$ 50	$ 10,000
8	2510-6745850	REMOVAL OF PAVEMENT	SY	4,050	$ 10	$ 40,500
9	2511-7526005	SIDEWALK, PCC, 5"	SY	1,350	$ 30	$ 40,500
10	2525-0000100	TRAFFIC SIGNALIZATION	LS	1	$ 190,000	$ 190,000
11	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	40	$ 100	$ 4,000
12	2599-	RETAINING WALL	SF	8,700	$ 50	$ 435,000
13	2528-8445110	TRAFFIC CONTROL	LS	1	$ 20,000	$ 20,000
14	2533-4980005	MOBILIZATION	LS	1	$ 80,000	$ 80,000

Note: This estimate is preliminary only and based on general bid items. Elements that are not part of this estimate: SEJH reconstruction, detention basin, storm sewer outside of ROW, roadway construction within IAIS ROW, IAIS bridge and track reconstruction, IAIS shoofly track, staging costs, detour roadway, and pavement markings outside of project limits.

Subtotal (rounded)	$ 1,299,000
Contingency (20%)	$ 260,000
Total (rounded)	$ 1,559,000

Mormon Trek Boulevard 3-Lane Section Conversion

Number	Description	Estimated Quantity	Units	Unit Price	Extended Amount
1	Mobilization	LS	1	$1,000.00	$1,000.00
2	Traffic Control	LS	1	$2,000.00	$2,000.00
3	Removals	SY	100	$10.00	$1,000.00
4	PCC Pavement	SY	100	$55.00	$5,500.00
5	Remove Pavement Markings	STA	45.03	$40.00	$1,801.00
6	Remove Painted Symbols	EACH	2.00	$60.00	$120.00
7	Install Pavement Markings	STA	55.48	$40.00	$2,219.00
8	Install Painted Symbols	EACH	15	$60.00	$900.00
9	Traffic Signal Modification	EACH	1	$10,000.00	$10,000.00
	SUBTOTAL				$24,540.00
	Contingency (20%)				$4,908.00
	TOTAL				$29,448.00

D. TIME SCHEDULE

The following schedule is anticipated:

- Underway — Design phase
- February 2015 — Construction letting
- April 2015-Dec 2016 — Construction
- Dec. 31, 2016 — Project complete

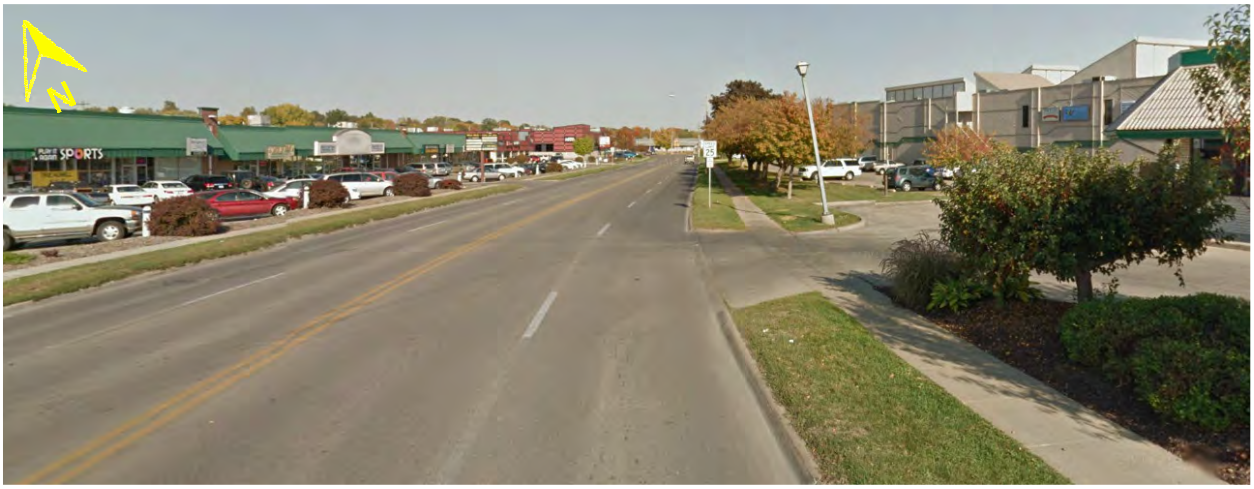
E. MAP identifying the location of the project.

F. COLOR PICTURES

Existing conditions on First Avenue at IAIS railroad crossing.

Computer simulation of railroad grade separation.

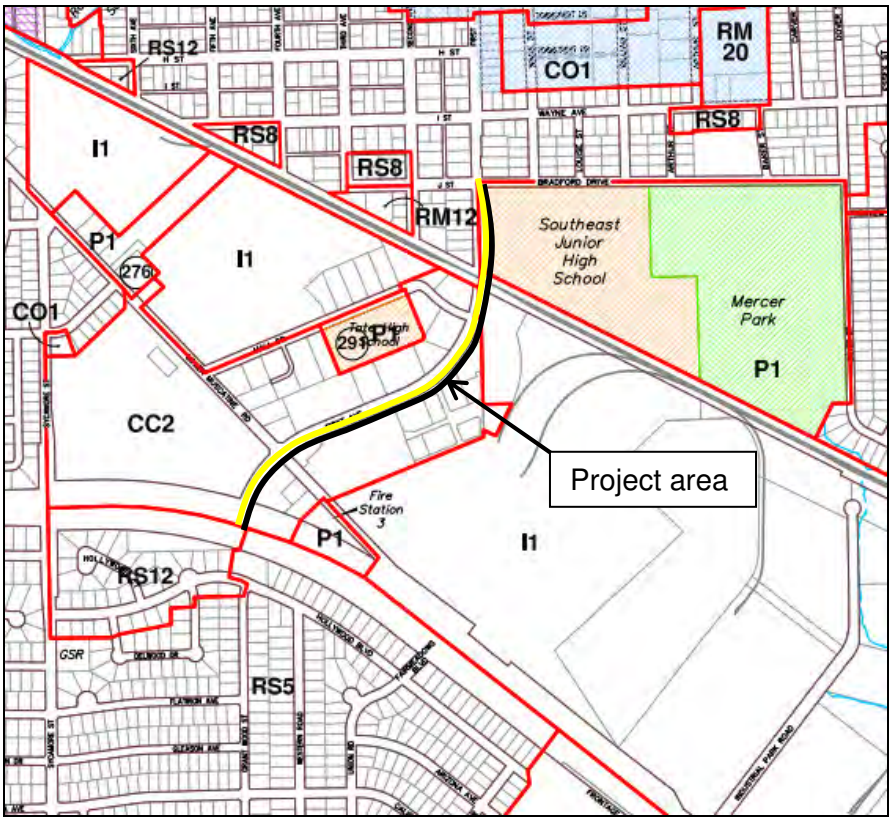
First Avenue, facing northeast, from Lower Muscatine Road. Commercial development lines the corridor, with driveways scattered throughout.



First Avenue at Mall Drive, facing north. The railroad tracks are just beyond the traffic signal (at the location of the bus in this image).

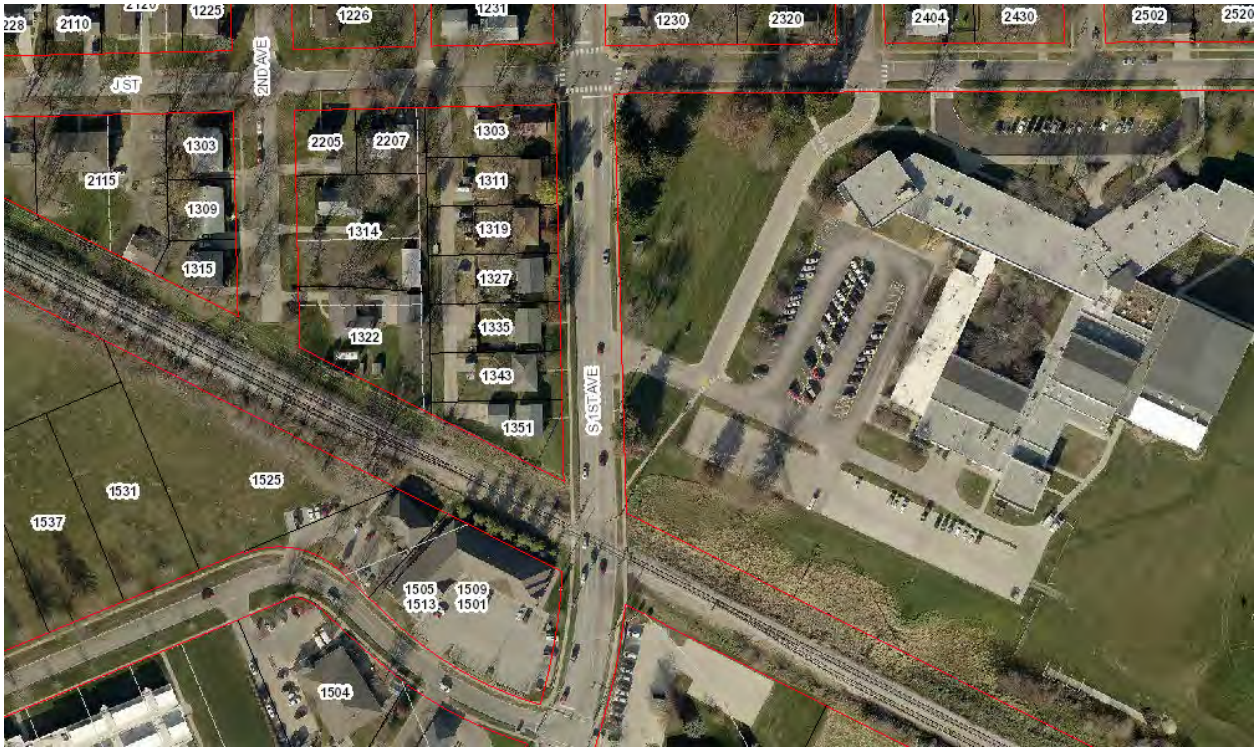
First Avenue at the IAIS Railroad tracks, facing south. The tracks bisect the right-of-way as well as the sidewalks. To the north (behind the cars in this image) is Southeast Junior High and Mercer Park.

Zoning in the area includes residential, commercial, and industrial land uses, contributing to a high volume of mixed modal traffic.


RS12
RM 20
CO1
RS8
I1
RS8
RS8
RM12
P1
276
I1
CO1
Southeast Junior High School
Mercer Park
P1
CC2
Project area
Fire Station 3
P1
I1
RS12
GSR
RS5

G. PLAN VIEW

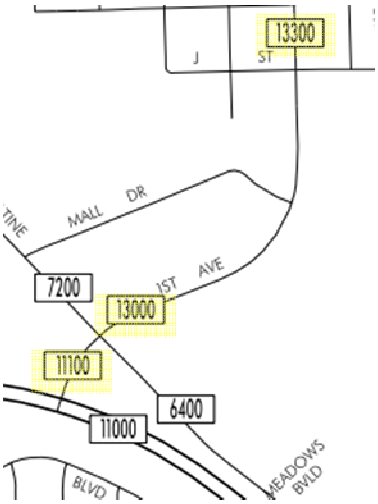
This aerial image indicates the existing right-of-way (red lines), which will remain the same after this project; i.e. no property acquisition is proposed.


2110
1225
1226
1231
1230
2320
2404
2430
2502
2520
J ST
2ND AVE
1303
2205
2207
1303
2115
1311
1309
1314
1319
1315
1327
1322
1335
1343
S 1ST AVE
1351
1531
1525
1537
1505
1513
1509
1501
1504

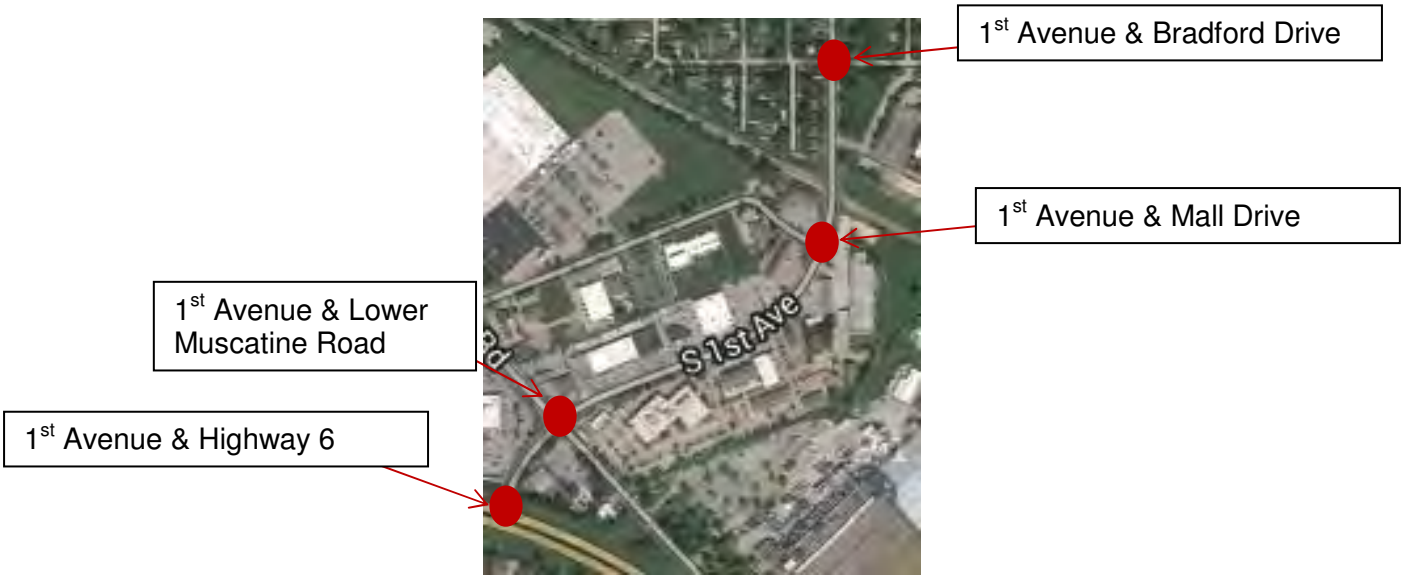
H. AERIAL PHOTOGRAPH

J. TRAFFIC VOLUMES & TURNING MOVEMENT

The highlighted DOT AADT counts below represent the 2010 estimates for average daily traffic in the project area and immediately adjacent intersections.



Turning movement peak hour counts will be provided for the following intersections, from north to south. Note: cyclists on sidewalks are counted as pedestrians.



First Avenue & Bradford Drive
AM Peak hour: 7:45-8:45, collected December 11, 2008

Vehicles and pedestrians

	1ST AVENUE Southbound				BRADFORD DRIVE Westbound				1ST AVENUE Northbound				BRADFORD DRIVE Eastbound			
Start Time	R	T	L	P	R	T	L	P	R	T	L	P	R	T	L	P
07:15 AM	0	121	0	0	25	0	31	0	17	81	0	0	3	0	3	0
07:30 AM	0	108	5	0	23	2	40	0	18	111	1	1	10	3	3	4
07:45 AM	0	158	7	3	34	5	52	0	20	113	1	0	9	2	0	1
08:00 AM	2	167	11	1	35	4	54	0	35	106	1	1	10	6	1	0
08:15 AM	0	129	1	0	6	0	30	0	24	118	1	0	2	1	0	0
08:30 AM	0	155	5	0	3	0	31	0	27	78	2	1	1	1	0	0

Trucks and buses

	1ST AVENUE Southbound			BRADFORD DRIVE Westbound			1ST AVENUE Northbound			BRADFORD DRIVE Eastbound		
Start Time	R	T	L	R	T	L	R	T	L	R	T	L
07:15 AM	0	0	0	0	0	0	1	6	0	1	0	0
07:30 AM	0	1	0	0	0	0	0	2	0	0	0	0
07:45 AM	0	3	0	2	1	9	1	5	0	0	3	0
08:00 AM	0	1	0	0	0	5	0	0	0	0	0	0
08:15 AM	0	2	0	0	0	1	0	0	0	0	0	0
08:30 AM	0	6	0	0	0	0	0	2	0	0	0	0

Bicycles

	1ST AVENUE Southbound			BRADFORD DRIVE Westbound			1ST AVENUE Northbound			BRADFORD DRIVE Eastbound		
Start Time	R	T	L	R	T	L	R	T	L	R	T	L
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0

First Avenue & Bradford Drive
PM Peak hour: 4:45-5:45, collected December 11, 2008

Vehicles and pedestrians

	1ST AVE Southbound				BRADFORD Westbound				1ST AVE Northbound				BRADFORD Eastbound			
Start Time	R	T	L	P	R	T	L	P	R	T	L	P	R	T	L	P
04:15 PM	2	135	11	0	34	2	61	0	57	143	1	1	1	0	1	0
04:30 PM	0	134	8	0	16	0	51	0	56	184	3	0	2	0	1	0
04:45 PM	1	161	5	1	16	0	54	0	41	162	0	0	3	3	3	1
05:00 PM	2	150	2	0	8	1	54	1	54	190	1	1	3	1	0	0
05:15 PM	1	164	5	0	7	0	64	0	48	207	2	0	3	3	2	0
05:30 PM	0	174	3	0	5	2	35	1	49	162	1	0	3	4	1	0

Trucks and buses

	1ST AVENUE Southbound			BRADFORD DRIVE Westbound			1ST AVENUE Northbound			BRADFORD DRIVE Eastbound		
Start Time	R	T	L	R	T	L	R	T	L	R	T	L
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0

Bicycles

	1ST AVENUE Southbound			BRADFORD DRIVE Westbound			1ST AVENUE Northbound			BRADFORD DRIVE Eastbound		
Start Time	R	T	L	R	T	L	R	T	L	R	T	L
04:15 PM	0	0	0	0	0	0	0	1	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0

First Avenue & Mall Drive
AM Peak hour: 7:45-8:45, collected February 28, 2013

Vehicles and pedestrians (P)

	1ST AVENUE Southbound				MALL DRIVE Westbound				1ST AVENUE Northbound				MALL DRIVE Eastbound			
Start Time	L	T	R	P	L	T	R	P	L	T	R	P	L	T	R	P
07:15 AM	2	64	26	0	0	0	0	0	1	88	0	0	21	0	0	1
07:30 AM	3	83	36	0	1	0	0	0	2	109	0	0	21	0	0	0
07:45 AM	3	102	59	1	0	0	1	0	2	162	0	0	21	1	3	1
08:00 AM	2	139	53	1	0	0	1	2	4	128	0	0	26	0	1	2
08:15 AM	4	110	36	0	0	0	0	1	2	102	0	2	24	0	3	0
08:30 AM	2	98	51	1	0	1	0	0	1	83	0	0	31	0	4	1

Trucks and buses

	1ST AVENUE Southbound			MALL DRIVE Westbound			1ST AVENUE Northbound			MALL DRIVE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	0	2	1	0	0	0	0	2	0	0	0	0
07:30 AM	0	1	0	0	0	0	0	6	0	0	0	0
07:45 AM	0	8	0	0	0	0	0	6	0	0	0	0
08:00 AM	0	4	1	1	0	0	0	1	0	2	1	0
08:15 AM	0	6	0	2	0	1	0	4	0	0	1	0
08:30 AM	0	6	1	2	0	0	0	3	0	0	0	0

Bicycles

	1ST AVENUE Southbound			MALL DRIVE Westbound			1ST AVENUE Northbound			MALL DRIVE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0

First Avenue & Mall Drive
PM Peak hour: 4:45-5:45, collected April 30, 2013

Vehicles and pedestrians

	1ST AVENUE Southbound				MALL DRIVE Westbound				1ST AVENUE Northbound				MALL DRIVE Eastbound			
Start Time	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L
04:15 PM	0	147	35	2	2	0	0	0	2	141	0	0	47	0	1	0
04:30 PM	1	137	50	2	1	1	8	4	1	142	0	1	46	0	6	1
04:45 PM	1	156	49	1	1	0	1	0	1	155	0	0	66	0	4	0
05:00 PM	0	187	41	4	0	0	2	1	2	179	0	2	56	0	6	1
05:15 PM	0	187	41	4	0	0	2	1	2	156	0	2	59	0	2	0
05:30 PM	1	173	49	3	0	0	0	1	3	128	0	0	36	0	1	0

Trucks and buses

	1ST AVENUE Southbound			MALL DRIVE Westbound			1ST AVENUE Northbound			MALL DRIVE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	0	1	0	0	0	1	0	1	0	0	0	0
04:30 PM	0	2	0	0	0	0	0	1	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	0

Bicycles

	1ST AVENUE Southbound			MALL DRIVE Westbound			1ST AVENUE Northbound			MALL DRIVE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	0	0	0	0	0	0	0	1	0	1	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	2	0	0
05:00 PM	0	0	0	0	1	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0
05:30 PM	0	0	1	0	0	0	0	0	0	0	0	0

First Avenue & Lower Muscatine Road
AM Peak hour: 7:45-8:45, collected March 7, 2013

Vehicles and pedestrians

	1ST AVENUE Southbound				LOWER MUSCATINE Westbound				1ST AVENUE Northbound				LOWER MUSCATINE Eastbound			
Start Time	L	T	R	P	L	T	R	P	L	T	R	P	L	T	R	P
07:15 AM	4	52	11	0	1	22	20	0	3	54	10	0	20	11	17	0
07:30 AM	6	50	12	0	2	22	27	2	6	62	5	0	21	18	4	0
07:45 AM	15	65	14	0	3	41	40	1	8	122	9	0	31	22	11	1
08:00 AM	2	43	18	0	1	18	24	0	6	89	7	1	25	13	4	0
08:15 AM	7	75	41	0	2	41	24	1	7	75	7	1	24	16	5	0
08:30 AM	4	64	26	0	5	30	19	0	6	58	5	0	25	20	8	0

Trucks and buses

	1ST AVENUE Southbound			LOWER MUSCATINE Westbound			1ST AVENUE Northbound			LOWER MUSCATINE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	1	1	0	0	1	1	0	2	2	0	0	0
07:30 AM	0	1	0	0	0	3	1	7	0	0	1	0
07:45 AM	1	10	0	0	1	1	0	3	0	1	0	0
08:00 AM	0	2	0	1	1	4	0	6	0	0	0	1
08:15 AM	0	6	1	0	0	0	0	4	0	2	0	1
08:30 AM	1	10	0	0	0	2	0	3	2	0	0	0

Bicycles

	1ST AVENUE Southbound			LOWER MUSCATINE Westbound			1ST AVENUE Northbound			LOWER MUSCATINE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0

First Avenue & Lower Muscatine Road
PM Peak hour: 4:45-5:45, collected March 14, 2013

Vehicles and pedestrians

	1ST AVENUE Southbound				LOWER MUSCATINE Westbound				1ST AVENUE Northbound				LOWER MUSCATINE Eastbound			
Start Time	L	T	R	P	L	T	R	P	L	T	R	P	L	T	R	P
04:15 PM	6	91	22	0	7	22	20	0	13	87	3	3	35	24	21	3
04:30 PM	7	84	32	0	18	37	21	0	7	56	2	0	44	29	22	2
04:45 PM	11	108	34	0	13	27	15	1	9	87	5	0	43	21	20	1
05:00 PM	15	105	34	0	12	44	38	2	15	77	5	0	42	36	18	0
05:15 PM	11	110	39	0	14	25	22	0	16	86	3	0	30	30	14	1
05:30 PM	10	96	37	0	13	32	24	5	10	78	2	0	50	20	15	1

Trucks and buses

	1ST AVENUE Southbound			LOWER MUSCATINE Westbound			1ST AVENUE Northbound			LOWER MUSCATINE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	1	1	1	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	1	1	0	0	2	1
04:45 PM	0	0	0	1	1	0	0	1	0	0	1	0
05:00 PM	0	0	0	0	1	0	0	0	0	0	1	0
05:15 PM	0	0	0	0	0	0	0	1	0	0	1	0
05:30 PM	0	0	0	0	1	0	0	0	0	1	0	1

Bicycles

	1ST AVENUE Southbound			LOWER MUSCATINE Westbound			1ST AVENUE Northbound			LOWER MUSCATINE Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	0

First Avenue & Highway 6 (3-Way Intersection)
AM Peak hour: 7:15-8:15, collected April 21, 2009

Vehicles and pedestrians

	1ST AVENUE Southbound				HIGHWAY 6 Westbound				1ST AVENUE Northbound				HIGHWAY 6 Eastbound			
Start Time	L	T	R	P	L	T	R	P	L	T	R	P	L	T	R	P
07:15 AM	0	0	0	0	66	86	0	0	12	0	52	0	0	98	2	0
07:30 AM	0	0	0	0	106	89	0	0	12	0	50	0	0	104	2	0
07:45 AM	0	0	0	0	127	98	0	0	13	0	72	0	0	120	3	0
08:00 AM	0	0	0	0	136	67	0	0	14	0	76	0	0	114	2	0
08:15 AM	0	0	0	0	107	96	0	0	11	0	51	0	0	85	6	0
08:30 AM	0	0	0	0	77	74	0	0	10	0	54	0	0	98	4	0

Trucks and buses

	1ST AVENUE Southbound			HIGHWAY 6 Westbound			1ST AVENUE Northbound			HIGHWAY 6 Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	0	0	0	4	4	0	0	0	0	0	3	1
07:30 AM	0	0	0	3	5	0	0	0	1	0	3	0
07:45 AM	0	0	0	3	2	0	1	0	2	0	6	1
08:00 AM	0	0	0	0	3	0	3	0	4	0	2	3
08:15 AM	0	0	0	2	4	0	1	0	3	0	5	0
08:30 AM				0	4	0	2	0	7	0	6	0

Bicycles

	1ST AVENUE Southbound			HIGHWAY 6 Westbound			1ST AVENUE Northbound			HIGHWAY 6 Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0

First Avenue & Highway 6 (3-Way Intersection)
PM Peak hour: 4:45-5:45, collected August 18, 2009

Vehicles and pedestrians

	1ST AVENUE Southbound				HIGHWAY 6 Westbound				1ST AVENUE Northbound				HIGHWAY 6 Eastbound			
Start Time	L	T	R	P	L	T	R	P	L	T	R	P	L	T	R	P
04:15 PM	0	0	0	0	102	151	0	0	28	0	125	0	0	123	5	0
04:30 PM	0	0	0	0	106	117	0	0	11	0	98	0	0	121	13	0
04:45 PM	0	0	0	0	133	160	0	0	13	0	119	0	0	106	6	0
05:00 PM	0	0	0	0	98	150	0	0	20	0	114	0	0	114	11	0
05:15 PM	0	0	0	0	128	196	0	0	28	0	120	0	0	107	2	0
05:30 PM	0	0	0	0	120	156	0	0	20	0	121	0	0	104	14	0

Trucks and buses

	1ST AVENUE Southbound			HIGHWAY 6 Westbound			1ST AVENUE Northbound			HIGHWAY 6 Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	0	0	0	0	0	0	0	0	0	0	5	0
04:30 PM	0	0	0	0	2	0	0	0	0	0	3	1
04:45 PM	0	0	0	0	1	0	0	0	1	0	1	0
05:00 PM	0	0	0	0	4	0	0	0	0	0	2	0
05:15 PM	0	0	0	0	3	0	1	0	0	0	2	0
05:30 PM	0	0	0	0	2	0	1	0	0	0	3	0

Bicycles

	1ST AVENUE Southbound			HIGHWAY 6 Westbound			1ST AVENUE Northbound			HIGHWAY 6 Eastbound		
Start Time	L	T	R	L	T	R	L	T	R	L	T	R
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0

K. TRAFFIC SIGNAL AYOUT, TYPE, PROPOSED PHASING, AND DETECTOR LOCATIONS

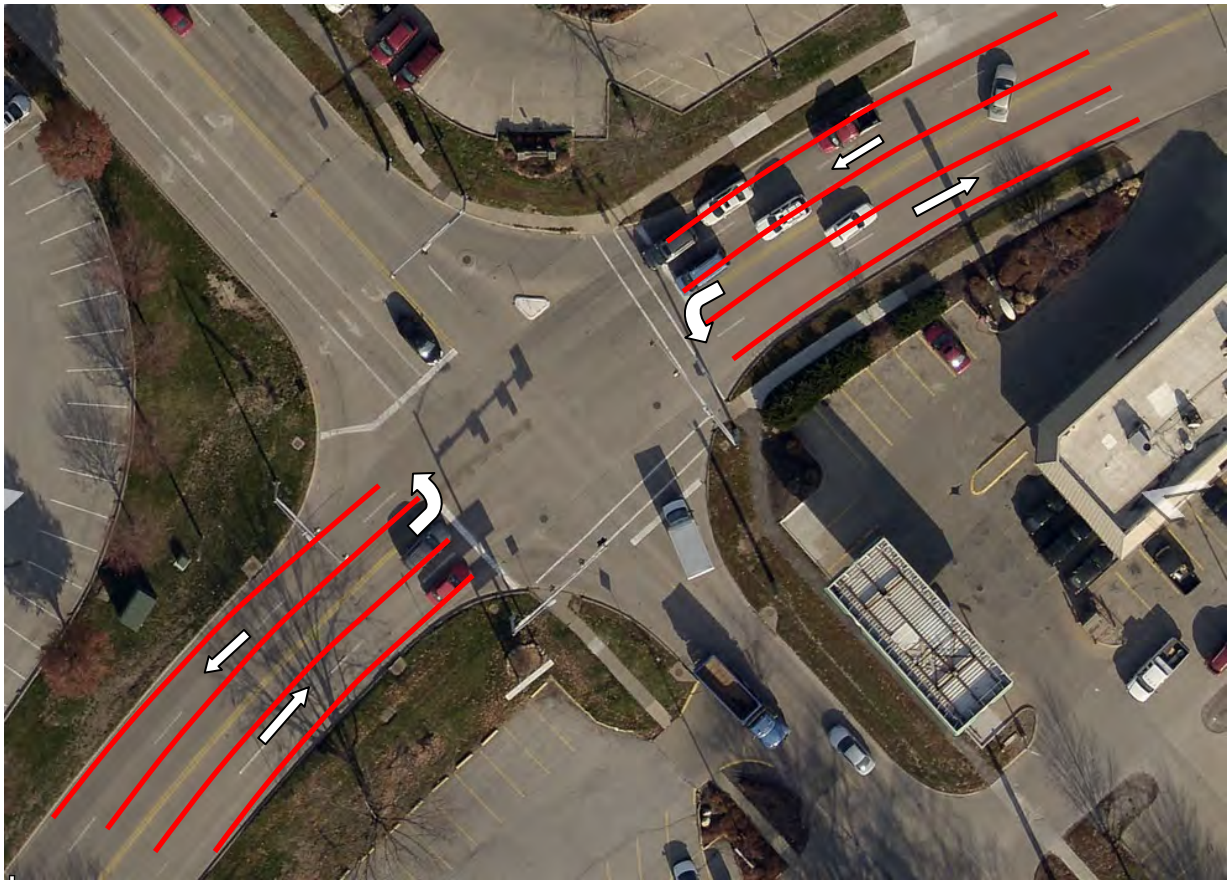
The City uses video detection at all signalized intersections. The video detection will be adjusted as needed for the new lane alignments.

The Metropolitan Planning Organization of Johnson County will provide new signal timings for each intersection using Sychro 7 when the project is funded and engineering commences.

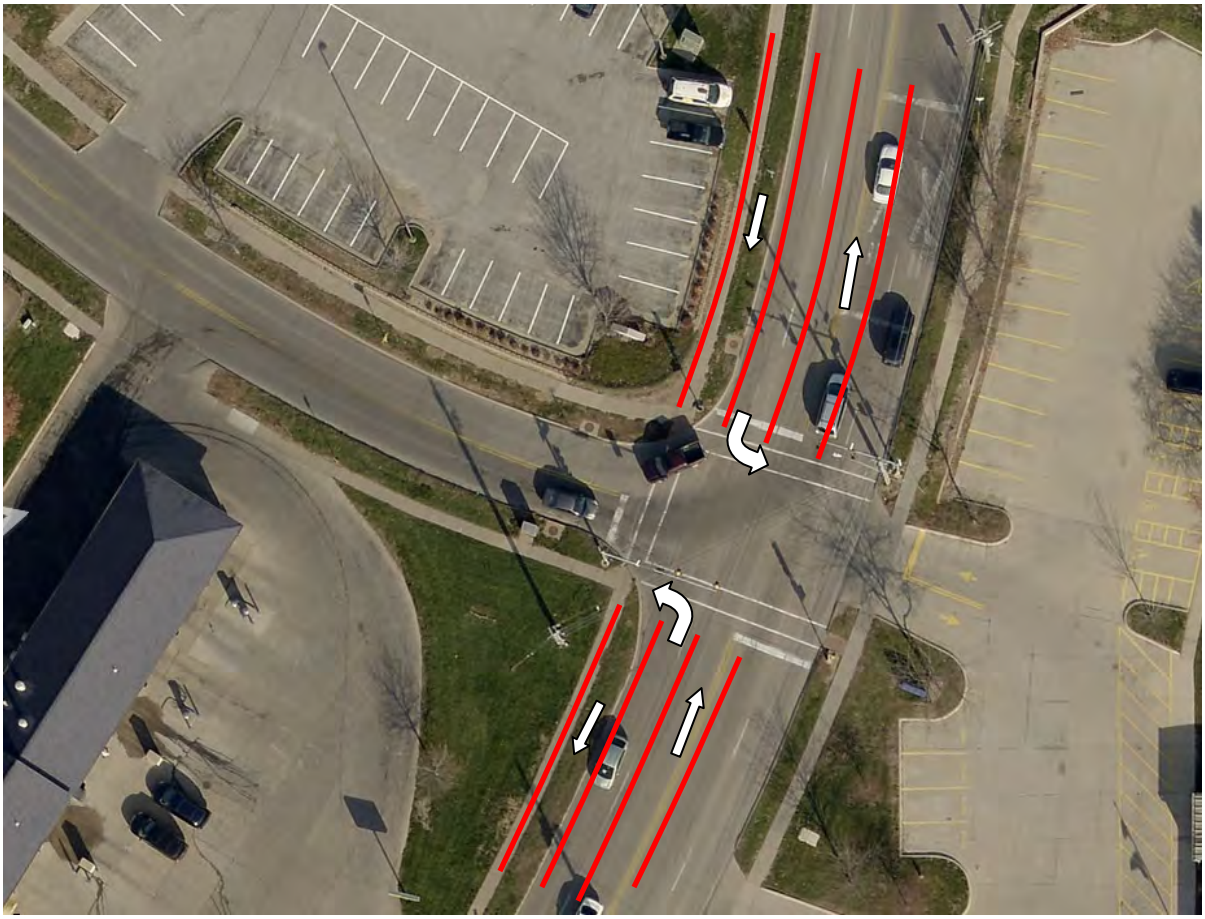
Proposed Phasing

Intersection	Yellow	All-red (adjusted for grade)	Total Change Period	85th/Posted Speed	Intersection Width	% Grade
1st Ave at Lower Muscatine Rd (northbound)	3.2	2.8	6.0	31mph	90ft	2.9
1st Ave at Lower Muscatine Rd (southbound)	3.2	2.4	5.6	31mph	90ft	-1.1
1st Ave at Mall Drive (northbound)	3.2	1.4	4.6	31mph	50ft	-2.5
1st Ave at Mall Drive (southbound)	3.2	2.1	5.3	31mph	50ft	4.5
Lower Muscatine Rd at 1st Ave (westbound)	3.0	2.6	5.6	25mph	70ft	0.8
Lower Muscatine Rd at 1st Ave (eastbound)	3.0	2.4	5.4	25mph	70ft	-1.0
Mall Drive at 1st Ave (eastbound)	3.0	2.6	5.6	25mph	70ft	1.0

First Avenue and Lower Muscatine Road



First Avenue and Mall Drive



L. BENEFIT/COST

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis
Iowa DOT Office of Traffic & Safety

County: Johnson | Prepared by: Kelly Davila | Date Prepared: Aug. 15, 2014

Location: 1st Avenue between Bradford Dr. and Lower Muscatine Rd.

Improvement

Proposed Improvement(s): Reduction from four lanes to three lanes including a center turn lane

$ 500,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	25	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
		$ 500,000	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 | 2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
0.40	13,000	1st Avenue between Bradfor
0.40	miles total	

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

5,200	Current Vehicle Miles / Day, **VM**
6,037	End of Life Veh. Miles / Day
1,898,000	Current Veh. Miles / Year, **AM**
30,551,908	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

2011 First full year --> | 2013 Last full year | 3.0 years, Time Period, **T**

Additional months | values as of Dec. 2007

0	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		1	Major Injuries @	$325,000	$ 325,000
18	Injury Crashes	3	Minor Injuries @	$65,000	$ 195,000
		14	Possible Injuries @	$35,000	$ 490,000
41	Property Damage Only		(assumed cost per crash)	$7,400	$ 436,600
			-OR- enter all Property Costs of all crashes:		
59	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,446,600

19.67	Current Crashes / Year, **AA** = TA / T
$ 24,519	Cost per Crash, **AVCR** = LOSS / TA
316.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8
4.96	Crashes Avoided First Year **AAR** = AA x CRF / 100
$ 121,514	Crash Costs Avoided in First Year, AAR x AVCR
79.8	Total Avoided Crashes, TCR x CRF/ 100

1,036.2	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 1,439,359	Present Value of Avoided Crashes, **BENEFIT**

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

Benefit / Cost Ratio

Benefit : Cost = $1,439,359 : $500,000 = **2.88** : 1

LETTERS OF SUPPORT

Enclosed Letters of Support

Joe Bolkcom, State Representative
Nancy Quellhorst, President & CEO, Iowa City Area Chamber of Commerce
Joshua Schamberger, President, Convention & Visitors Bureau
Steve Spenler, Director, Johnson County Emergency Ambulance Service
Andy Rocca, Fire Chief, Iowa City
Lane Plugge, Superintendent, Iowa City Community School District
Deb Wretman, Principal, South East Junior High School
Mike Reeve, Teacher, South East Junior High School
Connie Wicks, Teacher, South East Junior High School
Vicki Lensing, State Representative
Sam Hargadine, Chief of Police, Iowa City
John Yapp, Executive Director, JCCOG
Jeff Davidson, Director, Planning & Community Development, Iowa City
Patrick Sheldon, Vice-President, Engineering, Iowa Interstate Railroad
Garry Hamdorf, Four Seasons Car Wash
John Watson, President, Goodwill Industries of Southeast Iowa
Bradford Stiles, DDS, President, River City Dental Care, Inc.
Susan Koch, Branch Office Administrator, Edward Jones
David Henn, DDS, PC
John Stokes, Support Services Manager, Goodwill of the Heartland
Debra Jensen, Resident
L. Coelho, Resident
Dave Triplett, Resident
Johnson County Board of Supervisors

JOE BOLKCOM
STATE SENATOR
Thirty-ninth District
Statehouse: (515) 281-3371

HOME ADDRESS
728 2nd Avenue
Iowa City, Iowa 52245
Phone: (319) 337-6280
joe@joebolkcom.org
www.joebolkcom.org

The Senate
State of Iowa
Eighty-third General Assembly
STATEHOUSE
Des Moines, Iowa 50319

ASSISTANT MAJORITY LEADER

COMMITTEES

Appropriations
Commerce
Environmental & Energy Independence
Human Resources
Natural Resources & Environment
Ways & Means, *Chair*

February 4, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing in the past.

The City of Iowa City has committed $281,000 to the design and property acquisition for this project. The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service. Due to financial constraints brought-on by a devastating tornado in 2006 and flood in 2008, as well as the current recession, the city requires federal assistance to complete the project.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Joe

State Senator Joe Bolkcom
Senate District 39

Serving the communities of Coralville, Iowa City, North Liberty and Solon.

Iowa City Area Chamber of Commerce

February 11, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

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We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Nancy Quellhorst
President & CEO

325 E. Washington
Suite 100
Iowa City, IA 52240
Telephone: (319) 337-9637
Fax: (319) 338-9958
www.iowacityarea.com

ACTIVELY FOSTERING A BETTER BUSINESS ENVIRONMENT.

February 4, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

The Iowa City/Coralville Area Convention & Visitors Bureau would like to express our enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing in the past.

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We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Joshua Schamberger
President

900 First Avenue/Hayden Fry Way, Coralville, Iowa 52241 / TELEPHONE ~ 319 337 6592 ~ 800 283 6592 FACSIMILE ~ 319 337 9953
www.iowacitycoralvillearea.org

JOHNSON COUNTY
EMERGENCY AMBULANCE SERVICE

808 S. Dubuque Street ■ Iowa City, IA 52240

Business (319) 356-6013 FAX (319) 351-0695

February 8, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing in the past.

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We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Steve Spenler
Director

– Setting the Standard of Excellence –

Iowa City Fire Department

"Serving with Pride and Professionalism Since 1872"

February 11, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant Funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

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We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

IOWA CITY FIRE DEPARTMENT

Andrew J. Rocca

Andrew J. Rocca
Fire Chief

AJR/bdm

FIRE DEPARTMENT • *410 E. Washington Street* • *Iowa City, IA 52240* *Phone: (319) 356-5260* *FAX: (319) 356-5263* *www.icfd.org*

Office of the Fire Chief	***Office of the Fire Marshal***	***Battalion Chiefs***	***Fire Training***	***HazMat***	***Public Education***
Fire Administration	*Fire Prevention Bureau*	*Station 1*	*Station 1*	*Station 2*	*Station 3*
(319) 356-5256	(319) 356-5257	(319) 356-5262	(319) 356-5258	(319) 356-5266	(319) 356-5265

IOWA CITY COMMUNITY
SCHOOL DISTRICT

Lane Plugge, Ph.D.
Superintendent

509 S. Dubuque Street
Iowa City, IA 52240
(319) 688-1000
(319) 688-1009 FAX

February 10, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

Please accept my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project, a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. This project is of particular interest to me as superintendent of schools. The trains often come during the morning hours when South East Junior High students are trying to get to school and it is a serious safety risk to both vehicles and pedistrians.

The City of Iowa City has committed $281,000 to the design and property acquisition for this project. The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service. Due to financial constraints caused by a devastating tornado in 2006 and flood in 2008, as well as the current recession, the city requires federal assistance to complete the project.

We appreciate any assistance you can provide in the funding of this project.

Sincerely,

Lane Plugge

Lane Plugge

SOUTH EAST JUNIOR HIGH

Debra Wretman Principal
Lonnie Behnke, Associate Principal

2501 Bradford Drive
Iowa City, IA 52240
Phone: 319-688-1070

February 11, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing in the past.

The City of Iowa City has committed $281,000 to the design and property acquisition for this project. The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service. Due to financial constraints brought-on by a devastating tornado in 2006 and flood in 2008, as well as the current recession, the city requires federal assistance to complete the project.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Deb Wretman
Principal
South East Junior High School

SOUTH EAST JUNIOR HIGH

Debra Wretman, Principal
Lonnie Behnke, Associate Principal

2501 Bradford Drive
Iowa City, Iowa 52240
Telephone (319) 688-1070
Fax (319) 688-1079

February 16, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. I am a teacher at Southeast Junior High which is right next to the tracks. The trains often come during the morning hours when students are being dropped off at school, and during dismissal in the afternoon when parents and buses are trying to pick up children. It has caused students to be frequently late, as well as causing traffic jams. More importantly, there have been accidents at this crossing in the past.

The City of Iowa City has committed $281,000 to the design and property acquisition for this project. The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service. Due to financial constraints brought-on by a devastating tornado in 2006 and flood in 2008, as well as the current recession, the city requires federal assistance to complete the project.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Mike Reeve
Business Education Teacher @ Southeast JH

February 16, 2010

The Honorable Charles Grassley
United States Senate
135 Hart Senate Office Building
Washington, DC 20510-1501

Re: Grant funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Senator Grassley:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns plaguing the First Avenue corridor in east Iowa City. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing in the past.

The City of Iowa City has committed $281,000 to the design and property acquisition for this project. The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service. Due to financial constraints brought-on by a devastating tornado in 2006 and flood in 2008, as well as the current recession, the city requires federal assistance to complete the project.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Connie Wicks

Special education Teacher @ SE Junior High

Vicki Lensing
STATE REPRESENTATIVE
Seventy-Eighth District
Statehouse: (515) 281-3221
e-mail – vicki.lensing@legis.state.ia.us

HOME ADDRESS
2408 Mayfield Road
Iowa City, Iowa 52245
Home: (319) 338-6148

House of Representatives
State of Iowa
Eighty-Third General Assembly
STATEHOUSE
Des Moines, Iowa 50319

COMMITTEES
Environmental Protection
Government Oversight,
Chair
Judiciary
State Government

April 28, 2009

The Honorable Dave Loebsack
United States House of Representatives
1513 Longworth House Office Building
Washington, D.C. 20515

Dear Congressman Loebsack:

I would like to express my enthusiastic support for both the First Avenue-Iowa Interstate Railroad Grade Separation Project and the Park Road Bridge replacement and Dubuque Street elevation. I believe that both are high priorities for funding in our community.

This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns in the First Avenue corridor in east Iowa City. I live on this side of Iowa City and as recently as two weeks ago, I waited for 20 minutes while the train blocked the intersection. The trains often come during the morning hours when children are trying to get to school and there have been accidents at this crossing ion the past.

There were incidents with children's safety when my children attended nearby Southeast Junior High and it has not improved over the years. Parents were concerned and would complain and seek resolution but 20 years later, nothing has changed. Besides the impact on South East Junior High School, there are issues involving access and response by the Iowa City Fire Station #3, and the Johnson County Ambulance Service.

I would also like to express my support for the Park Road Bridge Replacement and Dubuque Street Elevation Project. I grew up on this side of Iowa City and my parents still live there. There have been issues with flooding since I was a child and the most recent floods impacted access to this part of town because of having to close both Park Road Bridge and Dubuque Street.

My parents and other residents were almost cut off from leaving their neighborhood. I am concerned for these residents safety as this could occur again if nothing is done. In 2008 it was under water for 32 days and in 1993 it was submerged for nearly two months. This also

impacted access to our downtown and the operations of the University of Iowa.

This project is critically important to mitigate the impact of flooding on our primary arterial link to Interstate 80. In addition to improving transportation, this project will diminish the impact of future floods by reducing backwater and providing the Corps of Engineers greater operational flexibility for the Coralville Reservoir.

The combined benefits of this project are significant and extend to two municipalities as well as county, state, and federal interests. The project was discussed during several public meetings including the Iowa City City Council and numerous service organizations. Additional local input will be solicited through workshops and public meetings. It is a top priority for flood mitigation.

The First Avenue project also has the strong support by the Iowa City City Council in terms of budget, design and property acquisition.

I appreciate any efforts which you can undertake to assist in the funding of these projects.

Sincerely,

Vicki Lensing

IOWA CITY POLICE DEPARTMENT

410 E. WASHINGTON
IOWA CITY, IA 52240-1826
PH: 319-356-5275
FAX: 319-356-5449

February 25, 2008

Honorable Dave Loebsack
1513 Longworth House Office Building
Washington, DC 20515

Dear Mr. Loebsack:

The First Avenue Grade Separation project, here in Iowa City should be a priority for funding due to the unsafe conditions that presently exist when a long train has to stop anywhere else in Iowa City. When a train stops to unload a car further up the track it cuts off the city for emergency services that may need to get across that intersection.

We are also receiving complaints that pedestrians; some of them school children are going under or between the cars because they don't want to wait for the stopped train. This is extremely dangerous because it's not known when the train will start moving again.

Thank your for your interest in this legislation and for your service to this Country.

Sincerely,

Samuel E. Hargadine
Chief of Police

Johnson County Council of Governments

March 5, 2008

Jeff Davidson, Director
Planning and Community Development Department
City of Iowa City
410 E Washington Street
Iowa City, IA 52240

Re: Iowa Interstate Railroad bridge over First Avenue

Dear Jeff:

This letter is to express the support of the Johnson County Council of Governments (JCCOG) for the Iowa Interstate Railroad Bridge over First Avenue project in Iowa City. The existing at-grade crossing of the Iowa Interstate Railroad track at First Avenue is frequently blocked by trains during peak periods, causing congestion and significant cut-through traffic on neighborhood streets. Idling vehicles waiting for the trains to pass cause increased vehicle emissions. Junior High students have been observed passing through stopped or slow moving trains to get to South East Junior High School on the south side of the tracks. First Avenue is an arterial street in the adopted JCCOG Arterial Street Plan, and is a primary emergency service vehicle response route for east Iowa City. The railroad bridge would resolve many issues, including congestion, emissions issues, pedestrian traffic to school, and emergency service vehicle response delays.

The Johnson County Council of Governments is the Metropolitan Planning Agency for the Iowa City Urbanized Area, which includes Iowa City, Coralville, North Liberty, Tiffin, University Heights and the University of Iowa. Please feel free to include this letter of support in any grant application materials for the Iowa Interstate Railroad bridge over First Ave in Iowa City.

Sincerely,

John Yapp
Executive Director

Cc: David Ricketts, Chair, JCCOG Urbanized Area Policy Board
Regenia Bailey, Mayor, City of Iowa City

W:\wpdata\ccogadm\LETTERS\draft letters of support.doc

CITY OF IOWA CITY
410 East Washington Street
Iowa City, Iowa 52240-1826
(319) 356-5000
(319) 356-5009 FAX
www.icgov.org

April 28, 2009

The Honorable Dave Loebsack
United States House of Representatives
1513 Longworth House Office Building
Washington, D.C. 20515

Re: Request for funds for First Avenue-Iowa Interstate Railroad grade separation project; Iowa City, Iowa

Dear Congressman Loebsack:

When our Iowa City coalition met with you a year ago we had the opportunity to discuss the First Avenue-Iowa Interstate Railroad grade separation project. At this time I would like to formally reiterate my support for this project as we prepare to submit it as a High Priority Project for the next Surface Transportation Reauthorization bill. This project will address some significant public safety issues we have in east Iowa City, and the benefit to air quality has been well documented.

The City Council of Iowa City has indicated strong support for this project by budgeting the local match funds in our FY09 Capital Improvement Budget for the City of Iowa City. We have already committed funds for the design and engineering of the project as well as property acquisition. These activities are ongoing and the project should be ready for letting by the end of calendar year 2009.

Please give every consideration possible to funding this project through the Congressional High Priority Project process.

As always, feel free to contact me if you have any questions.

Sincerely,

Jeff Davidson, Director
Department of Planning and Community Development

jccogadm/ltrs/Loebsack-4-09.doc

IOWA IAIS INTERSTATE

December 21, 2005

John Yapp
Assistant Transportation Planner
Johnson County Council of Governments
410 E Washington Street
Iowa City, Iowa 52240

RE: First Avenue Railroad Grade Separation
Revised Concept Plan

Dear Mr. Yapp:

Thank you for taking the time to meet with us today to review the revised conceptual plan for a grade separation project at the First Avenue rail crossing in Iowa City.

We strongly support the current plan of a double-track rail bridge crossing above First Avenue, with a rail grade of 0.5% to the west and a 0.75% to the east.

We look forward to working with you on this project, and if you have any questions, please do not hesitate to call us at 319-298-5417.

Sincerely,

Patrick H. Sheldon
Vice-President, Engineering

Copy: Chad Lamb, P.E., IAIS

5900 6th Street S.W. • Cedar Rapids, IA 52404 • main ph 319.298.5400
customer service: 800.247.8570 • administrative fax 319.298.5456 • human resources fax 319.298.5458

FROM :

FAX NO. :

Sep. 22 2008 07:5

Attn: John Lapp

From Four Seasons Car Wash
1455 S. 1st Ave
Iowa City, Ia 52245
319-351-0942

The train has blocked traffic daily sometimes several times daily for much longer than the 10 minutes stipulated by law.

1 Child has been killed
1 Handicapped citizen hurt
1 Safety compromised for fire + police protection

Thank you for your work on this

GOODWILL INDUSTRIES of Southeast Iowa

Goodwill Works.

The mission of Goodwill Industries is to advance the social and economic well-being of people who experience barriers to independence.

September 18, 2006

John Yapp
Assistant Transportation Planner
Johnson County Council of Governments
410 East Washington Street
Iowa City, IA 52240

Dear John:

Thanks so much for visiting with me at Goodwill and giving an overview of the plans for the proposed railroad bridge over First Avenue. After reviewing the plans and narrative description of the project, we would like to offer our enthusiastic support for the project. We wish you success in your financing efforts.

The railroad crossing has become more and more problematic for us here at Goodwill for two primary reasons:

1. The Iowa Interstate Railroad has increased in traffic in recent years. While this is overall a good thing, it has meant that the frequency and duration of traffic stoppage on First Avenue has also increased.
2. The growth of businesses and public facilities on the Southeast side has also increased significantly, both north of the railroad (e.g. Walgreens and Hy-Vee) and south of the railroad (e.g. Core Fitness, Tate High School, Kirkwood Community College, Sycamore Mall, and numerous commercial/residential properties). As a result, traffic on First Avenue has increased significantly – from 14,000 vehicles per day in 2001 to 20,000 per day in 2004 (+43%).

The combination of these two factors has resulted in more and longer traffic tie-ups and delays. I have personally witnessed traffic lined up from the north past the Muscatine Avenue intersection and from the south to Highway 6. The timing of these delays is also a serious issue because they frequently occur around the 8:00 a.m. rush hour.

Our facility at the southeast corner of the intersection of the railroad and First Avenue houses employment and training programs for as many as 60 participants per day and, as our headquarters, is the work place for 35 employees. We also have a

[illegible]

suite of offices for program staff at Eastdale Plaza, one quarter mile to the south, with another 38 employees. It is not unusual for our Goodwill clients or employees to be as much as15 to 20 minutes late because of a train delay.

As well as the significant cost in time and fuel that these delays create, there is also an obvious safety concern. Goodwill clients and students traveling by foot or bicycle to Tate High School, Southeast Junior High School and Mark Twain Elementary School are often delayed to the point of tardiness. Although I have not personally witnessed students crossing under or between railroad cars, other Goodwill employees have. **A tragedy awaits.**

If there is anything we can do help advance this long-needed project, please let me know.

Sincerely,

John Watson
President

River City Dental Care, Inc.
Bradford Stiles, D.D.S.
1950 Lower Muscatine Road
Iowa City, Iowa 52240
(319) 337-6226

September 18, 2006

City of Iowa City
410 East Washington St.
Iowa City, IA 52240

To Whom It May Concern:

This letter is to show my support of the proposed idea to create a railroad bridge over First Avenue. Our dental office is located on the corner of First Avenue and Lower Muscatine Road. Many of our patients reside on the East side of Iowa City and quite a few use First Avenue to come to our office.

Occasionally patients will arrive for their appointment late stating that a train was crossing First Avenue and they got stuck there. A railroad bridge would eliminate this problem.

Thank you.

Sincerely,

Bradford Stiles, D.D.S.
President

John Yapp

From: Koch,Susan M [Susan.Koch@edwardjones.com]
Sent: Thursday, September 14, 2006 12:05 PM
To: John Yapp
Subject: First Avenue/Iowa Interstate Railroad crossing

Hi John,
I work at Edward Jones, a business located in the strip mall parallel with the railroad tracks at First Avenue. We received your letter today.
Without knowing all of the particulars about the funding of the project, I still would like to voice my opinion. There have been times when, as a business, the congestion caused by the railway has created delayed appointments. Our office banks at US Bank, located in Towncrest, just a few blocks from here. I have had occasions where it has taken me 45 minutes to run a deposit to the bank because of the train. I have heard that there is a limit of 10 minutes that the train can actually hold up traffic. Believe me, that limitation is often surpassed.

I have two children who have attended South East Junior Hi in the past. What a nightmare it is to take a child to school everyday. If you didn't time it just right, you could easily sit and wait forever to get your child to class on time in the morning. The back up of traffic from every direction around the school is horrendous whenever there is a train. I just know that there were a lot of tense moments in my vehicle on several mornings on the way to school!!!! I also find it almost unbelievable that the City has never implemented a safe crossing structure for the Jr Hi children to utilize whenever there was a train. The potential for a catastrophic event is huge.

Without a doubt, a bridge would alleviate a tremendous amount of daily congestion in this area. It's a lot of money to spend to rectify the situation, but in a time when we all want immediate gratification, sitting at a railroad crossing every single day is aggravating for a lot of people.

I am anxious to watch the progression of this proposal.

Thank you for your time,
Sue Koch

Susan Koch
Branch Office Administrator
Edward Jones
1509 Mall Drive
Iowa City, IA 52240
(319) 351-8904
www.edwardjones.com

E-mail sent and received by Edward Jones is electronically archived and subject to review and/or disclosure to someone other than the recipient. We cannot accept orders for transactions or other similar instructions through e-mail. We cannot ensure the security of information received via the Internet, so you should be careful not to transmit confidential information. It is also possible that, for regulatory reasons, your e-mail messages may be delayed or undeliverable.

If you are not the intended recipient of this message (including attachments), or if you have

SEP-27-2006 08:16 AM DR. DAVID D. HENN 319 341 6086

Sept 15, 2006

Dear Mr. Yapp:

I am writing this letter in Regards to the purposed Railroad bridge over First Avenue. I would wholeheartedly support this project.

There is never a week that goes by that the existing congestion does not interfere with our dental practice. My staff, my patients, and I have all arrived here late more than once becaus of the train delays. We pride ourselves on keepin on schedule and this project would alleviate o of our major sources of delays.

I would also point out that I have se emergency vehicles with lights flashing being forced to wait for the trains to clear, as you know, there is a fire station across the street f our office.

Thank you for your interest in this worthwhile project. Please contact me ~~let me know~~ if I can be of further assistance.

Sincerely,

April 29, 2009

The Honorable Dave Loebsack
United States House of Representatives
1513 Longworth House Office Building
Washington, D.C. 20515

Re: Request for funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Congressman Loebsack:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns in the First Avenue corridor in east Iowa City.

The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service.

The City Council of Iowa City has indicated their strong support for this project by budgeting local match in the FY09 municipal budget for the City of Iowa City. The City of Iowa City has committed funds for the design and property acquisition for this project. Design is ongoing and the project should be ready for letting by the end of calendar year 2009.

The City recently applied for Iowa Clean Air Attainment funding through the Iowa Department of Transportation, but no projects in the Cedar Rapids-Iowa City Corridor received funding from that program in Fiscal Year 2007. This makes it even more important to us that this project be considered for funding through the Congressional High Priority Project process.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

John Lohrer
Goodwill Of The Heartland
1410 First Ave,
Iowa City, Iowa 52240

Sept. 27, 2006

Dear John,

I am writing to support the railroad bridge on 1st Ave. I work on 1st Ave. & therefore am always being stopped by the Train. What's worse is there is not a specific schedule the Train goes by so it can be avoided. Not too long ago, it went by around 7:45 a.m. when traffic was at its worst. There was also all the school traffic too, because of the tracks being right by the Junior High. This is definitely a safety issue besides a congestion issue. Thanks for your efforts.

Sincerely,

Debra Jensen

51 Eversull Lane
Iowa City, IA 52245
September 11, 2006

City Manager's Office
410 East Washington Street
Iowa City, IA 52240

Dear Steve Atkins:

I have a concern.
I think on 1st Avenue by South East Junior High School there should be a bridge for the train to go over.
My concern is about the trains and the possible accidents.

For example:

- I've seen Junior High kids go to Wendy's and they have to cross the train tracks. They could get hurt.
- I've also seen other people riding bikes around that area too.
- What if the fire fighters have to get to a fire?

They also might not get there on time.

- People have to get to work on time.

It's our city that I'm worried about having a safe and secure crossing. Typically it takes about 10 minutes for a train to cross that area. That can be a lot of time wasted and many dangers and times we could get hurt.
What you could do is just move the tracks north of Iowa City.
Thank you for reading my letter. Do you have any plans for changing the area? If you do please write me back.

Sincerely,

L. Coelho

RECEIVED
SEP 12 2006

April 27, 2009

The Honorable Dave Loebsack
United States House of Representatives
1513 Longworth House Office Building
Washington, D.C. 20515

Re: Request for funds for First Avenue-Iowa Interstate Railroad Grade Separation Project; Iowa City, Iowa

Dear Congressman Loebsack:

I would like to express my enthusiastic support for the First Avenue-Iowa Interstate Railroad Grade Separation Project – a high priority for funding in our community. This project will raise the grade of the Iowa Interstate Railroad tracks and lower First Ave. to separate the existing at-grade crossing. This will resolve vehicle delay and emissions concerns in the First Avenue corridor in east Iowa City.

The safety issues regarding this project are well documented, including impacts on South East Junior High School, Iowa City Fire Station #3, and the Johnson County Ambulance Service.

The City Council of Iowa City has indicated their strong support for this project by budgeting local match in the FY09 municipal budget for the City of Iowa City. The City of Iowa City has committed funds for the design and property acquisition for this project. Design is ongoing and the project should be ready for letting by the end of calendar year 2009.

The City recently applied for Iowa Clean Air Attainment funding through the Iowa Department of Transportation, but no projects in the Cedar Rapids-Iowa City Corridor received funding from that program in Fiscal Year 2007. This makes it even more important to us that this project be considered for funding through the Congressional High Priority Project process.

We appreciate any efforts which you can undertake to assist in the funding of this project.

Sincerely,

Dave Triplett
151 Hummingbird Lane
Iowa City Iowa 52245

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Agency & Walgreens/ Kmart Intersection

Applicant: City of Burlington

Contact Person: Steve Hoambrecker Title: Public Works Director

Complete Mailing Address: 3510 Division
Burlington, IA 52601

Phone: 319-753-8171 (Area Code) E-Mail: hoambreckers@burlingtoniowa.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 $ 630,402.50

Safety Funds Requested $ 75,000

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 Burlington

Signed: Becky Anderson — August 18, 2014

Signature — Date Signed

Becky Anderson, Mayor Pro-Tem

Typed Name

Attest: Kathleen P. Salisbury — August 18, 2014

Signature — Date Signed

Kathleen P. Salisbury, City Clerk

Typed Name

RESOLUTION NO. 2014-185

Meeting No. 16 Paper No. 9

Seconded By: Shockley

AYES: Scott, Shockley, Anderson + Fleming

Introduced By: Fleming

NAYS: None
absent - McCampbell

A RESOLUTION AUTHORIZING THE FILING OF AN APPLICATION WITH THE STATE OF IOWA FOR TRANSPORTATION SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDS FOR SITE SPECIFIC IMPROVEMENTS INCLUDING NEW SIGNALS AND EXTENDED LEFT TURN LANES AT THE INTERSECTION OF AGENCY AND THE ENTRANCES OF WALGREENS/ KMART ON BEHALF OF THE CITY OF BURLINGTON

WHEREAS, The City of Burlington intends to apply for Traffic Safety Improvement Program funding through the Iowa Department of Transportation (IDOT), and

WHEREAS, in order to avail itself of possible receipt of funds pursuant to any grant under the said program an application must be filed by the City of Burlington, and

WHEREAS, The City of Burlington fully supports the application and intends to utilize Traffic Safety Improvement Program funding for site specific improvements including new signals and extended left turn lanes for the intersection of Agency and the entrances of Walgreens/ Kmart , and

WHEREAS, the filing of the application is in the best interests of the citizens of the City of Burlington, Iowa, and should be approved.

BE IT HEREBY RESOLVED BY THE BURLINGTON CITY COUNCIL: That the City of Burlington guarantees the availability of funds for any required local match of the Agency and Walgreens/ Kmart entrance intersection project costs and agrees to maintain, or cause to be maintained, the completed improvements in a manner acceptable to the IDOT throughout their useful life and hereby authorizes the Director of Public Works to submit an application for funding the improvements through Southeast Iowa Regional Planning Commission.

APPROVED and ADOPTED this 18th day of August, 2014.

ATTEST:

Kathleen P. Salisbury
City Clerk, M.M.C.

Becky Anderson
Mayor Pro-Tem

FILED-For Record

AUG 18 2014

CITY CLERKS OFFICE
BURLINGTON, IOWA

Existing Conditions:

Agency Street is a major arterial that runs east-west through Burlington and connects downtown Burlington with a commercial corridor located in the west portion of Burlington, extending into West Burlington. Agency Street is a four lane undivided road with lanes of approximately 11 foot in width and a speed limit of 30 miles per hour. Many commercial businesses are located along Agency Street east of Roosevelt Avenue/US Highway 61. One commercial store located on Agency Street is Walgreens. Walgreens has two accesses off of Agency Street. The furthest east access lies directly across from an access on the north portion of Agency Street which serves the currently vacant, but soon to be redeveloped K Mart parking lot. These two accesses and Agency Street meet to form an informal un-signalized intersection.

On July 23rd 2014 the Southeast Iowa Regional Planning Commission performed traffic counts along Agency Street at various intersections to provide data for this application. The Agency Street and Walgreens intersection was included in the SEIRPC traffic study. Along Agency Street the AADT eastbound was 7,684 and westbound was 4,156. At the Walgreens and Kmart access the AADT southbound was 157 and northbound was 797.

At this intersection there have been 21 crashes between the years of 2004 and 2012 according to CMAT data provided by the Iowa DOT. Of those accidents 2 had possible/unknown injuries and 19 had property damage only. There has been $65,700 worth of property damage as a result of accidents at this intersection between the years of 2004 and 2012. Out of the 21 accidents that have occurred at this intersection 15 of the accidents have been because of failing to yield the right of way. This failing to yield the right of way has occurred because of different situations such as uncontrolled intersections, stop signs, making left turns, driveways and others. The chart below provides a breakdown of these different scenarios that have caused accidents at this intersection.

FTYROW Accident Numbers at Agency and Walgreens Intersection	
Type	**Number of crashes**
At Uncontrolled Intersection	1
From Stop Sign	4
Making Left Turn	4
From Driveway	2
Other: explained in Narrative	4
Total	15

CMAT 2004 to 2012 crash data from Iowa DOT

A new commercial development is being proposed just to the south of this intersection next to Walgreens. The proposed commercial development will be called the Burlington Crossing Development and is planned to incorporate many different uses including apartments, a hotel, shopping center, convenience store, and restaurants. On the north side of Agency Street there is additional retail and commercial development going in the old Kmart. Jo-Ann Fabrics' and Dick's Sporting Goods have been announced with plans for additional development. These new developments will increase the amount of through traffic and turning traffic at the intersection of Agency Street and Walgreens.

Proposed Concepts

The proposed improvements for the Agency Street and Walgreens intersection include new traffic signals and an extension of existing left turn lanes. Currently there are no traffic signals at the intersection to guide traffic. These signals will provide necessary turn lights for the traffic entering into the intersection. Along with the new traffic signals the City of Burlington will also be extending the eastbound left turn lane. The extension of the left turn lane will require restructuring of the median but will allow more vehicles to stack in that lane. This will provide for better traffic operation at the Agency Street and Walgreens intersection by reducing stacking and deceleration in the existing through lanes.

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

Safety Justification

Based on the CMAT safety data the Agency Street and Walgreens intersection suffers largely from failure to yield the right of way. The above proposed improvements will mitigate this problem. Incorporating new turn signals and turn lanes and eliminating the extra parking access near the intersection will allow for traffic to move efficiently and safely through the intersection. These improvement will likely lead to more comfort for the driver and safer driving behavior by motorist.

Engineers Conceptual Cost Estimate 8/12/2014

Project: 2015/16 Agency TSIP Reconstruction By: RJT

Kmart/Burlington Crossings

Line No	Item	Unit	Unit Price	Quantity	Total
1	Traffic Control	LS	$ 10,000.00	1	$ 10,000.00
2	Class 10 Excavation	CY	$ 12.00	975	$ 11,700.00
3	Removal of Structure, Intake	EA	$ 500.00		$ -
4	Pavement Removals/Disposition	SY	$ 10.00	3100	$ 31,000.00
5	Modified Subbase	TON	$ 30.00	1225	$ 36,750.00
6	Adjust Manhole to Grade, Minor	EA	$ 500.00		$ -
7	Storm Sewer, 15" RCP	LF	$ 65.00		$ -
8	Subdrain, Longitudinal	LF	$ 12.00	1150	$ 13,800.00
9	Subdrain Outlet	EA	$ 150.00	1	$ 150.00
10	Intake, SW-508	EA	$ 4,000.00		$ -
11	Intake, SW-541	EA	$ 5,000.00		$ -
12	Manhole, SW-401, 4' Diameter	EA	$ 5,000.00		$ -
13	9" PCC Pavement	SY	$ 50.00	3580	$ 179,000.00
14	Sidewalk, PCC, 4"	SY	$ 55.00	9	$ 495.00
15	Sidewalk, PCC, 6"	SY	$ 60.00	8	$ 480.00
16	Removal of Sidewalk	SY	$ 30.00	25	$ 750.00
17	Detectable Warnings	SF	$ 50.00	16	$ 800.00
18	Traffic Signalization	LS	$ 290,000.00	1	$ 290,000.00
19	Street Sign, Remove and Replace	EA	$ 150.00	2	$ 300.00
20	Painted Pavement Markings	STA	$ 90.00	45	$ 4,050.00
21	Painted Pavement Symbols	EA	$ 200.00	20	$ 4,000.00
22	Earth Shoulder Finish	STA	$ 350.00	22	$ 7,700.00
23	Survey Construction	LS	$ 3,750.00	1	$ 3,750.00
24	Mobilization	LS	6%	1	$ 35,683.50
				Total	$ 630,408.50

Time Schedule for Project Development

Grant Award ..... December 2014

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

Submit Plans ..... March/April 2015

Bid Letting, Award, and Contract ..... June 2015

Begin Construction .....July/August 2015

Complete Construction ..... September/October 2015

Project Closeout..... December 2015

TSIP Site Location Map: Agency St. & Walgreens Site Specific

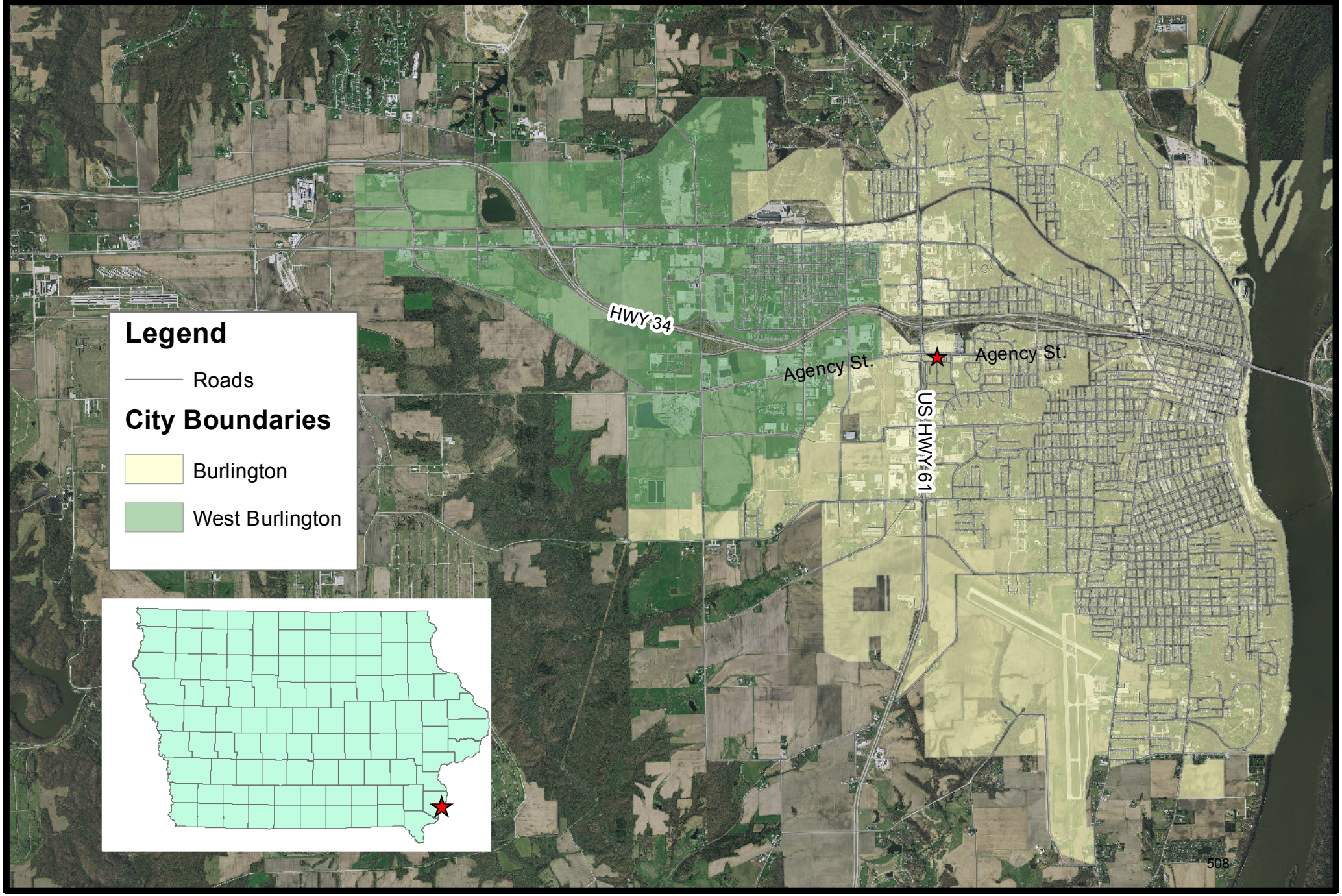
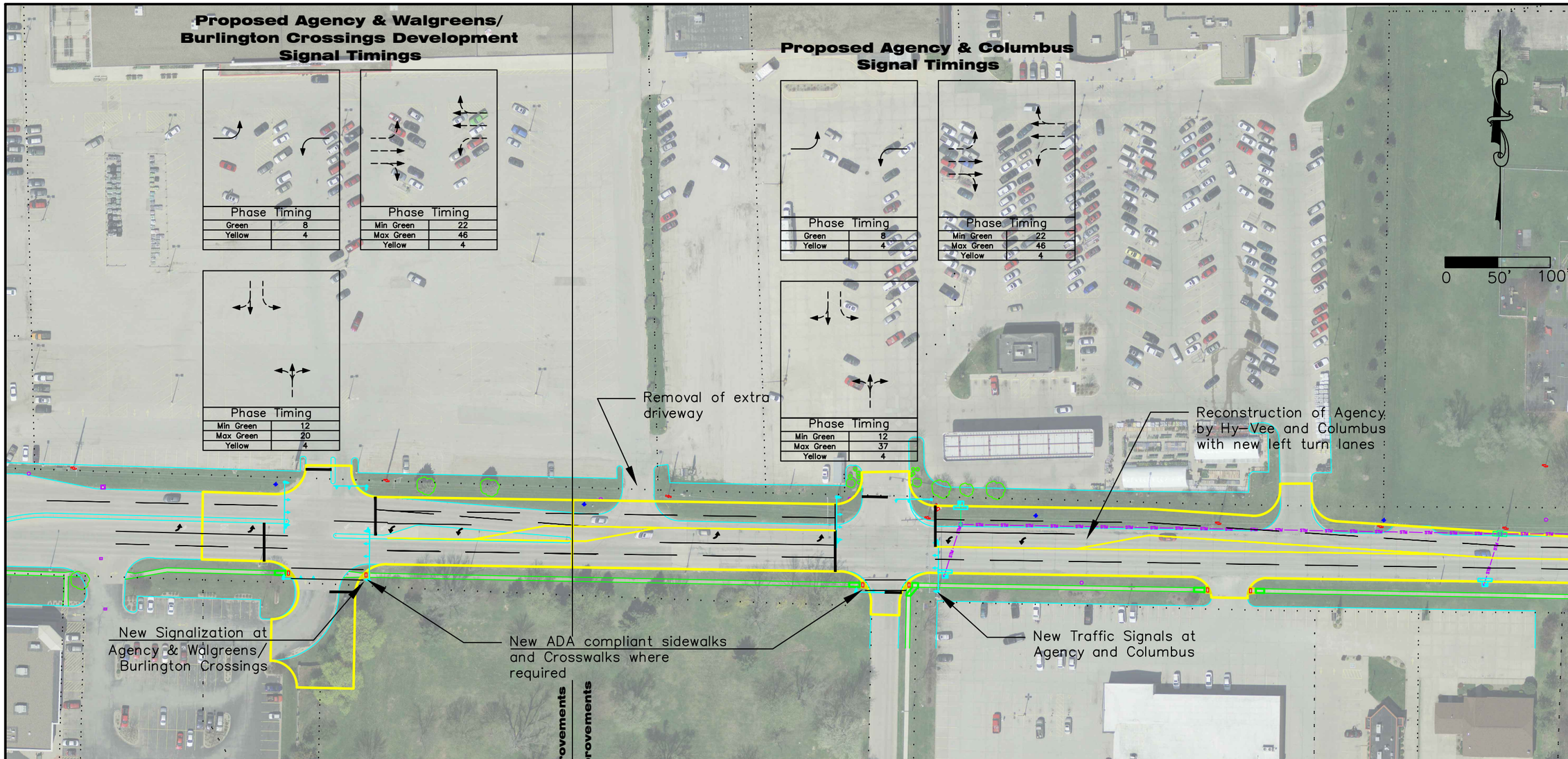


Figure 1 - Agency and Walgreens Intersection Looking SW

Figure 2 - Agency and Walgreens Intersection Looking SE

Figure 3 - Agency and Walgreens Intersection Looking NE

Figure 4 - Agency and Walgreens Intersection Looking NW



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

Reconstruction of Agency with turn lanes at Intersections with Columbus and Walgreens.

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

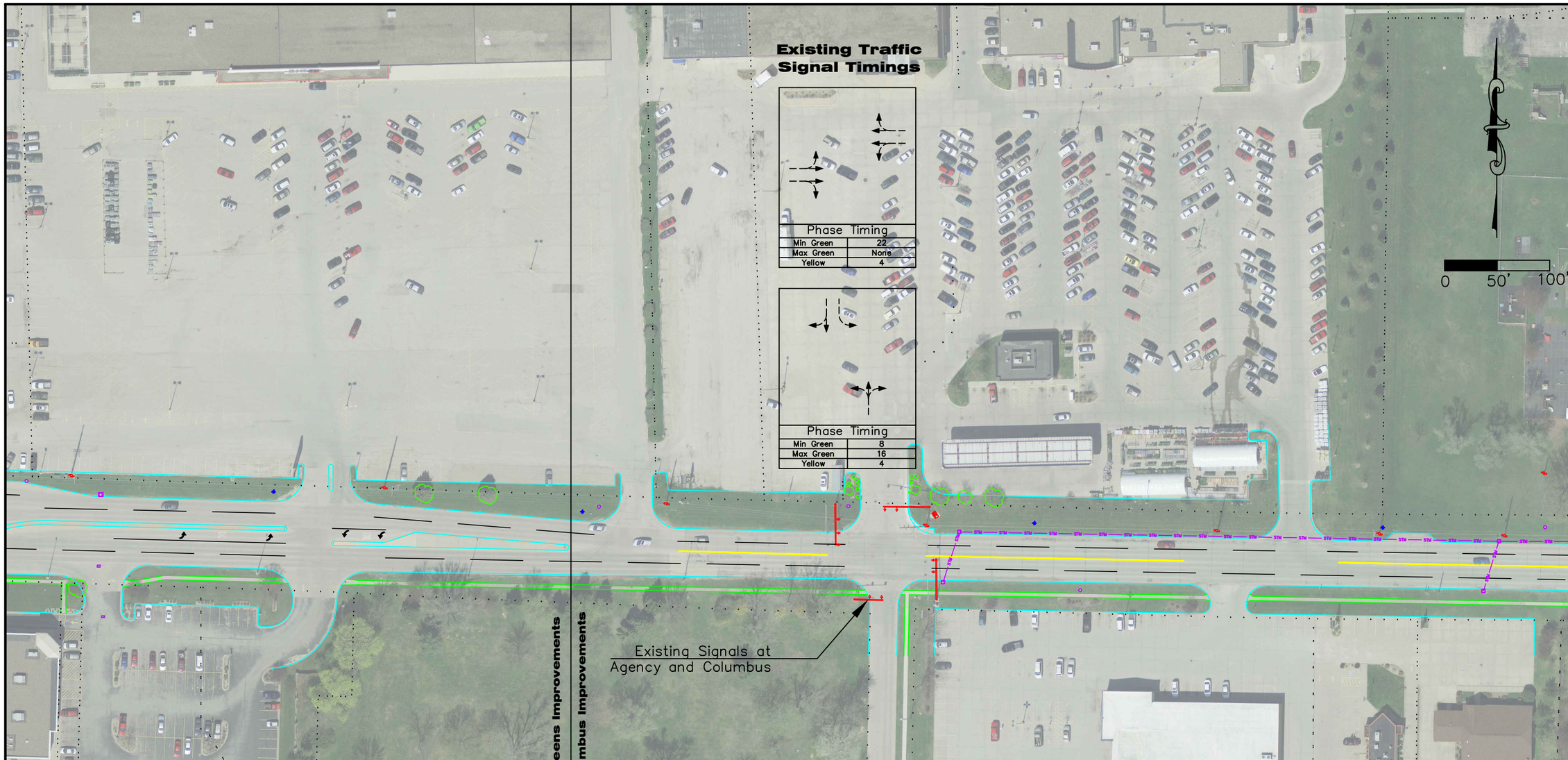
DESIGNED:

DRAWN: RT

Agency Site Specific TSIP Intersection Improvements ProposedConditions

SHEET: TBD

OF: TBD



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REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

DESIGNED:

DRAWN: RT

Agency Site Specific TSIP
Intersection Improvements
Existing Conditions

SHEET: TBD

OF: TBD

Aerial of Agency St. and Walgreens Entrance Intersection

0 0.02 0.04 Miles

N

Iowa Department of Transportation

Abbreviated Crash Report

Agency & Kmart Entrance

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
01/22/2004	2004202812	04-2832	Burlington	PDO	NB/EB AGENCY ST MEASURING 624 FEET WEST FROM COLUMBUS DR AND AGENCY
02/04/2004	2004205208	04-04553	Burlington	PDO	NB/EB AGENCY ST MEASURING 492 FEET EAST FROM US 0061 / US HWY 61 AND
04/17/2005	2005217153	05-12868	Burlington	PDO	NB/EB AGENCY ST measuring 711 Feet West from AGENCY ST and COLUMBUS
07/28/2005	2005233798	05-25900	Burlington	PDO	SB/WB AGENCY ST MEASURING 322 FEET WEST FROM AGENCY ST
12/14/2006	2006258907	06-44549	Burlington	PDO	SB/WB AGENCY ST
01/12/2007	2007201010	07-01229	Burlington	PDO	SB/WB AGENCY ST
01/17/2007	2007202423	07-1722	Burlington	PDO	SB/WB AGENCY ST MEASURING 554 FEET WEST FROM COLUMBUS DR AND AGENCY
04/18/2007	2007366961	07-12519	Burlington	PDO	NB/EB AGENCY ST measuring 613 Feet West from COLUMBUS DR and AGENCY
11/21/2007	2007404323	07-41959	Burlington	PDO	NB/EB AGENCY ST
12/23/2007	2007411502	07-45346	Burlington	PDO	SB/WB AGENCY ST
06/03/2008	2008443977	08-19379	Burlington	Poss/Unk	SB/WB AGENCY ST
11/11/2008	2008470211	08-41209	Burlington	PDO	AGENCY ST measuring 590 Feet Southeast from US 0061 / US HWY 61 and 0
01/07/2009	2009483549	09-00789	Burlington	PDO	AGENCY ST measuring 300 Feet East from AGENCY ST and US 0061 / US 61
03/23/2009	2009498937	09-9991	Burlington	PDO	SB/WB AGENCY ST measuring 462 Feet East from AGENCY ST and US 0061 /
10/12/2009	2009529677	09-37636	Burlington	PDO	SB/WB AGENCY ST
12/23/2010	2010608117	10-46671	Burlington	Poss/Unk	SB/WB AGENCY ST measuring 464 Feet West from AGENCY ST and COLUMBUS
04/30/2011	2011628044	11-015933	Burlington	PDO	NB/EB AGENCY ST measuring 428 Feet West from AGENCY ST and COLUMBUS
12/19/2011	2011663291	11-46970	Burlington	PDO	SB/WB AGENCY ST
04/19/2012	2012682059	12-12821	Burlington	PDO	NB/EB AGENCY ST
07/09/2012	2012693446	12-23377	Burlington	PDO	SB/WB AGENCY ST measuring 397 Feet West from AGENCY ST and COLUMBUS
12/25/2012	2012718239	12-44131	Burlington	PDO	3245 AGENCY ST

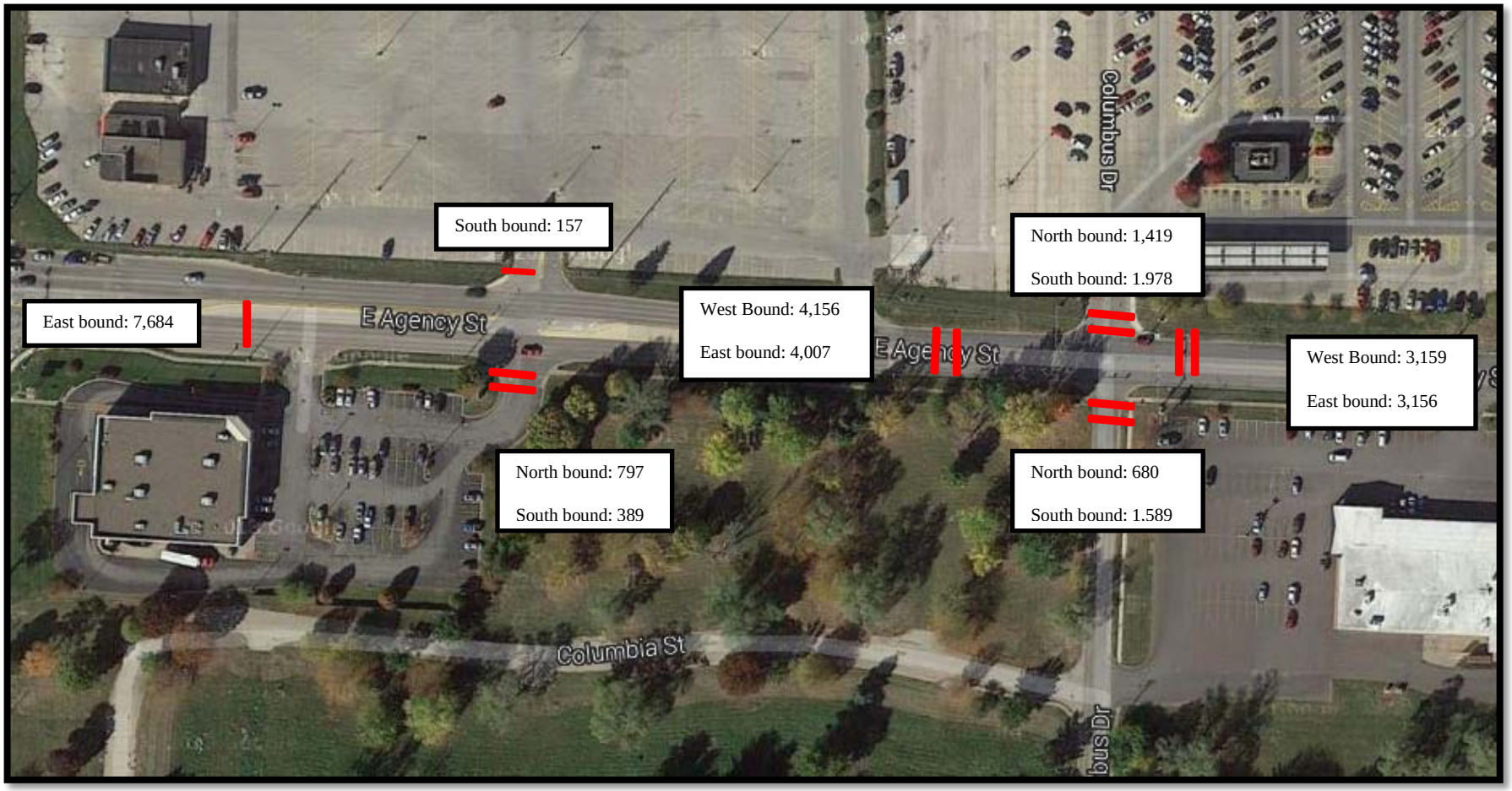
Selection Filter:

None

Analyst: R. Thornburg

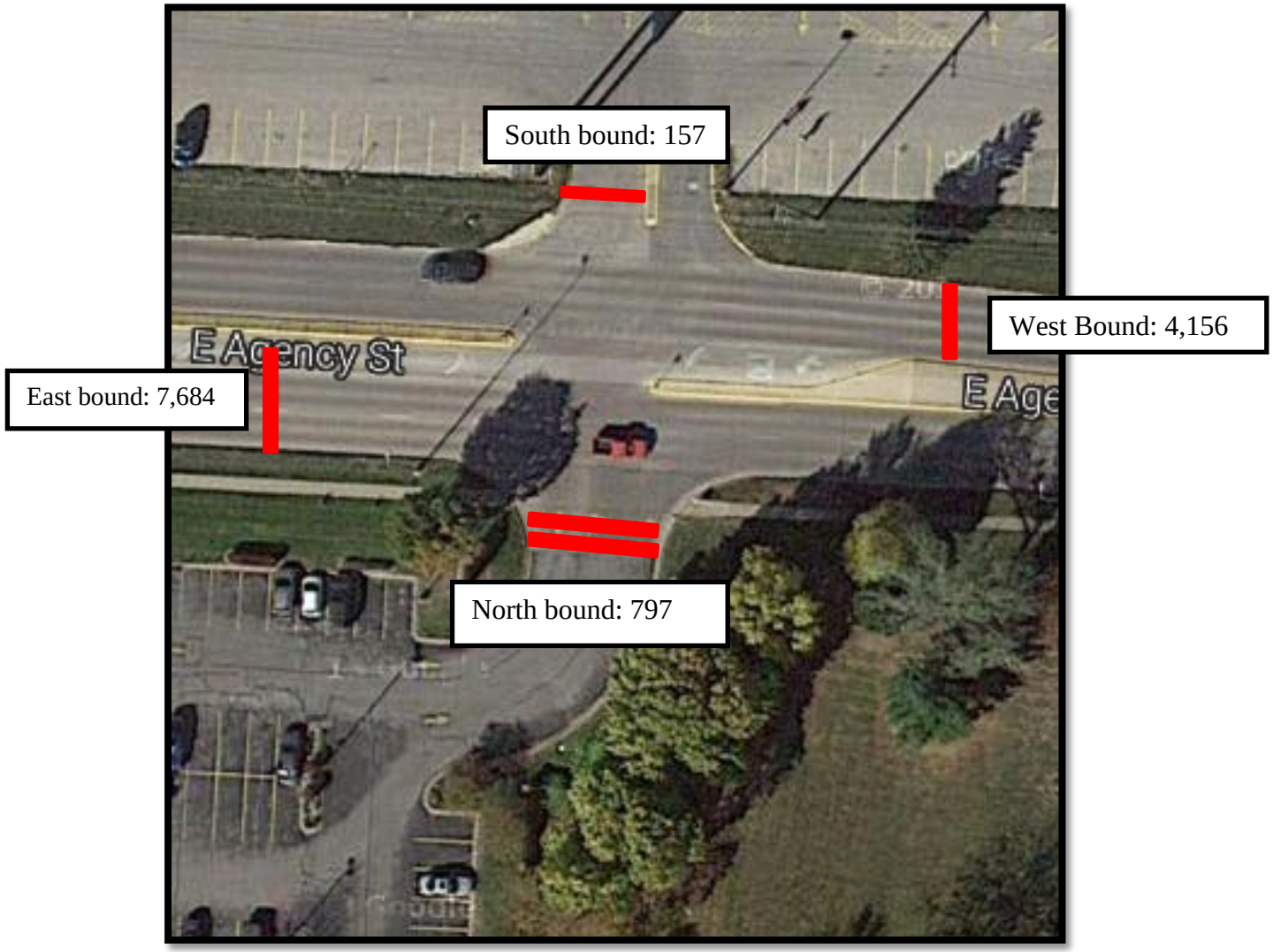
Notes:

Intersection Map and Traffic Counting Totals



*Traffic Count Conducted by the Southeast Iowa Regional Planning Commission on 7/23/14.

Walgreen' Intersection



*Traffic Count Conducted by the Southeast Iowa Regional Planning Commission on 7/23/14.

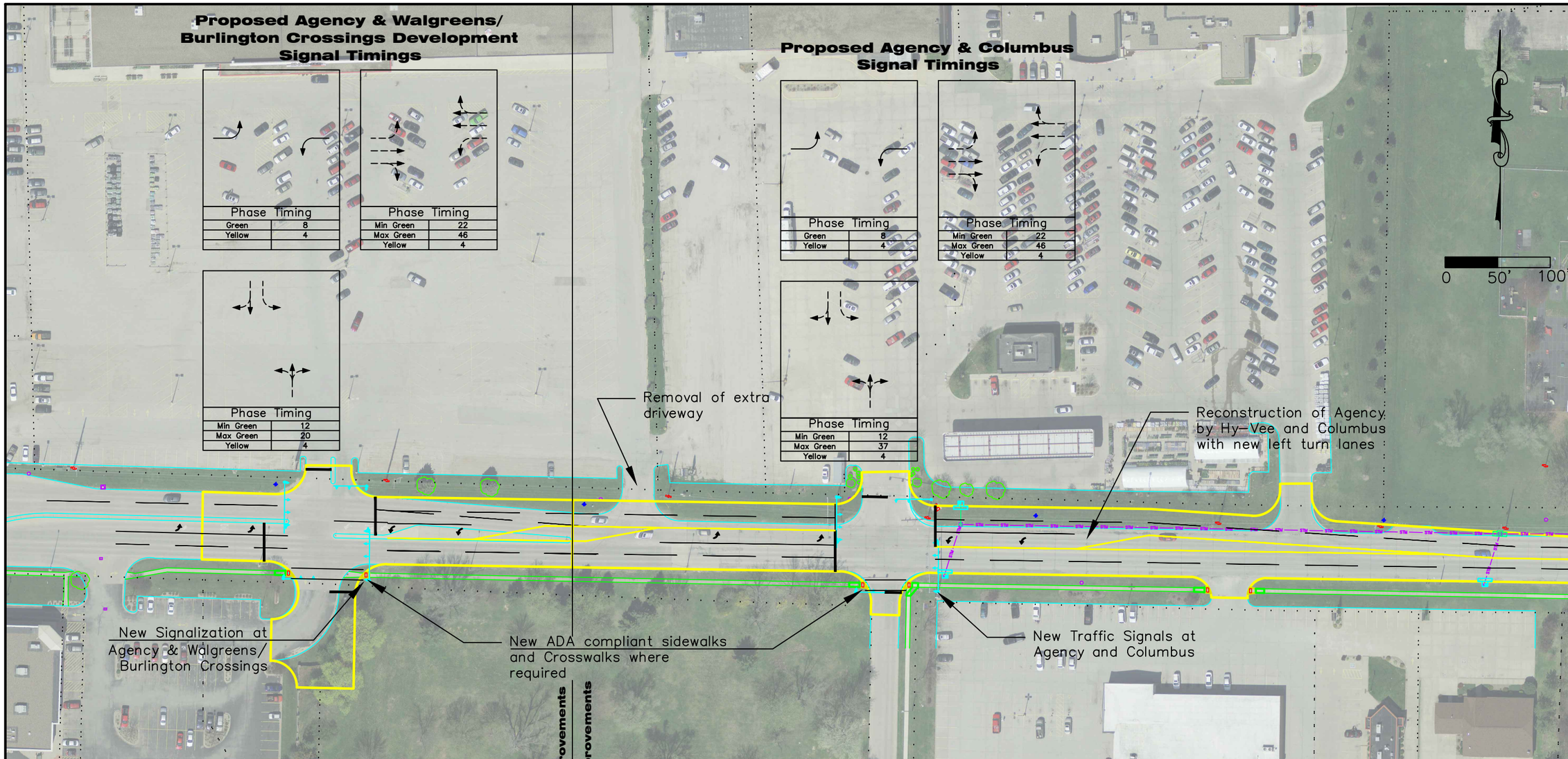
Hourly Break Down of Agency St. & Walgreens

Westbound	
1PM	315
2PM	331
3PM	345
4PM	349
5PM	347
6PM	303
7PM	214
8PM	166
9PM	123
10PM	71
11PM	26
12PM	16
1AM	18
2AM	16
3AM	14
4AM	29
5AM	93
6AM	149
7AM	181
8AM	214
9AM	264
10AM	281
11AM	291
Totals	4156

Northbound	
1PM	61
2PM	78
3PM	94
4PM	103
5PM	76
6PM	60
7PM	42
8PM	38
9PM	21
10PM	6
11PM	3
12PM	4
1AM	3
2AM	1
3AM	2
4AM	3
5AM	7
6AM	13
7AM	30
8AM	42
9AM	63
10AM	47
11AM	0
Totals	797

Southbound	
1PM	10
2PM	16
3PM	6
4PM	11
5PM	20
6PM	14
7PM	8
8PM	6
9PM	3
10PM	0
11PM	0
12PM	1
1AM	0
2AM	0
3AM	0
4AM	0
5AM	1
6AM	6
7AM	10
8AM	9
9AM	11
10AM	8
11AM	17
Totals	157

Eastbound	
12PM	10
1PM	16
2PM	6
3PM	11
4PM	20
5PM	14
6PM	8
7PM	6
8PM	3
9PM	0
10PM	0
11PM	1
12PM	0
1AM	0
2AM	0
3AM	0
4AM	1
5AM	6
6AM	10
7AM	9
8AM	11
9AM	8
10AM	17
Totals	157



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

Reconstruction of Agency with turn lanes at Intersections with Columbus and Walgreens.

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

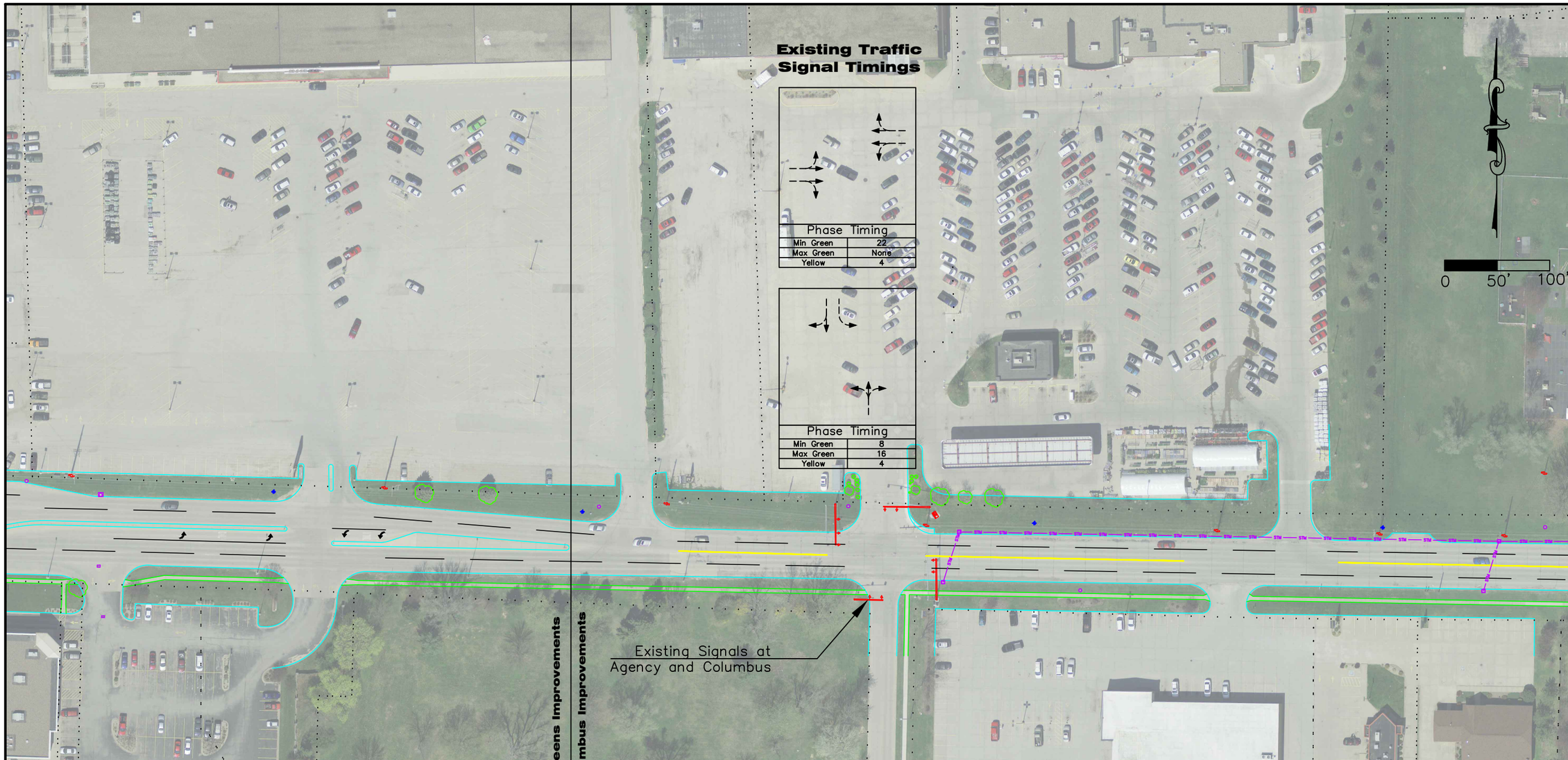
DESIGNED:

DRAWN: RT

Agency Site Specific TSIP Intersection Improvements ProposedConditions

SHEET: TBD

OF: TBD



Intersection Of Agency & Walgreens/Burlington Crossings Development

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DESIGNED:

DRAWN: RT

Agency Site Specific TSIP
Intersection Improvements
Existing Conditions

SHEET: TBD

OF: TBD

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Des Moines Prepared by: Zach James Date Prepared: Aug 13, 2014

Intersection: Agency Road and Kmart/Walgreens Entrances

Improvement

Proposed Improvement(s): New signal with left turn arrow, extend left turn lanes, close access

$ 75,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	47	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 75,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: SEIRPC 7/23/2014 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

157

7,684 → ← 4,007

797

4,615,425	Current Annual Entering Veh., **AEV** = DEV * 365
15,429	veh / day, Final Year DEV, **FDEV**
101.63	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
12,645	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004 First full year --> 2012 Last full year 9.0 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	$	-
2	Injury Crashes →	0	Minor Injuries @	$48,000	$	-
		3	Possible Injuries @	$25,000	$	75,000
19	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	65,700
21	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	140,700

2.33	Current Crashes / Year, **AA** = TA / T	0.51	Crashes / MEV, Crash Rate, **CR**
$ 6,700	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
51.4	Total Expected Crashes, **TECR** = CR x TMEV	$ 107,953	Present Value of Avoided Crashes, **BENEFIT**
1.09	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 7,309	Crash Costs Avoided in First Year, AAR x AVC		
24.0	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 = $107,953 : $75,000 = **1.44** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Intersection of Dubuque Road and Osage Avenue

Applicant: City of Waterloo

Contact Person: Mohammad Elahi Title: Traffic Engineer

Complete Mailing Address: 625 Glenwood Street, Public Works Building
Waterlooo, 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 $ $288,000

Safety Funds Requested $ $288,000

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 Waterloo

Signed: Ernest G. Clark — August 18, 2014

Signature — Date Signed

Ernest G. Clark

Typed Name

Attest: Suzy Schares — August 18, 2014

Signature — Date Signed

Suzy Schares

Typed Name

INTERSECTION OF DUBUQUE ROAD AND OSAGE AVENUE

B. NARRATIVE

The intersection experiencing right angle crashes. Some of the crashes have been injury crashes. It experiences a high number of crashes which include injury accidents. Dubuque Road is a divided multi-lane high speed highway with 2 lanes on each approach and a wide median. Osage Avenue intersect Dubuque at an acute angle and is stop sign controlled. Almost all of the injury crashes have involved stop sign violation. Dubuque Road runs SW-NE. Osage Avenue runs E-W with 2-lanes. Osage is stop controlled with yield signs on the median! Dubuque is uncontrolled. Dubuque approaches Osage from east on a curve and there is a slight degree of curvature at the intersection as well. Waterloo Police Department records show 28 traffic accidents in 3 years. Number or reports filed was 16. Of those crashes 5 were running the stop sign right angle crashes. 5 out of these 6 were injury crashes. Many of the stop sign violators indicated that they just didn't notice the traffic on Dubuque Road. The intersection layout makes the situation hazardous. Traffic signals are proposed along with some measures to reduce the probability of rea-rend collisions and red-light running after the signals are installed. Several other solutions, including J-turns, involving some geometric design revisions were investigated but due to the angle between the roadways and the railroad tracks signals are proposed as a plausible solution.

Proposed Solution

Traffic signals are proposed to reduce the injury right angle crashes. Properly installed traffic signals will assign right of way in a clear manner and will reduce the right angle collisions. Railroad tracks with gated crossing exist north of the intersection. Track clearance timing in needed that will require coordination with the railroad company.

Crash Reduction Factor

Only the right angle crashes were used in benefit-cost analysis. Traffic signals can increase rear-end collisions. The added benefits of proposed stop bars and pavement markings, and proposed advance end of green warning system were NOT included in the benefits to offset increases that might be causes by signal installation.

C. ITEMIZED BREAKDOWN OF ALL ESTIMATED COSTS:

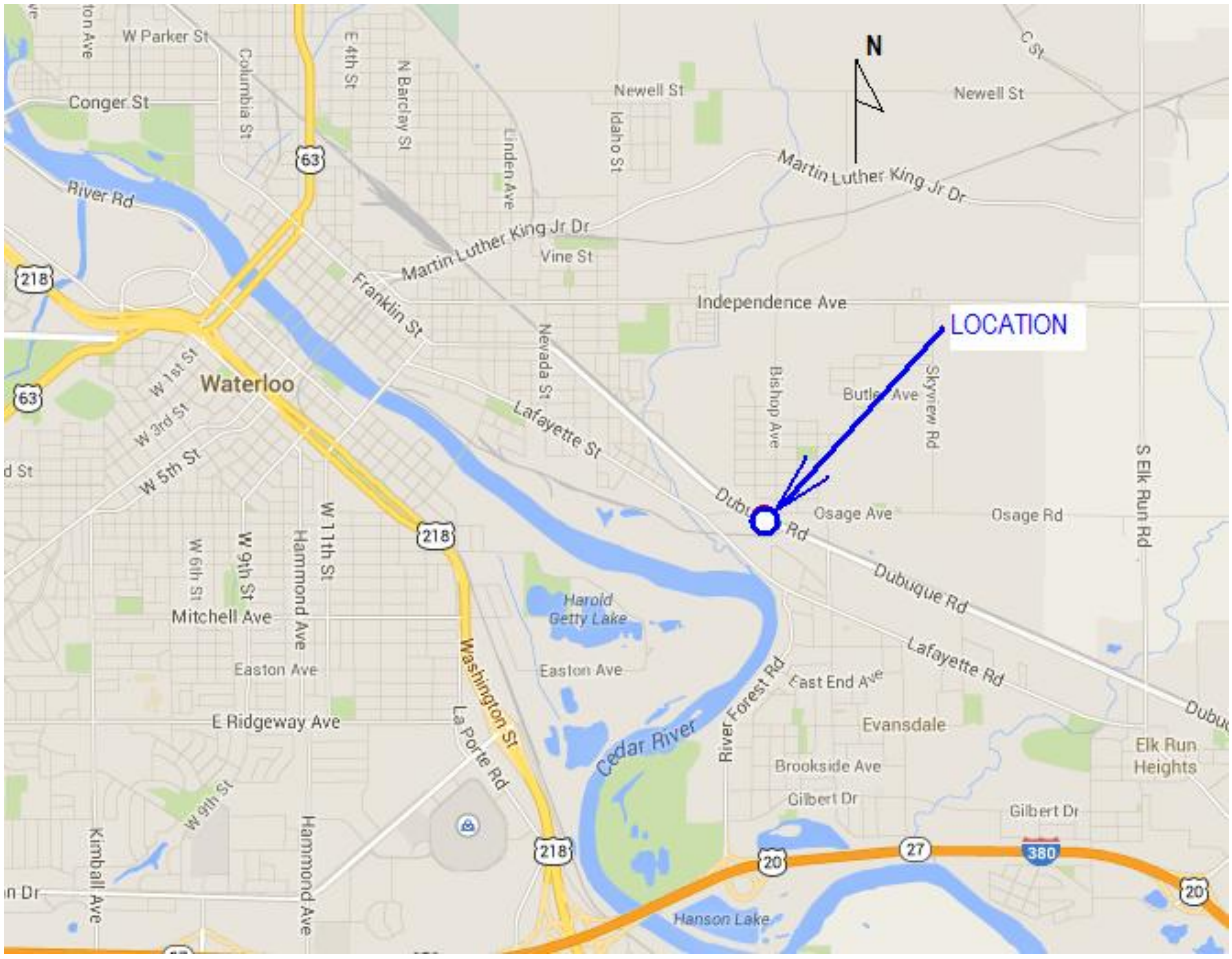
No.	Item	Quantity	Unit	Unit Cost	Item Cost
1	Mast Arm Poles	5	EA	10,000	50,000
2	pedestal poles	2	EA	1,800	3,600
3	Signal Heads	7	EA	800	5,600
4	Signal Heads PV	12	EA	1,600	19,200
5	Control Cabinet	1	EA	14,000	14,000
6	Advance End of Green Warning Ssyetm	2	EA	20,000	40,000
7	VID 4-Camera	1	EA	24,000	24,000
8	LED Luminaires	4	EA	450	1,800
9	Street Name Signs	4	ea	400	1,600
10	Detector Loop	8	EA	700	5,600
11	Handhole	10	EA	350	3,500
12	Wiring (Includes Trench Conduit)	1	LS	15,000	15,000
13	Conduit (Bore)	150	FT	20	3,000
14	Wireless Connection To TOC	1	EA	12,000	12,000
15	Pavement Markings	1	LS	8,000	8,000
16	High Durability Intersection Stop Bars	6	EA	3,000	18,000
17	video Monitoring Cameras	2	EA	2,000	4,000
18	Earthwork At Pole Locations	1	LS	10,000	10,000
19	Railroad Preemption System	1	LS	15,000	15,000
20	Railroad Interconnect (Cost to Railroad)	1	LS	7,000	7,000
21	Traffic Control	1	LS	4,000	4,000
22	Mobilization	1	LS	2,000	2,000
23	Contingency				20,500
	TOTAL:				$ 287,400

D. TIME SCHEDULE

D

	2015											2016							
	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
START	♦																		
DOT Agreement Exchange	▬	▬	▬																
Plans & Contract Documents					▬	▬	▬	▬											
Letting								▬	▬	▬									
Construction											▬	▬	▬	▬	▬	▬	▬	▬	▬
END																			♦

E. LOCATION MAP



F

F. COLOR PICTURES

East Leg of Osage Avenue

West Leg Osage (Left) and West Leg Dubuque (Right): Most Injury Crashes Involve Osage Avenue Stop Sign Violation.

Eastbound-Southbound Dubuque Approach to the Intersection

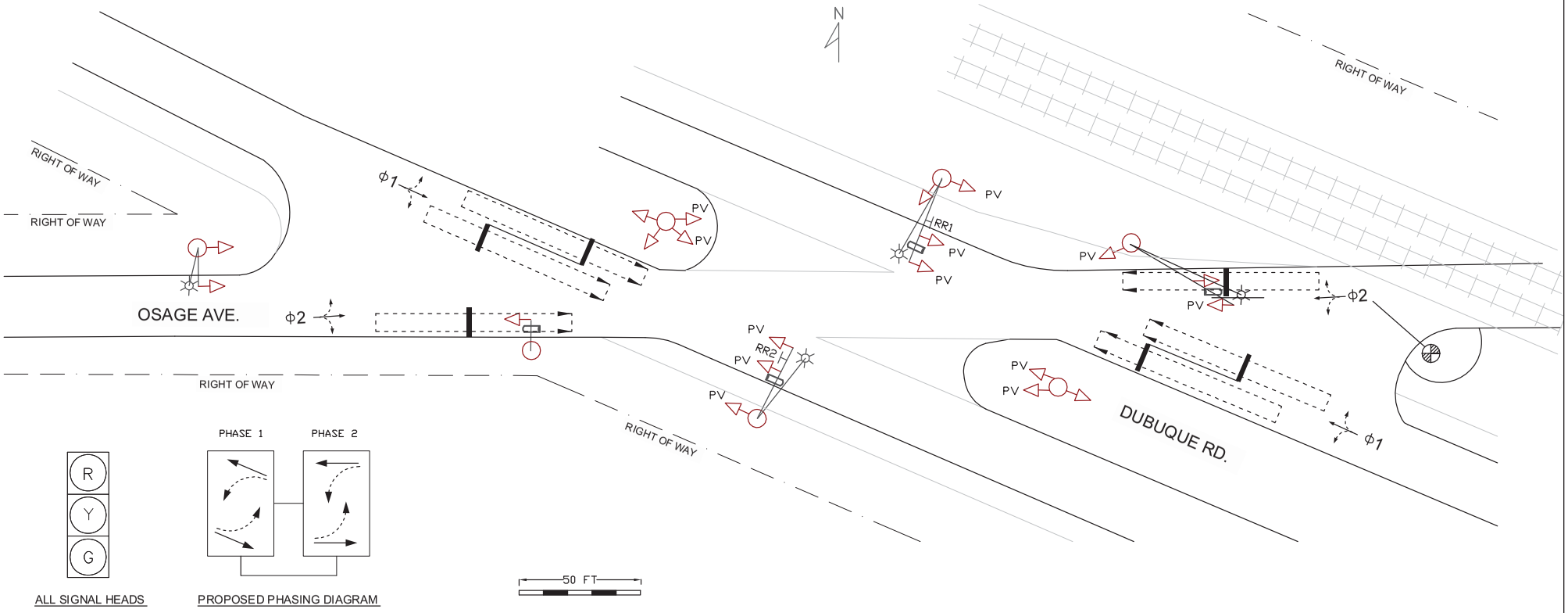
East Leg of Osage (Left) and East Leg of Dubuque (Right)

G

Intersection of Dubuque Rd. and Osage Ave.
Proposed Signalization

NOTE:
1- RR1 is a no right turn railroad preemption activated blank-out sign.
2- RR2 is a no left turn railroad preemption activated blank-out sign.
3- Advance detection on Dubuque Road will be by detector loops.
4- There will be advance end of green warning systems on Dubuque Road approaches.
5- Street name signs will be overhead mounted.
6- Railroad preemption will be installed.

LEGEND
- PROPOSED SIGNAL HEAD
- PV — PROPOSED PROGRAMMABLE VISIBILITY SIGNAL HEAD
- PROPOSED MAST-ARM POLE
- PROPOSED PEDESTAL POLE
- PROPOSED SIGN
- PROPOSED LUMINAIRE EXTENSION
- PROPOSED VIDEO DETECTION CAMERA
- VIDEO DETECTION ZONE & DIRECTION
- RAILROAD GATE



ALL SIGNAL HEADS

PROPOSED PHASING DIAGRAM

Waterloo, Iowa

H

H. AERIAL PHOTOGRAPH

J. TRAFFIC VOLUMES AND/OR TURNING MOVEMENT

Source: 2009 Iowa DOT Counts;
http://www.iowadotmaps.com/msp/traffic/2009/cities/WaterlooC.pdf

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Black Hawk | Prepared by: M.E. | Date Prepared: Aug 14-2014

Intersection: Dubuque Road and Osage Road

Improvement

Proposed Improvement(s): Install Traffic Signals with Railroad Preemption and add a Left Turn Pocket on Eastbound Osage Road.

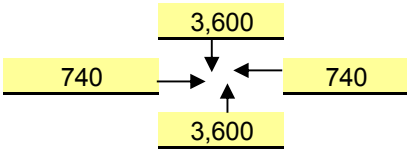
$ 287,400	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	67	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	0.8%	Discount Rate (time value of $), **INT**
		$ 287,400	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2009 Counts | 2009 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,168,200	Current Annual Entering Veh., **AEV** = DEV * 365
10,077	veh / day, Final Year DEV, **FDEV**
51.00	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
8,680	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2012	First full year -->	2013	Last full year	3.0 years, Time Period, **T**		
12	Additional months			values as of Dec. 2007		
0	Fatal Crashes		Fatalities @	$3,500,000	$	-
			Major Injuries @	$240,000	$	-
4	Injury Crashes	3	Minor Injuries @	$48,000	$	144,000
		1	Possible Injuries @	$25,000	$	25,000
1	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	43,000
5	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	212,000

1.67	Current Crashes / Year, **AA** = TA / T	0.53	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 42,400	Cost per Crash, **AVC** = LOSS / TA		
26.8	Total Expected Crashes, **TECR** = CR x TMEV	$ 713,864	Present Value of Avoided Crashes, **BENEFIT**
1.12	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 47,347	Crash Costs Avoided in First Year, AAR x AVC		
18.0	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 = $713,864 : $287,400 = **2.48** : 1

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

January 24, 2013

M-13-04

MEMORANDUM FOR THE HEADS OF DEPARTMENTS AND AGENCIES

FROM: Jeffrey D. Zients
Deputy Director for Management

SUBJECT: 2013 Discount Rates for OMB Circular No. A-94

On October 29, 1992, OMB issued a revision to OMB Circular No. A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." The revision established new discount rate guidelines for use in benefit-cost and other types of economic analysis.

The revised Circular specifies certain discount rates that will be updated annually when the interest rate and inflation assumptions in the budget are changed. These discount rates are found in Appendix C of the revised Circular. The attachment to this memorandum is an update of Appendix C. It provides discount rates that will be in effect for the calendar year 2013.

The rates presented in Appendix C do not apply to regulatory analysis or benefit-cost analysis of public investment. They are to be used for lease-purchase and cost-effectiveness analysis, as specified in the Circular.

Attachment

APPENDIX C
(Revised December 2012)

DISCOUNT RATES FOR COST-EFFECTIVENESS, LEASE PURCHASE, AND RELATED ANALYSES

Effective Dates. This appendix is updated annually. This version of the appendix is valid for calendar year 2013. A copy of the updated appendix can be obtained in electronic form through the OMB home page at http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/. The text of the Circular is found at http://www.whitehouse.gov/omb/circulars_a094/, and a table of past years' rates is located at http://www.whitehouse.gov/sites/default/files/omb/assets/a94/dischist.pdf. Updates of the appendix are also available upon request from OMB's Office of Economic Policy (202-395-3381).

Nominal Discount Rates. A forecast of nominal or market interest rates for calendar year 2013 based on the economic assumptions for the 2014 Budget is presented below. These nominal rates are to be used for discounting nominal flows, which are often encountered in lease-purchase analysis.

Nominal Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
0.5	1.1	1.5	2.0	2.7	3.0

Real Discount Rates. A forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the 2014 Budget is presented below. These real rates are to be used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis.

Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
-1.4	-0.8	-0.4	0.1	0.8	1.1

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Black Hawk Prepared by: M.E. Date Prepared: Aug 14-2014

Intersection: Dubuque Road and Osage Road

Improvement

Proposed Improvement(s): Install Traffic Signals with Railroad Preemption and add a Left Turn Pocket on Eastbound Osage Road.

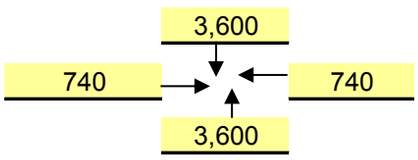
$ 300,000	Estimated Improvement Cost, **EC**	15	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	67	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 300,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Iowa DOT 2009 Counts 2009 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,168,200	Current Annual Entering Veh., **AEV** = DEV * 365
10,077	veh / day, Final Year DEV, **FDEV**
51.00	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
8,680	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2012	First full year -->	2013	Last full year	3.0	years, Time Period, **T**	
12	Additional months			values as of Dec. 2007		
0	Fatal Crashes		Fatalities @	$3,500,000	$	-
			Major Injuries @	$240,000	$	-
4	Injury Crashes	3	Minor Injuries @	$48,000	$	144,000
		1	Possible Injuries @	$25,000	$	25,000
1	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	43,000
5	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	212,000

1.67	Current Crashes / Year, **AA** = TA / T	0.53	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 42,400	Cost per Crash, **AVC** = LOSS / TA		
26.8	Total Expected Crashes, **TECR** = CR x TMEV	$ 560,829	Present Value of Avoided Crashes, **BENEFIT**
1.12	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 47,347	Crash Costs Avoided in First Year, AAR x AVC		
18.0	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 = $560,829 : $300,000 = **1.87** : 1

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 326

Install a traffic signal

Description:

Prior Condition: *No Prior Condition(s)*

Category: Intersection traffic control

Study: *Accident Modification Factors for Traffic Engineering and ITS Improvements*, Harkey et al., 2008

Star Quality Rating:	★★★★★

Crash Modification Factor (CMF)	
Value:	0.23
Adjusted Standard Error:	0.02
Unadjusted Standard Error:	0.02

Crash Reduction Factor (CRF)	
Value:	77 *(This value indicates a decrease in crashes)*
Adjusted Standard Error:	2
Unadjusted Standard Error:	2

Applicability	
Crash Type:	Angle
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	

Area Type:	Rural
Traffic Volume:	
Time of Day:	
	If countermeasure is intersection-based
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	3261 to 29926 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	101 to 10300 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	Yes. HSM lists this CMF in bold font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
Date Added to Clearinghouse:	11-01-2009
Comments:	Countermeasure name changed to match HSM

[View the Full Study Details]

Export PDF

Export this detail page as a PDF file

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

The information contained in the Crash Modification Factors (CMF) Clearinghouse is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in the CMF Clearinghouse. The information contained in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Mormon Trek Boulevard 3-Lane Conversion

Applicant: City of Iowa City

Contact Person: Ron Knoche Title: City Engineer

Complete Mailing Address: 410 E. Washington Street
Iowa City, IA 52240

Phone: (319) 356-5138 (Area Code) E-Mail: Ron-knoche@iowa-city.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 $ 748,431

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 Iowa City

Signed: _____ 8/15/14
Signature — Date Signed

Ron Knoche
Typed Name

Attest: Marian K. Karr 8/15/14
Signature — Date Signed

Marian Karr
Typed Name

B. NARRATIVE

Existing Conditions

The existing Mormon Trek Boulevard is a four-lane arterial roadway located in Iowa City's Southwest Planning District and serves as a link to Coralville and University Heights. The subject of this application is Mormon Trek Boulevard between Highway 1 West and Melrose Avenue. The corridor includes vertical and horizontal curves that hinder visibility, especially for entering and exiting turning movements.

The corridor has a posted speed limit of 35mph with 85th percentile speeds ranging from 39 to 41mph. Along this corridor all of the intersecting east/west streets are stop-controlled except where intersections are signalized at Rohret Road, Benton Street, Cameron Way, and Westside Drive.

The area surrounding the project includes commercial, residential, park and open space, as well as two public schools. The commercial businesses on Mormon Trek Boulevard are surrounded residential development and concentrated near Highway 1 West and Cameron Way. Walden Square Shopping Center, located at Mormon Trek and Cameron Way/Walden Square, is the largest commercial development within the area. The shopping center includes a Fareway grocery store, retail shops, restaurants, and a University of Iowa Community Credit Union. Many of Walden Square's customers walk or bike due to its proximity to the Willow Creek Trail.

Regional/Statewide Impact

This project is expected to save Iowans over $2 million in property damage and injuries over ten years(!). Rather than waste these resources, the diverted funds will instead be available to invest in our regional and state economy.

Mormon Trek Boulevard is an arterial road that runs from southern Iowa City north to Coralville and Interstate 80. This route is important from a state and regional perspective because it links the two metropolitan areas as well as its connections to Interstate 80 and Iowa Highway 1.

Project Goals

In addition to improved traffic circulation and accessibility, the following goals can be achieved through the completion of this project:

1. Reducing injuries and rear end, same direction sideswipe, and oncoming left turn collisions.

2. Create a bicycle- and pedestrian-friendly roadway to consistent with Iowa City's *Comprehensive Plan* and Complete Streets Policy.
3. Create an efficient and safe connection between Iowa City and Coralville, as well as Iowa Highway 1 and Interstate 80.
4. Improve our regional and state economy by diverting $2 million in property damage and injuries to enhance economic development.

Project Concept

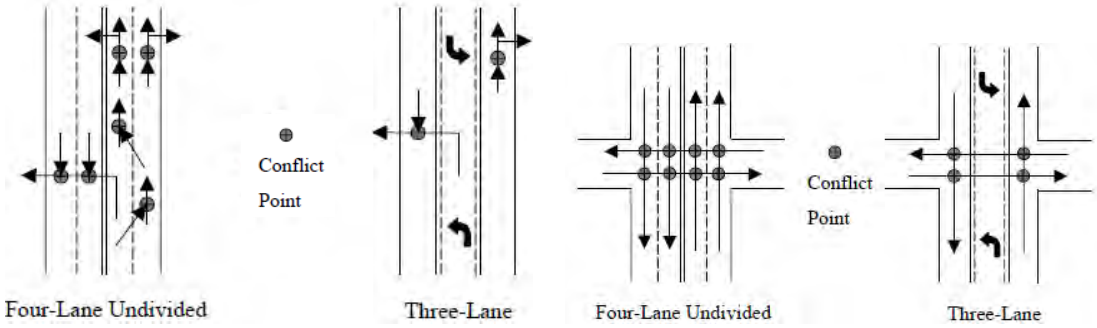
The subject of this application is Mormon Trek Boulevard between Highway 1 West and Melrose Avenue. Four lane roads, like Mormon Trek Boulevard, are especially prone to collisions. Without left turn lanes, cars are required to slow or stop in a through lane in order to make a left hand turn.

The proposed project regarding Mormon Trek Boulevard involves reducing the existing four lane roadway to a three lane roadway. The new three lane will include two through lanes (north and south bound) and a shared center left turn lane. In addition to this reduction, a right turn lane will also be added on Mormon Trek at the Mormon Trek Boulevard and Benton Street intersection. Both of these changes will reduce rear end, same direction sideswipe, and left turn angle collisions, while improving the flow of traffic.

Safety

The expected increase in safety that results from a four-lane undivided to three-lane cross section conversion stems from the decrease in the number of conflict points between vehicles, improved sight distance for the major-street left-turn vehicles, and reduced speeding along the roadway. A three-lane cross section removes left-turn vehicles from the through lane. The addition of a TWLTL, therefore, reduces the conflicts between these stopped vehicles and through traffic, and also any related lane changing conflicts that may result.

Reduced points of conflict for mid-blocks (left) and minor street intersections (right).



Suitability of corridor for three-lane conversion

In the past decade a growing body of research and situational evidence has found that converting four-lane undivided roadways to three lanes – one in each direction and a two-way left turn lane (TWLTL) – can improve safety and maintain an acceptable level of service.

The criteria to evaluate the suitability of road diet candidates are:

- Traffic volume – The Iowa Department of Transportation and Institute for Transportation at Iowa State University consider four-lane to three-lane cross section conversions as 'feasible' (with respect to volume only) when a roadway has (or is expected to have) ≤15,000 vehicles per day (vpd) or a peak-hour volume less than 1,500 vehicles. *With between 10,000-14,000 vpd, the Mormon Trek Boulevard corridor is suitable for a 3-lane conversion with respect to volume.*

- Pavement Width – The conversion from four to three lanes also allows the use of wider lanes or designated bike lanes to better accommodate bicyclists. *The current pavement width, back-of-curb to back-of-curb is 45-49 feet, which provides ample room for three travel lanes, curb and gutter, and possibly bike lanes (pending design consideration).*

- Frequent stopping and/or slow-moving vehicles – The frequency of stopping and/or slow-moving traffic (e.g., school bus drop-off/pick-up, mail delivery vehicles, etc.) that occurs along a roadway being considered for a 3-lane conversion should also be considered. With one thru lane per direction, the number of buses and delivery vehicles can cause delay. City buses account for nearly all stopping and slow-moving vehicles within the corridor. This segment of Mormon Trek Boulevard contains three southbound and six northbound bus stops. *Generally, there is one bus every ten minutes on Mormon Trek– infrequent enough to be insignificant.*

- Speed and Queues – The Iowa DOT and Iowa State Institute for Transportation Research found that average vehicle speed and speed variability (i.e., the number of speeding vehicles) usually decrease when an urban four-lane undivided roadway is converted to a three-lane cross section. Anecdotal observations revealed that the inability to change lanes or pass along a three-lane roadway results in more consistent and predictable vehicle speeds than a four-lane undivided roadway. Overall, they found reductions of three to five mph in the 85th percentile speed after the conversion. The traffic calming effect can be minimized (where desired) by, among other things, optimizing and coordinating signals…something the City will do during the design phase of this project using Synchro 7. *This project will not adversely affect speeds or queuing.*

- Mid-block turning movements – Heavily used offset minor streets or driveways can produce a situation with overlapping, head-to-head turning movements within the inside through lanes or the two-way left turn lane. The presence of "high-volume" minor streets (with no stop control for the road diet street) or driveways must be considered when evaluating the feasibility of road diet projects. *This project is does not produce conflicts as a result of minor street or driveway left-turn traffic.*

Project Justification

The corridor includes vertical and horizontal curves that hinder visibility, especially for entering and exiting turning movements. From 2008 to 2012, there have been 89 total collisions – a majority of those are rear-end collisions that would be mitigated by a shared center turn lane. The collisions that stand out are the ones resulting in major injury or fatality. In the time period of 5 years there has been one fatality and one major injury. The major injury was a result of a rear-end collision while the fatality was a result of a left turn collision.

This project has a remarkably **high benefit/cost ratio** of 2.19 using *conservative* assumptions:

- Project lifespan of ten years
- Estimated traffic volume growth rate of 0.5%
- CRF of 25, which does not include the planned right turn lane at Benton Street

In addition to vehicle collisions there have been bicycle and pedestrian collisions within the Mormon Trek Boulevard corridor. From 2008-12, motorists hit two pedestrians and three cyclists. One of the bicyclists was injured at the Benton Street/Mormon Trek Boulevard intersection, which ranks as the 20th highest intersection collision rate in the Iowa City urbanized area.

Iowa Department of Transportation

Major Cause Summary

Mormon Trek Boulevard

Analysis Years: 2008 [22], 2009 [14], 2010 [21], 2011 [15], 2012 [19]

Crash Summary:

Fatal	1
Major Injury	1
Minor Injury	7
Possible/Unknown	12
PDO	68
Total Crashes	89

Injury Summary:

Fatal	1
Major Injury	1
Minor Injury	9
Possible	18
Unknown	-
Total Injuries	29

TOT Property Damage: $517,250

AVG Property Damage: $5,812

Surface Condition Summary:

Dry	52
Wet	15
Ice	10
Snow	7
Slush	4
Sand/Dirt/Oil/Gravel	-
Water	-
Other	1
Unknown	-
Not Reported	-
Total Crashes	89

Major Cause Summary:

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

Selection Filter:

((CRCOMANNER = 3 or CRCOMANNER = 4 or CRCOMANNER = 6)) AND ((YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012))

Analyst: R. Serslev

Notes:

8/5/2014 Crash Mapping Analysis Tool Page: 1 of 1

C. ITEMIZED BREAKDOWN OF ALL COSTS

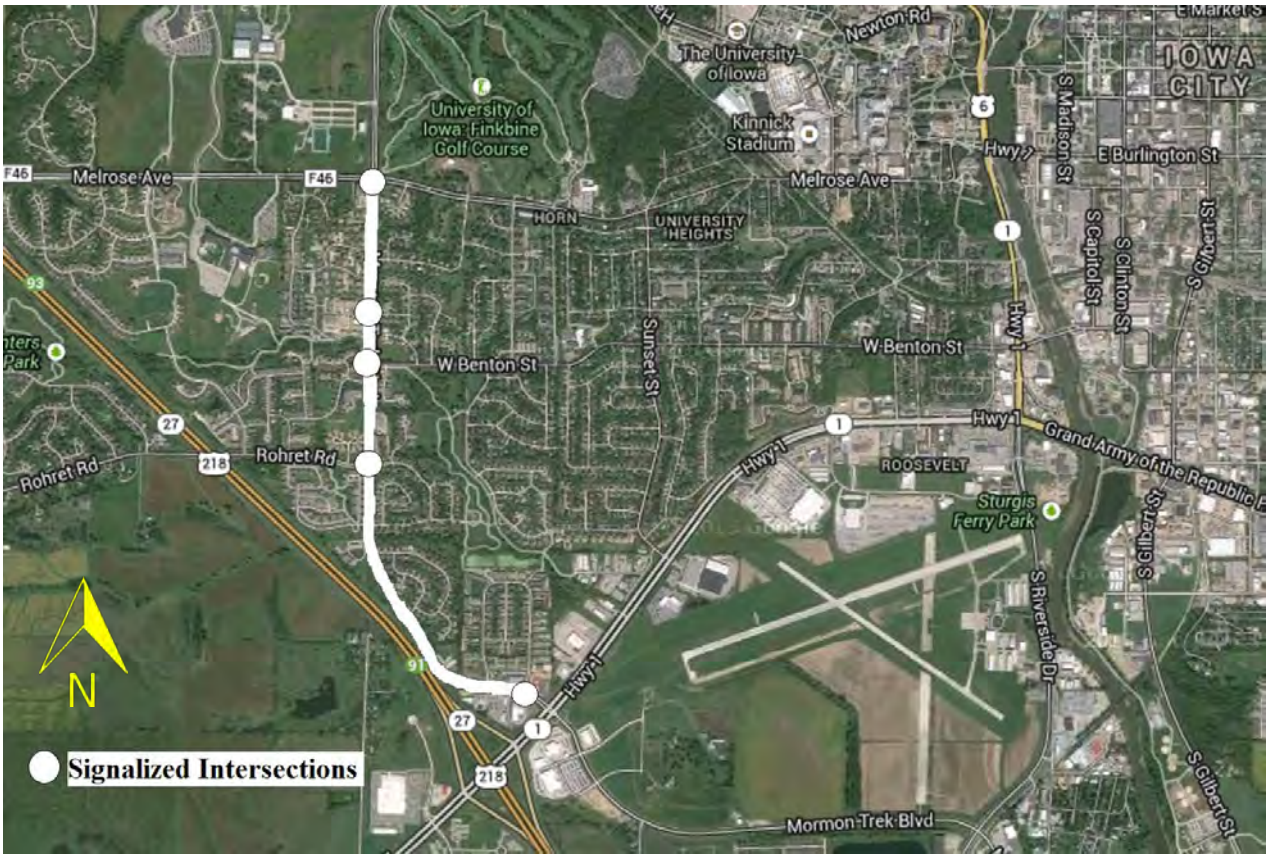
TSIP grant:	$500,000
GO Bonds:	$248,431
Total project:	**$748,431**

Mormon Trek Boulevard 3-Lane Section Conversion					
Number	Description	Estimated Quantity	Units	Unit Price	Extended Amount
1	Mobilization	LS	1	$10,000.00	$10,000.00
2	Traffic Control	LS	1	$5,000.00	$5,000.00
3	Removals	SY	500	$10.00	$5,000.00
4	PCC Sidewalk	SY	2,200	$35.00	$77,000.00
5	PCC Pavement	SY	200	$55.00	$11,000.00
6	Curb Ramp Removal/Replacement	EACH	24	$750.00	$18,000.00
7	Remove Pavement Markings	STA	150.89	$40.00	$6,035.50
8	Install Pavement Markings	STA	262.60	$40.00	$10,503.80
9	Install Painted Symbols	EACH	47	$60.00	$2,820.00
10	Traffic Signal Replacement	EACH	3	$150,000.00	$450,000.00
11	Storm Sewer Intake Removal/Replacement	EACH	1	$7,500.00	$7,500.00
	Construction Subtotal				$602,859.30
	Easements and ROW Acquisition	LS	1	$25,000.00	$25,000.00
	Contingency (20%)				*$120,571.86*
	TOTAL				$748,431.16

D. TIME SCHEDULE

- Jan-April 2015 Design phase
- July 2015 Funding available
- April 2015 Project bidding
- May-Aug 2015 Construction
- Sept 2015 Project complete

E. MAP

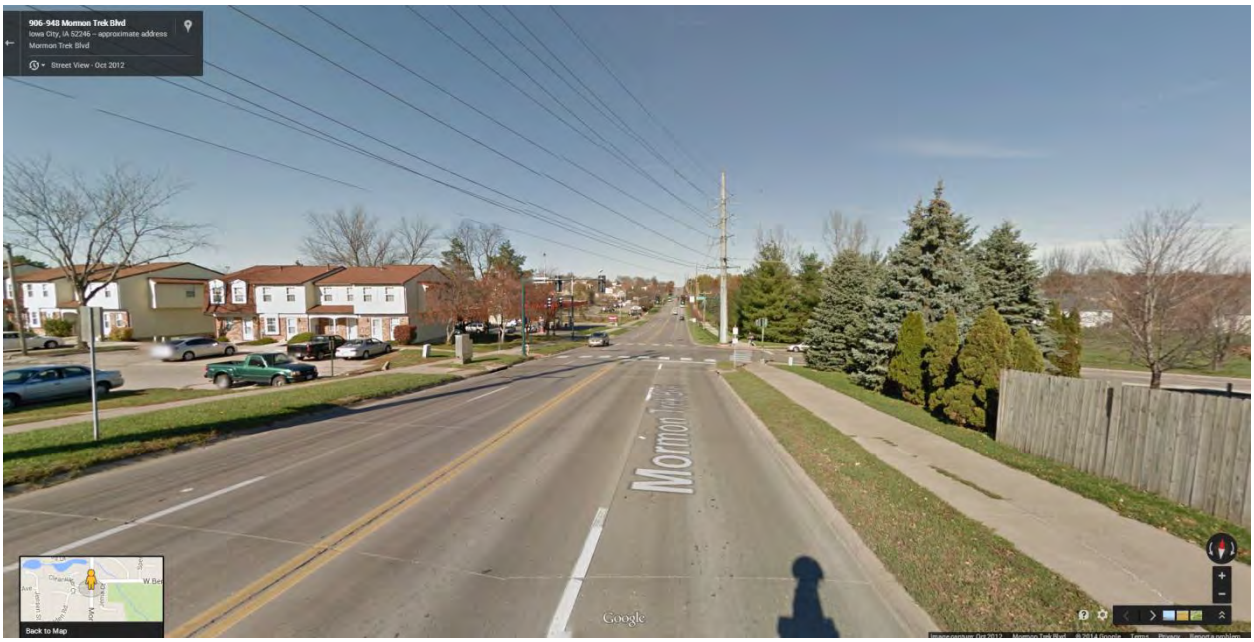

Newton Rd
The University of Iowa
IOWA CITY
University of Iowa Finkbine Golf Course
Kinnick Stadium
Melrose Ave
F46
HORN
UNIVERSITY HEIGHTS
S Madison St
E Burlington St
S Capitol St
S Clinton St
S Gilbert St
W Benton St
Sunset St
Hwy 1
Grand Army of the Republic
ROOSEVELT
Sturgis Ferry Park
S Riverside Dr
Rohret Rd
218
27
91
93
Mormon Trek Blvd
N
Signalized Intersections

F. COLOR PICTURES

Looking north at Mormon Trek Boulevard/Westside Drive

Looking north at Mormon Trek/Rohret Road

Looking north at Mormon Trek/W Benton Street



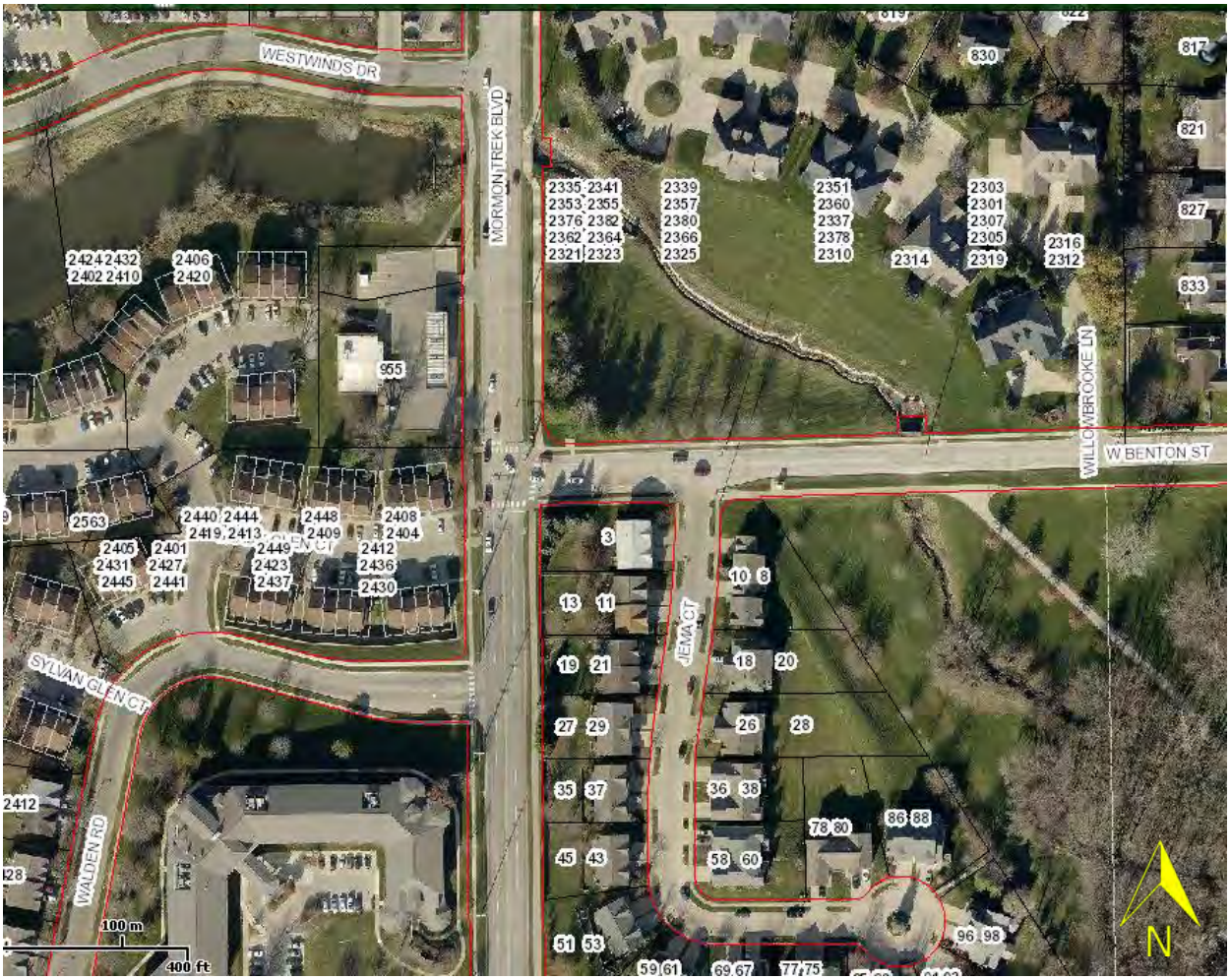
Looking north at Mormon Trek/Cameron Way

Looking North at Mormon Trek/Melrose Avenue

G. PLAN VIEW

W BENTON ST
KATELIN DR
IRWIN AVE
WALDEN RD
COLL DR
MORMON TREK BLVD
HAFOR DR
HAFOR CIR
TEG DR
ESTRON ST
DENBIGH DR
FLANIGAN CT
WOODBERRY CT
CASTLE DR
CASTLE LN
ABBEY LN
DOLENDL
GRYND
WEST SIDE DR
EAR LRD
KILLY LEE RD SW
HIGHWAY 218 SE
HIGHWAY 1
N

N
ELROSE AVE
MORMON TREK BLVD
BARTCLIFF RD
CAMERON WAY
W BENTON ST
ROHRET RD
CALVIN AVE
WESTGATE ST
EMERALD ST
KATHLIN DR
HARBOR DR
FLANIGAN CT
WOODBERRY CT
CASCADE LN
COLL DR
INCOME ST
SHANNON DR


WESTWINDS DR
MORMON TREK BLVD
W BENTON ST
WILLOWBROOKE LN
SYLVAN GLEN CT
WALDEN RD
JEMA CT
100 m
400 ft
N

H. AERIAL PHOTOGRAPH

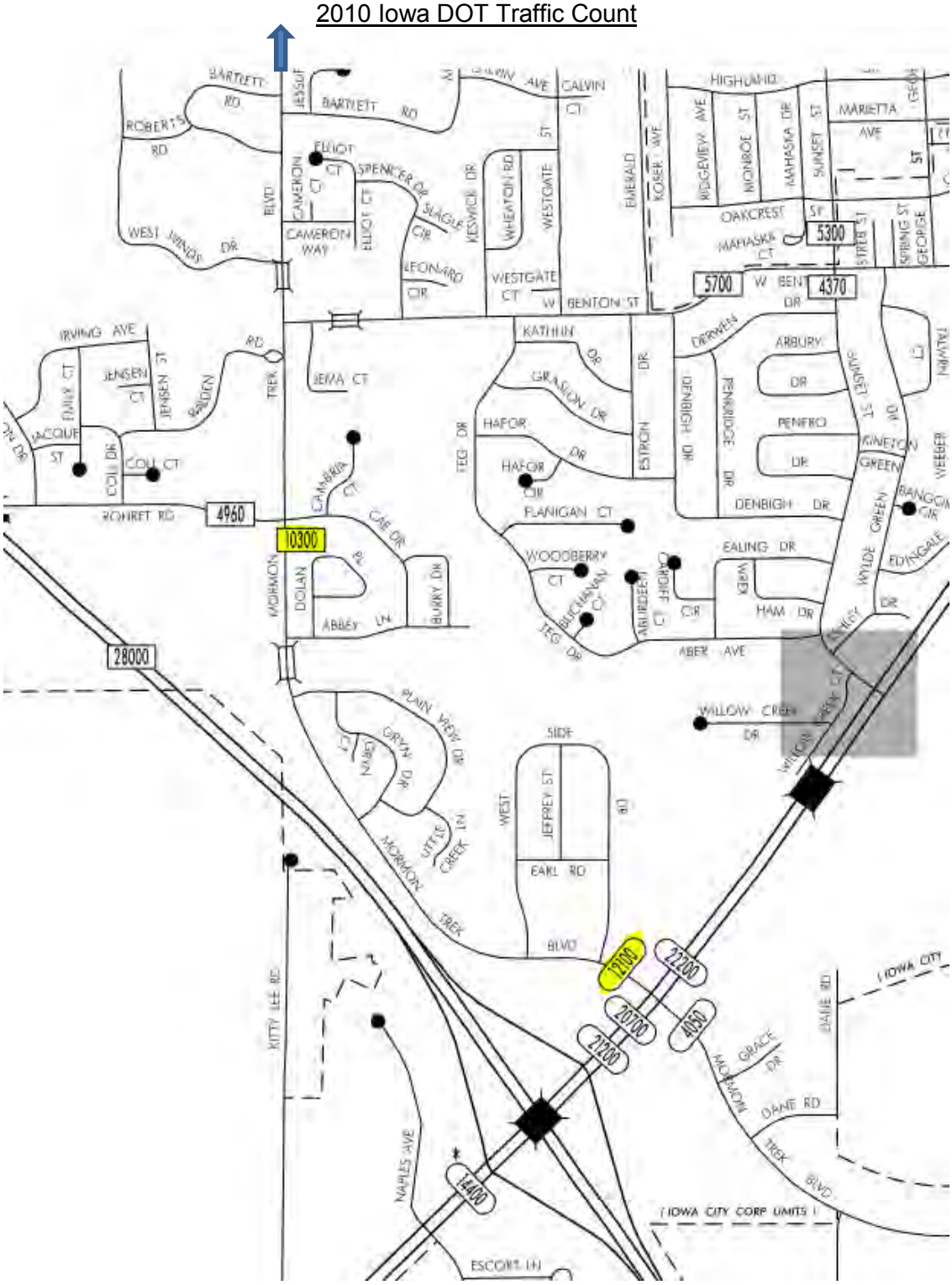
Mormon Trek Boulevard from Westside Drive to Rohret Road.

Mormon Trek Boulevard from Rohret Road to Melrose Avenue.

J. TRAFFIC VOLUMES AND/OR TURNING MOVEMENT

2010 Iowa DOT Traffic Count

2010 Iowa DOT Traffic Count



Peak Hour Counts at Signalized Intersections

Mormon Trek at Benton St (signalized)
AM (3/28/13)

Vehicle – Ped

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	20	48	0	0	15	0	39	6	0	118	39	0	0	0	0	3
07:30 AM	17	73	0	1	9	0	61	1	0	147	53	0	0	0	0	5
07:45 AM	30	66	0	0	17	0	56	4	0	150	58	0	0	0	1	1
08:00 AM	34	71	0	0	14	0	32	0	0	113	41	0	0	0	0	2
08:15 AM	25	69	0	0	36	0	40	1	0	104	48	0	0	0	0	1
08:30 AM	25	49	0	1	17	0	23	1	0	109	40	0	0	0	0	0

Trucks – Buses

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	1	3	0	0	0	0	0	0	0	9	1	0	0	0	0	0
07:30 AM	0	2	0	0	1	0	1	0	0	9	0	0	0	0	0	0
07:45 AM	1	11	0	0	1	0	1	0	0	3	2	0	0	0	0	0
08:00 AM	4	7	0	0	0	0	1	0	0	4	1	0	0	0	0	0
08:15 AM	1	4	0	0	3	0	0	0	0	3	1	0	0	0	0	0
08:30 AM	1	3	0	0	1	0	1	0	0	4	1	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (3/27/13)

Vehicle – Ped

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	43	99	0	1	31	0	49	5	0	109	19	2	0	0	0	9
04:30 PM	42	99	0	1	24	0	55	5	0	101	23	0	0	0	0	5
04:45 PM	62	165	0	1	35	0	60	4	0	107	19	0	0	0	0	6
05:00 PM	55	171	0	0	52	0	68	5	0	119	30	1	0	0	0	3
05:15 PM	63	168	0	1	49	0	77	3	0	118	29	0	0	0	0	2
05:30 PM	57	173	0	3	50	0	70	2	0	128	25	3	0	0	0	6

Trucks – Buses

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	2	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				BENTON Westbound				MORMON TREK Northbound				BENTON Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	2	0	0	0	0	0	1	0	0	0	0	1

Mormon Trek at Rohret Rd and Cae Dr (signalized)
AM (2/12/13)

Vehicle – Ped

	MORMONTREK Southbound				CAE Westbound				MORMONTREK Northbound				CAE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	35	10	0	1	0	4	1	4	81	1	0	44	0	15	0
07:30 AM	0	43	7	0	1	0	4	0	5	85	0	1	73	1	18	1
07:45 AM	2	62	15	3	2	0	14	0	10	104	2	0	69	0	29	0
08:00 AM	1	76	28	0	1	0	3	0	8	79	0	0	71	0	21	0
08:15 AM	2	68	18	0	1	0	11	0	19	97	0	0	45	0	24	0
08:30 AM	2	67	18	0	1	0	4	1	14	63	1	0	63	1	30	0

Trucks – Buses

	MORMONTREK Southbound				CAE Westbound				MORMONTREK Northbound				CAE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	3	0	0	0	1	1	0	0	3	1	0	2	0	0	0
07:30 AM	0	0	1	0	0	0	0	0	0	1	0	0	2	0	0	0
07:45 AM	0	4	0	0	0	0	1	0	1	4	0	0	4	0	1	0
08:00 AM	0	4	1	0	0	0	0	0	2	1	0	0	2	0	0	0
08:15 AM	0	2	5	0	0	0	1	0	0	3	0	0	1	0	2	0
08:30 AM	0	0	2	0	0	0	0	0	1	1	0	0	1	0	8	0

Bicycles

	MORMONTREK Southbound				CAE Westbound				MORMONTREK Northbound				CAE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (3/4/14)

Vehicle – Ped

	MORMONTREK Southbound				ROHRET Westbound				MORMONTREK Northbound				ROHRET Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:00 PM	3	104	44	0	1	0	1	0	18	84	0	0	29	0	10	0
04:15 PM	3	108	44	0	1	0	3	0	15	92	0	0	32	1	10	1
04:30 PM	5	103	50	1	1	1	6	0	15	103	3	0	28	0	13	1
04:45 PM	5	129	64	0	1	1	5	0	18	87	1	0	34	1	23	0
05:00 PM	7	121	50	0	1	0	1	0	22	100	1	2	35	0	20	0
05:15 PM	4	126	69	0	0	0	5	0	27	95	0	0	24	0	20	0

Trucks – Buses

	MORMONTREK Southbound				ROHRET Westbound				MORMONTREK Northbound				ROHRET Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:00 PM	0	2	0	0	0	0	0	0	1	3	0	0	0	0	0	0
04:15 PM	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0
04:30 PM	0	2	2	0	0	0	0	0	0	1	0	0	1	0	0	0
04:45 PM	0	2	0	0	0	0	0	0	0	1	0	0	2	0	0	0
05:00 PM	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0

Bicycles

	MORMONTREK Southbound				ROHRET Westbound				MORMONTREK Northbound				ROHRET Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mormon Trek at Westside Dr (signalized)
AM (10/7/08)

Vehicle – Ped

	MORMON TRK Southbound				WESTSIDE Westbound				MORMON TRK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	19	69	4	0	35	2	11	0	6	71	23	0	2	1	2	0
07:30 AM	14	86	3	0	43	0	7	0	10	65	33	0	0	0	1	0
07:45 AM	11	97	0	0	39	3	22	0	7	81	46	0	0	0	2	0
08:00 AM	9	69	7	0	31	0	19	0	3	64	41	0	3	0	3	0
08:15 AM	27	90	0	0	33	0	12	0	7	53	50	0	0	0	2	0
08:30 AM	16	80	2	0	29	1	10	0	4	67	48	0	0	0	2	0

Trucks and Buses

	MORMON TRK Southbound				WESTSIDE Westbound				MORMON TRK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	2	0	0	1	0	0	0	0	1	2	0	0	0	0	0
07:30 AM	0	1	0	0	1	0	0	0	0	6	2	0	0	0	0	0
07:45 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	5	0	0	0	0	1	0	0	0	2	0	0	0	0	0
08:15 AM	0	2	0	0	0	0	0	0	0	2	1	0	0	0	1	0
08:30 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0

Bicycles

	MORMON TRK Southbound				WESTSIDE Westbound				MORMON TRK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (10/15/08)

Vehicle – Ped

	MORMON TREK Southbound				WESTSIDE Westbound				MORMON TREK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	11	90	3	0	27	2	14	0	6	81	26	0	1	2	6	0
04:30 PM	10	96	0	0	38	0	7	0	5	81	29	0	0	1	2	0
04:45 PM	20	109	0	0	42	2	13	0	1	109	36	0	2	1	12	0
05:00 PM	7	95	2	4	53	0	19	0	4	108	29	0	1	0	8	0
05:15 PM	16	111	0	0	30	0	14	0	4	102	44	2	0	0	3	0
05:30 PM	29	109	1	0	32	4	17	0	2	82	37	0	1	0	8	0

Trucks – Buses

	MORMON TREK Southbound				WESTSIDE Westbound				MORMON TREK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:00 PM	0	3	0	0	0	0	2	0	0	2	1	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				WESTSIDE Westbound				MORMON TREK Northbound				WESTSIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mormon Trek at Cameron Way (signalized)
AM (10/21/08)

Vehicles – Ped

	MORMON TREK Southbound				CAMERON WAY Westbound				MORMON TREK Northbound				CAMERON WAY Eastbound					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	*Totals*	*Peak Hr?*
07:15 AM	7	58	0	0	7	1	0	1	0	154	2	0	6	0	3	0	238	1298
07:30 AM	12	101	0	0	1	0	0	0	1	195	6	2	8	0	13	0	337	PEAK 1368
07:45 AM	10	96	1	0	12	0	1	1	2	264	6	0	8	0	12	0	412	1294
08:00 AM	21	117	4	0	4	1	1	1	0	144	7	1	7	0	5	0	311	HOUR
08:15 AM	14	112	3	0	6	1	0	0	2	133	10	0	8	2	17	1	308	
08:30 AM	29	91	2	0	3	1	0	0	0	116	4	0	9	0	8	0	263	
Pk hr totals	57	426	8	0	23	2	2	2	5	736	29	3	31	2	47	1	1368	

Trucks – Buses

	MORMON TREK Southbound				CAMERON WAY Westbound				MORMON TREK Northbound				CAMERON WAY Eastbound			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
07:15 AM	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
07:30 AM	0	7	0	0	1	0	0	0	0	5	0	0	0	0	1	0
07:45 AM	0	2	0	0	1	0	0	0	0	4	0	0	0	0	0	0
08:00 AM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0
08:15 AM	0	5	0	0	0	0	0	0	0	2	0	0	0	0	1	0
08:30 AM	0	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				CAMERON WAY Westbound				MORMON TREK Northbound				CAMERON WAY Eastbound			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
07:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (10/16/08)

Vehicles – Ped

	MOR TREK Southbound				CAMERON XAY Westbound				MOR TREK Northbound				CAMERON XAY Eastbound					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	*Totals*	*Peak Hr?*
04:15 PM	44	151	5	7	0	3	0	1	0	136	11	0	14	1	22	0	387	1590
04:30 PM	30	154	4	0	1	0	0	0	1	121	12	6	19	0	29	0	371	1673
04:45 PM	43	155	1	3	5	0	1	1	3	145	10	6	19	1	20	1	403	PEAK 1762
05:00 PM	33	169	3	6	2	0	2	0	1	147	10	1	31	0	31	0	429	
05:15 PM	44	178	15	1	2	2	0	1	2	161	9	3	18	1	38	0	470	HOUR
05:30 PM	39	202	3	2	1	0	0	2	0	146	22	5	16	1	30	1	460	
Pk hr totals	159	704	22	12	10	2	3	4	6	599	51	15	84	3	119	2	1762	

Trucks – Buses

	MOR TREK Southbound				CAMERON XAY Westbound				MOR TREK Northbound				CAMERON XAY Eastbound			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
04:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:30 PM	0	3	0	0	1	0	0	0	0	2	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0
05:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0
05:15 PM	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
05:30 PM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0

Bicycles

	MOR TREK Southbound				CAMERON XAY Westbound				MOR TREK Northbound				CAMERON XAY Eastbound			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Un-signalized Intersections

Mormon Trek at Abbey Ln (un-signalized)
AM (3/27/12)

Vehicle – Ped

	MORMON TREK Southbound				ABBEY Westbound				MORMON TREK Northbound				ABBEY Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	2	60	1	0	4	0	5	0	1	67	2	0	5	0	5	0
07:30 AM	3	82	2	1	5	0	13	0	2	107	2	0	9	0	7	1
07:45 AM	4	89	5	0	6	0	2	0	0	106	1	2	10	0	4	0
08:00 AM	1	85	4	0	3	0	6	0	0	77	1	2	5	0	7	0
08:15 AM	3	72	1	2	1	0	3	0	2	67	2	1	3	1	5	0
08:30 AM	2	78	0	0	0	0	1	0	1	63	1	0	4	0	6	1

Trucks – Buses

	MORMON TREK Southbound				ABBEY Westbound				MORMON TREK Northbound				ABBEY Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	1	0	0	0	0	0	0	4	1	0	0	1	0	0
07:30 AM	0	7	0	0	0	0	0	0	0	7	1	0	0	0	0	0
07:45 AM	0	3	0	0	0	0	0	0	0	5	0	0	0	0	0	0
08:00 AM	1	4	0	0	0	0	1	0	0	2	1	0	0	0	1	0
08:15 AM	0	8	0	0	0	0	0	0	0	3	1	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				ABBEY Westbound				MORMON TREK Northbound				ABBEY Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (4/18/12)

Vehicle – Ped

	MORMON TREK BLVD Southbound				ABBEY LN Westbound				MORMON TREK BLVD Northbound				ABBEY LN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	4	109	5	0	0	0	8	4	1	100	6	2	5	0	2	1
04:30 PM	7	91	8	0	2	0	4	0	6	95	1	6	2	0	2	1
04:45 PM	6	115	7	0	5	0	4	2	5	89	3	2	9	0	1	2
05:00 PM	10	114	7	1	2	0	9	0	7	116	1	1	3	0	6	0
05:15 PM	5	119	10	1	1	1	10	3	4	106	6	4	8	0	2	0
05:30 PM	6	125	8	0	2	0	2	1	9	90	5	0	10	0	4	1

Trucks – Buses

	MORMON TREK BLVD Southbound				ABBEY LN Westbound				MORMON TREK BLVD Northbound				ABBEY LN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
04:45 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	2	0	0	0	0	0	0	0	2	1	0	0	0	0	0
05:30 PM	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0

Bicycles

	MORMON TREK BLVD Southbound				ABBEY LN Westbound				MORMON TREK BLVD Northbound				ABBEY LN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
04:45 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	2	0	0	0	0	0	0	0	2	1	0	0	0	0	0
05:30 PM	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0

Mormon Trek at Bartelt Rd and Macbride Dr (un-signalized)
AM (3/22/12)

Vehicle – Ped

	MORMONTREK Southbound				BARTLETCAMDEN Westbound				MORMONTREK Northbound				BARTLETCAMDEN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	71	2	2	0	0	1	0	0	161	1	0	3	0	2	0
07:30 AM	0	91	2	1	3	0	2	0	0	230	0	0	0	0	2	0
07:45 AM	1	120	0	0	1	0	3	0	0	219	1	0	0	0	2	0
08:00 AM	0	119	1	0	0	0	0	0	0	147	1	0	3	0	3	0
08:15 AM	0	76	1	2	3	0	0	0	0	128	0	2	4	0	3	1
08:30 AM	1	71	0	1	1	0	1	0	0	149	1	2	5	0	4	0

Trucks – Buses

	MORMONTREK Southbound				BARTLETCAMDEN Westbound				MORMONTREK Northbound				BARTLETCAMDEN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	9	1	0	0	0	0	0	0	6	0	0	0	0	1	0
07:30 AM	0	8	1	0	0	0	0	0	1	10	0	0	0	0	0	0
07:45 AM	0	7	0	0	0	0	0	0	0	9	0	0	0	0	1	0
08:00 AM	0	11	1	0	0	0	0	0	0	5	0	0	0	0	0	0
08:15 AM	0	3	1	0	0	0	0	0	0	5	0	0	0	0	2	0
08:30 AM	0	4	1	0	0	0	0	0	0	2	0	0	0	0	0	0

Bicycles

	MORMONTREK Southbound				BARTLETCAMDEN Westbound				MORMONTREK Northbound				BARTLETCAMDEN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

PM (4/11/12)

Vehicle – Ped

	MORMON Southbound				BARTELTMACBRIDE Westbound				MORMON Northbound				BARTELTMACBRIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	2	140	3	0	3	0	0	0	2	110	2	3	3	0	3	0
04:30 PM	3	173	4	5	3	0	4	1	1	149	0	0	1	0	3	1
04:45 PM	0	192	6	3	0	0	2	0	0	160	3	4	1	0	6	0
05:00 PM	1	186	1	0	1	0	0	0	2	179	1	4	2	0	5	0
05:15 PM	2	190	6	2	3	0	2	0	3	170	2	2	6	0	2	0
05:30 PM	1	174	3	4	3	0	0	0	1	153	2	0	2	0	2	0

Trucks – Buses

	MORMON Southbound				BARTELTMACBRIDE Westbound				MORMON Northbound				BARTELTMACBRIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
04:30 PM	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
05:00 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
05:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bicycles

	MORMON Southbound				BARTELTMACBRIDE Westbound				MORMON Northbound				BARTELTMACBRIDE Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0
05:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mormon Trek and Bartelt Rd South (un-signalized)
AM (4/4/12)

Vehicle – Ped

	MORMON TREK Southbound				BARTELT Westbound				MORMON TREK Northbound				BARTELT Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	77	3	0	0	0	0	0	7	136	0	1	2	0	2	0
07:30 AM	0	78	2	0	0	0	0	0	1	197	0	0	0	0	1	0
07:45 AM	0	87	0	0	0	0	0	0	4	207	0	0	2	0	2	0
08:00 AM	0	128	3	1	0	0	0	0	3	122	0	0	4	0	1	0
08:15 AM	0	88	2	0	0	0	0	0	2	110	0	0	4	0	1	0
08:30 AM	0	48	4	0	0	0	0	0	7	91	0	1	1	0	4	0

Trucks – Buses

	MORMON TREK Southbound				BARTELT Westbound				MORMON TREK Northbound				BARTELT Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	2	1
07:30 AM	0	4	0	0	0	0	0	0	0	7	0	0	1	0	2	0
07:45 AM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0
08:00 AM	0	8	2	0	0	0	0	0	0	5	0	0	0	0	1	0
08:15 AM	0	4	0	0	0	0	0	0	0	2	0	0	0	0	1	0
08:30 AM	0	1	0	0	0	0	0	0	0	4	0	0	1	0	0	0

Bicycles

	MORMON TREK Southbound				BARTELT Westbound				MORMON TREK Northbound				BARTELT Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (4/18/12)

Vehicle – Ped

	MORMON TREK Southbound				BARTELT ROAD SOUTH Westbound				MORMON TREK Northbound				BARTELT ROAD SOUTH Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	149	5	5	0	0	0	0	6	129	0	3	3	0	3	0
04:30 PM	0	163	3	2	0	0	0	0	3	156	0	0	3	0	1	0
04:45 PM	0	190	5	8	0	0	0	0	8	145	0	12	3	0	10	0
05:00 PM	0	207	6	1	0	0	0	0	4	180	0	6	5	0	5	0
05:15 PM	0	207	1	3	0	0	0	0	5	178	0	4	1	0	3	0
05:30 PM	0	211	4	2	0	0	0	0	1	161	0	1	4	0	8	0

Trucks – Buses

	MORMON TREK Southbound				BARTELT ROAD SOUTH Westbound				MORMON TREK Northbound				BARTELT ROAD SOUTH Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:30 PM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0
04:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	1	2	0	0	0	0	1	0
05:30 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				BARTELT ROAD SOUTH Westbound				MORMON TREK Northbound				BARTELT ROAD SOUTH Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
04:30 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	2	0
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Mormon Trek at Walden Rd (un-signalized)
AM (3/27/12)

Vehicles – Ped

	MORMONTREK Southbound				WALDEN Westbound				MORMONTREK Northbound				WALDEN Eastbound					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	*Totals*	*Peak Hr?*
7:15 AM	3	52	9	0	0	0	0	0	2	123	0	0	14	0	3	0	206	1114
7:30 AM	0	65	6	1	0	0	0	0	2	183	0	0	11	0	2	0	269	1157
7:45 AM	0	87	11	0	0	0	0	0	1	240	0	0	28	0	2	0	369	1164
8:00 AM	0	95	9	0	0	0	0	0	1	143	0	0	19	0	3	1	270	
8:15 AM	0	86	6	0	0	0	0	0	1	136	0	0	15	0	5	0	249	
8:30 AM	0	84	3	0	0	0	0	0	1	168	0	0	18	0	2	0	276	
Peak Hr	0	352	29	0	0	0	0	0	4	687	0	0	80	0	12	1	1164	

Trucks – Buses

	MORMONTREK Southbound				WALDEN Westbound				MORMONTREK Northbound				WALDEN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
07:30 AM	0	7	1	0	0	0	0	0	0	10	0	0	1	0	0	0
07:45 AM	0	1	0	0	0	0	0	0	1	6	0	0	0	0	0	0
08:00 AM	0	6	1	0	0	0	0	0	0	2	0	0	0	0	0	0
08:15 AM	0	3	0	0	0	0	0	0	0	9	0	0	0	0	0	0
08:30 AM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Bicycles

	MORMONTREK Southbound				WALDEN Westbound				MORMONTREK Northbound				WALDEN Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM (4/4/12)

Vehicle – Ped

	MORMON TREK Southbound				WALDEN ROAD Westbound				MORMON TREK Northbound				WALDEN ROAD Eastbound					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	*Totals*	*Peak Hr?*
04:15 PM	0	178	17	3	0	0	0	0	0	115	0	2	12	0	1	0	323	1422
04:30 PM	0	134	19	1	0	0	0	0	3	105	0	1	17	0	0	0	278	1528
04:45 PM	0	162	24	14	0	0	0	0	3	135	0	4	16	0	6	0	346	1657
05:00 PM	0	239	43	7	0	0	0	1	3	165	0	6	23	0	2	0	475	
05:15 PM	0	225	24	2	0	0	0	0	2	155	0	11	17	0	6	0	429	
05:30 PM	0	220	28	2	0	0	0	0	3	134	0	4	21	0	1	0	407	
Pk hr to	0	846	119	25	0	0	0	1	11	589	0	25	77	0	15	0	1657	

Trucks – Buses

	MORMON TREK Southbound				WALDEN ROAD Westbound				MORMON TREK Northbound				WALDEN ROAD Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:30 PM	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0
04:45 PM	0	3	1	0	0	0	0	0	0	3	0	0	0	0	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:15 PM	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Bicycles

	MORMON TREK Southbound				WALDEN ROAD Westbound				MORMON TREK Northbound				WALDEN ROAD Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:30 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
04:45 PM	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0
05:00 PM	0	3	1	0	0	0	0	0	0	3	0	0	0	0	0	0
05:15 PM	0	2	1	0	0	0	0	0	0	4	0	0	0	0	0	0
05:30 PM	0	5	1	0	0	0	0	0	0	2	0	0	0	0	0	0

Mormon Trek at Westwinds Dr (un-signalized)
AM (6/19/12)

Vehicles – Ped

	MORMONTREK Southbound				WESTWINDS Westbound				MORMONTREK Northbound				WESTWINDS Eastbound					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	*Totals*	*Peak Hr?*
07:15 AM	0	59	0	0	0	0	0	0	10	108	0	0	3	0	6	0	186	998
07:30 AM	0	63	1	0	0	0	0	0	18	157	0	3	3	0	10	0	252	1060
07:45 AM	0	96	0	2	0	0	0	0	14	184	0	2	1	0	17	0	312	1083
08:00 AM	0	85	2	2	0	0	0	0	23	119	0	3	2	0	17	0	248	
08:15 AM	0	120	2	2	0	0	0	0	11	104	0	0	4	0	7	0	248	
08:30 AM	0	91	3	10	0	0	0	0	26	131	0	0	4	0	20	0	275	
Pk hr totals	0	364	5	6	0	0	0	0	66	564	0	8	10	0	51	0	1060	

PEAK HOUR

Trucks – Buses

	MORMONTREK Southbound				WESTWINDS Westbound				MORMONTREK Northbound				WESTWINDS Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0
07:30 AM	0	2	0	0	0	0	0	0	0	5	0	0	0	0	0	0
07:45 AM	0	2	0	0	0	0	0	0	3	4	0	0	0	0	0	0
08:00 AM	0	6	0	0	0	0	0	0	0	3	0	0	0	0	0	0
08:15 AM	0	5	2	0	0	0	0	0	1	2	0	0	0	0	0	0
08:30 AM	0	4	0	0	0	0	0	0	2	1	0	0	0	0	0	0

Bicycles

	MORMONTREK Southbound				WESTWINDS Westbound				MORMONTREK Northbound				WESTWINDS Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0

PM (7/18/12)

Vehicles – Ped

	MORMON TK Southbound				WESTWINDS Westbound				MORMON TK Northbound				WESTWINDS Eastbound					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Totals	Peak Hr?
04:15 PM	0	148	0	1	0	0	0	0	32	120	0	0	2	0	43	0	345	1539
04:30 PM	0	151	6	1	0	0	0	0	62	117	0	0	4	0	45	0	385	1637
04:45 PM	0	143	6	3	0	0	0	0	52	125	0	2	2	0	41	0	369	1621
05:00 PM	0	160	6	3	0	0	0	0	51	165	0	4	1	0	57	0	440	
05:15 PM	0	208	3	4	0	0	0	0	46	144	0	3	1	0	41	0	443	
05:30 PM	0	163	1	2	0	0	0	0	27	125	0	4	3	0	50	0	369	
Pk hr totals	0	662	21	11	0	0	0	0	211	551	0	9	8	0	184	0	1637	

Trucks – Buses

	MORMON TK Southbound				WESTWINDS Westbound				MORMON TK Northbound				WESTWINDS Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0
04:45 PM	0	3	0	0	0	0	0	0	1	1	0	0	0	0	1	0
05:00 PM	0	3	0	0	0	0	0	0	1	0	0	0	1	0	0	0
05:15 PM	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bicycles

	MORMON TK Southbound				WESTWINDS Westbound				MORMON TK Northbound				WESTWINDS Eastbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

K. TRAFFIC SIGNAL LAYOUT, TYPE, PROPOSED PHASING, AND DETECTOR LOCATIONS.

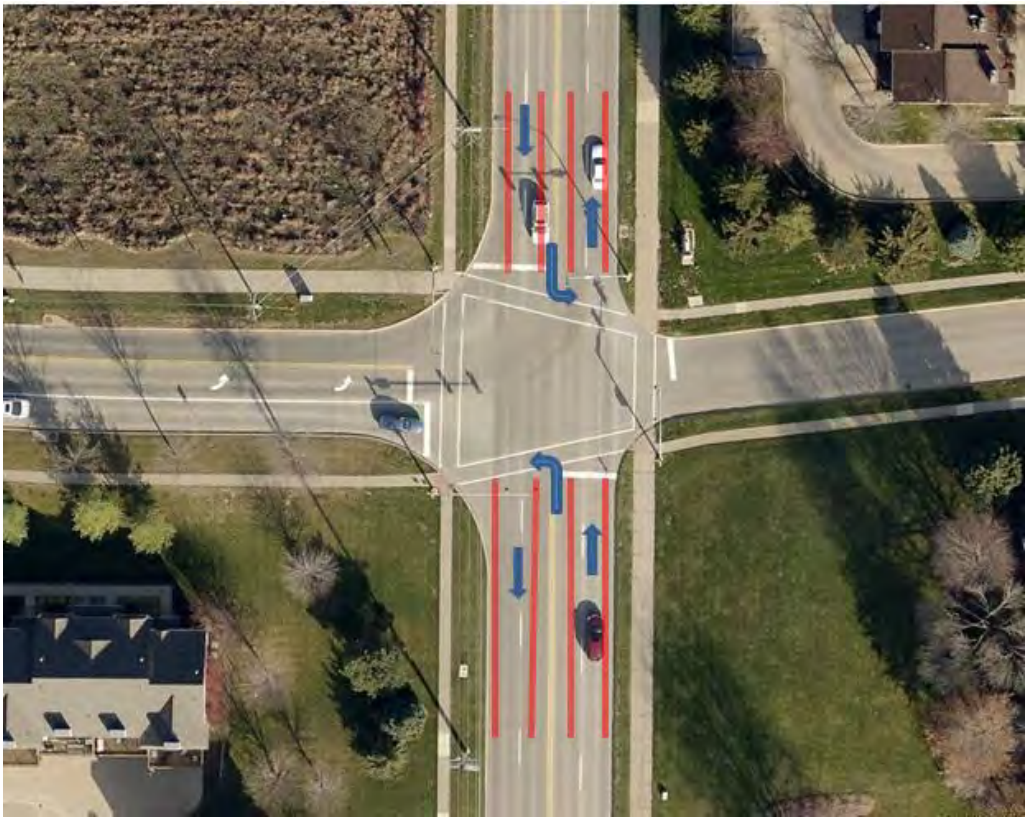
The City uses video detection at all signalized intersections. The video detection will be adjusted as needed for the new lane alignments.

The Metropolitan Planning Organization of Johnson County will provide new signal timings for each intersection using Sychro 7 when the project is funded and engineering commences.

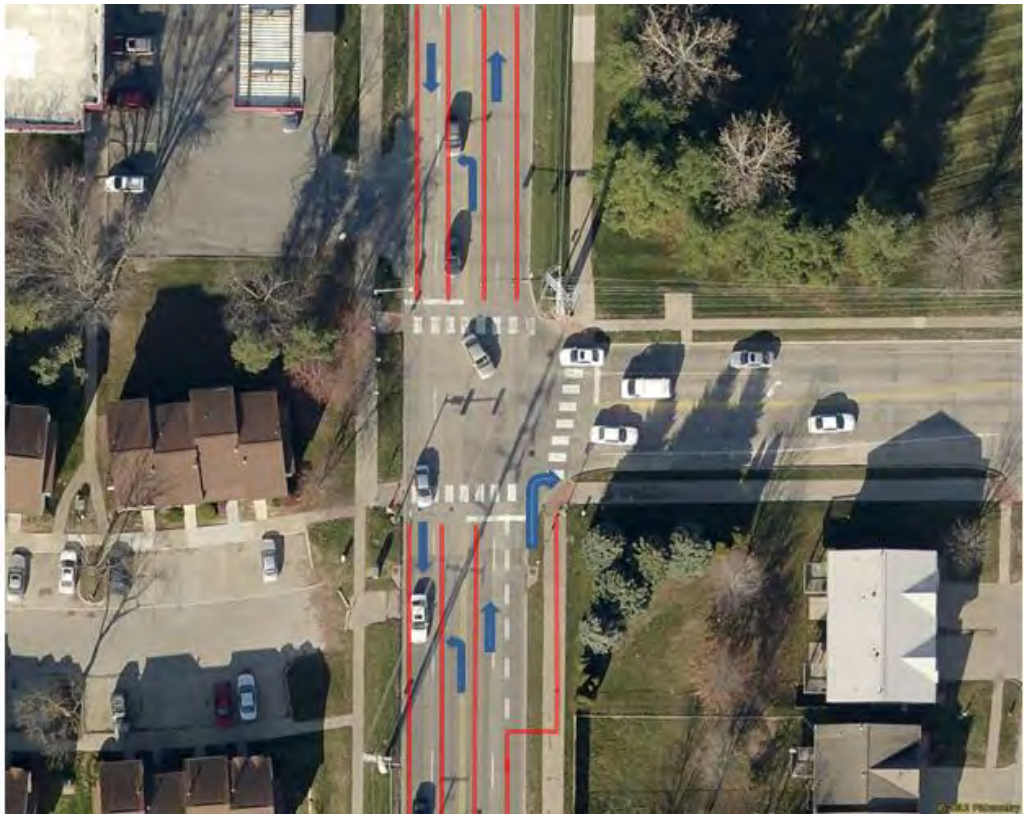
Proposed Phasing

Intersection	Yellow	All-red (adjusted for grade)	Total Change Period	85th/Posted Speed	Intersection width	% Grade
MTB at Westside Dr (westbound)	3.9	1.5	5.4	40mph	90ft	-4.0
MTB at Westside Dr (eastbound)	3.9	2.3	6.2	40mph	90ft	4.4
MTB at Rohert Rd (northbound)	3.9	0.9	4.8	40mph	70ft	-5.7
MTB at Rohert Rd (southbound)	3.9	2.0	5.9	40mph	70ft	5.4
MTB at Benton St (northbound)	3.9	2.2	6.1	40mph	70ft	7.3
MTB at Benton St (southbound)	3.9	1.0	4.9	40mph	70ft	-5.5
MTB at Cameron Way (northbound)	3.9	1.1	5.0	40mph	50ft	-1.5
MTB at Cameron Way (southbound)	3.9	1.4	5.3	40mph	50ft	1.7
Westside Dr at MTB (southbound)	3.0	3.6	6.6	25mph	110ft	0.8
Rohret Rd at MTB (eastbound)	3.6	1.8	5.4	35mph	90ft	-3.2
Cae Dr at MTB (westbound)	3.0	4.1	7.1	25mph	90ft	11.0
Benton St at MTB (westbound)	3.0	2.6	5.6	25mph	90ft	-4.5
Cameron Way at MTB (westbound)	3.0	3.4	6.4	25mph	90ft	3.9

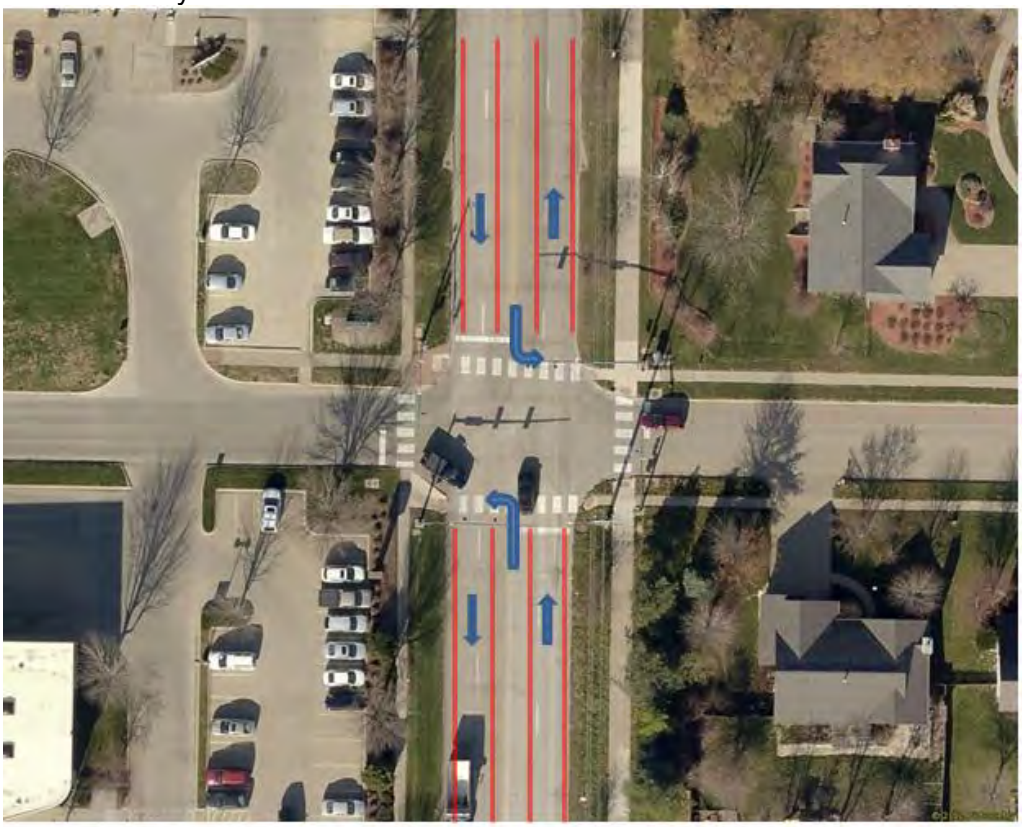
Rohret Road and Mormon Trek Boulevard



Benton Street and Mormon Trek Boulevard



Cameron Way and Mormon Trek Boulevard



Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County:	Johnson	Prepared by:	Rachel Serslev	Date Prepared:	Jul 11, 2014
Location:	Mormon Trek Boulevard				

Improvement

Proposed Improvement(s): Reduction from four lanes to three lanes with a center turn lane and one right turn lane at Benton St.

$ 500,000	Estimated Improvement Cost, **EC**	10	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	25	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

3-lane conversion only, does not include planned right turn lane

Traffic Volume Data

Source: Iowa DOT — 2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
1.65	36,500	Mormon Trek from Hwy 1 to Me
1.65	miles total	

60,225	Current Vehicle Miles / Day, **VM**
63,305	End of Life Veh. Miles / Day
21,982,125	Current Veh. Miles / Year, **AM**
224,833,755	Total Projected Veh. Miles Over Life of Project, **TVMT**

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

0.5% Projected Traffic Growth (0%-10%), **G**

Crash Data

2008 First full year --> 2012 Last full year — 5.0 years, Time Period, **T**

Additional months — values as of Dec. 2007

1	Fatal Crashes	0	Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
29	Injury Crashes	9	Minor Injuries @	$65,000	$ 585,000
		18	Possible Injuries @	$35,000	$ 630,000
68	Property Damage Only		(assumed cost per crash)	$7,400	$ 725,200
			-OR- enter all Property Costs of all crashes:		
98	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 2,590,200

19.60	Current Crashes / Year, **AA** = TA / T	**89.2**	Crashes / HMVM, Crash Rate, **CR**
$ 26,431	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
200.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8	**$ 1,094,119**	Present Value of Avoided Crashes, **BENEFIT**
5.00	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 132,100	Crash Costs Avoided in First Year, AAR x AVCR		
51.1	Total Avoided Crashes, TCR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $1,094,119 : $500,000 = **2.19** : 1

CRF = 100*(1-(1-CRF1/100)*(1-CRF2/100)*(1-CRF3/100)*(1-CRF4/100)*(1-CRF5/100))								
							Measure	Ref
or enter the individual values into this calculator:							1. converting four lane roadway to three lane roadway with center turn lane (road diet)	Pawlovich et. al. 2006
Enter up to 5 CRFs:	25.2	0						
Cummulative CRF =	25.2							

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Agency Street & Columbus Drive Intersection

Applicant: City of Burlington

Contact Person: Steve Hoambrecker Title: Public Works Director

Complete Mailing Address: 3510 Division
Burlington, IA 52601

Phone: 319-753-8171 (Area Code) E-Mail: hoambreckers@burlingtoniowa.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 $ 930,775.40

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 Burlington

Signed: Becky Anderson — August 18, 2014

Signature — Date Signed

Becky Anderson, Mayor Pro-Tem

Typed Name

Attest: Kathleen P. Salisbury — August 18, 2014

Signature — Date Signed

Kathleen P. Salisbury, City Clerk

Typed Name

RESOLUTION NO. 2014-186

Meeting No. 16 Paper No. 10

Seconded By: Shockley

AYES: Scott, Shockley, Anderson + Fleming

Introduced By: Scott

NAYS: none
absent - McCampbell

A RESOLUTION AUTHORIZING THE FILING OF AN APPLICATION WITH THE STATE OF IOWA FOR TRANSPORTATION SAFETY IMPROVEMENT PROGRAM (TSIP) FUNDS FOR SITE SPECIFIC IMPROVEMENTS INCLUDING NEW SIGNALS AND EXTENDED LEFT TURN LANES AT THE INTERSECTION OF AGENCY AND COLUMBUS DRIVE ON BEHALF OF THE CITY OF BURLINGTON

WHEREAS, The City of Burlington intends to apply for Traffic Safety Improvement Program funding through the Iowa Department of Transportation (IDOT), and

WHEREAS, in order to avail itself of possible receipt of funds pursuant to any grant under the said program an application must be filed by the City of Burlington, and

WHEREAS, The City of Burlington fully supports the application and intends to utilize Traffic Safety Improvement Program funding for site specific improvements including new signals and extended left turn lanes for the intersection of Agency and Columbus Drive, and

WHEREAS, the filing of the application is in the best interests of the citizens of the City of Burlington, Iowa, and should be approved.

BE IT HEREBY RESOLVED BY THE BURLINGTON CITY COUNCIL: That the City of Burlington guarantees the availability of funds for any required local match of the Agency and Columbus Drive intersection project costs and agrees to maintain, or cause to be maintained, the completed improvements in a manner acceptable to the IDOT throughout their useful life and hereby authorizes the Director of Public Works to submit an application for funding the improvements through Southeast Iowa Regional Planning Commission.

APPROVED and ADOPTED this 18th day of August, 2014.

ATTEST:

Kathleen P. Salisbury
City Clerk, M.M.C.

Becky Anderson
Mayor Pro-Tem

FILED-For Record

AUG 18 2014

CITY CLERKS OFFICE
BURLINGTON, IOWA

Existing Conditions:

Agency Street is a major arterial that runs east-west through Burlington and connects downtown Burlington with a commercial corridor located in the west portion of Burlington, extending into West Burlington. Agency Street is a four lane undivided road with lanes of approximately 11 foot in width and a speed limit of 30 miles per hour. Many commercial businesses are located along Agency Street and near the intersection of Agency Street and Columbus Drive. Columbus Drive is a two lane collector street that runs north-south intersecting with Agency Street. Columbus Drive provides access to Aldi's grocery store and will be a secondary access to the future Burlington Crossing Development. The speed limit for Columbus drive is 25 miles per hour. Currently the intersection is signalized however; there are no left turn lanes or left turn signals at this intersection.

On July 23rd 2014 the Southeast Iowa Regional Planning Commission performed traffic counts at Agency Street and Columbus Drive to provide data for this application. Along Agency Street the AADT eastbound was 4,007 and westbound was 3,159. On Columbus Drive the AADT southbound was 1,978 and northbound was 680. Speed data was also collected for traffic on Agency Street the speed limit on Agency Street at the project location is 30 mph. The traffic study conducted by the SEIRPC indicated that 25.6% of drivers exceeded 30 mph while 7.7% of drivers exceeded 35%.

At this intersection there have been 56 crashes between the years of 2004 and 2014 according to CMAT data provided by the Iowa DOT. Of those accidents, 5 had minor injuries, 16 had possible/unknown injuries and 35 had property damage only. There has been $244,550 worth of property damage as a result of accidents at this intersection between the years of 2004 and 2014. Out of the 56 accidents that have occurred at this intersection 26 of the accidents have been because of FTYROW: making left turns and 7 due to running the traffic signal. Rear end collisions have also been a problem at this intersection, out of the 56 total accidents 9 of the crashes were rear-end collisions. These types of accidents are likely a result of the uncontrolled left turning movements that occur at this intersection and just beyond at an access west of the intersection.

Just to the west of this intersection there will be a great deal of new commercial and retail development happening over the next few years. A development called the Burlington Crossing Development will be built just to the south of Agency Street next to the Walgreens. The main access for this will be just to the east of this intersection, with secondary access along Columbus Drive. This development will include many different uses including apartments, a hotel, shopping center, convenience store, and restaurants. On the north side of Agency Street there is commercial development already going in to the old Kmart facility. Jo-Ann Fabrics' and Dick's Sporting Goods have announced plans to locate facilities in this development and are currently under construction. Additional development is anticipated over the next few years. These new developments will increase the volume of traffic entering the Agency Street and Columbus intersection, creating a greater need for these improvements.

Proposed Concepts

The proposed improvements for the Agency Street and Columbus Drive intersection include new traffic signals, left turn lanes, and removal of an existing access. The signals will provide necessary turn lights for the traffic entering into the intersection. Along with the new traffic signals the City of Burlington will modify Agency Street near this intersection in order to widen the street. This will allow the City of Burlington to create east and west bound left turn lanes entering the intersection which will provide another level of increased safety for motorist. The implementation of left turn lanes at this intersection will serve two purposes. First the left turn lanes will increase the efficiency of traffic movement within the functional area of the intersection by segregating those wishing to turn from those wishing to move straight through. This will allow for less stacking and decelerating in the through lanes and will result in more efficiency. Secondly, by incorporating left turn lanes and turn lights the intersection will become safer by increased control of traffic movement and a reduction of potential points of conflict with the hope of reducing accidents at this intersection.

Another improvement that will be made will be the closing an access Just to the west of the intersection. There is a secondary access to the old Kmart and Hy-Vee parking lots which will be closed off to eliminate as much eastbound left turn traffic along the Agency Street corridor as possible. Many motorists will take this secondary access to reach Hy-Vee if they notice a red light at the Intersection of Agency Street and Columbus Drive. This creates more points of conflict near the functional area of the intersection. By eliminating this access the City of Burlington will increase the safety for motorist on Agency Street. These and other improvements along the corridor will improve the operation and safety of traffic on Agency Street All of the proposed improvements for the intersection will identify and incorporate any requirements set forth in the Manual on Uniform Traffic Control Devices and will address any problems within the clear zone.

Safety Justification

Based on the CMAT safety data the Agency Street and Columbus Drive intersection suffers largely from failure to yield the right of way, specifically with left turns and from rear-end collisions. The above proposed improvements will help mitigate this problem. Incorporating new turn signals and turn lanes and eliminating the extra parking lot access near the intersection will allow for traffic to move efficiently and safely through the intersection by eliminating conflict points and providing for safer left turn movements. These improvement will likely lead to more comfort for the driver and safer driving behavior by motorist.

Engineers Conceptual Cost Estimate 8/12/2014

Project: 2015/16 Agency TSIP Reconstruction By: RJT
at Columbus Drive

Line No	Item	Unit	Unit Price	Quantity	Total
1	Traffic Control	LS	$ 20,000.00	1	$ 20,000.00
2	Class 10 Excavation	CY	$ 10.00	1850	$ 18,500.00
3	Removal of Structure, Intake	EA	$ 500.00	4	$ 2,000.00
4	Pavement Removals/Disposition	SY	$ 8.00	5700	$ 45,600.00
5	Modified Subbase	TON	$ 30.00	2350	$ 70,500.00
6	Adjust Manhole to Grade, Minor	EA	$ 500.00		$ -
7	Storm Sewer, 15" RCP	LF	$ 65.00	20	$ 1,300.00
8	Subdrain, Longitudinal	LF	$ 12.00	2000	$ 24,000.00
9	Subdrain Outlet	EA	$ 150.00	8	$ 1,200.00
10	Intake, SW-508	EA	$ 4,000.00	4	$ 16,000.00
11	Intake, SW-541	EA	$ 5,000.00	1	$ 5,000.00
12	Manhole, SW-401, 4' Diameter	EA	$ 5,000.00	1	$ 5,000.00
13	9" PCC Pavement	SY	$ 50.00	6900	$ 345,000.00
14	Sidewalk, PCC, 4"	SY	$ 55.00	20	$ 1,100.00
15	Sidewalk, PCC, 6"	SY	$ 60.00	15	$ 900.00
16	Removal of Sidewalk	SY	$ 30.00	35	$ 1,050.00
17	Detectable Warnings	SF	$ 50.00	32	$ 1,600.00
18	Traffic Signalization	LS	$ 290,000.00	1	$ 290,000.00
19	Street Sign, Remove and Replace	EA	$ 150.00	5	$ 750.00
20	Painted Pavement Markings	STA	$ 90.00	51	$ 4,590.00
21	Painted Pavement Symbols	EA	$ 200.00	20	$ 4,000.00
22	Earth Shoulder Finish	STA	$ 350.00	40	$ 14,000.00
23	Survey Construction	LS	$ 6,000.00	1	$ 6,000.00
24	Mobilization	LS	6%	1	$ 52,685.40
				Total	$ 930,775.40

Time Schedule for Project Development

Grant Award ..... December 2014

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

Submit Plans ..... March/April 2015

Bid Letting, Award, and Contract ..... June 2015

Begin Construction .....July/August 2015

Complete Construction ..... September/October 2015

Project Closeout..... December 2015

TSIP Site Location Map: Agency St. & Columbus Dr. Site Specific

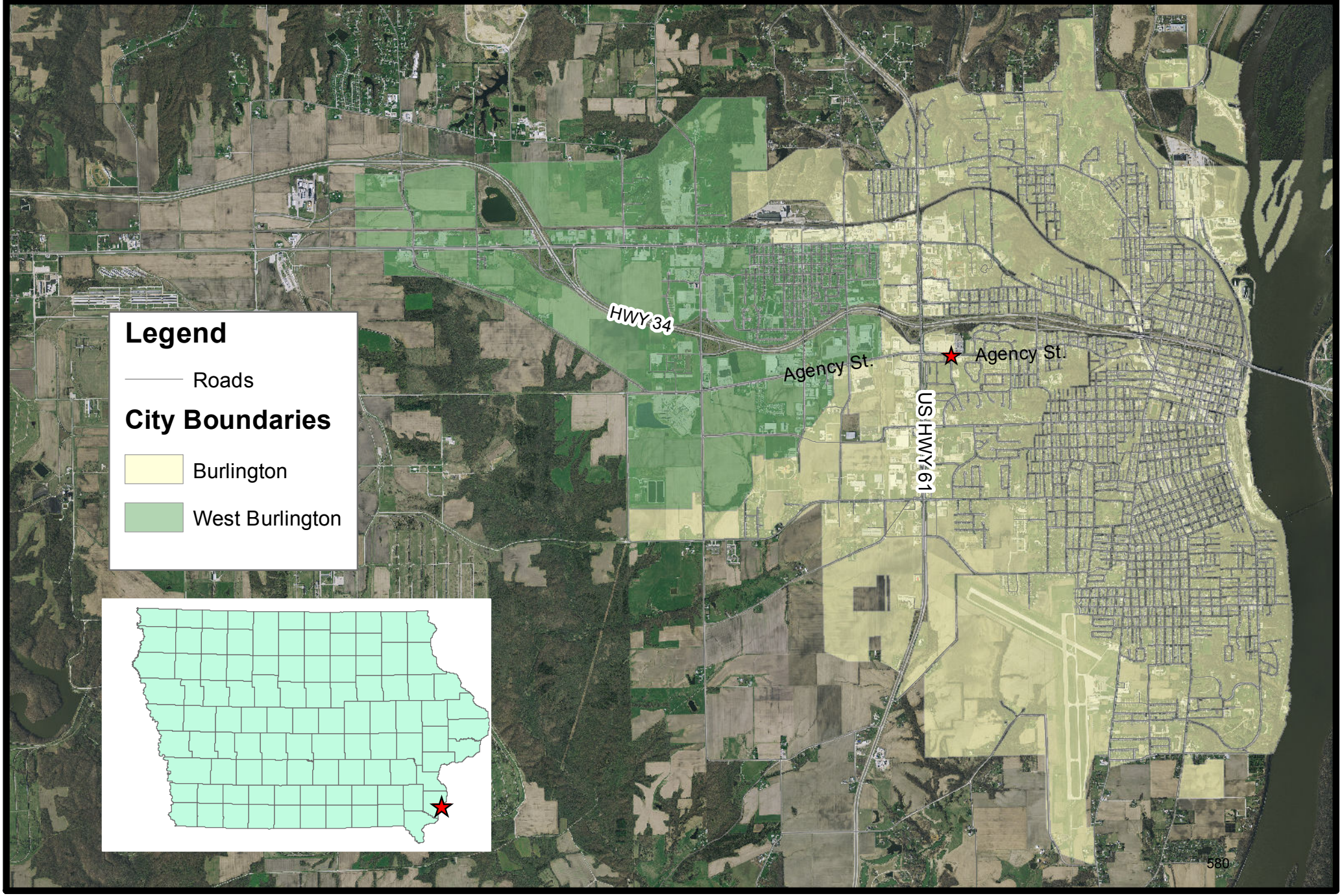
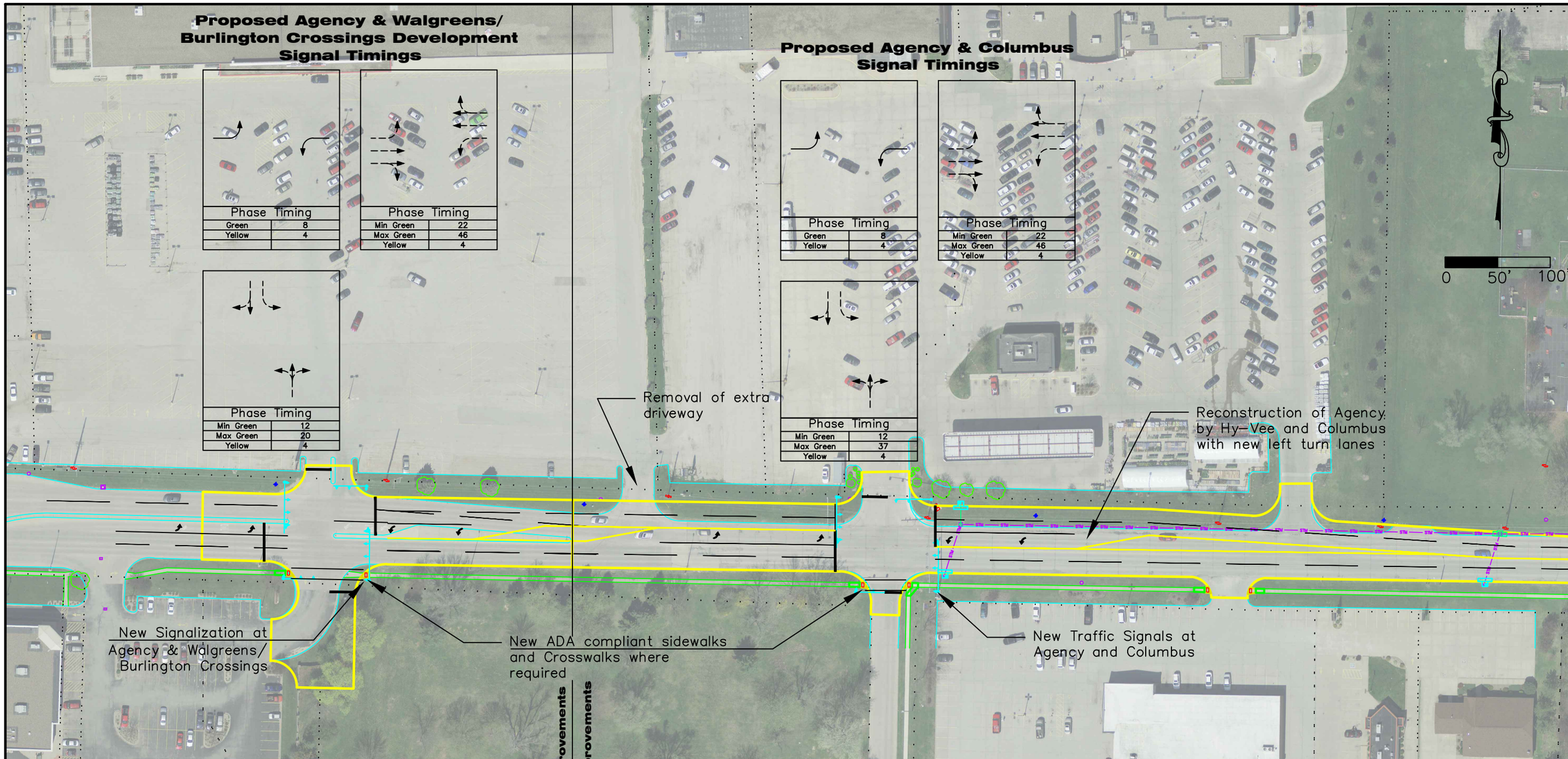


Figure 1 Agency & Columbus Looking NE

Figure 2 Agency & Columbus Looking NW

Figure 4 Agency & Columbus Looking SE

Figure 3 Agency & Columbus Looking SW



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

Reconstruction of Agency with turn lanes at Intersections with Columbus and Walgreens.

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

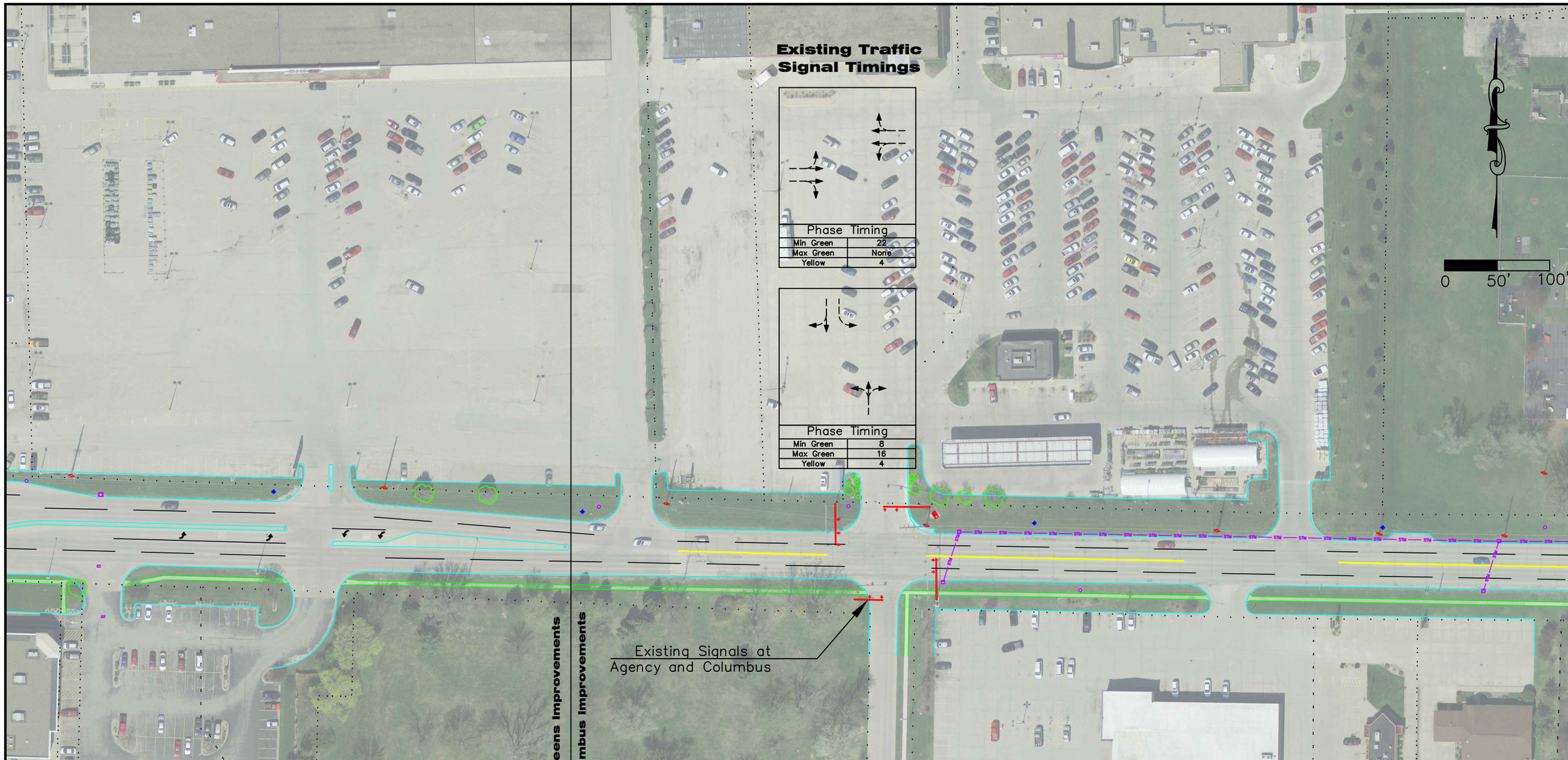
DESIGNED:

DRAWN: RT

Agency Site Specific TSIP Intersection Improvements ProposedConditions

SHEET: TBD

OF: TBD



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

DESIGNED:

DRAWN: RT

Agency Site Specific TSIP Intersection Improvements Existing Conditions

SHEET: TBD

OF: TBD

Aerial of Agency St. and Columbus Dr. Intersection

0 0.02 0.04 Miles

N

Iowa Department of Transportation

Abbreviated Crash Report

Columbus Drive and Agency Intersection

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
03/11/2004	2004212038	04-9348	Burlington	Minor	AGENCY ST AND COLUMBUS DR
04/05/2004	2004216014	04-12785	Burlington	PDO	AGENCY ST AND COLUMBUS DR
07/09/2004	2004231536	04-26034	Burlington	PDO	AGENCY ST AND COLUMBUS DR
07/22/2004	2004233202	04-27767	Burlington	PDO	AGENCY ST AND COLUMBUS DR
10/12/2004	2004248028	04-38471	Burlington	PDO	AGENCY ST AND COLUMBUS DR
12/22/2004	2004262317	04-46777	Burlington	PDO	AGENCY ST AND COLUMBUS DR
03/23/2005	2005213323	05-9573	Burlington	PDO	AGENCY ST AND COLUMBUS DR
06/18/2005	2005226705	05-20691	Burlington	PDO	AGENCY ST AND COLUMBUS DR
08/09/2005	2005236255	05-27413	Burlington	PDO	AGENCY ST AND COLUMBUS DR
08/31/2005	2005241866	05-30154	Burlington	Minor	AGENCY ST AND COLUMBUS DR
02/15/2006	2006206054	06-05462	Burlington	PDO	AGENCY ST AND COLUMBUS DR
02/24/2006	2006207775	06-6446	Burlington	PDO	AGENCY ST AND COLUMBUS DR
03/13/2006	2006210202	06-08532	Burlington	PDO	COLUMBUS DR and AGENCY ST
04/17/2006	2006215110	06-12815	Burlington	Poss/Unk	COLUMBUS DR AND AGENCY ST
06/12/2006	2006223686	06-20211	Burlington	PDO	COLUMBUS DR AND AGENCY ST
11/22/2006	2006252916	06-41864	Burlington	PDO	COLUMBUS DR AND AGENCY ST
06/01/2007	2007374375	07-18574	Burlington	Poss/Unk	COLUMBUS DR and AGENCY ST
06/15/2007	2007378104	07-20513	Burlington	Poss/Unk	COLUMBUS DR and AGENCY ST
10/18/2007	2007397785	07-37248	Burlington	PDO	COLUMBUS DR and AGENCY ST
11/02/2007	2007400332	07-39121	Burlington	PDO	COLUMBUS DR and AGENCY ST
01/02/2008	2008414054	08-00179	Burlington	Poss/Unk	COLUMBUS DR and AGENCY ST
02/02/2008	2008421965	08-03733	Burlington	PDO	COLUMBUS DR and AGENCY ST
02/03/2008	2008421966	08-03854	Burlington	PDO	COLUMBUS DR and AGENCY ST
03/09/2008	2008431123	08-07730	Burlington	PDO	COLUMBUS DR and AGENCY ST
04/20/2008	2008437115	08-13135	Burlington	Poss/Unk	COLUMBUS DR and AGENCY ST
06/27/2008	2008447958	08-22975	Burlington	Poss/Unk	COLUMBUS DR and AGENCY ST
07/30/2008	2008453643	08-27423	Burlington	Poss/Unk	AGENCY ST AND COLUMBUS DR
08/29/2008	2008457548	08-31703	Burlington	Minor	COLUMBUS DR and AGENCY ST
11/26/2008	2008473680	08-43109	Burlington	PDO	AGENCY ST and COLUMBUS DR
01/21/2009	2009487664	09-2207	Burlington	PDO	AGENCY ST and COLUMBUS DR
03/22/2009	2009499460	09-09828	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
06/05/2009	2009509769	09-19739	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR

Iowa Department of Transportation

Abbreviated Crash Report

Columbus Drive and Agency Intersection

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
08/21/2009	2009521615	09-30468	Burlington	PDO	AGENCY ST and COLUMBUS DR
09/02/2009	2009523340	09-32202	Burlington	PDO	AGENCY ST and COLUMBUS DR
11/23/2009	2009537840	09-42946	Burlington	PDO	AGENCY ST and COLUMBUS DR
06/01/2010	2010574396	10-19091	Burlington	PDO	AGENCY ST and COLUMBUS DR
04/15/2011	2011626302	11-13990	Burlington	PDO	AGENCY ST and COLUMBUS DR
07/15/2011	2011638775	11-26468	Burlington	PDO	AGENCY ST and COLUMBUS DR
09/16/2011	2011647568	11-35337	Burlington	PDO	AGENCY ST and COLUMBUS DR
06/20/2012	2012690832	12-20888	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
08/02/2012	2012697071	12-26732	Burlington	PDO	AGENCY ST and COLUMBUS DR
11/20/2012	2012713328	12-40111	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
12/21/2012	2012717739	12-43781	Burlington	PDO	AGENCY ST and COLUMBUS DR
12/21/2012	2012717913	12-43836	Burlington	PDO	AGENCY ST and COLUMBUS DR
12/22/2012	2012717918	1243902	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
06/06/2013	2013742639	13-20476	Burlington	Minor	AGENCY ST and COLUMBUS DR
06/14/2013	2013744008	13-21629	Burlington	PDO	AGENCY ST and COLUMBUS DR
07/04/2013	2013746849	13-24419	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
08/01/2013	2013750823	13-28283	Burlington	Poss/Unk	AGENCY ST and COLUMBUS DR
08/30/2013	2013755087	13-32412	Burlington	Minor	AGENCY ST and COLUMBUS DR
10/03/2013	2013760225	13-37286	Burlington	PDO	AGENCY ST and COLUMBUS DR
11/01/2013	2013764689	13-41308	Burlington	PDO	AGENCY ST and COLUMBUS DR
12/17/2013	2013774740	13-46785	Burlington	PDO	AGENCY ST and COLUMBUS DR
02/04/2014	2014782952	14-3916	Burlington	Poss/Unk	COLUMBUS DR
03/24/2014	2014791725	14-09641	Burlington	PDO	AGENCY ST AND COLUMBUS DR
07/07/2014	2014806291	14-23367	Burlington	Poss/Unk	AGENCY ST AND COLUMBUS DR

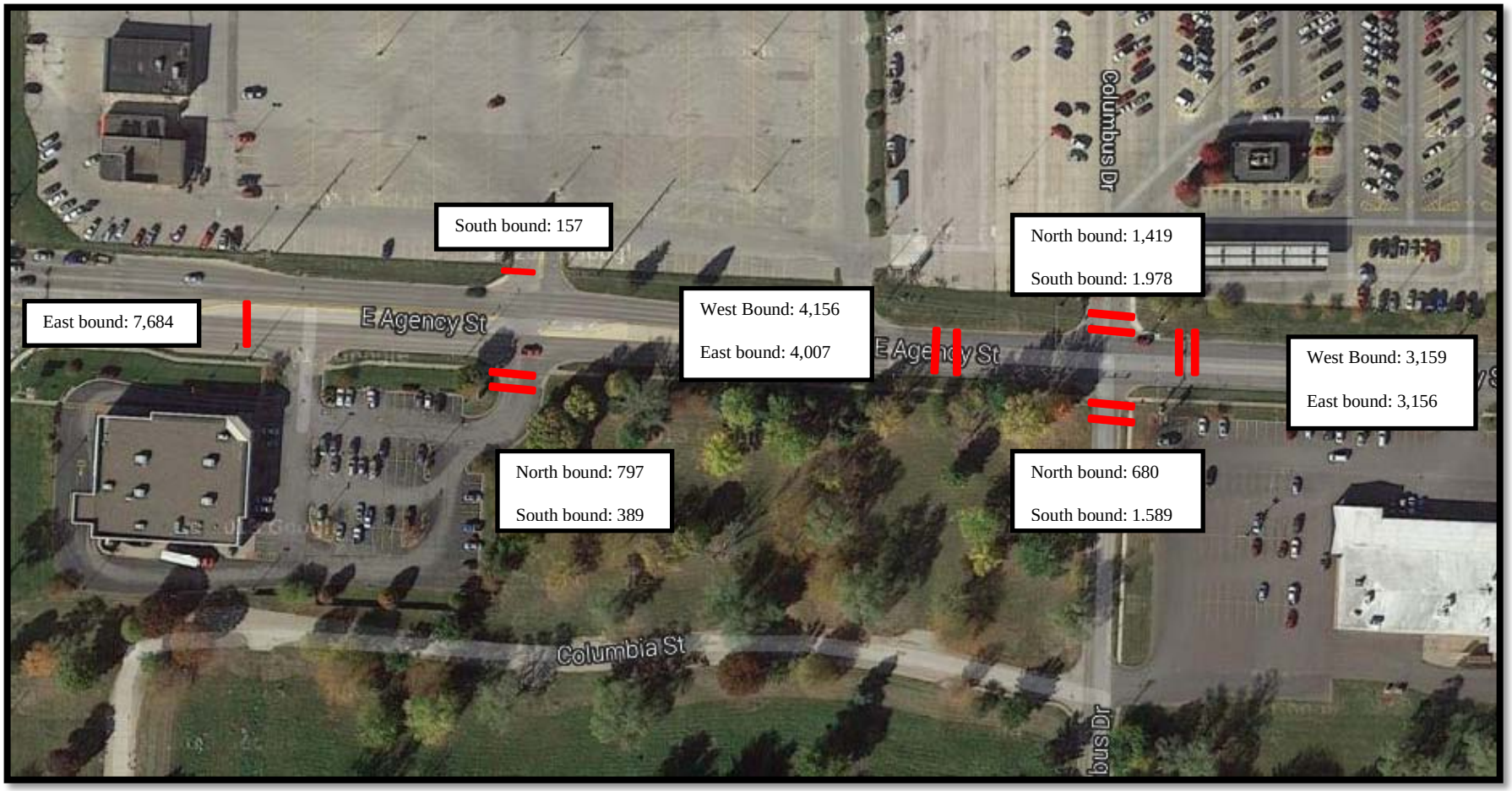
Selection Filter:

None

Analyst: Zach James

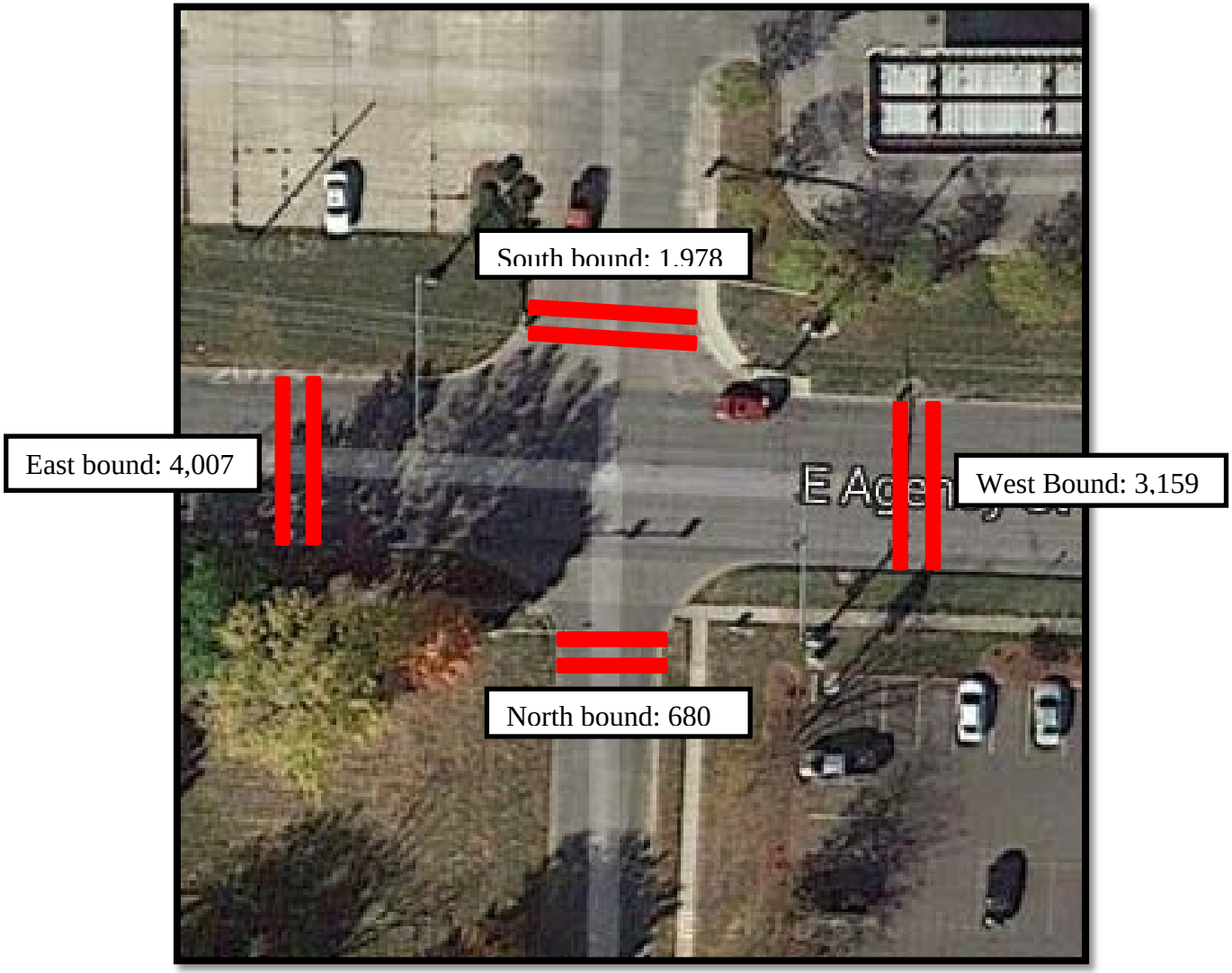
Notes: 75 Feet from Intersection - Abbreviated Report

Intersection Map and Traffic Counting Totals



*Traffic Count Conducted by the Southeast Iowa Regional Planning Commission on 7/23/14.

Agency St. and Columbus Dr. Intersection



*Traffic Count Conducted by the Southeast Iowa Regional Planning Commission on 7/23/14.

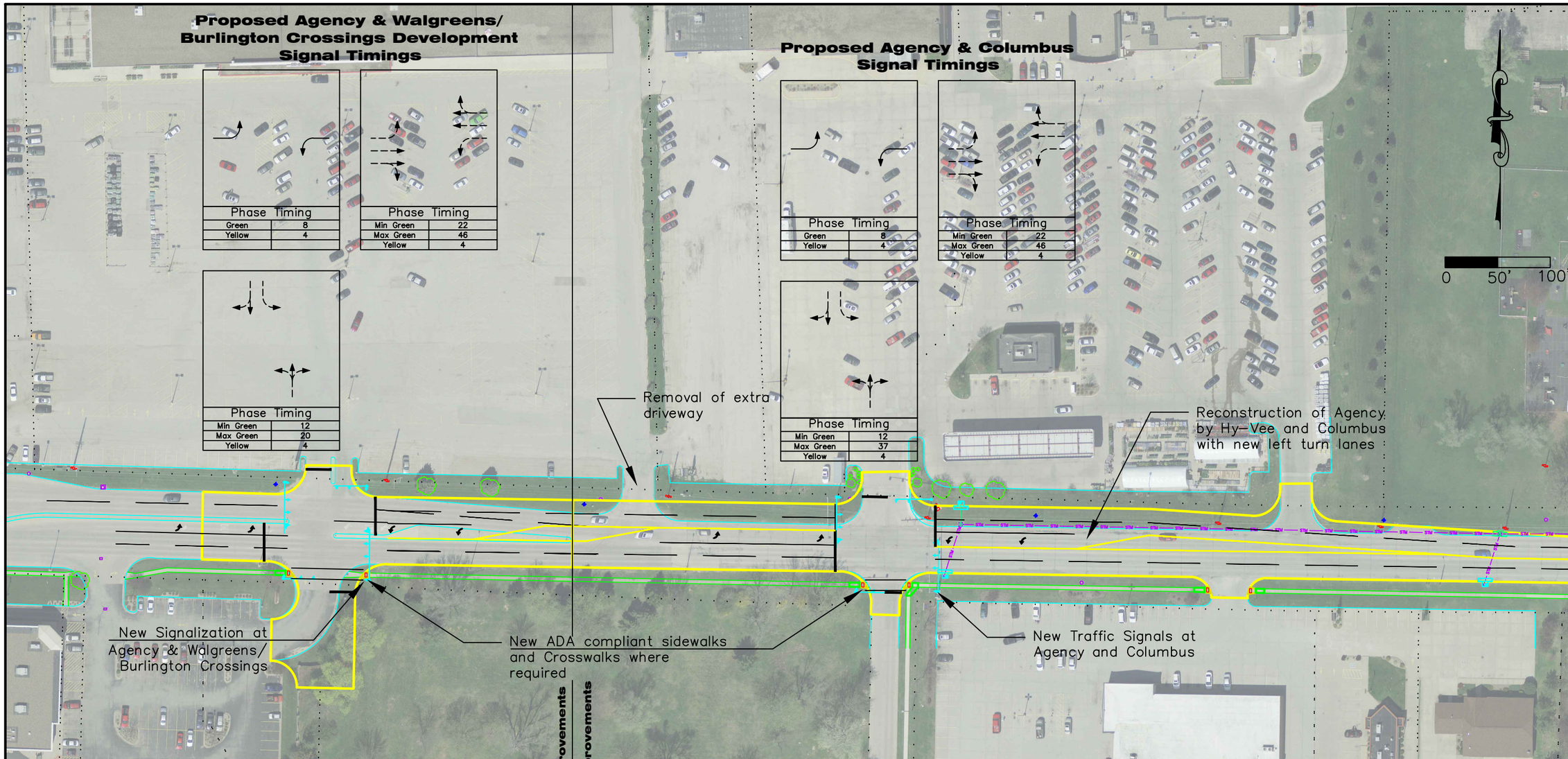
Hourly Break down of Agency St. & Columbus Dr. Intersection

Eastbound	
12PM	305
1PM	340
2PM	363
3PM	378
4PM	362
5PM	283
6PM	229
7PM	181
8PM	157
9PM	88
10PM	56
11PM	26
12PM	20
1AM	21
2AM	15
3AM	28
4AM	41
5AM	72
6AM	143
7AM	158
8AM	212
9AM	288
10AM	241
Totals	4007

Westbound	
12PM	268
1PM	226
2PM	227
3PM	238
4PM	221
5PM	253
6PM	212
7PM	143
8PM	103
9PM	78
10PM	43
11PM	16
12PM	12
1AM	15
2AM	12
3AM	7
4AM	28
5AM	57
6AM	116
7AM	146
8AM	155
9AM	195
10AM	207
11AM	181
Totals	3159

Southbound	
12PM	101
1PM	126
2PM	105
3PM	175
4PM	164
5PM	187
6PM	121
7PM	92
8PM	86
9PM	46
10PM	18
11PM	10
12PM	5
1AM	10
2AM	13
3AM	23
4AM	43
5AM	70
6AM	94
7AM	87
8AM	120
9AM	141
10AM	141
11AM	
Totals	1978

Northbound	
12PM	62
1PM	48
2PM	52
3PM	69
4PM	82
5PM	61
6PM	31
7PM	29
8PM	17
9PM	11
10PM	2
11PM	3
12PM	3
1AM	4
2AM	3
3AM	1
4AM	0
5AM	12
6AM	12
7AM	16
8AM	23
9AM	44
10AM	46
11AM	49
Totals	680



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

Reconstruction of Agency with turn lanes at Intersections with Columbus and Walgreens.

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

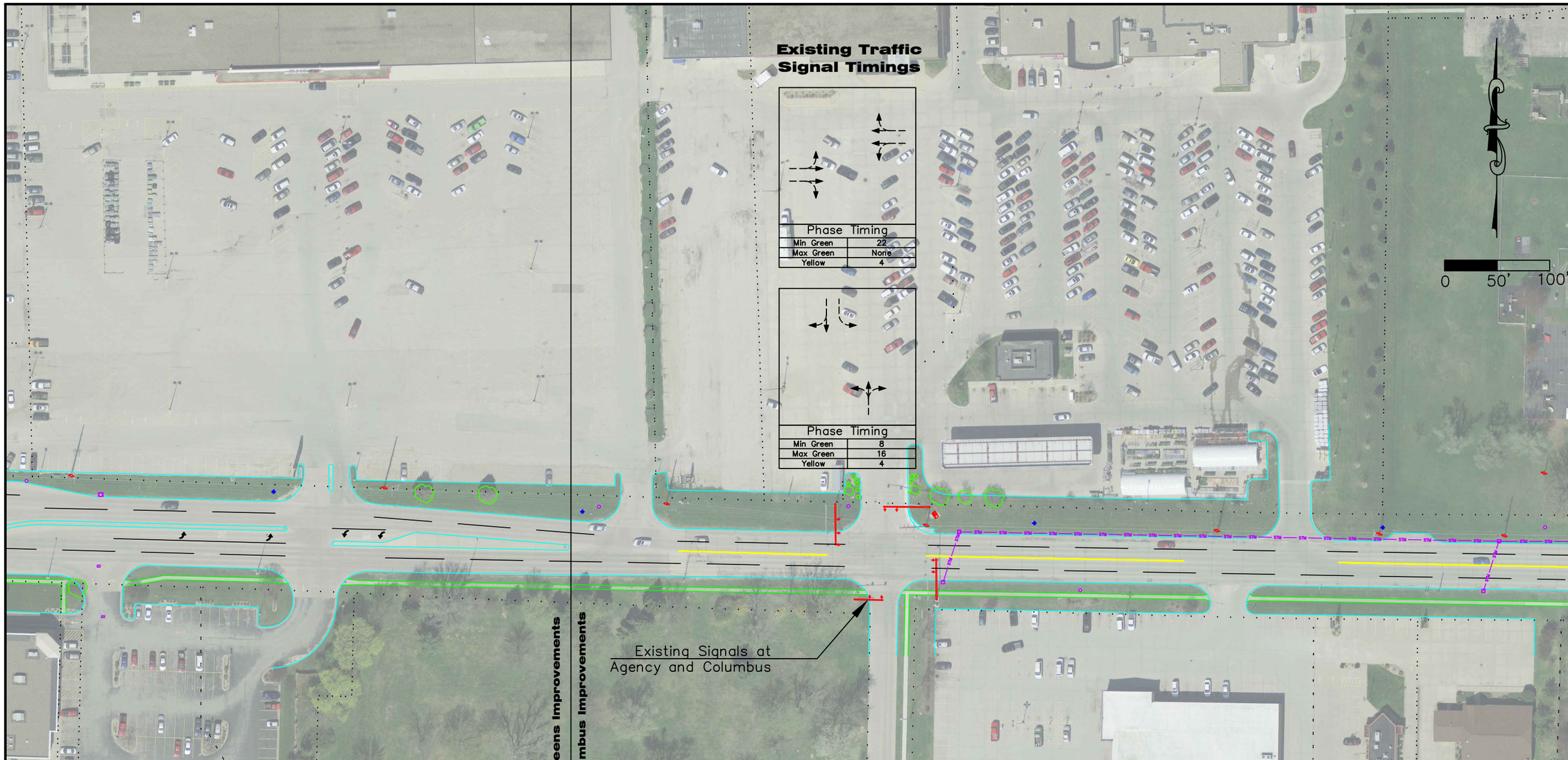
DESIGNED:

DRAWN: RT

Agency Site Specific TSIP Intersection Improvements ProposedConditions

SHEET: TBD

OF: TBD



Intersection Of Agency & Walgreens/Burlington Crossings Development

Limits of Agency & Walgreens Improvements

Limits of Agency and Columbus Improvements

Intersection Of Agency & Columbus

City of Burlington IOWA

REVISION:	DATE:	DESCRIPTION:	ARCH. LOCATION

DESIGNED:

DRAWN: RT

Agency Site Specific TSIP
Intersection Improvements
Existing Conditions

SHEET: TBD

OF: TBD

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Des Moines Prepared by: Zach James Date Prepared: Aug 13, 2014

Intersection: Columbus Drive and Agency Street

Improvement

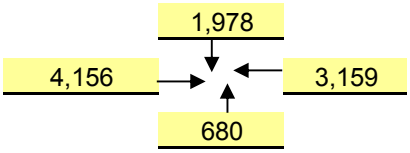
Proposed Improvement(s): New signal with left turn arrow, add left turn lanes, close access

$ 500,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	47	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: SEIRPC 7/23/2014 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



3,640,145	Current Annual Entering Veh., **AEV** = DEV * 365
12,169	veh / day, Final Year DEV, **FDEV**
80.15	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**
9,973	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004 First full year --> 2013 Last full year 10.4 years, Time Period, **T**

5 Additional months values as of Dec. 2007

0	Fatal Crashes	0	Fatalities @	$3,500,000	$	-
		0	Major Injuries @	$240,000	$	-
5	Injury Crashes	6	Minor Injuries @	$48,000	$	288,000
		28	Possible Injuries @	$25,000	$	700,000
35	Property Damage Only		(assumed cost per crash)	$2,700	$	-
		-OR-	enter all Property Costs of all crashes:		$	244,550
40	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,232,550

3.84	Current Crashes / Year, **AA** = TA / T	1.05	Crashes / MEV, Crash Rate, **CR**
$ 30,814	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
84.6	Total Expected Crashes, **TECR** = CR x TMEV	$ 817,069	Present Value of Avoided Crashes, **BENEFIT**
1.80	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 55,317	Crash Costs Avoided in First Year, AAR x AVC		
39.5	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 = $817,069 : $500,000 = **1.63** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project 2015/16 West Lincoln Way Intersection Improvements

Applicant City of Ames

Contact Person Damion Pregitzer PE, PTOE Title Traffic Engineer

Complete Mailing Address 515 Clark Ave.,
Ames, Iowa 50010

Phone 515-239-5275 (Area Code) E-Mail dpregitzer@city.ames.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 $ 1,019,000

Safety Funds Requested $ 500,000

A. Application Certification:

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 Ames

Signed: 8/15/2014

Signature Date Signed

Damion Pregitzer, PE (Traffic Enginer)

Typed Name

Attest: 8/15/2014

Signature Date Signed

John Joiner, PE (Public Works Director)

Typed Name

B. Narrative:

Introduction and Background
The Ames Area Metropolitan Planning Organization (MPO) conducted several visioning workshops while developing its 2035 Long Range Transportation Plan (LRTP) in 2010. The feedback and analysis gained during that process revealed that the intersection of Lincoln Way and Franklin Avenue had significant safe issues related to left-turn movements. This information prompted city officials to explore alternatives designed to help the local transportation system operate more safely and efficiently.

Existing Conditions
Lincoln Way is federally classified as an "Other Principal Arterial" street, which in this area is configured as a 4-lane undivided roadway with an 8-foot trail along the Southside and a 4-foot sidewalk along the North. Lincoln Way is one of the few continuous east-west arterial corridors in Ames. This segment serves as the main connection of the west Ames housing areas to Iowa State University (central Ames) as well as to business and service areas in Campustown, Downtown, and along the South Duff commercial corridor. Because of this, the traffic patterns are heavily weighted towards the through movements on Lincoln Way.

Franklin Avenue serves this area primarily as a residential street to collect traffic from the adjacent neighborhoods and provide access to Lincoln Way. At the intersection with Lincoln Way, traffic is currently control by a traffic signal that has permissive phasing both in the north-south and the east-west directions. It should be noted that this intersection can see moderate to high volumes of pedestrian and bicycle traffic during the school semesters.

Iowa DOT Annual Average Daily Traffic counts (2011) obtained for the proposed project area show that 13,400 cars traveled Lincoln Way between South Dakota Avenue and Franklin Avenue per day and 17,000 vehicles from Franklin Avenue east to Iowa State University. This area of Ames is expect to experience a high rate of growth in the next three to five years related most directly to the redevelopment of old Ames School district properties as well as significant growth within subdivisions in the west and southwest areas. The City of Ames overall will also see significant growth affecting this area due to high levels of ISU student enrollment, which is anticipated to top 38,000 students. In addition there is anticipated to be three to four thousand potential jobs created as part of the ISU research park expansion.

Proposed Project & Crash Analysis
Iowa DOT Traffic Safety Improvement Program funds are critical in helping the City's effort to improve the safety of this intersection by proving additional paving for new east-west left-turn lanes, as well as a protected left-turn phases at the traffic signal. The improvements will also provide ADA upgrades of the pedestrian signals to be audible and virbrotactical. This will include fully compliant ADA pedestrian ramps at all four corners and crossing areas. It should be noted that the City of Ames current standard for vehicle detection is using radar based units; this detection system will also be able to pick up on-street cyclists.

An evaluation of the crash history for Lincoln Way & Franklin Avenue was performed using the most current crash data from Iowa's statewide database (2004-2013). There were found to be 169 total crashes in those ten years, of which there was 14 Minor Injury, 30 Possible Injury, and 126 Property Damage Only crashes. A "major cause" and "time of day" summary have been provided under Section I of this application. **The data showed an overrepresentation of angle and broadside accidents for similar Ames intersection with these traffic volumes.**

The crash experience along Lincoln Way and Franklin Avenue appears to be attributed to the existing geometry and the safety issues caused by the four-lane cross section of Lincoln Way. Of the 169 accidents that occurred in the 10-year time period most notable were 77 Rear-End (45.6%), 45 Angle (26.6%), 17 Broadside (10.1%), and 16 Side-Swipe Same Direction (9.5%) that are likely related to the queuing that occurs at 4-lane approaches without left-turn movements channelized (example = 13th Street and Grand Avenue intersection).

Field observations by Ames Traffic Engineering staff found that when left-turn movements occur they have to yield to the much higher through volumes until there is a gap large enough for them to turn. The wait is often long enough to frustrate the motorist into taking unnecessary risk when turning. A related issue is those vehicles queued behind the left-turners wanting to proceed through the intersection also take unnecessary risk and will dart into the right-hand lane to go around the turning vehicle. This situations in various forms are what is causing the Angle, Broadside, and Side-Swipe accidents. It is likely that a good portion of the Rear-End accidents are also attributable to the scenario described above.

This grant application utilized the benefit/cost worksheet provided by the Iowa DOT and resulted in a relatively high **B/C ratio of 4.05:1** for the 20 year life of this project. This is believed to be a conservative value based upon past and anticipated future growth in development for the area. This area of Ames has and continues to exceed expected growth rates as it is a highly desirable area for development of student and moderate incoming house. The westbound left-turn movement is of the greatest concern as it will experience some of the highest growth as in-fill residential development occurs south of Lincoln Way.

The proposed improvements to widen Lincoln Way at its intersection with Franklin Avenue with additional lanes and upgraded traffic signal controls will significantly improve safety by providing protection for left-turn movements as well as dedicated space for those vehicles so as to not impede Lincoln Way traffic. The project will also enhance the awareness of bicyclists and pedestrians by way of providing additional detection equipment, signs & pavement markings.

C. Itemized Breakdown of All Costs:

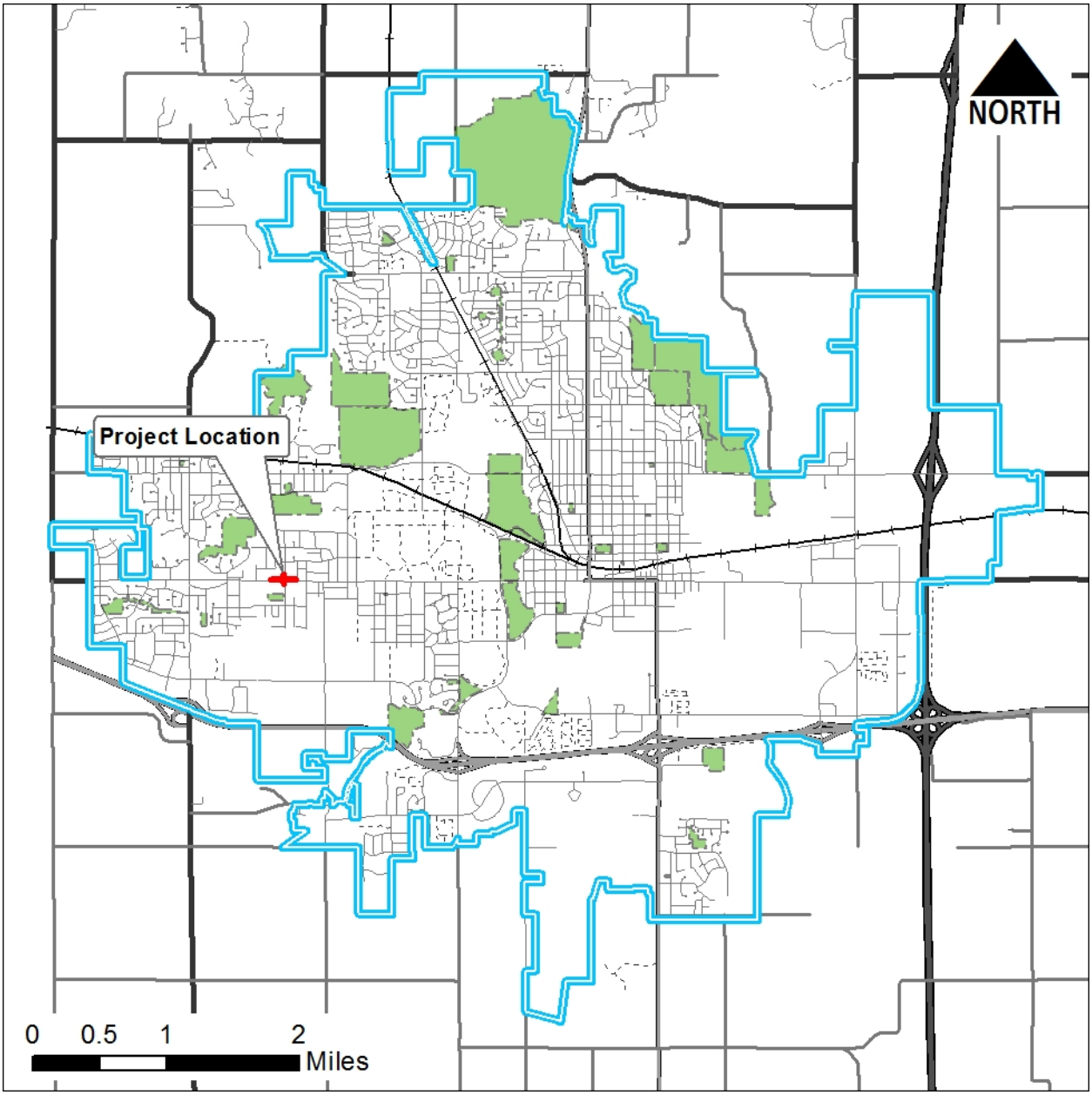
Work Activity		***Estimated Cost***
General (Traffic Control / Mobilization / Staking)	$	94,000
Underground Utilities (Storm / Water / Sanitary)	$	110,000
Streets and Related Work (Paving / Grading / Restoration)	$	480,000
Traffic Signal (Poles / Footings / Lights / Equipment)	$	250,000
Right-of-Way	$	85,000
Total Project Cost	$	1,019,000

Project Funding		
Traffic Safety Improvement Program	$	500,000
Local Match	$	519,000

D. Time Schedule:

Dates:	Project Activity:
August 2014	Submit TSIP Grant Application
September 2014	Prepare Plans and Specifications
October 2014	Iowa DOT Plan Review
November 2014	Final Plan Revisions
December 2014	Grant Approval from Commission
February 2015	Bid Letting
March 2015	Award Project
May 2015	Begin Construction
November 2015	Project Completion

E. Map (City of Ames – West Lincoln Way):



F. Color Pictures:

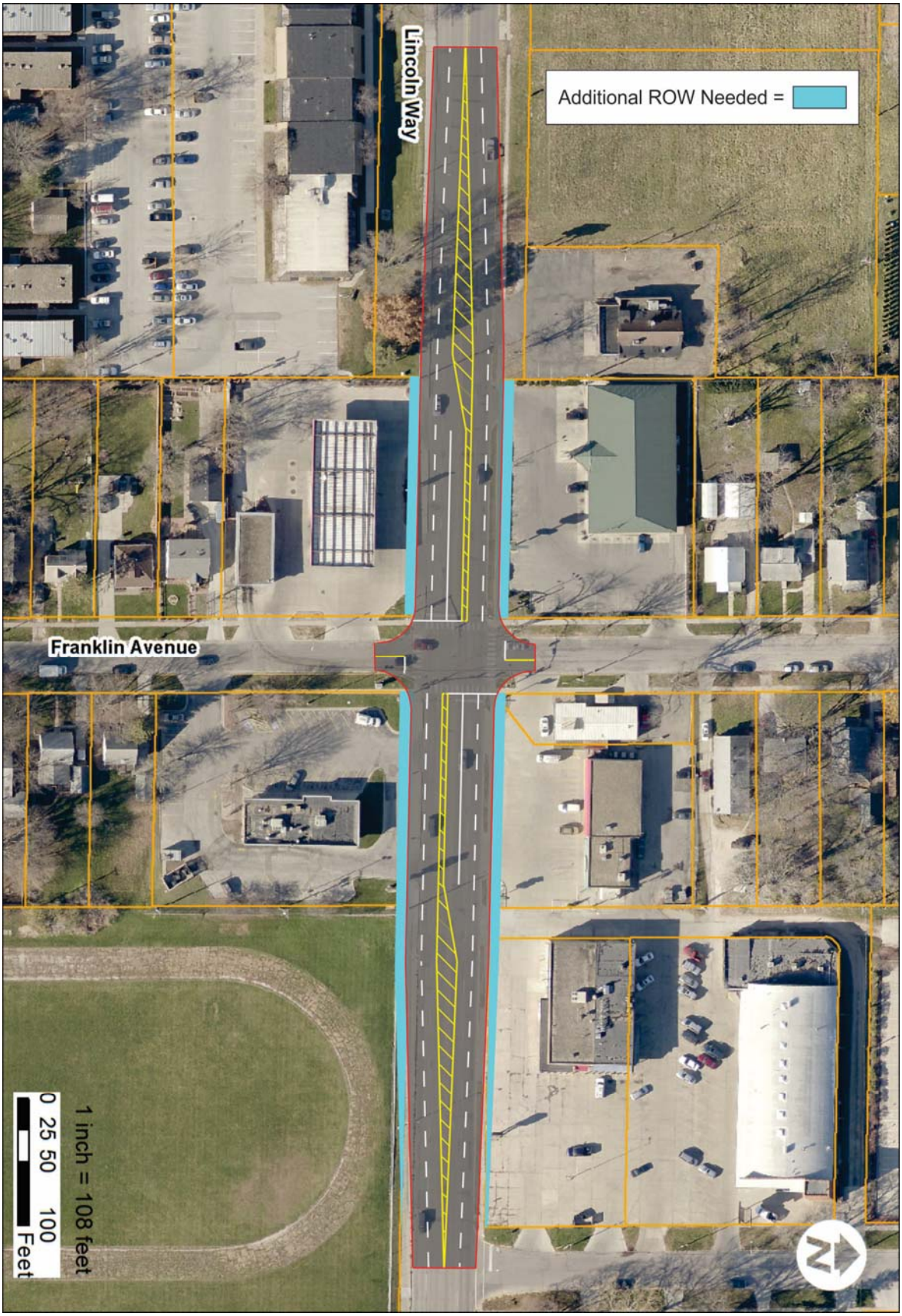
Figure 1: Westbound Approach

Figure 2: Eastbound Approach

Figure 3: Northbound Approach

Figure 4: Southbound Approach

G. Plan View:


Additional ROW Needed =
Lincoln Way
Franklin Avenue
1 inch = 108 feet
0 25 50 100
Feet

H. Aerial Photographs:

I. Summary of Injury Crashes (3-Year:2013-2011):

Iowa Department of Transportation

Driver and Time Summary

Lincoln Way & Franklin Ave

Report Version 1.0 Aug 2006

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	1	1	2	8	1	-	-	15	9
MON	-	-	1	1	-	2	1	7	9	4	4	-	-	29	17
TUE	-	-	-	-	-	1	5	2	11	6	1	-	-	26	15
WED	-	1	-	1	2	-	-	4	3	3	1	1	-	16	9
THU	-	-	-	-	1	2	4	2	6	5	4	1	-	25	15
FRI	1	1	-	2	1	4	5	4	11	6	3	-	-	38	22
SAT	-	-	-	-	1	1	3	1	2	4	4	4	-	20	12
Tot.	2	2	1	4	5	11	19	21	44	36	18	6		169	
%	1	1	1	2	3	7	11	12	26	21	11	4			100

Driver Age/Gender Summary:

Age	Male	Female	NR	Drivers	%
<14	-	-	-		
14	1	-	-	1	0
15	-	-	-		
16	1	8	-	9	3
17	3	3	-	6	2
18	3	5	-	8	2
19	27	13	-	40	11
20	15	10	-	25	7
21 to 24	55	57	1	113	32
25 to 29	31	10	-	41	12
30 to 34	14	6	1	21	6
35 to 39	5	5	-	10	3
40 to 44	12	7	1	20	6
45 to 49	4	5	1	10	3
50 to 54	6	4	-	10	3
55 to 59	7	8	-	15	4
60 to 64	3	2	-	5	1
65 to 69	-	2	-	2	1
70 to 74	3	1	-	4	1
75 to 79	2	-	-	2	1
80 to 84	-	1	-	1	0
85 to 89	-	1	-	1	0
90 to 94	-	1	-	1	0
95 plus	-	-	-		
NR	2	-	9	11	3
Drivers	194	149	13	356	
%	54	42	4		100

Drug/Alcohol Summary:

	Total	%
Drug		
Alcohol, Less than Statutory	1	1
Alcohol, Statutory	2	1
Drug/Alcohol, Less than Statutory		
Drug/Alcohol, Statutory		
Refused	2	1
Under Influence of Alc/Drugs/Meds		
None Indicated	164	97
Total Crashes	169	100

Fixed Object Struck Summary:

	Vehs.	%
Bridge/Bridge rail/Overpass		
Underpass/Structure Support		
Culvert		
Ditch/Embankment		
Curb/Island/Raised Median		
Guardrail		
Concrete Barrier		
Tree	2	1
Pole - Utility/Light/Etc	1	0
Sign Post	1	0
Mailbox		
Impact Attenuator		
Other Fixed Object	1	0
None	351	99
Total Vehicles	356	100

Selection Filter:

((YEAR <> 2014))

Analyst: DNP

Notes: 2004 - 2013

8/11/2014 **Crash Mapping Analysis Tool** **Page:** 1 of 1

Iowa Department of Transportation

Major Cause Summary

Lincoln Way & Franklin Ave

Report Version 1.1 Jan 2005

Analysis Years: 2004 [17], 2005 [20], 2006 [15], 2007 [12], 2008 [19], 2009 [27], 2010 [16], 2011 [19], 2012 [13], 2013 [11]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	14
Possible/Unknown	30
PDO	125
Total Crashes	169

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	16
Possible	42
Unknown	2
Total Injuries	60

TOT Property Damage: $756,450

AVG Property Damage: $4,476

Surface Condition Summary:

Dry	124
Wet	23
Ice	5
Snow	10
Slush	6
Sand/Dirt/Oil/Gravel	-
Water	-
Other	1
Unknown	-
Not Reported	-
Total Crashes	169

Major Cause Summary:

	Animal		Improper Backing
10	Ran Traffic Signal		Illegally Parked/Unattended
	Ran Stop Sign	4	Swerving/Evasive Action
1	Crossed Centerline		Over-Correcting/Over-Steering
	FTYROW: At Uncontrolled Intersection		Downhill Runaway
1	FTYROW: Making Right Turn on Red Signal		Equipment Failure
	FTYROW: From Stop Sign		Separation of Units
	FTYROW: From Yield Sign	1	Ran Off Road - Right
41	FTYROW: Making Left Turn		Ran Off Road - Straight
5	FTYROW: From Driveway		Ran Off Road - Left
1	FTYROW: From Parked Position	4	Lost Control
2	FTYROW: To Pedestrian		Inattentive/Distracted By: Passenger
5	FTYROW: Other (explain in narrative)	2	Inattentive/Distracted By: Use of Phone or Other
1	Traveling Wrong Way or on Wrong Side of Rd	1	Inattentive/Distracted By: Fallen Object
25	Driving Too Fast for Conditions		Inattentive/Distracted By: Fatigued/Asleep
	Exceeded Authorized Speed		Other: Vision Obstructed
4	Made Improper Turn		Oversized Load/ Oversized Vehicle
	Improper Lane Change		Cargo/Equipment Loss or Shift
40	Followed Too Close	16	Other: Other Improper Action
	Disregarded Railroad Signal	3	Unknown
	Disregarded Warning Sign	1	Other: No Improper Action
1	Operating Vehicle in Reckless/Aggressive Manner		None Indicated

Selection Filter:

((YEAR <> 2014))

Analyst: DNP

Notes: 2004 - 2013

8/11/2014 **Crash Mapping Analysis Tool** **Page:** 1 of 1

Iowa Department of Transportation

Abbreviated Crash Report

Lincoln Way & Franklin Ave

Report Version: 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
02/03/2004	2004205182	04-01903	Ames	Poss/Unk	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
02/17/2004	2004208858	04-2851	Ames	PDO	LINCOLN WAY and S FRANKLIN and N FRANKLIN
02/20/2004	2004209792	04-3009	Ames	PDO	LINCOLN WAY measuring 100 Feet West from LINCOLN WAY and S FRANKLIN
03/27/2004	2004215220	04-5279	Ames	PDO	LINCOLN WAY
04/25/2004	2004220206	04-07238	Ames	PDO	LINCOLN WAY MEASURING 98 FEET EAST FROM LINCOLN WAY AND S FRANKLIN
05/15/2004	2004222287	04-8499	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
05/20/2004	2004223408	04-08785	Ames	Poss/Unk	LINCOLN WAY
06/22/2004	2004229595	04-10928	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
07/05/2004	2004231292	04-11720	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
07/17/2004	2004233187	04-12537	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
08/02/2004	2004237672	04-13494	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
08/05/2004	2004237679	04-13728	Ames	Minor	LINCOLN WAY
08/27/2004	2004241322	04-15301	Ames	PDO	LINCOLN WAY
09/14/2004	2004243057	04-16612	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
09/17/2004	2004243962	04-16806	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
11/01/2004	2004253592	04-19943	Ames	PDO	LINCOLN WAY
12/22/2004	2004264725	04-22986	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
01/10/2005	2005202793	05-535	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
01/11/2005	2005202795	05-586	Ames	PDO	LINCOLN WAY
01/13/2005	2005202797	05-696	Ames	PDO	LINCOLN WAY
01/31/2005	2005205065	05-1776	Ames	Poss/Unk	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
02/04/2005	2005205839	05-1978	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
02/11/2005	2005207271	05-2445	Ames	PDO	3300 BLK LINCOLN WAY
02/12/2005	2005207277	05-2567	Ames	PDO	LINCOLN WAY
03/25/2005	2005213622	05-05152	Ames	Poss/Unk	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
04/17/2005	2005216731	05-6918	Ames	PDO	LINCOLN WAY
04/18/2005	2005217151	05-6997	Ames	PDO	LINCOLN WAY
04/29/2005	2005218472	05-7639	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
06/20/2005	2005228260	05-11406	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
07/07/2005	2005231474	05-12549	Ames	Poss/Unk	3400 BLOCK LINCOLN WAY
07/29/2005	2005234205	05-14036	Ames	PDO	LINCOLN WAY
09/05/2005	2005240559	05-017086	Ames	Poss/Unk	LINCOLN WAY JUST WEST OF FRANKLIN
10/13/2005	2005247412	05-20216	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
10/28/2005	2005250487	05-21421	Ames	PDO	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
11/03/2005	2005253818	05-008749	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE.
11/17/2005	2005256078	05-23031	Ames	PDO	S FRANKLIN
12/11/2005	2005259392	05-24665	Ames	PDO	LINCOLN WAY
01/17/2006	2006215612	06-1224	Ames	PDO	0 / LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
01/20/2006	2006203500	06-1423	Ames	PDO	LINCOLN WAY
03/06/2006	2006209349	06-04899	Ames	Poss/Unk	LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
03/30/2006	2006213198	06-6556	Ames	Poss/Unk	0 / LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
04/13/2006	2006215384	06-7621	Ames	PDO	0 / LINCOLN WAY
04/29/2006	2006231991	06-8845	Ames	PDO	0 / LINCOLN WAY
06/23/2006	2006227815	06-12715	Ames	PDO	LINCOLN WAY and S FRANKLIN and N FRANKLIN
06/27/2006	2006226812	06-13037	Ames	PDO	0 / LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
06/29/2006	2006227814	06-013192	Ames	PDO	LINCOLN WAY
09/07/2006	2006238129	06-18921	Ames	PDO	0 / LINCOLN WAY AND S FRANKLIN AND N FRANKLIN
09/22/2006	2006241135	06-20141	Ames	PDO	0 / LINCOLN WAY
10/13/2006	2006245456	06-21879	Ames	Poss/Unk	LINCOLN WAY AND FRANKLIN AVE
10/18/2006	2006246735	06-22267	Ames	PDO	0 / LINCOLN WAY
11/10/2006	2006250071	06-24022	Ames	Poss/Unk	0 / LINCOLN WAY MEASURING 98 FEET EAST FROM 0 / LINCOLN WAY AND S
11/20/2006	2006254322	06-24740	Ames	PDO	0 / LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
01/21/2007	2007203054	07-1486	Ames	PDO	0 / LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
03/31/2007	2007216108	07-6551	Ames	PDO	0 / LINCOLN WAY
04/13/2007	2007367030	07-7433	Ames	Minor	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
05/20/2007	2007373646	07-10747	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
05/31/2007	2007374561	07-11571	Ames	Minor	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
07/05/2007	2007380687	07-14179	Ames	Poss/Unk	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
08/24/2007	2007389124	07-18032	Ames	PDO	0 / LINCOLN WAY
10/05/2007	2007395663	07-21774	Ames	Minor	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
10/14/2007	2007397044	07-22482	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
12/04/2007	2007410281	07-26196	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
12/05/2007	2007407801	07-26421	Ames	PDO	S FRANKLIN AVE
12/09/2007	2007411061	07-26574	Ames	Poss/Unk	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE

01/11/2008	2008416922	08-646	Ames	PDO	3300LK LINCOLN WAY
01/12/2008	2008416925	08-728	Ames	PDO	0 / LINCOLN WAY
01/25/2008	2008421348	08-1786	Ames	PDO	0 / LINCOLN WAY
02/09/2008	2008425262	08-2873	Ames	Poss/Unk	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
02/28/2008	2008434737	08-002446	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE
04/30/2008	2008438918	08-9065	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
05/26/2008	2008442674	08-11183	Ames	PDO	0 / LINCOLN WAY
07/11/2008	2008452312	08-14682	Ames	Minor	LINCOLN WAY
07/31/2008	2008453147	08-16175	Ames	PDO	LINCOLN WAY
08/01/2008	2008453757	08-16212	Ames	Minor	0 / LINCOLN WAY
08/04/2008	2008453753	08-16470	Ames	PDO	FRANKLIN AVE
08/14/2008	2008455961	08-17146	Ames	PDO	0 / LINCOLN WAY
08/19/2008	2008458102	08-17565	Ames	Minor	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
08/30/2008	2008458113	08-18707	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
10/11/2008	2008464860	08-22388	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
10/16/2008	2008466140	08-22790	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
10/31/2008	2008468562	08-24035	Ames	PDO	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
11/21/2008	2008473974	08-25624	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
11/26/2008	2008473957	08-25934	Ames	PDO	LINCOLN WAY
01/03/2009	2009482698	09-205	Ames	PDO	FRANKLIN AVE
03/30/2009	2009500093	09-06615	Ames	Poss/Unk	0 / LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
03/30/2009	2009500097	09-6628	Ames	PDO	S FRANKLIN AVE and FRANKLIN AVE and LINCOLN WAY
03/30/2009	2009500098	09-6652	Ames	PDO	S FRANKLIN AVE and FRANKLIN AVE and LINCOLN WAY
04/05/2009	2009501151	09-7169	Ames	PDO	S FRANKLIN AVE and FRANKLIN AVE and LINCOLN WAY
04/11/2009	2009504765	09-7649	Ames	PDO	0 / LINCOLN WAY
04/17/2009	2009502731	09-8136	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
05/01/2009	2009504774	09-9566	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
05/11/2009	2009505990	09-10498	Ames	PDO	LINCOLN WAY
05/19/2009	2009507562	09-11072	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
06/11/2009	2009511494	09-12935	Ames	Poss/Unk	S FRANKLIN AVE
06/12/2009	2009511497	09-13078	Ames	PDO	LINCOLN WAY and S FRANKLIN AVE and FRANKLIN AVE
06/14/2009	2009511500	09-13219	Ames	PDO	LINCOLN WAY
07/26/2009	2009518380	09-16512	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
07/28/2009	2009518382	09-16650	Ames	Poss/Unk	LINCOLN WAY AND SOUTH FRANKLIN AVENUE
08/07/2009	2009519629	09-17477	Ames	PDO	LINCOLN WAY
08/31/2009	2009523040	09-19474	Ames	PDO	3300 BLOCK LINCOLN WAY
09/12/2009	2009525347	09-20599	Ames	PDO	3300 BLK LINCOLNWAY
09/18/2009	2009527202	09-21117	Ames	Minor	LINCOLN WAY E OF FRANKLIN
09/26/2009	2009527211	09-21801	Ames	Minor	3335 LINCOLN WAY
10/03/2009	2009528604	09-22305	Ames	PDO	LINCOLN WAY
10/06/2009	2009529567	09-22516	Ames	Poss/Unk	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
10/15/2009	2009530825	09-23076	Ames	PDO	LINCOLN WAY
11/16/2009	2009536605	09-025502	Ames	Poss/Unk	LINCOLN WAY
11/18/2009	2009536834	09-25620	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
12/14/2009	2009542252	09-27516	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
12/14/2009	2009542257	09-27540	Ames	PDO	LINCOLN WAY 3300 BLOCK
01/01/2010	2010546127	10-19	Ames	PDO	S FRANKLIN AVE
01/04/2010	2010549436	10-168	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
01/05/2010	2010549439	10-280	Ames	PDO	FRANKLIN AVE
01/11/2010	2010549463	10-704	Ames	PDO	LINCOLN WAY
01/16/2010	2010549878	10-1098	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
02/02/2010	2010554152	10-2260	Ames	PDO	LINCOLN WAY
02/09/2010	2010555842	10-2776	Ames	PDO	LINCOLN WAY
03/21/2010	2010563026	10-05742	Ames	Minor	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
03/29/2010	2010564296	10-06436	Ames	Poss/Unk	LINCOLN WAY 3300 BLOCK
04/06/2010	2010565449	10-7120	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
04/06/2010	2010565450	10-7121	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
04/23/2010	2010568794	10-8890	Ames	PDO	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
06/23/2010	2010578047	10-13646	Ames	Minor	LINCOLN WAY AND FRANKLIN AVE AND S FRANKLIN AVE
09/27/2010	2010592821	10-21584	Ames	PDO	LINCOLN WAY
10/06/2010	2010595916	10-012199	Ames	Poss/Unk	LINCOLN WAY & FRANKLYN AVE.
12/16/2010	2010607424	10-27724	Ames	PDO	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
01/12/2011	2011612475	11-710	Ames	Poss/Unk	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
01/21/2011	2011613833	11-1373	Ames	PDO	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE

03/09/2011	2011622681	11-4981	Ames	Poss/Unk	FRANKLIN AVE
03/16/2011	2011622359	11-5485	Ames	PDO	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
03/22/2011	2011623917	11-5926	Ames	PDO	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
03/27/2011	2011623918	11-6248	Ames	PDO	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
04/05/2011	2011625080	11-6988	Ames	Poss/Unk	LINCOLN WAY
04/05/2011	2011625081	11-6991	Ames	PDO	LINCOLN WAY
05/04/2011	2011629438	11-9517	Ames	Minor	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
06/03/2011	2011633252	11-11925	Ames	PDO	LINCOLN WAY
09/19/2011	2011648256	11-21550	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
09/20/2011	2011648257	11-21595	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
10/02/2011	2011650482	11-22712	Ames	Poss/Unk	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
10/03/2011	2011650018	11-22764	Ames	PDO	LINCOLN WAY
10/06/2011	2011650806	11-22978	Ames	PDO	LINCOLN WAY
10/10/2011	2011651695	11-23364	Ames	PDO	LINCOLN WAY
10/15/2011	2011652207	11-23738	Ames	Poss/Unk	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
10/19/2011	2011653298	11-24059	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
11/08/2011	2011656762	11-25665	Ames	Poss/Unk	LINCOLN WAY
01/13/2012	2012667621	12-934	Ames	PDO	LINCOLN WAY
02/21/2012	2012674113	12-003839	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
02/23/2012	2012674478	12-3958	Ames	Poss/Unk	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
05/04/2012	2012684430	12-9792	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
05/22/2012	2012687433	12-11190	Ames	Minor	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
08/06/2012	2012698371	12-013545	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY MEASURING 0 FEET EAST
08/16/2012	2012699525	12-013743	Ames	Poss/Unk	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
08/25/2012	2012700473	12-013941	Ames	PDO	LINCOLN WAY
09/21/2012	2012704784	12-14500	Ames	PDO	LINCOLN WAY/FRANKLIN
10/05/2012	2012706384	12-014801	Ames	Poss/Unk	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
11/03/2012	2012713935	12-15362	Ames	PDO	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
11/29/2012	2012715129	12-015810	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
12/14/2012	2012717246	12-016067	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY
02/24/2013	2013728510	13-981	Ames	PDO	LINCOLN WAY
04/23/2013	2013736668	13-002131	Ames	Poss/Unk	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
04/23/2013	2013736669	13-002132	Ames	PDO	LINCOLN WAY
05/02/2013	2013737567	13-002286	Ames	PDO	LINCOLN WAY
05/26/2013	2013741357	13-002707	Ames	PDO	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
07/29/2013	2013750929	13-003775	Ames	PDO	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
08/23/2013	2013754601	13-4219	Ames	PDO	FRANKLIN AVE AND LINCOLN WAY
09/04/2013	2013756284	13-004524	Ames	Minor	LINCOLN WAY AND S FRANKLIN AVE AND FRANKLIN AVE
10/02/2013	2013761901	13-005110	Ames	PDO	LINCOLN WAY
10/30/2013	2013764377	13-001735	Ames	PDO	S FRANKLIN AVE AND FRANKLIN AVE AND LINCOLN WAY
11/02/2013	2013765888	13-005687	Ames	PDO	FRANKLIN AVE AND S FRANKLIN AVE AND LINCOLN WAY

Selection Filter:
((YEAR <> 2014))

Analyst: DNP

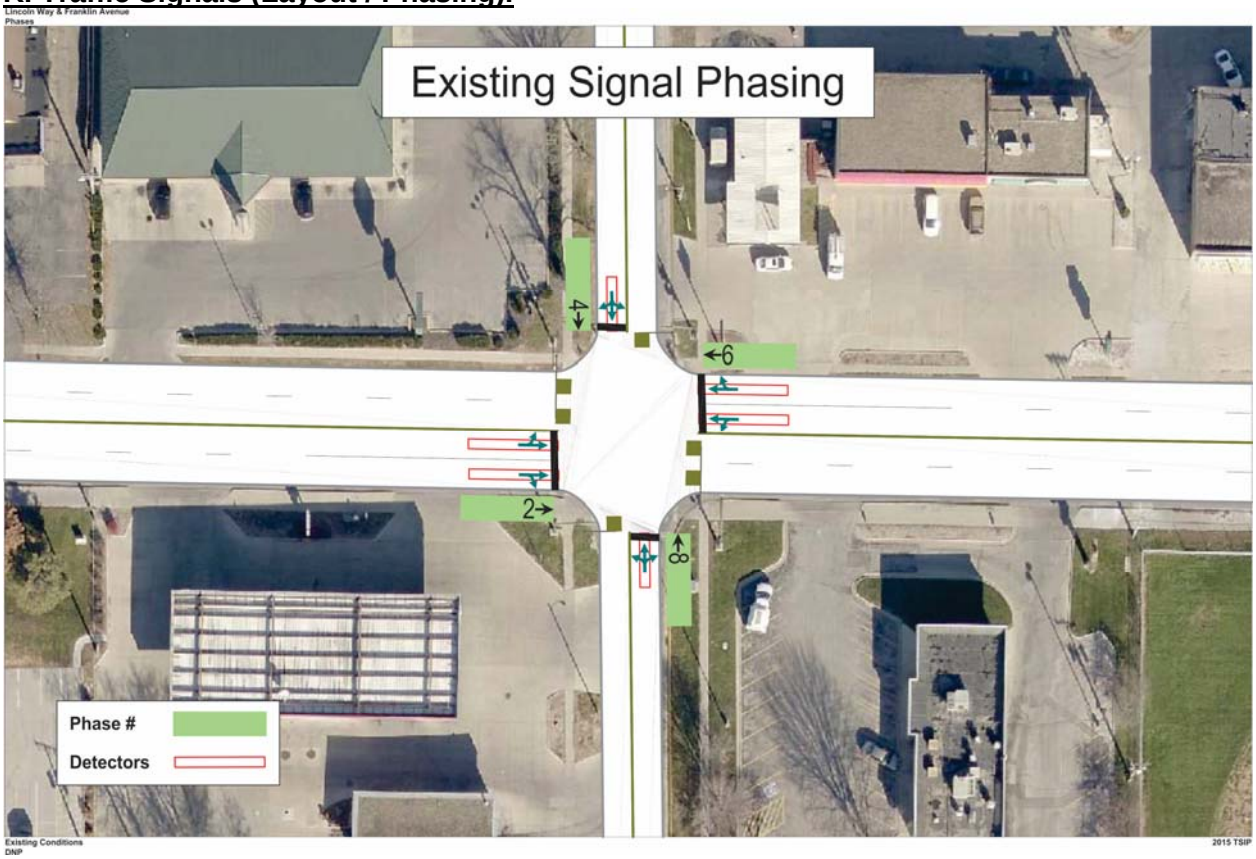
Notes: 2004 - 2013

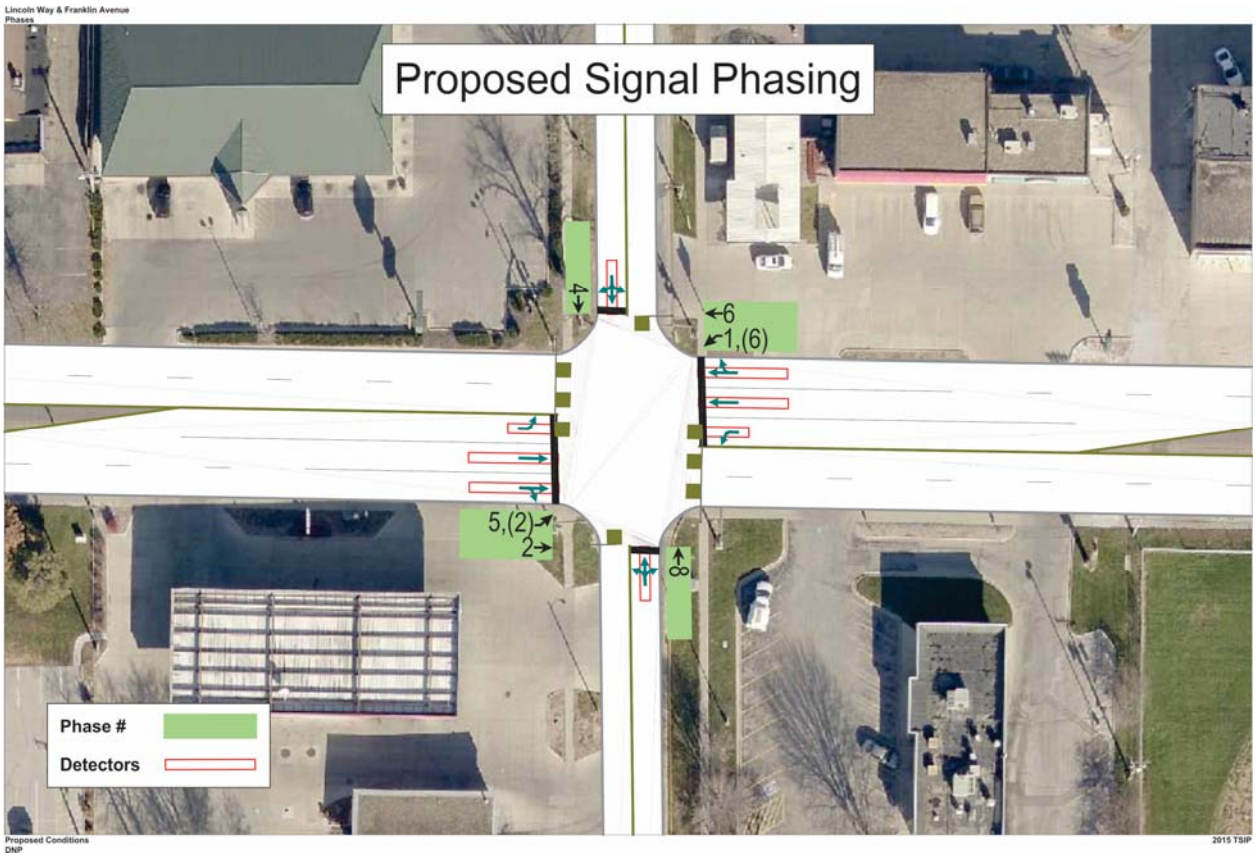
J. Traffic Volumes and/or Turning Movements (August 2014):

AM	Franklin Avenue Southbound			Lincoln Way Westbound			Franklin Avenue Northbound			Lincoln Way Eastbound		
Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left
7:15 AM	3	0	5	2	53	4	10	0	0	1	124	2
7:30 AM	7	1	5	2	57	3	9	0	1	2	131	2
7:45 AM	5	0	5	3	62	0	11	1	0	1	130	6
8:00 AM	4	1	3	1	55	8	11	1	2	1	92	3
SUM	**19**	**2**	**18**	**8**	**227**	**15**	**41**	**2**	**3**	**5**	**477**	**13**
PHF	**0.68**	**0.50**	**0.90**	**0.67**	**0.92**	**0.47**	**0.93**	**0.50**	**0.38**	**0.63**	**0.91**	**0.54**

PM	Franklin Avenue Southbound			Lincoln Way Westbound			Franklin Avenue Northbound			Lincoln Way Eastbound		
Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left
4:30 PM	16	1	2	5	179	13	11	1	7	1	114	3
4:45 PM	11	4	6	1	146	9	11	2	2	1	124	3
5:00 PM	9	3	4	4	165	10	8	1	3	1	112	3
5:15 PM	8	4	4	7	203	8	8	1	7	1	121	6
SUM	**44**	**12**	**16**	**17**	**693**	**40**	**38**	**5**	**19**	**4**	**471**	**15**
PHF	**0.69**	**0.75**	**0.67**	**0.61**	**0.85**	**0.77**	**0.86**	**0.63**	**0.68**	**1.00**	**0.95**	**0.63**

K. Traffic Signals (Layout / Phasing).





L. Benefit/Cost Worksheet (Result = 4.05:1):

Rev. 5/14

Intersection or Spot Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Story | Prepared by: Damion Pregitzer | Date Prepared: Aug 12, 2014

Intersection: Lincoln Way & Franklin Avenue

Improvement

Proposed Improvement(s): Add E/W Left-Turn Lane & various traffic signal improvments (protected left phasing, bike dectection, ADA vibrotactil+audiable pushbuttons, and Pedestrain ramps and markings)

$1,019,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
	Other Annual Cost (after initial year), **AC**	72	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate (time value of $), **INT**
		$ 1,019,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: City of Ames | 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

750
6,700 → ← 8,500
650

6,059,000 Current Annual Entering Veh., **AEV** = DEV * 365

29,981 veh / day, Final Year DEV, **FDEV**

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

3.0% Projected Traffic Growth (0%-10%), **G**

16,600 Current Daily Entering Vehicles, **DEV**

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

Crash Data

2004 First full year --> 2013 Last full year 10.0 years, Time Period, **T**

0 Additional months

values as of May 2014

0	Fatal Crashes	0	Fatalities @	$4,500,000	$	-
		0	Major Injuries @	$325,000	$	-
44	Injury Crashes	16	Minor Injuries @	$65,000	$	1,040,000
		42	Possible Injuries @	$35,000	$	1,470,000
125	Property Damage Only		(assumed cost per crash)	$7,400	$	-
		-OR-	enter all Property Costs of all crashes:		$	756,450
169	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	3,266,450

16.90	Current Crashes / Year, **AA** = TA / T	2.79	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 19,328	Cost per Crash, **AVC** = LOSS / TA	$ 4,124,493	Present Value of Avoided Crashes, **BENEFIT**
454.1	Total Expected Crashes, **TECR** = CR x TMEV		
12.14	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 234,727	Crash Costs Avoided in First Year, AAR x AVC		
326.3	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 = $4,124,493 : $1,019,000 = **4.05** : 1

A)

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Shoulder Paving and rumbles. Jesup to Frost Ave.

Applicant: Buchanan County Secondary Roads

Contact Person: Brian Keierleber Title: Buchanan County Engineer

Complete Mailing Address: Buchanan County Secondary Roads 1511 1st St. East
Independence, Iowa 50644

Phone: 319-334-6031 (Area Code) E-Mail: engineer@co.buchanan.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 $ 549,687.

Safety Funds Requested $ 300,000.

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 Buchanan County Secondary Roads

Signed: _____ 8/26/14
Signature Date Signed

Brian P. Keierleber
Typed Name

Attest: _____ 8/26/14
Signature Date Signed

Janet Payne
Typed Name

Application For TSIP Funds Buchanan County Jesup to Frost Avenue.

B) Buchanan County is requesting funds to place 4 ft. paved shoulders, center rumbles , edge rumbles, and safety edges from the East corporate limits of Jesup to the center of Frost Avenue along D-22 . D-22 was formerly IA 939 and prior to that was US 20. Buchanan County was transferred IA 939 and since that has diligently worked on creating a safer road. This route is carrying from 2460 to 2650 VPD. We acquired approximately 20 ft. of right of way on each side to flatten the fore slopes and widen the shoulders to 10 ft. At that time we were not familiar with placing safety edges on concrete or we would have done so. Now the economical method to place a safety edge is to pave the shoulder. The speed limit is 55mph. Placing centerline rumbles, edge rumbles, paved shoulders, and safety edges are proven methods of reducing cross over accidents and run off road accidents.

C)See Attachment

D)Time Schedule

Approval of Application January 2015

Concept Statement Submittal February 2015

Plan Development February 2015

Letting August 2015.

Due to the Late letting Date a late start date for construction of June 2016 may be assigned by the Iowa Department of Transportation.

ESTIMATED PROJECT QUANTITIES								
PROJECT NUMBER:								
PAVED SHOULDERS								
REF.#	ITEM CODE	ITEM DESCRIPTION	UNIT	TOTAL	UNIT PRICE	ITEM COST		x.535
1	2102-2710090	EXCAVATION, CLASS 10, WASTE	C.Y.	12711.00	$ 4.97	$ 63,173.67		33,797
2	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	13213.00	$ 17.95	$ 237,173.35		126,887
3	2122-5190006	PAVED SHOULDER, P.C. CONCRETE, 6 IN.	S.Y.	38133.33	$ 22.06	$ 841,221.26		450,053
4	2518-6910000	SAFETY CLOSURE	EACH	30.00	$ 110.00	$ 3,300.00		1,765
5	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	987.40	$ 9.48	$ 9,360.55		5007
6	2528-8445110	TRAFFIC CONTROL	L.S.	1.00	$ 10,000.00	$ 10,000.00		5350
7	2533-4980005	MOBILIZATION	L.S.	1.00	$ 20,000.00	$ 20,000.00		10,700
8	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	686.40	$ 22.38	$ 15,361.63		8,218
9	2548-0000320	MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE	STA	343.20	$ 24.82	$ 8,518.22		4,557
TOTAL COST						$ 1,208,108.69		646,337

~~17,187~~ 90 ft
18,458
16,050 ft = 53.48%
~~33,239~~ ft.
34,500

TOTAL COST FOR SEGMENT
= $ 646,337.

Requested TSIP = $300,000
FM FUNDS = $346,337

E)

PROPOSED TSIP PROJECT
PAVED & SHOULDERS
& rumbles, Edge Rumbles, SAFETY Edge

HIGHWAY AND TRANSPORTATION MAP

BUCHANAN COUNTY

IOWA

Prepared By
Iowa Department of Transportation
Phone (515) 239-1282
In Cooperation With
United States Department of Transportation

SCALE IN MILES
SCALE IN KILOMETERS

JANUARY 1, 2009

TRANSPORTATION DATA
10 - 31 - 09

LEGEND

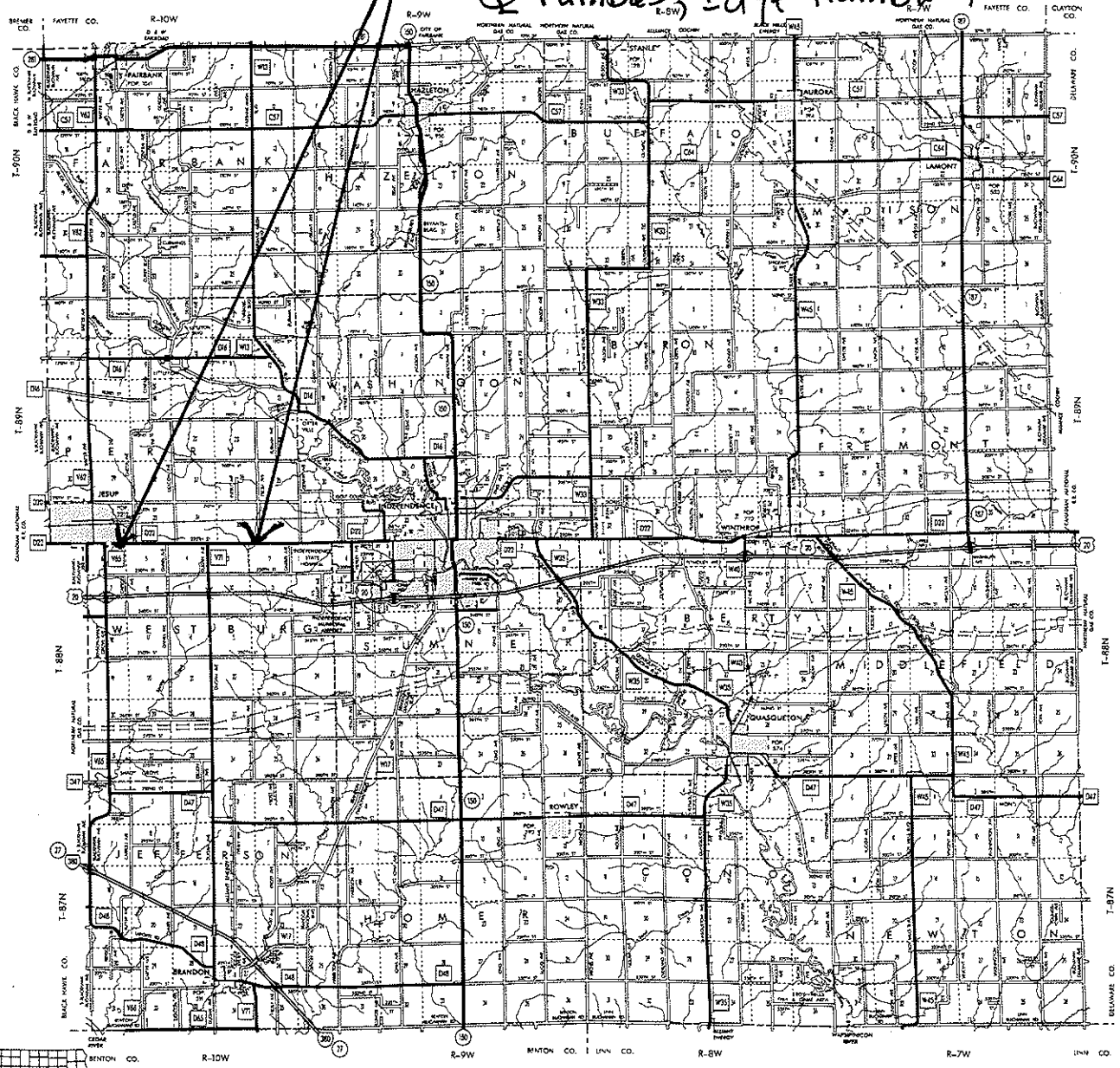
DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTH ROAD

INTERSTATE HIGHWAY
UNITED STATES HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY

RAILROAD
PIPELINE
AIRPORT
HYDROLOGY
BRIDGE

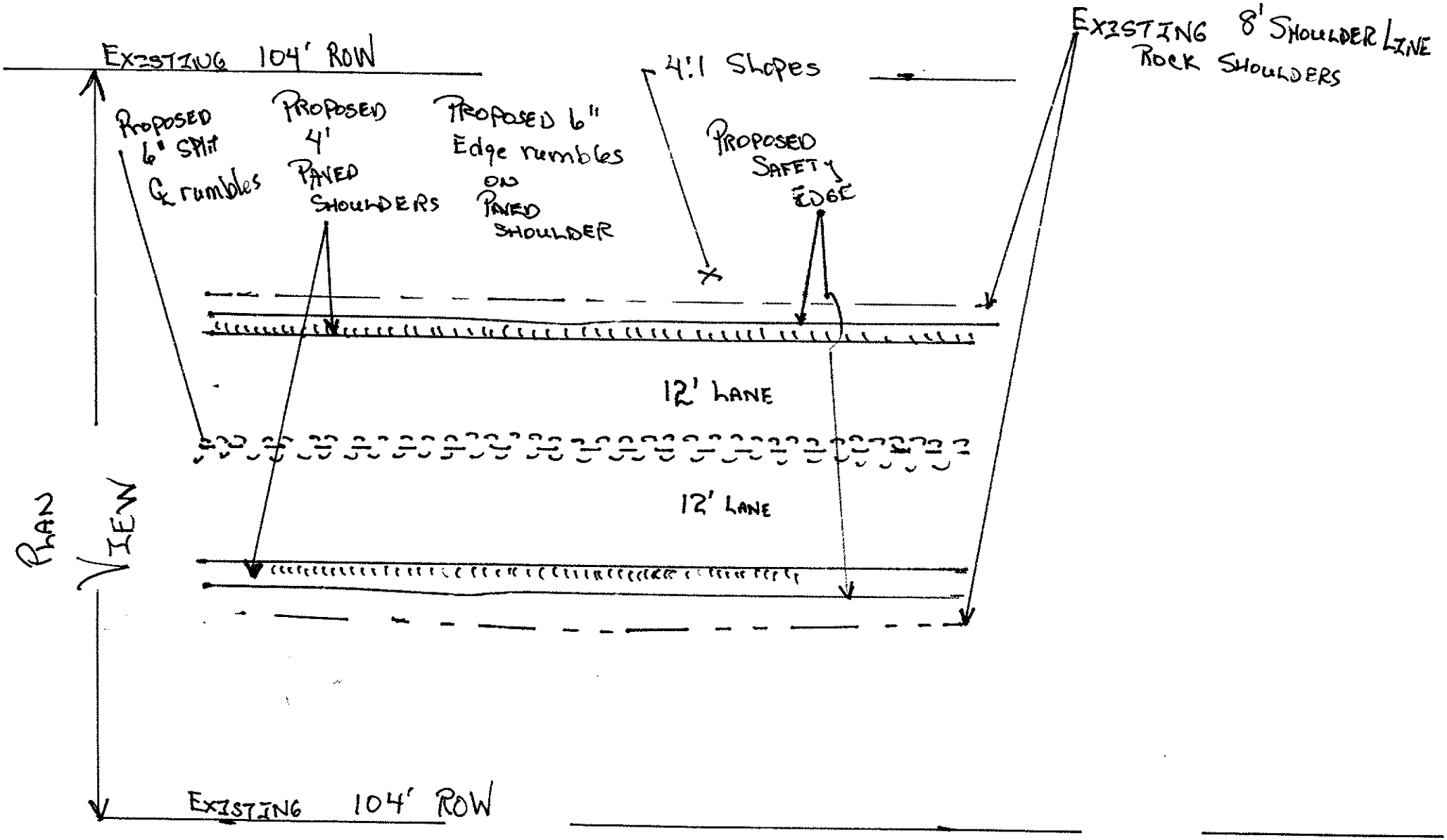
STATE BOUNDARY
COUNTY BOUNDARY
CORPORATE LIMIT LINE
TOWNSHIP LINE
SECTION LINE
ROAD NAMES

STATE PARKS
INSTITUTIONS



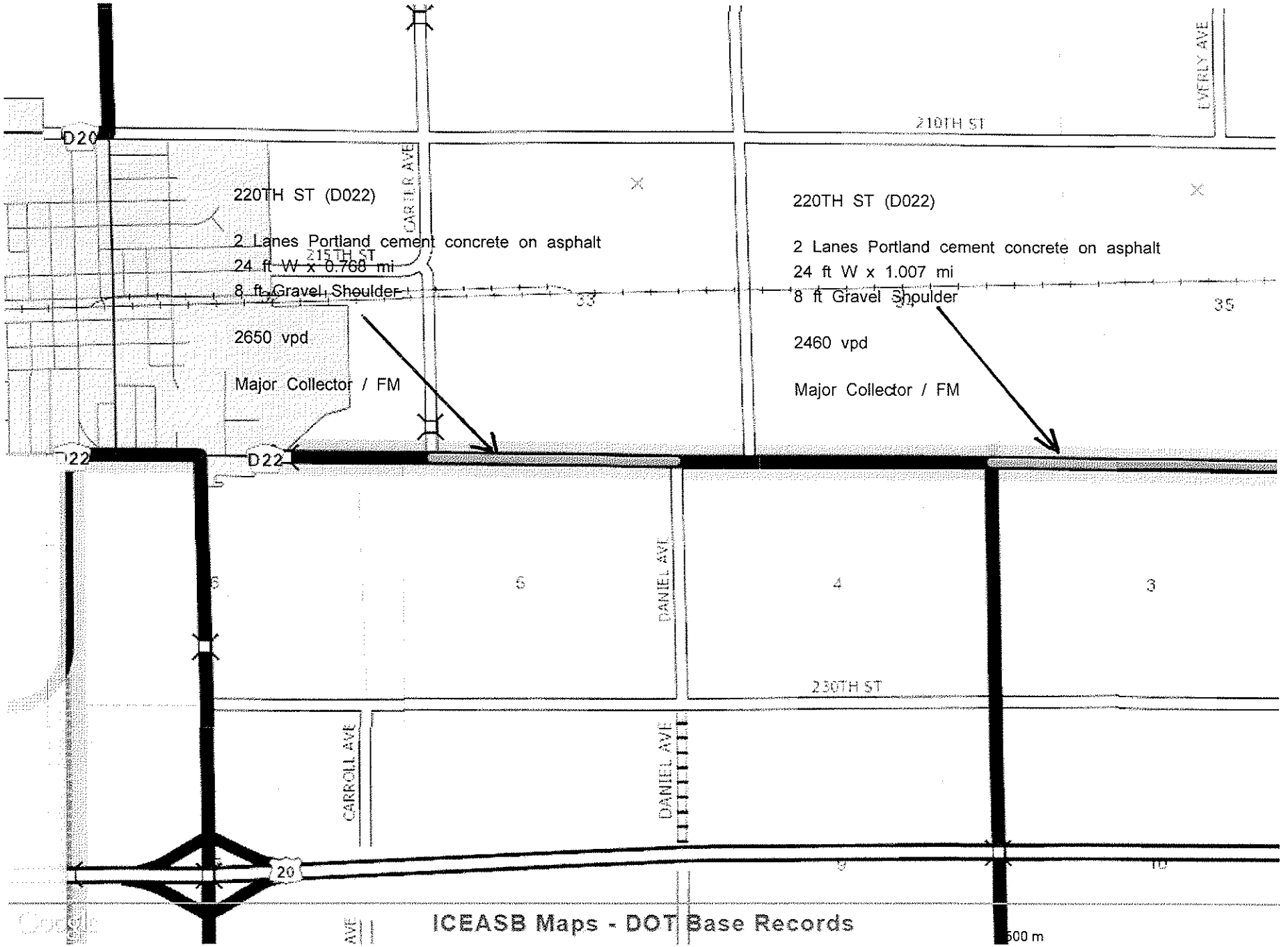
10

618


EXISTING 104' ROW
PROPOSED 6" SPIT & rumbles
PROPOSED 4' PAVED SHOULDERS
PROPOSED 6" Edge rumbles ON PAVED SHOULDER
4:1 Slopes
PROPOSED SAFETY EDGE
EXISTING 8' SHOULDER LINE ROCK SHOULDERS
12' LANE
12' LANE
PLAN VIEW
EXISTING 104' ROW

H

I


D20
210TH ST
EVERLY AVE
CARTER AVE
215TH ST
220TH ST (D022)
2 Lanes Portland cement concrete on asphalt
24 ft W x 0.768 mi
8 ft Gravel Shoulder
2650 vpd
Major Collector / FM
220TH ST (D022)
2 Lanes Portland cement concrete on asphalt
24 ft W x 1.007 mi
8 ft Gravel Shoulder
2460 vpd
Major Collector / FM
D22
D22
33
34
35
6
5
4
3
DANIEL AVE
230TH ST
CARROLL AVE
DANIEL AVE
20
9
10
AVE
ICEASB Maps - DOT Base Records
500 m

J

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: BUCHANAN Co. Prepared by: _____ Date Prepared: _____

Location: JESUP TO FROST AVE.

Improvement

Proposed Improvement(s): _____

$ 300,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	26	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 300,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Maps 2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.50	2,650	
3.50	miles total	

9,275	Current Vehicle Miles / Day, **VM**
11,317	End of Life Veh. Miles / Day
3,385,375	Current Veh. Miles / Year, **AM**
74,542,586	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 --> 2013 Last full year 9.0 years, Time Period, **T**

_____ Additional months values as of May 2014

_____	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
10	Injury Crashes →	4	Minor Injuries @	$65,000	$ 260,000
		7	Possible Injuries @	$35,000	$ 245,000
8	Property Damage Only		(assumed cost per crash)	$7,400	$ 133,200
			-OR- enter all Property Costs of all crashes:		
18	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,288,200

2.00	Current Crashes / Year, **AA** = TA / T	**59.1**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 71,567	Cost per Crash, **AVCR** = LOSS / TA	$ 549,687	Present Value of Avoided Crashes, **BENEFIT**
44.0	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.52	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 37,215	Crash Costs Avoided in First Year, AAR x AVCR		
11.4	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 = $549,687 : $300,000 = **1.83** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Reconstruction of South Fulton St & IA 7 Intersection.

Applicant: Buena Vista County

Contact Person: Jon Ites Title: County Engineer

Complete Mailing Address: P.O. Box 368
Storm Lake, IA 50588

Phone: (712) 749-2540 (Area Code) E-Mail: jites@co.buena-vista.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): City of Newell

Contact Person: Dick Christensen Title: Mayor

Complete Mailing Address: P.O. Box 315
Newell, IA 50568

Phone: (712) 272-4410 (Area Code) E-Mail:

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 450,000

Safety Funds Requested $ 450,000

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 Buena Vista County

Signed: _____ 8/4/14
Signature Date Signed

Jon Ites
Typed Name

Attest: _____ 8/4/14
Signature Date Signed

Preston Jacobs
Typed Name

Office of
Buena Vista County Engineer
P.O. Box 368
Storm Lake, Iowa 50588
712-749-2540 (Fax 712-749-2704)

Jon L. Ites, P.E./L.S.
County Engineer
Karen Crilly
Administrative Assistant

August 4, 2014

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

Dear Sir/Madam:

We are applying for Traffic Safety Improvement Funds for the Intersection of South Fulton Street and Iowa Highway 7 on the south edge of Newell, IA. We are proposing to reconstruct the intersection from its current configuration with three different intersections coming off IA 7 at different angles to one intersection connecting to IA 7 at a 90° angle. Removal and replacement of an existing drainage cross pipe will also be done.

The current traffic map shows 340 vehicles per day. This is one of the major truck routes into town. Much of the current traffic is farm equipment, which includes tractors, semis, trucks w/ grain wagons and feed trucks. The existing shoulders are between 2'-5' wide. The slopes are at a 3:1 for the length of the project. Except at the north end by the cross pipe, here the slopes are 2:1 at best. The only additional Right-of-Way that will be required will be at the Northwest side for clear zone of the cross pipe, the realignment will take place on existing state / city Right-of-Way at the intersection.

The current configuration of the intersection is very much a hazard when you are the south bound traffic trying to get onto east bound IA 7. A driver must pull up far enough to turn around and look out their back window to see if traffic from the west is clear. This is made even more difficult if a vehicle is in the middle gravel portion trying to go south onto 205th Ave. This project will help with these problems by giving better sight lines at the intersection.

If you have any questions please feel free to call.

Sincerely,

Jon L. Ites, P.E./L.S.
Buena Vista County Engineer

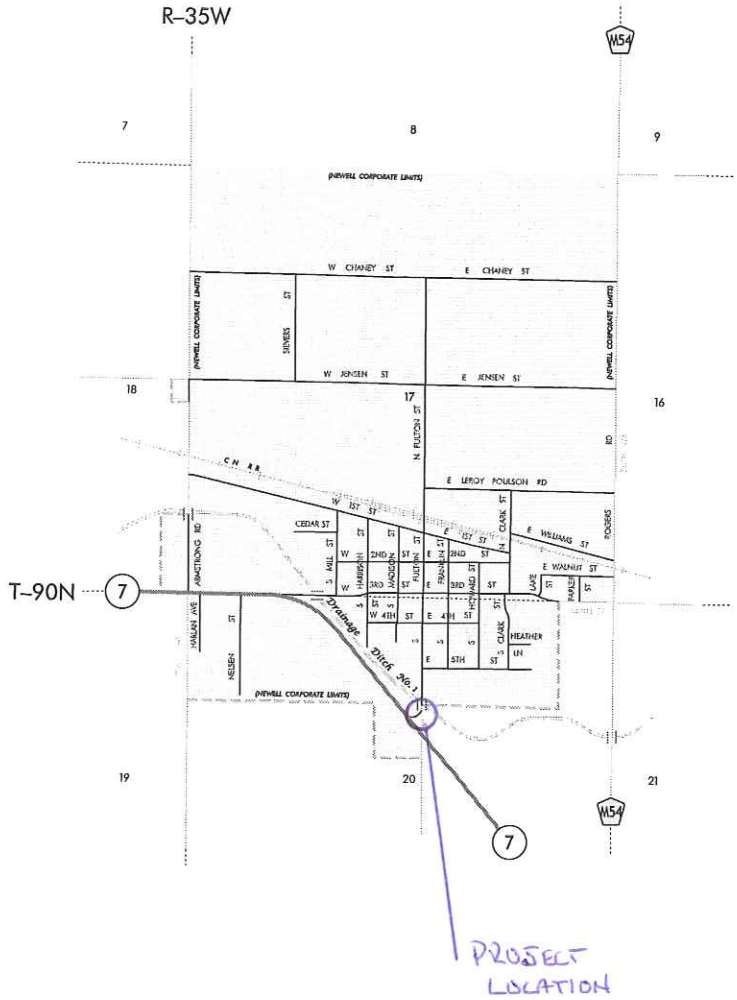
Buena Vista County / City of Newell - S. Fulton / IA 7 Intersection Re-Construciton Estimate

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	ENG. PRICE	ESTIMAT TOTAL
1	2102-2710070	EXCAVATION, CL 10, RDWY+BORROW	CY	4000	$ 15.00	$ 60,000.00
2	2104-2710020	EXCAVATION, CL 10, CHANNEL	CY	113	$ 10.00	$ 1,130.00
3	2107-0875000	COMPACTION W/MOISTURE+DENSITY CONTROL	CY	540	$ 26.00	$ 14,040.00
4	2110-3825010	GRANULAR MATERIAL	TON	100	$ 24.00	$ 2,400.00
5	2111-8174100	GRANULAR SUBBASE	SY	1600	$ 30.00	$ 48,000.00
6	2121-7425021	GRANULAR SHLD, TYPE B	STA	10	$ 420.00	$ 4,200.00
7	2123-7450000	SHLD CONSTRUCTION, EARTH	STA	10	$ 325.00	$ 3,250.00
8	2301-1003100	STD/S-F PCC PAV'T, QM-C CL 3, 10"	SY	1600	$ 100.00	$ 160,000.00
9	2301-6911722	PCC PAV'T SAMPLE	LS	1	$ 1,000.00	$ 1,000.00
10	2401-6745650	RMVL OF EXIST STRUCT	LS	1	$ 5,000.00	$ 5,000.00
11	2402-0425030	GRANULAR BACKFILL	CY	55	$ 35.00	$ 1,925.00
12	2402-2720100	EXCAVATION, CL 20, RDWY PIPE CULV	CY	100	$ 10.00	$ 1,000.00
13	2415-2111208	PRECAST CONC BOX CULV, 12'X8'	LF	40	$ 1,000.00	$ 40,000.00
14	2415-2201208	PRECAST CONC BOX CULV ST END SEC, 12'X8'	EACH	2	$ 20,000.00	$ 40,000.00
15	2505-4008130	RMVL OF CABLE G'RAIL	LF	120	$ 10.00	$ 1,200.00
16	2510-6745850	RMVL OF PAV'T	SY	1882	$ 7.00	$ 13,174.00
17	2518-6910000	SAFETY CLOSURE	EACH	4	$ 500.00	$ 2,000.00
18	2526-8285000	CONSTRUCTION SURVEY	LS	1	$ 3,500.00	$ 3,500.00
19	2527-9263109	PAINTED PAV'T MARK, WATERBORNE/SOLVENT	STA	20	$ 30.00	$ 600.00
20	2528-8445110	TRAFFIC CONTROL	LS	1	$ 5,000.00	$ 5,000.00
21	2533-4980005	MOBILIZATION	LS	1	$ 40,000.00	$ 40,000.00
22	2601-2634100	MULCH	ACRE	1	$ 1,100.00	$ 1,100.00
23	2601-2636043	SEED+FERTILIZE (RURAL)	ACRE	1	$ 1,100.00	$ 1,100.00
24	2602-0000309	PERIMETER+SLOPE SEDIMENT CNTL DEVICE, 9"	LF	100	$ 5.00	$ 500.00
						$ 450,119.00

PROPOSED PROJECT SCHEDULE
S. FULTON & IA 7 INTERSECTION IMPROVEMENTS
NEWELL, IA

August 2014	TSIP Application
December 2014	Iowa DOT Approval
January 2015	TSIP Agreement
Jan. 2015 - Jan. 2016	Project Engineering & Permits
February 2016	Project Letting
March 2016 – November 2016	Project Construction



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TRANSPORTATION DATA
01 - 13 - 11

LEGEND

INTERSTATE ROUTE	35
FREEWAY OR EXPRESSWAY ROUTE	30
U.S. NUMBERED ROUTE	6
BUSINESS ROUTE	61
STATE NUMBERED ROUTE	44
UNSIGNED ROUTE	461
COUNTY NUMBERED ROUTE	R38
SECONDARY ROAD OR ADJOINING CITY STREET	
CITY STREET	
PARK, INSTITUTION, OR FEDERAL ROAD	
RAILROAD	
CORPORATION LINE	
SECTION LINE	
CUL-DE-SAC	
SECTION, TOWNSHIP & RANGE NUMBERS	9, T-81N, R-30W

SCALE IN MILES

0 0.1 0.2 0.3 0.4 0.5 0.75 1.0

0 0.1 0.2 0.3 0.4 0.5 1.0 1.5 2.0

SCALE IN KILOMETERS

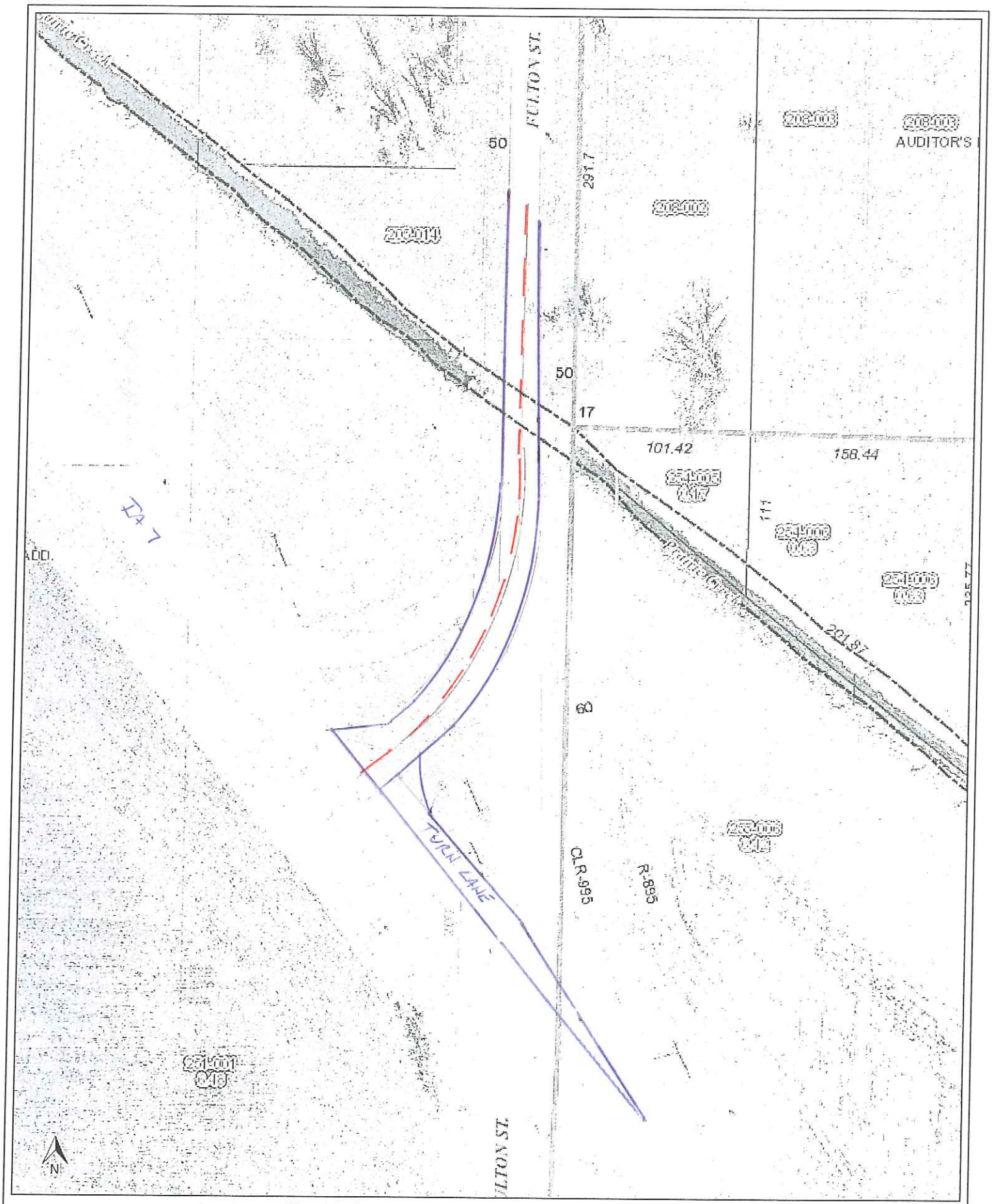
HIGHWAY AND STREET MAP OF

NEWELL
IOWA

PREPARED BY

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING, PROGRAMMING, AND MODAL DIVISION
OFFICE OF TRANSPORTATION DATA
PHONE (515) 239-1289
IN COOPERATION WITH
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

11-5470



Buena Vista, IA

Date Printed: 07/15/2014

This map is for illustrative purposes only and does not represent a survey. It is provided 'as is' without warranty or any representation of accuracy, timeliness or completeness. The user acknowledges and accepts all inherent limitations of the maps and data, including the fact that the maps and data are dynamic and in a constant state of maintenance, correction and revision. No liability is assumed by Buena Vista County as to the accuracy of the data delineated hereon.

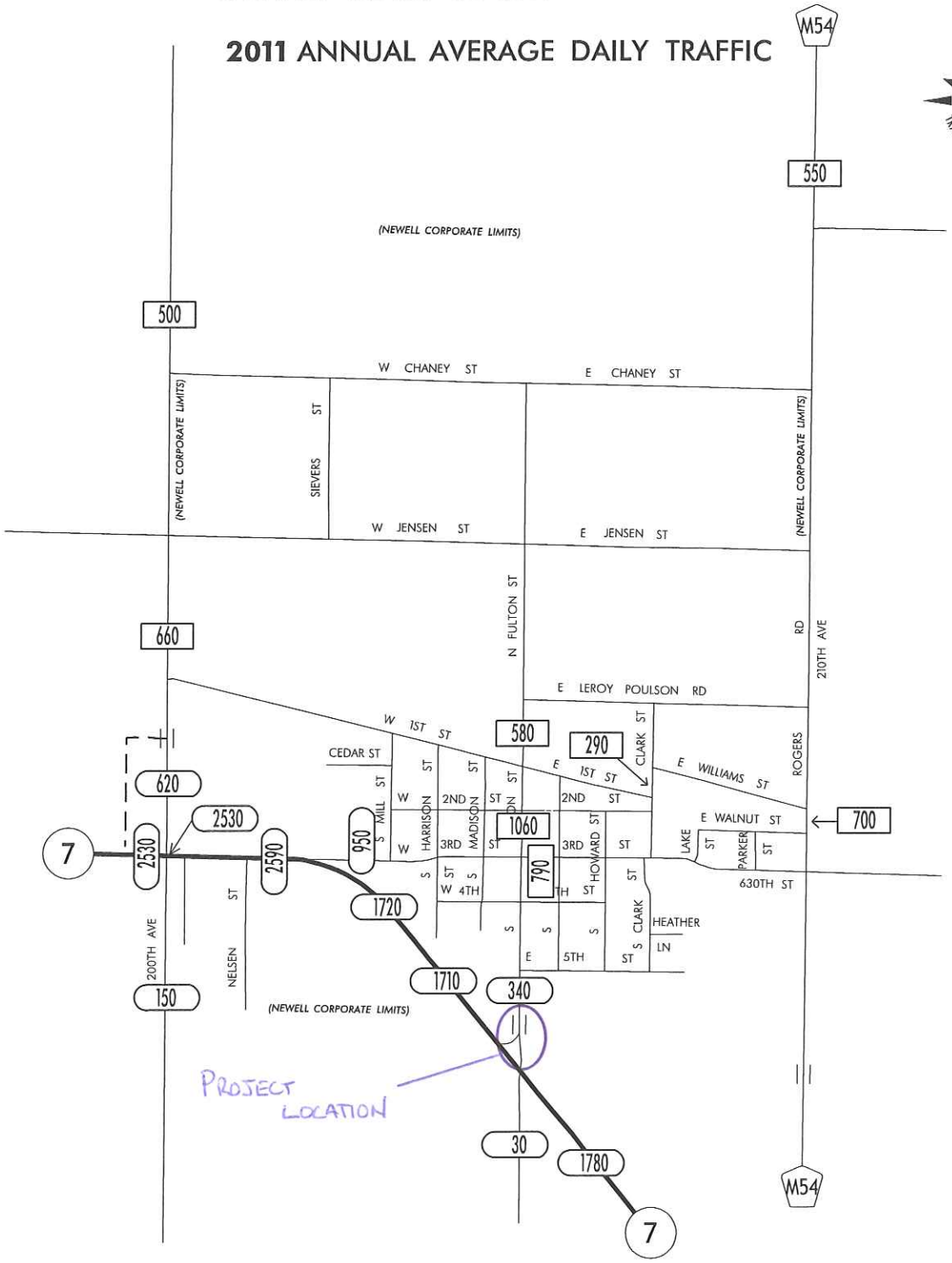
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

NEWELL

BUENA VISTA COUNTY

2011 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

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Buena Vista Prepared by: P. Jacobs Date Prepared: Aug 4, 2014

Intersection: The intersection of Iowa Highway 7 and South Fulton Street in Newell, Iowa

Improvement

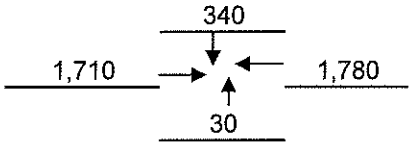
Proposed Improvement(s): Re-alignment and paving of the intersection of South Fulton Street from East 5th Street south to Iowa Highway 7

$ 450,000	Estimated Improvement Cost, **EC**	50	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**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 450,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,408,900	Current Annual Entering Veh., **AEV** = DEV * 365
44,264	veh / day, Final Year DEV, **FDEV**
294.95	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
5.0%	Projected Traffic Growth (0%-10%), **G**
3,860	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2005 First full year --> 2013 Last full year 9.6 years, Time Period, **T**

7 Additional months values as of Dec. 2007

1	Fatal Crashes →	1	Fatalities @	$3,500,000	$ 3,500,000
		0	Major Injuries @	$240,000	$ -
1	Injury Crashes →	0	Minor Injuries @	$48,000	$ -
		2	Possible Injuries @	$25,000	$ 50,000
1	Property Damage Only		(assumed cost per crash)	$2,700	$ 8,100
		-OR-	enter all Property Costs of all crashes:		
3	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 3,558,100

0.31	Current Crashes / Year, **AA** = TA / T	**0.22**	Crashes / MEV, Crash Rate, **CR**
$1,186,033	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
65.5	Total Expected Crashes, **TECR** = CR x TMEV	##########	Present Value of Avoided
0.16	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 185,640	Crash Costs Avoided in First Year, AAR x AVC		
32.8	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 = ######### : $450,000 = **25.31** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: B35 Roadway Improvement Project

Applicant: Cerro Gordo County

Contact Person: Mary Kelly Title: County Engineer

Complete Mailing Address: 2716 South Federal Avenue
Mason City, Iowa 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 $ 3,864,135

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 Cerro Gordo County

Signed: Mary K Kelly — 8-13-14

Signature — Date Signed

Mary Kelly

Typed Name

Attest: Shelly Tuttle — 8/13/14

Signature — Date Signed

Shelly Tuttle

Typed Name

RESOLUTION
2014-64

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, past traffic data shows the existing B35 corridor has an accident history and safety for the travelling motorists could be improved by incorporating safety improvements such as roadway widening and turning lanes; and

WHEREAS, the reconstruction of B35 between Mason City and Clear Lake is included in the Cerro Gordo County Five (5) 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 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 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 12th day August, 2014.

Robert E. Amosson
Chairman, Board of Supervisors
Cerro Gordo County

ATTEST:

Becky J. Kischgatter, Deputy
Kenneth W. Kline, Auditor
Cerro Gordo County

Traffic Safety Improvement Program Application
B35 Roadway Improvement Project
Cerro Gordo County, Iowa

Existing Conditions

The project corridor includes the 2.5 mile segment of B35 (255th Street) between the corporate limits of the City of Mason City, Iowa and the City of Clear Lake, Iowa. The corridor includes three (3) major intersections at Lark Avenue, Killdeer Avenue and Jonquil Avenue. Refer to Figure 1 for project location map.

County Road B35 is a 24' wide HMA roadway with 10' wide granular shoulders on both sides. The two-lane roadway serves as a secondary east/west connection between the City of Mason City and the City of Clear Lake. The segment is identified as a Major Collector on the Iowa Department of Transportation Federal Functional Classification Map and plays a vital role in serving both local and regional traffic. Lark Avenue is classified as a Minor Collector with Killdeer Avenue and Jonquil Avenue both receiving Local Road classification.

The roadway segment is bordered by the Iowa Traction Railroad on the north and a recreational trail on the south side. The posted speed limit is 55 miles per hour.

The study intersections are controlled by two-way stop control on the minor approaches and do not currently provide auxiliary lanes for left turning or right turning movements.

Data Collection

Existing traffic volume data available from the Iowa Department of Transportation for the years 2001, 2005 and 2009 was obtained. The volume data represents the Average Annual Daily Traffic (AADT) as collected and adjusted by the Iowa Department of Transportation and does not include specific turning movement or directional volume data at specific intersections.

New manual turning movement counts of eight-hour duration were conducted at the three study intersections. The counts identified both automobiles and trucks and tabulated both segments for ease in calculating the percentage of trucks within the corridor. Summaries of the turning movement counts are provided with the application.

The eight hour turning movement counts were then converted to AADT utilizing hourly and seasonal adjustment factors provided by the Iowa Department of Transportation. A truck adjustment factor was then applied to the AADT in accordance with the Iowa Department of Transportation Design Manual, Chapter 6. Additionally, a growth rate of 2% per year over 20 years was applied to determine the design year (2033) AADT.

Figures 2, 3, and 4 illustrate the AADT volumes for each study intersection.

Intersection Analysis

The traffic volume (AADT), crash data and existing geometrics were reviewed and analyzed to determine what, if any, improvements to the study intersections should be incorporated into the planned corridor improvements.

The AADT data and Section 6A-1, Horizontal Intersection Design: Rural Two-Lane of the Iowa Department of Transportation Design Manual were utilized to conduct Auxiliary Lane Warrants for B35 left and right turn movement at the three study intersection. The manual indicates that the traffic volumes should be adjusted for the percentage of trucks. Design year AADT with truck adjustment was used to determine left-turn lane warrants and warrants for right-turn lanes were based upon present AADT with truck adjustment.

Warrants are determined by plotting the thru traffic volume and the turning traffic volume on the figure provided in the manual. Figures 5, 6, and 7 include the plotted results of the warrant determination for the study intersections. A summary of the results by study intersection is as follows:

1. B35 at Lark Avenue
   - Westbound Left-Turn Lane – warranted (for current and design year traffic)
   - Westbound "Major" Right-Turn Lane – warranted
   - Eastbound Left-Turn Lane – warranted (for design year traffic)
   - Eastbound "Minor" Right-Turn Lane – warranted
2. B35 at Killdeer Avenue
   - Westbound Left-Turn Lane – warranted (for current and design year traffic)
   - Westbound Right-Turn Lane – not warranted (private drive)

- Eastbound Left-Turn Lane – not warranted (private drive)
- Eastbound "Minor" Right-Turn Lane – warranted

3. B35 at Jonquil Avenue
   - Westbound Left-Turn Lane – not warranted
   - Westbound "Major" Right-Turn Lane – warranted
   - Eastbound Left-Turn Lane – warranted (for current and design year traffic)
   - Eastbound Right-Turn Lane – not warranted

Crash History

Crash data for the corridor and study intersections obtained includes the ten year period from 2003 to 2012. The data pertaining to the five year period from 2008 to 2012 was utilized for the purposes of this report. A summary of crash data is as follows:

1. B35 Study Corridor
   - 26 crashes
     - 1 Fatality, 1 Major Injury, 3 Minor Injury, 1 Possible /Unknown Injury and 20 Property Damage Only (PDO)
     - Crash Types
       - Sideswipe, Opposite Direction (1)
       - Head-On – Crossed Centerline (1)
       - Read-End (5)
       - Non-Collision – Left Roadway (4)
       - Non-Collision – Evasive Action / Swerving (2)
       - Sideswipe, Same Direction (1)
       - Non-Collision – Animal (11)
       - Made Improper Turn (1)
     - Crash Rate is 110 crashes per hundred million vehicle miles traveled (HMVMT)

2. B35 at Lark Avenue
   - 7 crashes
     - 1 Fatality, 1 Major Injury, 1 Minor Injury, 1 Possible /Unknown Injury and 3 Property Damage Only (PDO)
     - Crash Types
       - Sideswipe, Opposite Direction (1)
       - Head-On – Crossed Centerline (1)
       - Read-End (3)
       - Non-Collision – Left Roadway (1)
       - Sideswipe, Same Direction (1)
     - Crash Rate is 0.65 crashes per million entering vehicles (CR/MEV)
3. B35 at Killdeer Avenue
   - 6 crashes
     - 6 Property Damage Only (PDO)
     - Crash Types
       - Read End (2)
       - Non-Collision, Evasive Action / Swerving (2)
       - Non-Collision, Animal (2)
     - Crash Rate is 0.65 CR/MEV
4. B35 at Jonquil Avenue
   - 1 crashes
     - 1 Property Damage Only (PDO)
     - Crash Types
       - Non-Collision - Animal
     - Crash Rate is 0.11 CR/MEV

The crash rate of 110 HMVMT is slightly lower than the statewide average of 186 HMVMT for rural secondary roads. The crash rate of 0.65 CR/MEV calculated for the Lark Avenue and Killdeer Avenue intersections is comparable to the statewide average crash rate of 0.7 CR/MEV at rural intersections with similar entering traffic volumes. A copy of the crash detail reports (CMAT) are included with the application.

Traffic Signal Warrants

A traffic signal needs study was completed to determine if warrants are met at any of the study intersections. The following warrants as described in the Manual on Uniform Traffic Control Devices (MUTCD) were analyzed at the three study intersections:

Warrant 1, Eight-Hour Vehicular Volume
Warrant 2, Four-Hour Vehicular Volume
Warrant 3, Peak Hour
Warrant 7, Crash Experience

The 70% volume factor was utilized for Warrants 1, 2, and 3 for all study intersections based upon the speed limit within the corridor. Additionally, the 56% volume factor was utilized for Warrant 7 at all study intersections. The detailed warrant study results for current and design year traffic at the three study intersections are included in Appendix D. The results indicated that no signal warrants were satisfied for either current or design year traffic volumes. Additional analysis of traffic control alternatives was not completed as a part of this report. All-way stop control would not be considered based upon the imbalance of the major and minor approach traffic volumes and intended use of the corridor. A roundabout option was not considered based upon right-of-way and railroad constraints along the corridor.

Proposed Improvements

Cerro Gordo County is planning for reconstruction of County Roadway B35 (255th Street) between the corporate limits of the City of Mason City and the City of Clear Lake. The project will be partially funded by the Surface Transportation Program. A review of existing geometrics, traffic volumes and crash history was completed to determine the appropriate improvements options for the corridor and intersections.

Based upon the analysis of existing conditions, turn movement counts, auxiliary lane warrants and crash data, it is recommended that the County plan for the as follows:

1. B35 Study Corridor
   - Construct 28' wide rural section to provide for 2' paved shoulder with 8' granular shoulder
2. B35 at Lark Avenue
   - Construct a westbound and eastbound left-turn lane
   - Construct a westbound "major" right-turn lane
   - Consider construction of an eastbound "minor" right-turn lane (less than 50 turning vehicles per day)
3. B35 at Killdeer Avenue
   - Construct a westbound left-turn lane
   - Construct an eastbound "minor" right turn lane
4. B35 at Jonquil Avenue
   - Construct a eastbound left-turn lane
   - Construct a westbound "major" right-turn lane

Refer to Figures 8, 9 and 10 for layout of recommended improvements.

The proposed improvements for this application include pavement widening from 24' to 28' and construction of left and right turn lanes at the major intersections as described above. The pavement widening should reduce the potential for vehicles losing control and either leaving the roadway or crossing the centerline. Additionally, the construction of left turn lanes at the major intersections should reduce the potential of sideswipe collisions and rear end collisions. Construction of right turn lanes at the intersections should reduce the potential of rear end collisions.

Traffic Safety Improvement Program Application
B35 Roadway Improvement Project
Cerro Gordo County, Iowa

Opinion of Probable Cost

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Pavement Removal	43,400	SY	$5.00	$217,000.00
2	Excavation, Cl. 10	17,000	CY	$9.00	$153,000.00
3	Excavation, Cl. 10, Unsuitable or Unstable Material	4,000	CY	$15.00	$60,000.00
4	Modified Subbase	21,500	TON	$16.00	$344,000.00
5	Special Backfill	5,000	TON	$15.00	$75,000.00
6	Standard or Slipform PCC Pavement, 8"	58,930	SY	$35.00	$2,062,550.00
7	Bridge Approach, RK-18	150	SY	$100.00	$15,000.00
8	Granular Shoulder	9,000	TON	$16.00	$144,000.00
9	Granular Surfacing	500	TON	$16.00	$8,000.00
10	Recreational Trail, HMA	7,600	SY	$28.00	$212,800.00
11	Painted Pavement Markings	670	STA	$75.00	$50,250.00
12	Painted Symbol and Legend	25	EA	$150.00	$3,750.00
13	Seeding	5	ACRE	$2,500.00	$12,500.00
14	Signage	1	LS	$5,000.00	$5,000.00
15	Silt Fence	1,000	LF	$5.00	$5,000.00
16	Culvert Pipe	200	LF	$75.00	$15,000.00
17	Railroad Crossing Modifications	1	LS	$50,000.00	$50,000.00
18	Traffic Control	1	LS	$20,000.00	$20,000.00
19	Mobilization	1	LS	$50,000.00	$50,000.00
20	Right-of-Way Land Acquisition / Easements	1	LS	$10,000.00	$10,000.00
	Subtotal Construction				$3,512,850.00
	Contingency (10%)				$351,285.00
	TOTAL PROJECT				$3,864,135.00

Project Funding

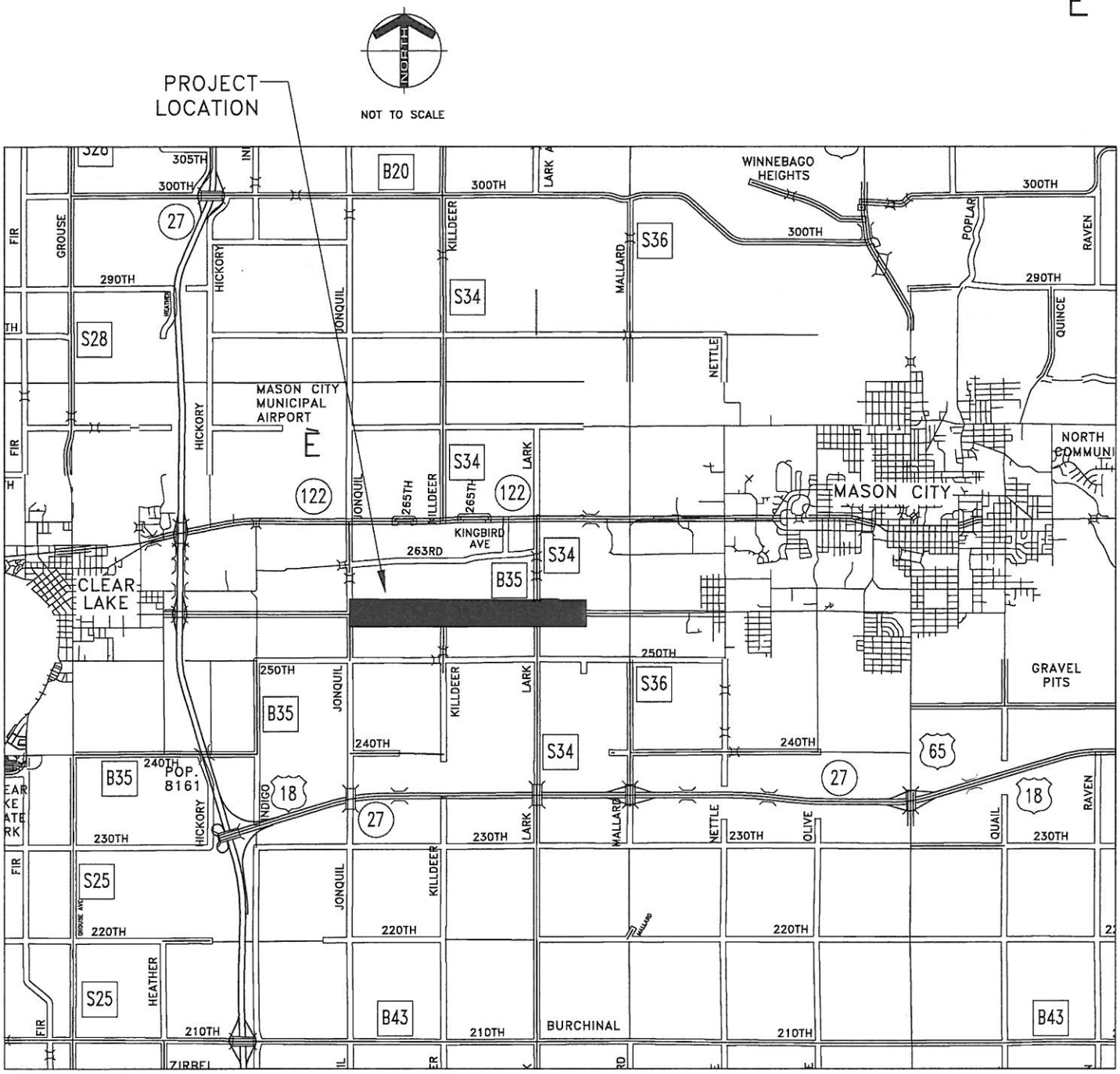
Surface Transportation Program (STP) - FY 2016	$1,600,000.00
Traffic Safety Improvement Program (TSIP) "Pending Funding Approval"	$500,000.00
Cerro Gordo County	$1,764,135.00
Total Project	$3,864,135.00

Traffic Safety Improvement Program Application
B35 Roadway Improvement Project
Cerro Gordo County, Iowa

Time Schedule

TSIP Application	August 15, 2014
TSIP Funding Award	January 2015
Preliminary Project Design	January 2015 – May 2015
Final Project Design	June 2015 – August 2015
Project Letting	December 2015
Project Construction	April 2016 – September 2016

E



YAGGY COLBY ASSOCIATES

- ENGINEERS
- LANDSCAPE ARCHITECTS
- SURVEYORS
- PLANNERS

215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TSIP APPLICATION
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

PROJECT LOCATION MAP

PROJECT NUMBER	12174
COMPUTER FILE	12174LOCATION.DWG
DATE	
DRAWN BY	MD
CHECKED BY	

REVISIONS

SHEET NUMBER

FIG. 1

OF SHEETS

B35, looking west from end of project (Mason City city limits)

B35, looking east from beginning of project (Clear Lake city limits)

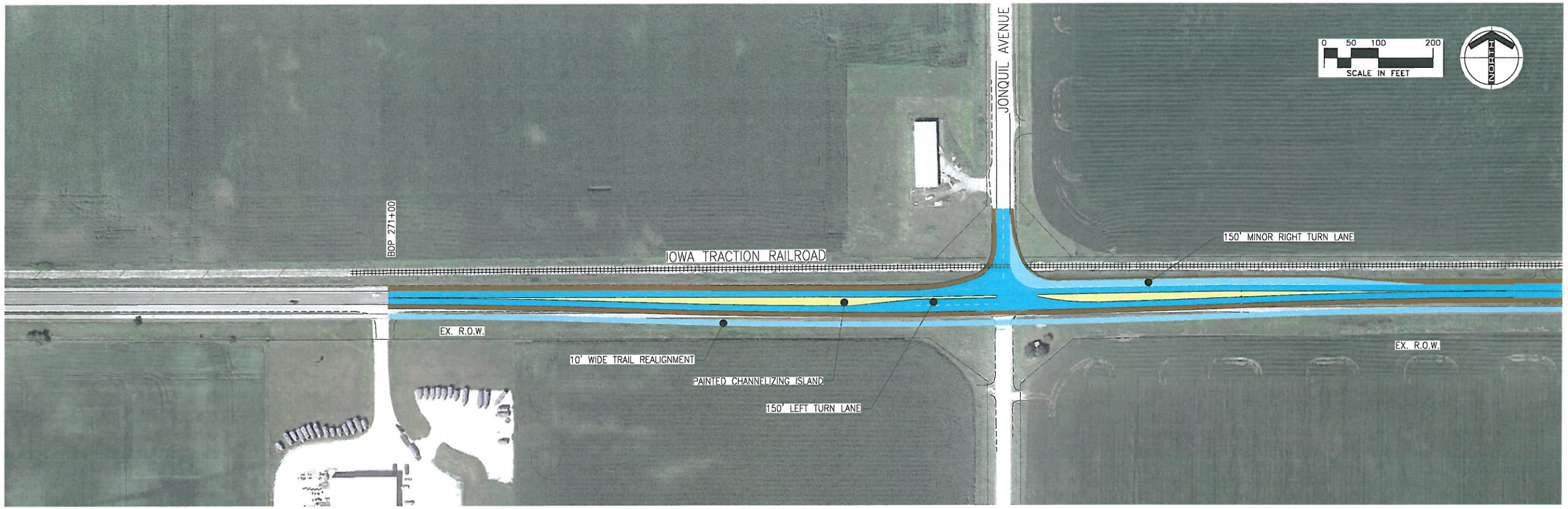
B35, looking west toward Lark Avenue

B35, looking east toward Lark Avenue

B35, looking west toward Killdeer Avenue

B35, looking east toward Jonquill Avenue

G



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DESIGNER: –				
CHECKED BY: –				
DESIGN TEAM				

SEH YAGGY
PHONE: 641.424.6344
215 NORTH ADAMS AVENUE
MASON CITY, IA 50401-3119
www.sehinc.com

TSIP APPLICATION
B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY

IMPROVEMENT PLAN

FILE NO. 12174DP0721.DWG

FIG 8 –

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SEH YAGGY
PHONE: 641.424.6344
215 NORTH ADAMS AVENUE
MASON CITY, IA 50401-3119
www.sehinc.com

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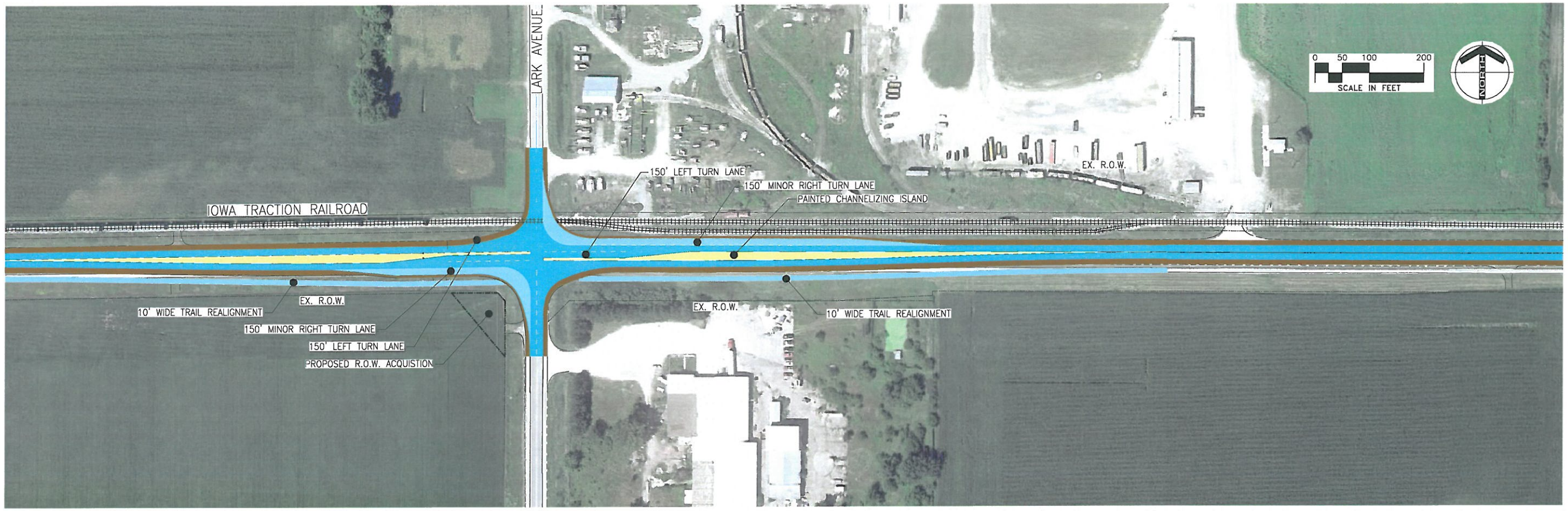
B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY

IMPROVEMENT PLAN

FILE NO. 12174DP0721.DWG

FIG 9 / –

G



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DESIGNER: –				
CHECKED BY: –				
DESIGN TEAM				

SEH YAGGY
PHONE: 641.424.6344
215 NORTH ADAMS AVENUE
MASON CITY, IA 50401-3119
www.sehinc.com

TSIP APPLICATION
B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY

IMPROVEMENT PLAN

FILE NO.
12174DP0721.DWG

FIG 10
–

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2007414209 05/30/2007 18:18 B035 / 255TH ST
County: 17 City: Mason City

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: Minor
Fatalities: 0
Major Injuries: 0
Minor Injuries: 1
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Wet
Light Conditions: Daylight
Weather Conditions: Rain
Drug/Alc Involved: none indicated
Property Damage: $15000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Leaving traffic lane	0	0
Configuration:	Passenger car	0	0
Driver Age:	31	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2008434555 03/30/2008 01:57 B035 / 255TH ST
County: 17 City: Mason City

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: Minor
Fatalities: 0
Major Injuries: 0
Minor Injuries: 1
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Dry
Light Conditions: Dark - roadway not lighted
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $11000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	21	0	0
Driver Gender:	F		
Driver Cond:	Other	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	Pole: utility/light/etc	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2008451948 07/22/2008 10:00 B035 / 255TH ST
County: 17 City:

Major Cause: Made improper turn
Roadway Type: Non-intersection: Business drive

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Dry
Light Conditions: Daylight
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $1000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	South	0	0
Veh Action:	Turning right	0	0
Configuration:	Tractor/semi-trailer	0	0
Driver Age:	21	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Made improper turn	0	0
Drivr Contr 2:	Lost control	0	0
Fixed Object:	Ditch/embankment	0	0

2008465660 10/11/2008 19:04 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: not reported
Surface Conditions: not reported
Light Conditions: not reported
Weather Conditions: not reported
Drug/Alc Involved: none indicated
Property Damage: $2000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Not reported	0	0
Driver Age:	18	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2008470179 11/03/2008 22:50 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	Manner of Crash:	not reported
Fatalities:	0	Surface Conditions:	not reported
Major Injuries:	0	Light Conditions:	not reported
Minor Injuries:	0	Weather Conditions:	not reported
Possible Injuries:	0	Drug/Alc Involved:	none indicated
Unknown Injuries:	0	Property Damage:	$2000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Not reported	0	0
Driver Age:	49	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2008478499 12/08/2008 13:21 B035 / 255TH ST and KILLDEER AVE
County: 17 City:

Major Cause: Driving too fast for conditions
Roadway Type: Intersection: T - intersection

Severity:	PDO	Manner of Crash:	Rear-end
Fatalities:	0	Surface Conditions:	Ice
Major Injuries:	0	Light Conditions:	Daylight
Minor Injuries:	0	Weather Conditions:	Sleet/hail/freezing rain
Possible Injuries:	0	Drug/Alc Involved:	none indicated
Unknown Injuries:	0	Property Damage:	$2200

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	North	North	0
Veh Action:	Slowing/stopping	Stopped for sign/signal	0
Configuration:	4-tire light truck	3+ axle SU truck	0
Driver Age:	25	60	0
Driver Gender:	M	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	Too fast for conditions	none	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2009484201 01/03/2009 17:41
County: 17 City:

B035 / 255TH ST measuring 0.1 Miles West from S034 / LARK AVE and B035 / 255TH ST

Major Cause: Swerving/evasive action
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Sideswipe, opposite direction
Fatalities:	0	**Surface Conditions:**	Ice
Major Injuries:	0	**Light Conditions:**	Dark - roadway not lighted
Minor Injuries:	0	**Weather Conditions:**	Sleet/hail/freezing rain
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$3000

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	West	0
Veh Action:	Essentially straight	Essentially straight	0
Configuration:	Passenger car	Passenger car	0
Driver Age:	24	22	0
Driver Gender:	M	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	none	Lost control	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	Ditch/embankment	0

2009512709 04/30/2009 21:00
County: 17 City:

B035 / 255TH ST and WILLOW CR / Crane Creek

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	**Manner of Crash:**	not reported
Fatalities:	0	**Surface Conditions:**	not reported
Major Injuries:	0	**Light Conditions:**	not reported
Minor Injuries:	0	**Weather Conditions:**	not reported
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$4000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Not reported	0	0
Driver Age:	59	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	unknown	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2009556774 06/16/2009 15:56 — B035 / 255TH ST and KILLDEER AVE
County: 17 **City:** Mason City

Major Cause: Other improper action
Roadway Type: Non-intersection: No special feature

Severity:	PDO	**Manner of Crash:**	Rear-end
Fatalities:	0	**Surface Conditions:**	Wet
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	0	**Weather Conditions:**	Mist
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$3000

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	East	0
Veh Action:	Slowing/stopping	Essentially straight	0
Configuration:	Sport utility vehicle	4-tire light truck	0
Driver Age:	32	59	0
Driver Gender:	F	F	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	none	Other improper action	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

2009514649 06/22/2009 13:40 — S034 / LARK AVE and B035 / 255TH ST
County: 17 **City:**

Major Cause: Crossed centerline
Roadway Type: Intersection: Four-way intersection

Severity:	Fatal	**Manner of Crash:**	Head-on
Fatalities:	1	**Surface Conditions:**	Dry
Major Injuries:	0	**Light Conditions:**	Daylight
Minor Injuries:	1	**Weather Conditions:**	Clear
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$20000

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	West	0
Veh Action:	Essentially straight	Overtaking/passing	0
Configuration:	Passenger car	Passenger car	0
Driver Age:	57	74	0
Driver Gender:	F	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	none	Crossed centerline	0
Drivr Contr 2:	not reported	Swerved to avoid	0
Fixed Object:	none	none	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2009556852 12/09/2009 11:23 S034 / LARK AVE and B035 / 255TH ST
County: 17 City:

Major Cause: Driving too fast for conditions
Roadway Type: Non-intersection: No special feature

Severity:	Minor	Manner of Crash:	Rear-end
Fatalities:	0	Surface Conditions:	Snow
Major Injuries:	0	Light Conditions:	Daylight
Minor Injuries:	2	Weather Conditions:	Snow
Possible Injuries:	0	Drug/Alc Involved:	Alcohol: Statutory
Unknown Injuries:	0	Property Damage:	$12000

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	West	0
Veh Action:	Essentially straight	Essentially straight	0
Configuration:	Passenger car	Sport utility vehicle	0
Driver Age:	31	38	0
Driver Gender:	F	M	
Driver Cond:	Normal	Infl by alc/drugs/meds	0
Drivr Contr 1:	Vision obstructed	Too fast for conditions	0
Drivr Contr 2:	not reported	Followed too close	0
Fixed Object:	none	none	0

2010556886 01/15/2010 17:26 S034 / LARK AVE and B035 / 255TH ST
County: 17 City:

Major Cause: Other: No improper action
Roadway Type: Intersection: Four-way intersection

Severity:	Poss/Unk	Manner of Crash:	Rear-end
Fatalities:	0	Surface Conditions:	Wet
Major Injuries:	0	Light Conditions:	Dark - roadway lighted
Minor Injuries:	0	Weather Conditions:	Fog/smoke
Possible Injuries:	1	Drug/Alc Involved:	none indicated
Unknown Injuries:	0	Property Damage:	$9000

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	West	0
Veh Action:	Essentially straight	Turning left	0
Configuration:	Van or mini-van	Passenger car	0
Driver Age:	75	55	0
Driver Gender:	F	F	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	none	none	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2010624422 06/28/2010 05:45 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	Manner of Crash:	not reported
Fatalities:	0	Surface Conditions:	not reported
Major Injuries:	0	Light Conditions:	not reported
Minor Injuries:	0	Weather Conditions:	not reported
Possible Injuries:	0	Drug/Alc Involved:	none indicated
Unknown Injuries:	0	Property Damage:	$2500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	not reported	0	0
Configuration:	Passenger car	0	0
Driver Age:	51	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2010624323 09/08/2010 10:53 B035 / 255TH ST
County: 17 City:

Major Cause: Swerving/evasive action
Roadway Type: Intersection: T - intersection

Severity:	PDO	Manner of Crash:	Non-collision
Fatalities:	0	Surface Conditions:	Dry
Major Injuries:	0	Light Conditions:	Daylight
Minor Injuries:	0	Weather Conditions:	Clear
Possible Injuries:	0	Drug/Alc Involved:	none indicated
Unknown Injuries:	0	Property Damage:	$10100

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Tractor/semi-trailer	0	0
Driver Age:	22	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Swerved to avoid	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2010624431 10/30/2010 18:49 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Non-intersection: No special feature

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: unknown
Light Conditions: Daylight
Weather Conditions: unknown
Drug/Alc Involved: none indicated
Property Damage: $2500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	51	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2010624363 11/09/2010 19:00 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: not reported
Light Conditions: not reported
Weather Conditions: not reported
Drug/Alc Involved: none indicated
Property Damage: $5000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	78	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2010624300 12/31/2010 16:31 B035 / 255TH ST
County: 17 City:

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: PDO
Manner of Crash: Non-collision
Fatalities: 0
Surface Conditions: Ice
Major Injuries: 0
Light Conditions: Dusk
Minor Injuries: 0
Weather Conditions: Sleet/hail/freezing rain
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $7000
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Van or mini-van	0	0
Driver Age:	67	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2011624310 03/04/2011 18:38 KILLDEER AVE and B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity: PDO
Manner of Crash: Non-collision
Fatalities: 0
Surface Conditions: not reported
Major Injuries: 0
Light Conditions: not reported
Minor Injuries: 0
Weather Conditions: not reported
Possible Injuries: 0
Drug/Alc Involved: none indicated
Unknown Injuries: 0
Property Damage: $1500
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	58	0	0
Driver Gender:	F		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2006

2011624317 03/23/2011 20:16 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Non-intersection: No special feature

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: unknown
Light Conditions: Dark - unknown roadway lighting
Weather Conditions: unknown
Drug/Alc Involved: none indicated
Property Damage: $5000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	45	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2011638467 07/11/2011 12:41 495 FEET WEST OF KILLDEER AVENUE ON 255TH STREET
County: 17 City:

Major Cause: Ran off road - right
Roadway Type: Non-intersection: No special feature

Severity: Minor
Fatalities: 0
Major Injuries: 0
Minor Injuries: 1
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Dry
Light Conditions: Daylight
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Moped/ATV	0	0
Driver Age:	60	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2011643436 08/12/2011 05:45 — 4TH AVE S and JONQUIL AVE and B035 / 255TH ST
County: 17 **City:** Clear Lake

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	**Manner of Crash:**	Non-collision
Fatalities:	0	**Surface Conditions:**	not reported
Major Injuries:	0	**Light Conditions:**	not reported
Minor Injuries:	0	**Weather Conditions:**	not reported
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$5000

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	not reported	0	0
Veh Action:	Essentially straight	0	0
Configuration:	4-tire light truck	0	0
Driver Age:	40	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

2011658809 11/23/2011 07:00 — B035 / 255TH ST and KILLDEER AVE
County: 17 **City:**

Major Cause: Animal
Roadway Type: Not reported

Severity:	PDO	**Manner of Crash:**	not reported
Fatalities:	0	**Surface Conditions:**	not reported
Major Injuries:	0	**Light Conditions:**	not reported
Minor Injuries:	0	**Weather Conditions:**	not reported
Possible Injuries:	0	**Drug/Alc Involved:**	none indicated
Unknown Injuries:	0	**Property Damage:**	$4500

Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Passenger car	0	0
Driver Age:	45	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2005

2012671359 01/23/2012 19:02 B035 / 255TH ST
County: 17 City:

Major Cause: Over correcting/over steering
Roadway Type: Non-intersection: No special feature

Severity: Major
Fatalities: 0
Major Injuries: 1
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Non-collision
Surface Conditions: Ice
Light Conditions: Dark - roadway not lighted
Weather Conditions: Blowing sand/soil/dirt/snow
Drug/Alc Involved: none indicated
Property Damage: $8000
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Van or mini-van	0	0
Driver Age:	48	0	0
Driver Gender:	M		
Driver Cond:	Normal	0	0
Drivr Contr 1:	Lost control	0	0
Drivr Contr 2:	Over correcting/steering	0	0
Fixed Object:	Ditch/embankment	0	0

2012705868 09/26/2012 13:27 B035 / 255TH ST
County: 17 City:

Major Cause: Crossed centerline
Roadway Type: Non-intersection: No special feature

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Sideswipe, opposite direction
Surface Conditions: Dry
Light Conditions: Daylight
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $9000
Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	East	0
Veh Action:	Essentially straight	Essentially straight	0
Configuration:	Passenger car	Tractor/semi-trailer	0
Driver Age:	62	65	0
Driver Gender:	F	M	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	Crossed centerline	none	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2016

2012705876 10/03/2012 10:11 S034 / LARK AVE and B035 / 255TH ST
County: 17 City:

Major Cause: Other improper action
Roadway Type: Intersection: Four-way intersection

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Rear-end
Surface Conditions: Dry
Light Conditions: Daylight
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $12000
Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	East	East	0
Veh Action:	Turning left	Essentially straight	0
Configuration:	4-tire light truck	Passenger car	0
Driver Age:	65	25	0
Driver Gender:	M	F	
Driver Cond:	Normal	Emotional/angry/disturbed	0
Drivr Contr 1:	none	Other improper action	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

2012712281 11/04/2012 21:40 B035 / 255TH ST
County: 17 City:

Major Cause: Animal
Roadway Type: Not reported

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: not reported
Surface Conditions: not reported
Light Conditions: not reported
Weather Conditions: not reported
Drug/Alc Involved: none indicated
Property Damage: $3000
Number of Vehicles: 1

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	0	0
Veh Action:	Essentially straight	0	0
Configuration:	Sport utility vehicle	0	0
Driver Age:	62	0	0
Driver Gender:	M		
Driver Cond:	not reported	0	0
Drivr Contr 1:	none	0	0
Drivr Contr 2:	not reported	0	0
Fixed Object:	none	0	0

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Iowa Department of Transportation

Crash Detail Report

Report Version 1.3 Aug 2008

2012712284 11/08/2012 13:14 S034 / LARK AVE and B035 / 255TH ST
County: 17 City:

Major Cause: Other improper action
Roadway Type: Intersection: Four-way intersection

Severity: PDO
Fatalities: 0
Major Injuries: 0
Minor Injuries: 0
Possible Injuries: 0
Unknown Injuries: 0

Manner of Crash: Sideswipe, same direction
Surface Conditions: Dry
Light Conditions: Daylight
Weather Conditions: Clear
Drug/Alc Involved: none indicated
Property Damage: $5500

Number of Vehicles: 2

	Unit 1	Unit 2	Unit 3
Init Trav Dir:	West	West	0
Veh Action:	Essentially straight	Overtaking/passing	0
Configuration:	Passenger car	Passenger car	0
Driver Age:	16	60	0
Driver Gender:	F	F	
Driver Cond:	Normal	Normal	0
Drivr Contr 1:	Other improper action	Other improper action	0
Drivr Contr 2:	not reported	not reported	0
Fixed Object:	none	none	0

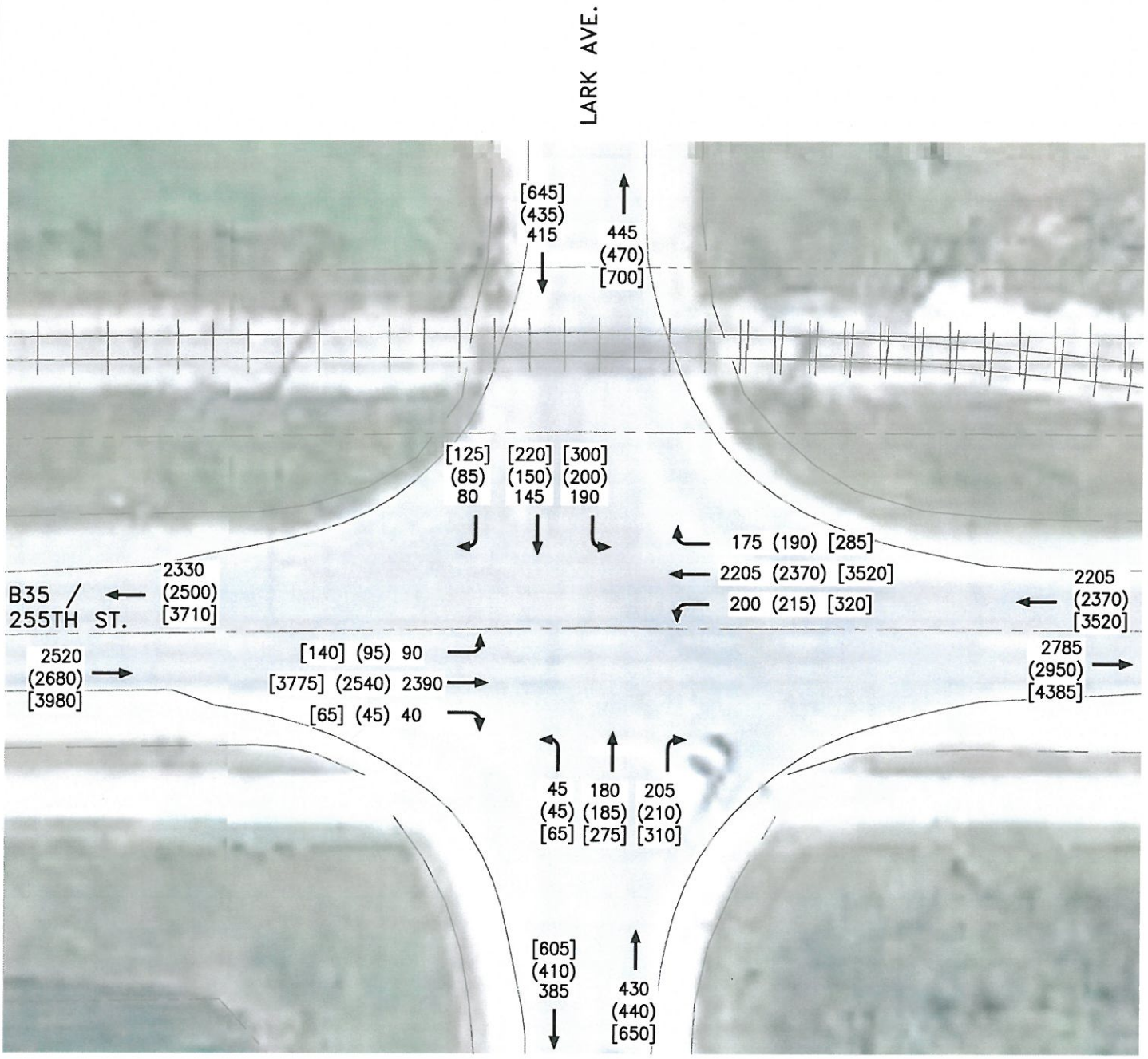
J

LEGEND

2013 AADT

(##) 2013 AADT W/ TRUCK ADJUSTMENT

[##] 2033 DESIGN YEAR AADT



YAGGY COLBY ASSOCIATES

- ENGINEERS
- LANDSCAPE ARCHITECTS
- SURVEYORS
- PLANNERS

215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

TRAFFIC VOLUME DIAGRAM

LARK AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174TRAF.DWG
DATE
DRAWN BY MD
CHECKED BY

REVISIONS

SHEET NUMBER

FIG. 2

OF SHEETS

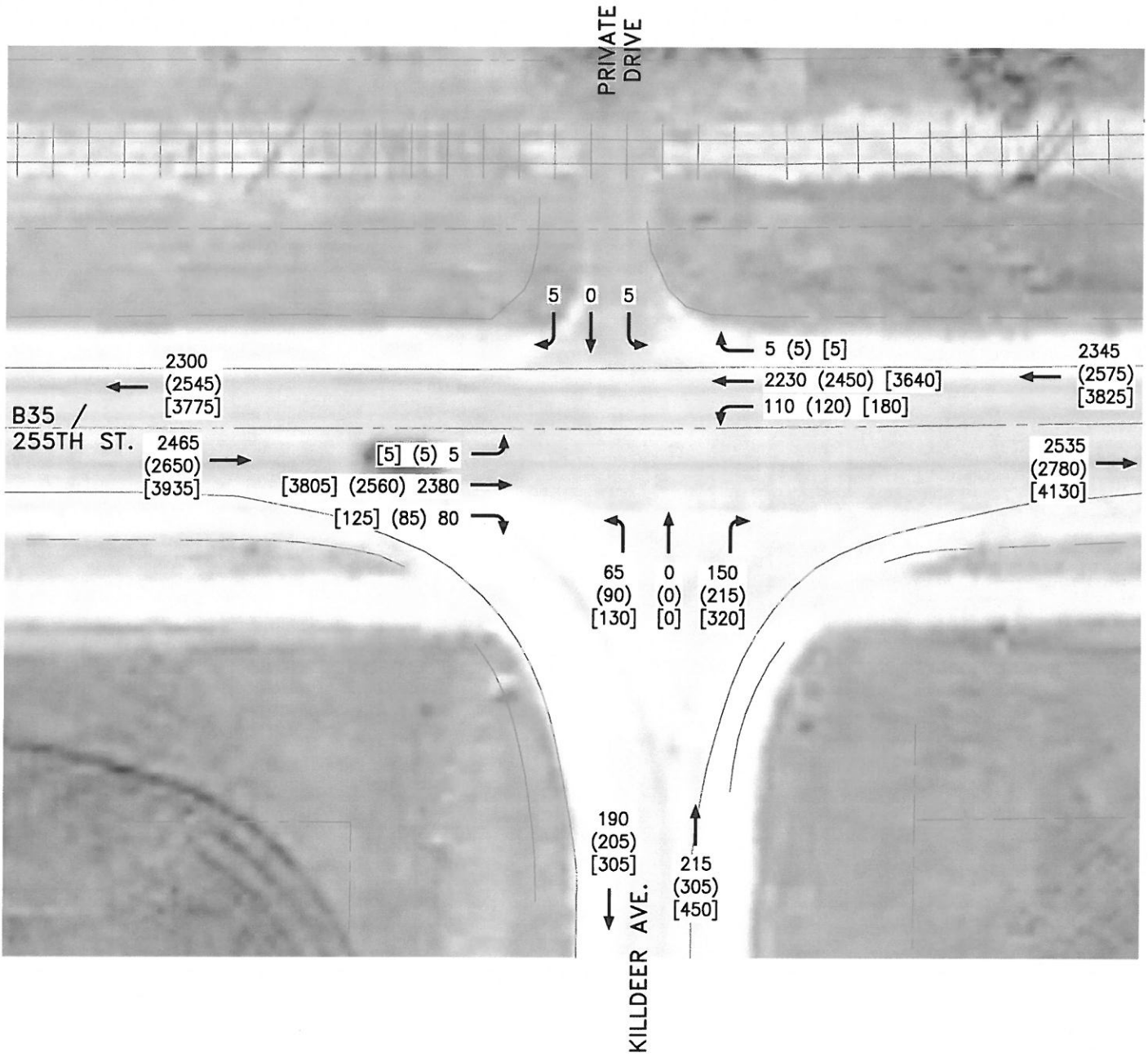
J

LEGEND

2013 AADT

(##) 2013 AADT W/ TRUCK ADJUSTMENT

[##] 2033 DESIGN YEAR AADT



YAGGY COLBY ASSOCIATES

- ENGINEERS
- LANDSCAPE ARCHITECTS
- SURVEYORS
- PLANNERS

215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

TRAFFIC VOLUME DIAGRAM
KILLDEER AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174TRAF.DWG
DATE
DRAWN BY MD
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REVISIONS
SHEET NUMBER
FIG. 3
OF SHEETS

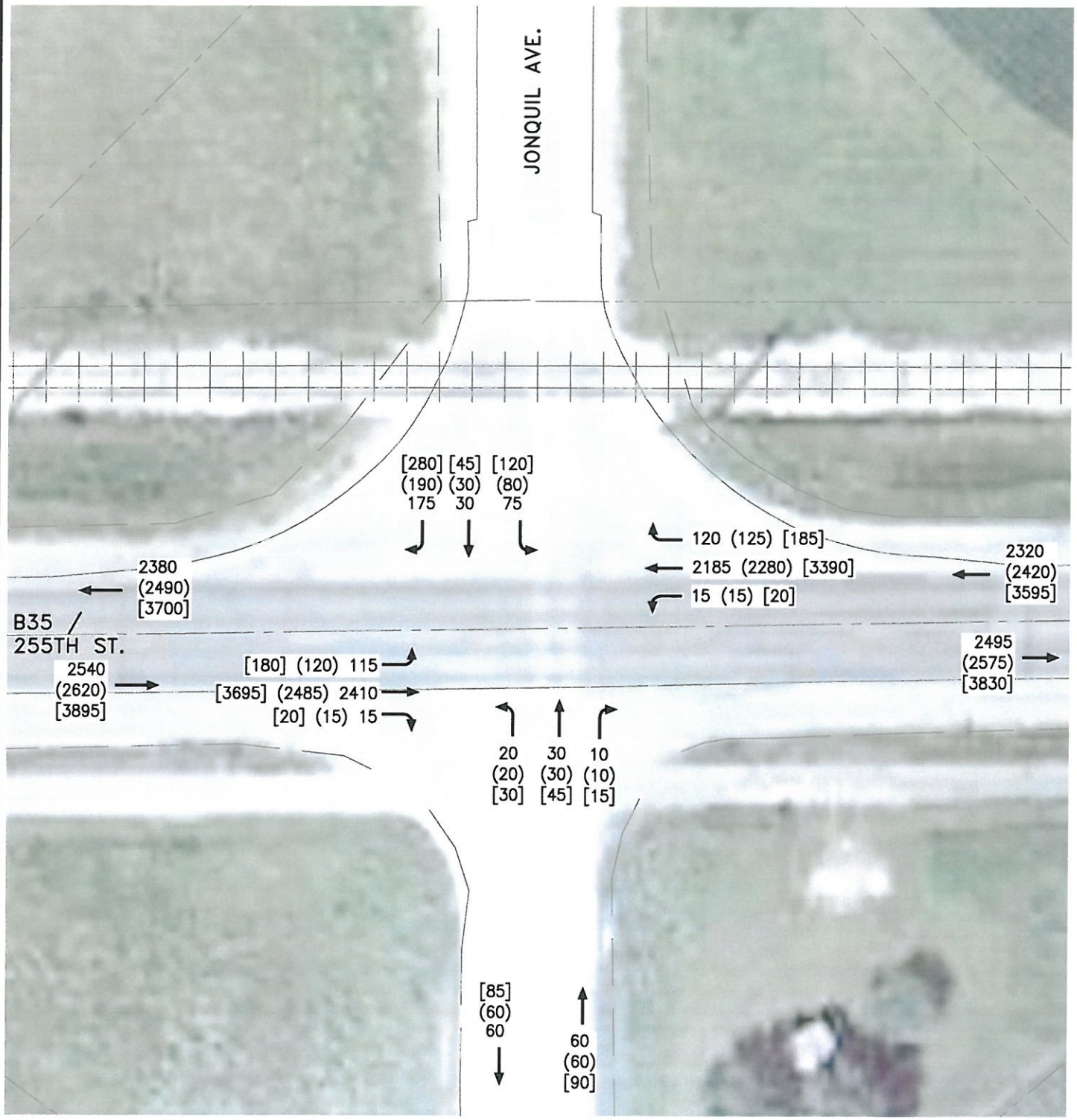
J

LEGEND

2013 AADT

(##) 2013 AADT W/ TRUCK ADJUSTMENT

[##] 2033 DESIGN YEAR AADT



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- ENGINEERS
- LANDSCAPE ARCHITECTS
- SURVEYORS
- PLANNERS

215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

TRAFFIC VOLUME DIAGRAM

JONQUIL AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174TRAF.DWG
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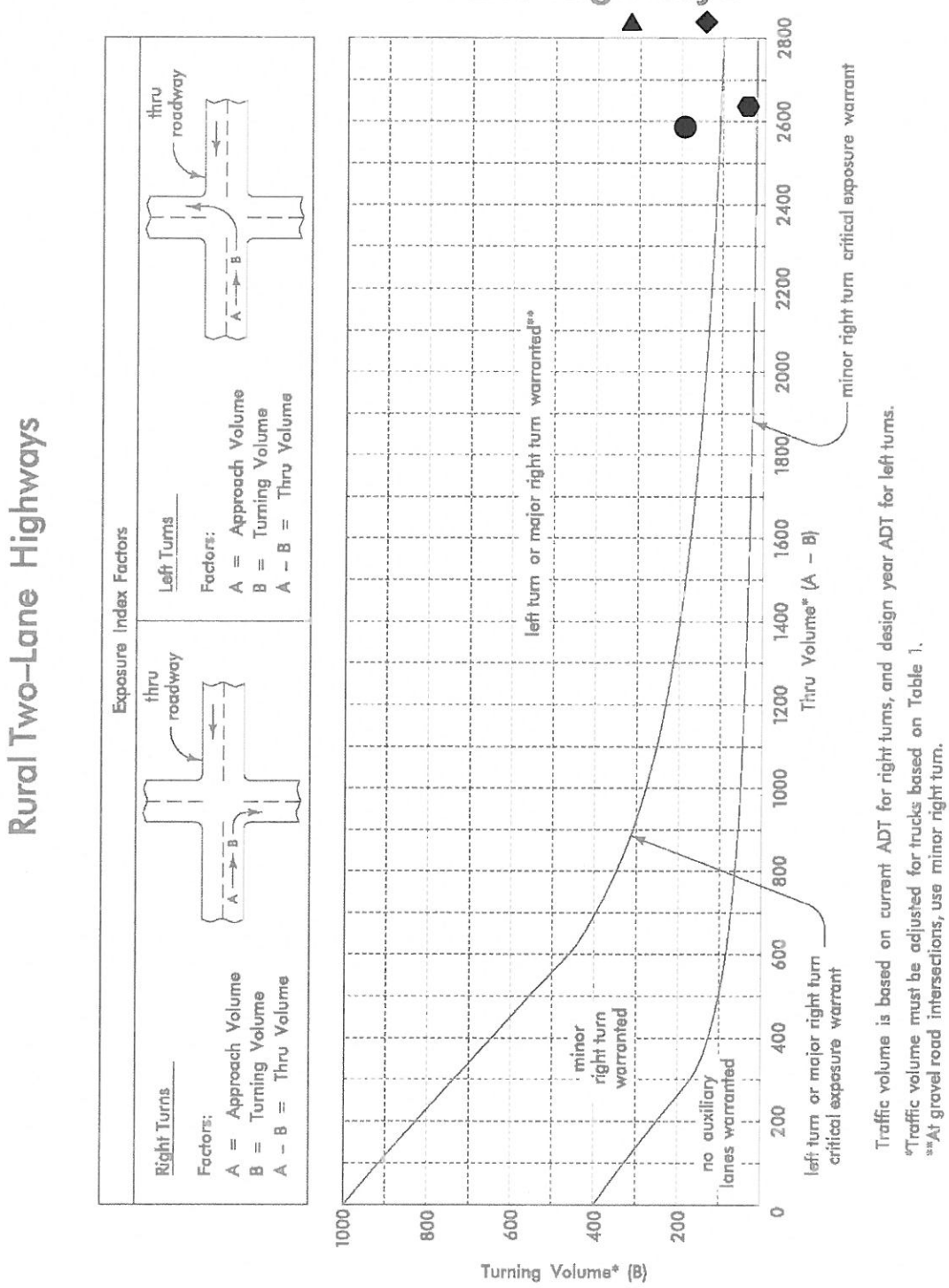
SHEET NUMBER

FIG. 4

OF SHEETS

J

Rural Two-Lane Highways



▲ B35 WB LEFT–TURN
DESIGN YEAR AADT
A–B = 3805
B = 320

LEFT–TURN LANE WARRANTED

● B35 WB RIGHT–TURN
2013 AADT
A–B = 2585
B = 190

"MAJOR" RIGHT–TURN LANE WARRANTED

◆ B35 EB LEFT–TURN
DESIGN YEAR AADT
A–B = 3840
B = 140

LEFT–TURN LANE WARRANTED

⬢ B35 EB RIGHT–TURN
2013 AADT
A–B = 2635
B = 45

"MINOR" RIGHT–TURN LANE WARRANTED

Figure 1: Rural two-lane highway auxiliary lane warrants.

YAGGY COLBY ASSOCIATES
• ENGINEERS
• LANDSCAPE ARCHITECTS
• SURVEYORS
• PLANNERS
215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

AUXILLARY LANE WARRANT
LARK AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174WARRANT.DWG
DATE
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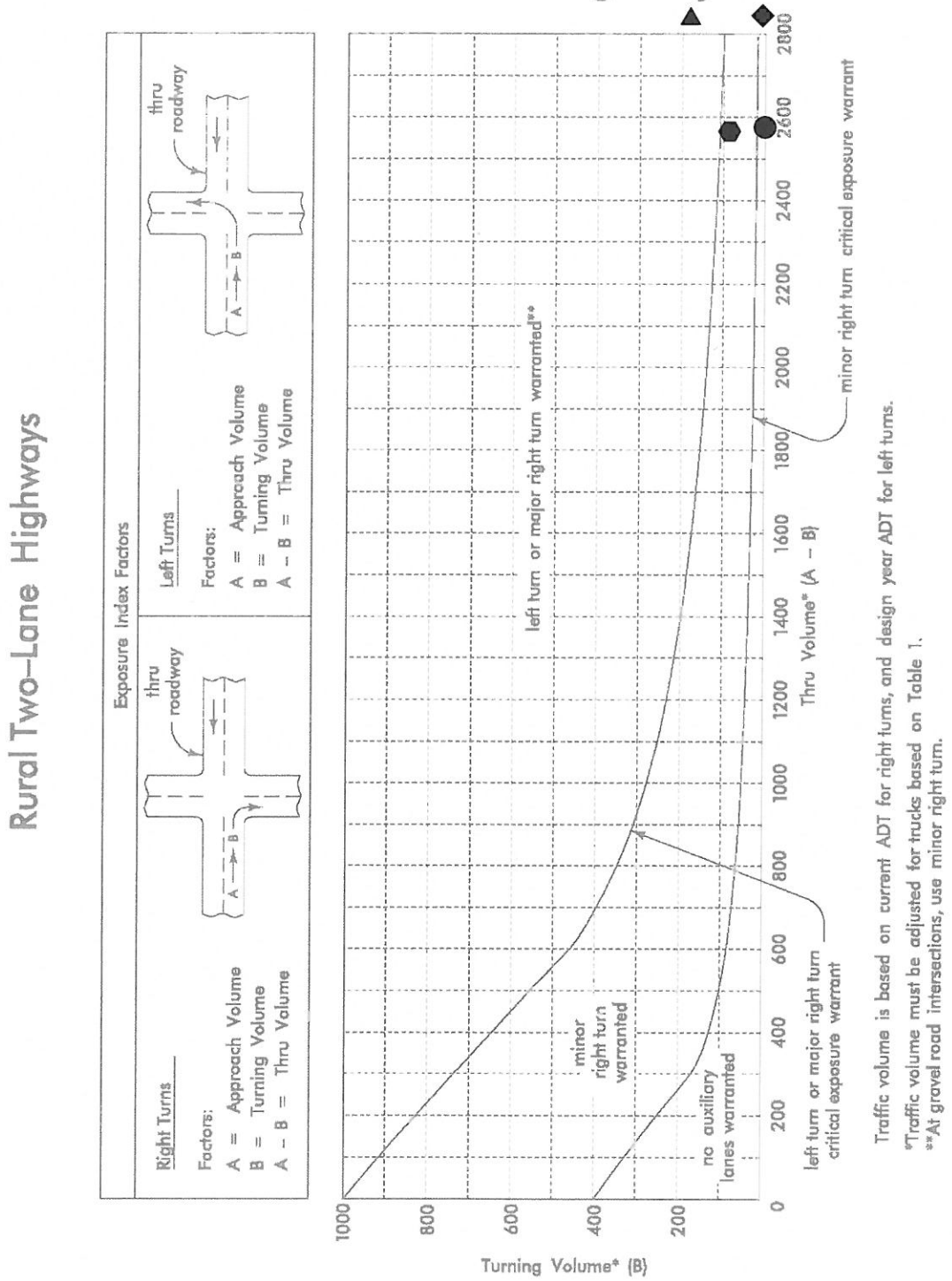
SHEET NUMBER
FIG. 5
OF 668 SHEETS

J

Rural Two-Lane Highways



▲ B35 WB LEFT–TURN
DESIGN YEAR AADT
A–B = 3645
B = 180

LEFT–TURN LANE WARRANTED

● B35 WB RIGHT–TURN
2013 AADT
A–B = 2575
B = 5

RIGHT–TURN LANE NOT WARRANTED

◆ B35 EB LEFT–TURN
DESIGN YEAR AADT
A–B = 3800
B = 5

LEFT–TURN LANE NOT WARRANTED

⬢ B35 EB RIGHT–TURN
2013 AADT
A–B = 2565
B = 85

"MINOR" RIGHT–TURN LANE WARRANTED

Figure 1: Rural two-lane highway auxiliary lane warrants.

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• ENGINEERS
• LANDSCAPE ARCHITECTS
• SURVEYORS
• PLANNERS
215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

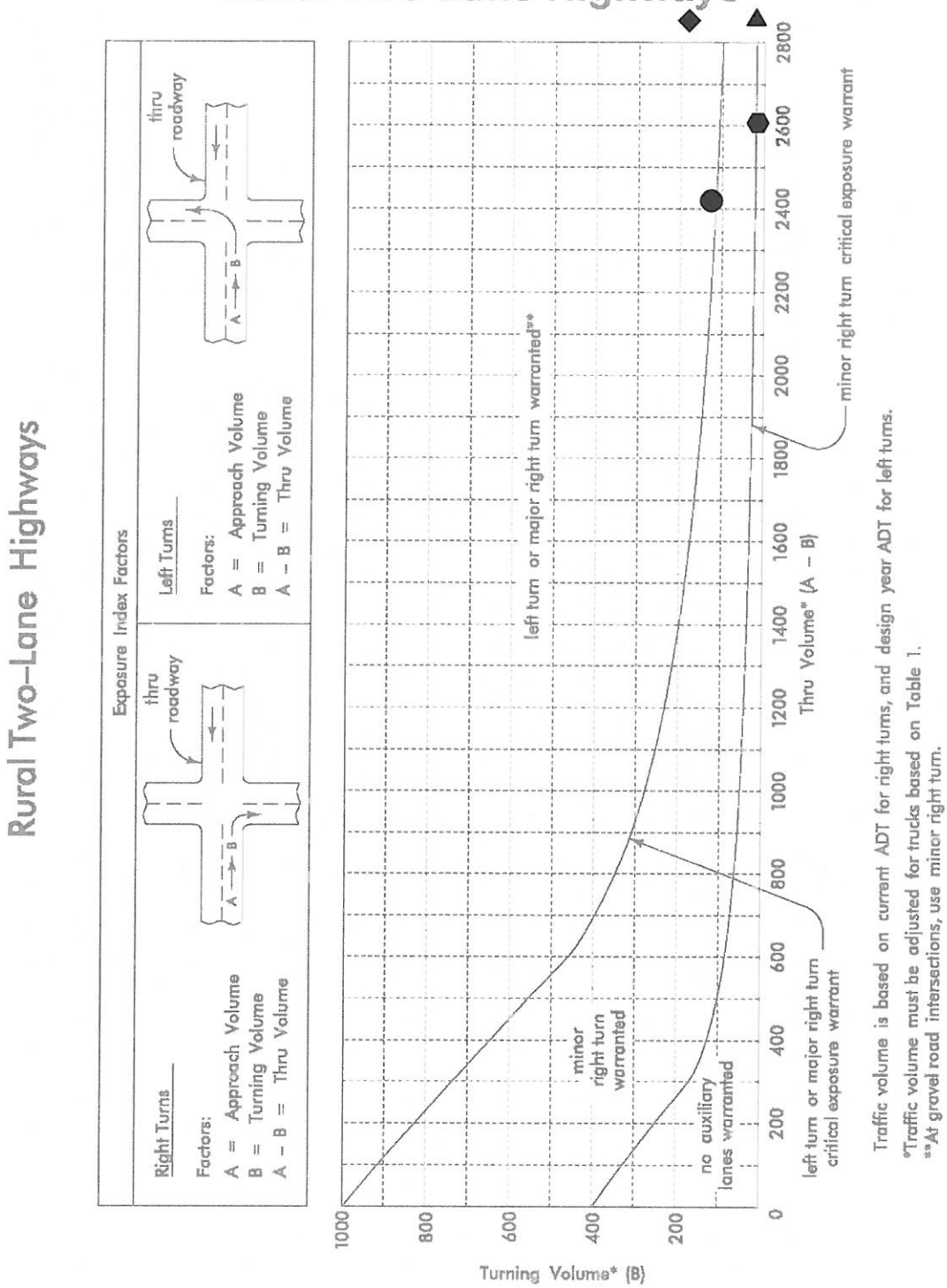
TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

AUXILLARY LANE WARRANT
KILLDEER AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174WARRANT.DWG
DATE
DRAWN BY MD
CHECKED BY
REVISIONS
SHEET NUMBER
FIG. 6
OF SHEETS

J

Rural Two-Lane Highways



▲ B35 WB LEFT–TURN
DESIGN YEAR AADT
A–B = 3575
B = 20

LEFT–TURN LANE
NOT WARRANTED

● B35 WB RIGHT–TURN
2013 AADT
A–B = 2420
B = 125

"MAJOR" RIGHT–TURN
LANE WARRANTED

◆ B35 EB LEFT–TURN
DESIGN YEAR AADT
A–B = 3715
B = 180

LEFT–TURN LANE
WARRANTED

⬢ B35 EB RIGHT–TURN
2013 AADT
A–B = 2605
B = 15

RIGHT–TURN LANE
NOT WARRANTED

Figure 1: Rural two-lane highway auxiliary lane warrants.

YAGGY COLBY ASSOCIATES
• ENGINEERS
• LANDSCAPE ARCHITECTS
• SURVEYORS
• PLANNERS
215 NORTH ADAMS
MASON CITY, IOWA 50401
641-424-6344
FAX 641-424-0351
EMAIL INFO@YAGGY.COM

TRAFFIC ANALYSIS
COUNTY ROAD B35 IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

AUXILLARY LANE WARRANT
JONQUIL AVENUE

PROJECT NUMBER 12174
COMPUTER FILE 12174WARRANT.DWG
DATE
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REVISIONS
SHEET NUMBER
FIG. 7
OF SHEETS

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : LarkAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

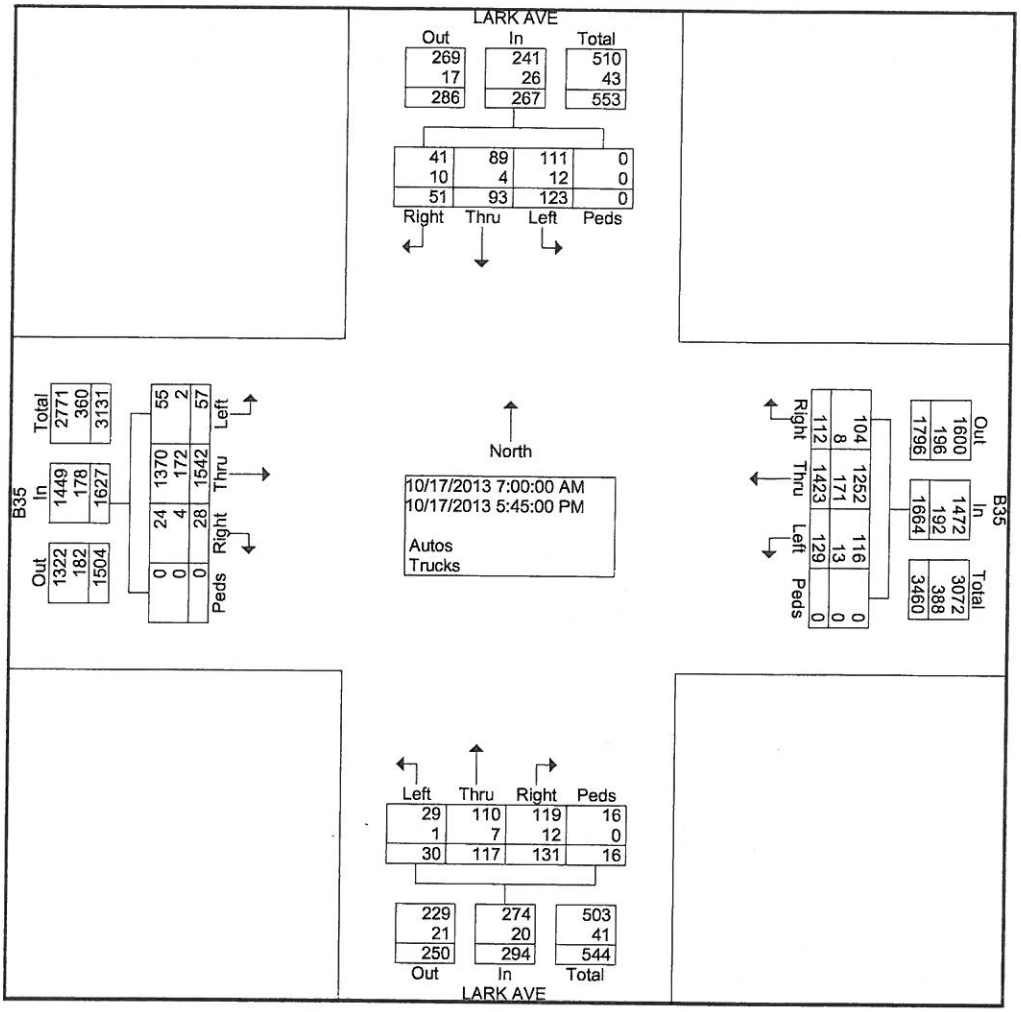
Groups Printed- Autos - Trucks

	LARK AVE From North					B35 From East					LARK AVE From South					B35 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	1	3	2	0	6	4	17	0	0	21	6	5	2	0	13	1	44	2	0	47	87
07:15 AM	0	3	3	0	6	6	28	0	0	34	6	5	1	0	12	0	65	1	0	66	118
07:30 AM	0	1	4	0	5	9	47	2	0	58	6	4	0	0	10	0	76	1	0	77	150
07:45 AM	4	1	2	0	7	5	50	1	0	56	6	10	0	0	16	0	59	0	0	59	138
Total	5	8	11	0	24	24	142	3	0	169	24	24	3	0	51	1	244	4	0	249	493
08:00 AM	1	2	2	0	5	2	40	3	0	45	3	5	2	0	10	0	44	4	0	48	108
08:15 AM	1	1	3	0	5	5	39	2	0	46	2	1	1	0	4	0	51	5	0	56	111
08:30 AM	1	0	2	0	3	1	33	2	0	36	5	4	3	0	12	0	33	2	0	35	86
08:45 AM	2	1	6	0	9	6	40	0	0	46	4	4	2	1	11	1	47	4	0	52	118
Total	5	4	13	0	22	14	152	7	0	173	14	14	8	1	37	1	175	15	0	191	423
09:00 AM	0	1	2	0	3	2	29	1	0	32	3	3	0	0	6	0	32	1	0	33	74
09:15 AM	1	1	3	0	5	4	38	1	0	43	2	2	0	0	4	0	39	0	0	39	91
09:30 AM	1	3	2	0	6	1	33	2	0	36	4	3	3	0	10	2	41	1	0	44	96
09:45 AM	1	1	1	0	3	2	30	3	0	35	3	1	1	0	5	2	43	1	0	46	89
Total	3	6	8	0	17	9	130	7	0	146	12	9	4	0	25	4	155	3	0	162	350
*** BREAK ***																					
11:00 AM	1	4	5	0	10	2	25	3	0	30	3	5	0	0	8	1	39	0	0	40	88
11:15 AM	2	7	1	0	10	5	30	3	0	38	2	1	0	0	3	1	47	3	0	51	102
11:30 AM	0	4	3	0	7	2	31	6	0	39	5	5	0	0	10	1	42	2	0	45	101
11:45 AM	4	3	4	0	11	3	43	1	0	47	5	2	2	1	10	0	33	0	0	33	101
Total	7	18	13	0	38	12	129	13	0	154	15	13	2	1	31	3	161	5	0	169	392
12:00 PM	2	0	1	0	3	2	43	3	0	48	2	3	1	1	7	1	38	1	0	40	98
12:15 PM	3	2	2	0	7	4	39	1	0	44	4	5	2	0	11	2	43	0	0	45	107
12:30 PM	1	5	0	0	6	2	36	6	0	44	3	2	0	0	5	2	34	3	0	39	94
12:45 PM	3	4	5	0	12	1	43	5	0	49	4	7	1	0	12	1	51	2	0	54	127
Total	9	11	8	0	28	9	161	15	0	185	13	17	4	1	35	6	166	6	0	178	426
*** BREAK ***																					
03:00 PM	0	2	3	0	5	2	49	4	0	55	5	2	1	1	9	1	45	2	0	48	117
03:15 PM	3	8	5	0	16	3	52	6	0	61	2	2	0	0	4	0	40	4	0	44	125
03:30 PM	3	3	4	0	10	7	61	8	0	76	3	3	0	0	6	0	54	1	0	55	147
03:45 PM	4	4	6	0	14	4	49	8	0	61	8	0	1	0	9	1	53	1	0	55	139
Total	10	17	18	0	45	16	211	26	0	253	18	7	2	1	28	2	192	8	0	202	528
04:00 PM	1	2	16	0	19	3	54	9	0	66	1	2	0	0	3	1	80	2	0	83	171
04:15 PM	1	5	3	0	9	7	49	6	0	62	7	1	1	1	10	0	63	0	0	63	144
04:30 PM	3	0	7	0	10	3	78	10	0	91	2	4	1	2	9	2	60	3	0	65	175
04:45 PM	2	2	10	0	14	2	71	5	0	78	8	5	0	0	13	1	49	1	0	51	156
Total	7	9	36	0	52	15	252	30	0	297	18	12	2	3	35	4	252	6	0	262	646
05:00 PM	0	6	6	0	12	1	59	7	0	67	4	5	0	4	13	2	59	2	0	63	155
05:15 PM	1	5	3	0	9	8	83	11	0	102	3	3	0	1	7	2	61	3	0	66	184
05:30 PM	4	2	4	0	10	1	63	4	0	68	6	4	1	1	12	1	42	4	0	47	137
05:45 PM	0	7	3	0	10	3	41	6	0	50	4	9	4	3	20	2	35	1	0	38	118
Total	5	20	16	0	41	13	246	28	0	287	17	21	5	9	52	7	197	10	0	214	594
Grand Total	51	93	123	0	267	112	1423	129	0	1664	131	117	30	16	294	28	1542	57	0	1627	3852
Apprch %	19.1	34.8	46.1	0.0		6.7	85.5	7.8	0.0		44.6	39.8	10.2	5.4		1.7	94.8	3.5	0.0		
Total %	1.3	2.4	3.2	0.0	6.9	2.9	36.9	3.3	0.0	43.2	3.4	3.0	0.8	0.4	7.6	0.7	40.0	1.5	0.0	42.2	

TURNING MOVEMENT COUNT SUMMARY

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : LarkAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 2



TURNING MOVEMENT COUNT SUMMARY

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : LarkAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

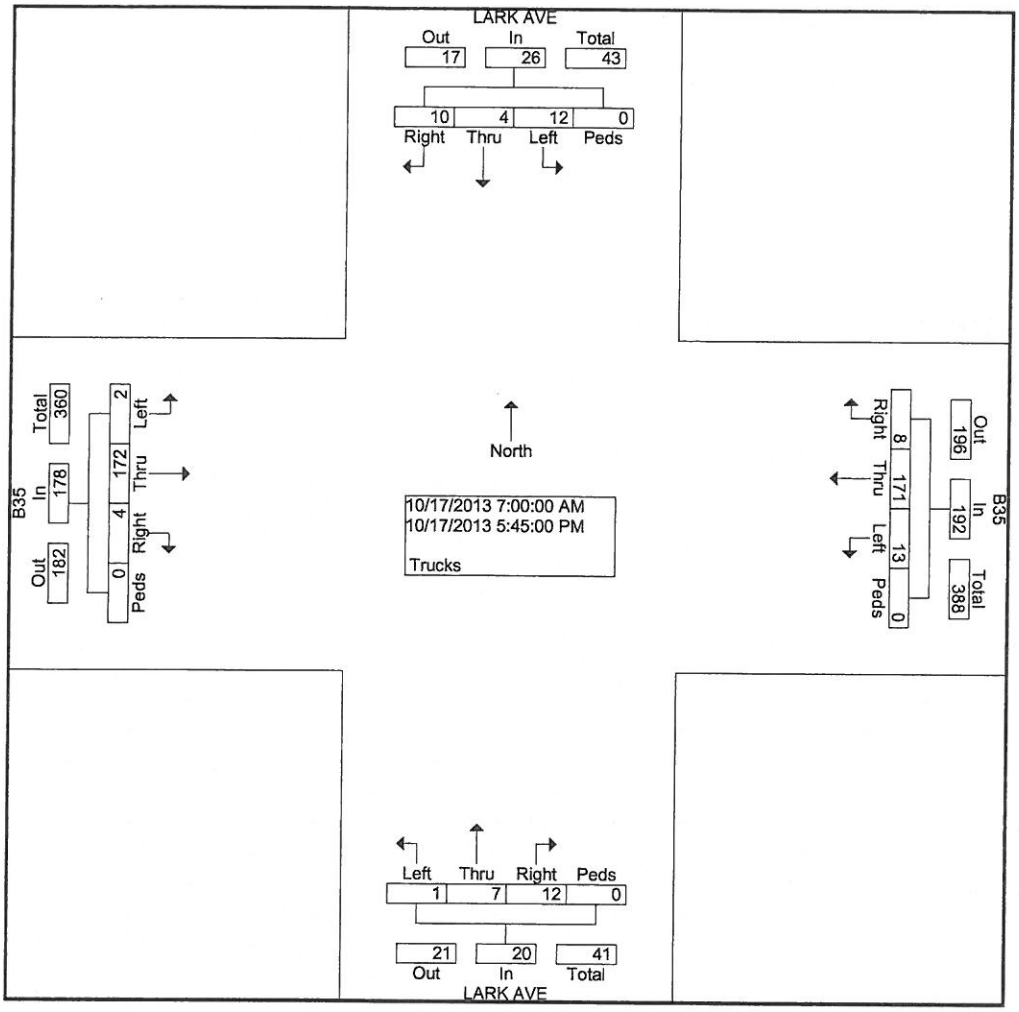
Groups Printed- Trucks

	LARK AVE From North					B35 From East					LARK AVE From South					B35 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
07:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	9
07:30 AM	0	0	2	0	2	1	5	0	0	6	0	0	0	0	0	0	4	0	0	4	12
07:45 AM	1	0	1	0	2	0	10	0	0	10	0	1	0	0	1	0	3	0	0	3	16
Total	1	0	3	0	4	1	23	0	0	24	0	1	0	0	1	0	13	0	0	13	42
08:00 AM	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	0	6	0	0	6	15
08:15 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	5
08:30 AM	0	0	0	0	0	1	7	1	0	9	0	0	0	0	0	0	6	1	0	7	16
08:45 AM	1	0	1	0	2	2	9	0	0	11	0	0	0	0	0	0	6	0	0	6	19
Total	1	1	2	0	4	4	24	1	0	29	0	0	0	0	0	0	21	1	0	22	55
09:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	10
09:15 AM	1	0	0	0	1	0	7	0	0	7	0	1	0	0	1	0	9	0	0	9	18
09:30 AM	1	0	0	0	1	0	9	0	0	9	0	0	0	0	0	2	9	0	0	11	21
09:45 AM	1	0	1	0	2	1	11	0	0	12	0	0	0	0	0	1	8	0	0	9	23
Total	3	0	1	0	4	1	31	0	0	32	0	1	0	0	1	3	32	0	0	35	72
*** BREAK ***																					
11:00 AM	0	0	2	0	2	1	8	0	0	9	0	0	0	0	0	0	6	0	0	6	17
11:15 AM	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	13	0	0	13	21
11:30 AM	0	0	1	0	1	0	6	1	0	7	1	1	0	0	2	0	8	1	0	9	19
11:45 AM	1	1	1	0	3	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	14
Total	2	1	4	0	7	1	28	1	0	30	1	1	0	0	2	0	31	1	0	32	71
12:00 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	7	0	0	7	15
12:15 PM	0	0	0	0	0	1	7	0	0	8	1	0	0	0	1	1	8	0	0	9	18
12:30 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	9
12:45 PM	1	0	0	0	1	0	4	2	0	6	0	3	0	0	3	0	7	0	0	7	17
Total	1	0	0	0	1	1	24	2	0	27	1	3	0	0	4	1	26	0	0	27	59
*** BREAK ***																					
03:00 PM	0	0	0	0	0	0	2	1	0	3	2	0	1	0	3	0	3	0	0	3	9
03:15 PM	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	8
03:30 PM	2	1	0	0	3	0	3	1	0	4	1	0	0	0	1	0	6	0	0	6	14
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
Total	2	2	0	0	4	0	9	2	0	11	3	0	1	0	4	0	20	0	0	20	39
04:00 PM	0	0	0	0	0	0	7	3	0	10	1	0	0	0	1	0	3	0	0	3	14
04:15 PM	0	0	0	0	0	0	1	0	0	1	3	0	0	0	3	0	8	0	0	8	12
04:30 PM	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	7	0	0	7	14
04:45 PM	0	0	1	0	1	0	1	0	0	1	2	1	0	0	3	0	4	0	0	4	9
Total	0	0	1	0	1	0	15	4	0	19	6	1	0	0	7	0	22	0	0	22	49
05:00 PM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	0	0	0	0	6
05:15 PM	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	3	0	0	3	5
05:30 PM	0	0	1	0	1	0	5	2	0	7	0	0	0	0	0	0	1	0	0	1	9
05:45 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	3	0	0	3	9
Total	0	0	1	0	1	0	17	3	0	20	1	0	0	0	1	0	7	0	0	7	29
Grand Total	10	4	12	0	26	8	171	13	0	192	12	7	1	0	20	4	172	2	0	178	416
Apprch %	38.5	15.4	46.2	0.0		4.2	89.1	6.8	0.0		60.0	35.0	5.0	0.0		2.2	96.6	1.1	0.0		
Total %	2.4	1.0	2.9	0.0	6.3	1.9	41.1	3.1	0.0	46.2	2.9	1.7	0.2	0.0	4.8	1.0	41.3	0.5	0.0	42.8	

TURNING MOVEMENT COUNT SUMMARY

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : LarkAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 2



TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

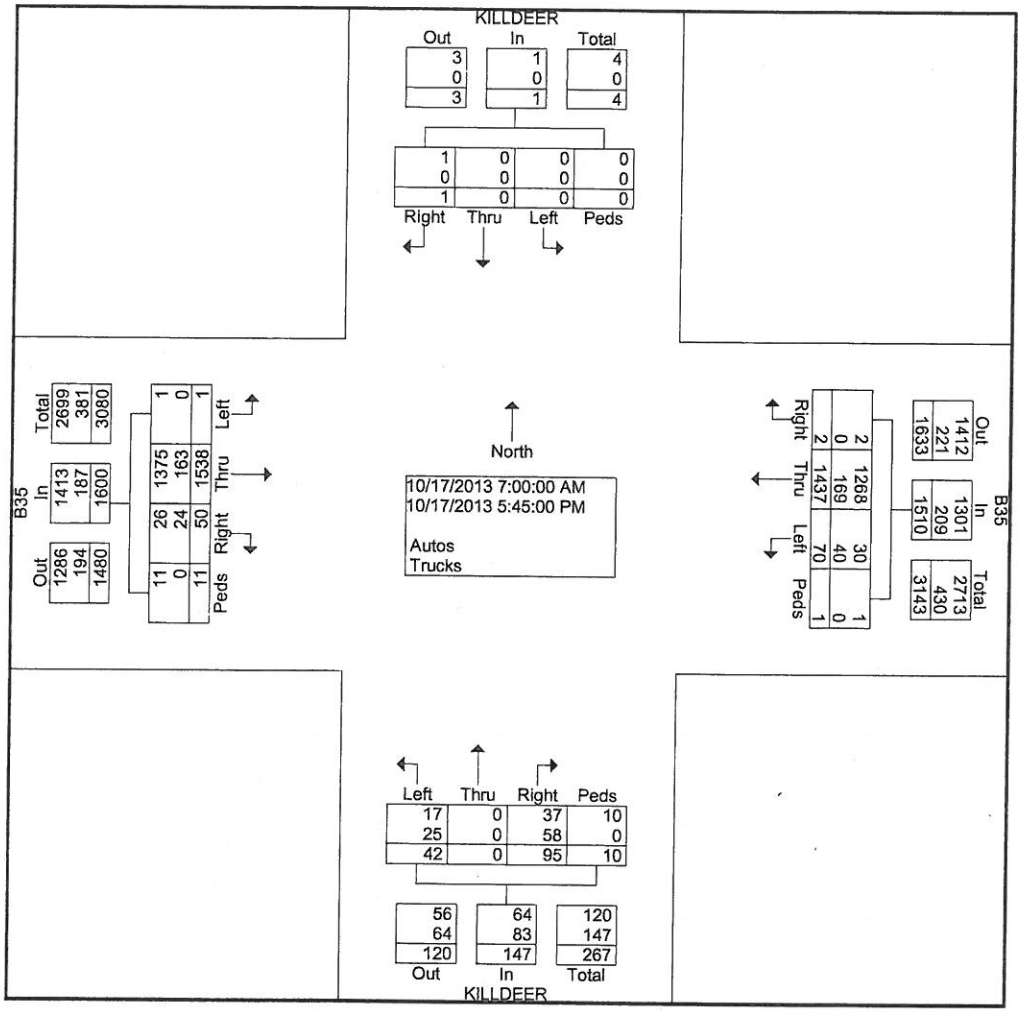
File Name : KilldeerAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

Groups Printed- Autos - Trucks

	KILLDEER From North					B35 From East					KILLDEER From South					B35 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	48	0	2	50	69
07:15 AM	0	0	0	0	0	0	30	1	0	31	1	0	1	2	4	0	64	0	0	64	99
07:30 AM	0	0	0	0	0	0	43	1	0	44	0	0	1	0	1	2	78	0	0	80	125
07:45 AM	0	0	0	0	0	0	53	2	0	55	2	0	0	0	2	5	56	0	0	61	118
Total	0	0	0	0	0	0	145	4	0	149	3	0	2	2	7	7	246	0	2	255	411
08:00 AM	0	0	0	0	0	0	40	2	0	42	0	0	0	0	0	1	47	0	0	48	90
08:15 AM	0	0	0	0	0	0	39	0	0	39	3	0	2	0	5	0	52	0	0	52	96
08:30 AM	0	0	0	0	0	0	38	4	0	42	1	0	1	0	2	3	35	0	0	38	82
08:45 AM	0	0	0	0	0	0	38	2	0	40	3	0	2	1	6	3	49	0	0	52	98
Total	0	0	0	0	0	0	155	8	0	163	7	0	5	1	13	7	183	0	0	190	366
09:00 AM	0	0	0	0	0	0	29	2	0	31	3	0	3	0	6	2	31	0	0	33	70
09:15 AM	0	0	0	0	0	0	36	5	0	41	2	0	2	0	4	1	36	0	0	37	82
09:30 AM	0	0	0	0	0	0	34	3	0	37	8	0	0	0	8	1	35	0	0	36	81
09:45 AM	0	0	0	0	0	0	31	0	0	31	3	0	0	0	3	3	44	0	1	48	82
Total	0	0	0	0	0	0	130	10	0	140	16	0	5	0	21	7	146	0	1	154	315
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	21	3	0	24	6	0	4	0	10	4	32	0	0	36	70
11:15 AM	0	0	0	0	0	0	30	3	1	34	7	0	2	0	9	0	47	0	0	47	90
11:30 AM	0	0	0	0	0	0	33	2	0	35	6	0	0	0	6	1	39	0	0	40	81
11:45 AM	1	0	0	0	1	0	40	6	0	46	2	0	2	1	5	4	33	0	0	37	89
Total	1	0	0	0	1	0	124	14	1	139	21	0	8	1	30	9	151	0	0	160	330
12:00 PM	0	0	0	0	0	0	43	3	0	46	6	0	5	0	11	0	33	0	0	33	90
12:15 PM	0	0	0	0	0	0	38	5	0	43	1	0	5	0	6	2	44	0	0	46	95
12:30 PM	0	0	0	0	0	1	32	5	0	38	3	0	0	0	3	2	35	0	0	37	78
12:45 PM	0	0	0	0	0	0	43	2	0	45	7	0	2	0	9	4	49	0	0	53	107
Total	0	0	0	0	0	1	156	15	0	172	17	0	12	0	29	8	161	0	0	169	370
*** BREAK ***																					
03:00 PM	0	0	0	0	0	0	49	3	0	52	2	0	1	1	4	1	48	0	0	49	105
03:15 PM	0	0	0	0	0	0	57	4	0	61	3	0	1	0	4	3	41	0	0	44	109
03:30 PM	0	0	0	0	0	0	55	6	0	61	5	0	0	0	5	1	52	0	0	53	119
03:45 PM	0	0	0	0	0	0	57	0	0	57	5	0	1	0	6	3	55	0	0	58	121
Total	0	0	0	0	0	0	218	13	0	231	15	0	3	1	19	8	196	0	0	204	454
04:00 PM	0	0	0	0	0	0	44	3	0	47	5	0	1	0	6	0	75	0	0	75	128
04:15 PM	0	0	0	0	0	0	61	0	0	61	4	0	3	1	8	0	60	0	2	62	131
04:30 PM	0	0	0	0	0	1	74	1	0	76	3	0	0	0	3	0	59	0	0	59	138
04:45 PM	0	0	0	0	0	0	67	0	0	67	1	0	2	0	3	2	49	1	0	52	122
Total	0	0	0	0	0	1	246	4	0	251	13	0	6	1	20	2	243	1	2	248	519
05:00 PM	0	0	0	0	0	0	64	0	0	64	1	0	1	1	3	1	65	0	4	70	137
05:15 PM	0	0	0	0	0	0	85	0	0	85	1	0	0	0	1	1	65	0	0	66	152
05:30 PM	0	0	0	0	0	0	64	2	0	66	1	0	0	1	2	0	47	0	1	48	116
05:45 PM	0	0	0	0	0	0	50	0	0	50	0	0	0	2	2	0	35	0	1	36	88
Total	0	0	0	0	0	0	263	2	0	265	3	0	1	4	8	2	212	0	6	220	493
Grand Total	1	0	0	0	1	2	1437	70	1	1510	95	0	42	10	147	50	1538	1	11	1600	3258
Apprch %	100.0	0.0	0.0	0.0		0.1	95.2	4.6	0.1		64.6	0.0	28.6	6.8		3.1	96.1	0.1	0.7		
Total %	0.0	0.0	0.0	0.0	0.0	0.1	44.1	2.1	0.0	46.3	2.9	0.0	1.3	0.3	4.5	1.5	47.2	0.0	0.3	49.1	

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : KilldeerAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 2



TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : KilldeerAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

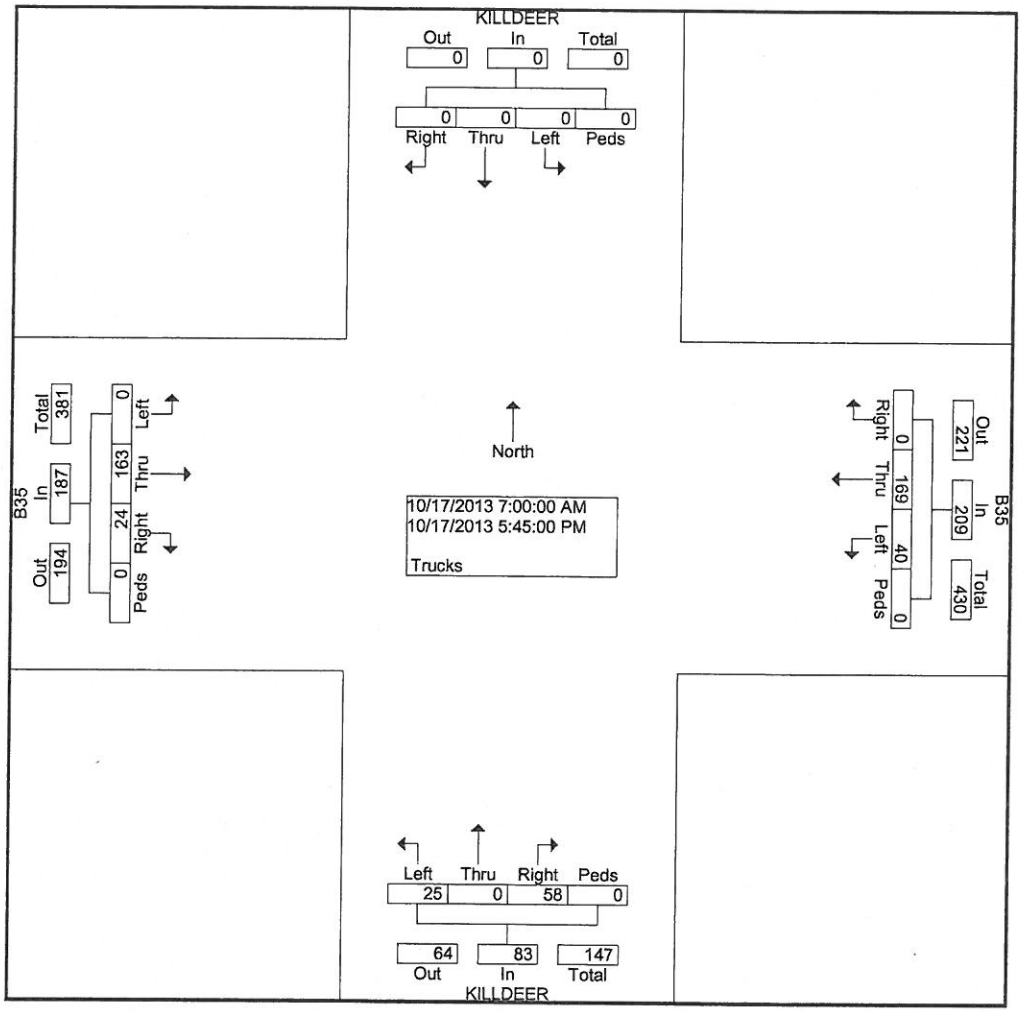
Groups Printed- Trucks

	KILLDEER From North					B35 From East					KILLDEER From South					B35 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
07:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
07:30 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	4	0	0	4	12
07:45 AM	0	0	0	0	0	0	8	2	0	10	0	0	0	0	0	3	3	0	0	6	16
Total	0	0	0	0	0	0	24	2	0	26	0	0	0	0	0	3	16	0	0	19	45
08:00 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	1	7	0	0	8	17
08:15 AM	0	0	0	0	0	0	1	0	0	1	3	0	2	0	5	0	1	0	0	1	7
08:30 AM	0	0	0	0	0	0	8	3	0	11	0	0	1	0	1	2	7	0	0	9	21
08:45 AM	0	0	0	0	0	0	11	2	0	13	2	0	1	0	3	1	5	0	0	6	22
Total	0	0	0	0	0	0	29	5	0	34	5	0	4	0	9	4	20	0	0	24	67
09:00 AM	0	0	0	0	0	0	3	1	0	4	2	0	2	0	4	1	4	0	0	5	13
09:15 AM	0	0	0	0	0	0	4	4	0	8	2	0	2	0	4	0	9	0	0	9	21
09:30 AM	0	0	0	0	0	0	7	3	0	10	7	0	0	0	7	0	4	0	0	4	21
09:45 AM	0	0	0	0	0	0	11	0	0	11	2	0	0	0	2	1	8	0	0	9	22
Total	0	0	0	0	0	0	25	8	0	33	13	0	4	0	17	2	25	0	0	27	77
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	4	3	0	7	5	0	3	0	8	4	2	0	0	6	21
11:15 AM	0	0	0	0	0	0	8	2	0	10	7	0	2	0	9	0	10	0	0	10	29
11:30 AM	0	0	0	0	0	0	6	1	0	7	3	0	0	0	3	1	6	0	0	7	17
11:45 AM	0	0	0	0	0	0	7	3	0	10	2	0	1	0	3	1	2	0	0	3	16
Total	0	0	0	0	0	0	25	9	0	34	17	0	6	0	23	6	20	0	0	26	83
12:00 PM	0	0	0	0	0	0	8	1	0	9	2	0	2	0	4	0	7	0	0	7	20
12:15 PM	0	0	0	0	0	0	3	4	0	7	1	0	3	0	4	2	9	0	0	11	22
12:30 PM	0	0	0	0	0	0	4	4	0	8	3	0	0	0	3	1	2	0	0	3	14
12:45 PM	0	0	0	0	0	0	5	0	0	5	5	0	2	0	7	0	7	0	0	7	19
Total	0	0	0	0	0	0	20	9	0	29	11	0	7	0	18	3	25	0	0	28	75
*** BREAK ***																					
03:00 PM	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	0	2	0	0	2	8
03:15 PM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	2	4	0	0	6	10
03:30 PM	0	0	0	0	0	0	4	4	0	8	3	0	0	0	3	1	5	0	0	6	17
03:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	2	7	0	0	9	12
Total	0	0	0	0	0	0	11	5	0	16	6	0	2	0	8	5	18	0	0	23	47
04:00 PM	0	0	0	0	0	0	3	2	0	5	1	0	1	0	2	0	6	0	0	6	13
04:15 PM	0	0	0	0	0	0	4	0	0	4	3	0	1	0	4	0	10	0	0	10	18
04:30 PM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	8	0	0	8	14
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	5	0	0	6	8
Total	0	0	0	0	0	0	14	2	0	16	5	0	2	0	7	1	29	0	0	30	53
05:00 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
05:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	7
05:30 PM	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	0	3	0	0	3	10
05:45 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	2	0	0	2	10
Total	0	0	0	0	0	0	21	0	0	21	1	0	0	0	1	0	10	0	0	10	32
Grand Total	0	0	0	0	0	0	169	40	0	209	58	0	25	0	83	24	163	0	0	187	479
Apprch %	0.0	0.0	0.0	0.0		0.0	80.9	19.1	0.0		69.9	0.0	30.1	0.0		12.8	87.2	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	35.3	8.4	0.0	43.6	12.1	0.0	5.2	0.0	17.3	5.0	34.0	0.0	0.0	39.0	

TURNING MOVEMENT COUNT SUMMARY

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : KilldeerAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 2



TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : JonquilAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

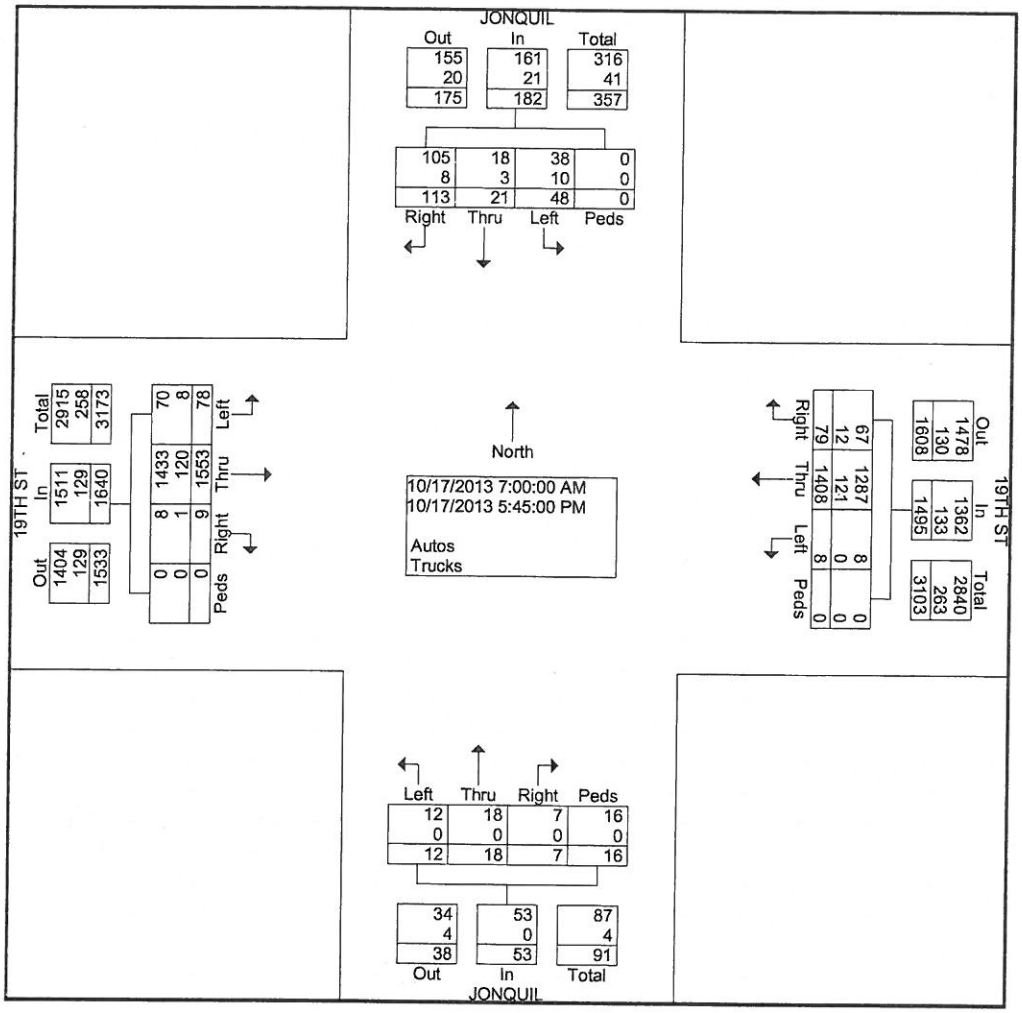
Groups Printed- Autos - Trucks

	JONQUIL From North					19TH ST From East					JONQUIL From South					19TH ST From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	0	0	1	0	1	0	22	0	0	22	0	0	0	0	0	3	54	4	0	61	84
07:15 AM	3	0	1	0	4	3	29	0	0	32	1	1	1	0	3	0	56	6	0	62	101
07:30 AM	1	0	1	0	2	1	40	0	0	41	0	0	0	0	0	1	80	3	0	84	127
07:45 AM	8	0	2	0	10	2	54	0	0	56	0	0	0	0	0	0	60	2	0	62	128
Total	12	0	5	0	17	6	145	0	0	151	1	1	1	0	3	4	250	15	0	269	440
08:00 AM	1	1	1	0	3	6	33	0	0	39	0	0	2	0	2	0	54	3	0	57	101
08:15 AM	2	0	2	0	4	4	37	0	0	41	0	0	0	0	0	1	42	4	0	47	92
08:30 AM	3	0	1	0	4	0	38	0	0	38	1	1	2	0	4	0	39	4	0	43	89
08:45 AM	2	0	3	0	5	2	33	1	0	36	0	2	0	0	2	0	47	5	0	52	95
Total	8	1	7	0	16	12	141	1	0	154	1	3	4	0	8	1	182	16	0	199	377
09:00 AM	6	1	1	0	8	4	33	0	0	37	0	0	0	1	1	0	33	3	0	36	82
09:15 AM	1	0	0	0	1	1	36	0	0	37	0	0	0	0	0	0	38	0	0	38	76
09:30 AM	2	0	1	0	3	3	33	0	0	36	0	0	1	0	1	0	35	1	0	36	76
09:45 AM	3	1	2	0	6	3	30	0	0	33	0	0	0	1	1	1	45	1	0	47	87
Total	12	2	4	0	18	11	132	0	0	143	0	0	1	2	3	1	151	5	0	157	321
*** BREAK ***																					
11:00 AM	3	0	2	0	5	0	26	1	0	27	0	0	0	0	0	0	42	0	0	42	74
11:15 AM	2	3	0	0	5	1	33	0	0	34	1	0	1	0	2	0	48	1	0	49	90
11:30 AM	0	0	0	0	0	0	31	1	0	32	0	0	0	0	0	0	36	3	0	39	71
11:45 AM	5	0	2	0	7	2	44	0	0	46	0	1	0	1	2	0	34	4	0	38	93
Total	10	3	4	0	17	3	134	2	0	139	1	1	1	1	4	0	160	8	0	168	328
12:00 PM	4	0	1	0	5	1	50	1	0	52	0	1	0	0	1	0	42	3	0	45	103
12:15 PM	7	1	2	0	10	5	41	0	0	46	0	0	0	0	0	0	46	1	0	47	103
12:30 PM	4	0	1	0	5	2	33	0	0	35	0	2	1	0	3	0	38	3	0	41	84
12:45 PM	2	1	1	0	4	2	43	0	0	45	2	2	0	0	4	0	50	1	0	51	104
Total	17	2	5	0	24	10	167	1	0	178	2	5	1	0	8	0	176	8	0	184	394
*** BREAK ***																					
03:00 PM	6	3	0	0	9	3	42	0	0	45	1	0	0	0	1	0	46	3	0	49	104
03:15 PM	7	0	2	0	9	0	56	1	0	57	0	1	0	2	3	1	46	1	0	48	117
03:30 PM	3	2	4	0	9	5	50	1	0	56	1	0	0	0	1	0	49	6	0	55	121
03:45 PM	5	0	4	0	9	1	56	1	0	58	0	0	1	0	1	0	50	3	0	53	121
Total	21	5	10	0	36	9	204	3	0	216	2	1	1	2	6	1	191	13	0	205	463
04:00 PM	1	0	4	0	5	4	40	0	0	44	0	2	1	0	3	0	71	0	0	71	123
04:15 PM	5	1	2	0	8	6	54	0	0	60	0	0	0	2	2	0	58	1	0	59	129
04:30 PM	2	2	3	0	7	5	68	0	0	73	0	2	0	1	3	0	56	4	0	60	143
04:45 PM	3	1	1	0	5	2	71	0	0	73	0	2	1	2	5	1	51	3	0	55	138
Total	11	4	10	0	25	17	233	0	0	250	0	6	2	5	13	1	236	8	0	245	533
05:00 PM	10	2	1	0	13	4	61	0	0	65	0	0	1	3	4	0	66	2	0	68	150
05:15 PM	6	0	1	0	7	2	80	1	0	83	0	0	0	0	0	1	60	0	0	61	151
05:30 PM	6	1	1	0	8	3	65	0	0	68	0	0	0	2	2	0	49	3	0	52	130
05:45 PM	0	1	0	0	1	2	46	0	0	48	0	1	0	1	2	0	32	0	0	32	83
Total	22	4	3	0	29	11	252	1	0	264	0	1	1	6	8	1	207	5	0	213	514
Grand Total	113	21	48	0	182	79	1408	8	0	1495	7	18	12	16	53	9	1553	78	0	1640	3370
Apprch %	62.1	11.5	26.4	0.0		5.3	94.2	0.5	0.0		13.2	34.0	22.6	30.2		0.5	94.7	4.8	0.0		
Total %	3.4	0.6	1.4	0.0	5.4	2.3	41.8	0.2	0.0	44.4	0.2	0.5	0.4	0.5	1.6	0.3	46.1	2.3	0.0	48.7	

TURNING MOVEMENT COUNT SUMMARY

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : JonquilAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 2



TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

File Name : JonquilAve
Site Code : 00000000
Start Date : 10/17/2013
Page No : 1

Groups Printed- Trucks

	JONQUIL From North					19TH ST From East					JONQUIL From South					19TH ST From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
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	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	6
07:15 AM	1	0	0	0	1	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	4
07:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
07:45 AM	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	6
Total	1	0	2	0	3	1	8	0	0	9	0	0	0	0	0	0	8	0	0	8	20
08:00 AM	0	0	1	0	1	1	5	0	0	6	0	0	0	0	0	0	4	0	0	4	11
08:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
08:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	1	0	1	1	13	0	0	14	0	0	0	0	0	0	10	0	0	10	25
09:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
09:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
09:30 AM	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	11
09:45 AM	0	0	1	0	1	0	11	0	0	11	0	0	0	0	0	0	4	0	0	4	16
Total	0	0	2	0	2	0	22	0	0	22	0	0	0	0	0	0	15	0	0	15	39
*** BREAK ***																					
11:00 AM	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	12
11:15 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	14
11:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	3	1	0	4	10
11:45 AM	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	8
Total	0	0	2	0	2	0	24	0	0	24	0	0	0	0	0	0	17	1	0	18	44
12:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	6	0	0	6	13
12:15 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	15
12:30 PM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	2	0	0	2	6
12:45 PM	1	0	0	0	1	1	4	0	0	5	0	0	0	0	0	0	6	0	0	6	12
Total	1	0	0	0	1	2	20	0	0	22	0	0	0	0	0	0	23	0	0	23	46
*** BREAK ***																					
03:00 PM	1	2	0	0	3	0	3	0	0	3	0	0	0	0	0	0	2	2	0	4	10
03:15 PM	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	1	4	0	0	5	9
03:30 PM	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	6	1	0	7	12
03:45 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	5	1	0	6	8
Total	1	2	3	0	6	1	10	0	0	11	0	0	0	0	0	1	17	4	0	22	39
04:00 PM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	8
04:15 PM	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	0	7	0	0	7	10
04:30 PM	1	0	0	0	1	2	4	0	0	6	0	0	0	0	0	0	5	1	0	6	13
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	5	1	0	6	7
Total	3	0	0	0	3	4	9	0	0	13	0	0	0	0	0	0	20	2	0	22	38
05:00 PM	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	1	1	0	2	7
05:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5
05:30 PM	2	1	0	0	3	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	11
05:45 PM	0	0	0	0	0	2	5	0	0	7	0	0	0	0	0	0	2	0	0	2	9
Total	2	1	0	0	3	3	15	0	0	18	0	0	0	0	0	0	10	1	0	11	32
Grand Total	8	3	10	0	21	12	121	0	0	133	0	0	0	0	0	1	120	8	0	129	283
Apprch %	38.1	14.3	47.6	0.0		9.0	91.0	0.0	0.0		0.0	0.0	0.0	0.0		0.8	93.0	6.2	0.0		
Total %	2.8	1.1	3.5	0.0	7.4	4.2	42.8	0.0	0.0	47.0	0.0	0.0	0.0	0.0	0.0	0.4	42.4	2.8	0.0	45.6	

TRAFFIC ANALYSIS
B35 ROADWAY IMPROVEMENT PROJECT
CERRO GORDO COUNTY, IOWA

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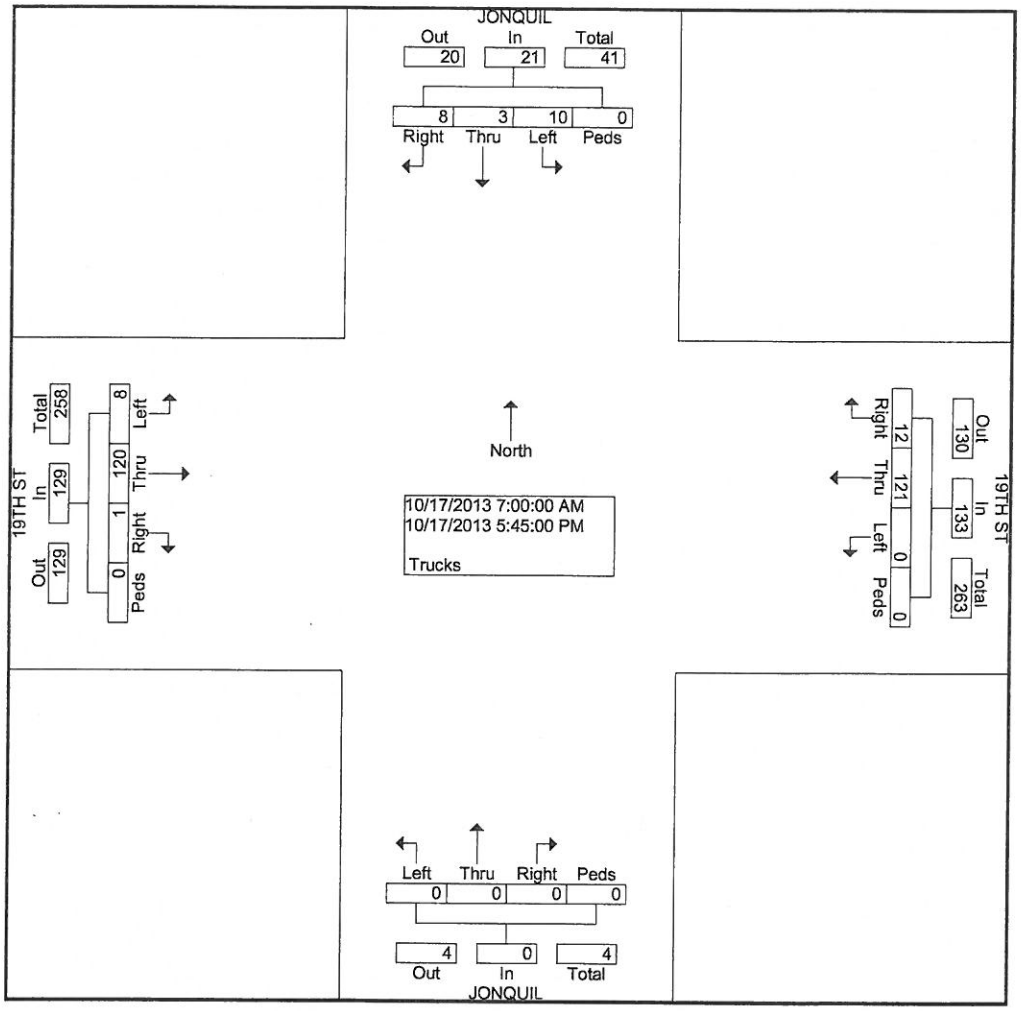


Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Cerro Gordo Prepared by: Michael Danburg Date Prepared: Jul 31, 2014

Location: B35 from Mason City Corp Limits to Clear Lake Corp Limits

Improvement

Proposed Improvement(s): Construct PCC Pavement (widened section for safety shoulder) with left and right turn lane improvements for major approaches at three intersections

$ 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, **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: Eight Hour Turning Movement Counts 10/17/2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
2.71	4,875	
2.71	miles total	

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

13,211 Current Vehicle Miles / Day, **VM**

19,631 End of Life Veh. Miles / Day

4,822,106 Current Veh. Miles / Year, **AM**

117,164,499 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

2008 First full year --> 2012 Last full year 5.0 years, Time Period, **T**

Additional months values as of May 2014

1	Fatal Crashes →	0	Fatalities @	$4,500,000	$	-
		2	Major Injuries @	$325,000	$	650,000
5	Injury Crashes →	3	Minor Injuries @	$65,000	$	195,000
		1	Possible Injuries @	$35,000	$	35,000
20	Property Damage Only		(assumed cost per crash)	$7,400	$	192,400
			-OR- enter all Property Costs of all crashes:			
26	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	1,072,400

5.20	Current Crashes / Year, **AA** = TA / T	**107.8**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 41,246	Cost per Crash, **AVCR** = LOSS / TA	$ 1,035,401	Present Value of Avoided Crashes, **BENEFIT**
126.3	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
1.56	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 64,344	Crash Costs Avoided in First Year, AAR x AVCR		
37.9	Total Avoided Crashes, TCR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $1,035,401 : $500,000 = **2.07** : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Bloomfield / US 63 4 Lane to 3 Lane Conversion

Applicant: Iowa DOT - District 5

Contact Person: James Armstrong Title: District Engineer

Complete Mailing Address: 307 W. Briggs
Fairfield, IA 52556

Phone: 641-472-4171 (Area Code) E-Mail: James.Armstrong@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): 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 $ 45,000.00

Safety Funds Requested $ 45,000.00

APPLICATION CERTIFICATION FOR LOCAL GOVERNMENT

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

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

Representing the _____

Signed: _____

Signature Date Signed

_____

Typed Name

Attest: _____

Signature Date Signed

_____

Typed Name

District 5 Office
307 W Briggs, PO Box 587 l Fairfield, Iowa 52556-0587
Phone: 641.469.4005 l Email: James.Armstrong@dot.iowa.gov

August 14th, 2014

RE: TSIP Application

Terry Ostendorf
Office of Traffic & Safety
800 Lincoln Way
Ames, Iowa 50010

Mr. Ostendorf:

Please find attached documentation relating to the TSIP application for U.S. 63 in the City of Bloomfield, Iowa. District 5 wishes to convert the existing four lanes of U.S. 63 to three lanes within the City. The City is currently working on Streetscapes project in the downtown area and the District would like to partner with the City on this project.

The following narrative describes the projects intent as outlined in the application instructions.

"A"

The City of Bloomfield is currently working towards sending the District a Resolution stating that this conversion will be in place for at least five years. Once we have received the resolution, the District will send the Office of Traffic and Safety a copy.

"B"

In Bloomfield, Iowa US 63 is a 4-lane undivided highway. The area in question has a speed reduction as you enter the central business district, both northbound and southbound, from 45 to 35 then 25 mph. Three signals control traffic at E. Franklin, W. Jefferson and W. Locust Streets. A roll out school stop sign is used at E. North Ave. during morning and afternoon school traffic.

The Major Cause Summary from CMAT is included showing crashes that could be avoided from the 3-lane environment vs the current 4-lane layout. The crashes that would be reduced are highlighted for your reference.

“C”

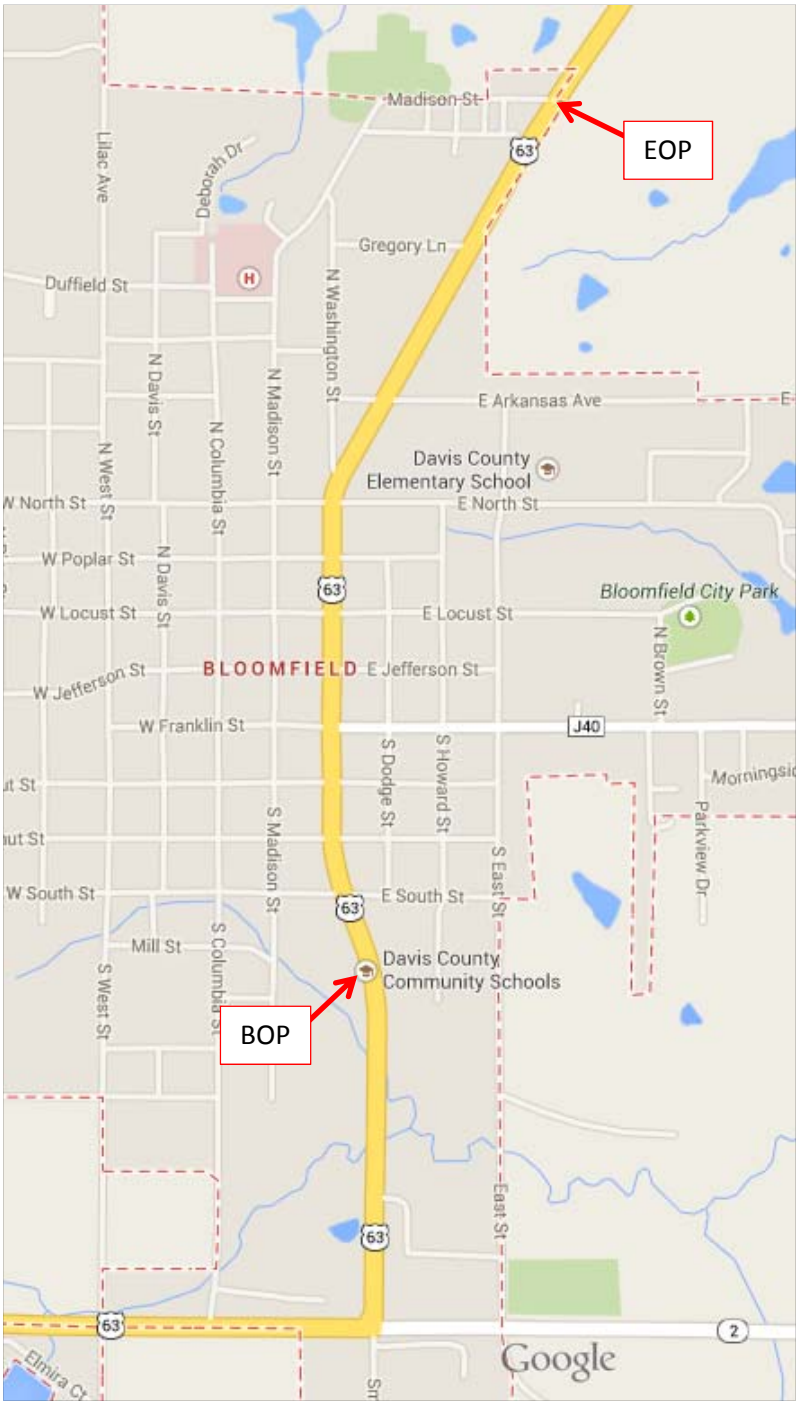
Using the average cost for statewide projects in 2013 the cost to remove paint from the current 4-lane configuration is $11,324.07. The cost to restripe the facility to a 3-lane configuration, including symbols, is $18,995.33. The cost for traffic control, mobilization, and contingency is estimated to be $14,680.60 for a total project cost of $45,000.00. The funds for this project come from the TSIP application or district monies.

“D”

The timeline for removal and restriping this section of US 63 will take place, as weather permits, early in 2015.

"E"

Roughly .5 miles north of the east junction of Iowa 2 / U.S. 63 north to just north of Madison Street. The approximate distance for this project is 1.25 miles.



“F”

South End – NB Transition Area

School Role Out at E. North Avenue

Downtown – 3 Signalized Intersections

North End – SB Transition Area

“G”

Project will be within the existing right of way; Surface Treatment Only

“H” – Spot Locations

South End – Near South Street

Downtown

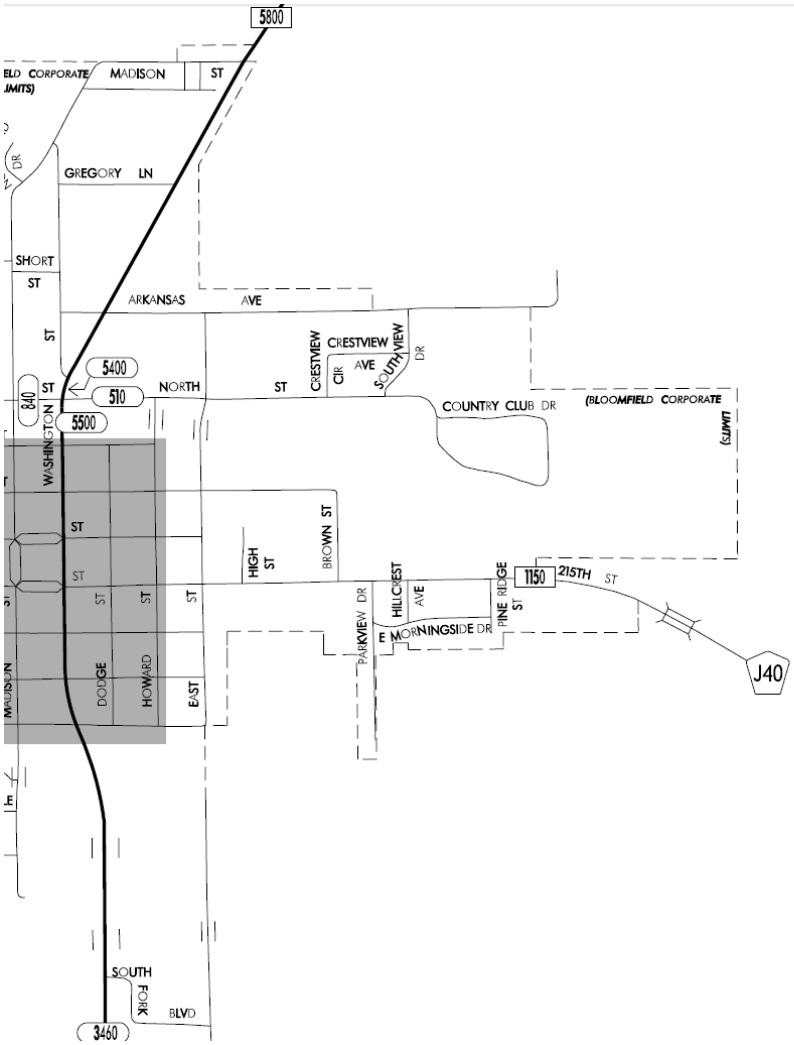
Between Poplar St and North St

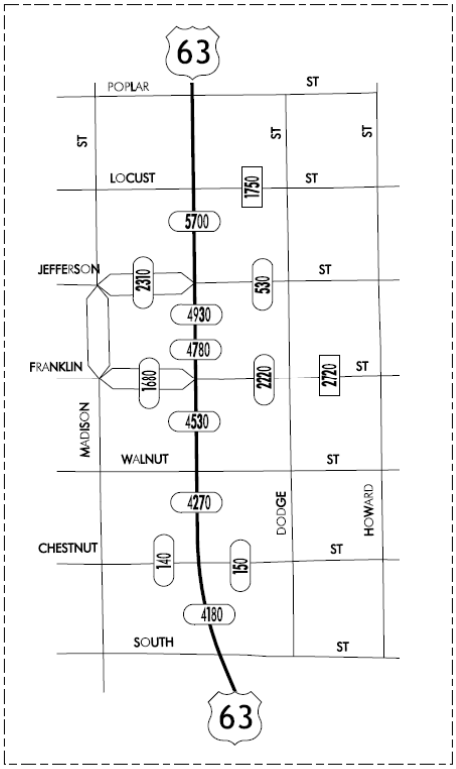
North End – Near Madison

"I" – N / A

"J" – Year 2010 (Actual Count Year)

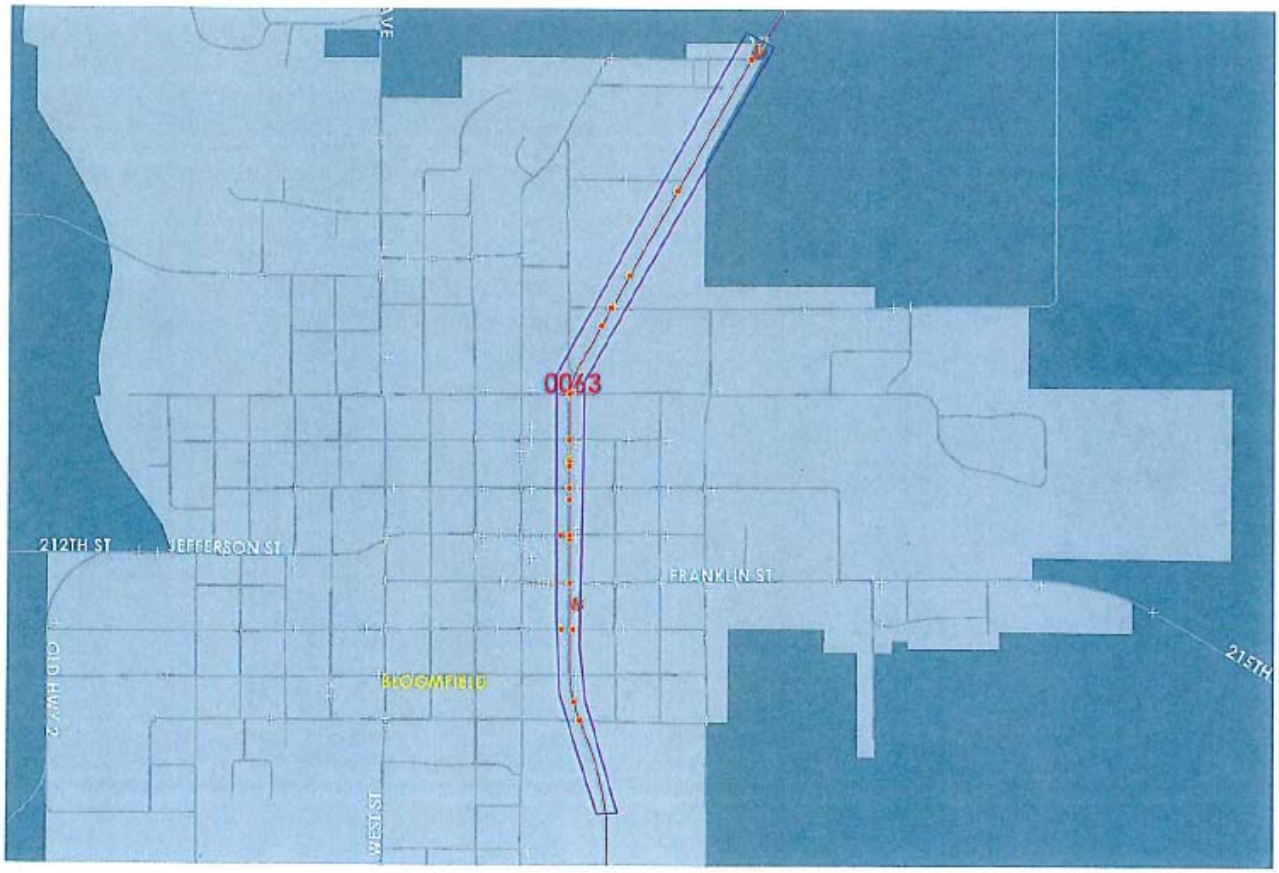
Counts range from 3460 ADT on the south end to to 5800 ADT on the north end.





"K"

Signals will not be modified


0063
212TH ST
JEFFERSON ST
FRANKLIN ST
BLOOMFIELD
WEST ST
215TH

Iowa Department of Transportation

Major Cause Summary

2009-2013 US 63 4-lane in Bloomfield

Analysis Years: 2009 [5], 2010 [3], 2011 [7], 2012 [9], 2013 [9]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	7
PDO	29
Total Crashes	36

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible	11
Unknown	-
Total Injuries	11

Surface Condition Summary:

Dry	32
Wet	1
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	2
Total Crashes	36

TOT Property Damage: $185,883

AVG Property Damage: $5,163

Major Cause Summary:

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

Selection Filter:

((YEAR = 2009 or YEAR = 2010 or YEAR = 2011 or YEAR = 2012 or YEAR = 2013))

Analyst:

Notes:

"L"

Rev. 4/08

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County:	Davis	Prepared by: Redeker	Date Prepared: Jul 24, 2014
Location:	US 63 in Bloomfield, 4-lane section		

Improvement

Proposed Improvement(s): Restriping in town from 4-lane to 3-lane

$ 45,000	Estimated Improvement Cost, EC	2	Est. Improvement Life, years, **Y**
$ 5,276	Other Annual Cost (after initial year), AC	37	Crash Reduction Factor, **CRF**
$ 9,950	Present Value Other Annual Costs, OC	4.0%	Discount Rate, **INT**
	$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$	$ 54,950	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source:	IA DOT	2010	Date of traffic count

Length (mi.)	Two-way veh/day	Description		
1.27	5,500	US 63 @ North St.	6,985	Current Vehicle Miles / Day, **VM**
			7,125	End of Life Veh. Miles / Day
			2,549,525	Current Veh. Miles / Year, **AM**
			5,124,545	Total Projected Veh. Miles Over Life of Project, **TVMT**
1.27	miles total			$TVMT = \frac{AM}{-G}\left(1 - \left(\frac{1+G}{1}\right)^Y\right)$
1.0%	Projected Traffic Growth (0%-10%), G			

Crash Data

2009	First full year -->	2013	Last full year	5.0	years, Time Period, T
0	Additional months				values as of Dec. 2007

0	Fatal Crashes		Fatalities @	$3,500,000	$ -
			Major Injuries @	$240,000	$ -
7	Injury Crashes		Minor Injuries @	$48,000	$ -
		11	Possible Injuries @	$25,000	$ 275,000
29	Property Damage Only		(assumed cost per crash)	$2,700	$ 78,300
			-OR- enter Actual Cost of all property damage:		
36	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 353,300

7.20	Current Crashes / Year, **AA** = TA / T	282.4	Crashes / HMVM, Crash Rate, **CR**
$ 9,814	Cost per Crash, **AVCR** = LOSS / TA		CR = TA x 10^8 / (AM x T)
14.5	Total Expected Crashes, **TCR** = CR x TVMT/10^8	$ 49,552	Present Value of Avoided Crashes, **BENEFIT**
2.66	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 26,144	Crash Costs Avoided in First Year, AAR x AVCR		$BEN. = \frac{AVCR \times AAR}{(INT - G)}\left(1 - \left(\frac{1+G}{1+INT}\right)^Y\right)$
5.4	Total Avoided Crashes, TCR x CRF/ 100		

Benefit / Cost Ratio

Benefit : Cost =	$49,552	:	$54,950	=	0.90 : 1

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: FY 2016--220th Street; PCC pavement, paved shoulders & rumble strips

Applicant: Henry County

Contact Person: Jake Hotchkiss Title: County Engineer

Complete Mailing Address: PO Box 655
Mt. Pleasant IA 52641

Phone: 319 385-0762 (Area Code) E-Mail: jhotchkiss@henrycountyiowa.us

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 500,000

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 Henry County

Signed: _____ 8/5/14
Signature Date Signed

Jake Hotchkiss
Typed Name

Attest: _____ 8/5/2014
Signature Date Signed

Jelen G. McCall
Typed Name

B. **Proposed Project:**

Henry County is applying for Traffic Safety Improvement Program funds to improve the safety on a section of County Road H38 (220th Street) from the overpass with Hwy 218 to the intersection of X23 (Racine Avenue) approximately 6.9 miles. We are seeking safety funds to replace existing 22' pavement with a 24' pavement and add 2 foot paved shoulders with 8" rumble strips to the roadway. Originally we were planning on crushing existing 22 foot pavement, relay as sub-base and construct an 8" PCC pavement 22 feet wide. Our proposed safety improvement would allow us to place a 24 foot pavement with 2 foot paved shoulders including 8" rumble strips. The wider road, 2' paved shoulders with rumble strips will improve safety for cars and trucks immediately, by warning and allowing improved reaction time for traveling motorist.

Existing Conditions:

The existing road was paved in 1965 at 22' wide with 6' granular shoulders. In 1987 a 6" concrete overlay was constructed and 4' earthen shoulders placed. Because of overlays and design standards utilized at the time fore-slopes have been constructed at a 2:1 slope. Existing slopes are unforgiving for vehicles that leave the traveled roadway. The road has reasonably high traffic count (1,060 vpd) and is the main road heading east out of the north side of Mount Pleasant.

Safety Improvement:

H38 (220th Street) is seeing increased truck traffic count resulting from Mount Pleasant's Industrial park. With this increased traffic we want to be proactive in preventing future accidents along H38 (220th Street). The majority of accidents have resulted in running off the roadway into ditches. Fortunately accidents have been minor to property damage only. With the proposed paved shoulder and rumble strips we will be able to minimize edge drop off and warn drivers with rumble strips when they are drifting away from roadway. (See Typical PCC Section)

C. **ESTIMATED TOTAL PROJECT COST**

1. See attached Sheet for specific estimate costs with and without safety improvement.

2. Henry County is requesting $500,000 for 1' widening, 2' Paved shoulders with rumble strips

Funding Source Breakdown				
Project with Safety Improvement			Project excluding Safety improvement	
Funding source	Amount		Funding Source	Amount
Federal Aid	$1,400,000		Federal Aid	$1,400,000
Farm to Market	$1,900,000		Farm to Market	$1,900,000
TSIP	$500,000		TSIP	$0
Local	$158,000		Local	$0
TOTAL	$3,958,000		TOTAL	$3,300,000

D. **TIME SCHEDULE**

220th Street is scheduled for a January 2016 letting construction to start during the spring and be completed by Fall of 2016.

E. **PROJECT LOCATION (Map attached)**

F. **Pictures (attached)**

G. **Plan view (attached 1"=1,000')**

No Additional Right-of-Way will be required only minimal work will be done to fore slopes to waste excess material resultant from Shoulder construction.

H. **Aerial Photo (11x17 attached)**

I. **Accident reports**

From 2009 to 2014 supplied by Henry County Sheriff's department (attached)

CMAT data will be provided by Office of Traffic and Safety to include most recent data. (Used CMAT crashes prepared by Bob Sperry for Benefit/Cost ratio worksheet.

J. **2010 ADT shows 1,060 vpd**

K. **Traffic Signals – N/A**

L. **Benefit to Cost ratio worksheet (attached)**

Henry County is requesting $500,000 for Safety Improvement. The Benefit to Cost ratio is 1.22:1 we feel that this is more of a proactive approach rather than reactive. The B/C ratio is positive and with the understanding of higher traffic counts expected as well as higher percentage of Trucks this B/C could be substantially higher.

Crash Reduction Factors selected:

1. Paved shoulders with 8" Rumble strips value of 37 CRF used
2. Widen Paved road from 22' to 24' value of 2 CRF used

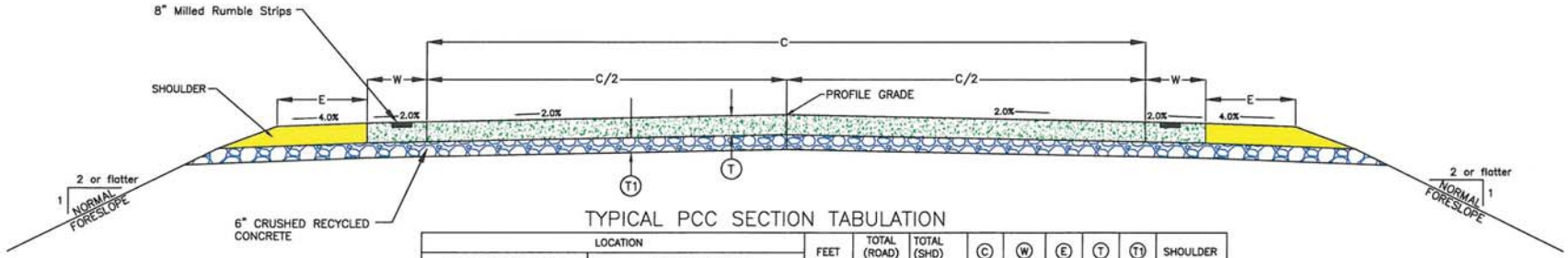
Crash Reduction Factors selected from www.cmfclearinghouse.org/

(B): Proposed Project

HENRY 16
8/01/14

TYPICAL PCC SECTION

NOTES:



TYPICAL PCC SECTION TABULATION

LOCATION			FEET	TOTAL (ROAD) SY	TOTAL (SHD) SY	©	Ⓦ	Ⓔ	Ⓣ	Ⓣ1	SHOULDER TYPE
ROAD IDENTIFICATION	STATION TO STATION										
220TH STREET	124+91	200+00	7,509.0	20,024.0	3,337.3	24.0'	2.0'	3.0'	8"	6"	B
220TH STREET	200+00	222+00	2,182.0	0.0	969.8	24.0'	2.0'	3.0'	8"	6"	B
220TH STREET	222+00	474+04	25,204.0	67,210.7	11,201.8	24.0'	2.0'	3.0'	8"	6"	B
		TOTALS	34,895.0	87,234.7	15,508.9						

NOT TO SCALE

FILE: WINFIELD AVENUE.DWG	HENRY COUNTY	PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NUMBER
		SAFETY APPLICATION	IA	5	2016	B.01

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C. ESTIMATED TOTAL PROJECT COST

ENGINEER'S ESTIMATE 220th STREET

PROJECT# STP-S-CO44(77)--5-44

				Safety Improvement			Original Plan		
				24' pavement, 2' Paved shoulders, 3' granular shoulders			22' Pavement & 6' Granular shoulders		
ITEM NO.	ITEM CODE	ITEM	UNIT	QUANTITY	UNIT/PRICE	TOTAL	QUANTITY	UNIT/PRICE	TOTAL
1	2101-0850001	CLEARING AND GRUBBING	ACRE	1	$ 2,700.00	$ 2,700.00	1.00	2700	$ 2,700.00
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	15000	$ 5.00	$ 75,000.00	25,000.00	5	$ 125,000.00
3	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	13000	$ 18.00	$ 234,000.00	9,000.00	18	$ 162,000.00
4	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	697.9	$ 120.00	$ 83,748.00	697.90	120	$ 83,748.00
5	2213-7100400	RELOCATION OF MAILBOX	EACH	16	$ 150.00	$ 2,400.00	16.00	150	$ 2,400.00
6	2301-1033080	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 8 IN.	SY	102744	$ 28.00	$ 2,876,832.00	79,965.10	28	$ 2,239,022.80
7	2301-6911722	PORTLAND CEMENT CONCRETE PAVEMENT SAMPLES	LS	1	$ 2,500.00	$ 2,500.00	1.00	2500	$ 2,500.00
8	2301-9091000	RUMBLE STRIP PANEL (PCC SURFACE)	EACH	2	$ 300.00	$ 600.00	2.00	300	$ 600.00
9	2315-8275025	SURFACING, DRIVEWAY , CLASS A CRUSHED STONE	TON	402	$ 28.33	$ 11,388.66	402.00	28.33	$ 11,388.66
10	2416-1240024	CULVERT, 3000D CONCRETE ROADWAY PIPE, 24 IN. DIA	LF	185	$ 60.00	$ 11,100.00	185.00	60	$ 11,100.00
11	2416-1240030	CULVERT, 3000D CONCRETE ROADWAY PIPE, 30 IN. DIA	LF	225	$ 70.00	$ 15,750.00	225.00	70	$ 15,750.00
12	2416-1240036	CULVERT, 3000D CONCRETE ROADWAY PIPE, 36 IN. DIA	LF	250	$ 90.00	$ 22,500.00	250.00	90	$ 22,500.00
13	2416-1240042	CULVERT, 3000D CONCRETE ROADWAY PIPE, 42 IN. DIA	LF	86	$ 120.00	$ 10,320.00	86.00	120	$ 10,320.00
14	2510-6750501	REMOVAL AND CRUSHING OF PAVEMENT	SY	101774	$ 5.00	$ 508,870.00	101,774.00	5	$ 508,870.00
15	2518-6910000	SAFETY CLOSURE	EACH	13	$ 154.44	$ 2,007.72	13.00	154.44	$ 2,007.72
16	2528-8445110	TRAFFIC CONTROL	LS	1	$ 6,533.00	$ 6,533.00	1.00	6533	$ 6,533.00
17	2528-8445112	FLAGGERS	EACH	2	$ 285.00	$ 570.00	2.00	$285.00	$ 570.00
18	2533-4980005	MOBILIZATION	LS	1	$ 32,000.00	$ 32,000.00	1.00	$32,000.00	$ 32,000.00
19	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	50	$ 700.00	$ 35,000.00	50.00	$700.00	$ 35,000.00
20	2602-0000020	SILT FENCE	LF	3000	$ 3.00	$ 9,000.00	3,000.00	$3.00	$ 9,000.00
21	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	1000	$ 3.00	$ 3,000.00	1,000.00	$3.00	$ 3,000.00
22	2602-0000090	CLEAN-OUT OF SILT FENCE	LF	3000	$ 3.00	$ 9,000.00	3,000.00	$3.00	$ 9,000.00
23	2602-0000100	CLEAN-OUT OF SILT FENCE DITCH CHECK	LF	1000	$ 3.00	$ 3,000.00	1,000.00	$3.00	$ 3,000.00
					TOTAL	$ 3,957,819.38		TOTAL	$ 3,298,010.18

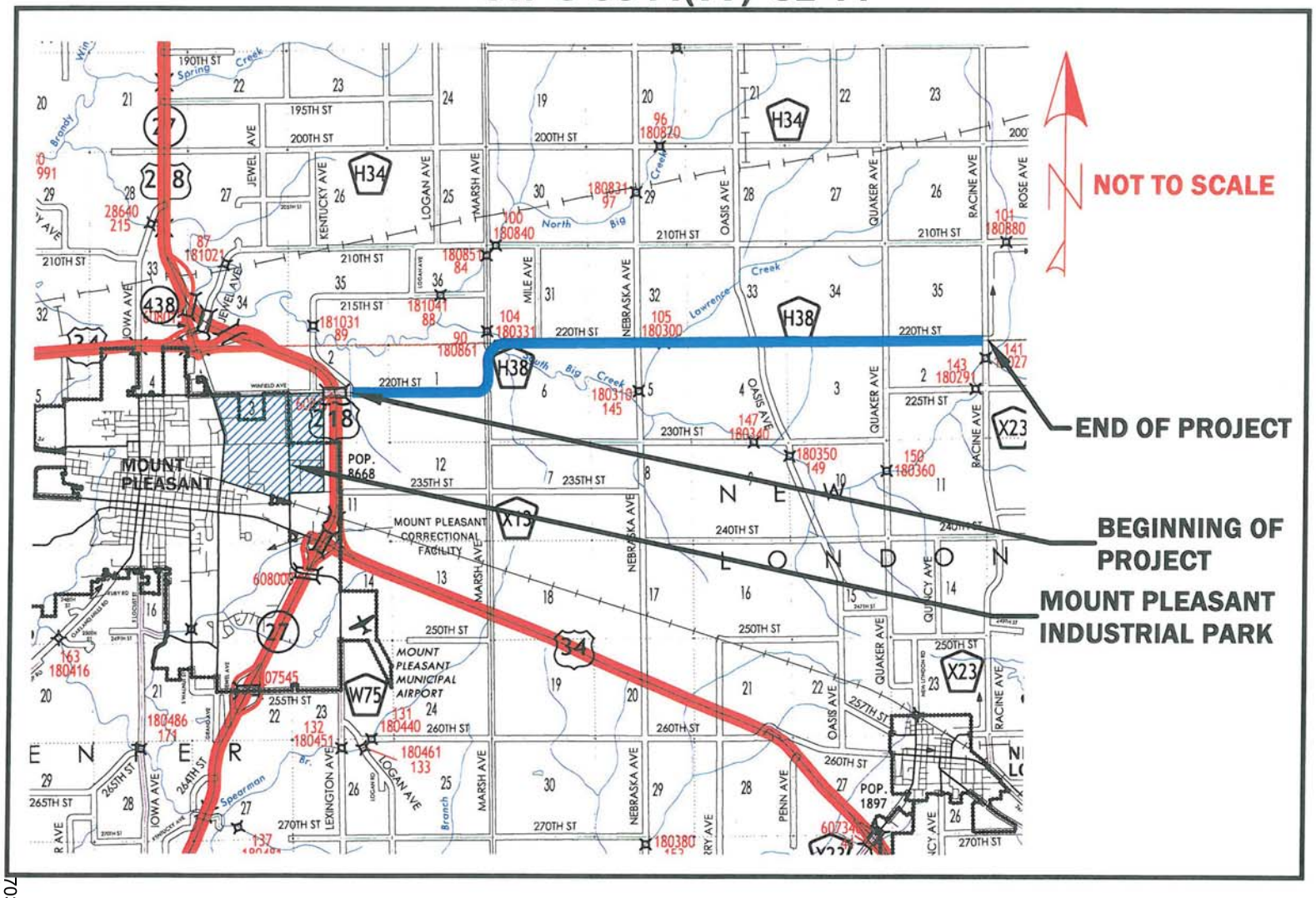
FUNDING SOURCE BREAKDOWN

Safety Improvement		Original Plan	
Funding Source	Amount	Funding Sources	Amount
Federal Aid	1,400,000	Federal Aid	$ 1,400,000.00
Farm to Market	1,900,000	Farm to Market	$ 1,900,000.00
TSIP	$500,000	TSIP	$ -
Local	$ 157,819.38	Local	$ -
TOTAL	3,957,819	TOTAL	3,300,000

Y:\2016 projects\Winfield Avenue\STP-s-co44(77).xls

E. PROJECT LOCATION

H38 (220th Street) PROJECT LOCATION
STP-S-C044(77)--5E-44



F. PICTURES

Intersection of Oasis Avenue & 220th Street

Typical Road Section along 220th Street, Henry County for safety reasons and maintenance will be paving intersections to minimize rock and edge rut issues.

220th Street Just East of HWY 218 Bridge Overpass

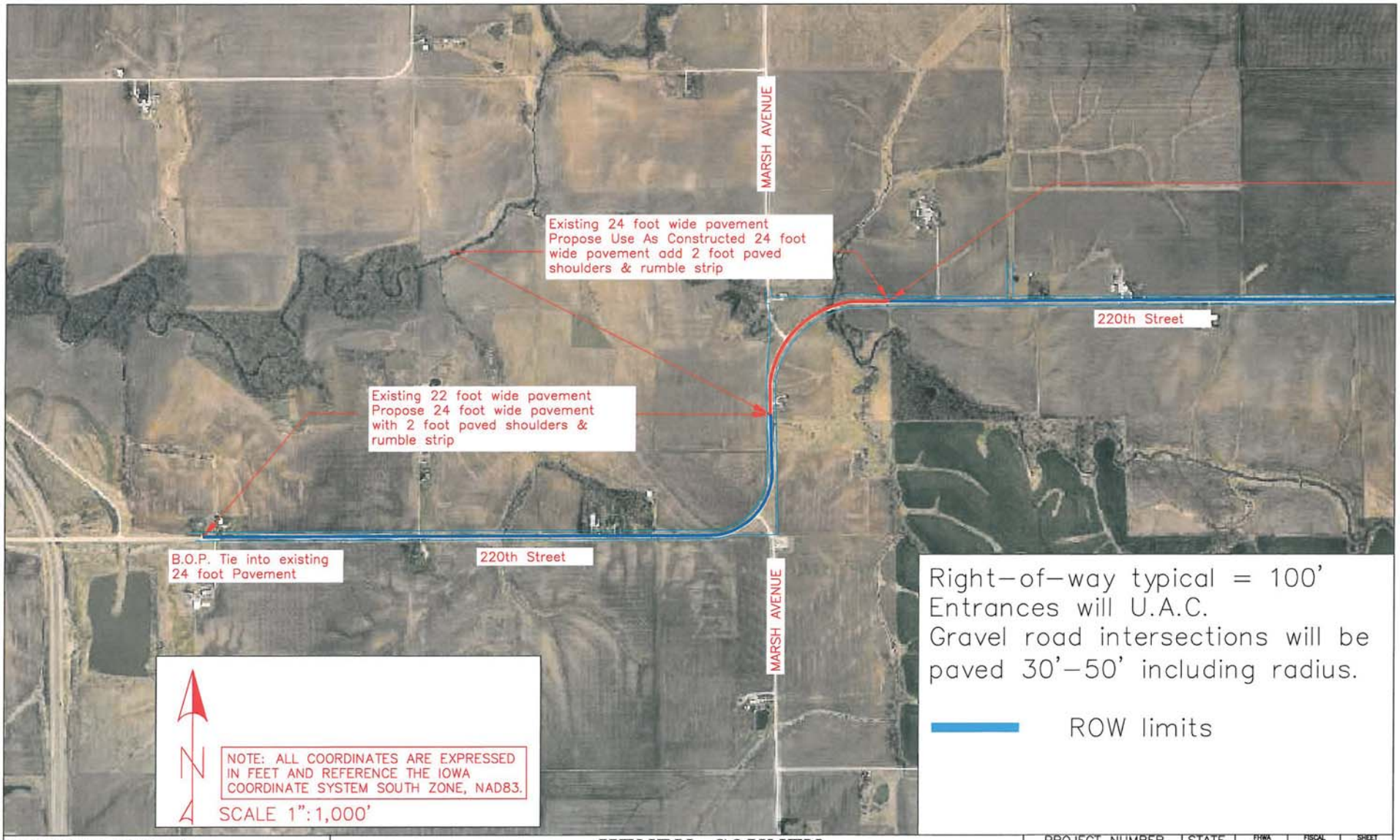
Inside curve of 220th Street, note edge rut

F. PICTURES CONTINUED

220th Street Just East of HWY 218 Bridge Overpass

Inside Curve note traveling path of Van, truck traffic tends to drift toward inside curve creating edge rut issues.

(G/H): PLAN VIEW/AERIAL PHOTO



FILE: WINFIELD AVENUE.DWG

HENRY COUNTY

PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NUMBER
Safety Application	IA	5	2015	D.01

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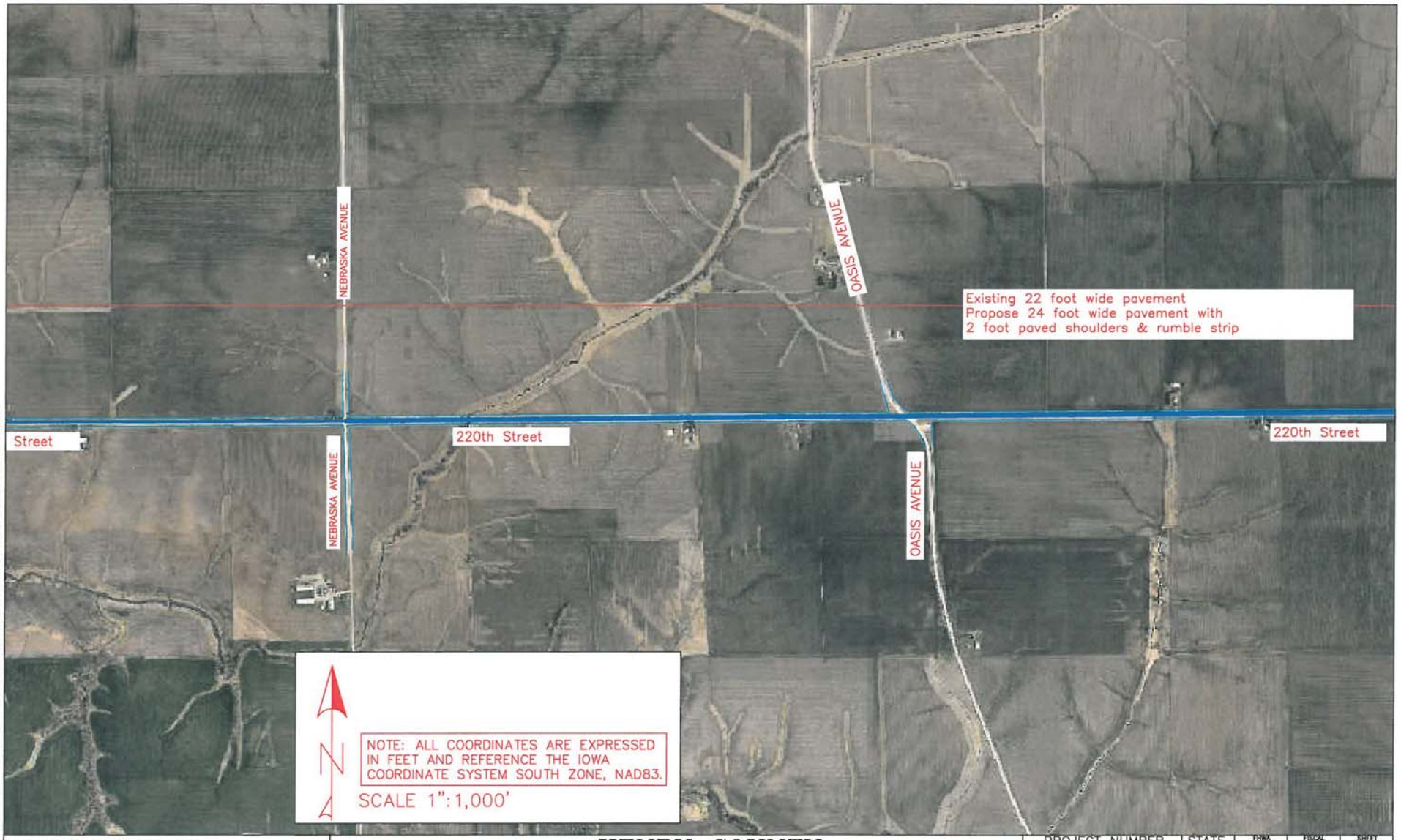
(G/H): PLAN VIEW/AERIAL PHOTO



FILE: WINFIELD AVENUE.DWG	HENRY COUNTY	PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NUMBER
		Safety Application	IA	5	2015	D.02

J:\2016 PROJECTS\WINFIELD AVENUE\WINFIELD AVENUE.DWG, 8/1/2014 3:47:16 PM, ANSI EXPAND B (11.00 X 17.00 INCHES), 1:1

(G/H): PLAN VIEW/AERIAL PHOTO

FILE: WINFIELD AVENUE.DWG	HENRY COUNTY	PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NUMBER
		Safety Application	IA	5	2015	D.03

2016 PROJECTS\WINFIELD AVENUE\WINFIELD AVENUE.DWG, 8/4/2014 10:19:35 AM, ANSI EXPAND B (11.00 X 17.00 INCHES), 1:1

L.

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Henry Prepared by: Jake Hotchkiss Date Prepared: Jul 16, 2014

Location: H38 (220TH STREET) from HWY 218 overpass to Racine Avenue (X23)

Improvement

Proposed Improvement(s): Pave 2' Shoulders, Edgeline rumble strips, widen from 11' lane to 12' lane

$ 500,000	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, **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: Dot Traffic Count Data 2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
6.93	1,060	IA 27/US218 to X23
6.93	miles total	

7,346 Current Vehicle Miles / Day, **VM**

8,963 End of Life Veh. Miles / Day

2,681,217 Current Veh. Miles / Year, **AM**

59,037,728 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

2009 First full year --> 2013 Last full year 5.0 years, Time Period, **T**

0.5 Additional months values as of May 2014

0	Fatal Crashes		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
7	Injury Crashes	6	Minor Injuries @	$65,000	$ 390,000
		1	Possible Injuries @	$35,000	$ 35,000
8	Property Damage Only		(assumed cost per crash)	$7,400	$ 111,000
			-OR- enter all Property Costs of all crashes:		
15	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 536,000

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

$ 35,733 Cost per Crash, **AVCR** = LOSS / TA

65.5 Total Expected Crashes, **TCR** = CR x TVMT/10^8

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

$ 41,462 Crash Costs Avoided in First Year, AAR x AVCR

25.5 Total Avoided Crashes, TCR x CRF/ 100

111.0 Crashes / HMVM, Crash Rate, **CR**

CR = TA x 10^8 / (AM x T)

$ 612,430 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 = $612,430 : $500,000 = **1.22** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Iowa Highway 415 / NW 2nd Avenue

Applicant: Polk County

Contact Person: Kurt Bailey, P.E. Title: Polk County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: 515-286-3705 (Area Code) E-Mail: kurt.bailey@polkcountyiowa.gov

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 514,000

Safety Funds Requested $ 320,000

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 County of Polk

Signed: John F Mauro 8/12/14

Signature Date Signed

John F. Mauro, Chair, Polk County Board of Supervisors

Typed Name

Attest: Becky Dewey 8/12/14

Signature Date Signed

Becky Dewey, Chief Asst County Clerk

Typed Name

Res. No. 150-14
August 12, 2014

RESOLUTION

Moved by Hockensmith, Seconded by Connolly that the following resolution be adopted:

WHEREAS, the Public Works Department has received requests for traffic safety improvements from the area residents and businesses that utilize the NW 49th Place to access IA Hwy 415 (NW 2nd Avenue); and

WHEREAS, in response to these concerns, in 2012 the Iowa Department of Transportation, in cooperation with the Polk County Public Works Department, completed a Traffic Engineering Assistance Program (TEAP) report on the Iowa 415 corridor from NW Aurora Avenue to NW 54 Avenue which resulted in several traffic safety improvement recommendations, including construction of traffic signals at the intersection of NW 49th Place and signal coordination of the existing signals in the corridor; and

WHEREAS, Resolution 139-14 dated July 22, 2014, approved a Cooperative Agreement with the Iowa DOT which specified the funding and project development responsibilities for each entity for completion of the project and also approved a Professional Services Agreement with Snyder & Associates, Inc. to design the traffic safety improvements and prepare a Traffic Safety Improvement Program (TSIP) funding application; and

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 recommends that the completed TSIP application be submitted to the Iowa Department of Transportation for possible funding for the above referenced 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 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 certification 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:

John F. Mauro
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

ROLL CALL FOR ALLOWANCE

AUG 12 2014

Steve Van Oort	~~Yea~~	Nay
Robert Brownell	~~Yea~~	Nay
Tom Hockensmith	~~Yea~~	Nay
Angela Connolly	~~Yea~~	Nay
John F. Mauro	~~Yea~~	Nay

ALLOWED BY VOTE OF BOARD Yea 5 Nay 0

Above tabulation made by BJ

John F. Mauro
CHAIRPERSON

#13

NARRATIVE

Existing Conditions

Iowa Highway 415 (NW 2nd Avenue) is a divided four-lane rural roadway with gravel shoulders grass median from the intersection with Iowa Highway 160 and undivided south of NW 43rd Place. Iowa Highway 415 is a parallel route to I-35 and provides access to the western side of Ankeny from I-80/35. The posted speed limit north of NE 54th Avenue is 55 MPH, north of 43rd Place is 45 mph, and south of NW 43rd Place, the posted speed limit is 35 mph.

The intersections of Iowa Highway 415 from NE 54th Avenue to Aurora Avenue controlled by traffic signals include NE 54th Avenue, I-80/35 North Ramps, I-80/35 South Ramps, NW 47th Place, NE 46th Avenue, and Aurora Avenue. All other roads intersecting Iowa Highway 415 are STOP controlled on the intersecting street. Properties adjacent to Iowa Highway 415 are mostly commercial within the corridor with the only residential properties along NW 51st Place.

Recent development along NW 49th Place east of Iowa Highway 415 and growth of Ankeny westward has created congestion during the peak periods at the IA 415 and I-80/35 Ramp intersections and NW 49th Place. During the AM peak period, southbound queues at the north ramp intersection often extend to NW 52nd Avenue. Also the recent development near NW 49th Place has also raised concern about traffic control at the intersection.

The corridor was the subject of a joint Polk County/Iowa DOT Traffic Engineering Assistance Program (TEAP) study completed in April 2012. The request of the study was to mitigate traffic congestion/operations and improve safety along the corridor. This TSIP application is consistent with the capacity and safety improvements recommended in the TEAP report.

Traffic Counts
The Iowa DOT conducted intersection turning movement traffic counts at 54th Avenue, I-80/35 north ramp, I-80/35 south ramp, Broadway Avenue, and Aurora Avenue in 2012. Traffic counts were conducted at 49th Place in 2011 including peak hour turning movement counts and 24-hour approach road-tube counts. The 2012 average annual daily traffic (AADT) ranged from 23,400 vehicles per day (vpd) near NW 54th Avenue to 19,400 vpd near Aurora Avenue. Traffic count data are included in Section J.

Crash History
Crash data from 2009 to May of 2014 for the corridor of Iowa Highway 415 from NE 54th Avenue to Aurora Avenue was obtained from the Iowa Department of Transportation and analyzed through Iowa Department of Transportation's crash analysis software CMAT and SAVER. Crash reports for injury crashes were obtained from Polk County Sheriff's Department. Crash trends and crash mitigations were identified in the previous TEAP study from analyzing crash data from 2006 to 2010.

During this five and a half year period from NE 54th Avenue to Aurora Avenue, 286 crashes occurred, including one fatal crash and 57 personal injury crashes (3 major injury, 12 minor injury, and 42 possible/unknown injury crashes). The injury crashes resulted in one fatality, four

major injuries, 19 minor injuries, and 53 possible/unknown injuries. The crash rate for the corridor was 454.9 crashes/hundred million vehicle miles traveled (cr/HMVMT). The crash rate is higher than the statewide average of 275 cr/HMVMT for municipal primary highways. Although the corridor is not within corporate limits, the corridor is within the Des Moines metro area, so the municipal primary crash rate was used for comparison.

Crashes were associated to intersections based on location of the crash being within 150 foot spatial proximity. Eight cashes reported at NW 49th Place during the analysis period are considered correctable with the installation of a traffic signal, and seven crashes were southbound rear-end collisions which are associated with slowing or stopped vehicles.

The crash analysis of the north ramp of the interchange with I-80/35 may not report all the crashes related to the intersection due to the long queues during peak traffic periods along Iowa Highway 415 and the lack of information on the investigating officer crash report. Table 1 lists crashes and injuries by severities per location. Section I includes personal injury crashes investigating officers report for the intersections of NW 49th Place, I-80/35 north ramp, and NW 47th Place during the analysis period. Major cause summaries and collision diagrams are provided in the appendix.

Table 1: Crash (Injury) Severity Iowa Highway 415, (2009 – May 2014)

Location	Fatal	Major Injury	Minor Injury	Possible/ Unknown	PDO	Total	Amount of Property Damage
NW 49th Pl	-	-	-	2 (2)	15	17 (2)	$86,350
I-80/35 North Ramp	-	-	-	4 (4)	22	26 (4)	$143,470
NW 47th Pl	-	-	1 (1)	1 (1)	17	19 (2)	$111,895
54th Ave to Aurora Ave	1 (1)	3 (4)	12 (19)	42 (53)	228	286 (77)	$1,750,634

NW 49th Place Traffic Signal Warrant Analysis

Traffic signal warrant analysis was performed for the intersection of NW 49th Place with Iowa Highway 415 using 2011 traffic volumes. The warrant analysis was conducted according to the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, standards. Warrant 4 (Pedestrian Volume), Warrant 5 (School Crossing), Warrant 6 (Coordinated Signal System), Warrant 8 (Roadway Network), and Warrant 9 (Near Grade Crossing) were not considered applicable to the study. Table 2 summarizes the warrant analysis and also lists the number of hours that satisfy each warrant condition. Warrant analysis worksheets are included in the appendix.

Table 2: Traffic Signal Warrant Analysis (#Hours)

Warrant	Met ?
Warrant 1 -8 Hour Volumes	
1A - Minimum Volume	No (1)
1B - Interruption of Continuous Traffic	Yes (11)
Warrant 2 - 4 Hour Volume	Yes (9)
Warrant 3 - Peak Hour	
3A - Peak Hour Delay	Not Evaluated
3B - Peak Hour Volume	Yes
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated System	Not Evaluated
Warrant 7 - Crash Experience	No (2 crashes)
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - At-Grade Crossing	Not Evaluated

Proposed Improvement Plan

Based on the above corridor safety performance and identified concerns, as well as the 2012 Iowa DOT TEAP report, the Polk County proposes the following corridor and intersection improvements.

Traffic Signal Interconnect

- Currently there is fiber optic cable running along the east side of the corridor from Aurora Ave to NW 54th Ave. Only the traffic signal controllers at the intersections of NW 47th Place, I-80/35 south ramp, and I-80/35 north ramp are connected by fiber optic cable. The remainder of the signalized intersections will be connected to the existing fiber optic cable to provide coordinated signal operation and allow the City of Des Moines to monitor the traffic signals and implement any signal timing changes from their traffic control center.
- Coordinated traffic signal timings plans will be implemented for the corridor. The coordinated timing plans will be based on current traffic patterns.

NW 49th Place

- With the increased left turning traffic from Iowa Highway 415, dedicated positive offset left turn-lanes will be provided. The south approach has a dedicated left turn-lane and should be reconfigured to obtain a positive offset.
- The existing traffic volumes at the intersection satisfy traffic signal warrants, and from analyses and observations of the intersection, a traffic signal would be beneficial. Although intersection spacing is less than ideal, acceptable operations and queuing are expected with proper signal timing and coordination. Once a traffic signal is installed, monitoring of the intersection will ensure that the new traffic signal timings are properly coordinated with the adjacent I-80/35 ramp traffic signals and progressive flow of traffic

is provided through the traffic signals. The traffic signal phasing will included protected/permissive left turns for Iowa Highway 415 traffic and permissive left turning phasing for NW 49th Place.

- Intersection improvements along with traffic signal layout are shown in Section K.

I-80/35 North Ramp

The southbound right turn-lane should be channelized to provide a free movement on to the westbound entrance ramp with the addition of a receiving lane on the ramp. The two lanes on the ramp would merge to one lane with the start of the lane drop taper 200 feet west of the intersection. The channelization should provide a 100 feet radius with a raised island to provide lane definition. The ramp merge should have the northbound left turning vehicles in the outside lane merging into the right turning vehicles in the inside lane. This modification is expected to significantly reduce southbound queuing and improve northbound left turn operations at the intersection.

NW 47th Place

- A southbound left turn-lane is warranted and will remove southbound left turning vehicles from the through travel lanes. The existing conditions either cause a southbound left turning vehicle to block one of the through lanes or pull into the median opening and block northbound left turning vehicles from entering the median opening. The southbound left turn-lane will be positive offset so that opposing northbound and southbound left turning vehicles due not block sight distance.
- Intersection improvements are shown in Section G.

Agency Support

Polk County has worked with Iowa DOT District 1 and Iowa DOT Office of Traffic & Safety in developing the proposed improvements in the April 2012 Iowa DOT TEAP Report. Iowa DOT is currently preparing an interchange operations report for the proposed interchange modifications. DOT District 1 has approved the use of C-STEP funding to assist with construction of proposed improvements.

ITEMIZED PROJECT COST BREAKDOWN
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	FIBER OPTIC CONNECTIONS FOR SIGNALS	EA	4	$4,000	$16,000
2	NW 47TH PLACE TURN LANE	EA	1	$40,000	$40,000
3	NW 49TH PLACE TRAFFIC SIGNAL	EA	1	$185,000	$185,000
	LEFT TURN LANES	EA	1	$60,000	$60,000
4	RIGHT TURN LANE FOR WB I-80	EA	1	$90,000	$90,000
	SIGNAL MODIFICATIONS	EA	1	$40,000	$40,000
				SUBTOTAL COSTRUCTION	$431,000
				POLK COUNTY IN-KIND COST FOR DESIGN, ADMINISTRATION AND CONSTRUCTION OBSERVATION	$28,000
				CONSULTANT COST FOR TRAFFIC SIGNAL DESIGN, CONSTRUCTION SERVICES AND SIGNAL TIMING PLANS	$55,000
				TOTAL PROJECT COST	**$514,000**

PROPOSED FUNDING SOURCES
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

SOURCE	AMOUNT
Traffic Safety Improvement Program Funding (TSIP - Site Specific)	$320,000
County-State Traffic Engineering Program (C-STEP)	$111,000
Local Funds – Design Services and Construction	$83,000
PROJECT TOTAL	**$514,000**

PROPOSED PROJECT SCHEDULE
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

August 2014	TSIP Application
December 2014	Iowa DOT Approval
January 2015	TSIP Agreement
September 2014 – March 2015	Project Engineering & Plan Development
April 2015	Project Letting
May 2015 – November 2015	Project Construction to Substantial Completion

LOCATON MAP
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

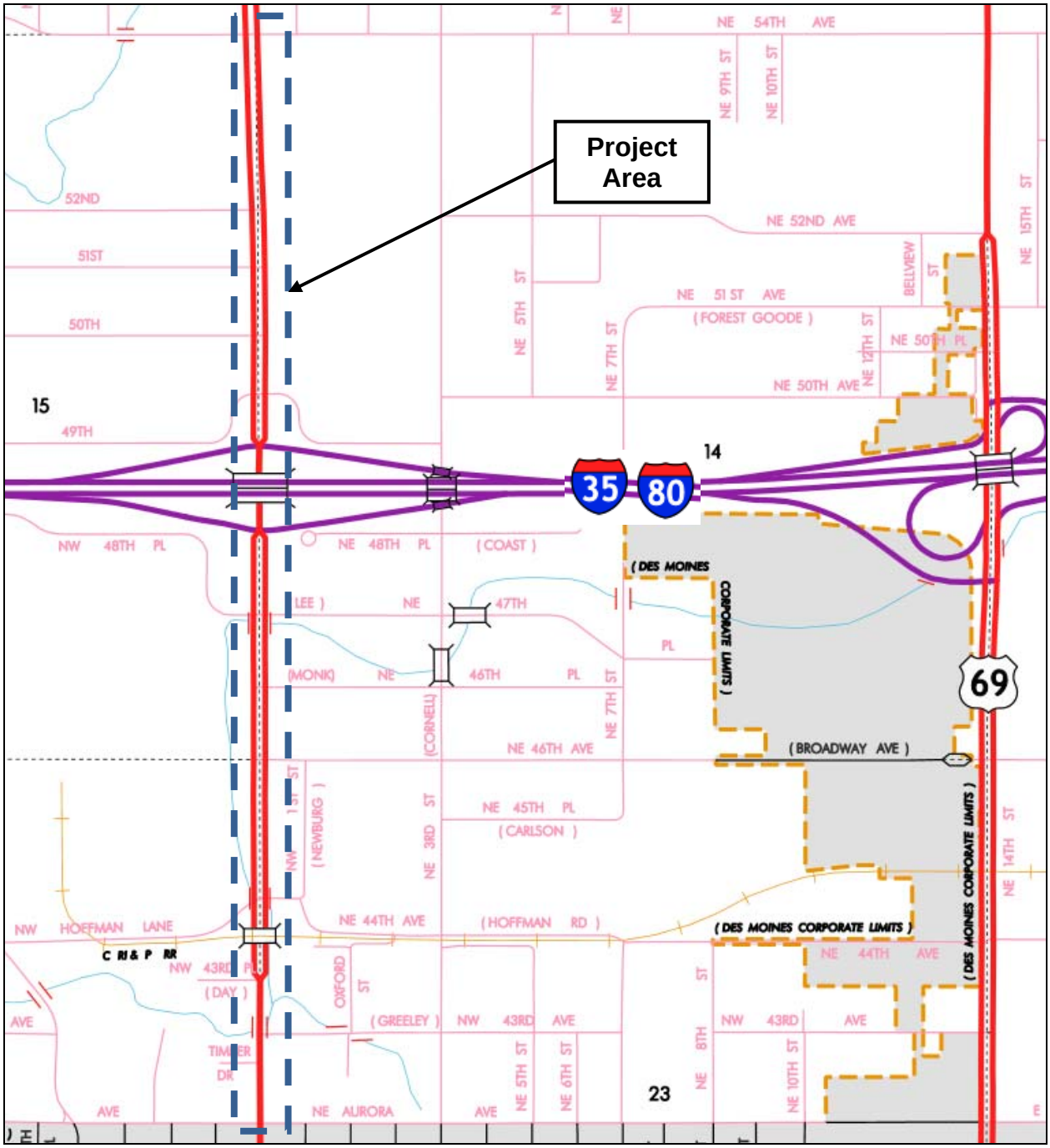


Photo 1: IA 415 looking south, north of NW 49th Place

Photo 2: IA 415 looking north at I-80/35 North Ramp

Photo 3: NW 49th Place, west approach, looking south

Photo 4: NW 49th Place, east approach, looking north

Photo 5: I-80/35 North Ramp looking west

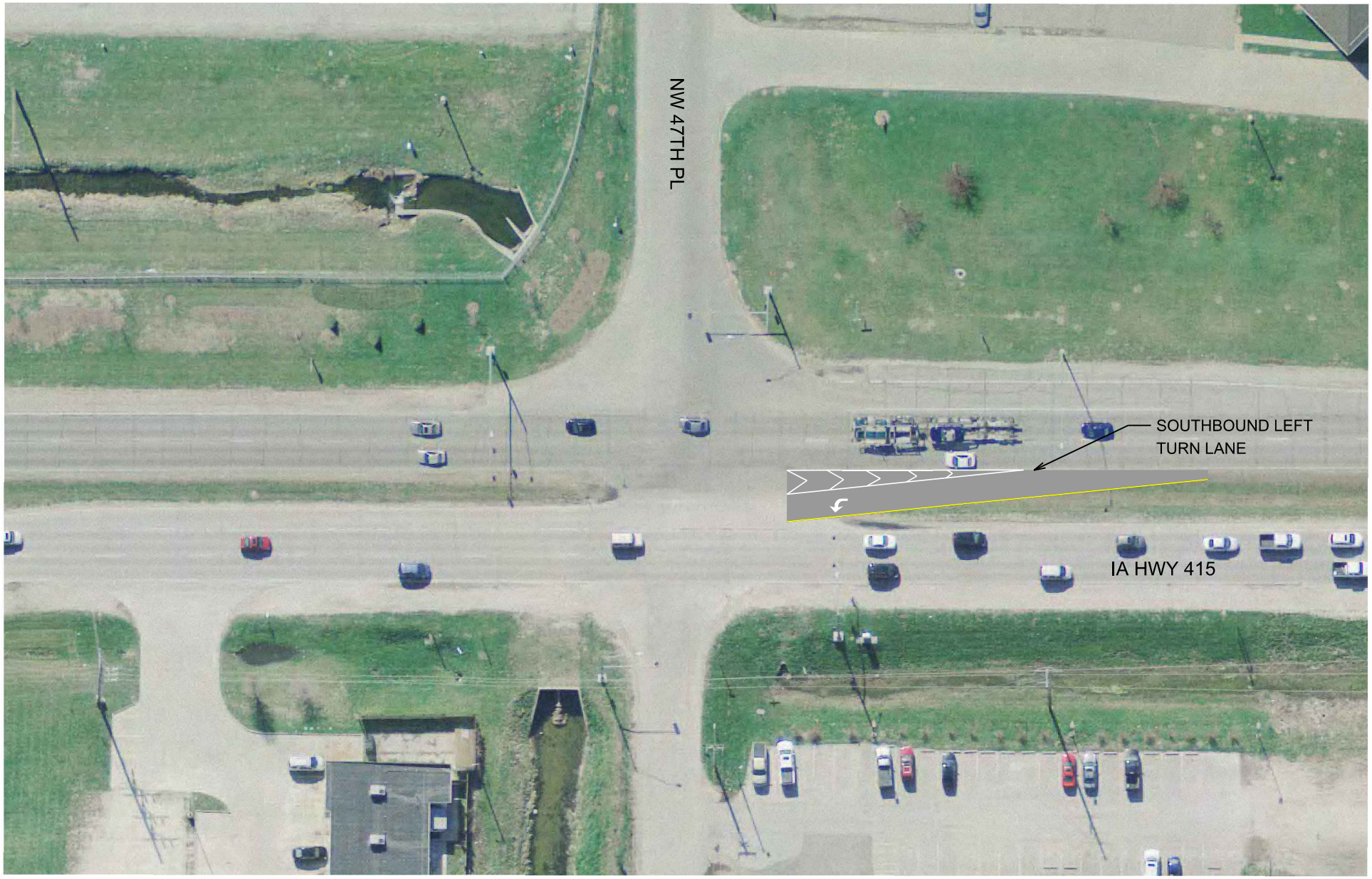
Photo 6: IA 415 looking south, north of NW 47th Place

I-80/35 NORTH RAMP & IA HWY 415
INTERSECTION AND RAMP IMPROVEMENTS
POLK COUNTY, IOWA

N

0 30
SCALE (FEET)

G



NW 47TH PL & IA HWY 415
INTERSECTION IMPROVEMENTS
POLK COUNTY, IOWA

0 30
SCALE (FEET)

G

NW 54TH AVE
NW 52ND AVE
NW 51ST PL
NW 50TH PL
NW 49TH PL
415
I8035 WB ON RMP
I8035 EB OFF RMP
400ft

NW 48TH PL
NW 47TH PL
NW 2ND ST
NW 46TH PL
NW 46TH AVE
NW 1ST ST
NW HOFFMAN LN
NW 44TH AVE
NW 43RD PL
NW 43RD AVE
NW 42ND PL
400ft
AURORA AVE
NW AURORA AVE

DETAILED CRASH REPORTS – INJURY CRASHES

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77226565099

Count Date:

Monday, July 23, 2012

County:

Polk

Location Description:

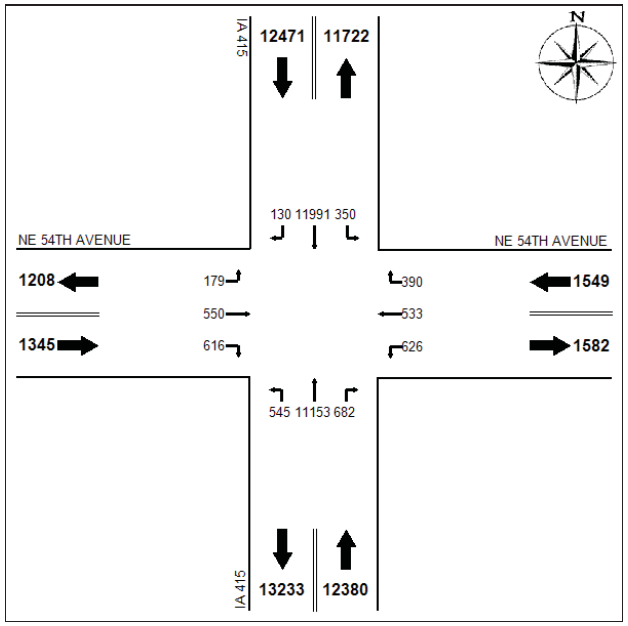
IA 415 & NW 54th Av

Volume Factor: 2.023

Pass Class Factor: 2.027

SU Class Factor: 1.637

Combo Class Factor: 1.752



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	14	428	5	16	6	3	5	124	11	5	13	10
07:15	6	227	2	5	10	6	5	66	11	4	12	23
07:30	15	476	6	16	5	10	7	266	18	4	19	30
07:45	8	526	5	16	9	6	6	210	18	4	20	30
08:00	9	387	1	10	3	3	6	123	15	5	9	8
08:15	6	220	3	16	5	2	9	125	5	3	5	11
08:30	6	192	5	12	1	8	7	113	5	1	5	15
08:45	5	163	2	3	8	5	10	129	6	2	5	16
11:00	3	142	1	14	3	3	12	116	9	9	11	7
11:15	6	118	1	10	11	4	8	152	13	0	6	12
11:30	8	147	1	12	6	3	9	128	12	2	1	7
11:45	2	128	0	9	8	6	15	130	16	1	10	10
12:00	5	145	0	14	12	4	15	128	12	1	3	6
12:15	3	145	3	13	11	5	14	138	13	1	14	9
12:30	2	136	4	11	13	6	4	123	8	4	10	21
12:45	6	137	3	9	5	8	10	133	10	2	7	9
15:00	4	155	0	8	12	12	6	153	16	1	10	11
15:15	6	148	3	4	10	4	11	178	10	4	7	8
15:30	6	208	3	14	18	7	11	195	15	3	15	13

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	9	208	1	6	14	8	10	248	10	2	16	11
16:00	3	199	4	15	8	12	12	205	9	4	5	5
16:15	5	189	1	5	13	7	17	320	20	3	8	8
16:30	7	214	0	20	16	6	15	360	15	5	10	7
16:45	6	200	2	10	16	14	9	425	18	6	13	8
17:00	5	185	4	15	16	20	15	338	18	6	7	8
17:15	8	162	1	12	10	5	23	374	10	4	12	5
17:30	5	212	1	11	10	9	3	289	9	2	9	5
17:45	7	161	3	7	7	8	8	261	9	2	12	7

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

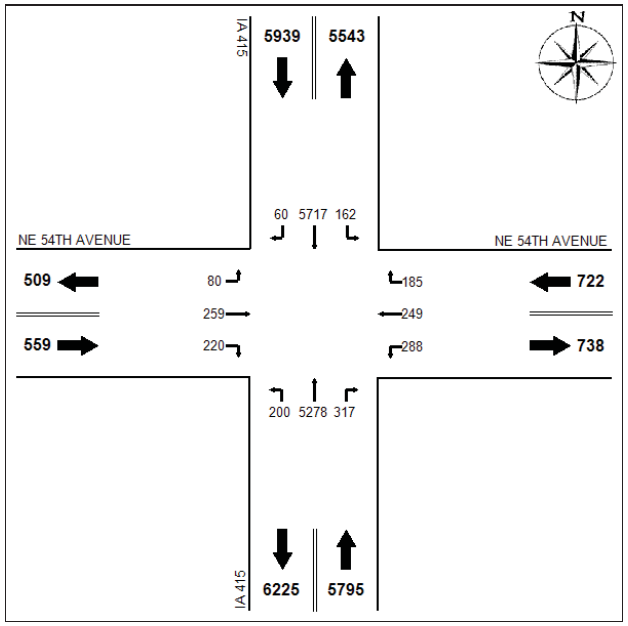
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	13	421	5	15	6	2	4	116	11	3	12	8
07:15	6	226	2	5	9	4	5	60	11	3	11	20
07:30	15	465	6	15	5	10	2	250	17	4	19	24
07:45	8	517	4	14	8	5	3	194	15	4	19	21
08:00	8	379	1	9	3	2	4	104	12	3	8	5
08:15	6	215	3	14	4	2	3	109	4	3	5	7
08:30	4	184	5	8	1	7	0	100	5	0	5	12
08:45	5	149	2	3	7	5	6	115	6	2	5	6
11:00	3	132	1	14	3	3	2	104	9	9	9	4
11:15	4	106	1	8	10	4	5	142	12	0	6	6
11:30	5	134	1	12	5	3	7	117	12	2	0	5
11:45	2	121	0	9	8	6	13	123	16	0	9	6
12:00	4	133	0	12	12	4	7	119	8	1	3	5
12:15	3	132	1	12	10	5	11	133	11	1	14	6
12:30	2	129	3	10	12	6	1	115	8	3	6	11
12:45	6	127	3	7	4	7	9	120	8	2	7	5
15:00	4	149	0	7	12	12	5	148	15	1	10	8
15:15	5	131	3	4	10	4	7	167	10	3	7	4
15:30	5	201	2	13	15	7	9	182	13	3	14	8

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	9	200	1	5	12	8	8	244	9	2	16	7
16:00	3	189	4	15	6	12	8	198	9	3	5	4
16:15	4	173	1	5	12	6	12	315	19	3	8	6
16:30	7	204	0	18	16	6	13	349	14	5	9	5
16:45	6	198	2	10	16	14	9	417	18	6	13	5
17:00	5	179	4	15	16	19	15	332	17	6	7	7
17:15	8	162	1	11	10	5	21	368	10	4	11	3
17:30	5	206	1	11	10	9	3	281	9	2	9	5
17:45	7	155	3	7	7	8	8	256	9	2	12	7

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

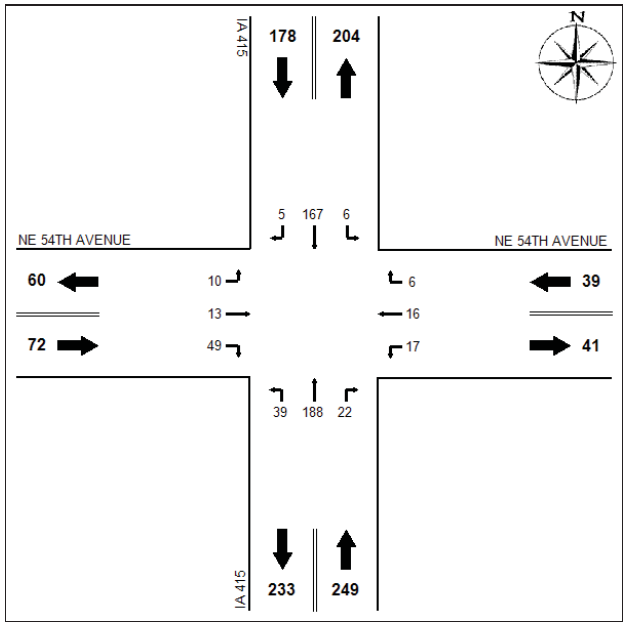
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	4	0	1	0	1	0	6	0	2	1	1
07:15	0	0	0	0	0	2	0	3	0	1	1	0
07:30	0	8	0	1	0	0	2	14	1	0	0	3
07:45	0	6	1	1	1	1	2	7	3	0	1	3
08:00	1	7	0	0	0	0	1	9	3	2	1	2
08:15	0	4	0	2	1	0	5	10	1	0	0	3
08:30	1	6	0	1	0	1	2	9	0	1	0	2
08:45	0	10	0	0	1	0	1	13	0	0	0	4
11:00	0	7	0	0	0	0	5	11	0	0	1	1
11:15	1	9	0	2	1	0	3	6	1	0	0	3
11:30	1	7	0	0	1	0	0	8	0	0	1	1
11:45	0	4	0	0	0	0	1	4	0	1	1	2
12:00	0	9	0	2	0	0	3	5	4	0	0	1
12:15	0	11	2	1	1	0	1	4	2	0	0	0
12:30	0	5	1	1	1	0	2	7	0	1	4	5
12:45	0	6	0	1	1	1	0	8	2	0	0	3
15:00	0	3	0	1	0	0	1	2	1	0	0	0
15:15	1	13	0	0	0	0	0	7	0	1	0	4
15:30	0	6	1	1	3	0	1	12	2	0	1	2

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	6	0	1	2	0	0	2	1	0	0	3
16:00	0	6	0	0	2	0	2	6	0	1	0	0
16:15	0	12	0	0	1	0	4	4	0	0	0	0
16:30	0	6	0	1	0	0	2	10	0	0	0	2
16:45	0	1	0	0	0	0	0	6	0	0	0	2
17:00	0	3	0	0	0	0	0	5	1	0	0	1
17:15	0	0	0	0	0	0	1	4	0	0	1	1
17:30	0	5	0	0	0	0	0	2	0	0	0	0
17:45	0	3	0	0	0	0	0	4	0	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

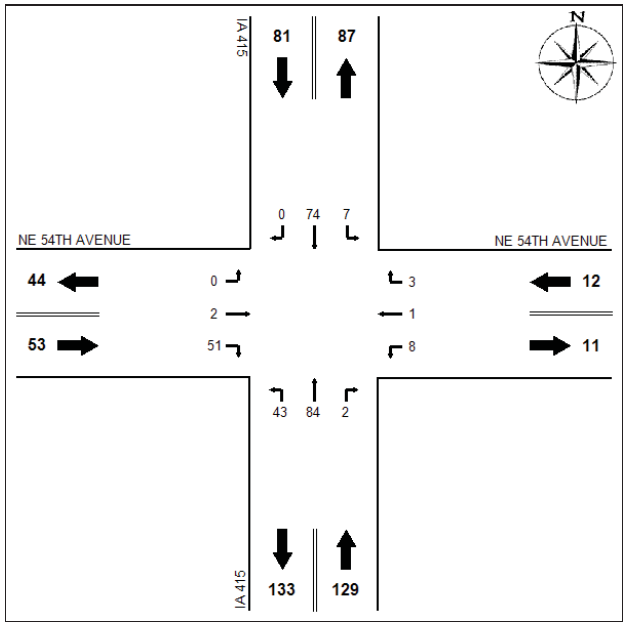
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	0	3	0	0	0	0	1	2	0	0	0	1
07:15	0	1	0	0	1	0	0	3	0	0	0	3
07:30	0	3	0	0	0	0	3	2	0	0	0	3
07:45	0	3	0	1	0	0	1	9	0	0	0	6
08:00	0	1	0	1	0	1	1	10	0	0	0	1
08:15	0	1	0	0	0	0	1	6	0	0	0	1
08:30	1	2	0	3	0	0	5	4	0	0	0	1
08:45	0	4	0	0	0	0	3	1	0	0	0	6
11:00	0	3	0	0	0	0	5	1	0	0	1	2
11:15	1	3	0	0	0	0	0	4	0	0	0	3
11:30	2	6	0	0	0	0	2	3	0	0	0	1
11:45	0	3	0	0	0	0	1	3	0	0	0	2
12:00	1	3	0	0	0	0	5	4	0	0	0	0
12:15	0	2	0	0	0	0	2	1	0	0	0	3
12:30	0	2	0	0	0	0	1	1	0	0	0	5
12:45	0	4	0	1	0	0	1	5	0	0	0	1
15:00	0	3	0	0	0	0	0	3	0	0	0	3
15:15	0	4	0	0	0	0	4	4	0	0	0	0
15:30	1	1	0	0	0	0	1	1	0	0	0	3

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	2	0	0	0	0	2	2	0	0	0	1
16:00	0	4	0	0	0	0	2	1	0	0	0	1
16:15	1	4	0	0	0	1	1	1	1	0	0	2
16:30	0	4	0	1	0	0	0	1	1	0	1	0
16:45	0	1	0	0	0	0	0	2	0	0	0	1
17:00	0	3	0	0	0	1	0	1	0	0	0	0
17:15	0	0	0	1	0	0	1	2	0	0	0	1
17:30	0	1	0	0	0	0	0	6	0	0	0	0
17:45	0	3	0	0	0	0	0	1	0	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77225765099

Count Date:

Monday, July 11, 2011

County:

Polk

Location Description:

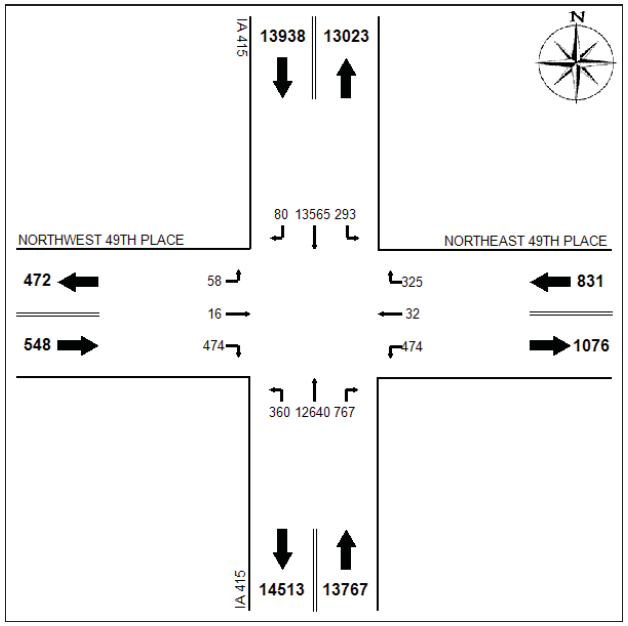
IA 415 & NW 49th Pl

Volume Factor: 2.027

Pass Class Factor: 2.039

SU Class Factor: 1.656

Combo Class Factor: 1.722



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	1	303	1	2	1	0	1	126	3	0	0	4
07:15	1	523	0	0	0	1	1	159	2	0	0	1
07:30	3	505	0	0	0	2	1	198	6	0	0	5
07:45	4	424	1	1	0	3	5	225	11	0	0	5
08:00	1	334	2	0	1	1	6	164	7	3	0	8
08:15	3	305	1	1	0	2	5	127	6	0	0	7
08:30	2	263	0	5	0	4	4	145	8	0	0	11
08:45	2	218	1	1	0	0	4	161	6	1	0	7
11:00	3	150	2	10	0	3	4	113	16	2	0	6
11:15	7	168	2	8	0	3	7	177	14	0	0	2
11:30	7	165	4	10	1	6	7	150	18	0	2	7
11:45	8	155	2	13	2	5	11	156	14	0	0	12
12:00	10	178	4	7	0	8	10	137	27	1	1	9
12:15	11	161	2	15	0	6	12	169	16	1	0	5
12:30	6	161	1	16	2	7	10	135	19	0	0	6
12:45	7	159	1	17	1	10	8	137	20	2	0	11
15:00	5	155	2	4	3	6	2	189	9	5	0	3
15:15	1	160	0	6	2	6	7	212	14	3	2	9
15:30	4	210	0	16	1	9	6	209	18	1	0	25

732

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	4	297	1	17	0	7	12	291	15	1	0	7
16:00	1	199	1	13	0	7	7	273	18	1	0	10
16:15	8	194	3	13	0	4	13	331	12	2	0	8
16:30	5	241	3	12	0	11	3	308	17	1	1	11
16:45	11	261	1	7	0	4	3	406	12	2	1	11
17:00	8	191	1	9	0	11	12	400	15	1	0	22
17:15	11	221	2	5	0	11	6	414	15	1	0	12
17:30	6	185	1	13	2	9	11	376	23	0	0	7
17:45	5	217	2	12	0	15	7	356	17	1	1	11

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

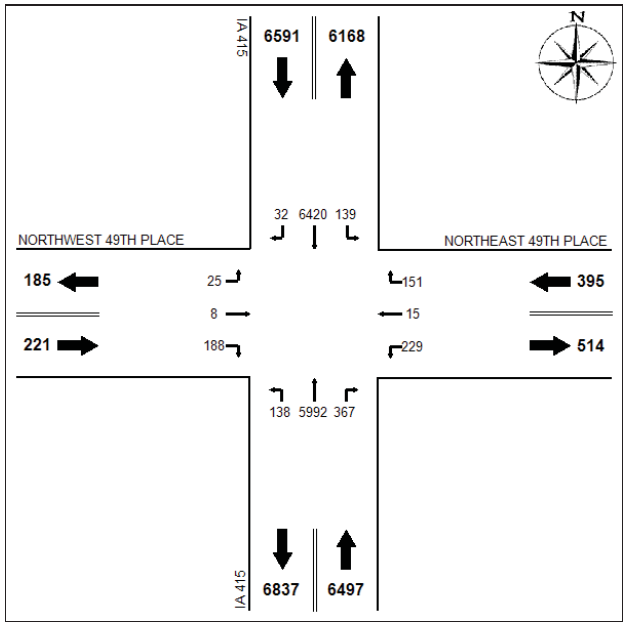
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	1	295	1	2	1	0	1	115	3	0	0	2
07:15	1	511	0	0	0	1	1	152	2	0	0	1
07:30	3	501	0	0	0	2	1	186	5	0	0	4
07:45	4	416	1	1	0	2	4	216	11	0	0	2
08:00	1	319	1	0	1	1	6	152	7	3	0	6
08:15	3	294	1	1	0	2	4	122	5	0	0	5
08:30	2	252	0	5	0	3	2	132	8	0	0	5
08:45	2	201	0	1	0	0	2	144	6	0	0	4
11:00	3	142	1	10	0	3	3	106	16	1	0	6
11:15	5	156	1	8	0	3	5	163	13	0	0	1
11:30	7	155	3	10	1	5	6	138	16	0	2	5
11:45	8	142	2	11	2	4	9	143	13	0	0	8
12:00	10	171	3	7	0	8	9	130	26	0	1	7
12:15	11	150	2	15	0	6	10	163	15	1	0	4
12:30	5	151	1	16	2	7	8	132	19	0	0	6
12:45	7	146	1	17	1	10	8	133	20	2	0	9
15:00	4	148	1	4	3	6	2	176	9	5	0	2
15:15	1	149	0	6	1	6	6	203	14	2	2	9
15:30	4	202	0	15	1	9	2	202	18	1	0	22

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	4	289	1	17	0	6	10	285	15	1	0	5
16:00	1	193	1	12	0	6	4	263	17	1	0	7
16:15	8	185	3	13	0	4	9	323	12	2	0	8
16:30	5	232	3	12	0	9	2	293	17	1	1	9
16:45	10	246	1	7	0	4	1	394	12	2	1	8
17:00	8	179	1	9	0	10	6	393	14	1	0	19
17:15	11	205	1	5	0	10	4	412	14	1	0	12
17:30	6	180	1	13	2	9	8	369	23	0	0	6
17:45	4	210	1	12	0	15	5	352	17	1	1	6

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

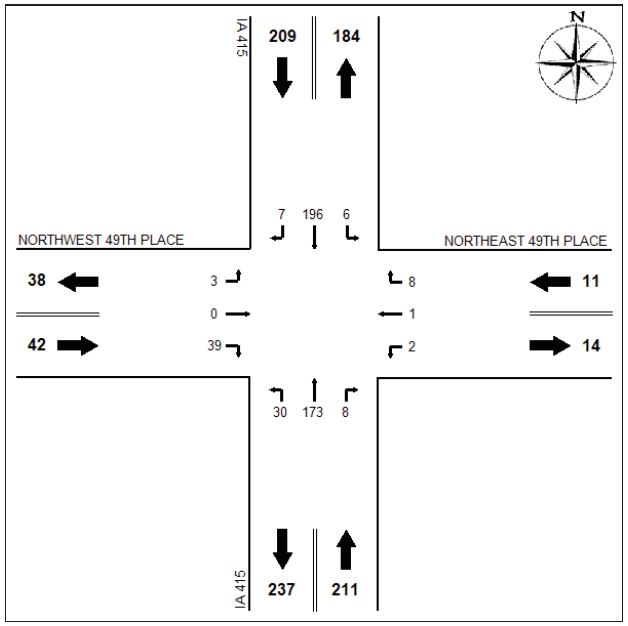
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	0	5	0	0	0	0	0	4	0	0	0	2
07:15	0	10	0	0	0	0	0	4	0	0	0	0
07:30	0	4	0	0	0	0	0	8	1	0	0	1
07:45	0	6	0	0	0	1	1	9	0	0	0	2
08:00	0	12	1	0	0	0	0	10	0	0	0	2
08:15	0	8	0	0	0	0	1	4	1	0	0	1
08:30	0	6	0	0	0	1	1	7	0	0	0	4
08:45	0	10	0	0	0	0	1	11	0	1	0	2
11:00	0	5	1	0	0	0	1	5	0	0	0	0
11:15	2	8	1	0	0	0	1	6	1	0	0	1
11:30	0	9	1	0	0	1	1	8	1	0	0	2
11:45	0	10	0	1	0	0	2	4	0	0	0	3
12:00	0	2	1	0	0	0	1	4	1	1	0	2
12:15	0	5	0	0	0	0	1	5	1	0	0	0
12:30	1	8	0	0	0	0	2	3	0	0	0	0
12:45	0	10	0	0	0	0	0	3	0	0	0	2
15:00	1	1	1	0	0	0	0	12	0	0	0	1
15:15	0	10	0	0	1	0	1	6	0	1	0	0
15:30	0	5	0	1	0	0	3	6	0	0	0	2

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	6	0	0	0	1	0	6	0	0	0	1
16:00	0	4	0	0	0	1	2	6	1	0	0	3
16:15	0	8	0	0	0	0	2	7	0	0	0	0
16:30	0	5	0	0	0	2	0	12	0	0	0	1
16:45	1	9	0	0	0	0	2	12	0	0	0	2
17:00	0	10	0	0	0	0	4	6	1	0	0	3
17:15	0	13	0	0	0	1	1	2	0	0	0	0
17:30	0	3	0	0	0	0	2	2	0	0	0	0
17:45	1	4	1	0	0	0	0	1	0	0	0	2

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

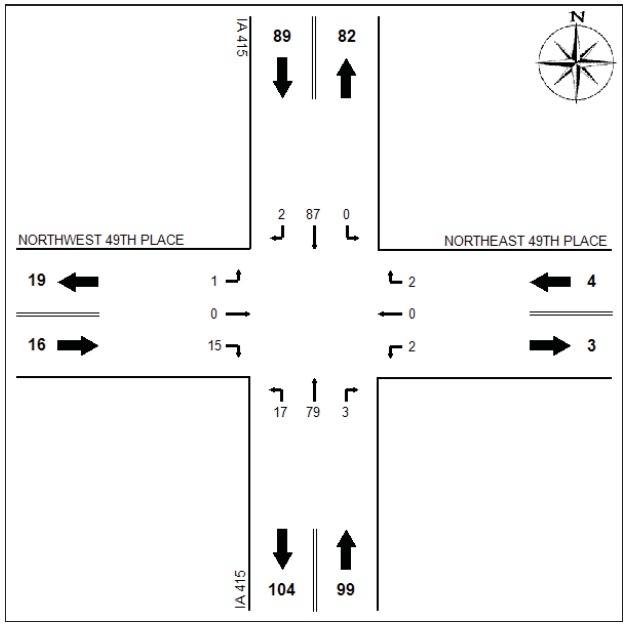
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	0	3	0	0	0	0	0	7	0	0	0	0
07:15	0	2	0	0	0	0	0	3	0	0	0	0
07:30	0	0	0	0	0	0	0	4	0	0	0	0
07:45	0	2	0	0	0	0	0	0	0	0	0	1
08:00	0	3	0	0	0	0	0	2	0	0	0	0
08:15	0	3	0	0	0	0	0	1	0	0	0	1
08:30	0	5	0	0	0	0	1	6	0	0	0	2
08:45	0	7	1	0	0	0	1	6	0	0	0	1
11:00	0	3	0	0	0	0	0	2	0	1	0	0
11:15	0	4	0	0	0	0	1	8	0	0	0	0
11:30	0	1	0	0	0	0	0	4	1	0	0	0
11:45	0	3	0	1	0	1	0	9	1	0	0	1
12:00	0	5	0	0	0	0	0	3	0	0	0	0
12:15	0	6	0	0	0	0	1	1	0	0	0	1
12:30	0	2	0	0	0	0	0	0	0	0	0	0
12:45	0	3	0	0	0	0	0	1	0	0	0	0
15:00	0	6	0	0	0	0	0	1	0	0	0	0
15:15	0	1	0	0	0	0	0	3	0	0	0	0
15:30	0	3	0	0	0	0	1	1	0	0	0	1

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	2	0	0	0	0	2	0	0	0	0	1
16:00	0	2	0	1	0	0	1	4	0	0	0	0
16:15	0	1	0	0	0	0	2	1	0	0	0	0
16:30	0	4	0	0	0	0	1	3	0	0	0	1
16:45	0	6	0	0	0	0	0	0	0	0	0	1
17:00	0	2	0	0	0	1	2	1	0	0	0	0
17:15	0	3	1	0	0	0	1	0	1	0	0	0
17:30	0	2	0	0	0	0	1	5	0	0	0	1
17:45	0	3	0	0	0	0	2	3	0	0	0	3

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

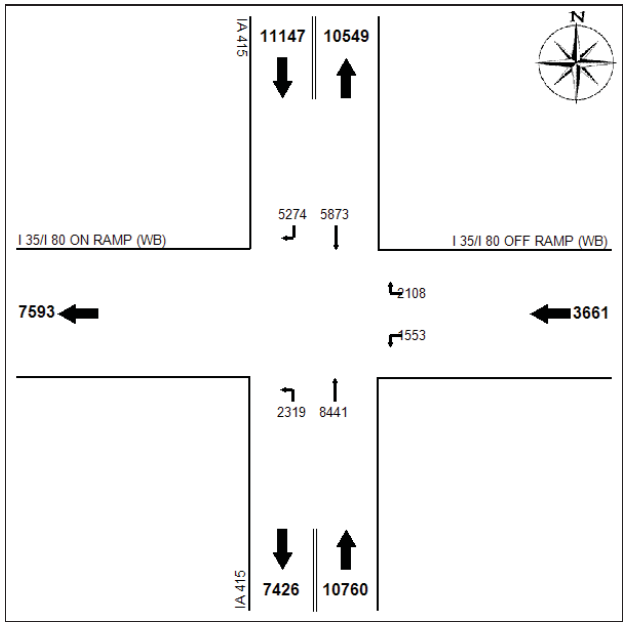
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

Volume Factor: 1.860
Pass Class Factor: 1.874
SU Class Factor: 1.505
Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
07:00	143	155	44	36	47	97
07:15	228	186	43	36	42	130
07:30	186	158	42	46	68	141
07:45	139	155	40	46	34	144
08:00	139	144	28	23	48	124
08:15	127	123	28	27	37	115
08:30	128	105	19	30	42	125
08:45	91	83	28	35	38	143
11:00	74	41	18	33	33	105
11:15	68	88	20	32	31	133
11:30	83	82	13	34	38	138
11:45	88	76	26	43	39	119
12:00	86	62	23	42	38	129
12:15	100	87	19	37	36	147
12:30	100	75	18	38	37	151
12:45	89	67	18	33	20	131
15:00	32	38	18	19	28	64
15:15	110	82	26	45	34	188
15:30	137	96	42	45	47	220

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	146	105	33	56	52	203
16:00	140	149	29	53	71	253
16:15	137	133	43	59	79	255
16:30	80	83	37	71	61	195
16:45	96	101	41	36	39	235
17:00	94	86	30	54	49	201
17:15	122	111	34	51	89	232
17:30	102	71	59	49	42	235
17:45	104	89	22	42	31	184

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

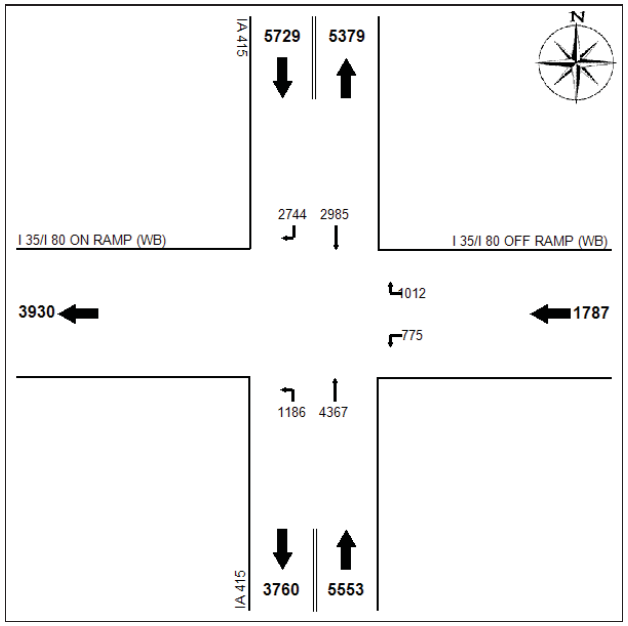
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	139	154	41	33	46	90
07:15	223	179	39	29	39	125
07:30	183	154	37	41	64	137
07:45	129	152	34	42	30	139
08:00	132	142	25	18	43	119
08:15	116	119	26	25	31	105
08:30	119	98	17	24	39	118
08:45	81	80	26	24	36	134
11:00	64	37	16	25	29	96
11:15	61	86	17	26	31	124
11:30	77	79	9	27	37	132
11:45	79	72	21	32	35	112
12:00	79	62	23	38	35	120
12:15	87	84	17	34	32	143
12:30	93	67	17	30	36	144
12:45	84	62	16	27	16	126
15:00	29	37	18	16	28	56
15:15	101	79	24	42	33	178
15:30	130	93	36	42	46	207

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	139	98	33	52	51	196
16:00	137	148	26	48	67	245
16:15	130	131	40	54	78	251
16:30	75	79	37	69	60	192
16:45	92	96	40	34	36	235
17:00	92	86	27	50	49	198
17:15	117	111	33	48	88	230
17:30	99	70	59	45	40	232
17:45	98	89	21	37	31	183

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

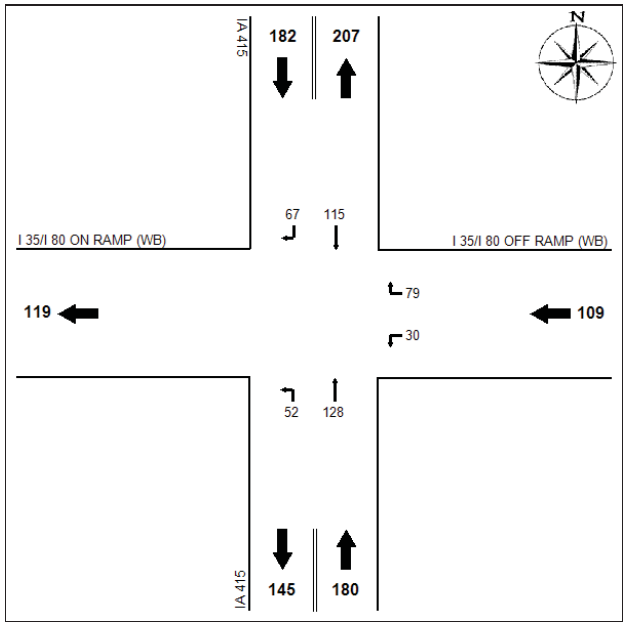
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	2	1	1	1	1	5
07:15	4	7	3	6	2	3
07:30	2	4	2	4	4	4
07:45	5	2	1	2	2	4
08:00	6	2	1	2	4	1
08:15	7	4	1	0	5	8
08:30	4	5	0	5	2	7
08:45	8	1	1	6	2	4
11:00	5	3	1	6	4	7
11:15	3	2	1	4	0	6
11:30	4	3	3	3	1	5
11:45	7	2	2	7	4	5
12:00	3	0	0	2	2	8
12:15	7	3	1	1	1	3
12:30	5	6	0	4	1	6
12:45	3	2	1	4	3	2
15:00	2	1	0	1	0	6
15:15	5	3	0	1	1	9
15:30	4	2	5	1	1	10

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	5	5	0	2	1	6
16:00	3	0	2	2	4	8
16:15	6	2	1	4	1	4
16:30	3	4	0	2	0	2
16:45	2	2	0	0	3	0
17:00	1	0	3	3	0	2
17:15	3	0	0	1	1	1
17:30	2	1	0	1	2	2
17:45	4	0	0	4	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

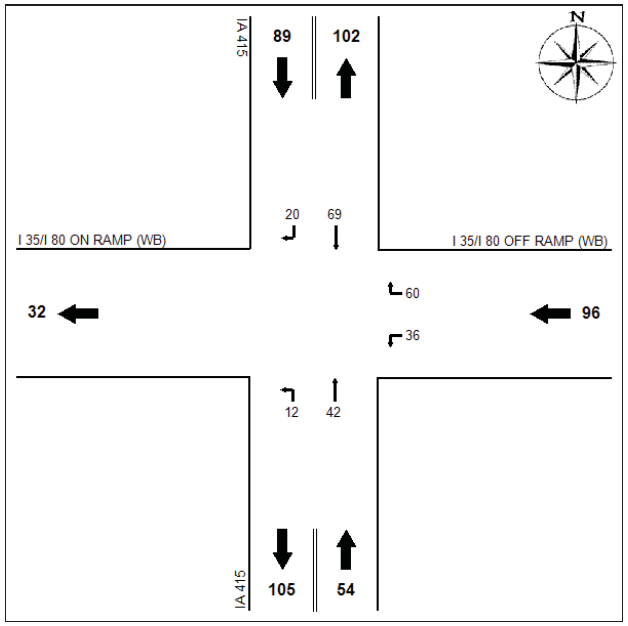
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	2	0	2	2	0	2
07:15	1	0	1	1	1	2
07:30	1	0	3	1	0	0
07:45	5	1	5	2	2	1
08:00	1	0	2	3	1	4
08:15	4	0	1	2	1	2
08:30	5	2	2	1	1	0
08:45	2	2	1	5	0	5
11:00	5	1	1	2	0	2
11:15	4	0	2	2	0	3
11:30	2	0	1	4	0	1
11:45	2	2	3	4	0	2
12:00	4	0	0	2	1	1
12:15	6	0	1	2	3	1
12:30	2	2	1	4	0	1
12:45	2	3	1	2	1	3
15:00	1	0	0	2	0	2
15:15	4	0	2	2	0	1
15:30	3	1	1	2	0	3

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	2	2	0	2	0	1
16:00	0	1	1	3	0	0
16:15	1	0	2	1	0	0
16:30	2	0	0	0	1	1
16:45	2	3	1	2	0	0
17:00	1	0	0	1	0	1
17:15	2	0	1	2	0	1
17:30	1	0	0	3	0	1
17:45	2	0	1	1	0	1

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77225465599

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

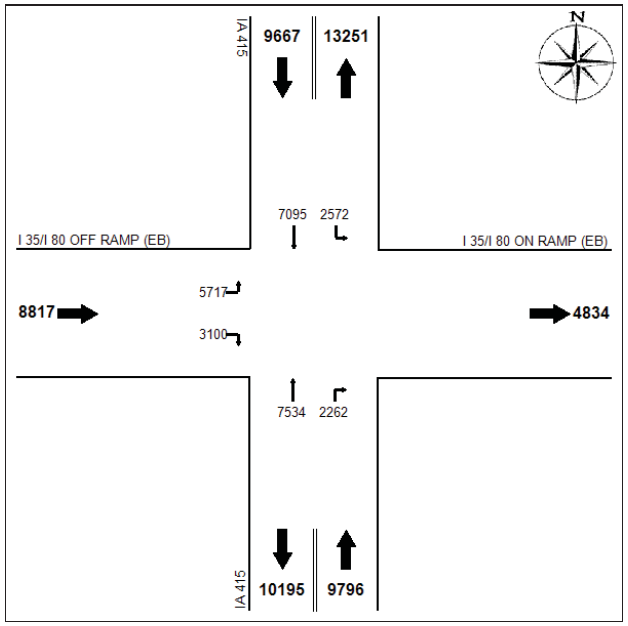
I-35/I-80 & IA 415

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	69	188	100	37	76	68
07:15	89	239	110	33	94	78
07:30	71	243	171	48	102	87
07:45	79	217	120	30	134	92
08:00	62	137	105	36	82	70
08:15	61	117	98	42	76	60
08:30	42	147	99	26	67	48
08:45	28	106	113	20	74	49
11:00	25	98	102	25	63	45
11:15	24	72	105	28	71	40
11:30	25	87	124	35	94	49
11:45	34	101	126	34	70	64
12:00	33	99	98	32	79	48
12:15	39	80	118	30	93	52
12:30	30	100	114	27	79	43
12:45	35	95	117	30	92	51
15:00	27	106	130	53	70	43
15:15	52	99	129	70	106	61
15:30	67	140	168	63	111	76

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	67	144	160	48	132	63
16:00	47	149	207	66	137	55
16:15	56	132	211	68	156	62
16:30	52	155	206	85	168	52
16:45	65	172	287	63	165	66
17:00	67	124	194	62	189	64
17:15	38	163	237	49	155	59
17:30	62	153	166	52	180	58
17:45	56	141	131	34	155	70

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

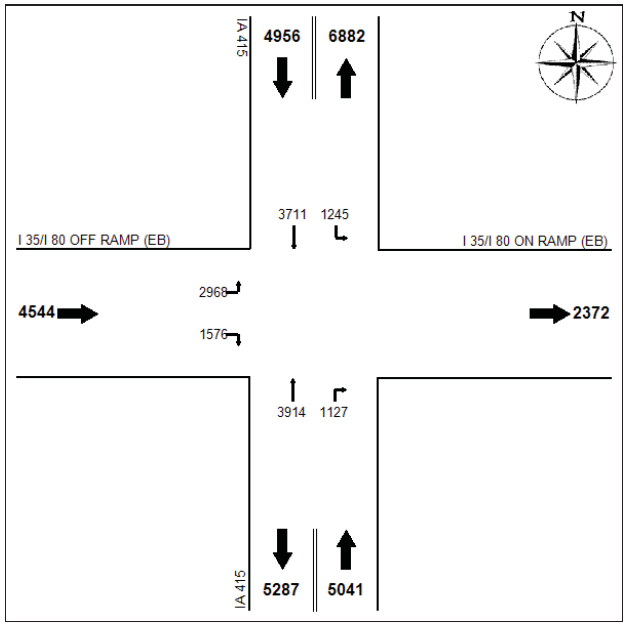
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	68	185	97	34	75	67
07:15	84	236	107	31	91	75
07:30	65	238	164	45	100	83
07:45	69	210	110	28	130	89
08:00	54	132	95	30	79	66
08:15	52	115	94	39	68	59
08:30	35	142	93	22	61	45
08:45	21	103	110	13	67	47
11:00	14	92	93	21	60	38
11:15	18	69	102	26	65	34
11:30	24	79	119	34	91	46
11:45	30	94	118	31	67	60
12:00	26	99	93	25	74	46
12:15	28	76	114	25	89	50
12:30	26	98	106	19	76	43
12:45	29	92	113	24	88	47
15:00	18	105	119	49	65	41
15:15	45	95	127	66	100	56
15:30	62	136	166	59	103	68

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	65	142	156	45	129	58
16:00	47	145	201	62	133	48
16:15	52	129	209	65	155	54
16:30	48	152	204	81	167	47
16:45	60	169	282	61	162	64
17:00	60	123	193	62	187	62
17:15	34	163	235	47	154	58
17:30	59	152	165	51	179	58
17:45	52	140	129	32	153	67

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

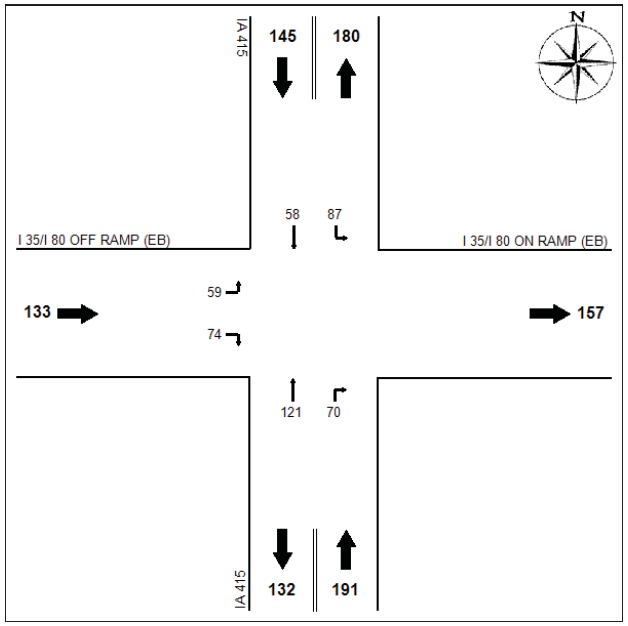
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	1	1	3	2	0	1
07:15	2	2	2	1	1	2
07:30	3	2	6	3	1	4
07:45	7	2	10	2	2	1
08:00	6	2	9	4	2	4
08:15	7	1	4	3	2	1
08:30	3	2	5	3	5	1
08:45	5	2	3	2	3	2
11:00	4	4	9	2	2	6
11:15	3	2	3	1	2	3
11:30	1	6	4	1	2	3
11:45	1	5	8	2	2	2
12:00	3	0	4	5	4	2
12:15	5	2	2	4	1	2
12:30	3	1	8	6	2	0
12:45	4	2	4	2	1	4
15:00	5	1	11	2	3	2
15:15	3	4	2	4	3	4
15:30	2	3	2	4	7	6

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	1	2	4	3	2	4
16:00	0	3	6	2	3	7
16:15	3	2	2	3	1	5
16:30	2	3	2	4	1	5
16:45	2	2	5	1	2	1
17:00	4	1	1	0	2	1
17:15	3	0	1	2	1	1
17:30	3	1	0	1	0	0
17:45	1	0	1	1	2	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

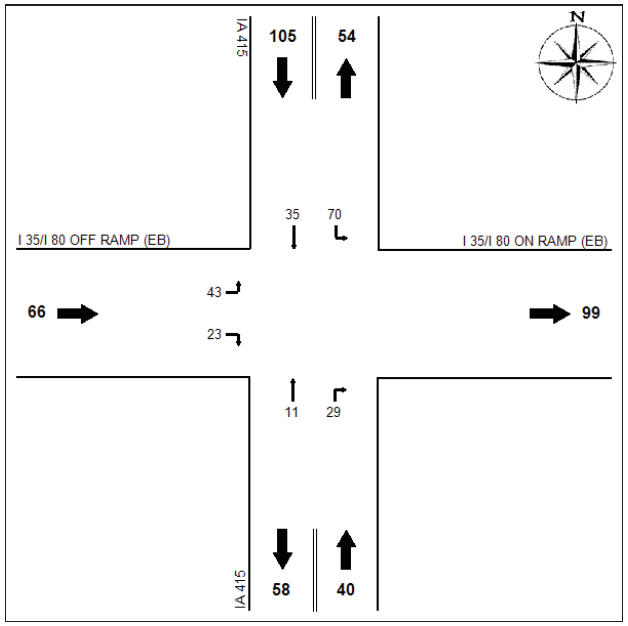
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	0	2	0	1	1	0
07:15	3	1	1	1	2	1
07:30	3	3	1	0	1	0
07:45	3	5	0	0	2	2
08:00	2	3	1	2	1	0
08:15	2	1	0	0	6	0
08:30	4	3	1	1	1	2
08:45	2	1	0	5	4	0
11:00	7	2	0	2	1	1
11:15	3	1	0	1	4	3
11:30	0	2	1	0	1	0
11:45	3	2	0	1	1	2
12:00	4	0	1	2	1	0
12:15	6	2	2	1	3	0
12:30	1	1	0	2	1	0
12:45	2	1	0	4	3	0
15:00	4	0	0	2	2	0
15:15	4	0	0	0	3	1
15:30	3	1	0	0	1	2

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	1	0	0	0	1	1
16:00	0	1	0	2	1	0
16:15	1	1	0	0	0	3
16:30	2	0	0	0	0	0
16:45	3	1	0	1	1	1
17:00	3	0	0	0	0	1
17:15	1	0	1	0	0	0
17:30	0	0	1	0	1	0
17:45	3	1	1	1	0	3

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77224965099

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

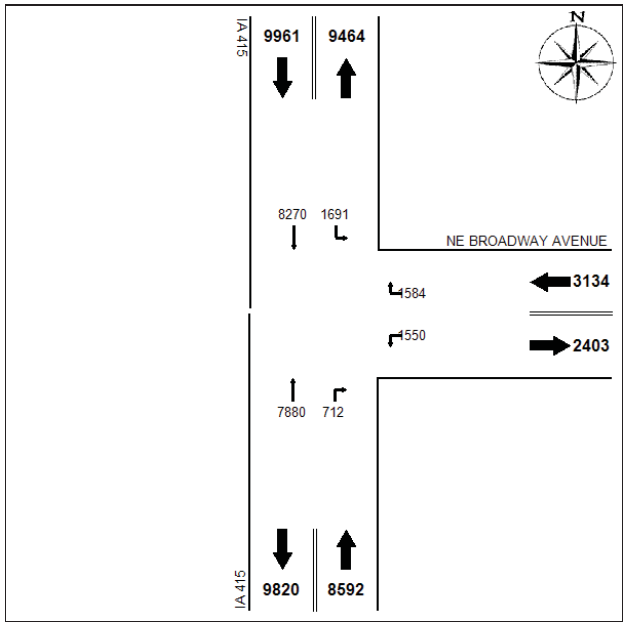
IA 415 & NW Broadway Ave

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	36	208	25	25	114	8
07:15	52	276	36	19	114	17
07:30	29	268	32	38	166	19
07:45	44	252	25	24	127	14
08:00	14	182	23	26	101	16
08:15	23	155	23	25	104	9
08:30	21	159	24	28	98	7
08:45	27	118	18	21	111	6
11:00	19	115	25	22	109	9
11:15	26	93	23	27	100	17
11:30	34	113	40	28	124	13
11:45	31	133	25	30	112	7
12:00	31	124	41	19	122	11
12:15	19	112	22	31	128	13
12:30	20	114	28	30	112	12
12:45	27	126	23	21	120	13
15:00	38	119	41	18	141	20
15:15	36	129	27	29	158	19
15:30	40	184	43	22	186	15

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	32	168	25	37	164	18
16:00	39	171	43	37	196	12
16:15	40	164	34	34	225	23
16:30	26	156	46	41	225	22
16:45	74	182	26	37	263	12
17:00	30	131	40	39	223	22
17:15	53	170	25	67	239	13
17:30	25	163	22	50	211	9
17:45	34	153	30	36	140	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

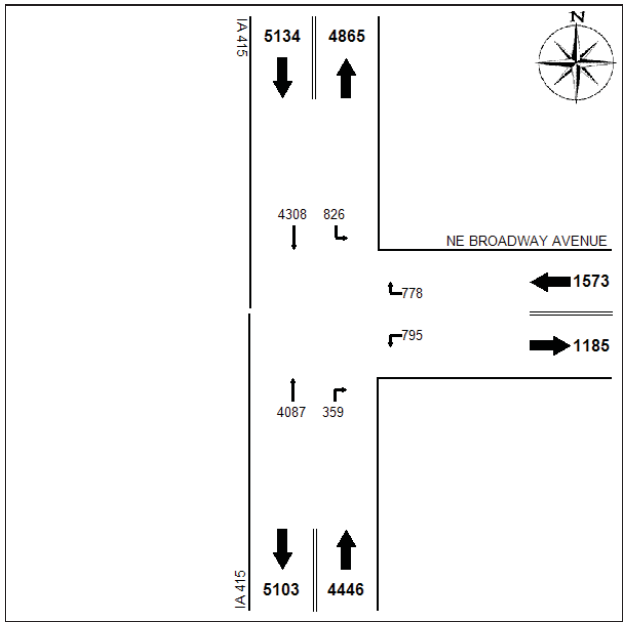
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	32	205	21	20	111	8
07:15	48	271	33	14	114	17
07:30	27	262	31	33	163	18
07:45	35	247	22	21	121	11
08:00	12	173	20	21	87	14
08:15	23	151	20	23	100	9
08:30	19	154	24	25	93	7
08:45	20	114	18	19	103	4
11:00	14	109	24	21	98	7
11:15	20	90	21	23	97	16
11:30	32	103	35	27	118	12
11:45	28	122	23	25	108	7
12:00	30	122	39	16	115	9
12:15	17	107	21	26	121	10
12:30	18	112	26	23	105	10
12:45	23	121	22	17	112	12
15:00	37	116	40	14	132	20
15:15	32	123	27	27	155	17
15:30	36	178	42	19	185	14

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	29	163	25	30	158	18
16:00	36	166	43	34	189	11
16:15	30	159	33	34	225	23
16:30	24	152	45	40	217	21
16:45	71	181	26	36	259	11
17:00	28	126	39	38	221	22
17:15	51	169	24	67	234	13
17:30	23	163	22	49	208	9
17:45	31	149	29	36	138	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

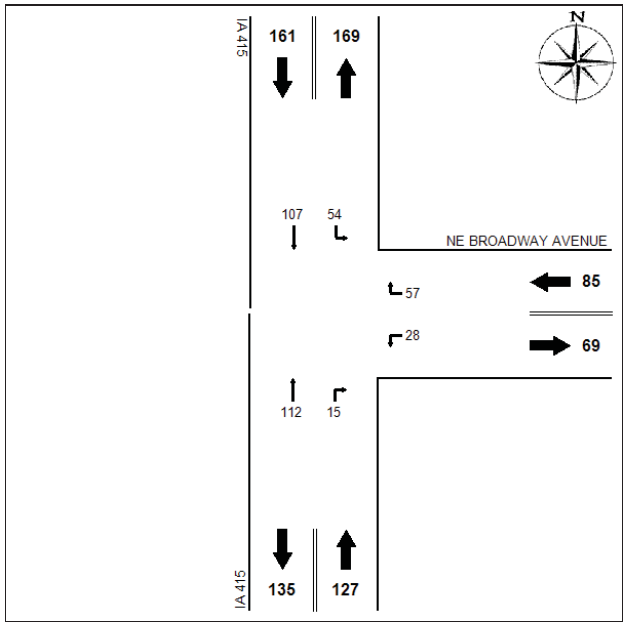
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	1	3	4	3	3	0
07:15	4	5	1	4	0	0
07:30	2	4	1	2	3	1
07:45	4	3	2	2	5	1
08:00	1	8	2	3	13	1
08:15	0	3	2	2	4	0
08:30	0	3	0	1	4	0
08:45	6	3	0	0	5	2
11:00	4	4	1	0	8	0
11:15	3	2	2	3	2	1
11:30	2	9	4	1	5	1
11:45	0	9	0	4	3	0
12:00	1	2	1	2	5	0
12:15	1	4	1	2	6	2
12:30	1	2	1	6	5	1
12:45	3	3	0	2	5	1
15:00	0	3	1	3	7	0
15:15	2	6	0	2	2	1
15:30	3	5	1	3	0	0

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	1	5	0	6	2	0
16:00	2	5	0	3	6	1
16:15	5	4	1	0	0	0
16:30	2	3	0	1	7	1
16:45	3	0	0	1	3	1
17:00	1	5	1	1	2	0
17:15	1	1	1	0	4	0
17:30	1	0	0	0	2	0
17:45	0	3	1	0	1	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

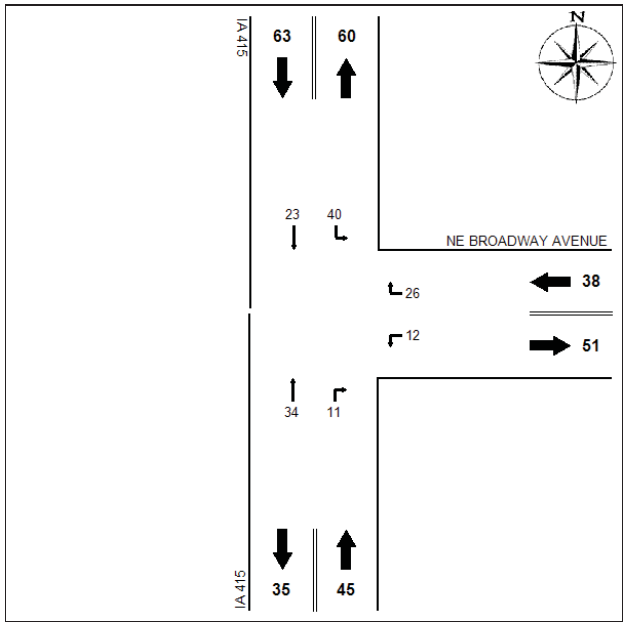
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	3	0	0	2	0	0
07:15	0	0	2	1	0	0
07:30	0	2	0	3	0	0
07:45	5	2	1	1	1	2
08:00	1	1	1	2	1	1
08:15	0	1	1	0	0	0
08:30	2	2	0	2	1	0
08:45	1	1	0	2	3	0
11:00	1	2	0	1	3	2
11:15	3	1	0	1	1	0
11:30	0	1	1	0	1	0
11:45	3	2	2	1	1	0
12:00	0	0	1	1	2	2
12:15	1	1	0	3	1	1
12:30	1	0	1	1	2	1
12:45	1	2	1	2	3	0
15:00	1	0	0	1	2	0
15:15	2	0	0	0	1	1
15:30	1	1	0	0	1	1

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	2	0	0	1	4	0
16:00	1	0	0	0	1	0
16:15	5	1	0	0	0	0
16:30	0	1	1	0	1	0
16:45	0	1	0	0	1	0
17:00	1	0	0	0	0	0
17:15	1	0	0	0	1	0
17:30	1	0	0	1	1	0
17:45	3	1	0	0	1	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77224165099

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

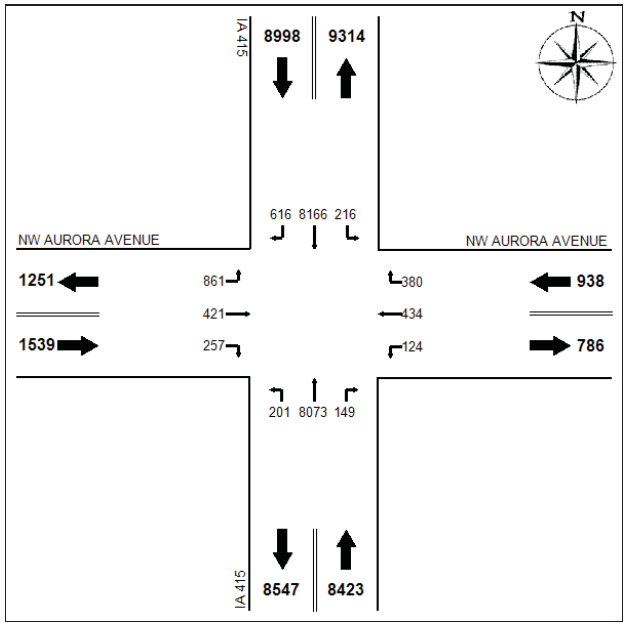
IA 415 & NW Aurora Ave

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	4	189	10	0	10	12	2	112	1	13	5	6
07:15	2	281	14	5	7	3	1	129	1	17	12	11
07:30	1	286	15	2	10	15	2	162	3	41	9	11
07:45	8	275	7	4	6	10	2	115	3	35	9	12
08:00	1	174	8	1	5	10	3	101	3	18	4	6
08:15	3	158	9	1	1	9	1	97	3	17	11	12
08:30	5	156	7	0	3	5	1	100	1	10	3	7
08:45	4	140	5	2	3	3	1	110	3	9	4	8
11:00	6	122	9	0	9	1	2	92	2	10	7	4
11:15	4	89	3	2	9	5	3	113	9	12	7	1
11:30	4	120	11	4	12	5	5	128	2	8	6	0
11:45	1	142	11	2	9	5	4	112	1	19	11	3
12:00	4	145	16	0	13	7	2	138	1	11	9	2
12:15	12	100	8	4	8	9	2	125	4	14	11	4
12:30	3	128	9	4	3	6	3	113	2	13	4	4
12:45	1	122	7	1	9	7	3	140	3	11	4	3
15:00	4	109	5	2	11	8	4	154	1	14	5	3
15:15	7	125	9	1	7	4	7	166	4	18	17	1
15:30	2	190	14	1	11	3	1	201	2	24	7	5

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	3	124	16	1	11	5	1	163	3	11	7	4
16:00	6	160	14	2	7	13	7	208	4	15	10	2
16:15	3	144	15	2	9	12	2	210	3	22	12	3
16:30	4	161	15	5	9	10	5	230	3	23	12	2
16:45	5	165	14	3	10	7	10	269	2	15	12	0
17:00	7	140	27	7	12	9	15	265	3	16	9	5
17:15	2	148	19	4	15	8	12	232	3	25	7	9
17:30	5	151	16	3	7	9	4	201	3	11	6	5
17:45	5	134	17	3	7	3	3	142	7	9	6	5

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

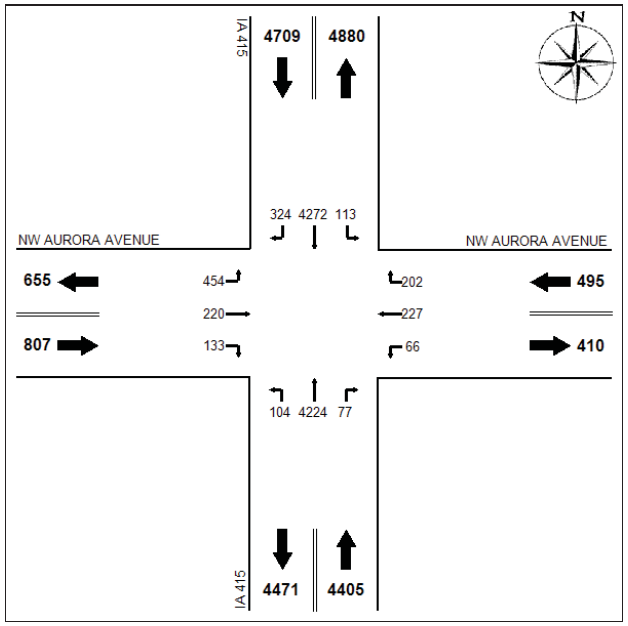
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

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	4	186	9	0	10	12	2	108	1	13	5	6
07:15	2	276	14	5	7	3	1	127	1	17	12	11
07:30	1	280	15	2	10	15	2	159	3	41	9	11
07:45	8	270	7	4	6	10	1	111	3	35	9	12
08:00	1	167	7	1	5	10	3	93	3	16	4	6
08:15	3	153	9	1	1	9	1	92	3	16	11	12
08:30	4	152	7	0	2	5	1	97	1	8	3	5
08:45	3	137	4	2	3	3	0	105	3	9	4	7
11:00	6	115	9	0	8	1	2	84	1	10	7	4
11:15	4	85	3	2	8	5	2	109	9	12	7	1
11:30	4	113	11	4	12	5	5	126	2	8	6	0
11:45	1	133	11	2	8	5	4	110	1	19	11	3
12:00	4	143	15	0	13	7	2	131	1	11	9	2
12:15	12	96	8	4	8	9	1	119	4	13	10	4
12:30	3	125	9	4	3	6	3	105	2	13	4	4
12:45	1	120	7	1	8	7	3	136	3	11	4	3
15:00	4	108	5	2	11	8	4	150	1	14	5	3
15:15	7	121	9	1	7	4	7	164	4	18	14	1
15:30	2	185	13	1	11	3	1	199	2	24	7	5

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	3	121	16	1	11	5	1	159	3	11	7	4
16:00	6	156	14	2	7	13	7	202	4	15	10	2
16:15	2	142	15	2	9	12	2	210	3	22	11	3
16:30	4	155	15	5	8	10	5	227	2	22	12	2
16:45	5	164	14	3	10	7	10	266	2	15	12	0
17:00	7	139	26	7	12	9	15	261	3	16	9	3
17:15	2	148	19	4	15	7	12	232	3	25	7	9
17:30	5	150	16	3	7	9	4	201	3	11	5	5
17:45	5	132	17	3	7	3	3	141	6	9	6	5

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

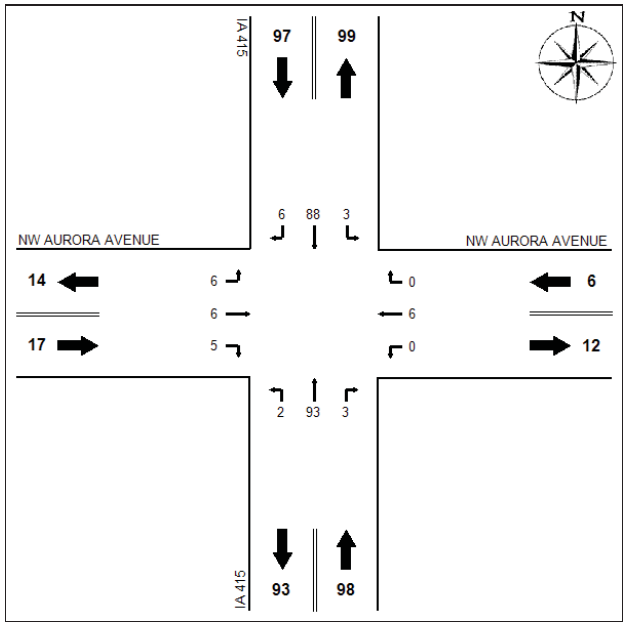
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

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	0	2	1	0	0	0	0	4	0	0	0	0
07:15	0	4	0	0	0	0	0	2	0	0	0	0
07:30	0	6	0	0	0	0	0	3	0	0	0	0
07:45	0	4	0	0	0	0	0	4	0	0	0	0
08:00	0	7	1	0	0	0	0	6	0	2	0	0
08:15	0	3	0	0	0	0	0	5	0	1	0	0
08:30	1	3	0	0	1	0	0	3	0	2	0	2
08:45	1	2	1	0	0	0	1	4	0	0	0	1
11:00	0	6	0	0	1	0	0	8	1	0	0	0
11:15	0	4	0	0	1	0	0	4	0	0	0	0
11:30	0	7	0	0	0	0	0	2	0	0	0	0
11:45	0	7	0	0	1	0	0	2	0	0	0	0
12:00	0	2	1	0	0	0	0	7	0	0	0	0
12:15	0	2	0	0	0	0	1	5	0	1	1	0
12:30	0	2	0	0	0	0	0	5	0	0	0	0
12:45	0	1	0	0	1	0	0	4	0	0	0	0
15:00	0	1	0	0	0	0	0	4	0	0	0	0
15:15	0	2	0	0	0	0	0	1	0	0	3	0
15:30	0	5	1	0	0	0	0	2	0	0	0	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	3	0	0	0	0	0	2	0	0	0	0
16:00	0	4	0	0	0	0	0	6	0	0	0	0
16:15	1	2	0	0	0	0	0	0	0	0	1	0
16:30	0	5	0	0	1	0	0	3	1	0	0	0
16:45	0	0	0	0	0	0	0	3	0	0	0	0
17:00	0	1	1	0	0	0	0	4	0	0	0	2
17:15	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	1	0	0	0	0	0	0	0	0	1	0
17:45	0	2	0	0	0	0	0	0	1	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

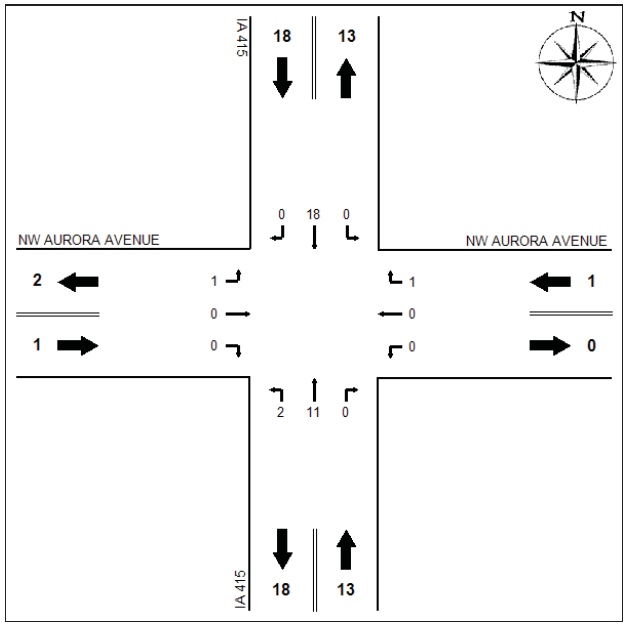
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A

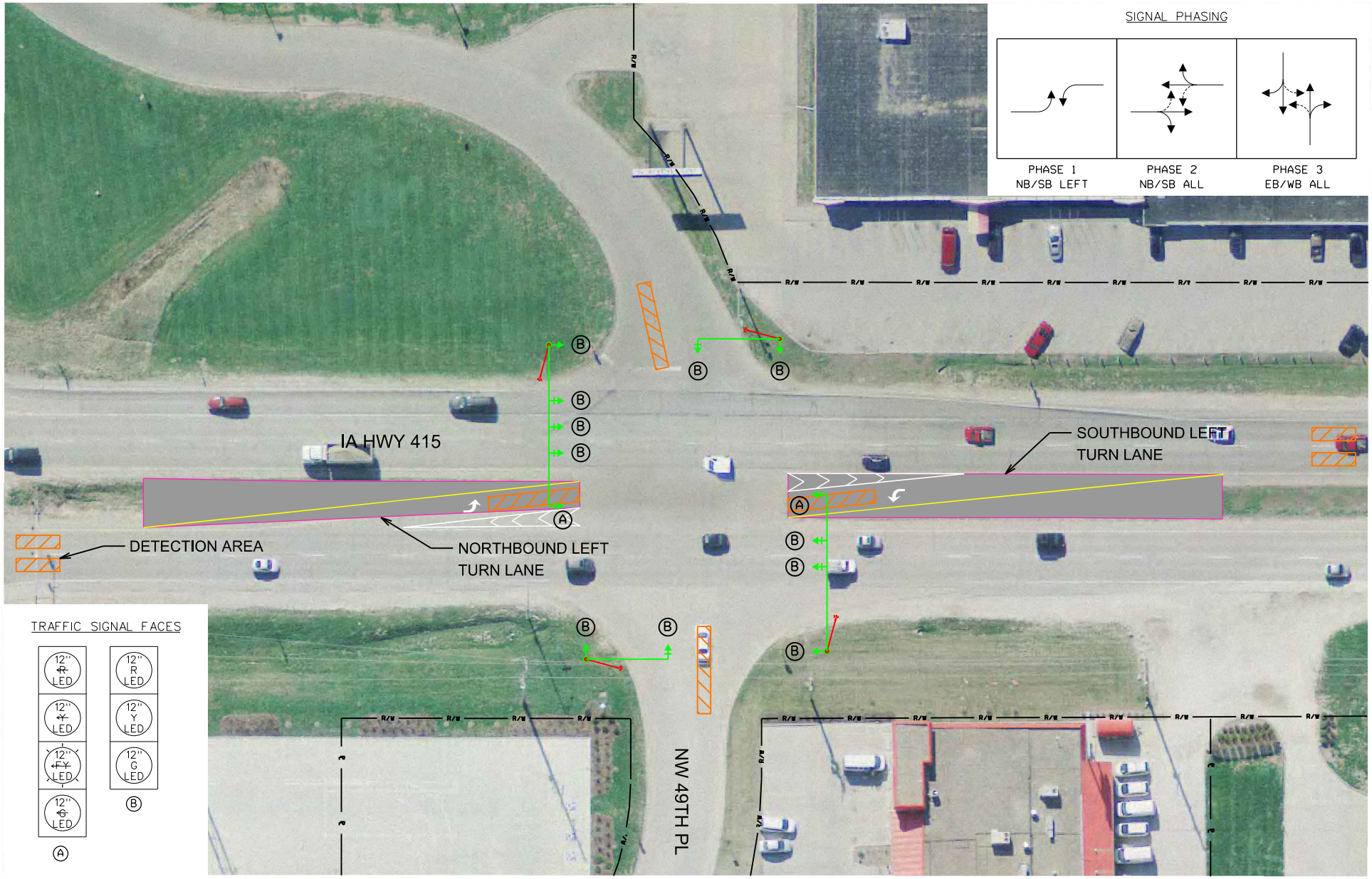


Raw Data-Combination Trucks:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	0	1	0	0	0	0	0	0	0	0	0	0
07:15	0	1	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	1	0	0	0	0	1	0	0	0	0	0
08:00	0	0	0	0	0	0	0	2	0	0	0	0
08:15	0	2	0	0	0	0	0	0	0	0	0	0
08:30	0	1	0	0	0	0	0	0	0	0	0	0
08:45	0	1	0	0	0	0	0	1	0	0	0	0
11:00	0	1	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	1	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	2	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	2	0	0	0	0	0	1	0	0	0	0
12:30	0	1	0	0	0	0	0	3	0	0	0	0
12:45	0	1	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	2	0	0	0	0	0	1	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0

751

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	0	0	0	0	0	0	2	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	1	0	0	0	0	0	0	0	1	0	0
16:45	0	1	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	1	0	0	0	0



NW 49th PL & IA HWY 415
INTERSECTION AND TRAFFIC SIGNAL IMPROVEMENTS
POLK COUNTY, IOWA

0 30
SCALE (FEET)

K

BENEFIT/COST ANALYSIS
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

Per Iowa DOT TSIP Benefit/Cost Analysis instructions, an estimated improvement life of 20 years was selected for turn lane and traffic signal improvements. Because the proposed improvements are intersection improvements, a benefit/cost analysis was performed for each intersection. The methodology used per benefit/cost analysis is listed below. *Crash Modification Factors Clearinghouse* website was utilized to obtain crash reduction factors (CRF) for each improvement. The projected traffic growth of 2% was chosen given the development trend of western Ankeny and at this point, no additional accesses planned for I-80/35 west of 2nd Avenue.

NW 49th Place

- 45% CRF – 20% traffic signalization & 35% for positive offset left turn lanes. Both crash reductions factors are conservative given the nature of reported crashes and mitigations of those crashes with proposed improvements.
- Requested amount $150,000 resulting in benefit/cost ratio of 1.72.

I-80/35 North Ramp

- 30% CRF- Physical channelization of right turn lane and signal coordination combined.
- Requested amount $130,000 resulting in benefit/cost ratio of 2.24.

NW 47th Place

- 20% CRF since south approach already has a dedicated left turn-lane.
- Requested amount $40,000 resulting in benefit/cost ratio of 2.44.

The County is requesting $320,000 in TSIP funding assistance for this entire project.

NW 49th Place Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Jul 25, 2014

Intersection: IA Hwy 415 @ 49th Pl

Improvement

Proposed Improvement(s): Traffic signalization, IA Hwy 415 left turn lanes

$ 150,000	Estimated Improvement Cost, **EC**	20	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**
		$ 150,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: DOT 2011 Date of traffic coun

Daily Entering Vehicles by Approach (or AADT / 2)

13,480

500 → ← 950

14,140

10,610,550	Current Annual Entering Veh., **AEV** = DEV * 365
43,196	veh / day, Final Year DEV, **FDEV**
257.81	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
29,070	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes →		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
2	Injury Crashes →		Minor Injuries @	$65,000	$ -
		2	Possible Injuries @	$35,000	$ 70,000
15	Property Damage Only		(assumed cost per crash)	$7,400	$ 125,800
		-OR-	enter all Property Costs of all crashes:		
17	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 195,800

3.09	Current Crashes / Year, **AA** = TA / T	0.29	Crashes / MEV, Crash Rate, **CR**
$ 11,518	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
75.1	Total Expected Crashes, **TECR** = CR x TMEV	$ 257,788	Present Value of Avoided Crashes, **BENEFIT**
1.39	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 16,020	Crash Costs Avoided in First Year, AAR x AVC		
33.8	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 = $257,788 : $150,000 = **1.72** : 1

I-80/35 North Ramp Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Jul 25, 2014

Intersection: IA Hwy 415 @ I-80/35 North Ramp

Improvement

Proposed Improvement(s): Southbound channelized free right lane, entrance ramp widening, traffic signal modifications

$ 130,000	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**
		$ 130,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: DOT 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

10,850

3,660

9,090

8,614,000	Current Annual Entering Veh., **AEV** = DEV * 365
35,068	veh / day, Final Year DEV, **FDEV**
209.30	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
23,600	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
4	Injury Crashes		Minor Injuries @	$65,000	$	-
		4	Possible Injuries @	$35,000	$	140,000
22	Property Damage Only		(assumed cost per crash)	$7,400	$	192,400
			-OR- enter all Property Costs of all crashes:			
26	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	332,400

4.73	Current Crashes / Year, **AA** = TA / T	0.55	Crashes / MEV, Crash Rate, **CR**
$ 12,785	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
114.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 291,756	Present Value of Avoided Crashes, **BENEFIT**
1.42	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 18,131	Crash Costs Avoided in First Year, AAR x AVC		
34.5	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 = $291,756 : $130,000 = 2.24 : 1

NW 47th Place Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Aug 13, 2014

Intersection: IA Hwy 415 @ 47th Place

Improvement

Proposed Improvement(s): IA Hwy 415 Positive Offset Left Turn Lane

$ 40,000	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 (time value of $), **INT**
		$ 40,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Polk County 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

10,850 ↓

1,130 → ← 500

↑ 9,090

7,873,050	Current Annual Entering Veh., **AEV** = DEV * 365
32,052	veh / day, Final Year DEV, **FDEV**
191.29	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
21,570	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009	First full year -->	2013	Last full year	5.5 years, Time Period, **T**		
6	Additional months			values as of May 2014		
	Fatal Crashes →		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
2	Injury Crashes →	1	Minor Injuries @	$65,000	$	65,000
		1	Possible Injuries @	$35,000	$	35,000
7	Property Damage Only		(assumed cost per crash)	$7,400	$	66,600
			-OR- enter all Property Costs of all crashes:			
9	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	166,600

1.64	Current Crashes / Year, **AA** = TA / T	0.21	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 18,511	Cost per Crash, **AVC** = LOSS / TA	$ 97,486	Present Value of Avoided Crashes, **BENEFIT**
39.8	Total Expected Crashes, **TECR** = CR x TMEV		
0.33	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 6,058	Crash Costs Avoided in First Year, AAR x AVC		
8.0	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 = $97,486 : $40,000 = **2.44** : 1

Appendix

- Crash Location Map (2009 - May 2014)
- Crash Summaries (2009 - May 2014)
- Crash Diagrams (2009 - May 2014)
- Traffic Signal Warrant Analysis Sheets

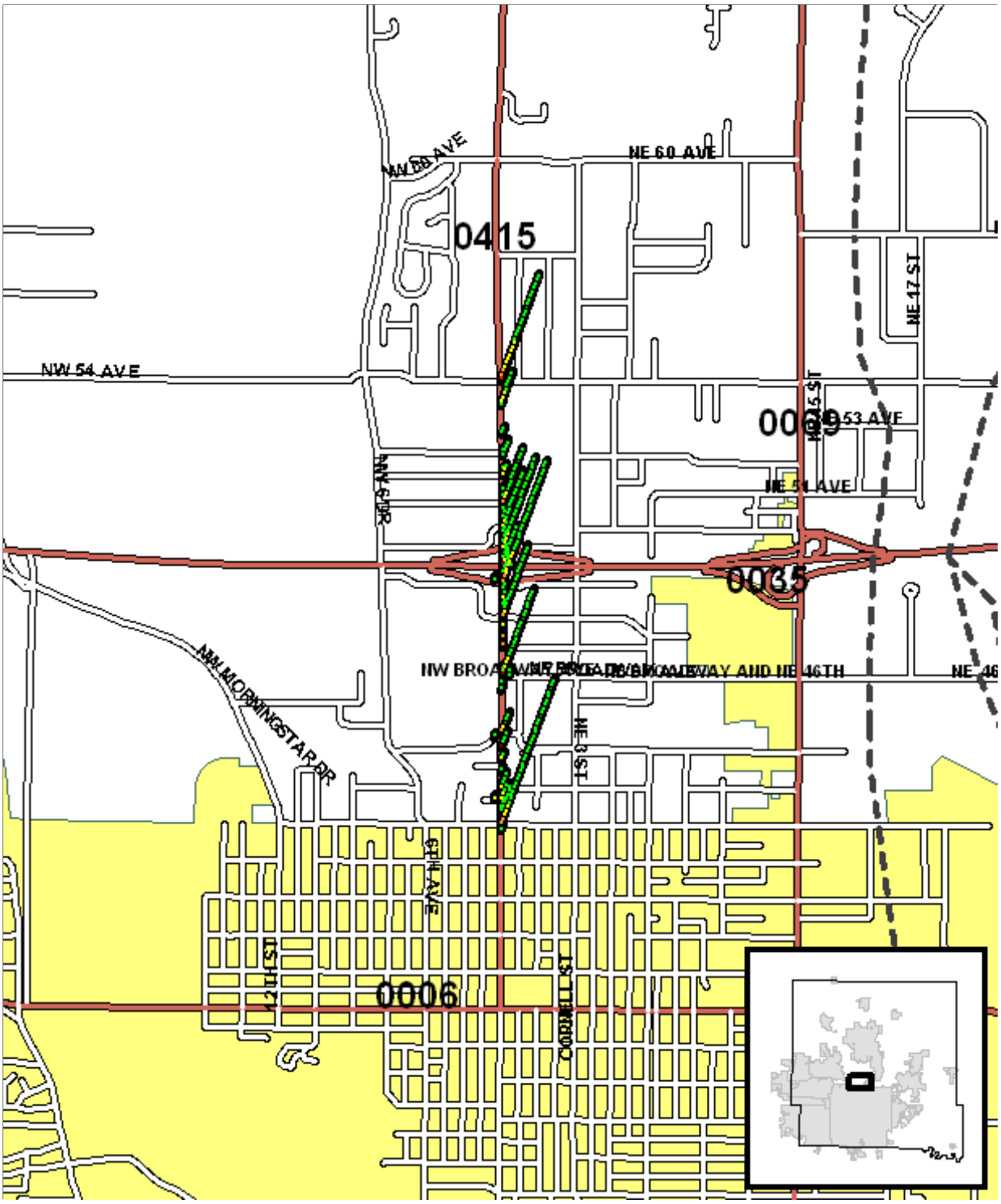
Iowa Department of Transportation

Location Map

IA 415 (NE 54th Ave to Aurora Ave)

Incidents: 286

Report Version 1.1 Mar 2005



Analyst:	Notes:

Iowa Department of Transportation

Major Cause Summary

IA 415 (NE 54th Ave to Aurora Ave)

Report Version 1.1 Jan 2005

Analysis Years: 2009 [43], 2010 [58], 2011 [55], 2012 [48], 2013 [51], 2014 [31]

Crash Summary:

Fatal	1
Major Injury	3
Minor Injury	12
Possible/Unknown	42
PDO	228
Total Crashes	286

Injury Summary:

Fatal	1
Major Injury	4
Minor Injury	19
Possible	49
Unknown	4
Total Injuries	77

TOT Property Damage: $1,750,634

AVG Property Damage: $6,121

Surface Condition Summary:

Dry	214
Wet	52
Ice	9
Snow	8
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	1
Other	-
Unknown	-
Not Reported	1
Total Crashes	286

Major Cause Summary:

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

Selection Filter:

((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

Iowa Department of Transportation

Major Cause Summary

IA 415 & 47th Pl

Report Version 1.1 Jan 2005

Analysis Years: 2009 [4], 2010 [2], 2011 [4], 2012 [3], 2013 [3], 2014 [3]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	1
Possible/Unknown	1
PDO	17
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	1
Possible	1
Unknown	-
Total Injuries	2

TOT Property Damage: $111,895

AVG Property Damage: $5,889

Surface Condition Summary:

Dry	13
Wet	6
Ice	-
Snow	-
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	19

Major Cause Summary:

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

Selection Filter:

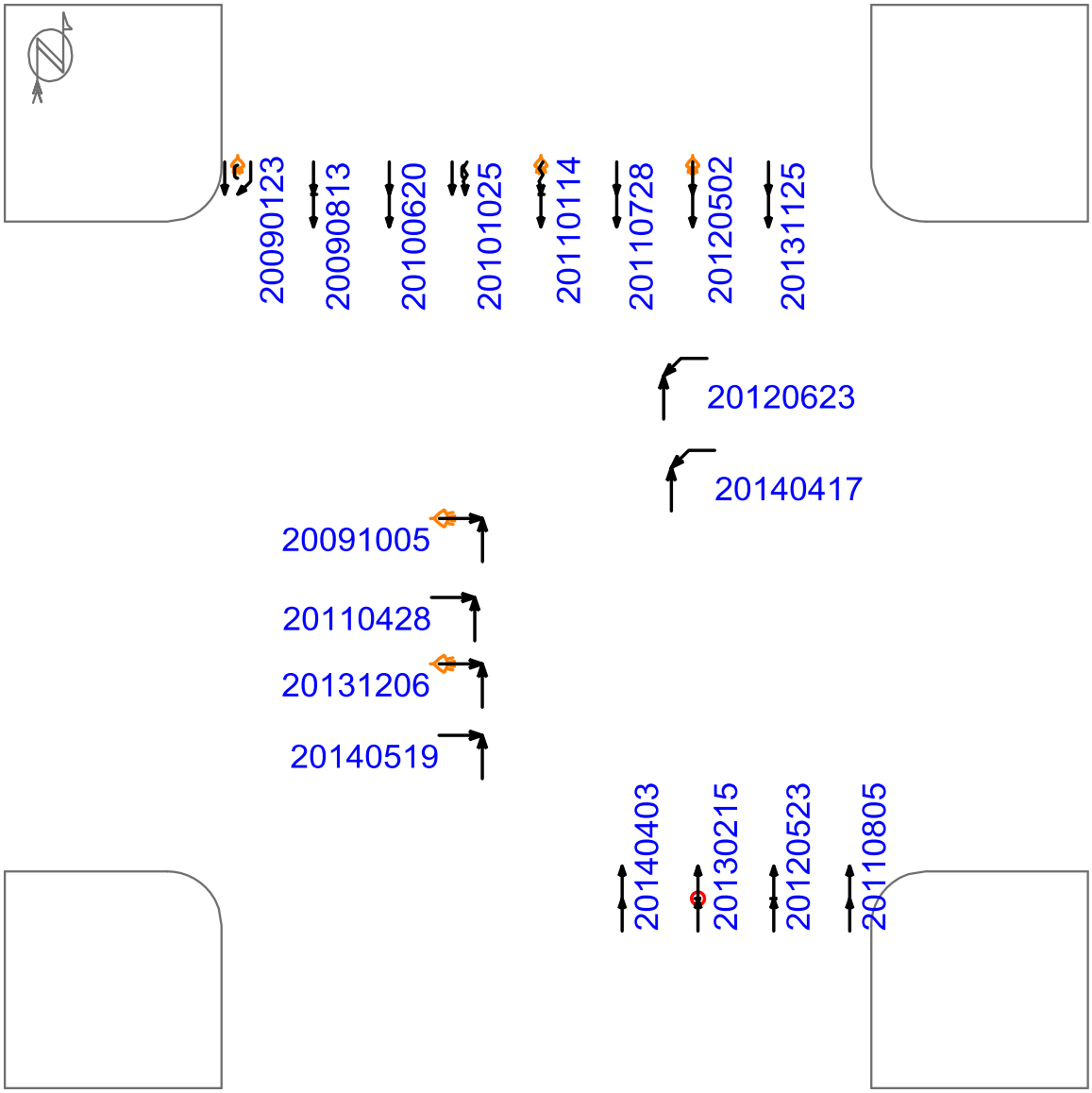
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & 47th Pl

2009 - 2014 May 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. 07/29/2014

Iowa Department of Transportation

Major Cause Summary

IA 415 & I-80/35 North Ramp

Report Version 1.1 Jan 2005

Analysis Years: 2009 [7], 2010 [2], 2011 [5], 2012 [4], 2013 [3], 2014 [5]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	4
PDO	22
Total Crashes	26

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible	4
Unknown	-
Total Injuries	4

TOT Property Damage: $143,470

AVG Property Damage: $5,518

Surface Condition Summary:

Dry	16
Wet	5
Ice	2
Snow	3
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	26

Major Cause Summary:

	Animal		Improper Backing
5	Ran Traffic Signal		Illegally Parked/Unattended
	Ran Stop Sign	2	Swerving/Evasive Action
1	Crossed Centerline		Over-Correcting/Over-Steering
	FTYROW: At Uncontrolled Intersection		Downhill Runaway
	FTYROW: Making Right Turn on Red Signal		Equipment Failure
	FTYROW: From Stop Sign		Separation of Units
	FTYROW: From Yield Sign	1	Ran Off Road - Right
2	FTYROW: Making Left Turn		Ran Off Road - Straight
	FTYROW: From Driveway		Ran Off Road - Left
	FTYROW: From Parked Position		Lost Control
	FTYROW: To Pedestrian		Inattentive/Distracted By: Passenger
2	FTYROW: Other (explain in narrative)		Inattentive/Distracted By: Use of Phone or Other
	Traveling Wrong Way or on Wrong Side of Rd		Inattentive/Distracted By: Fallen Object
4	Driving Too Fast for Conditions		Inattentive/Distracted By: Fatigued/Asleep
	Exceeded Authorized Speed		Other: Vision Obstructed
	Made Improper Turn		Oversized Load/ Oversized Vehicle
	Improper Lane Change		Cargo/Equipment Loss or Shift
2	Followed Too Close	4	Other: Other Improper Action
	Disregarded Railroad Signal	2	Unknown
	Disregarded Warning Sign		Other: No Improper Action
1	Operating Vehicle in Reckless/Aggressive Manner		None Indicated

Selection Filter:

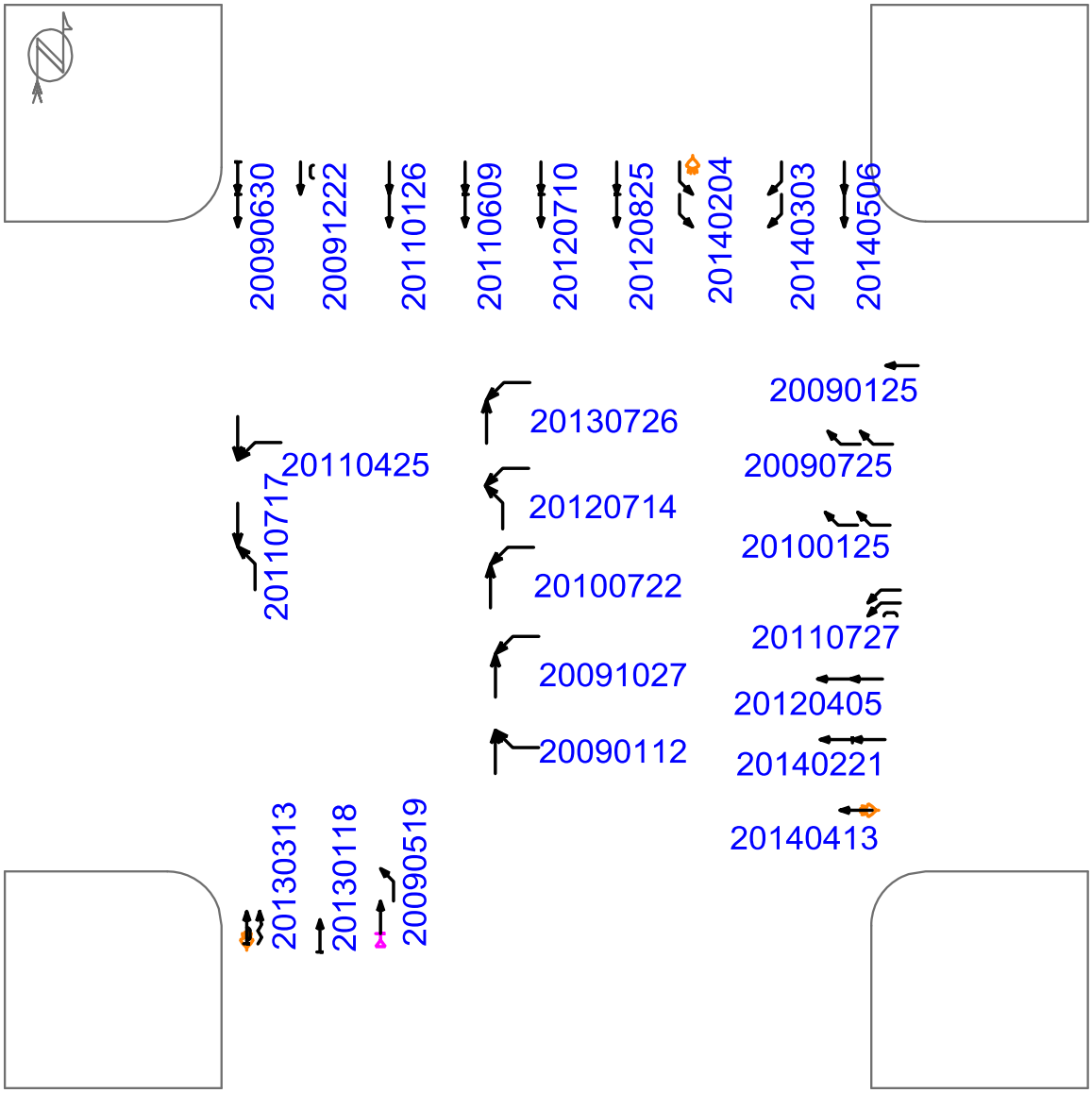
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & I-80/35 North Ramp

2009 - May 2014 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

Pd' Programming, Inc. 07/29/2014

Iowa Department of Transportation

Major Cause Summary

IA 415 & 49th Pl

Report Version 1.1 Jan 2005

Analysis Years: 2009 [3], 2010 [2], 2011 [4], 2012 [2], 2013 [5], 2014 [1]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	2
PDO	15
Total Crashes	17

Injury Summary:

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

TOT Property Damage: $86,350

AVG Property Damage: $5,079

Surface Condition Summary:

Dry	15
Wet	1
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	17

Major Cause Summary:

	Animal
	Ran Traffic Signal
	Ran Stop Sign
	Crossed Centerline
1	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
3	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
1	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	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
2	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
3	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
1	Ran Off Road - Right
1	Ran Off Road - Straight
	Ran Off Road - Left
	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
2	Other: Other Improper Action
1	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

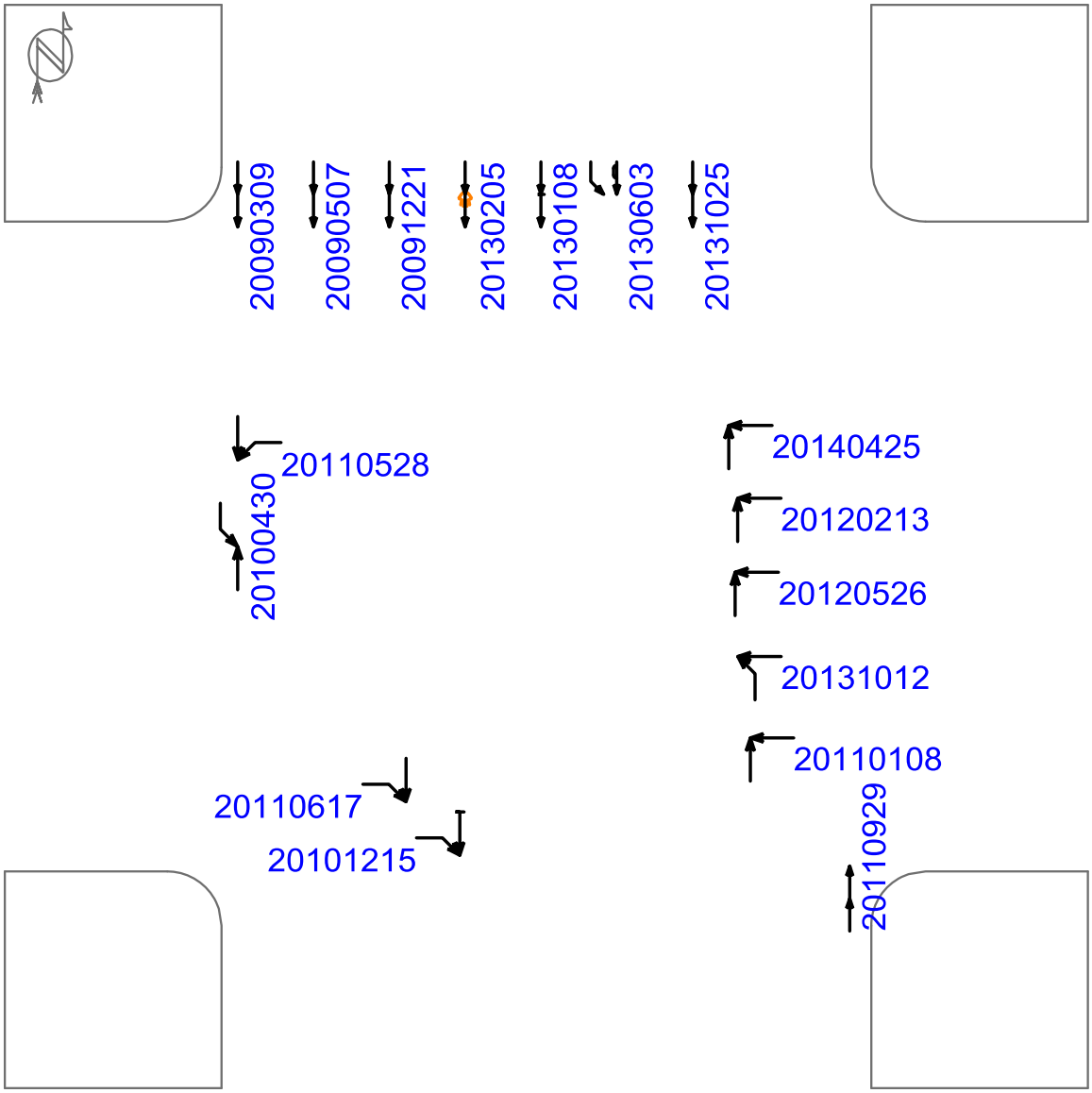
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & 49th Pl

2009 - May 2014 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

Pd' Programming, Inc. 07/29/2014

Snyder & Associates, Inc.
Ankeny, Iowa

Study Name **: IA415-49thPl_Warrant**

Signal Warrants - Summary

Major Street Approaches

Northbound: **IA 415**
Number of Lanes: **2**
Approach Speed: **41**
Total Approach Volume: **15,619**

Southbound: **IA 415**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **14,187**

Minor Street Approaches

Eastbound: **NW 49th Pl**
Number of Lanes: **1**

Total Approach Volume: **831**

Westbound: **NW 49th Pl**
Number of Lanes: **1**

Total Approach Volume: **934**

Warrant Summary **(Rural values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Not Satisfied**
Required volumes reached for 1 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Satisfied**
Required volumes reached for 11 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Not Satisfied**
Required volumes reached for 5 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (9) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes ..... **Satisfied**
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (2) is less than minimum (5). Volume minimums are met.

Warrant 8 - Roadway Network ..... **Not Evaluated**

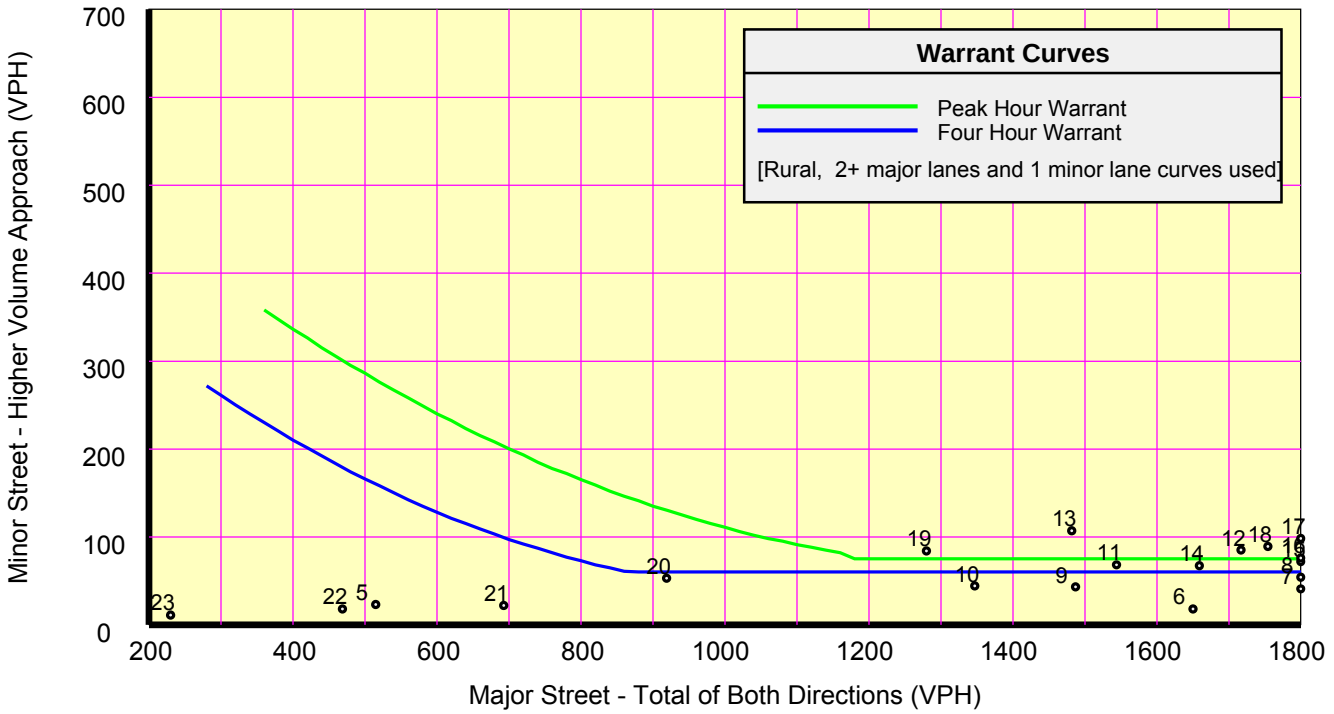
Warrant 9 - Intersection Near a Grade Crossing ..... **Not Evaluated**

Snyder & Associates, Inc.

Ankeny, Iowa

Study Name : **IA415-49thPl_Warrant**

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War 1A			War 1B			War 1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	126	7	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
01:00	70	7	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
02:00	73	5	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
03:00	68	6	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
04:00	172	9	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
05:00	515	23	EB	420-Yes	105-No	Major	630-No	53-No	---	504-Yes	84-No	Major
06:00	1,650	18	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
07:00	3,129	41	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
08:00	1,807	54	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
09:00	1,487	43	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
10:00	1,347	44	WB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
11:00	1,544	68	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
12:00	1,717	85	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
13:00	1,482	107	WB	420-Yes	105-Yes	Both	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
14:00	1,659	67	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
15:00	2,122	72	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
16:00	2,718	76	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
17:00	2,775	98	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
18:00	1,754	89	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
19:00	1,280	84	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
20:00	919	53	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
21:00	693	22	WB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
22:00	469	18	EB	420-Yes	105-No	Major	630-No	53-No	---	504-No	84-No	---
23:00	230	11	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---

Rev. 3/08

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Citywide Fixed-Time Signal Upgrade Project - Phase 2

Applicant: City of Des Moines

Contact Person: Calvin Miller Title: Civil Engineer I

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

Phone: 515-283-4748 (Area Code) E-Mail: cbmiller@dmgov.org

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

Co-Applicant(s): N/A

Contact Person: _____ Title: _____

Complete Mailing Address: _____

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

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost: $ 660,000

Safety Funds Requested: $ 120,000

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 8-13-14
Signature Date Signed

T.M. Franklin Cownie, Mayor
Typed Name

Attest: Laura L. Baumgartner 8-13-14
Signature Date Signed

Laura L. Baumgartner, Chief Deputy City Clerk
Typed Name

Exhibit A-3

★ **Roll Call Number** 14-1206

Agenda Item Number 9

Date August 11, 2014

APPROVING FISCAL YEAR 2016 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. East 42nd Street and Hubbell Avenue Intersection Widening and Signalization

2. Martin Luther King Jr. Parkway and Prospect Road Traffic Signal Installation

3. Citywide Fixed-Time Signal Upgrade Project – Phase 2

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 14-400 Attached)

Moved by Hensley to adopt.

APPROVED AS TO FORM:

Kathleen Vanderpool
Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE	✓			
COLEMAN	✓			
GATTO	✓			
GRAY	✓			
HENSLEY	✓			
MAHAFFEY	✓			
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

CITYWIDE FIXED TIME SIGNAL UPGRADE PROJECT – PHASE 2

Proposed Project:

This project consists of upgrading the traffic signal operation at 25 existing intersections in Des Moines that currently operate as fixed- time signals. The proposed project would provide "semi-actuated" operation by installing vehicle detectors on the side-street and left-turning phases, along with adding pedestrian push-buttons and pedestrian signal indications.

The locations are along several of the city's heavy volume transportation corridors – E. 14th/ E. 15th Street (U.S. 69), ML King Jr. Pkwy / 19th Street, 6th Avenue, and Ingersoll Avenue. The specific locations are listed below and also shown on Exhibit E:

1. E 14th Street and Walker Street
2. E 14th Street and Grand Avenue
3. E 14th Street and Walnut Street
4. E 14th Street at Court Avenue
5. E 15th Street and Walker Street
6. E 15th Street and Grand Avenue
7. E 15th Street and Walnut Street
8. E 15th Street and Court Avenue
9. 6th Avenue and Holcomb Avenue
10. 6th Avenue and Hickman Road
11. 6th Avenue and College Avenue
12. 6th Avenue and Forest Avenue
13. 6th Avenue and University Ave.
14. 19th Street and Carpenter Ave
15. 19th Street and Forest Avenue
16. 19th Street and Clark Street
17. ML King and Carpenter Ave
18. ML King and Forest Avenue
19. ML King and Clark Street
20. 25th Street and Forest Avenue
21. 27th Street and Forest Avenue
22. 17th Street and Ingersoll Avenue
23. 18th Street and Ingersoll Avenue
24. 8th Street and Cherry Street
25. 9th Street and Cherry Street

The total construction cost is estimated to be $600,000. FY2015 Iowa Clean Air Attainment (ICAAP) funds have been approved in the amount of $480,000. State Traffic Safety funds in the amount of $120,000 are being requested in order to complete the funding package for the construction portion of this project.

Existing Conditions:

The twenty-five traffic signal locations proposed to be upgraded on this project are all "fixed-time" signals. Since there is no side-street vehicle or pedestrian detection, the traffic signals must cycle through all of their phases on a pre-timed basis, regardless of the presence of vehicles or pedestrians. This operation results in the main-street vehicles stopping or waiting unnecessarily when no vehicles are present on the side street.

Traffic volumes vary on these streets. From Iowa DOT 2012 traffic count data, the E 14th/E 15th Street (U.S. 69) corridor carries up to 40,000 vehicles per day (veh/day). The 19th/ML King Jr. Pkwy corridor volumes are 22,500 veh/day. The 6th Avenue corridor handles about 10,000 veh/day. Ingersoll Avenue volumes are approximately 10,500 veh/day, with Forest Avenue carrying 7,000 veh/day and Cherry Street carrying about 5,000 veh/day.

Speed limits also vary, but are generally in the 25-35 mph range.

Project Justification:

Because of the fixed-time signal operation, drivers on the main street are exposed to more rear-end and sideswipe-same direction crashes than if the signals remained green for their approaches. When this new project is implemented, motorists on the main street will not be required to stop as often, thereby reducing the number of these rear-end and sideswipe conflicts.

Research numbers for the Crash Mitigation Factors (CMF) vary from 10-80 percent reduction. For our analysis, a very conservative approach was taken, in that ONLY rear-end and sideswipe crashes were considered to be correctable, and then a 10% CMF was applied. (All other types of crashes, including right-angle, were not considered to be "correctable" in this analysis.)

A review of the crash history for the 3-year period between 2011-2013 indicated a total of 357 crashes at the 25 subject intersections. The analysis of this crash information indicates the following:

Accident Type	Number
Broadside	111
Rear End	**106**
Sideswipe – same direction	**71**
Left-Turning	28
Head-on	10
Non-Collision	31
Total	**357**
Average per year per intersection:	**4.8**

There were a total of 177 reported crashes that are considered correctable (Rear-end and Sideswipe-same direction- highlighted above). Of these, there were 46 personal injury crashes involving 52 injuries.

Based on current IDOT value factors, the total estimated loss from crashes during the described three-year period is $ 3,789,800 (See Exhibit "L-1"). Assuming a crash reduction of 10 percent of the correctible crashes and an estimated project life of 15 years, the request for $120,000 of Traffic Safety Funds relates to a benefit-cost factor of **12.47:1.**

Exhibit "C"

COST ESTIMATE	
Citywide Fixed-Time Signal Upgrade Project - Phase 2	
1. 6th Avenue at College Ave.	$20,000
2. 6th Avenue at Forest Ave.	$20,000
3. 6th Avenue at Hickman Rd.	$30,000
4. 6th Avenue at Holcomb Ave.	$20,000
5. 6th Avenue at University Ave.	$30,000
6. Cherry St. at 8th Street	$15,000
7. Cherry St. at 9th Street	$15,000
8. East 14th St. at Court Ave.	$25,000
9. East 14th St. at Walnut St.	$20,000
10. East 14th St. at Grand Ave.	$25,000
11. East 14th St. at Walker St.	$20,000
12. East 15th St. at Court Ave.	$25,000
13. East 15th St. at Walnut St.	$20,000
14. East 15th St. at Grand Ave.	$25,000
15. East 15th St. at Walker St.	$20,000
16. Ingersoll Ave. at 17th St.	$20,000
17. Ingersoll Ave. at 18th St.	$20,000
18. 19th St. at Carpenter Ave.	$25,000
19. 19th St. at Forest Ave.	$25,000
20. 19th St. at Clark St.	$20,000
21. ML King at Clark St.	$20,000
22. ML King at Forest Ave.	$25,000
23. ML King at Carpenter Ave.	$20,000
24. Forest Ave. at 25th St.	$20,000
25. Forest Ave. at 27th St.	$20,000
TRAFFIC SIGNAL MODIFICATIONS:	$545,000
CONTINGENCY (10%):	$55,000
TOTAL CONSTRUCTION COST:	**$600,000**
DESIGN/INCIDENTALS:	$60,000
TOTAL PROJECT COST:	$660,000

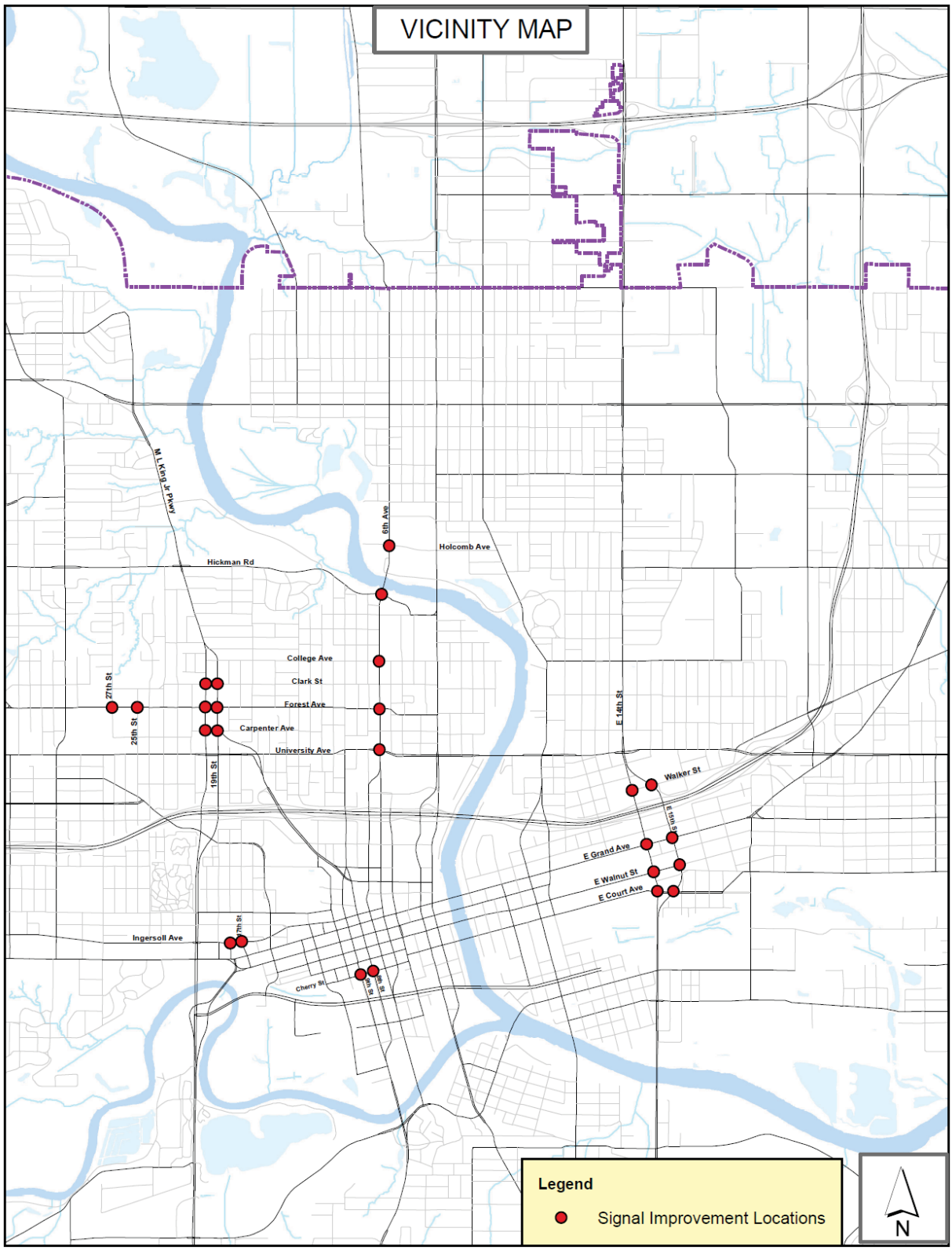
Exhibit D

TIME SCHEDULE

CITYWIDE FIXED-TIME SIGNAL UPGRADE PROJECT – PHASE 2

Project Approval:	**December 2014**
Agreement Signed:	**February 2015**
Project bid:	**April 2015**
Construction completed:	**October 2015**
Project Closeout:	**January 2016**

Exhibit E


VICINITY MAP
M. L. King Jr Pkwy
6th Ave
Holcomb Ave
Hickman Rd
College Ave
Clark St
Forest Ave
Carpenter Ave
University Ave
27th St
25th St
19th St
E 14th St
Walker St
E 6th St
E Grand Ave
E Walnut St
E Court Ave
Ingersoll Ave
7th St
Cherry St
Legend
Signal Improvement Locations
N

Photos of 3 typical intersections that are part of project Exhibit F-1

On Walnut Street, looking east toward E 14th Street

On E

On Walnut Street, looking west toward E 14th Street

Exhibit F-2

On East 14th Street, looking south toward Walnut Street.

On Ingersoll Avenue, looking west toward 17th Street.

On Ingersoll Avenue, looking east toward 17th Street.

On 17th Street, looking north toward Ingersoll Avenue

On 17th Street, looking south toward Ingersoll Avenue

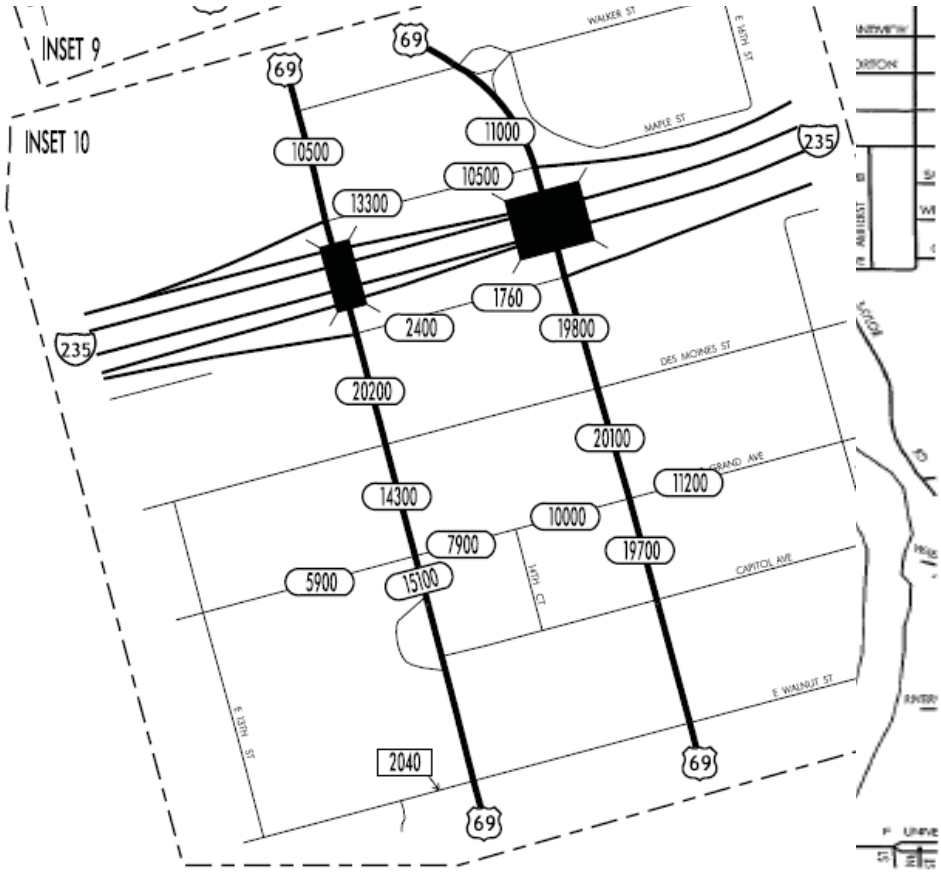
On 19th Street, looking north toward Forest Avenue.

On Forest Avenue, looking west toward 19th Street

On Forest Avenue, looking east toward 19th Street

Exhibit J-1

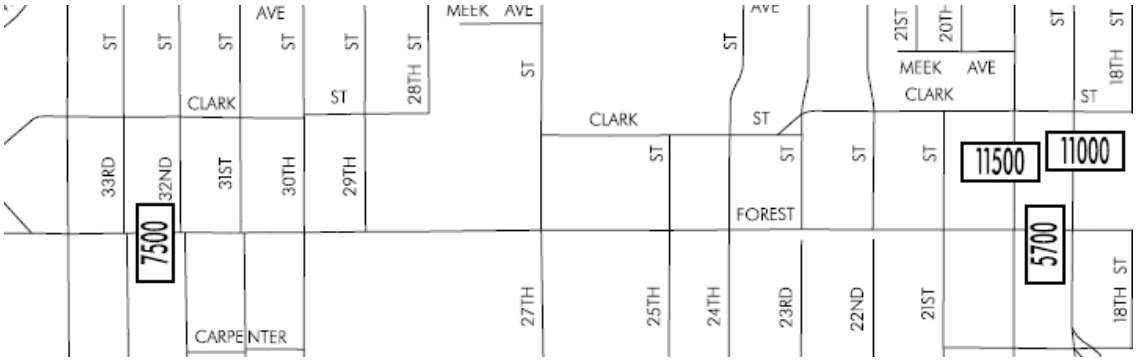
E 14th / E 15th Street Corridor - 2012 IDOT Counts



ML King / 19th Street Corridor - 2012 IDOT Counts

Exhibit J-2

Forest Avenue Corridor - 2012 IDOT Counts

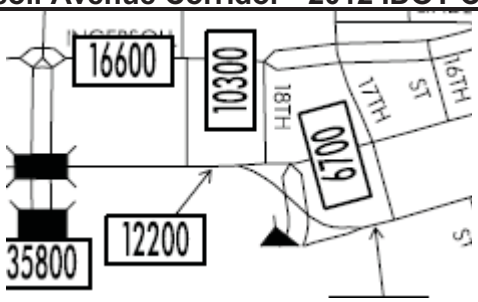


Cherry Street Corridor - 2008 IDOT Counts

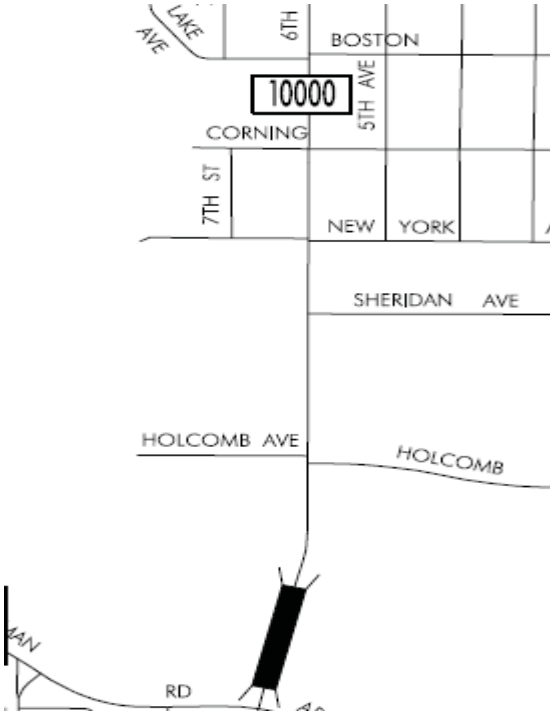
[There were no recent counts available for the Cherry Street corridor, although it is estimated to be approximately 5,000 vehicles/day.

Exhibit J-3

Ingersoll Avenue Corridor - 2012 IDOT Counts



6th Avenue Corridor - 2012 IDOT Counts



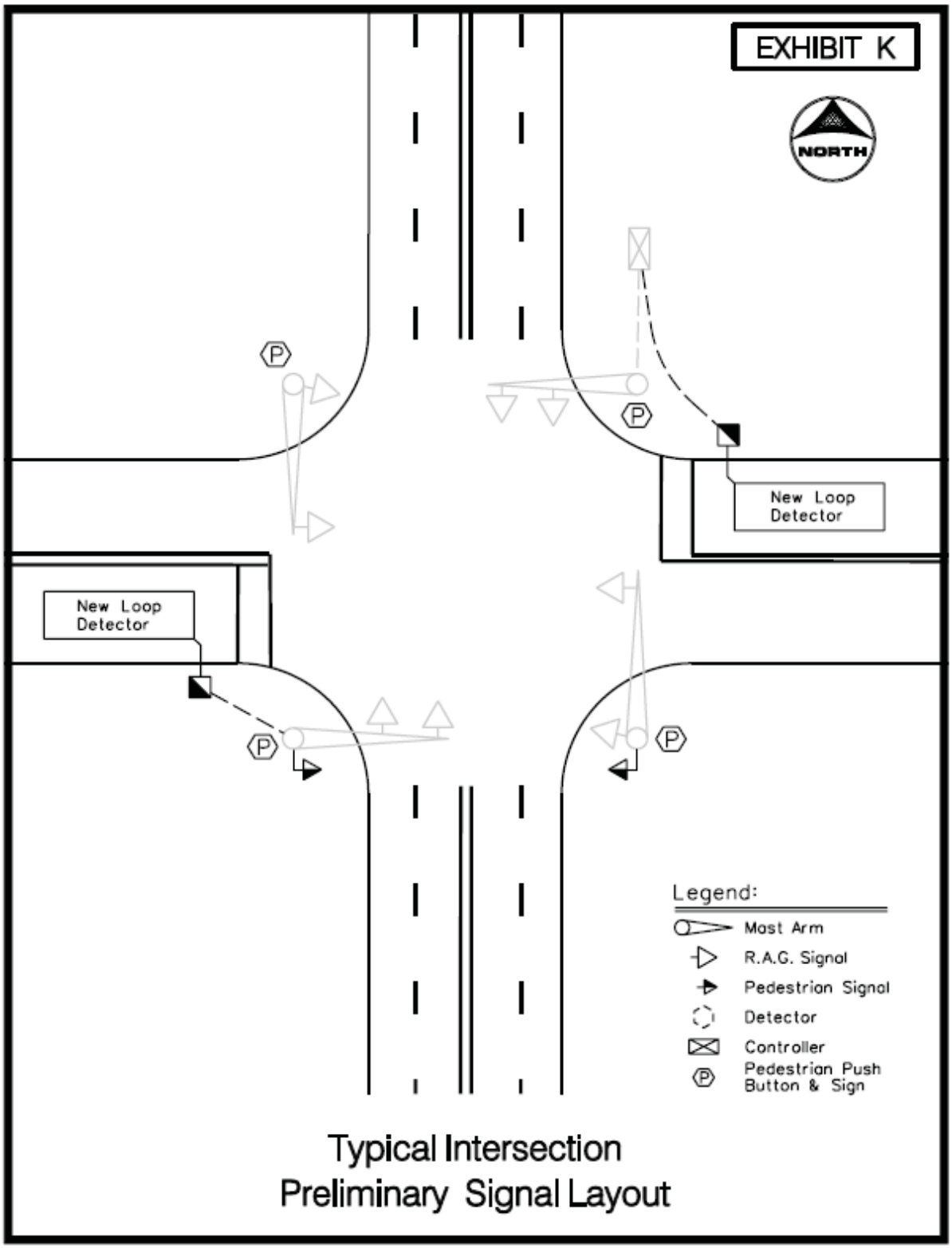


EXHIBIT K
NORTH
New Loop Detector
New Loop Detector
Legend:
Mast Arm
R.A.G. Signal
Pedestrian Signal
Detector
Controller
Pedestrian Push Button & Sign
Typical Intersection
Preliminary Signal Layout

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County:	Polk	Prepared by:	Mike Ring	Date Prepared:	Aug 5, 2014
Intersection:	Citywide Fixed-Time Traffic Signal Upgrade - Phase 2 (25 intersections				

Improvement

Proposed Improvement(s): Upgrade existing fixed-time signals to sem-actuated

Note: Only "Correctable" crashes are included in analysis (sideswipe-same direction, rear-end)

$ 120,000	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**
		$ 120,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: IDOT — 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

2,000		6,935,000	Current Annual Entering Veh., **AEV** = DEV * 365
7,500	7,500	22,058	veh / day, Final Year DEV, **FDEV**
2,000		111.63	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
1.0%	Projected Traffic Growth (0%-10%), **G**		
19,000	Current Daily Entering Vehicles, **DEV**		

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

Crash Data

2011	First full year -->	2013	Last full year		3.0	years, Time Period, **T**
	Additional months				values as of May 2014	
0	Fatal Crashes	0	Fatalities @	$4,500,000	$	-
		0	Major Injuries @	$325,000	$	-
46	Injury Crashes	22	Minor Injuries @	$65,000	$	1,430,000
		30	Possible Injuries @	$35,000	$	1,050,000
131	Property Damage Only		(assumed cost per crash)	$7,400	$	1,309,800
		-OR-	enter all Property Costs of all crashes:			
177	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	3,789,800

59.00	Current Crashes / Year, **AA** = TA / T	8.51	Crashes / MEV, Crash Rate, **CR**
$ 21,411	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
949.7	Total Expected Crashes, **TECR** = CR x TMEV	$ 1,496,361	Present Value of Avoided
5.90	Crashes Avoided First Year **AAR** = AA x CRF / 100		Crashes, **BENEFIT**
$ 126,327	Crash Costs Avoided in First Year, AAR x AVC		
95.0	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 = $1,496,361 : $120,000 = **12.47** : 1

6th and Holcomb

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011626368	20110416	Property Damage Only	4000	Rear-end	Wet	South	Movement essentially straight	0	
2011626368			0			South	Slowing/stopping	4000	
2011637259	20110705	Property Damage Only	4500	Rear-end	Dry	North	Slowing/stopping	2000	
2011637259			0			North	Slowing/stopping	2500	
2012678645	20120323	Possible/Unknown	6000	Rear-end	Dry	South	Movement essentially straight	4500	Possible
2012678645			0			South	Movement essentially straight	1500	
2012686913	20120523	Property Damage Only	13000	Rear-end	Dry	South	Movement essentially straight	8000	
2012686913			0			South	Stopped for stop sign/signal	2000	
2012686913			0			South	Stopped for stop sign/signal	1000	
2012686913			0			South	Stopped for stop sign/signal	2000	
2012705455	20121002	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	0	
2012705455			0			North	Stopped for stop sign/signal	4000	
2012709830	20121030	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	1500	
2012709830			0			South	Movement essentially straight	3000	
2012709830			0			South	Movement essentially straight	1500	
2012714780	20121128	Property Damage Only	3500	Sideswipe - same direction	Dry	South	Changing lanes	2000	
2012714780			0			South	Movement essentially straight	1500	
2013743120	20130608	Property Damage Only	4000	Rear-end	Wet	North	Movement essentially straight	2500	
2013743120			0			North	Stopped for stop sign/signal	1500	

6th and Hickman/Arlington

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011654642	20111102	Property Damage Only	1500	Rear-end	Wet	North	Movement essentially straight	300	
2011654642			0			North	Stopped for stop sign/signal	1200	
2012701216	20120904	Property Damage Only	8000	Rear-end	Dry	South	Movement essentially straight	4000	
2012701216			0			South	Stopped for stop sign/signal	4000	
2012706692	20121010	Property Damage Only	2000	Sideswipe - same direction	Dry	West	Turning right	0	
2012706692			0			West	Turning right	2000	
2012715530	20121204	Property Damage Only	2489	Rear-end	Dry	Not Reported	Unknown	0	
2012715530			0			Not Reported	Stopped for stop sign/signal	2489	
2013749189	20130721	Property Damage Only	2200	Rear-end	Wet	North	Slowing/stopping	200	
2013749189			0			North	Movement essentially straight	2000	
2013750077	20130724	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	2000	
2013750077			0			South	Stopped for stop sign/signal	2000	
2013750077			0			South	Stopped for stop sign/signal	1000	
2013750077			0			South	Stopped for stop sign/signal	1000	
2013757498	20130917	Property Damage Only	10000	Rear-end	Wet	East	Slowing/stopping	8000	
2013757498			0			East	Stopped for stop sign/signal	2000	

6th and College

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS

Exhibit L-2

2011631478	20110525	Property Damage Only	2500	Rear-end	Dry	South	Movement essentially straight	1000	
2011631478			0			South	Slowing/stopping	1500	
2012676882	20120313	Property Damage Only	2600	Rear-end	Dry	South	Stopped for stop sign/signal	2500	
2012676882			0			South	Slowing/stopping	100	
2012690786	20120619	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	0	
2012690786			0			North	Stopped for stop sign/signal	4000	
2012710665	20121101	Property Damage Only	7000	Rear-end	Dry	South	Movement essentially straight	4000	
2012710665			0			South	Legally Parked	3000	
2013755155	20130901	Property Damage Only	5000	Sideswipe - same direction	Dry	North	Movement essentially straight	1500	
2013755155			0			North	Changing lanes	3500	
2013758517	20130919	Minor Injury	4500	Rear-end	Wet	East	Stopped for stop sign/signal	4500	Non-incapacitating
2013758517			0			North	Movement essentially straight	0	
2013763387	20131024	Property Damage Only	3500	Rear-end	Dry	South	Movement essentially straight	500	
2013763387			0			South	Movement essentially straight	3000	

6th and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011625162	20110407	Property Damage Only	5500	Rear-end	Wet	South	Movement essentially straight	1500	
2011625162			0			South	Slowing/stopping	2500	
2011625162			0			South	Stopped for stop sign/signal	1500	

6th and University

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011629468	20110430	Property Damage Only	6500	Rear-end	Dry	West	Movement essentially straight	1500	
2011629468			0			West	Slowing/stopping	3000	
2011629468			0			West	Slowing/stopping	1000	
2011629468			0			West	Slowing/stopping	1000	
2011632344	20110601	Property Damage Only	1500	Rear-end	Dry	West	Changing lanes	0	
2011632344			0			West	Stopped for stop sign/signal	1500	
2011635910	20110627	Property Damage Only	2000	Sideswipe - same direction	Dry	North	Movement essentially straight	0	
2011635910			0			North	Turning right	2000	
2011654270	20111031	Property Damage Only	1500	Sideswipe - same direction	Dry	West	Changing lanes	500	
2011654270			0			West	Movement essentially straight	1000	
2012668707	20120110	Possible/Unknown	1000	Rear-end	Dry	West	Stopped for stop sign/signal	1000	Possible
2012668707			0			West	Movement essentially straight	0	
2012669799	20120126	Property Damage Only	1500	Rear-end	Dry	East	Movement essentially straight	1500	
2012669799			0			East	Unknown	0	
2012698996	20120817	Property Damage Only	3500	Sideswipe - same direction	Dry	South	Changing lanes	1500	
2012698996			0			South	Stopped for stop sign/signal	2000	
2012701640	20120906	Minor Injury	1000	Rear-end	Dry	North	Movement essentially straight	250	Non-incapacitating
2012701640			0			North	Turning right	750	
2012703060	20120917	Property Damage Only	1600	Rear-end	Wet	South	Movement essentially straight	650	
2012703060			0			South	Slowing/stopping	950	
2013719895	20130103	Property Damage Only	1500	Sideswipe - same direction	Dry	South	Turning left	0	
2013719895			0			South	Movement essentially straight	1500	

2013734166	20130409	Property Damage Only	6500	Rear-end	Wet	West	Movement essentially straight	2000
2013734166			0			West	Slowing/stopping	4500
2013738863	20130510	Property Damage Only	1500	Sideswipe - same direction	Dry	West	Movement essentially straight	0
2013738863			0			West	Movement essentially straight	1500
2013763238	20131022	Property Damage Only	2000	Rear-end	Dry	North	Movement essentially straight	1000
2013763238			0			North	Turning right	1000
2013771373	20131129	Property Damage Only	2500	Sideswipe - same direction	Dry	South	Entering traffic lane (merging)	500
2013771373			0			South	Changing lanes	2000

19th and Keo/Carpenter

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011642036	20110807	Property Damage Only	6500	Sideswipe - same direction	Dry	North	Turning left	3000	
2011642036			0			North	Movement essentially straight	3500	
2011642467	20110802	Property Damage Only	4307	Sideswipe - same direction	Dry	North	Changing lanes	1500	
2011642467			0			North	Movement essentially straight	2807	
2012691462	20120622	Property Damage Only	2000	Rear-end	Dry	North	Changing lanes	1000	
2012691462			0			North	Movement essentially straight	1000	
2012702633	20120913	Property Damage Only	6000	Sideswipe - same direction	Wet	North	Turning left	3000	
2012702633			0			North	Movement essentially straight	3000	
2013726574	20130219	Property Damage Only	2500	Sideswipe - same direction	Dry	North	Turning left	500	
2013726574			0			North	Movement essentially straight	2000	
2013737914	20130503	Property Damage Only	2500	Rear-end	Snow	North	Movement essentially straight	2000	
2013737914			0			North	Stopped for stop sign/signal	500	
2013764174	20131029	Possible/Unknown	1500	Rear-end	Dry	West	Movement essentially straight	500	Unknown
2013764174			0			West	Stopped for stop sign/signal	1000	

19th and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011625603	20110408	Minor Injury	500	Rear-end	Dry	East	Movement essentially straight	500	Non-incapacitating
2011625603			0			East	Movement essentially straight	0	
2011645556	20110902	Property Damage Only	1500	Sideswipe - same direction	Dry	North	Movement essentially straight	750	
2011645556			0			North	Movement essentially straight	750	
2012676889	20120313	Property Damage Only	1650	Sideswipe - same direction	Dry	East	Turning left	800	
2012676889			0			East	Movement essentially straight	850	
2012687640	20120529	Property Damage Only	2000	Rear-end	Dry	North	Turning right	1000	
2012687640			0			East	Slowing/stopping	1000	
2012701219	20120902	Minor Injury	50	Rear-end	Dry	East	Stopped for stop sign/signal	50	Non-incapacitating
2012701219			0			East	Slowing/stopping	0	
2012702260	20120903	Property Damage Only	3000	Rear-end	Dry	North	Stopped for stop sign/signal	3000	
2012702260			0			North	Movement essentially straight	0	
2012705594	20121003	Possible/Unknown	4500	Rear-end	Dry	North	Slowing/stopping	2500	Possible
2012705594			0			North	Slowing/stopping	1000	
2012705594			0			North	Slowing/stopping	1000	
2012710678	20121106	Property Damage Only	6000	Sideswipe - same direction	Dry	South	Leaving traffic lane	3000	

2012710678			0			South	Turning left	3000	
2012715467	20121206	Property Damage Only	2500	Rear-end	Wet	North	Movement essentially straight	500	
2012715467			0			North	Movement essentially straight	2000	

19th and Clark

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011627979	20110401	Possible/Unknown	500	Rear-end	Dry	West	Movement essentially straight	0	Unknown
2011627979			0			West	Stopped for stop sign/signal	500	
2011647678	20110912	Property Damage Only	3000	Sideswipe - same direction	Dry	North	Turning left	2000	
2011647678			0			North	Movement essentially straight	1000	
2011659792	20111129	Minor Injury	4000	Sideswipe - same direction	Dry	North	Changing lanes	2000	Non-incapacitating
2011659792			0			North	Movement essentially straight	2000	
2011663623	20111220	Minor Injury	7000	Angle - oncoming left turn	Dry	East	Turning left	4000	Non-incapacitating
2011663623			0			West	Movement essentially straight	3000	
2012706680	20121011	Property Damage Only	1500	Rear-end	Dry	North	Slowing/stopping	1000	
2012706680			0			North	Slowing/stopping	500	
2013724301	20130204	Property Damage Only	2500	Sideswipe - same direction	Wet	North	Movement essentially straight	1500	
2013724301			0			North	Changing lanes	1000	
2013735748	20130417	Minor Injury	7500	Sideswipe - same direction	Wet	North	Turning left	4500	Non-incapacitating
2013735748			0			North	Movement essentially straight	2000	
2013761586	20131008	Possible/Unknown	2000	Sideswipe - same direction	Dry	North	Movement essentially straight	0	Possible
2013761586			0			North	Turning left	2000	

MLK and Clark

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011637916	20110711	Property Damage Only	4500	Rear-end	Dry	South	Stopped for stop sign/signal	1000	
2011637916			0			South	Slowing/stopping	3500	
2011639992	20110727	Minor Injury	8500	Sideswipe - same direction	Dry	South	Movement essentially straight	5000	Non-incapacitating
2011639992			0			South	Slowing/stopping	2500	
2011639992			0			South	Stopped for stop sign/signal	1000	
2013721978	20130113	Property Damage Only	25000	Rear-end	Dry	South	Movement essentially straight	10000	
2013721978			0			South	Stopped for stop sign/signal	10000	
2013721978			0			South	Stopped for stop sign/signal	5000	
2013756194	20130906	Property Damage Only	2000	Rear-end	Dry	South	Movement essentially straight	1500	
2013756194			0			South	Stopped for stop sign/signal	500	

MLK and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011622213	20110314	Possible/Unknown	7300	Rear-end	Dry	South	Movement essentially straight	2500	Possible
2011622213			0			South	Slowing/stopping	4000	
2011622213			0			South	Slowing/stopping	500	
2011622213			0			South	Slowing/stopping	300	
2011646648	20110906	Property Damage Only	7500	Sideswipe - same direction	Dry	South	Turning left	3500	

2011646648			0			South	Movement essentially straight	4000	
2012668666	20120120	Property Damage Only	4300	Sideswipe - same direction	Dry	South	Changing lanes	1800	
2012668666			0			South	Movement essentially straight	2500	
2012693670	20120710	Property Damage Only	2000	Rear-end	Dry	East	Movement essentially straight	500	
2012693670			0			East	Stopped for stop sign/signal	1500	
2013746446	20130630	Property Damage Only	5500	Sideswipe - same direction	Dry	South	Turning left	2000	
2013746446			0			South	Movement essentially straight	3500	
2013757210	20130913	Property Damage Only	5000	Sideswipe - same direction	Dry	South	Movement essentially straight	3000	
2013757210			0			South	Turning left	2000	

MLK and Carpenter

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011644396	20110825	Minor Injury	10500	Rear-end	Dry	South	Movement essentially straight	4500	Non-incapacitating
2011644396			0			South	Turning left	6000	
2012674091	20120223	Property Damage Only	2800	Sideswipe - same direction	Wet	South	Changing lanes	800	
2012674091			0			South	Movement essentially straight	2000	
2012679295	20120324	Property Damage Only	3000	Sideswipe - same direction	Dry	South	Changing lanes	1500	
2012679295			0			South	Turning left	1500	
2012707892	20121018	Property Damage Only	2400	Rear-end	Wet	South	Movement essentially straight	2000	
2012707892			0			South	Movement essentially straight	400	
2013772803	20131212	Property Damage Only	4000	Sideswipe - same direction	Dry	South	Turning left	4000	
2013772803			0			South	Movement essentially straight	0	

25th and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2012702867	20120914	Property Damage Only	2000	Rear-end	Dry	North	Movement essentially straight	1000	
2012702867			0			North	Stopped for stop sign/signal	1000	

27th and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011639350	20110715	Property Damage Only	1700	Sideswipe - same direction	Dry	West	Turning left	0	
2011639350			0			West	Movement essentially straight	1700	

17th and Ingersoll

none

18th and Ingersoll

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2013729002	20130226	Minor Injury	200	Rear-end	Snow	West	Movement essentially straight	100	Non-incapacitating
2013729002			0			West	Stopped for stop sign/signal	100	

SW 8th and Cherry

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2012043158	2001 Officer TraCS	Property Damage Only	5000	Sideswipe - same direction	Dry	West	Movement essentially straight	2500	
2012043158			0			West	Turning right	2500	

SW 9th and Cherry

none

E 14th and Walker

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011617317	20110210	Possible/Unknown	3500	Rear-end	Dry	South	Movement essentially straight	2500	Possible
2011617317			0			South	Movement essentially straight	1000	
2011626618	20110417	Possible/Unknown	8000	Rear-end	Wet	South	Movement essentially straight	5000	Possible
2011626618			0			South	Movement essentially straight	3000	
2011630945	20110521	Possible/Unknown	1568	Rear-end	Dry	South	Movement essentially straight	0	Possible
2011630945			0			South	Movement essentially straight	1568	
2011639972	20110723	Property Damage Only	3000	Rear-end	Wet	South	Slowing/stopping	500	
2011639972			0			South	Stopped for stop sign/signal	2500	
2011653571	20110926	Possible/Unknown	0	Rear-end	Unknown	West	Movement essentially straight	0	Unknown
2011653571			0			West	Movement essentially straight	0	
2012701404	20120905	Possible/Unknown	2500	Rear-end	Dry	South	Movement essentially straight	1000	Possible
2012701404			0			South	Stopped for stop sign/signal	1500	
2012702262	20120904	Property Damage Only	3500	Rear-end	Dry	South	Movement essentially straight	2500	
2012702262			0			South	Slowing/stopping	1000	

E 14th and Grand

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011610596	20110105	Possible/Unknown	1500	Rear-end	Dry	South	Movement essentially straight	1000	Possible
2011610596			0			South	Other (explain in narrative)	500	Possible
2011611098	20110111	Property Damage Only	2500	Rear-end	Snow	South	Turning right	2500	
2011611098			0			South	Movement essentially straight	0	
2011619184	20110221	Property Damage Only	3000	Rear-end	Dry	West	Movement essentially straight	2000	
2011619184			0			West	Movement essentially straight	1000	
2011621308	20110307	Property Damage Only	4200	Rear-end	Wet	South	Movement essentially straight	3000	
2011621308			0			South	Slowing/stopping	1200	
2011631663	20110525	Property Damage Only	4128	Rear-end	Wet	South	Slowing/stopping	2500	
2011631663			0			South	Slowing/stopping	1628	
2011643209	20110810	Minor Injury	1000	Rear-end	Dry	South	Movement essentially straight	0	Non-incapacitating
2011643209			0			South	Movement essentially straight	1000	
2011645218	20110830	Possible/Unknown	9000	Sideswipe - same direction	Wet	North	Turning left	5000	Possible
2011645218			0			North	Movement essentially straight	4000	
2011665583	20111128	Possible/Unknown	4500	Sideswipe - same direction	Dry	South	Turning left	2500	Possible
2011665583			0			South	Movement essentially straight	2000	

Exhibit L-7

2012668849	20120110	Property Damage Only	2300	Sideswipe - same direction	Dry	South	Movement essentially straight	800	
2012668849			0			South	Turning left	1500	
2012670365	20120130	Property Damage Only	2500	Sideswipe - same direction	Dry	South	Turning left	2000	
2012670365			0			South	Movement essentially straight	500	
2012680537	20120405	Property Damage Only	5000	Rear-end	Dry	South	Slowing/stopping	3000	
2012680537			0			South	Stopped for stop sign/signal	2000	
2012685296	20120514	Property Damage Only	4000	Rear-end	Dry	South	Movement essentially straight	2500	
2012685296			0			South	Turning right	1500	
2012694327	20120702	Possible/Unknown	6000	Sideswipe - same direction	Dry	South	Movement essentially straight	4000	Possible
2012694327			0			South	Movement essentially straight	2000	
2012695541	20120621	Minor Injury	600	Rear-end	Dry	South	Stopped for stop sign/signal	300	Non-incapacitating
2012695541			0			South	Slowing/stopping	300	Non-incapacitating
2012700378	20120824	Minor Injury	6500	Rear-end	Dry	South	Movement essentially straight	3500	Non-incapacitating
2012700378			0			South	Movement essentially straight	3000	
2012706697	20121010	Property Damage Only	7000	Rear-end	Dry	South	Movement essentially straight	3000	
2012706697			0			South	Other (explain in narrative)	4000	
2012707870	20121018	Property Damage Only	4000	Rear-end	Wet	South	Movement essentially straight	2000	
2012707870			0			South	Slowing/stopping	2000	
2013720218	20130107	Property Damage Only	4000	Rear-end	Dry	South	Stopped for stop sign/signal	3000	
2013720218			0			South	Slowing/stopping	1000	
2013744585	20130613	Property Damage Only	2300	Sideswipe - same direction	Dry	South	Turning left	1000	
2013744585			0			South	Movement essentially straight	1300	
2013760526	20130930	Property Damage Only	1700	Sideswipe - same direction	Dry	South	Turning left	1500	
2013760526			0			South	Movement essentially straight	200	
2013765957	20131022	Property Damage Only	1500	Rear-end	Wet	South	Turning right	1000	
2013765957			0			South	Turning right	500	

E 14th and Walnut

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011634307	20110607	Property Damage Only	1500	Rear-end	Dry	South	Movement essentially straight	1000	
2011634307			0			South	Slowing/stopping	500	
2011635175	20110620	Property Damage Only	4000	Rear-end	Wet	South	Movement essentially straight	3000	
2011635175			0			South	Stopped for stop sign/signal	1000	
2011637345	20110701	Property Damage Only	2700	Rear-end	Dry	South	Slowing/stopping	1500	
2011637345			0			South	Slowing/stopping	1200	
2011644382	20110823	Possible/Unknown	4000	Sideswipe - same direction	Dry	West	Movement essentially straight	1000	Possible
2011644382			0			West	Legally Parked	1000	
2011644382			0			West	Legally Parked	1000	
2011644382			0			West	Legally Parked	1000	
2011665193	20111229	Possible/Unknown	10000	Rear-end	Dry	South	Movement essentially straight	5000	Unknown
2011665193			0			South	Movement essentially straight	5000	
2012679624	20120401	Property Damage Only	4000	Sideswipe - same direction	Dry	North	Turning left	2000	
2012679624			0			North	Turning left	2000	
2012695542	20120531	Property Damage Only	4500	Rear-end	Wet	South	Slowing/stopping	200	
2012695542			0			South	Other (explain in narrative)	4000	
2012695542			0			South	Other (explain in narrative)	300	

2012698502	20120814	Minor Injury	6300	Sideswipe - same direction	Dry	South	Movement essentially straight	3000	Non-incapacitating
2012698502			0			South	Movement essentially straight	3000	
2012707149	20121012	Property Damage Only	2600	Rear-end	Dry	South	Movement essentially straight	2500	
2012707149			0			South	Movement essentially straight	100	
2013726684	20130208	Property Damage Only	3000	Rear-end	Dry	South	Movement essentially straight	1500	
2013726684			0			South	Slowing/stopping	1500	
2013759519	20130928	Property Damage Only	2000	Rear-end	Wet	South	Movement essentially straight	1000	
2013759519			0			South	Stopped for stop sign/signal	1000	
2013776646	20131231	Minor Injury	7000	Rear-end	Wet	South	Movement essentially straight	5000	Non-incapacitating
2013776646			0			South	Movement essentially straight	2000	

E 14th and Court

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011653779	20111022	Property Damage Only	5000	Rear-end	Dry	South	Slowing/stopping	4000	
2011653779			0			South	Slowing/stopping	1000	
2011655156	20111104	Possible/Unknown	2500	Rear-end	Dry	South	Movement essentially straight	2000	Possible
2011655156			0			South	Movement essentially straight	500	
2012682276	20120419	Property Damage Only	3000	Rear-end	Dry	South	Movement essentially straight	2000	
2012682276			0			South	Stopped for stop sign/signal	1000	
2012692357	20120702	Property Damage Only	5000	Rear-end	Dry	South	Movement essentially straight	3500	
2012692357			0			South	Stopped for stop sign/signal	1500	
2012704249	20120924	Possible/Unknown	0	Rear-end	Dry	South	Movement essentially straight	0	Possible
2012704249			0			South	Movement essentially straight	0	
2012710897	20121103	Property Damage Only	1500	Sideswipe - same direction	Dry	South	Changing lanes	0	
2012710897			0			South	Movement essentially straight	1500	
2012711915	20121111	Property Damage Only	2000	Sideswipe - same direction	Wet	South	Changing lanes	0	
2012711915			0			South	Movement essentially straight	2000	
2013721639	20130113	Property Damage Only	3700	Rear-end	Dry	East	Movement essentially straight	200	
2013721639			0			East	Stopped for stop sign/signal	3500	
2013740598	20130523	Property Damage Only	3000	Sideswipe - same direction	Dry	West	Turning left	1500	
2013740598			0			West	Movement essentially straight	1500	
2013749156	20130719	Minor Injury	4000	Sideswipe - same direction	Dry	South	Movement essentially straight	2000	Non-incapacitating
2013749156			0			South	Movement essentially straight	2000	
2013773304	20131213	Minor Injury	8000	Rear-end	Wet	South	Slowing/stopping	5000	Non-incapacitating
2013773304			0			South	Stopped for stop sign/signal	3000	
2013775671	20131225	Property Damage Only	9000	Rear-end	Wet	South	Movement essentially straight	5000	
2013775671			0			South	Slowing/stopping	4000	

E 15th and Court

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011647657	20110915	Property Damage Only	1800	Sideswipe - same direction	Dry	North	Turning left	900	
2011647657			0			North	Movement essentially straight	900	
2012668906	20120118	Property Damage Only	1800	Rear-end	Dry	North	Movement essentially straight	900	
2012668906			0			North	Movement essentially straight	900	
2012703059	20120917	Property Damage Only	1700	Rear-end	Wet	North	Movement essentially straight	1200	

2012703059			0			North	Movement essentially straight	500	
2012709632	20121022	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	1000	
2012709632			0			North	Stopped for stop sign/signal	3000	
2013726114	20130131	Property Damage Only	2500	Rear-end	Snow	North	Stopped for stop sign/signal	1500	
2013726114			0			North	Slowing/stopping	1000	
2013733963	20130327	Minor Injury	1800	Rear-end	Dry	North	Movement essentially straight	800	Non-incapacitating
2013733963			0			North	Stopped for stop sign/signal	1000	

E 15th and Walnut

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011659590	20111129	Property Damage Only	6000	Sideswipe - same direction	Dry	North	Turning left	3000	
2011659590			0			North	Movement essentially straight	3000	
2012676740	20120303	Minor Injury	10000	Sideswipe - same direction	Dry	North	Turning left	5000	Possible
2012676740			0			North	Movement essentially straight	5000	Non-incapacitating
2012698997	20120817	Property Damage Only	3500	Sideswipe - same direction	Dry	North	Changing lanes	1500	
2012698997			0			North	Movement essentially straight	2000	
2012706343	20121007	Possible/Unknown	5000	Sideswipe - same direction	Dry	North	Changing lanes	1900	Possible
2012706343			0			North	Movement essentially straight	3000	
2013726379	20130214	Property Damage Only	2500	Sideswipe - same direction	Dry	North	Changing lanes	1500	
2013726379			0			North	Movement essentially straight	1000	
2013735346	20130417	Property Damage Only	2000	Sideswipe - same direction	Wet	North	Movement essentially straight	1000	
2013735346			0			North	Turning left	1000	
2013741328	20130524	Possible/Unknown	12000	Sideswipe - same direction	Dry	North	Turning left	6000	Possible
2013741328			0			North	Movement essentially straight	6000	
2013751076	20130731	Property Damage Only	6700	Sideswipe - same direction	Dry	North	Movement essentially straight	3500	
2013751076			0			North	Changing lanes	200	
2013751076			0			North	Movement essentially straight	3000	

E 15th and Grand

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011613462	20110104	Property Damage Only	2000	Rear-end	Dry	North	Stopped for stop sign/signal	2000	
2011613462			0			North	Movement essentially straight	0	
2011613729	20110123	Property Damage Only	9821	Sideswipe - same direction	Dry	North	Turning right	2500	
2011613729			0			North	Movement essentially straight	7321	
2011628980	20110508	Possible/Unknown	1501	Rear-end	Dry	North	Movement essentially straight	0	Possible
2011628980			0			North	Stopped for stop sign/signal	1501	
2011634545	20110613	Property Damage Only	1600	Rear-end	Dry	East	Movement essentially straight	1500	
2011634545			0			East	Other (explain in narrative)	100	
2011635902	20110626	Possible/Unknown	4500	Sideswipe - same direction	Dry	North	Turning left	2500	Possible
2011635902			0			North	Movement essentially straight	2000	Possible
2011639440	20110722	Property Damage Only	4500	Sideswipe - same direction	Dry	North	Turning left	2000	
2011639440			0			West	Movement essentially straight	2500	
2011656633	20111109	Minor Injury	1000	Rear-end	Wet	North	Slowing/stopping	500	Non-incapacitating
2011656633			0			North	Stopped for stop sign/signal	200	
2011656633			0			North	Stopped for stop sign/signal	300	

2011657374	20111115	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	2000	
2011657374			0			North	Turning right	2000	
2012668945	20120115	Property Damage Only	5000	Sideswipe - same direction	Dry	North	Turning left	3000	
2012668945			0			North	Movement essentially straight	2000	
2012681525	20120414	Property Damage Only	6000	Sideswipe - same direction	Wet	North	Turning left	3500	
2012681525			0			North	Movement essentially straight	2500	
2012698126	20120811	Property Damage Only	4000	Sideswipe - same direction	Dry	North	Movement essentially straight	2000	
2012698126			0			North	Changing lanes	2000	
2012703460	20120912	Property Damage Only	3620	Sideswipe - same direction	Dry	West	Movement essentially straight	3620	
2012703460			0			North	Turning right	0	
2012705426	20121001	Property Damage Only	2500	Rear-end	Dry	North	Movement essentially straight	0	
2012705426			0			North	Movement essentially straight	2500	
2012707155	20121011	Possible/Unknown	6500	Rear-end	Dry	West	Turning right	1500	Possible
2012707155			0			West	Turning right	1500	
2012707155			0			West	Movement essentially straight	3500	
2012715900	20121209	Property Damage Only	1501	Sideswipe - same direction	Dry	North	Movement essentially straight	0	
2012715900			0			North	Turning left	1501	
2012718952	20121228	Property Damage Only	2100	Rear-end	Wet	North	Movement essentially straight	100	
2012718952			0			North	Changing lanes	1000	
2012718952			0			North	Slowing/stopping	1000	
2013734857	20130410	Property Damage Only	2000	Rear-end	Wet	West	Movement essentially straight	500	
2013734857			0			West	Stopped for stop sign/signal	1500	
2013736871	20130423	Property Damage Only	8000	Sideswipe - same direction	Dry	North	Changing lanes	5000	
2013736871			0			North	Movement essentially straight	3000	
2013741532	20130530	Property Damage Only	3000	Rear-end	Wet	North	Movement essentially straight	1500	
2013741532			0			North	Slowing/stopping	1500	
2013743118	20130607	Property Damage Only	1500	Sideswipe - same direction	Dry	North	Movement essentially straight	0	
2013743118			0			North	Movement essentially straight	1500	
2013750899	20130731	Property Damage Only	3000	Sideswipe - same direction	Dry	North	Turning left	1500	
2013750899			0			North	Movement essentially straight	1500	
2013752270	20130807	Property Damage Only	2000	Rear-end	Dry	North	Movement essentially straight	1000	
2013752270			0			North	Stopped for stop sign/signal	1000	
2013752295	20130812	Property Damage Only	4000	Sideswipe - same direction	Dry	North	Changing lanes	2500	
2013752295			0			North	Movement essentially straight	1500	
2013753867	20130818	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	2000	
2013753867			0			North	Stopped for stop sign/signal	2000	
2013755217	20130830	Possible/Unknown	6000	Rear-end	Dry	North	Movement essentially straight	2500	Possible
2013755217			0			North	Stopped for stop sign/signal	3500	
2013755726	20130824	Property Damage Only	4000	Sideswipe - same direction	Dry	North	Movement essentially straight	2000	
2013755726			0			North	Turning left	2000	
2013756954	20130909	Property Damage Only	4000	Sideswipe - same direction	Dry	West	Changing lanes	2500	
2013756954			0			West	Movement essentially straight	1500	
2013760093	20131002	Property Damage Only	5000	Sideswipe - same direction	Dry	North	Turning left	2000	
2013760093			0			North	Movement essentially straight	3000	
2013761390	20131005	Property Damage Only	2000	Rear-end	Dry	North	Movement essentially straight	1000	
2013761390			0			North	Slowing/stopping	1000	
2013764832	20131101	Property Damage Only	1500	Sideswipe - same direction	Dry	North	Movement essentially straight	0	
2013764832			0			North	Movement essentially straight	1500	

Exhibit L-11

2013764835	20131101	Property Damage Only	1500	Rear-end	Dry	North	Turning right	1500
2013764835			0			North	Movement essentially straight	0

E 15th and Walker

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2012700443	20120828	Property Damage Only	7000	Sideswipe - same direction	Dry	North	Movement essentially straight	4000	
2012700443			0			North	Turning left	3000	

106	Rear End Crashes
71	Sideswipe - Same Direction

46 injury crashes

FATALITIES	INJURIES	MAJINJURY	MININJURY	POSSINJURY	UNKINJURY	PROPDMG
0	52	0	22	26	4	$ 711,635

Exhibit L-12

6th and Holcomb

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
201162368	20110416	Property Damage Only	4000	Rear-end	Wet	South	Movement essentially straight	0	
201162368			0			South	Slowing/stopping	4000	
201167259	20110705	Property Damage Only	4500	Rear-end	Dry	North	Slowing/stopping	2000	
201167259			0			North	Slowing/stopping	2500	
201267645	20120523	PossibleUnknown	6000	Rear-end	Dry	South	Movement essentially straight	4500	Possible
201267645			0			South	Movement essentially straight	1500	
201268913	20120523	Property Damage Only	13000	Rear-end	Dry	South	Movement essentially straight	8000	
201268913			0			South	Stopped for stop sign/signal	2000	
201268913			0			South	Stopped for stop sign/signal	1000	
201268913			0			South	Stopped for stop sign/signal	2000	
201270455	20121002	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	0	
201270455			0			North	Stopped for stop sign/signal	4000	
201270830	20121030	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	1500	
201270830			0			South	Movement essentially straight	3000	
201270830			0			South	Movement essentially straight	1500	
201274780	20121128	Property Damage Only	3500	Sideswipe - same direction	Dry	South	Changing lanes	2000	
201274780			0			South	Movement essentially straight	1500	
201374120	20130608	Property Damage Only	4000	Rear-end	Wet	North	Movement essentially straight	2500	
201374120			0			North	Stopped for stop sign/signal	1500	

6th and Hickman/Arlington

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
201163642	20111102	Property Damage Only	1500	Rear-end	Wet	North	Movement essentially straight	300	
201163642			0			North	Stopped for stop sign/signal	1200	
201270216	20120904	Property Damage Only	8000	Rear-end	Dry	South	Movement essentially straight	4000	
201270216			0			South	Stopped for stop sign/signal	4000	
201270692	20121010	Property Damage Only	2000	Sideswipe - same direction	Dry	West	Turning right	0	
201270692			0			West	Turning right	2000	
201271530	20121204	Property Damage Only	2489	Rear-end	Dry	Not Reported	Unknown	0	
201271530			0			Not Reported	Stopped for stop sign/signal	2489	
201374189	20130721	Property Damage Only	2200	Rear-end	Wet	North	Slowing/stopping	200	
201374189			0			North	Movement essentially straight	2000	
201373077	20130724	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	2000	
201373077			0			South	Stopped for stop sign/signal	2000	
201373077			0			South	Stopped for stop sign/signal	1000	
201373077			0			South	Stopped for stop sign/signal	1000	
201375498	20130917	Property Damage Only	10000	Rear-end	Wet	East	Slowing/stopping	8000	
201375498			0			East	Stopped for stop sign/signal	2000	

6th and College

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS

6th and Holcomb

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011626368	20110416	Property Damage Only	4000	Rear-end	Wet	South	Movement essentially straight	0	
2011626368			0			South	Slowing/stopping	4000	
2011637259	20110705	Property Damage Only	4500	Rear-end	Dry	North	Slowing/stopping	2000	
2011637259			0			North	Slowing/stopping	2500	
2012678645	20120323	Possible/Unknown	6000	Rear-end	Dry	South	Movement essentially straight	4500	Possible
2012678645			0			South	Movement essentially straight	1500	
2012686913	20120523	Property Damage Only	13000	Rear-end	Dry	South	Movement essentially straight	8000	
2012686913			0			South	Stopped for stop sign/signal	2000	
2012686913			0			South	Stopped for stop sign/signal	1000	
2012686913			0			South	Stopped for stop sign/signal	2000	
2012705455	20121002	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	0	
2012705455			0			North	Stopped for stop sign/signal	4000	
2012709830	20121030	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	1500	
2012709830			0			South	Movement essentially straight	3000	
2012709830			0			South	Movement essentially straight	1500	
2012714780	20121128	Property Damage Only	3500	Sideswipe - same direction	Dry	South	Changing lanes	2000	
2012714780			0			South	Movement essentially straight	1500	
2013743120	20130608	Property Damage Only	4000	Rear-end	Wet	North	Movement essentially straight	2500	
2013743120			0			North	Stopped for stop sign/signal	1500	

6th and Hickman/Arlington

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011654642	20111102	Property Damage Only	1500	Rear-end	Wet	North	Movement essentially straight	300	
2011654642			0			North	Stopped for stop sign/signal	1200	
2012701216	20120904	Property Damage Only	8000	Rear-end	Dry	South	Movement essentially straight	4000	
2012701216			0			South	Stopped for stop sign/signal	4000	
2012706692	20121010	Property Damage Only	2000	Sideswipe - same direction	Dry	West	Turning right	0	
2012706692			0			West	Turning right	2000	
2012715530	20121204	Property Damage Only	2489	Rear-end	Dry	Not Reported	Unknown	0	
2012715530			0			Not Reported	Stopped for stop sign/signal	2489	
2013749189	20130721	Property Damage Only	2200	Rear-end	Wet	North	Slowing/stopping	200	
2013749189			0			North	Movement essentially straight	2000	
2013750077	20130724	Property Damage Only	6000	Rear-end	Dry	South	Movement essentially straight	2000	
2013750077			0			South	Stopped for stop sign/signal	2000	
2013750077			0			South	Stopped for stop sign/signal	1000	
2013750077			0			South	Stopped for stop sign/signal	1000	
2013757498	20130917	Property Damage Only	10000	Rear-end	Wet	East	Slowing/stopping	8000	
2013757498			0			East	Stopped for stop sign/signal	2000	

6th and College

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS

2011631478	20110525	Property Damage Only	2500	Rear-end	Dry	South	Movement essentially straight	1000	
2011631478			0			South	Slowing/stopping	1500	
2012676882	20120313	Property Damage Only	2600	Rear-end	Dry	South	Stopped for stop sign/signal	2500	
2012676882			0			South	Slowing/stopping	100	
2012690786	20120619	Property Damage Only	4000	Rear-end	Dry	North	Movement essentially straight	0	
2012690786			0			North	Stopped for stop sign/signal	4000	
2012710665	20121101	Property Damage Only	7000	Rear-end	Dry	South	Movement essentially straight	4000	
2012710665			0			South	Legally Parked	3000	
2013755155	20130901	Property Damage Only	5000	Sideswipe - same direction	Dry	North	Movement essentially straight	1500	
2013755155			0			North	Changing lanes	3500	
2013758517	20130919	Minor Injury	4500	Rear-end	Wet	East	Stopped for stop sign/signal	4500	Non-incapacitating
2013758517			0			North	Movement essentially straight	0	
2013763387	20131024	Property Damage Only	3500	Rear-end	Dry	South	Movement essentially straight	500	
2013763387			0			South	Movement essentially straight	3000	

6th and Forest

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011625162	20110407	Property Damage Only	5500	Rear-end	Wet	South	Movement essentially straight	1500	
2011625162			0			South	Slowing/stopping	2500	
2011625162			0			South	Stopped for stop sign/signal	1500	

6th and University

CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	SURF_COND	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2011629468	20110430	Property Damage Only	6500	Rear-end	Dry	West	Movement essentially straight	1500	
2011629468			0			West	Slowing/stopping	3000	
2011629468			0			West	Slowing/stopping	1000	
2011629468			0			West	Slowing/stopping	1000	
2011632344	20110601	Property Damage Only	1500	Rear-end	Dry	West	Changing lanes	0	
2011632344			0			West	Stopped for stop sign/signal	1500	
2011635910	20110627	Property Damage Only	2000	Sideswipe - same direction	Dry	North	Movement essentially straight	0	
2011635910			0			North	Turning right	2000	
2011654270	20111031	Property Damage Only	1500	Sideswipe - same direction	Dry	West	Changing lanes	500	
2011654270			0			West	Movement essentially straight	1000	
2012668707	20120110	Possible/Unknown	1000	Rear-end	Dry	West	Stopped for stop sign/signal	1000	Possible
2012668707			0			West	Movement essentially straight	0	
2012669799	20120126	Property Damage Only	1500	Rear-end	Dry	East	Movement essentially straight	1500	
2012669799			0			East	Unknown	0	
2012698996	20120817	Property Damage Only	3500	Sideswipe - same direction	Dry	South	Changing lanes	1500	
2012698996			0			South	Stopped for stop sign/signal	2000	
2012701640	20120906	Minor Injury	1000	Rear-end	Dry	North	Movement essentially straight	250	Non-incapacitating
2012701640			0			North	Turning right	750	
2012703060	20120917	Property Damage Only	1600	Rear-end	Wet	South	Movement essentially straight	650	
2012703060			0			South	Slowing/stopping	950	
2013719895	20130103	Property Damage Only	1500	Sideswipe - same direction	Dry	South	Turning left	0	
2013719895			0			South	Movement essentially straight	1500	

2nd and Euclid

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007002115	2007202169	20070114	Possible/Unknown	21000	Broadside	1	North	Movement essentially straight	9000	Possible
2007002115	2007202169			0		2	West	Movement essentially straight	12000	
2007005835	2007206054	20070208	Property Damage Only	2100	Angle - oncoming left turn	1	South	Turning right	1100	
2007005835	2007206054			0		2	North	Turning left	1000	
2007007186	2007207481	20070208	Possible/Unknown	2000	Broadside	1	East	Movement essentially straight	1000	Unknown
2007007186	2007207481			0		2	South	Movement essentially straight	500	
2007007186	2007207481			0		3	South	Movement essentially straight	500	
2007010136	2007210541	20070221	Property Damage Only	4000	Sideswipe - same direction	1	East	Movement essentially straight	1000	
2007010136	2007210541			0		2	East	Movement essentially straight	2000	
2007010136	2007210541			0		3	East	Movement essentially straight	1000	
2007010170	2007210580	20070224	Possible/Unknown	2000	Rear-end	1	West	Movement essentially straight	1000	Unknown
2007010170	2007210580			0		2	West	Stopped for stop sign/signal	1000	
2007015634	2007216353	20070331	Property Damage Only	2200	Sideswipe - opposite direction	1	Not Reported	Movement essentially straight	1200	
2007015634	2007216353			0		2	West	Turning right	1000	
2007018364	2007368632	20070425	Property Damage Only	4800	Sideswipe - same direction	1	West	Movement essentially straight	2800	
2007018364	2007368632			0		2	West	Changing lanes	2000	
2007022917	2007373797	20070525	Property Damage Only	2500	Angle - oncoming left turn	1	West	Turning left	2000	
2007022917	2007373797			0		2	East	Movement essentially straight	500	
2007025090	2007376250	20070607	Possible/Unknown	7000	Angle - oncoming left turn	1	South	Movement essentially straight	3000	Possible
2007025090	2007376250			0		2	North	Turning left	4000	Possible
2007025540	2007376760	20070613	Possible/Unknown		Non-collision	1	North	Turning right		Possible
2007028168	2007379730	20070703	Property Damage Only	1100	Rear-end	1	East	Movement essentially straight	1000	
2007028168	2007379730			0		2	East	Movement essentially straight	100	
2007028755	2007380393	20070628	Property Damage Only	6000	Rear-end	1	West	Movement essentially straight	3000	
2007028755	2007380393			0		2	West	Turning right	3000	
2007029971	2007381764	20070711	Minor Injury	6000	Angle - oncoming left turn	1	East	Turning left	3000	Non-incapacitating
2007029971	2007381764			0		2	West	Movement essentially straight	3000	
2007031384	2007383361	20070725	Property Damage Only	8000	Rear-end	1	East	Movement essentially straight	6000	
2007031384	2007383361			0		2	East		2000	
2007039261	2007392284	20070917	Possible/Unknown	3000	Rear-end	1	East	Stopped for stop sign/signal	2000	Possible
2007039261	2007392284			0		2	East	Stopped for stop sign/signal	1000	Possible
2007047035	2007400928	20071029	Property Damage Only	3000	Unknown	1	West	Movement essentially straight	1500	
2007047035	2007400928			0		2	North	Movement essentially straight	1500	
2007048803	2007402893	20071112	Possible/Unknown	5500	Broadside	1	South	Movement essentially straight	2000	Possible
2007048803	2007402893			0		2	East	Movement essentially straight	3500	
2007056317	2007411124	20071211	Property Damage Only	4500	Broadside	1	West	Movement essentially straight	2500	
2007056317	2007411124			0		2	South	Turning right	2000	
2008007897	2008424992	20080201	Possible/Unknown	2900	Angle - oncoming left turn	1	East	Movement essentially straight	1900	Possible
2008007897	2008424992			0		2	West	Turning left	1000	Possible
2008011039	2008428498	20080218	Possible/Unknown		Rear-end	1	East	Movement essentially straight		Possible
2008011039	2008428498			0		2	East	Movement essentially straight		
2008027991	2008447733	20080620	Property Damage Only	4000	Rear-end	1	West	Movement essentially straight	3500	
2008027991	2008447733			0		2	West	Stopped for stop sign/signal	500	
2008034181	2008454865	20080809	Property Damage Only	11000	Angle - oncoming left turn	1	East	Turning left	6000	
2008034181	2008454865			0		2	West	Movement essentially straight	5000	
2008055426	2008478582	20081216	Property Damage Only	5500	Broadside	1	South	Movement essentially straight	4000	
2008055426	2008478582			0		2	West	Movement essentially straight	1500	
2008059396	2008483280	20081220	Property Damage Only	8000	Broadside	1	West	Turning left	4000	
2008059396	2008483280			0		2	South	Movement essentially straight	4000	
2009003976	2009489088	20090114	Property Damage Only	1700	Rear-end	1	East	Stopped for stop sign/signal	1600	
2009003976	2009489088			0		2	East	Movement essentially straight	100	
2009006209	2009491933	20090130	Property Damage Only	5000	Broadside	1	East	Movement essentially straight	2000	
2009006209	2009491933			0		2	North	Movement essentially straight	3000	
2009011045	2009497570	20090310	Property Damage Only	6000	Rear-end	1	West	Movement essentially straight	3500	

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2009011045	2009497570			0		2	West	Slowing/stopping	2500	
2009020694	2009508692	20090521	Property Damage Only	4300	Rear-end	1	West	Stopped for stop sign/signal	2800	
2009020694	2009508692			0		2	West	Movement essentially straight	1500	
2009020698	2009508697	20090519	Property Damage Only	3000	Sideswipe - same direction	1	East	Changing lanes	1500	
2009020698	2009508697			0		2	East	Movement essentially straight	1500	
2009022221	2009510380	20090606	Property Damage Only	3000	Broadside	1	West	Movement essentially straight	2000	
2009022221	2009510380			0		2	North	Movement essentially straight	1000	
2009028251	2009517134	20090716	Property Damage Only	1000	Rear-end	1	West	Slowing/stopping	0	
2009028251	2009517134			0		2	West	Slowing/stopping	1000	
2009030340	2009519518	20090808	Property Damage Only	4500	Broadside	1	East	Movement essentially straight	1500	
2009030340	2009519518			0		2	South	Movement essentially straight	3000	
2009031348	2009520673	20090811	Property Damage Only	2000	Rear-end	1	West	Slowing/stopping	1000	
2009031348	2009520673			0		2	West	Slowing/stopping	1000	
2009034961	2009524762	20090913	Property Damage Only	2000	Rear-end	1	East	Stopped for stop sign/signal	1000	
2009034961	2009524762			0		2	East	Movement essentially straight	1000	
2009036437	2009526420	20090914	Possible/Unknown	50	Non-collision	1	East	Turning right	50	Possible
2009037003	2009527054	20090925	Property Damage Only		Broadside	1	East	Turning left	3000	
2009037003	2009527054			0		2	West	Movement essentially straight		
2009037005	2009527056	20090926	Minor Injury	4000	Broadside	1	South	Movement essentially straight	2500	Non-incapacitating
2009037005	2009527056			0		2	East	Movement essentially straight	1500	
2009047106	2009538265	20091122	Minor Injury	2000	Non-collision	1	North	Turning right	2000	Non-incapacitating
2009047172	2009538341	20091127	Property Damage Only	2000	Sideswipe - same direction	1	East	Changing lanes	1500	
2009047172	2009538341			0		2	East	Turning left	500	
2009050275	2009541701	20091210	Property Damage Only	7000	Rear-end	1	South	Turning right	3000	
2009050275	2009541701			0		2	South	Movement essentially straight	4000	
2009051974	2009543539	20091219	Property Damage Only	7000	Sideswipe - same direction	1	South	Changing lanes	2000	
2009051974	2009543539			0		2	South	Movement essentially straight	5000	
2009054509	2009546615	20091224	Possible/Unknown	7500	Broadside	1	South	Movement essentially straight	2500	Possible
2009054509	2009546615			0		2	West	Slowing/stopping	5000	

2nd and New York

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007017296	2007367421	20070413	Property Damage Only	2500	Angle - oncoming left turn	1	South	Turning left	1500	
2007017296	2007367421			0		2	North	Movement essentially straight	1000	
2007025081	2007376241	20070531	Property Damage Only	3500	Angle - oncoming left turn	1	North	Turning left	1500	
2007025081	2007376241			0		2	South	Movement essentially straight	2000	
2007038567	2007391509	20070912	Minor Injury	0	Non-collision	1	East	Turning right	0	Non-incapacitating
2008000198	2008414989	20080103	Property Damage Only		Rear-end	1	South	Slowing/stopping		
2008000198	2008414989			0		2	South	Stopped for stop sign/signal	1000	
2008009263	2008426508	20080215	Property Damage Only	3500	Broadside	1	East	Turning left	1600	
2008009263	2008426508			0		2	South	Movement essentially straight	1900	
2008022760	2008441841	20080511	Property Damage Only		Broadside	1	North	Movement essentially straight	3000	
2008022760	2008441841			0		2	East	Movement essentially straight		
2008033267	2008453816	20080730	Possible/Unknown	0	Non-collision	1	South	Movement essentially straight	0	Possible
2008043197	2008465165	20081008	Property Damage Only		Angle - oncoming left turn	1	South	Movement essentially straight	2500	
2008043197	2008465165			0		2	West	Turning left		
2009006201	2009491922	20090130	Property Damage Only	3500	Rear-end	1	South	Slowing/stopping	3000	
2009006201	2009491922			0		2	South	Stopped for stop sign/signal	500	
2009006464	2009492247	20090127	Possible/Unknown	29000	Rear-end	1	South	Movement essentially straight	15000	Possible
2009006464	2009492247			0		2	South	Stopped for stop sign/signal	14000	Possible
2009024736	2009513160	20090617	Minor Injury	1000	Rear-end	1	South	Movement essentially straight	200	Non-incapacitating
2009024736	2009513160			0		2	South	Stopped for stop sign/signal	800	
2009026375	2009515015	20090706	Property Damage Only	6500	Rear-end	1	North	Movement essentially straight	5000	
2009026375	2009515015			0		2	North	Stopped for stop sign/signal	1500	
2009034810	2009524596	20090903	Property Damage Only	7000	Broadside	1	North	Movement essentially straight	5000	

2009034810	2009524596			0		2	East	Movement essentially straight	2000	
2009034810	2009524596			0		2	East	Movement essentially straight	2000	
2009034810	2009524596			0		2	East	Movement essentially straight	2000	
2009034810	2009524596			0		2	East	Movement essentially straight	2000	

2nd and holcomb

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLI	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007015604	2007216320	20070405	Property Damage Only	6500	Rear-end	1	South	Movement essentially straight	1500	
2007015604	2007216320			0		2	South	Changing lanes	5000	
2007044879	2007398566	20071017	Possible/Unknown	10000	Rear-end	1	North	Movement essentially straight	5000	Possible
2007044879	2007398566			0		2	North	Slowing/stopping	5000	
2007057951	2007412958	20071216	Property Damage Only	5800	Broadside	1	West	Movement essentially straight	2900	
2007057951	2007412958			0		2	South	Movement essentially straight	2900	
2008013487	2008431191	20080308	Minor Injury	2000	Broadside	1	East	Movement essentially straight	1000	Non-incapacitating
2008013487	2008431191			0		2	North	Movement essentially straight	1000	Non-incapacitating
2008015427	2008433398	20080320	Property Damage Only	4500	Broadside	1	North	Movement essentially straight	1500	
2008015427	2008433398			0		2	East	Movement essentially straight	3000	
2008017901	2008436260	20080408	Property Damage Only	2000	Head-on	1	South	Turning left	500	
2008017901	2008436260			0		2	North	Movement essentially straight	1500	
2008022058	2008441025	20080508	Minor Injury	30000	Broadside	1	South	Turning left	12000	Non-incapacitating
2008022058	2008441025			0		2	North	Movement essentially straight	8000	
2008022058	2008441025			0		3	West	Stopped for stop sign/signal	6000	
2008022058	2008441025			0		4	West	Stopped for stop sign/signal	4000	
2008028935	2008448841	20080627	Possible/Unknown	13000	Angle - oncoming left turn	1	South	Turning left	9000	Possible
2008028935	2008448841			0		2	North	Movement essentially straight	4000	Possible
2008032507	2008452935	20080730	Major Injury	3000	Angle - oncoming left turn	1	North	Movement essentially straight	1000	Non-incapacitating
2008032507	2008452935			0		2	South	Turning left	2000	Incapacitating
2008034115	2008454788	20080808	Property Damage Only		Sideswipe - same direction	1	North	Stopped for stop sign/signal	1000	
2008034115	2008454788			0		2	North			
2008056893	2008480153	20081223	Possible/Unknown		Rear-end	1	South	Unknown		Possible
2008056893	2008480153			0		2	South	Stopped for stop sign/signal	1000	Possible
2009000594	2009483952	20090108	Property Damage Only	3300	Angle - oncoming left turn	1	North	Turning left	2500	
2009000594	2009483952			0		2	South	Movement essentially straight	800	
2009001288	2009485323	20090113	Property Damage Only	5175	Broadside	1	West	Movement essentially straight	1000	

2nd and College

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLI	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007000725	2007200750	20070107	Property Damage Only	1050	Broadside	1	East	Movement essentially straight	50	
2007000725	2007200750			0		2	South	Movement essentially straight	1000	
2007014391	2007215018	20070317	Property Damage Only	4500	Sideswipe - same direction	1	North	Changing lanes	2500	
2007014391	2007215018			0		2	North	Movement essentially straight	2000	
2007019380	2007369793	20070504	Property Damage Only	10000	Broadside	1	East	Movement essentially straight	4000	
2007019380	2007369793			0		2	North	Movement essentially straight	4000	
2007019380	2007369793			0		3	West	Stopped for stop sign/signal	2000	
2007020245	2007370742	20070510	Property Damage Only	2500	Broadside	1	North	Movement essentially straight	1500	
2007020245	2007370742			0		2	East	Turning left	1000	
2007040413	2007393581	20070921	Minor Injury	2000	Non-collision	1	South	Movement essentially straight	2000	Non-incapacitating
2007045938	2007399733	20071026	Property Damage Only	4000	Rear-end	1	West	Backing	1000	
2007045938	2007399733			0		2	West	Stopped for stop sign/signal	3000	
2007057789	2007412781	20071226	Property Damage Only	2200	Broadside	1	West	Backing	1200	
2007057789	2007412781			0		2	North	Movement essentially straight	1000	
2008027040	2008446666	20080617	Possible/Unknown	1000	Non-collision	1	North	Movement essentially straight	1000	Possible
2008049993	2008472648	20081120	Property Damage Only	5000	Sideswipe - opposite direction	1	South	Movement essentially straight	1500	
2008049993	2008472648			0		2	North	Turning left	3500	

[illegible]	[illegible]			0		2	West	Movement essentially straight		
2008054964	2008478084	20081215	Property Damage Only	4500	Rear-end	1	North	Movement essentially straight	2000	
2008054964	2008478084			0		2	North	Movement essentially straight	2500	
2008055945	2008479119	20081210	Property Damage Only	2000	Rear-end	1	East	Movement essentially straight	500	
2008055945	2008479119			0		2	East	Movement essentially straight	1500	
2008056420	2008479634	20081210	Property Damage Only	2500	Rear-end	1	West	Movement essentially straight	1000	
2008056420	2008479634			0		2	West	Turning right	1500	
2009005224	2009490768	20090123	Property Damage Only	3000	Broadside	1	South	Stopped for stop sign/signal	1000	
2009005224	2009490768			0		2	East	Turning left	2000	
2009005245	2009490799	20090119	Major Injury	5000	Broadside	1	South	Turning left	2000	Incapacitating
2009005245	2009490799			0		2	East	Movement essentially straight	3000	
2009007026	2009492894	20090213	Property Damage Only	1000	Rear-end	1	North	Movement essentially straight	0	
2009007026	2009492894			0		2	North	Stopped for stop sign/signal	1000	
2009007527	2009493466	20090210	Property Damage Only	4000	Rear-end	1	South	Backing	1000	
2009007527	2009493466			0		2	South	Stopped for stop sign/signal	3000	
2009009349	2009495595	20090226	Property Damage Only	2000	Rear-end	1	East	Movement essentially straight	1000	
2009009349	2009495595			0		2	East	Stopped for stop sign/signal	1000	
2009011053	2009497581	20090311	Possible/Unknown	0	Non-collision	1	South	Turning right	0	Possible
2009020963	2009508992	20090527	Possible/Unknown	6500	Rear-end	1	West	Movement essentially straight	4000	Possible
2009020963	2009508992			0		2	West	Stopped for stop sign/signal	2000	
2009020963	2009508992			0		3	West	Stopped for stop sign/signal	500	
2009021718	2009509838	20090526	Property Damage Only	3000	Rear-end	1	East	Movement essentially straight	2000	
2009021718	2009509838			0		2	East	Movement essentially straight	1000	
2009021922	2009510054	20090607	Property Damage Only		Rear-end	1	West	Movement essentially straight		
2009021922	2009510054			0		2	West	Stopped for stop sign/signal	1500	
2009031810	2009521187	20090815	Property Damage Only	1000	Rear-end	1	West	Turning right	500	
2009031810	2009521187			0		2	North	Turning right	500	
2009033735	2009523380	20090831	Property Damage Only	2000	Rear-end	1	West	Movement essentially straight	1000	
2009033735	2009523380			0		2	West	Movement essentially straight	1000	
2009036568	2009526568	20090922	Possible/Unknown	2000	Non-collision	1	North	Movement essentially straight	2000	Possible
2009040664	2009531106	20091015	Minor Injury		Broadside	1	East	Movement essentially straight	2000	Possible
2009040664	2009531106			0		2	West	Turning left		Non-incapacitating
2009041739	2009532265	20091026	Possible/Unknown	2000	Angle - oncoming left turn	1	South	Turning left	1500	Possible
2009041739	2009532265			0		2	North	Movement essentially straight	500	
2009048220	2009539474	20091031	Property Damage Only		Rear-end	1	Not Reported	Stopped for stop sign/signal	1000	
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		
2009048220	2009539474			0		2	Not Reported	Not Reported		

E12th and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007017847	2007368046	20070424	Property Damage Only	1500	Broadside	1	South	Movement essentially straight	1000	
2007017847	2007368046			0		2	West	Movement essentially straight	500	
2007031376	2007383352	20070724	Property Damage Only	6000	Broadside	1	East	Movement essentially straight	3000	

E9th and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007022875	2007373745	20070524	Property Damage Only	2400	Broadside	1	West	Movement essentially straight	1200	
2007022875	2007373745			0		2	South	Movement essentially straight	1200	

2008007334	2008424329	20080117	Property Damage Only	2300	Broadside	1	East	Movement essentially straight	800	
2008007334	2008424329			0		2	North	Movement essentially straight	1500	
2008034967	2008455780	20080806	Minor Injury	4000	Broadside	1	East	Movement essentially straight	2000	Possible
2008034967	2008455780			0		2	North	Movement essentially straight	2000	Non-incapacitating
2008034979	2008455792	20080730	Property Damage Only	3500	Broadside	1	South	Movement essentially straight	1500	
2008034979	2008455792			0		2	East	Movement essentially straight	2000	
2009012984	2009499852	20090326	Property Damage Only	7000	Broadside	1	East	Turning right	2000	
2009012984	2009499852			0		2	South	Movement essentially straight	5000	
2009028842	2009517803	20090708	Property Damage Only	7000	Broadside	1	North	Movement essentially straight	3500	
2009028842	2009517803			0		2	East	Movement essentially straight	3500	

9th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007001371	2007201404	20070109	Property Damage Only	2000	Rear-end	1	East	Movement essentially straight	1000	
2007001371	2007201404			0		2	East	Stopped for stop sign/signal	1000	
2007016686	2007366714	20070416	Possible/Unknown	5000	Rear-end	1	West	Movement essentially straight	1500	Possible
2007016686	2007366714			0		2	West	Movement essentially straight	1500	Possible
2007016686	2007366714			0		3	West	Movement essentially straight	1000	Possible
2007016686	2007366714			0		4	West	Movement essentially straight	1000	Possible
2008012790	2008430409	20080304	Property Damage Only	5000	Angle - oncoming left turn	1	East	Turning left	2500	
2008012790	2008430409			0		2	West	Movement essentially straight	2500	
2008022484	2008441524	20080516	Major Injury	4000	Non-collision	1	West	Turning left	4000	Incapacitating
2008030558	2008450699	20080715	Property Damage Only	2000	Broadside	1	North	Movement essentially straight	500	
2008030558	2008450699			0		2	East	Movement essentially straight	1500	
2008032930	2008453422	20080731	Property Damage Only	4000	Rear-end	1	North	Movement essentially straight	1500	
2008032930	2008453422			0		2	North	Stopped for stop sign/signal	2500	
2008043076	2008465021	20081014	Property Damage Only	4500	Angle - oncoming left turn	1	West	Turning left	2000	
2008043076	2008465021			0		2	East	Movement essentially straight	2500	
2008047480	2008469894	20081107	Property Damage Only	4500	Angle - oncoming left turn	1	West	Turning left	2500	
2008047480	2008469894			0		2	East	Movement essentially straight	2000	
2009026994	2009515733	20090710	Property Damage Only		Broadside	1	West	Movement essentially straight	2500	
2009026994	2009515733			0		2	Not Reported	Not Reported		
2009028088	2009516954	20090721	Property Damage Only	10000	Head-on	1	East	Turning left	5000	
2009028088	2009516954			0		2	West	Movement essentially straight	5000	
2009030357	2009519539	20090806	Property Damage Only		Rear-end	1	West			
2009030357	2009519539			0		2	West	Movement essentially straight	2500	
2009034741	2009524518	20090909	Property Damage Only	6000	Head-on	1	East	Turning left	2000	
2009034741	2009524518			0		2	West	Movement essentially straight	4000	
2009035918	2009525839	20090917	Minor Injury	1000	Non-collision	1	South	Turning right	1000	Non-incapacitating
2009039208	2009529496	20091009	Property Damage Only	2500	Sideswipe - same direction	1	South	Movement essentially straight	1000	
2009039208	2009529496			0		2	South	Changing lanes	1500	
2009043815	2009534667	20091105	Minor Injury	5000	Non-collision	1	West	Movement essentially straight	5000	Non-incapacitating
2009043815	2009534667			0		0			0	Non-incapacitating
2009045013	2009535975	20091112	Major Injury	7500	Angle - oncoming left turn	1	West	Turning left	2500	Incapacitating
2009045013	2009535975			0		2	East	Movement essentially straight	5000	

13th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007002225	2007202286	20070116	Property Damage Only	2000	Rear-end	1	West	Movement essentially straight	1000	
2007002225	2007202286			0		2	West	Not Reported	1000	
2007002230	2007202292	20070116	Property Damage Only	1500	Rear-end	1	West	Stopped for stop sign/signal	500	
2007002230	2007202292			0		2	West	Slowing/stopping	1000	
2007003100	2007203204	20070119	Possible/Unknown	2000	Angle - oncoming left turn	1	South	Turning left	1000	Possible

2007003100	2007203204			0		2	South	Movement essentially straight	1000	Unknown
2007013238	2007213789	20070316	Property Damage Only	3000	Angle - oncoming left turn	1	East	Turning left	1000	
2007013238	2007213789			0		2	West	Movement essentially straight	2000	
2007018369	2007368637	20070424	Property Damage Only	1100	Broadside	1	West	Movement essentially straight	1000	
2007018369	2007368637			0		2	North	Movement essentially straight	100	
2007029094	2007380766	20070702	Property Damage Only	6000	Sideswipe - same direction	1	East	Changing lanes	3000	
2007029094	2007380766			0		2	East	Movement essentially straight	3000	
2007029095	2007380767	20070702	Possible/Unknown		Rear-end	1	East	Movement essentially straight		Possible
2007029095	2007380767			0		2	East	Stopped for stop sign/signal	500	Possible
2007029095	2007380767			0		0			0	Possible
2007041172	2007394433	20071001	Property Damage Only		Rear-end	1	East	Movement essentially straight	1000	
2007041172	2007394433			0		2	East	Movement essentially straight		
2007044011	2007397604	20071016	Major Injury	18000	Broadside	1	South	Movement essentially straight	9000	Non-incapacitating
2007044011	2007397604			0		2	East	Movement essentially straight	9000	Incapacitating
2007044011	2007397604			0		0			0	Possible
2007044035	2007397631	20071013	Property Damage Only	3500	Rear-end	1	East	Movement essentially straight	2000	
2007044035	2007397631			0		2	East	Movement essentially straight	1500	
2007053254	2007407745	20071202	Property Damage Only	1400	Rear-end	1	East	Movement essentially straight	400	
2007053254	2007407745			0		2	East	Movement essentially straight	1000	
2008033448	2008454021	20080804	Property Damage Only	3500	Rear-end	1	East	Turning left	2500	
2008033448	2008454021			0		2	East	Movement essentially straight	1000	
2008042646	2008464545	20081010	Property Damage Only	9000	Broadside	1	West	Movement essentially straight	4000	
2008042646	2008464545			0		2	South	Movement essentially straight	1500	
2008042646	2008464545			0		3	North	Movement essentially straight	3500	
2009026144	2009514767	20090706	Possible/Unknown		Broadside	1	East	Movement essentially straight		Possible
2009026144	2009514767			0		2	South	Movement essentially straight	3000	
2009027645	2009516471	20090716	Major Injury	7000	Angle - oncoming left turn	1	North	Turning left	2000	Incapacitating
2009027645	2009516471			0		2	South	Movement essentially straight	5000	
2009034935	2009524733	20090911	Minor Injury	3500	Broadside	1	West	Turning left	1000	Non-incapacitating
2009034935	2009524733			0		2	East	Movement essentially straight	2500	Non-incapacitating
2009038253	2009528445	20091002	Property Damage Only		Broadside	1	West	Turning left	3000	
2009038253	2009528445			0		2	East	Movement essentially straight	2500	
2009038253	2009528445			0		3	North	Stopped for stop sign/signal	2500	

19th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLI	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007001540	2007201576	20070115	Property Damage Only	4000	Broadside	1	North	Movement essentially straight	1000	
2007001540	2007201576			0		2	East	Movement essentially straight	3000	
2007003005	2007203097	20070122	Major Injury	10000	Broadside	1	East	Movement essentially straight	5000	Incapacitating
2007003005	2007203097			0		2	North	Movement essentially straight	3000	
2007003005	2007203097			0		3	West	Stopped for stop sign/signal	2000	
2007004207	2007204361	20070130	Property Damage Only	1500	Rear-end	1	North	Movement essentially straight	0	
2007004207	2007204361			0		2	North	Slowing/stopping	1500	
2007017264	2007367382	20070415	Property Damage Only		Broadside	1	Not Reported	Movement essentially straight	3900	
2007017264	2007367382			0		2	Not Reported	Not Reported		
2007018028	2007368251	20070425	Property Damage Only	2500	Rear-end	1	North	Movement essentially straight	1500	
2007018028	2007368251			0		2	Unknown	Legally Parked	1000	
2007018481	2007368770	20070428	Property Damage Only	2100	Rear-end	1	North	Slowing/stopping	100	
2007018481	2007368770			0		2	North	Slowing/stopping	2000	
2007018481	2007368770			0		3	North	Unknown	0	
2007035427	2007387940	20070822	Property Damage Only		Broadside	1	Not Reported	Not Reported		
2007035427	2007387940			0		2	North	Movement essentially straight	2000	

2008052916	2008475861	20081205	Property Damage Only	2200	Rear-end	1	North	Slowing/stopping	2000	
2008052916	2008475861			0		2	North	Movement essentially straight	200	
2009003645	2009488653	20090123	Property Damage Only	5000	Angle - oncoming left turn	1	North	Turning left	2500	
2009003645	2009488653			0		2	South	Movement essentially straight	2500	
2009010041	2009496390	20090206	Property Damage Only	5000	Angle - oncoming left turn	1	North	Turning left	2000	
2009010041	2009496390			0		2	South	Movement essentially straight	3000	
2009010126	2009496489	20090228	Minor Injury	7500	Sideswipe - same direction	1	South	Movement essentially straight	3000	Non-incapacitating
2009010126	2009496489			0		2	West	Turning left	4500	
2009034143	2009523836	20090903	Property Damage Only	8000	Broadside	1	North	Movement essentially straight	4000	
2009034143	2009523836			0		2	East	Movement essentially straight	4000	

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CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007013606	2007214180	20070313	Property Damage Only	2000	Rear-end	1	East	Movement essentially straight	1000	
2007013606	2007214180			0		2	East	Stopped for stop sign/signal	1000	
2007025957	2007377249	20070617	Property Damage Only	2500	Broadside	1	South	Turning right	1000	
2007025957	2007377249			0		2	Unknown	Unknown	1500	
2007026596	2007377973	20070621	Possible/Unknown	1000	Non-collision	1	South	Turning right	1000	Possible
2007029853	2007381630	20070715	Property Damage Only	1500	Sideswipe - same direction	1	East	Turning left	1000	
2007029853	2007381630			0		2	East	Turning left	500	
2007035494	2007388021	20070816	Property Damage Only		Rear-end	1	Not Reported	Not Reported		
2007035494	2007388021			0		2	Not Reported	Stopped for stop sign/signal	1000	
2007035770	2007388335	20070823	Property Damage Only	2500	Rear-end	1	East	Slowing/stopping	1200	
2007035770	2007388335			0		2	East	Stopped for stop sign/signal	1300	
2007036852	2007389567	20070901	Property Damage Only	1500	Rear-end	1	East	Slowing/stopping	500	
2007036852	2007389567			0		2	East	Movement essentially straight	1000	
2007037705	2007390533	20070908	Property Damage Only	3050	Broadside	1	West	Turning right	50	
2007037705	2007390533			0		2	South	Stopped for stop sign/signal	3000	
2007038058	2007390936	20070907	Property Damage Only	7900	Rear-end	1	North	Slowing/stopping	1400	
2007038058	2007390936			0		2	North	Stopped for stop sign/signal	3700	
2007038058	2007390936			0		3	South	Turning left	2800	
2007052500	2007406929	20071120	Property Damage Only	3000	Rear-end	1	West	Stopped for stop sign/signal	2500	
2007052500	2007406929			0		2	West	Stopped for stop sign/signal	500	
2007054126	2007408697	20071210	Property Damage Only	4000	Broadside	1	West	Movement essentially straight	1500	
2007054126	2007408697			0		2	North	Turning left	2500	
2007057970	2007412982	20071215	Property Damage Only	18000	Broadside	1	South	Movement essentially straight	15000	
2007057970	2007412982			0		2	East	Movement essentially straight	3000	
2007060461	2007417275	20071226	Property Damage Only	4500	Head-on	1	East	Movement essentially straight	1500	
2007060461	2007417275			0		2	West	Turning left	3000	
2008003518	2008419812	20080117	Property Damage Only		Rear-end	1	East	Slowing/stopping	3500	
2008003518	2008419812			0		2	East	Stopped for stop sign/signal		
2008006532	2008423424	20080206	Property Damage Only	2000	Angle - oncoming left turn	1	West	Turning left	1000	
2008006532	2008423424			0		2	East	Movement essentially straight	1000	
2008006813	2008423747	20080206	Property Damage Only	2500	Angle - oncoming left turn	1	East	Movement essentially straight	1000	
2008006813	2008423747			0		2	West	Turning left	1000	
2008006813	2008423747			0		3	East	Turning left	500	
2008012169	2008429727	20080228	Possible/Unknown	1000	Rear-end	1	East	Movement essentially straight	500	Possible
2008012169	2008429727			0		2	East	Stopped for stop sign/signal	500	
2008014606	2008432446	20080315	Property Damage Only		Broadside	1	East	Movement essentially straight		
2008014606	2008432446			0		2	South	Movement essentially straight	5000	
2008029100	2008449026	20080704	Minor Injury	100	Unknown	1	South	Turning right	100	Non-incapacitating
2008037203	2008458341	20080827	Minor Injury	1500	Rear-end	1	East	Stopped for stop sign/signal	1000	Non-incapacitating
2008037203	2008458341			0		2	East	Movement essentially straight	500	
2008054962	2008478082	20081216	Possible/Unknown		Rear-end	1	West	Slowing/stopping	500	Possible

2007040489	2007393673	20070925	Property Damage Only		Broadside	1	East	Movement essentially straight		
2007040489	2007393673			0		2	North	Movement essentially straight	4000	
2007041181	2007394442	20071001	Property Damage Only	1500	Rear-end	1	North	Movement essentially straight	1000	
2007041181	2007394442			0		2	North	Stopped for stop sign/signal	500	
2007044297	2007397930	20071017	Possible/Unknown	2000	Sideswipe - same direction	1	North	Movement essentially straight	1500	Possible
2007044297	2007397930			0		2	North	Turning left	500	
2007053763	2007408300	20071207	Minor Injury		Broadside	1	East	Unknown		Non-incapacitating
2007053763	2007408300			0		2	North	Movement essentially straight	5000	
2007058151	2007413180	20071225	Major Injury	2000	Broadside	1	East	Movement essentially straight	1000	Incapacitating
2007058151	2007413180			0		2	North	Movement essentially straight	1000	
2008001051	2008416732	20080103	Property Damage Only	2000	Rear-end	1	North	Movement essentially straight	1500	
2008001051	2008416732			0		2	North	Movement essentially straight	500	
2008001747	2008417715	20080117	Property Damage Only	1700	Rear-end	1	North	Slowing/stopping	500	
2008001747	2008417715			0		2	North	Stopped for stop sign/signal	1200	
2008008666	2008425858	20080216	Possible/Unknown	2000	Broadside	1	East	Movement essentially straight	1000	Possible
2008008666	2008425858			0		2	North	Movement essentially straight	1000	
2008010552	2008427958	20080223	Possible/Unknown	2700	Broadside	1	East	Movement essentially straight	700	Possible
2008010552	2008427958			0		2	North	Movement essentially straight	2000	
2008012481	2008430063	20080229	Minor Injury		Broadside	1	North	Movement essentially straight		Non-incapacitating
2008012481	2008430063			0		2	East	Movement essentially straight	2500	
2008018765	2008437242	20080417	Property Damage Only	3500	Broadside	1	North	Movement essentially straight	2000	
2008018765	2008437242			0		2	East	Movement essentially straight	1500	
2008027508	2008447202	20080612	Property Damage Only	2500	Non-collision	1	West	Turning right	2500	
2008035807	2008456734	20080822	Possible/Unknown	1000	Rear-end	1	West	Movement essentially straight	500	Possible
2008035807	2008456734			0		2	West	Stopped for stop sign/signal	500	
2008046924	2008469291	20081104	Property Damage Only	9000	Broadside	1	East	Movement essentially straight	5000	
2008046924	2008469291			0		2	North	Movement essentially straight	4000	
2008051067	2008473830	20081127	Property Damage Only	4500	Broadside	1	West	Movement essentially straight	2000	
2008051067	2008473830			0		2	North	Movement essentially straight	2500	
2009003782	2009488848	20090118	Property Damage Only	4000	Broadside	1	North	Movement essentially straight	2000	
2009003782	2009488848			0		2	East	Movement essentially straight	2000	
2009007490	2009493423	20090111	Property Damage Only	5500	Broadside	1	West	Movement essentially straight	500	
2009007490	2009493423			0		2	North	Movement essentially straight	5000	
2009008323	2009494371	20090220	Property Damage Only		Broadside	1	Not Reported	Unknown		
2009008323	2009494371			0		2	North	Movement essentially straight	1000	
2009012068	2009498770	20090320	Possible/Unknown	5500	Broadside	1	East	Movement essentially straight	3000	Possible
2009012068	2009498770			0		2	North	Movement essentially straight	2500	
2009014502	2009501606	20090410	Property Damage Only	2200	Rear-end	1	West	Movement essentially straight	200	
2009014502	2009501606			0		2	West	Stopped for stop sign/signal	2000	
2009015965	2009503379	20090419	Property Damage Only	10000	Broadside	1	North	Movement essentially straight	5000	
2009015965	2009503379			0		2	East	Movement essentially straight	5000	
2009020838	2009508859	20090527	Property Damage Only	1750	Broadside	1	East	Movement essentially straight	1500	
2009020838	2009508859			0		2	North	Movement essentially straight	250	
2009034957	2009524758	20090912	Property Damage Only	2000	Rear-end	1	West	Movement essentially straight	1000	
2009034957	2009524758			0		2	West	Stopped for stop sign/signal	1000	
2009052385	2009543980	20091221	Property Damage Only	6500	Rear-end	1	North	Movement essentially straight	2000	
2009052385	2009543980			0		2	North	Stopped for stop sign/signal	4000	
2009052385	2009543980			0		3	North	Stopped for stop sign/signal	500	
2009053120	2009544785	20091227	Property Damage Only	13000	Broadside	1	East	Movement essentially straight	3500	
2009053120	2009544785			0		2	North	Movement essentially straight	6000	
2009053120	2009544785			0		3	North	Movement essentially straight	3500	

MLK and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007001842	2007201894	20070115	Possible/Unknown	4000	Broadside	1	West	Movement essentially straight	1000	Possible

2007001842	2007201894			0		2	South	Movement essentially straight	3000	
2007003070	2007203168	20070121	Minor Injury	2000	Broadside	1	South	Movement essentially straight	1000	Non-incapacitating
2007003070	2007203168			0		2	West	Movement essentially straight	1000	
2007004203	2007204357	20070129	Property Damage Only	5000	Broadside	1	East	Movement essentially straight	2500	
2007004203	2007204357			0		2	South	Movement essentially straight	2500	
2007012638	2007213179	20070314	Property Damage Only	2000	Rear-end	1	East	Slowing/stopping	500	
2007012638	2007213179			0		2	East	Slowing/stopping	1500	
2007019845	2007370287	20070507	Property Damage Only	3000	Broadside	1	West	Movement essentially straight	2000	
2007019845	2007370287			0		2	South	Movement essentially straight	1000	
2007022898	2007373773	20070524	Property Damage Only	3500	Rear-end	1	East	Movement essentially straight	500	
2007022898	2007373773			0		2	East	Stopped for stop sign/signal	3000	
2007030726	2007382632	20070719	Property Damage Only	5000	Sideswipe - same direction	1	South	Changing lanes	2000	
2007030726	2007382632			0		2	South	Movement essentially straight	3000	
2007033314	2007385565	20070805	Major Injury	2000	Rear-end	1	East	Slowing/stopping	1000	Incapacitating
2007033314	2007385565			0		2	East	Stopped for stop sign/signal	1000	Possible
2007040328	2007393486	20070915	Possible/Unknown		Broadside	1	South	Movement essentially straight	3000	Possible
2007040328	2007393486			0		2	West	Movement essentially straight		Possible
2007049964	2007404164	20071115	Property Damage Only	2250	Sideswipe - same direction	1	South	Changing lanes	750	
2007049964	2007404164			0		2	South	Not Reported	1500	
2007052174	2007406568	20071201	Property Damage Only	2000	Sideswipe - same direction	1	South	Turning left	1000	
2007052174	2007406568			0		2	South	Turning left	1000	
2007052181	2007406575	20071130	Possible/Unknown		Rear-end	1	East	Stopped for stop sign/signal	2000	Possible
2007052181	2007406575			0		2	East	Movement essentially straight		
2008013494	2008431199	20080307	Property Damage Only	2000	Rear-end	1	South	Slowing/stopping	1000	
2008013494	2008431199			0		2	South	Slowing/stopping	1000	
2008013767	2008431512	20080309	Possible/Unknown	2000	Broadside	1	East	Movement essentially straight	1000	Possible
2008013767	2008431512			0		2	South	Movement essentially straight	1000	Possible
2008013767	2008431512			0		0			0	Possible
2008015429	2008433400	20080323	Property Damage Only	4000	Broadside	1	West	Movement essentially straight	2000	
2008015429	2008433400			0		2	South	Movement essentially straight	2000	
2008030867	2008451067	20080719	Property Damage Only	3000	Broadside	1	East	Movement essentially straight	1500	
2008030867	2008451067			0		2	South	Movement essentially straight	1500	
2008032061	2008452434	20080719	Property Damage Only	8000	Broadside	1	West	Movement essentially straight	3000	
2008032061	2008452434			0		2	South	Movement essentially straight	5000	
2008034109	2008454780	20080806	Fatal	7500	Broadside	1	South	Movement essentially straight	2500	Fatal
2008034109	2008454780			0		2	West	Movement essentially straight	5000	
2008039958	2008461474	20080921	Possible/Unknown	3000	Broadside	1	West	Movement essentially straight	1500	Possible
2008039958	2008461474			0		2	South	Movement essentially straight	1500	
2008043778	2008465794	20081017	Minor Injury	10500	Broadside	1	West	Movement essentially straight	3000	Non-incapacitating
2008043778	2008465794			0		2	South	Movement essentially straight	7500	Possible
2008048250	2008470742	20081112	Minor Injury	7800	Broadside	1	East	Movement essentially straight	4000	Possible
2008048250	2008470742			0		2	South	Movement essentially straight	3800	Non-incapacitating
2008048250	2008470742			0		0			0	Possible
2009005344	2009490906	20090131	Possible/Unknown	5000	Broadside	1	West	Movement essentially straight	1500	Possible
2009005344	2009490906			0		2	South	Movement essentially straight	3500	
2009006451	2009492231	20090207	Minor Injury	11000	Broadside	1	West	Movement essentially straight	6000	Possible
2009006451	2009492231			0		2	South	Movement essentially straight	5000	Possible
2009006451	2009492231			0		0			0	Non-incapacitating
2009009803	2009496117	20090303	Possible/Unknown	2000	Rear-end	1	South	Movement essentially straight	1000	Possible
2009009803	2009496117			0		2	South	Stopped for stop sign/signal	1000	Possible
2009010496	2009496922	20090308	Possible/Unknown	10000	Broadside	1	West	Movement essentially straight	5000	Possible
2009010496	2009496922			0		2	South	Movement essentially straight	5000	Possible
2009012089	2009498792	20090315	Property Damage Only	6000	Broadside	1	West	Movement essentially straight	4000	
2009012089	2009498792			0		2	South	Movement essentially straight	2000	
2009014775	2009501922	20090406	Possible/Unknown	7500	Broadside	1	South	Movement essentially straight	2500	Possible
2009014775	2009501922			0		2	East	Movement essentially straight	5000	

2009020836	2009508857	20090529	Property Damage Only	5000	Sideswipe - same direction	1	East	Turning left	3000	
2009020836	2009508857			0		2	East	Movement essentially straight	2000	
2009021541	2009509642	20090509	Possible/Unknown	15000	Broadside	1	South	Movement essentially straight	7500	Possible
2009021541	2009509642			0		2	West	Movement essentially straight	7500	Possible
2009024116	2009512480	20090621	Property Damage Only	8500	Broadside	1	West	Movement essentially straight	5000	
2009024116	2009512480			0		2	South	Movement essentially straight	3500	
2009027101	2009515856	20090629	Possible/Unknown		Non-collision	1	East	Turning right		Possible
2009027463	2009516253	20090715	Possible/Unknown	150	Rear-end	1	South	Movement essentially straight	50	Possible
2009027463	2009516253			0		2	South	Movement essentially straight	100	
2009028254	2009517137	20090720	Property Damage Only	3000	Sideswipe - same direction	1	South	Movement essentially straight	1500	
2009028254	2009517137			0		2	South	Movement essentially straight	1500	
2009033015	2009522558	20090825	Property Damage Only	2000	Broadside	1	South	Turning right	1000	
2009033015	2009522558			0		2	West	Movement essentially straight	1000	
2009034936	2009524734	20090905	Property Damage Only	1500	Non-collision	1	East	Movement essentially straight	1500	
2009036132	2009526075	20090920	Property Damage Only	5000	Broadside	1	East	Movement essentially straight	3000	
2009036132	2009526075			0		2	South	Movement essentially straight	2000	
2009042471	2009533200	20091031	Possible/Unknown	6000	Broadside	1	South	Movement essentially straight	3000	Possible
2009042471	2009533200			0		2	West	Movement essentially straight	3000	
2009047137	2009538302	20091127	Minor Injury	7000	Broadside	1	East	Movement essentially straight	3000	Non-incapacitating
2009047137	2009538302			0		2	East	Turning left	4000	

12th and Keo Way

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007001666	2007201707	20070112	Property Damage Only	5000	Broadside	1	West	Movement essentially straight	2500	
2007001666	2007201707			0		2	North	Turning right	2500	
2007035212	2007387702	20070821	Possible/Unknown	3500	Head-on	1	South	Movement essentially straight	500	Possible
2007035212	2007387702			0		2	North	Turning left	3000	
2008015431	2008433402	20080322	Property Damage Only	1500	Angle - oncoming left turn	1	East	Movement essentially straight	500	
2008015431	2008433402			0		2	West	Turning left	1000	
2008018564	2008437021	20080408	Property Damage Only	3000	Sideswipe - opposite direction	1	North	Movement essentially straight	1500	
2008018564	2008437021			0		2	South	Movement essentially straight	1500	
2008051045	2008473801	20081128	Major Injury	1000	Non-collision	1	South	Turning right	1000	Incapacitating
2009001276	2009485311	20090112	Property Damage Only	2000	Broadside	1	East	Movement essentially straight	1000	
2009001276	2009485311			0		2	North	Movement essentially straight	1000	
2009025192	2009513692	20090627	Possible/Unknown	10000	Broadside	1	East	Movement essentially straight	6000	Possible
2009025192	2009513692			0		2	North	Movement essentially straight	4000	Possible
2009025192	2009513692			0		0			0	Possible
2009040377	2009530789	20091019	Property Damage Only	3500	Broadside	1	North	Turning left	2000	
2009040377	2009530789			0		2	South	Movement essentially straight	1500	

24th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007022675	2007373530	20070529	Property Damage Only	7000	Broadside	1	West	Movement essentially straight	4000	
2007022675	2007373530			0		2	North	Movement essentially straight	3000	
2007035755	2007388319	20070823	Property Damage Only	2500	Broadside	1	South	Movement essentially straight	1500	
2007035755	2007388319			0		2	East	Movement essentially straight	1000	
2007039324	2007392353	20070913	Property Damage Only	3500	Broadside	1	West	Movement essentially straight	1500	
2007039324	2007392353			0		2	South	Movement essentially straight	2000	
2007040569	2007393765	20070922	Property Damage Only	1750	Angle - oncoming left turn	1	East	Turning left	750	
2007040569	2007393765			0		2	West	Movement essentially straight	1000	
2008007386	2008424384	20080105	Property Damage Only	3000	Broadside	1	East	Legally Parked	2500	
2008007386	2008424384			0		2	East	Movement essentially straight	500	
2009010243	2009496626	20090305	Property Damage Only	3300	Broadside	1	South	Turning left	1500	
2009010243	2009496626			0		2	East	Movement essentially straight	1800	

2007016951	2007367012			0		2	West	Movement essentially straight	500	
2007049318	2007403455	20071112	Property Damage Only	1300	Rear-end	1	East	Movement essentially straight	1000	
2007049318	2007403455			0		2	East	Stopped for stop sign/signal	300	
2007052861	2007407330	20071130	Property Damage Only	10000	Non-collision	1	West	Movement essentially straight	10000	
2008025766	2008445241	20080609	Property Damage Only	1500	Sideswipe - same direction	1	South	Turning left	300	
2008025766	2008445241			0		2	South	Turning left	1200	

28th and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007002235	2007202297	20070114	Property Damage Only	3100	Non-collision	1	South	Movement essentially straight	2500	
2007046321	2007400148	20071018	Minor Injury	3500	Broadside	1	South	Movement essentially straight	1500	Non-incapacitating
2007046321	2007400148			0		2	West	Movement essentially straight	2000	
2008014159	2008431954	20080311	Property Damage Only	8000	Broadside	1	North	Turning left	4000	
2008014159	2008431954			0		2	West	Movement essentially straight	4000	
2008015956	2008434022	20080326	Property Damage Only	8000	Rear-end	1	West	Movement essentially straight	4000	
2008015956	2008434022			0		2	West	Slowing/stopping	4000	
2009044632	2009535560	20091105	Minor Injury	15000	Angle - oncoming left turn	1	South	Turning left	5000	Non-incapacitating
2009044632	2009535560			0		2	West	Movement essentially straight	10000	

35th and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007008270	2007208610	20070214	Possible/Unknown	1400	Rear-end	1	East	Movement essentially straight	800	Possible
2007008270	2007208610			0		2	East	Movement essentially straight	600	
2007016987	2007367058	20070409	Property Damage Only	1998	Rear-end	1	East	Stopped for stop sign/signal	999	
2007016987	2007367058			0		2	East	Slowing/stopping	999	
2008028922	2008448828	20080628	Property Damage Only	1700	Rear-end	1	South	Stopped for stop sign/signal	200	
2008028922	2008448828			0		2	South	Movement essentially straight	1500	
2008037816	2008459031	20080828	Property Damage Only	7700	Rear-end	1	East	Slowing/stopping	1200	
2008037816	2008459031			0		2	East	Slowing/stopping	3500	
2008037816	2008459031			0		3	East	Movement essentially straight	3000	
2008038080	2008459336	20080911	Property Damage Only	3500	Sideswipe - same direction	1	East	Movement essentially straight	2000	
2008038080	2008459336			0		2	East	Turning left	1500	
2009033368	2009522975	20090828	Property Damage Only	7000	Broadside	1	South	Turning right	4500	
2009033368	2009522975			0		2	West	Movement essentially straight	2500	

42nd and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007019945	2007370395	20070430	Property Damage Only	6000	Broadside	1	North	Movement essentially straight	3000	
2007019945	2007370395			0		2	East	Movement essentially straight	3000	
2007039491	2007392534	20070918	Property Damage Only	5500	Rear-end	1	East	Movement essentially straight	4000	
2007039491	2007392534			0		2	East	Slowing/stopping	1500	
2007054548	2007409183	20071202	Property Damage Only	4700	Rear-end	1	North	Slowing/stopping	3500	
2007054548	2007409183			0		2	North	Stopped for stop sign/signal	1200	
2008005370	2008422100	20080202	Minor Injury	4500	Head-on	1	South	Turning left	2500	Non-incapacitating
2008005370	2008422100			0		2	North	Movement essentially straight	2000	
2008011041	2008428500	20080218	Property Damage Only	3000	Angle - oncoming left turn	1	East	Turning left	1500	
2008011041	2008428500			0		2	West	Movement essentially straight	1500	
2008059753	2008483961	20081212	Property Damage Only	10000	Non-collision	1	South	Movement essentially straight	10000	
2009010136	2009496505	20090227	Property Damage Only		Broadside	1	East	Movement essentially straight		
2009010136	2009496505			0		2	South	Movement essentially straight	1500	
2009011054	2009497582	20090311	Property Damage Only	4000	Angle - oncoming left turn	1	West	Turning left	2500	
2009011054	2009497582			0		2	East	Movement essentially straight	1500	

2009023118	2009511374	20090606	Property Damage Only	8000	Broadside	1	West	Movement essentially straight	5000	
2009023118	2009511374			0		2	South	Movement essentially straight	3000	
2009023522	2009511815	20090617	Property Damage Only	1700	Angle - oncoming left turn	1	South	Turning left	1500	
2009023522	2009511815			0		2	North	Movement essentially straight	200	
2009053112	2009544773	20091226	Property Damage Only	2700	Rear-end	1	East	Movement essentially straight	2000	
2009053112	2009544773			0		2	East	Stopped for stop sign/signal	700	

25th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007016214	2007366181	20070403	Major Injury	7500	Broadside	1	West	Movement essentially straight	5000	Possible
2007016214	2007366181			0		2	South	Movement essentially straight	2500	Incapacitating
2008002159	2008418237	20080118	Property Damage Only	2000	Broadside	1	West	Movement essentially straight	1000	
2008002159	2008418237			0		2	North	Movement essentially straight	1000	
2008057265	2008480568	20081223	Property Damage Only	5700	Rear-end	1	Not Reported	Legally Parked	3000	
2008057265	2008480568			0		2	Not Reported	Legally Parked	200	
2008057265	2008480568			0		3	North	Turning left	2500	
2009017375	2009504967	20090502	Possible/Unknown	6000	Rear-end	1	West	Movement essentially straight	5000	Possible
2009017375	2009504967			0		2	West	Stopped for stop sign/signal	1000	
2009021710	2009509829	20090603	Property Damage Only	10000	Rear-end	1	East	Movement essentially straight	3000	
2009021710	2009509829			0		2	East	Slowing/stopping	4000	
2009021710	2009509829			0		3	East	Slowing/stopping	2000	
2009021710	2009509829			0		4	East	Slowing/stopping	1000	
2009024117	2009512481	20090621	Property Damage Only	2500	Broadside	1	South	Movement essentially straight	1000	
2009024117	2009512481			0		2	West	Movement essentially straight	1500	

28th and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007006351	2007206593	20070201	Possible/Unknown	0	Non-collision	1	North	Turning left	0	Possible
2007006353	2007206595	20070131	Property Damage Only	2800	Sideswipe - same direction	1	North	Turning right	300	
2007006353	2007206595			0		2	East	Legally Parked	2500	
2007021480	2007372161	20070518	Possible/Unknown	3000	Rear-end	1	West	Movement essentially straight	2000	Possible
2007021480	2007372161			0		2	West	Stopped for stop sign/signal	1000	
2007040593	2007393793	20070920	Property Damage Only	11500	Rear-end	1	West	Movement essentially straight	2500	
2007040593	2007393793			0		2	West	Stopped for stop sign/signal	7000	
2007040593	2007393793			0		3	West	Stopped for stop sign/signal	2000	
2008037201	2008458339	20080825	Property Damage Only	4000	Rear-end	1	East	Movement essentially straight	3500	
2008037201	2008458339			0		2	East	Stopped for stop sign/signal	500	
2009046281	2009537356	20091119	Property Damage Only	7500	Rear-end	1	East	Movement essentially straight	7500	
2009046281	2009537356			0		2	East	Stopped for stop sign/signal	0	

Polk and University

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007027259	2007378709	20070626	Possible/Unknown	0	Non-collision	1	North	Turning right	0	Possible
2008027750	2008447466	20080624	Property Damage Only	1000	Sideswipe - same direction	1	West	Changing lanes	500	
2008027750	2008447466			0		2	West	Movement essentially straight	500	
2009053118	2009544779	20091227	Property Damage Only	4000	Rear-end	1	North	Movement essentially straight	500	
2009053118	2009544779			0		2	North	Movement essentially straight	3500	

19th and Grand

CRASH_KEY	CASENUMBER	DATE	CSEVERITY	PROPDMG	CRCOMANNER	VEHICLE	INITDIR	VACTION	REPAIRCOST	INJSTATUS
2007016951	2007367012	20070417	Property Damage Only	1000	Rear-end	1	West	Stopped for stop sign/signal	500	

2009012560	2009499347	20090324	Property Damage Only	10000	Broadside	1	West	Turning right	5000
2009012560	2009499347			0		2	North	Movement essentially straight	5000
2009015358	2009502674	20090413	Property Damage Only	2000	Angle - oncoming left turn	1	East	Turning left	1000
2009015358	2009502674			0		2	West	Movement essentially straight	1000
2009018256	2009505963	20090511	Property Damage Only		Non-collision	1	North	Turning right	
2009028092	2009516958	20090720	Property Damage Only	6000	Angle - oncoming left turn	1	East	Turning left	3500
2009028092	2009516958			0		2	West	Movement essentially straight	2500

200	Property Damage Only
53	Possible/Unknown Injury
26	Minor Injury
11	Major Injury
1	Fatal
291	Total Crashes

$1,242,748

79	possible
31	non-incapacitating
11	incapacitating
1	fatal

112	Broadside
32	Angle - oncoming left turn
23	Non-Collision
92	Rear End
21	Sideswipe- same direction
3	Sideswipe - opposite direction
6	Head-on
2	Unknown
291	

Exhibit L-28

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Highway G 28 Shoulder Widening Project

Applicant: Marion County Road Department

Contact Person: Jay Davis Title: Assistant County Engineer

Complete Mailing Address: 402 Willetts Drive
Knoxville, Iowa 50138

Phone: 641-828-2225 (Area Code) E-Mail: jdavis@co.marion.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 $ 893,787.90

Safety Funds Requested $ 500,000.00

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 Marion County Road Department

Signed: Craig Agan 3-25-14

Signature Date Signed

Craig Agan, Board of Supervisors Chairman

Typed Name

Attest: Jake Grandia 3-25-14

Signature Date Signed

Jake Grandia, Auditor

Typed Name

MARION COUNTY RESOLUTION
2014/22

WHEREAS, the TRAFFIS SAFETY IMPROVEMENT PROGRAM (TSIP) operates under the rules of the Iowa Administrative Code 761- Ch. 164 and TSIP allocates Traffic Safety Funds (TSF), and

WHEREAS, only city and county governments and the Iowa Department of Transportation may apply for the Traffic Safety Funds, and

WHEREAS, Marion County route G 28 is an eligible route, and

WHEREAS, the TSF awards are limited to a maximum of $500,000 per project and any project costs above the maximum award shall be paid by the local agency, and

WHEREAS, the Sponsoring Agent shall maintain or cause to be maintained, the complete improvements in a manner acceptable to the Iowa Department of Transportation.

Passed and approved this 25th day of March, 2014.

Marion County Board of Supervisors

Craig Agan

Mark Raymie

Jim Kingery

Attest:

Jake Grandia, Auditor

Exhibit "B"

Marion County G28 TSIP Application

B. NARRATIVE

Marion County is submitting an application for Traffic Safety Funds (TSIP) to help fund safety improvements to County Highway G 28 from State Highway 14 east to County Highway T 15. This route runs generally along the north side of Red Rock Lake and has a length of 8.3 miles. It serves as a major collector connecting Pella to the state highway and carries significant recreational traffic due to the lake. Several residential areas have developed along the eastern portion of this route. The most recent traffic count along the route ranges from 1280 vpd to 2490 vpd.

The existing roadway section is a of 22' composite pavement consisting of PCC pavement with an HMA overlay. The shoulder has granular surfacing and varies in width from 5' to 8'. The foreslopes also vary ranging from 2:1 to 2.5:1. Some sections along the south shoulder have a recreational trail adjacent to the shoulder. The trail is shielded with guard rail.

Due to the rolling hilly terrain and the alignment along the lake the roadway geometry consists of numerous vertical and horizontal curves. The posted speed limit is 55mph with several advisory speed warning signs at curves.

Considering the usage of the route, traffic volumes, alignment, and narrow shoulders this route is a good candidate for safety improvements. These factors increase the probability of vehicles leaving the roadway. And any vehicles leaving the paved road have limited opportunity to recover and return safely to the pavement.

Evaluating 10 year crash history 2003 through 2012 indicates 111 crashes. A significant number of the crashes had Run-Off-Road listed as the major cause. Considering all of the crashes the severity of the crashes includes 3 fatalities, 9 major injuries, 26 minor injuries, and 6 possible injuries as well as 25 unknown injury accidents.

We are proposing a systematic approach to improve traffic safety along this route. Our proposal includes a 3' wide HMA paved shoulder with a milled rumble strip. The milled rumble strip will serve as a warning for vehicles leaving the roadway. The paved shoulder will provide some opportunity to recover and return to the roadway before encountering a granular surface or an edge rut. Using the Crash Modification Factors Clearinghouse website, we are predicting that these improvements would provide a crash reduction factor of 0.35

EXHIBIT "C"

MARION COUNTY HIGHWAY G 28 TSIP APPLICATION

C. ITEMIZED BREAKDOWN OF ALL COSTS

ITEM	UNIT	Quantity	Unit Price	Extended Price
Excavation Class 13 for Widening	CY	4869.33	$20.00	$97,386.60
Paved Shoulder, HMA , 6"	SY	29216	$24.00	$701,184.00
Milled Shoulder Rumble Strip, HMA Surf	STA	876.48	$12.50	$10,956.00
Pavement Marking, Waterborne	STA	876.48	$10.00	$8,764.80
Mobilization	LS	1	$50,000.00	$50,000.00
Traffic Control	LS	1	$10,000.00	$10,000.00
Flaggers	EA	18	$325.00	$5,850.00
Pilot Car	EA	6	$500.00	$3,000.00
Asphalt Emulsion for Fog Seal, Rumble Strips	GAL	1266	$5.25	$6,646.50
			TOTAL	**$893,787.90**

Proposed Funding For Project

Traffic Safety Improvement Funds	$500,000.00
Marion County FM Funds	$393,787.90
TOTAL	**$893,787.90**

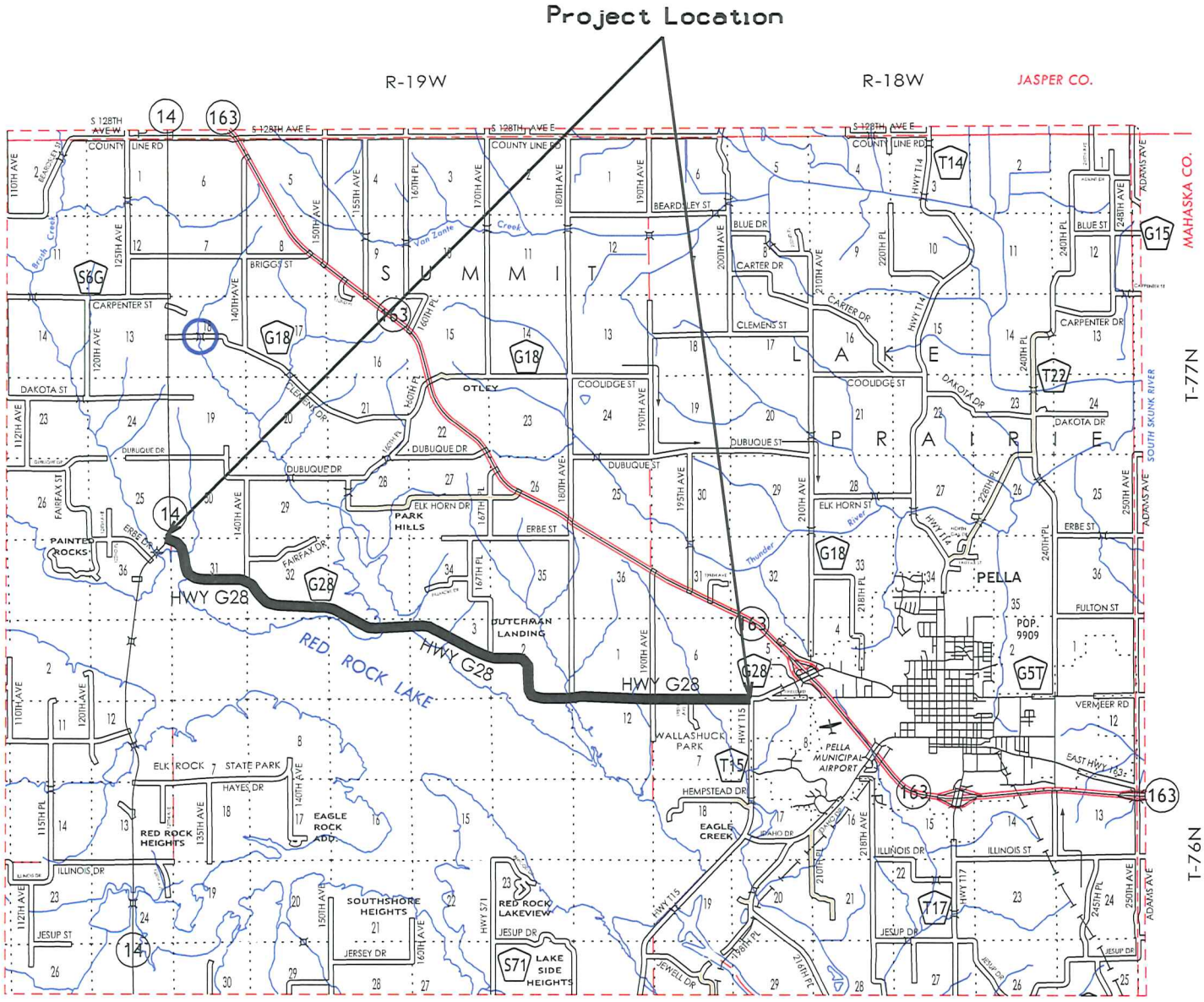
Marion County Highway G 28 TSIP Application

Proposed Timeline

1. Application deadline: August 15, 2014
2. Project Decision: December 2014
3. Funds Available: July 2015
4. Bid Letting: January or February 2016
5. Project Completion: November 2016

HIGHWAY G 28 TSIP APPLICATION
PROJECT LOCATION MAP

Exhibit E



MARION COUNTY

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Exhibit "F"

Photos of Route G28 along proposed TSIP Project from Hwy 14 to Hwy T 15

Photos taken starting at Hwy 14 and commencing easterly to Hwy T 15 . All photos were taken looking in an easterly direction.

From Hwy 14

Looking across fill section small tributary to Red Rock

From east end of same road fill

From near Cordova Tower entrance

From near house #1405

Cordova Cabins entrance

From near a pedestrian bride along adjacent trail south of roadway

From near west Roberts Creek entrance

Looking across Roberts Creek Dam, new trail along shoulder with cable guard rail
Already has a paved rumble shoulder across south side between road and guard rail

Another view of Roberts Creek Dam Trail & shoulder

From near east end of Roberts Creek Dam

Trail section east of Roberts Creek, Cable Rail , no paved rumble shoulder

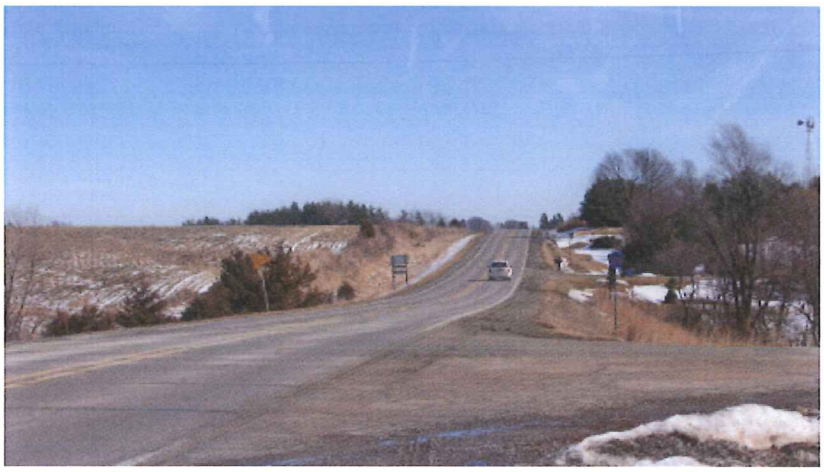
From near Fifield Recreation Area

From west of Dutchman's Landing Subdivisions

Intersection at Dutchman's Landing, trail along south side, guard rail no paved shoulder

East of Dutchman's Landing, more trail along south side

From Hunters Ridge Subdivision



From Wallashuck Recreation Area

From area east of Wallashuck entrance, nearing Pella & Hwy T15

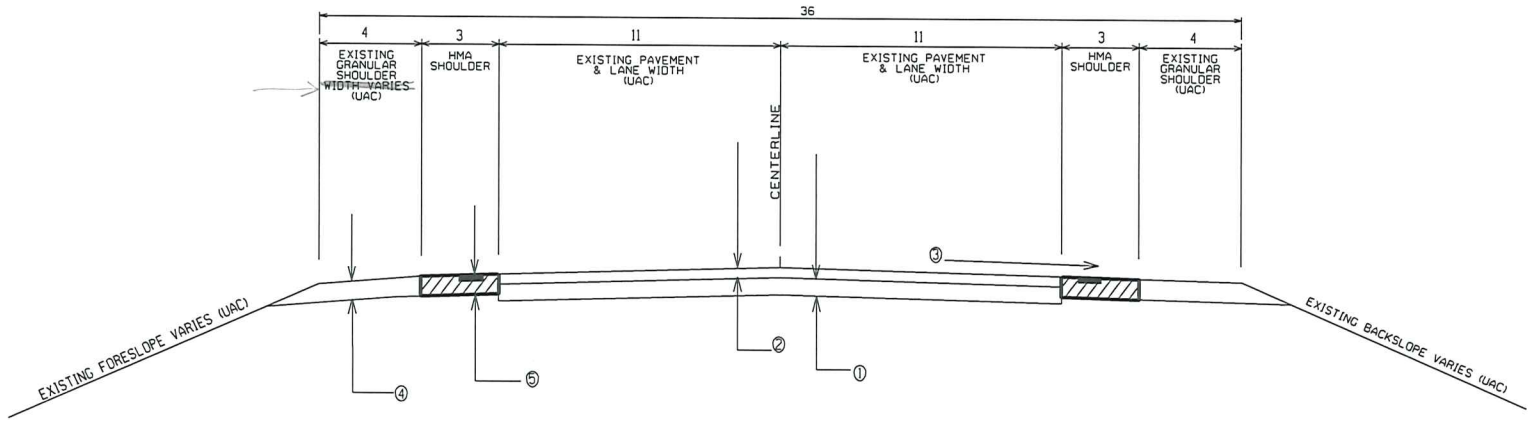
Looking at T 15 intersection

LETTING DATE: XX/XX/XX

MARION COUNTY

EXHIBIT "G"

TYPICAL WIDENING SECTION
SYMETRICAL ABOUT CENTERLINE
STATION 0+00 TO 438+20



NOTES

1. Existing PCC pavement 7" thick (UAC). Subbase material is unkown.

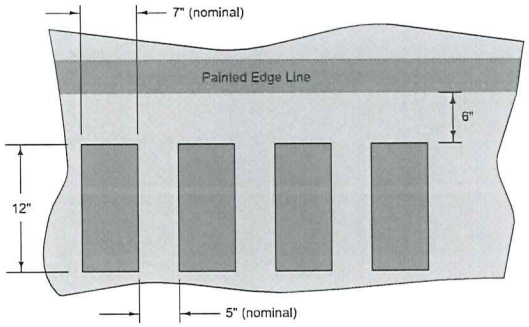
2. Existing HMA Resurfacing in 2004, 3" thick; consisting of 1.5" Intermediate and 1.5" Surface (UAC).

3. Slope of the existing pavement is 2% but may vary. Slope of HMA Paved Shoulders shall be match the pavement slope. Slope of granular shoulder is 4% (UAC).

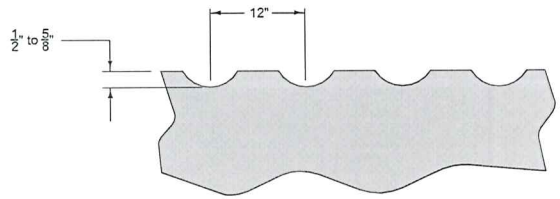
4. Existing Granular Shoulder (UAC).

5. HMA Widening 3' width and 6" thickness. Class 13 Excavation for Widening 3' width and 6" depth. Milled Shoulder Rumble Strip per Standard Road Plan PV 12.

DESIGNER INFO



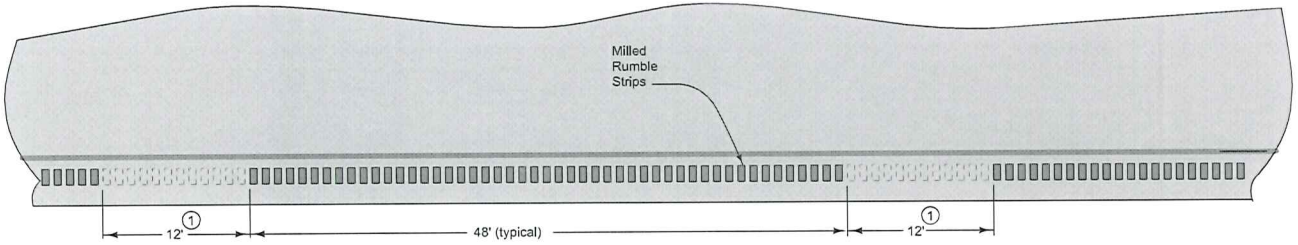
PLAN



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

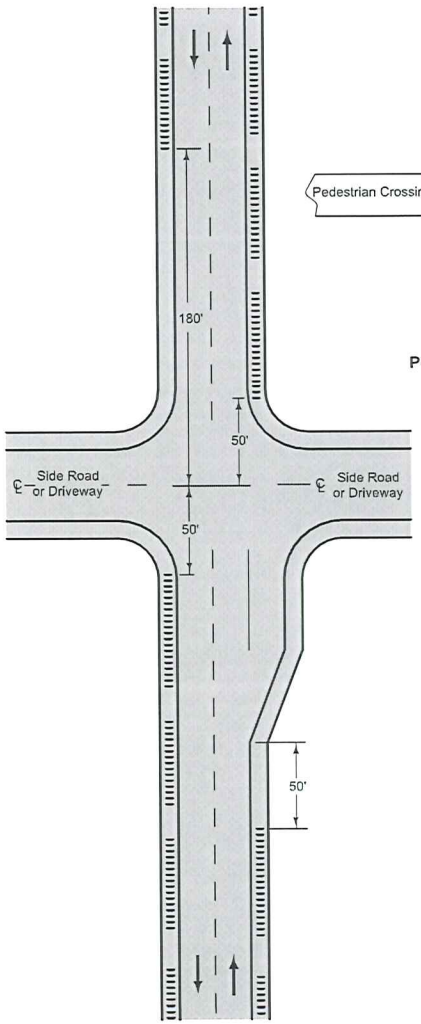
SHEET 1 of 2

REVISIONS: Added drawing to sheet 2 to clarify procedure for gapping rumble strips for a pedestrian crossing.

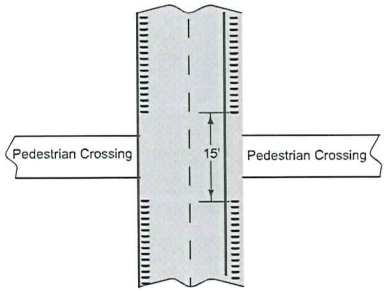
Deanna Maifeld
APPROVED BY DESIGN METHODS ENGINEER

MILLED SHOULDER RUMBLE STRIPS

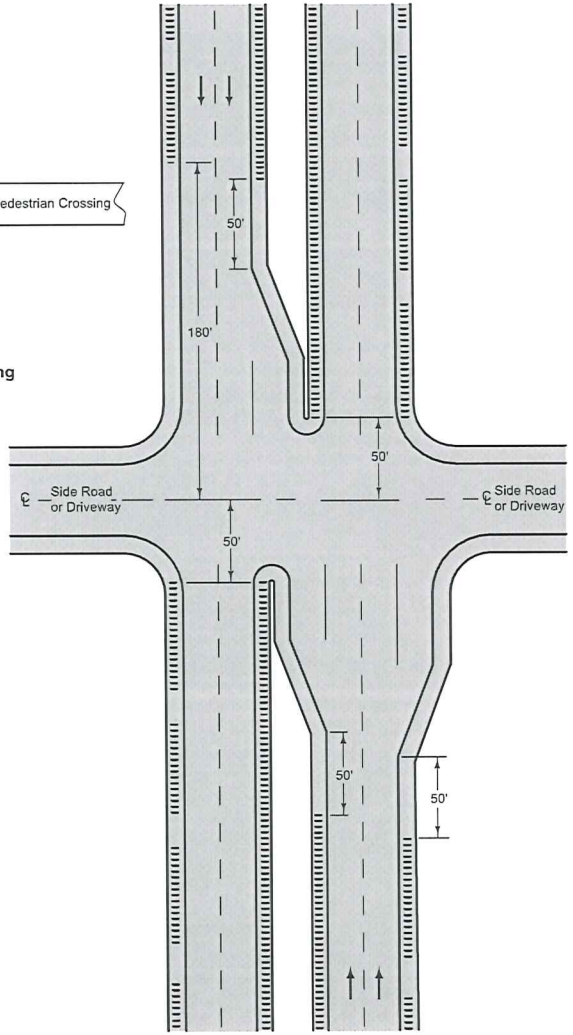
Exhibit "G"



UNDIVIDED HIGHWAYS

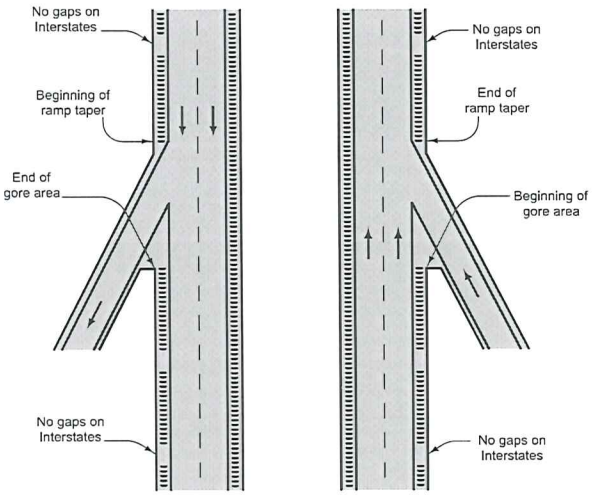


Pedestrian Crossing

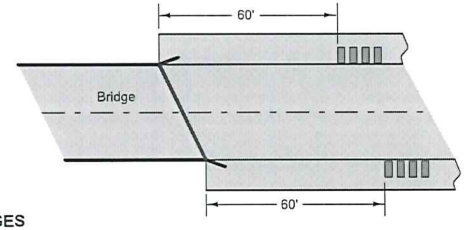


DIVIDED HIGHWAYS

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

Exhibit "G"

Marion County G 28 TSIP Application

Exhibit "H"

0 2,625 5,250 10,500 Feet

N

Exhibit "I"

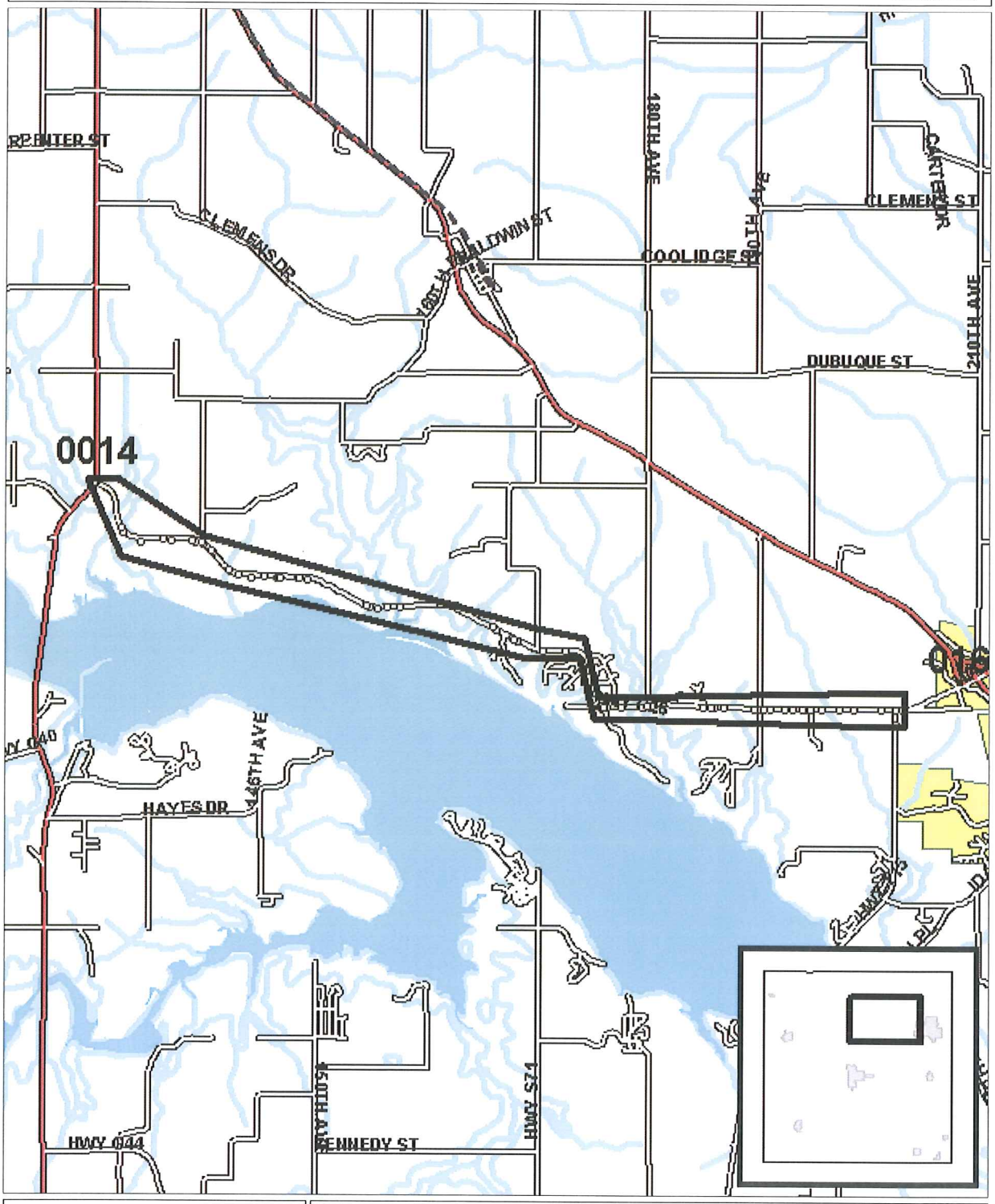
Iowa Department of Transportation

Location Map

Hwy G28 From Hwy14 to Hwy T 15

Incidents: 111

Report Version 1 1 Mar 2005



Analyst: Jay

Notes: Potential TSF/HSIP Safety Project Safety Widening With

Iowa Department of Transportation

Major Cause Summary

Hwy G28 From Hwy14 to Hwy T 15

Report Version 1.1 Jan 2005

Analysis Years: 2003 [12], 2004 [21], 2005 [16], 2006 [11], 2007 [7], 2008 [10], 2009 [9],

Crash Summary:

Fatal	2
Major Injury	4
Minor Injury	18
Possible/Unknown	21
PDO	66
Total Crashes	111

Injury Summary:

Fatal	3
Major Injury	9
Minor Injury	26
Possible	6
Unknown	25
Total Injuries	69

TOT Property Damage: $459,855

AVG Property Damage: $4,143

Surface Condition Summary:

Dry	57
Wet	7
Ice	5
Snow	5
Slush	1
Sand/Dirt/Oil/Gravel	1
Water	-
Other	1
Unknown	19
Not Reported	15
Total Crashes	111

Major Cause Summary:

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

Selection Filter:

None

Analyst: Jay

Notes: Potential TSF/HSIP Safety Project Safety Widening With

Iowa Department of Transportation

Abbreviated Crash Report

Hwy G28 From Hwy14 to Hwy T 15

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
01/25/2003	2003002680	03A-018		Minor	HWY G28 / G028 measuring 3 Miles West from AIRPORT RD
01/27/2003	2003003827	03A-021		Minor	HWY G28 / G028 measuring 0.5 Miles Southeast from Iowa 0014 / HWY 14
02/11/2003	2003007120	03A-032		PDO	0 / 180TH AVE and G028 / HWY G28
02/15/2003	2003007121	03A-036		PDO	180TH AVE / 0 and HWY G28 / G028
04/24/2003	2003023004	03A-075		PDO	G028 / HWY G28 and T015 / HWY T15
05/01/2003	2003023013	03A-082		PDO	G028 / HWY G28 and T015 / HWY T15
07/10/2003	2003032979	03A-147		PDO	AMSTERDAM DR and G028 / HWY G28
08/07/2003	2003043240			PDO	G028 / HWY G28 measuring 4 Miles West from G028 / WASHINGTON ST and
11/04/2003	2003058036			PDO	G028 / HWY G28 measuring 6 Miles West from AIRPORT RD
11/16/2003	2003058026			PDO	G028 / HWY G28
11/26/2003	2003061736			PDO	G028 / HWY G28
12/13/2003	2003063887	SP314081249		✓ Major	G028 / HWY G28
01/01/2004	2004203567			PDO	G028 / HWY G28 measuring 2 Miles West from G028 / WASHINGTON ST
01/19/2004	2004203568			PDO	Iowa 0014 / HWY 14 measuring 5 Miles South from Iowa 0014 / MONROE ST
03/22/2004	2004214593			PDO	G028 / HWY G28 measuring 2 Miles Southeast from Iowa 0014 / HWY 14
04/10/2004	2004217584			Minor	G028 / HWY G28 measuring 0.5 Miles Southeast from Iowa 0014 / HWY 14
04/29/2004	2004226589			PDO	G028 / HWY G28
05/07/2004	2004222592	SP414169219		✓ Fatal	G028 / HWY G28
05/22/2004	2004223492	SP414169221		PDO	IOWA 0014 / HWY 14 AND G028 / HWY G28
06/06/2004	2004226990			PDO	G028 / HWY G28 and T015 / HWY T15
06/07/2004	2004226989			PDO	Iowa 0014 / HWY 14 and G028 / HWY G28
07/12/2004	2004240487			PDO	G028 / HWY G28
08/02/2004	2004235945			Poss/Unk	G028 / HWY G28 measuring 0.25 Miles West from G028 / HWY G28 and
09/28/2004	2004247833			PDO	G028 / HWY G28 measuring 250 Feet West from G028 / HWY G28 and 190TH
10/05/2004	2004247830			PDO	G028 / HWY G28 measuring 6 Miles West from G028 / WASHINGTON ST and
10/10/2004	2004247838			PDO	G028 / HWY G28
10/18/2004	2004265941	04A-217		Poss/Unk	G028 / HWY G28 and 195TH AVE
10/28/2004	2004253904			✓ Major	G028 / HWY G28 and 140TH AVE
11/15/2004	2004254690	SP414463246		PDO	G028 / HWY G28 MEASURING 7 MILES WEST OF PELLA (2.5 EAST OF HWY. 14)
11/18/2004	2004265936	04A-244		PDO	Iowa 0014 / HWY 14 and G028 / HWY G28
11/22/2004	2004265925	04A-247		PDO	G028 / HWY G28 measuring 1 Miles Southeast from Iowa 0014 / HWY 14
11/25/2004	2004265937	04A-253		PDO	G028 / HWY G28 measuring 4 Miles West from G028 / WASHINGTON ST and

Iowa Department of Transportation

Abbreviated Crash Report

Hwy G28 From Hwy14 to Hwy T 15

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
11/30/2004	2004265945	04A-259		PDO	G028 / HWY G28 measuring 6 Miles West from G028 / WASHINGTON ST and
02/08/2005	2005212152			PDO	G028 / HWY G28
02/18/2005	2005209647			PDO	G028 / HWY G28 and T015 / HWY T15
02/24/2005	2005209843	SP514076205		PDO	G028 / HWY G28 MEASURING 0.3 MILE EAST OF 140TH AVE. (7 WEST OF
03/10/2005	2005211766			PDO	G028 / HWY G28 and 140TH AVE
04/25/2005	2005238575	05A-071		Poss/Unk	G028 / HWY G28 measuring 2.2 Miles West from G028 / HWY G28 and T015
05/12/2005	2005238583	05A-081		PDO	G028 / HWY G28 and HOLLAND DR
05/29/2005	2005238592	05A-097		PDO	G028 / HWY G28
06/17/2005	2005238596	05A-105		Poss/Unk	G028 / HWY G28 and AMSTERDAM DR
06/20/2005	2005229690	SP514414226		Minor	G028 / HWY G28
07/10/2005	2005238620	05A-122		Poss/Unk	Iowa 0014 / HWY 14 and G028 / HWY G28
08/19/2005	2005238641	05A-145		PDO	Iowa 0014 / HWY 14 and G028 / HWY G28
09/05/2005	2005246496	05A-156		PDO	G028 / HWY G28 MEASURING 1 MILES EAST FROM G028 / HWY G28 AND 140TH
09/26/2005	2005243897	05A-166		Poss/Unk	819 HWY T15
11/07/2005	2005252004	05A-205		PDO	G028 / HWY G28 MEASURING 3 MILES WEST FROM OFF ROADWAY/ROADWAY NOT
12/11/2005	2005260289	05A-252		Poss/Unk	G028 / HWY G28 measuring 10872 Feet West from AIRPORT RD
12/29/2005	2005264974			PDO	G028 / HWY G28
01/14/2006	2006207879	06A-009		Minor	G028 / HWY G28 measuring 3 Miles West from G028 / WASHINGTON ST and
01/25/2006	2006202914	06A-037	Pella	PDO	G028 / HWY G28 MEASURING 4 MILES WEST FROM OFF ROADWAY/ROADWAY NOT
02/08/2006	2006205414	06A-033		PDO	IOWA 0014 / HWY 14 AND G028 / HWY G28
03/21/2006	2006211466	06A-067		PDO	G028 / HWY G28
06/16/2006	2006224312	06A-115	Pella	Minor	G028 / HWY G28 AND 0 / 180TH AVE
07/06/2006	2006227609	06A-132		PDO	HOLLAND DR and G028 / HWY G28
08/12/2006	2006233846	06A-156		PDO	G028 / HWY G28
09/09/2006	2006240829	06A-171		PDO	G028 / HWY G28 MEASURING 1 MILES WEST FROM G028 / WASHINGTON ST
09/10/2006	2006240831	06A-173		PDO	IOWA 0014 / HWY 14 AND G028 / HWY G28
09/28/2006	2006241954	40628ISP		PDO	3 E. HWY 14 ON G-28
11/05/2006	2006249235			PDO	G028 / HWY G28 measuring 0.5 Miles West from WASHINGTON ST and G028 /
01/03/2007	2007200069	07A-002		PDO	G028 / HWY G28 MEASURING 6.01 MILES WEST FROM G028 / HWY G28
01/05/2007	2007200516	07A-003		Poss/Unk	G028 / HWY G28 AND T015 / HWY T15
04/10/2007	2007366498	07A-072		Poss/Unk	G028 / HWY G28 measuring 0.5 Miles Southeast from Iowa 0014 / HWY 14
05/10/2007	2007371529	07A-096		Poss/Unk	G028 / HWY G28 and 180TH AVE

Iowa Department of Transportation

Abbreviated Crash Report

Hwy G28 From Hwy14 to Hwy T 15

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
07/09/2007	2007380819	07A126		Minor	G028 / HWY G28
07/29/2007	2007388263	07A-145		Poss/Unk	G028 / HWY G28
10/21/2007	2007402072	07A-200		✓Major	G028 / HWY G28 measuring 4 Miles West from G028 / WASHINGTON ST
01/04/2008	2008415864	08A-003		PDO	G028 / HWY G28 measuring 2500 Feet Southeast from Iowa 0014 / IOWA 14
01/13/2008	2008418127	08A-015		PDO	G028 / HWY G28 measuring 2 Miles West from G028 / WASHINGTON ST
01/24/2008	2008445000	08A-025		PDO	G028 / HWY G28
02/24/2008	2008429236			Minor	G028 / HWY G28 and T015 / HWY T15
04/05/2008	2008435985	08A-073		Poss/Unk	G028 / HWY G28
06/20/2008	2008448256	08A116		Minor	G028 / HWY G28
07/11/2008	2008451711	08A-122		PDO	ROBERTS CREEK CAMPGROUND SITE #84
08/15/2008	2008455790	39051ISP		Minor	G028 / HWY G28 and T015 / HWY T15
09/19/2008	2008461249	44200ISP		Poss/Unk	G028 / HWY G28 50FT FROM ENTRANCE TO ROBERTS CREEK
11/29/2008	2008476486	08A-194		PDO	G028 / HWY G28 measuring 7.08 Miles West from Off Roadway/Roadway Not
02/13/2009	2009492846	09A-036		Poss/Unk	G028 / HWY G28
06/04/2009	2009510018	09A-086		PDO	G028 / HWY G28
07/12/2009	2009515802	2009041690		PDO	G028 / HWY G28 and OTTER CR / Roberts Creek
07/23/2009	2009518547	09A-116		Poss/Unk	RED ROCK RESERVOIR and G028 / HWY G28
08/08/2009	2009519827	09A-119		Minor	G028 / HWY G28
09/28/2009	2009527663	09A-142		Poss/Unk	G028 / HWY G28 and AMSTERDAM DR
10/03/2009	2009528314	09A-148		PDO	G028 / HWY G28 and T015 / HWY T15
10/27/2009	2009532222	09A-162		PDO	G028 / HWY G28
12/07/2009	2009541638	09A-193		PDO	G028 / HWY G28 and 190TH AVE
01/11/2010	2010548689	10A-005		Minor	G028 / HWY G28
02/15/2010	2010556988	10A-031		PDO	G028 / HWY G28 and 190TH AVE
02/16/2010	2010562741		Pella	PDO	G028 / HWY G28 measuring 0.5 Miles West from G028 / HWY G28 and T015
07/15/2010	2010581601	10A-114		Minor	Iowa 0014 / IOWA 14 and G028 / HWY G28
09/30/2010	2010592697	10A-156		Poss/Unk	G028 / HWY G28
10/05/2010	2010593840	10A-160		Poss/Unk	G028 / HWY G28 measuring 509 Feet East from HOLLAND DR and G028 / HWY
10/22/2010	2010597386	10A-173		PDO	G028 / HWY G28
11/20/2010	2010602661			PDO	G028 / HWY G28 measuring 5 Miles West from WASHINGTON ST and G028 /
01/04/2011	2011610550	11A-002		PDO	190TH AVE and G028 / HWY G28
01/06/2011	2011610549	11A-003		PDO	Iowa 0014 / IOWA 14 measuring 79 Feet Southwest from Iowa 0014 / IOWA

Iowa Department of Transportation

Abbreviated Crash Report

Hwy G28 From Hwy14 to Hwy T 15

Report Version 1.2 Mar 2005

Date	DOT Case #	Agency Case #	City	Crash Sev.	Literal Description
01/13/2011	2011612552	2011002924		✓Major	INTERSECTION OF IOWA 0014 / IOWA 14 AND G028 / HWY G28
02/15/2011	2011618566	11A-019		PDO	G028 / HWY G28 measuring 4 Miles West from G028 / WASHINGTON ST
04/28/2011	2011628314	11A-041		Poss/Unk	G028 / HWY G28 measuring 298 Feet East from G028 / HWY G28 and 167TH
05/20/2011	2011631640	11A-048		PDO	G028 / HWY G28
07/10/2011	2011638595	11A-080		Minor	G028 / HWY G28
07/17/2011	2011638826	11A-082		Minor	G028 / HWY G28 and Iowa 0014 / IOWA 14
12/18/2011	2011663456			PDO	G028 / HWY G28 measuring 3 Miles West from WASHINGTON ST and G028 /
12/26/2011	2011664701	2011071637		Minor	G028 / HWY G28 AT ROBERTS CREEK PARK
04/01/2012	2012679590	12A-045		Minor	G028 / HWY G28
04/10/2012	2012682466	12A-0048		Poss/Unk	G028 / HWY G28
04/22/2012	2012682463	12A-055	Pella	✓Fatal	G028 / HWY G28
07/12/2012	2012707387	12A-089		PDO	G028 / HWY G28 AND DES MOINES R / WALLINGSLOCK CREEK MEASURING 200
08/08/2012	2012707395	12A-098		Poss/Unk	G028 / HWY G28
11/26/2012	2012713841	12A-169		PDO	G028/HWY G28 MEASURING 5296 FEET WEST FROM HWY T-15
12/02/2012	2012715420	12A-175		Minor	G028/HWY G28

Selection Filter:

None

Analyst: Jay

Notes: Potential TSF/HSIP Safety Project Safety Widening With Rumble Edge

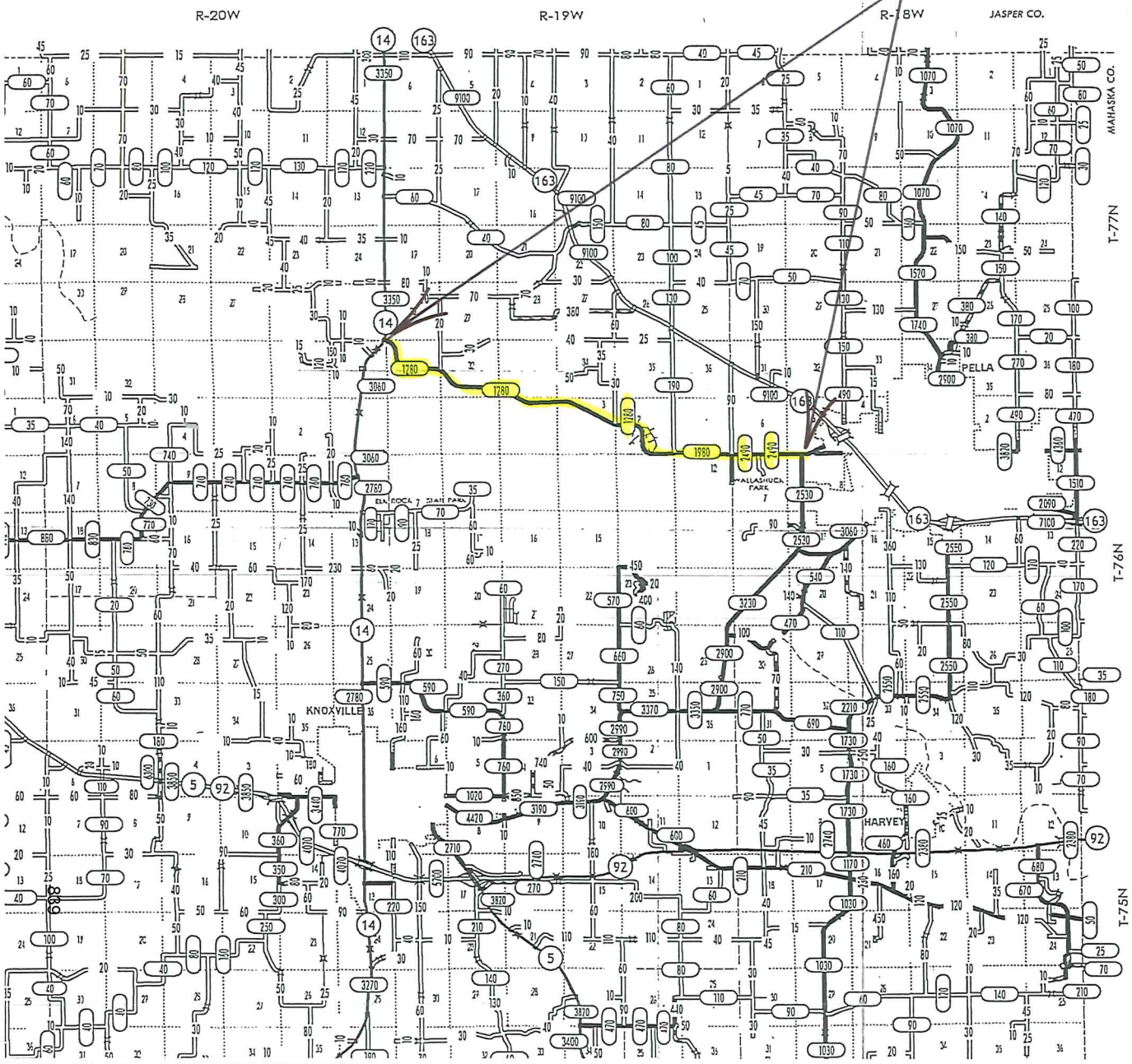
Marion County G28 TSIP Application

Exhibit "J"

(2010) ANNUAL AVERAGE DAILY TRAFFIC

2006 ANNUAL AVERAGE DAILY TRAFFIC

Project Location



TRAFFIC FLOW MAP OF MARION 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, 2010

MILES 0 1 2 3 4
KILOMETERS 0 1 2 3 4 5 6

9 - 17 - 10

LEGEND

DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD
LEGAL NOT OPEN ROAD

Exhibit "L"

Rev. 7/10

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: Marion Prepared by: Jay Davis Date Prepared: Mar 1, 2014

Location: Highway G 28 from Hwy 14 to Hwy T 15

Improvement

Proposed Improvement(s): HMA Widening/Paved Shoulder with Milled Rumble Strips

$ 893,788	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ 3,000	Other Annual Cost (after initial year), **AC**	35	Crash Reduction Factor (integer), **CRF**
$ 40,771	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	**$ 934,559**	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Count Map 2010 Date of traffic count

Length (mi.)	Two-way veh/day	Description
6.00	1,280	Hwy 14 to 180th
1.00	1,980	180th to 190th
1.07	2,490	190th to T 15
8.07	miles total	

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

12,324	Current Vehicle Miles / Day, **VM**
18,313	End of Life Veh. Miles / Day
4,498,370	Current Veh. Miles / Year, **AM**
109,298,547	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

2003 First full year --> 2012 Last full year 10.0 years, Time Period, **T**

Additional months values as of Dec. 2007

2	Fatal Crashes →	3	Fatalities @	$3,500,000	$ 10,500,000
		9	Major Injuries @	$240,000	$ 2,160,000
45	Injury Crashes →	26	Minor Injuries @	$48,000	$ 1,248,000
		31	Possible Injuries @	$25,000	$ 775,000
66	Property Damage Only		(assumed cost per crash)	$2,700	$ 305,100
			-OR- enter all Property Costs of all crashes:		
113	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 14,988,100

11.30	Current Crashes / Year, **AA** = TA / T	**251.2**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 132,638	Cost per Crash, **AVCR** = LOSS / TA	**$ 8,441,414**	Present Value of Avoided Crashes, **BENEFIT**
274.6	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
3.96	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 524,584	Crash Costs Avoided in First Year, AAR x AVCR		
96.1	Total Avoided Crashes, TCR x CRF/ 100		

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

Benefit / Cost Ratio

Benefit : Cost = $8,441,414 : $934,559 = **9.03** : 1

Iowa Department of Transportation

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Iowa Highway 415 / NW 2nd Avenue

Applicant: Polk County

Contact Person: Kurt Bailey, P.E. Title: Polk County Engineer

Complete Mailing Address: 5885 NE 14th Street
Des Moines, IA 50313

Phone: 515-286-3705 (Area Code) E-Mail: kurt.bailey@polkcountyiowa.gov

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

Co-Applicant(s) _____

Contact Person _____ Title _____

Complete Mailing Address _____

_____

Phone _____ (Area Code) E-Mail _____

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 514,000

Safety Funds Requested $ 320,000

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 County of Polk

Signed: John F Mauro 8/12/14

Signature Date Signed

John F. Mauro, Chair, Polk County Board of Supervisors

Typed Name

Attest: Becky Dewey 8/12/14

Signature Date Signed

Becky Dewey, Chief Asst County Clerk

Typed Name

Res. No. 150-14
August 12, 2014

RESOLUTION

Moved by Hockensmith, Seconded by Connolly that the following resolution be adopted:

WHEREAS, the Public Works Department has received requests for traffic safety improvements from the area residents and businesses that utilize the NW 49th Place to access IA Hwy 415 (NW 2nd Avenue); and

WHEREAS, in response to these concerns, in 2012 the Iowa Department of Transportation, in cooperation with the Polk County Public Works Department, completed a Traffic Engineering Assistance Program (TEAP) report on the Iowa 415 corridor from NW Aurora Avenue to NW 54 Avenue which resulted in several traffic safety improvement recommendations, including construction of traffic signals at the intersection of NW 49th Place and signal coordination of the existing signals in the corridor; and

WHEREAS, Resolution 139-14 dated July 22, 2014, approved a Cooperative Agreement with the Iowa DOT which specified the funding and project development responsibilities for each entity for completion of the project and also approved a Professional Services Agreement with Snyder & Associates, Inc. to design the traffic safety improvements and prepare a Traffic Safety Improvement Program (TSIP) funding application; and

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 recommends that the completed TSIP application be submitted to the Iowa Department of Transportation for possible funding for the above referenced 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 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 certification 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:

John F. Mauro
Chairperson

RECOMMENDED FOR APPROVAL:

Robert Rice
Robert Rice, Director
Polk County Public Works

ROLL CALL FOR ALLOWANCE			
	Steve Van Oort	Yea	Nay
	Robert Brownell	Yea	Nay
	Tom Hockensmith	Yea	Nay
AUG 12 2014	Angela Connolly	Yea	Nay
	John F. Mauro	Yea	Nay
ALLOWED BY VOTE OF BOARD	Yea 5	Nay 0	
	Above tabulation made by BJ		

John F. Mauro
CHAIRPERSON

#13

NARRATIVE

Existing Conditions

Iowa Highway 415 (NW 2nd Avenue) is a divided four-lane rural roadway with gravel shoulders grass median from the intersection with Iowa Highway 160 and undivided south of NW 43rd Place. Iowa Highway 415 is a parallel route to I-35 and provides access to the western side of Ankeny from I-80/35. The posted speed limit north of NE 54th Avenue is 55 MPH, north of 43rd Place is 45 mph, and south of NW 43rd Place, the posted speed limit is 35 mph.

The intersections of Iowa Highway 415 from NE 54th Avenue to Aurora Avenue controlled by traffic signals include NE 54th Avenue, I-80/35 North Ramps, I-80/35 South Ramps, NW 47th Place, NE 46th Avenue, and Aurora Avenue. All other roads intersecting Iowa Highway 415 are STOP controlled on the intersecting street. Properties adjacent to Iowa Highway 415 are mostly commercial within the corridor with the only residential properties along NW 51st Place.

Recent development along NW 49th Place east of Iowa Highway 415 and growth of Ankeny westward has created congestion during the peak periods at the IA 415 and I-80/35 Ramp intersections and NW 49th Place. During the AM peak period, southbound queues at the north ramp intersection often extend to NW 52nd Avenue. Also the recent development near NW 49th Place has also raised concern about traffic control at the intersection.

The corridor was the subject of a joint Polk County/Iowa DOT Traffic Engineering Assistance Program (TEAP) study completed in April 2012. The request of the study was to mitigate traffic congestion/operations and improve safety along the corridor. This TSIP application is consistent with the capacity and safety improvements recommended in the TEAP report.

Traffic Counts
The Iowa DOT conducted intersection turning movement traffic counts at 54th Avenue, I-80/35 north ramp, I-80/35 south ramp, Broadway Avenue, and Aurora Avenue in 2012. Traffic counts were conducted at 49th Place in 2011 including peak hour turning movement counts and 24-hour approach road-tube counts. The 2012 average annual daily traffic (AADT) ranged from 23,400 vehicles per day (vpd) near NW 54th Avenue to 19,400 vpd near Aurora Avenue. Traffic count data are included in Section J.

Crash History
Crash data from 2009 to May of 2014 for the corridor of Iowa Highway 415 from NE 54th Avenue to Aurora Avenue was obtained from the Iowa Department of Transportation and analyzed through Iowa Department of Transportation's crash analysis software CMAT and SAVER. Crash reports for injury crashes were obtained from Polk County Sheriff's Department. Crash trends and crash mitigations were identified in the previous TEAP study from analyzing crash data from 2006 to 2010.

During this five and a half year period from NE 54th Avenue to Aurora Avenue, 286 crashes occurred, including one fatal crash and 57 personal injury crashes (3 major injury, 12 minor injury, and 42 possible/unknown injury crashes). The injury crashes resulted in one fatality, four

major injuries, 19 minor injuries, and 53 possible/unknown injuries. The crash rate for the corridor was 454.9 crashes/hundred million vehicle miles traveled (cr/HMVMT). The crash rate is higher than the statewide average of 275 cr/HMVMT for municipal primary highways. Although the corridor is not within corporate limits, the corridor is within the Des Moines metro area, so the municipal primary crash rate was used for comparison.

Crashes were associated to intersections based on location of the crash being within 150 foot spatial proximity. Eight cashes reported at NW 49th Place during the analysis period are considered correctable with the installation of a traffic signal, and seven crashes were southbound rear-end collisions which are associated with slowing or stopped vehicles.

The crash analysis of the north ramp of the interchange with I-80/35 may not report all the crashes related to the intersection due to the long queues during peak traffic periods along Iowa Highway 415 and the lack of information on the investigating officer crash report. Table 1 lists crashes and injuries by severities per location. Section I includes personal injury crashes investigating officers report for the intersections of NW 49th Place, I-80/35 north ramp, and NW 47th Place during the analysis period. Major cause summaries and collision diagrams are provided in the appendix.

Table 1: Crash (Injury) Severity Iowa Highway 415, (2009 – May 2014)

Location	Fatal	Major Injury	Minor Injury	Possible/ Unknown	PDO	Total	Amount of Property Damage
NW 49th Pl	-	-	-	2 (2)	15	17 (2)	$86,350
I-80/35 North Ramp	-	-	-	4 (4)	22	26 (4)	$143,470
NW 47th Pl	-	-	1 (1)	1 (1)	17	19 (2)	$111,895
54th Ave to Aurora Ave	1 (1)	3 (4)	12 (19)	42 (53)	228	286 (77)	$1,750,634

NW 49th Place Traffic Signal Warrant Analysis

Traffic signal warrant analysis was performed for the intersection of NW 49th Place with Iowa Highway 415 using 2011 traffic volumes. The warrant analysis was conducted according to the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, standards. Warrant 4 (Pedestrian Volume), Warrant 5 (School Crossing), Warrant 6 (Coordinated Signal System), Warrant 8 (Roadway Network), and Warrant 9 (Near Grade Crossing) were not considered applicable to the study. Table 2 summarizes the warrant analysis and also lists the number of hours that satisfy each warrant condition. Warrant analysis worksheets are included in the appendix.

Table 2: Traffic Signal Warrant Analysis (#Hours)

Warrant	Met ?
Warrant 1 -8 Hour Volumes	
1A - Minimum Volume	No (1)
1B - Interruption of Continuous Traffic	Yes (11)
Warrant 2 - 4 Hour Volume	Yes (9)
Warrant 3 - Peak Hour	
3A - Peak Hour Delay	Not Evaluated
3B - Peak Hour Volume	Yes
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated System	Not Evaluated
Warrant 7 - Crash Experience	No (2 crashes)
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - At-Grade Crossing	Not Evaluated

Proposed Improvement Plan

Based on the above corridor safety performance and identified concerns, as well as the 2012 Iowa DOT TEAP report, the Polk County proposes the following corridor and intersection improvements.

Traffic Signal Interconnect

- Currently there is fiber optic cable running along the east side of the corridor from Aurora Ave to NW 54th Ave. Only the traffic signal controllers at the intersections of NW 47th Place, I-80/35 south ramp, and I-80/35 north ramp are connected by fiber optic cable. The remainder of the signalized intersections will be connected to the existing fiber optic cable to provide coordinated signal operation and allow the City of Des Moines to monitor the traffic signals and implement any signal timing changes from their traffic control center.
- Coordinated traffic signal timings plans will be implemented for the corridor. The coordinated timing plans will be based on current traffic patterns.

NW 49th Place

- With the increased left turning traffic from Iowa Highway 415, dedicated positive offset left turn-lanes will be provided. The south approach has a dedicated left turn-lane and should be reconfigured to obtain a positive offset.
- The existing traffic volumes at the intersection satisfy traffic signal warrants, and from analyses and observations of the intersection, a traffic signal would be beneficial. Although intersection spacing is less than ideal, acceptable operations and queuing are expected with proper signal timing and coordination. Once a traffic signal is installed, monitoring of the intersection will ensure that the new traffic signal timings are properly coordinated with the adjacent I-80/35 ramp traffic signals and progressive flow of traffic

is provided through the traffic signals. The traffic signal phasing will included protected/permissive left turns for Iowa Highway 415 traffic and permissive left turning phasing for NW 49th Place.

- Intersection improvements along with traffic signal layout are shown in Section K.

I-80/35 North Ramp

The southbound right turn-lane should be channelized to provide a free movement on to the westbound entrance ramp with the addition of a receiving lane on the ramp. The two lanes on the ramp would merge to one lane with the start of the lane drop taper 200 feet west of the intersection. The channelization should provide a 100 feet radius with a raised island to provide lane definition. The ramp merge should have the northbound left turning vehicles in the outside lane merging into the right turning vehicles in the inside lane. This modification is expected to significantly reduce southbound queuing and improve northbound left turn operations at the intersection.

NW 47th Place

- A southbound left turn-lane is warranted and will remove southbound left turning vehicles from the through travel lanes. The existing conditions either cause a southbound left turning vehicle to block one of the through lanes or pull into the median opening and block northbound left turning vehicles from entering the median opening. The southbound left turn-lane will be positive offset so that opposing northbound and southbound left turning vehicles due not block sight distance.
- Intersection improvements are shown in Section G.

Agency Support

Polk County has worked with Iowa DOT District 1 and Iowa DOT Office of Traffic & Safety in developing the proposed improvements in the April 2012 Iowa DOT TEAP Report. Iowa DOT is currently preparing an interchange operations report for the proposed interchange modifications. DOT District 1 has approved the use of C-STEP funding to assist with construction of proposed improvements.

ITEMIZED PROJECT COST BREAKDOWN
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

LINE NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	FIBER OPTIC CONNECTIONS FOR SIGNALS	EA	4	$4,000	$16,000
2	NW 47TH PLACE TURN LANE	EA	1	$40,000	$40,000
3	NW 49TH PLACE TRAFFIC SIGNAL	EA	1	$185,000	$185,000
	LEFT TURN LANES	EA	1	$60,000	$60,000
4	RIGHT TURN LANE FOR WB I-80	EA	1	$90,000	$90,000
	SIGNAL MODIFICATIONS	EA	1	$40,000	$40,000
				SUBTOTAL COSTRUCTION	$431,000
				POLK COUNTY IN-KIND COST FOR DESIGN, ADMINISTRATION AND CONSTRUCTION OBSERVATION	$28,000
				CONSULTANT COST FOR TRAFFIC SIGNAL DESIGN, CONSTRUCTION SERVICES AND SIGNAL TIMING PLANS	$55,000
				TOTAL PROJECT COST	**$514,000**

PROPOSED FUNDING SOURCES
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

SOURCE	AMOUNT
Traffic Safety Improvement Program Funding (TSIP - Site Specific)	$320,000
County-State Traffic Engineering Program (C-STEP)	$111,000
Local Funds – Design Services and Construction	$83,000
PROJECT TOTAL	**$514,000**

PROPOSED PROJECT SCHEDULE
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

August 2014	TSIP Application
December 2014	Iowa DOT Approval
January 2015	TSIP Agreement
September 2014 – March 2015	Project Engineering & Plan Development
April 2015	Project Letting
May 2015 – November 2015	Project Construction to Substantial Completion

LOCATON MAP
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

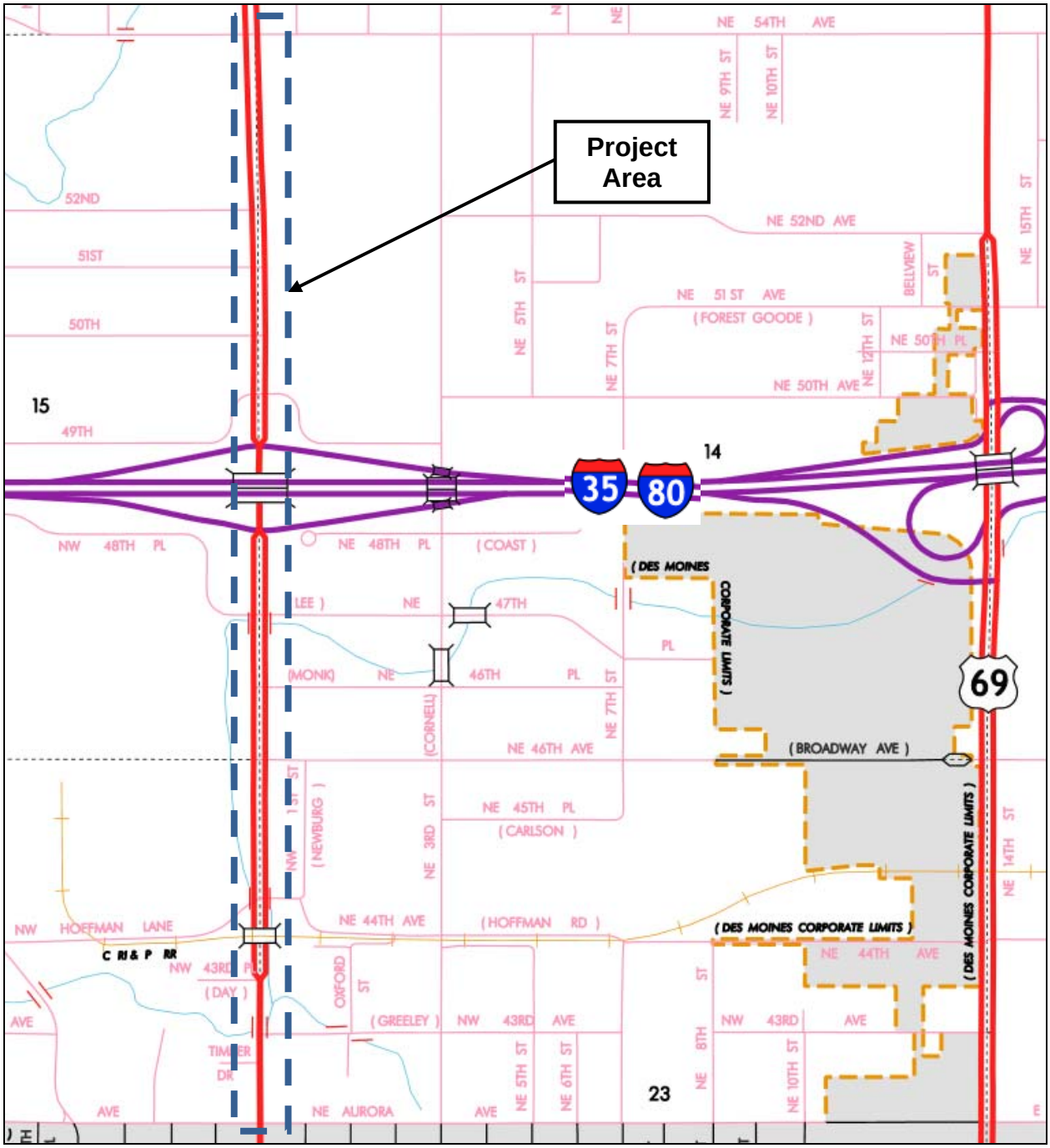


Photo 1: IA 415 looking south, north of NW 49th Place

Photo 2: IA 415 looking north at I-80/35 North Ramp

Photo 3: NW 49th Place, west approach, looking south

Photo 4: NW 49th Place, east approach, looking north

Photo 5: I-80/35 North Ramp looking west

Photo 6: IA 415 looking south, north of NW 47th Place

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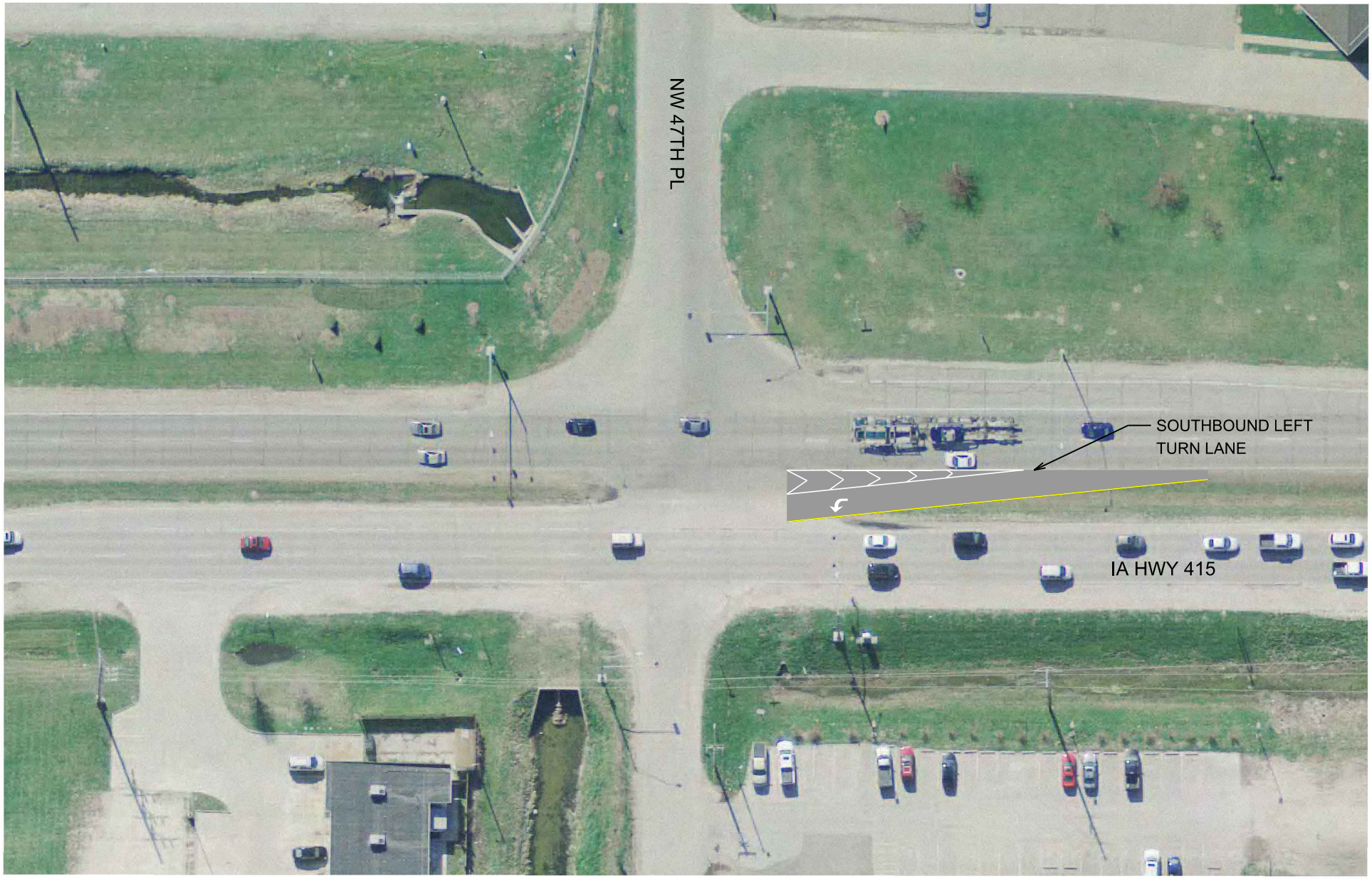
I-80/35 NORTH RAMP & IA HWY 415
INTERSECTION AND RAMP IMPROVEMENTS
POLK COUNTY, IOWA

N

0 30
SCALE (FEET)

G



855

NW 47TH PL & IA HWY 415
INTERSECTION IMPROVEMENTS
POLK COUNTY, IOWA

0 30
SCALE (FEET)

G

NW 54TH AVE
NW 52ND AVE
NW 51ST PL
NW 50TH PL
NW 49TH PL
415
I8035 WB ON RMP
I8035 EB OFF RMP
400ft

NW 48TH PL
NW 47TH PL
NW 2ND ST
NW 46TH PL
NW 46TH AVE
NW 1ST ST
NW HOFFMAN LN
NW 44TH AVE
NW 43RD PL
NW 43RD AVE
NW 42ND PL
400ft
AURORA AVE
NW AURORA AVE

DETAILED CRASH REPORTS – INJURY CRASHES

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77226565099

Count Date:

Monday, July 23, 2012

County:

Polk

Location Description:

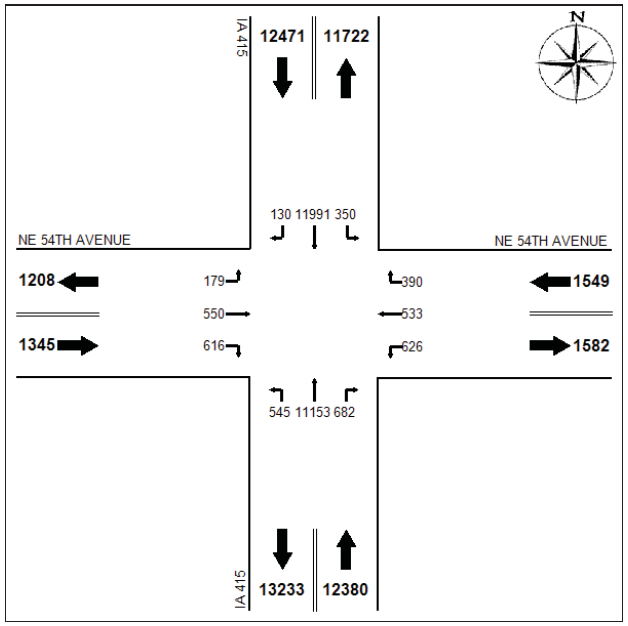
IA 415 & NW 54th Av

Volume Factor: 2.023

Pass Class Factor: 2.027

SU Class Factor: 1.637

Combo Class Factor: 1.752



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	14	428	5	16	6	3	5	124	11	5	13	10
07:15	6	227	2	5	10	6	5	66	11	4	12	23
07:30	15	476	6	16	5	10	7	266	18	4	19	30
07:45	8	526	5	16	9	6	6	210	18	4	20	30
08:00	9	387	1	10	3	3	6	123	15	5	9	8
08:15	6	220	3	16	5	2	9	125	5	3	5	11
08:30	6	192	5	12	1	8	7	113	5	1	5	15
08:45	5	163	2	3	8	5	10	129	6	2	5	16
11:00	3	142	1	14	3	3	12	116	9	9	11	7
11:15	6	118	1	10	11	4	8	152	13	0	6	12
11:30	8	147	1	12	6	3	9	128	12	2	1	7
11:45	2	128	0	9	8	6	15	130	16	1	10	10
12:00	5	145	0	14	12	4	15	128	12	1	3	6
12:15	3	145	3	13	11	5	14	138	13	1	14	9
12:30	2	136	4	11	13	6	4	123	8	4	10	21
12:45	6	137	3	9	5	8	10	133	10	2	7	9
15:00	4	155	0	8	12	12	6	153	16	1	10	11
15:15	6	148	3	4	10	4	11	178	10	4	7	8
15:30	6	208	3	14	18	7	11	195	15	3	15	13

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	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	9	208	1	6	14	8	10	248	10	2	16	11
16:00	3	199	4	15	8	12	12	205	9	4	5	5
16:15	5	189	1	5	13	7	17	320	20	3	8	8
16:30	7	214	0	20	16	6	15	360	15	5	10	7
16:45	6	200	2	10	16	14	9	425	18	6	13	8
17:00	5	185	4	15	16	20	15	338	18	6	7	8
17:15	8	162	1	12	10	5	23	374	10	4	12	5
17:30	5	212	1	11	10	9	3	289	9	2	9	5
17:45	7	161	3	7	7	8	8	261	9	2	12	7

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

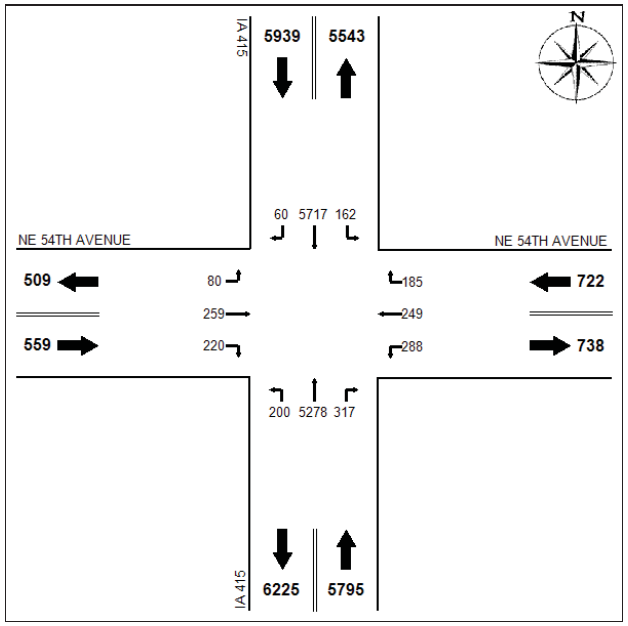
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	13	421	5	15	6	2	4	116	11	3	12	8
07:15	6	226	2	5	9	4	5	60	11	3	11	20
07:30	15	465	6	15	5	10	2	250	17	4	19	24
07:45	8	517	4	14	8	5	3	194	15	4	19	21
08:00	8	379	1	9	3	2	4	104	12	3	8	5
08:15	6	215	3	14	4	2	3	109	4	3	5	7
08:30	4	184	5	8	1	7	0	100	5	0	5	12
08:45	5	149	2	3	7	5	6	115	6	2	5	6
11:00	3	132	1	14	3	3	2	104	9	9	9	4
11:15	4	106	1	8	10	4	5	142	12	0	6	6
11:30	5	134	1	12	5	3	7	117	12	2	0	5
11:45	2	121	0	9	8	6	13	123	16	0	9	6
12:00	4	133	0	12	12	4	7	119	8	1	3	5
12:15	3	132	1	12	10	5	11	133	11	1	14	6
12:30	2	129	3	10	12	6	1	115	8	3	6	11
12:45	6	127	3	7	4	7	9	120	8	2	7	5
15:00	4	149	0	7	12	12	5	148	15	1	10	8
15:15	5	131	3	4	10	4	7	167	10	3	7	4
15:30	5	201	2	13	15	7	9	182	13	3	14	8

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	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	9	200	1	5	12	8	8	244	9	2	16	7
16:00	3	189	4	15	6	12	8	198	9	3	5	4
16:15	4	173	1	5	12	6	12	315	19	3	8	6
16:30	7	204	0	18	16	6	13	349	14	5	9	5
16:45	6	198	2	10	16	14	9	417	18	6	13	5
17:00	5	179	4	15	16	19	15	332	17	6	7	7
17:15	8	162	1	11	10	5	21	368	10	4	11	3
17:30	5	206	1	11	10	9	3	281	9	2	9	5
17:45	7	155	3	7	7	8	8	256	9	2	12	7

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

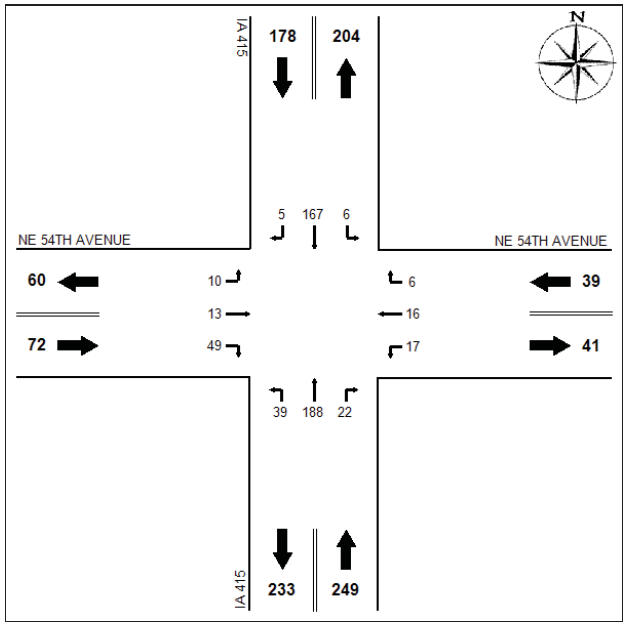
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	4	0	1	0	1	0	6	0	2	1	1
07:15	0	0	0	0	0	2	0	3	0	1	1	0
07:30	0	8	0	1	0	0	2	14	1	0	0	3
07:45	0	6	1	1	1	1	2	7	3	0	1	3
08:00	1	7	0	0	0	0	1	9	3	2	1	2
08:15	0	4	0	2	1	0	5	10	1	0	0	3
08:30	1	6	0	1	0	1	2	9	0	1	0	2
08:45	0	10	0	0	1	0	1	13	0	0	0	4
11:00	0	7	0	0	0	0	5	11	0	0	1	1
11:15	1	9	0	2	1	0	3	6	1	0	0	3
11:30	1	7	0	0	1	0	0	8	0	0	1	1
11:45	0	4	0	0	0	0	1	4	0	1	1	2
12:00	0	9	0	2	0	0	3	5	4	0	0	1
12:15	0	11	2	1	1	0	1	4	2	0	0	0
12:30	0	5	1	1	1	0	2	7	0	1	4	5
12:45	0	6	0	1	1	1	0	8	2	0	0	3
15:00	0	3	0	1	0	0	1	2	1	0	0	0
15:15	1	13	0	0	0	0	0	7	0	1	0	4
15:30	0	6	1	1	3	0	1	12	2	0	1	2

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	6	0	1	2	0	0	2	1	0	0	3
16:00	0	6	0	0	2	0	2	6	0	1	0	0
16:15	0	12	0	0	1	0	4	4	0	0	0	0
16:30	0	6	0	1	0	0	2	10	0	0	0	2
16:45	0	1	0	0	0	0	0	6	0	0	0	2
17:00	0	3	0	0	0	0	0	5	1	0	0	1
17:15	0	0	0	0	0	0	1	4	0	0	1	1
17:30	0	5	0	0	0	0	0	2	0	0	0	0
17:45	0	3	0	0	0	0	0	4	0	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

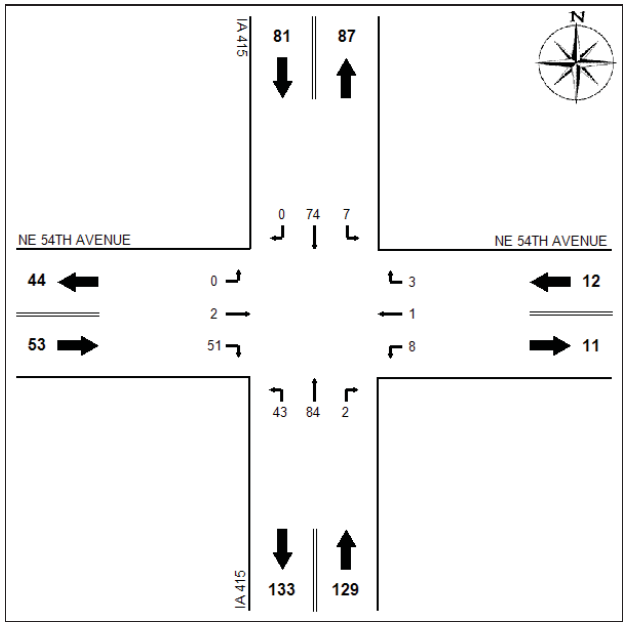
Station Number:
77226565099

Count Date:
Monday, July 23, 2012

County:
Polk

Location Description:
IA 415 & NW 54th Av

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	0	3	0	0	0	0	1	2	0	0	0	1
07:15	0	1	0	0	1	0	0	3	0	0	0	3
07:30	0	3	0	0	0	0	3	2	0	0	0	3
07:45	0	3	0	1	0	0	1	9	0	0	0	6
08:00	0	1	0	1	0	1	1	10	0	0	0	1
08:15	0	1	0	0	0	0	1	6	0	0	0	1
08:30	1	2	0	3	0	0	5	4	0	0	0	1
08:45	0	4	0	0	0	0	3	1	0	0	0	6
11:00	0	3	0	0	0	0	5	1	0	0	1	2
11:15	1	3	0	0	0	0	0	4	0	0	0	3
11:30	2	6	0	0	0	0	2	3	0	0	0	1
11:45	0	3	0	0	0	0	1	3	0	0	0	2
12:00	1	3	0	0	0	0	5	4	0	0	0	0
12:15	0	2	0	0	0	0	2	1	0	0	0	3
12:30	0	2	0	0	0	0	1	1	0	0	0	5
12:45	0	4	0	1	0	0	1	5	0	0	0	1
15:00	0	3	0	0	0	0	0	3	0	0	0	3
15:15	0	4	0	0	0	0	4	4	0	0	0	0
15:30	1	1	0	0	0	0	1	1	0	0	0	3

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	2	0	0	0	0	2	2	0	0	0	1
16:00	0	4	0	0	0	0	2	1	0	0	0	1
16:15	1	4	0	0	0	1	1	1	1	0	0	2
16:30	0	4	0	1	0	0	0	1	1	0	1	0
16:45	0	1	0	0	0	0	0	2	0	0	0	1
17:00	0	3	0	0	0	1	0	1	0	0	0	0
17:15	0	0	0	1	0	0	1	2	0	0	0	1
17:30	0	1	0	0	0	0	0	6	0	0	0	0
17:45	0	3	0	0	0	0	0	1	0	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

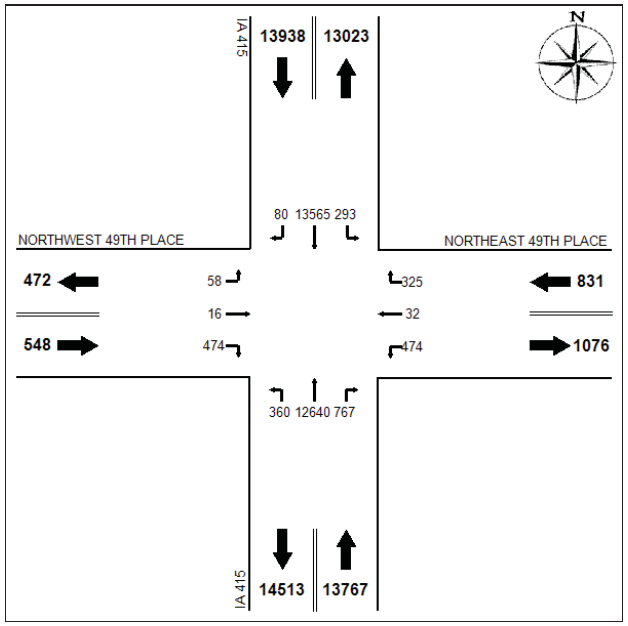
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

Volume Factor: 2.027
Pass Class Factor: 2.039
SU Class Factor: 1.656
Combo Class Factor: 1.722



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	1	303	1	2	1	0	1	126	3	0	0	4
07:15	1	523	0	0	0	1	1	159	2	0	0	1
07:30	3	505	0	0	0	2	1	198	6	0	0	5
07:45	4	424	1	1	0	3	5	225	11	0	0	5
08:00	1	334	2	0	1	1	6	164	7	3	0	8
08:15	3	305	1	1	0	2	5	127	6	0	0	7
08:30	2	263	0	5	0	4	4	145	8	0	0	11
08:45	2	218	1	1	0	0	4	161	6	1	0	7
11:00	3	150	2	10	0	3	4	113	16	2	0	6
11:15	7	168	2	8	0	3	7	177	14	0	0	2
11:30	7	165	4	10	1	6	7	150	18	0	2	7
11:45	8	155	2	13	2	5	11	156	14	0	0	12
12:00	10	178	4	7	0	8	10	137	27	1	1	9
12:15	11	161	2	15	0	6	12	169	16	1	0	5
12:30	6	161	1	16	2	7	10	135	19	0	0	6
12:45	7	159	1	17	1	10	8	137	20	2	0	11
15:00	5	155	2	4	3	6	2	189	9	5	0	3
15:15	1	160	0	6	2	6	7	212	14	3	2	9
15:30	4	210	0	16	1	9	6	209	18	1	0	25

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	4	297	1	17	0	7	12	291	15	1	0	7
16:00	1	199	1	13	0	7	7	273	18	1	0	10
16:15	8	194	3	13	0	4	13	331	12	2	0	8
16:30	5	241	3	12	0	11	3	308	17	1	1	11
16:45	11	261	1	7	0	4	3	406	12	2	1	11
17:00	8	191	1	9	0	11	12	400	15	1	0	22
17:15	11	221	2	5	0	11	6	414	15	1	0	12
17:30	6	185	1	13	2	9	11	376	23	0	0	7
17:45	5	217	2	12	0	15	7	356	17	1	1	11

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

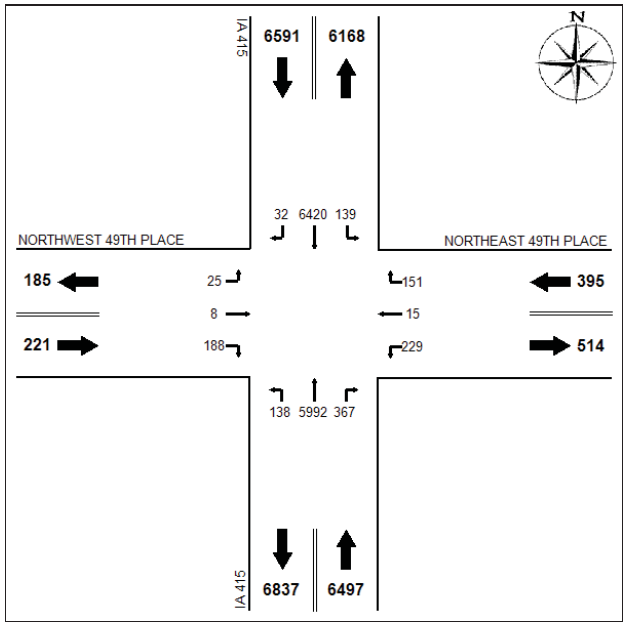
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	1	295	1	2	1	0	1	115	3	0	0	2
07:15	1	511	0	0	0	1	1	152	2	0	0	1
07:30	3	501	0	0	0	2	1	186	5	0	0	4
07:45	4	416	1	1	0	2	4	216	11	0	0	2
08:00	1	319	1	0	1	1	6	152	7	3	0	6
08:15	3	294	1	1	0	2	4	122	5	0	0	5
08:30	2	252	0	5	0	3	2	132	8	0	0	5
08:45	2	201	0	1	0	0	2	144	6	0	0	4
11:00	3	142	1	10	0	3	3	106	16	1	0	6
11:15	5	156	1	8	0	3	5	163	13	0	0	1
11:30	7	155	3	10	1	5	6	138	16	0	2	5
11:45	8	142	2	11	2	4	9	143	13	0	0	8
12:00	10	171	3	7	0	8	9	130	26	0	1	7
12:15	11	150	2	15	0	6	10	163	15	1	0	4
12:30	5	151	1	16	2	7	8	132	19	0	0	6
12:45	7	146	1	17	1	10	8	133	20	2	0	9
15:00	4	148	1	4	3	6	2	176	9	5	0	2
15:15	1	149	0	6	1	6	6	203	14	2	2	9
15:30	4	202	0	15	1	9	2	202	18	1	0	22

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	4	289	1	17	0	6	10	285	15	1	0	5
16:00	1	193	1	12	0	6	4	263	17	1	0	7
16:15	8	185	3	13	0	4	9	323	12	2	0	8
16:30	5	232	3	12	0	9	2	293	17	1	1	9
16:45	10	246	1	7	0	4	1	394	12	2	1	8
17:00	8	179	1	9	0	10	6	393	14	1	0	19
17:15	11	205	1	5	0	10	4	412	14	1	0	12
17:30	6	180	1	13	2	9	8	369	23	0	0	6
17:45	4	210	1	12	0	15	5	352	17	1	1	6

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

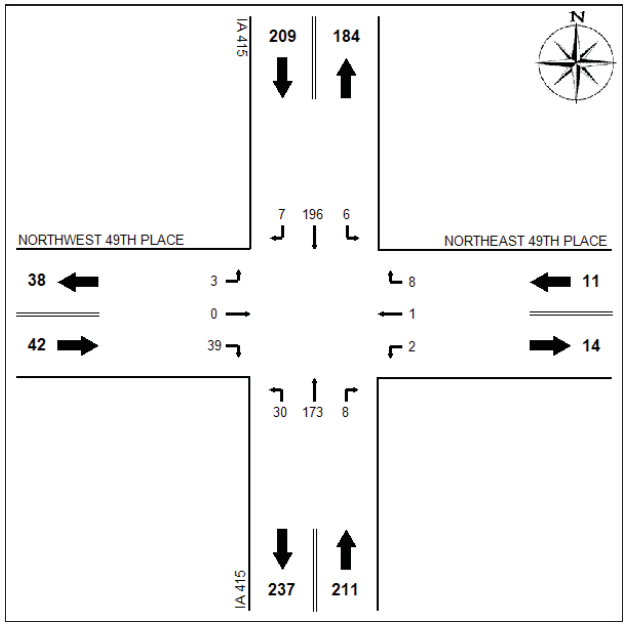
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	0	5	0	0	0	0	0	4	0	0	0	2
07:15	0	10	0	0	0	0	0	4	0	0	0	0
07:30	0	4	0	0	0	0	0	8	1	0	0	1
07:45	0	6	0	0	0	1	1	9	0	0	0	2
08:00	0	12	1	0	0	0	0	10	0	0	0	2
08:15	0	8	0	0	0	0	1	4	1	0	0	1
08:30	0	6	0	0	0	1	1	7	0	0	0	4
08:45	0	10	0	0	0	0	1	11	0	1	0	2
11:00	0	5	1	0	0	0	1	5	0	0	0	0
11:15	2	8	1	0	0	0	1	6	1	0	0	1
11:30	0	9	1	0	0	1	1	8	1	0	0	2
11:45	0	10	0	1	0	0	2	4	0	0	0	3
12:00	0	2	1	0	0	0	1	4	1	1	0	2
12:15	0	5	0	0	0	0	1	5	1	0	0	0
12:30	1	8	0	0	0	0	2	3	0	0	0	0
12:45	0	10	0	0	0	0	0	3	0	0	0	2
15:00	1	1	1	0	0	0	0	12	0	0	0	1
15:15	0	10	0	0	1	0	1	6	0	1	0	0
15:30	0	5	0	1	0	0	3	6	0	0	0	2

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	6	0	0	0	1	0	6	0	0	0	1
16:00	0	4	0	0	0	1	2	6	1	0	0	3
16:15	0	8	0	0	0	0	2	7	0	0	0	0
16:30	0	5	0	0	0	2	0	12	0	0	0	1
16:45	1	9	0	0	0	0	2	12	0	0	0	2
17:00	0	10	0	0	0	0	4	6	1	0	0	3
17:15	0	13	0	0	0	1	1	2	0	0	0	0
17:30	0	3	0	0	0	0	2	2	0	0	0	0
17:45	1	4	1	0	0	0	0	1	0	0	0	2

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

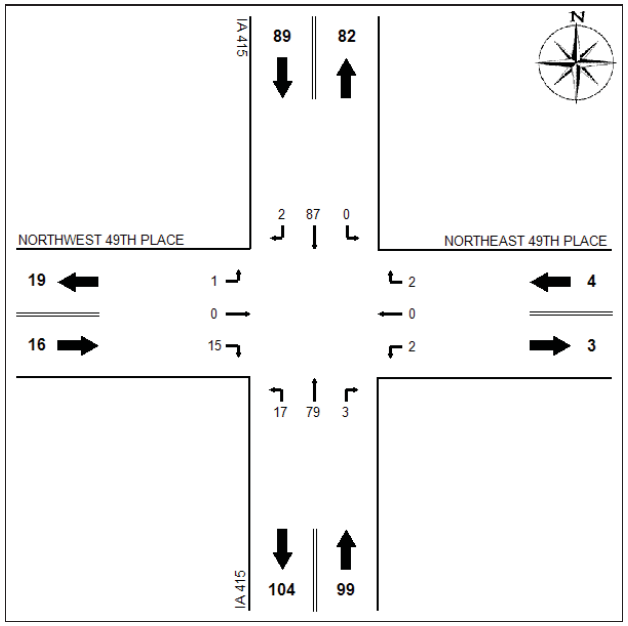
Station Number:
77225765099

Count Date:
Monday, July 11, 2011

County:
Polk

Location Description:
IA 415 & NW 49th Pl

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	0	3	0	0	0	0	0	7	0	0	0	0
07:15	0	2	0	0	0	0	0	3	0	0	0	0
07:30	0	0	0	0	0	0	0	4	0	0	0	0
07:45	0	2	0	0	0	0	0	0	0	0	0	1
08:00	0	3	0	0	0	0	0	2	0	0	0	0
08:15	0	3	0	0	0	0	0	1	0	0	0	1
08:30	0	5	0	0	0	0	1	6	0	0	0	2
08:45	0	7	1	0	0	0	1	6	0	0	0	1
11:00	0	3	0	0	0	0	0	2	0	1	0	0
11:15	0	4	0	0	0	0	1	8	0	0	0	0
11:30	0	1	0	0	0	0	0	4	1	0	0	0
11:45	0	3	0	1	0	1	0	9	1	0	0	1
12:00	0	5	0	0	0	0	0	3	0	0	0	0
12:15	0	6	0	0	0	0	1	1	0	0	0	1
12:30	0	2	0	0	0	0	0	0	0	0	0	0
12:45	0	3	0	0	0	0	0	1	0	0	0	0
15:00	0	6	0	0	0	0	0	1	0	0	0	0
15:15	0	1	0	0	0	0	0	3	0	0	0	0
15:30	0	3	0	0	0	0	1	1	0	0	0	1

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	2	0	0	0	0	2	0	0	0	0	1
16:00	0	2	0	1	0	0	1	4	0	0	0	0
16:15	0	1	0	0	0	0	2	1	0	0	0	0
16:30	0	4	0	0	0	0	1	3	0	0	0	1
16:45	0	6	0	0	0	0	0	0	0	0	0	1
17:00	0	2	0	0	0	1	2	1	0	0	0	0
17:15	0	3	1	0	0	0	1	0	1	0	0	0
17:30	0	2	0	0	0	0	1	5	0	0	0	1
17:45	0	3	0	0	0	0	2	3	0	0	0	3

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77225465199

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

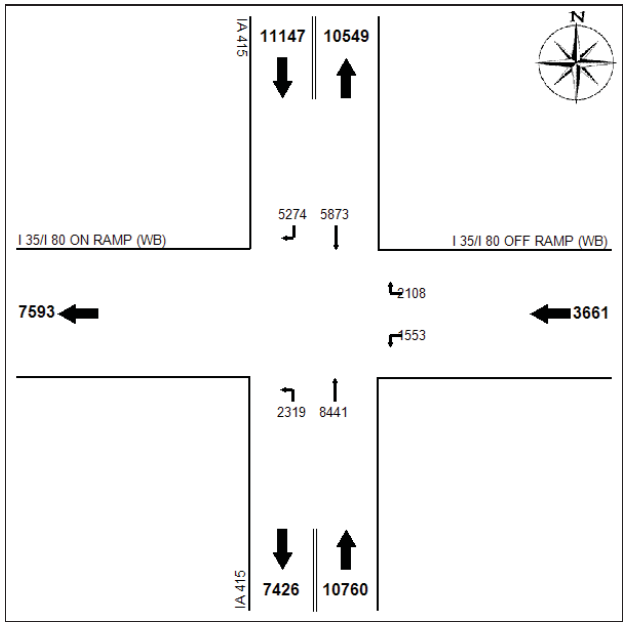
I 35, I 80 & IA 415

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
07:00	143	155	44	36	47	97
07:15	228	186	43	36	42	130
07:30	186	158	42	46	68	141
07:45	139	155	40	46	34	144
08:00	139	144	28	23	48	124
08:15	127	123	28	27	37	115
08:30	128	105	19	30	42	125
08:45	91	83	28	35	38	143
11:00	74	41	18	33	33	105
11:15	68	88	20	32	31	133
11:30	83	82	13	34	38	138
11:45	88	76	26	43	39	119
12:00	86	62	23	42	38	129
12:15	100	87	19	37	36	147
12:30	100	75	18	38	37	151
12:45	89	67	18	33	20	131
15:00	32	38	18	19	28	64
15:15	110	82	26	45	34	188
15:30	137	96	42	45	47	220

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	146	105	33	56	52	203
16:00	140	149	29	53	71	253
16:15	137	133	43	59	79	255
16:30	80	83	37	71	61	195
16:45	96	101	41	36	39	235
17:00	94	86	30	54	49	201
17:15	122	111	34	51	89	232
17:30	102	71	59	49	42	235
17:45	104	89	22	42	31	184

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

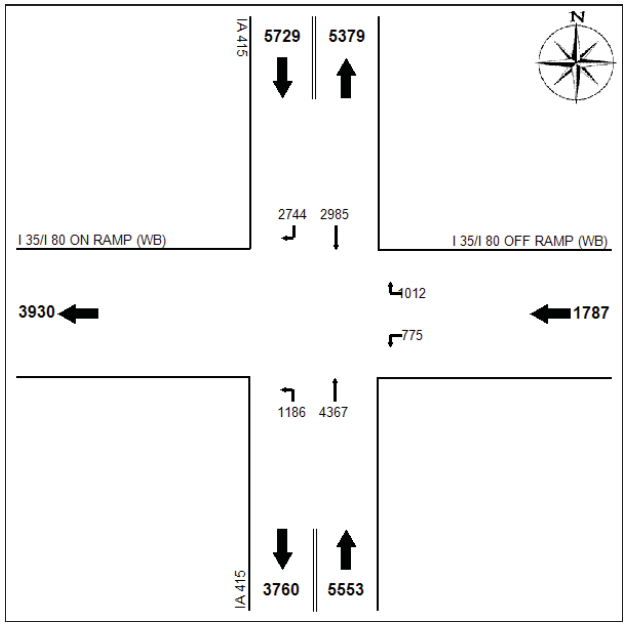
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	139	154	41	33	46	90
07:15	223	179	39	29	39	125
07:30	183	154	37	41	64	137
07:45	129	152	34	42	30	139
08:00	132	142	25	18	43	119
08:15	116	119	26	25	31	105
08:30	119	98	17	24	39	118
08:45	81	80	26	24	36	134
11:00	64	37	16	25	29	96
11:15	61	86	17	26	31	124
11:30	77	79	9	27	37	132
11:45	79	72	21	32	35	112
12:00	79	62	23	38	35	120
12:15	87	84	17	34	32	143
12:30	93	67	17	30	36	144
12:45	84	62	16	27	16	126
15:00	29	37	18	16	28	56
15:15	101	79	24	42	33	178
15:30	130	93	36	42	46	207

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	139	98	33	52	51	196
16:00	137	148	26	48	67	245
16:15	130	131	40	54	78	251
16:30	75	79	37	69	60	192
16:45	92	96	40	34	36	235
17:00	92	86	27	50	49	198
17:15	117	111	33	48	88	230
17:30	99	70	59	45	40	232
17:45	98	89	21	37	31	183

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

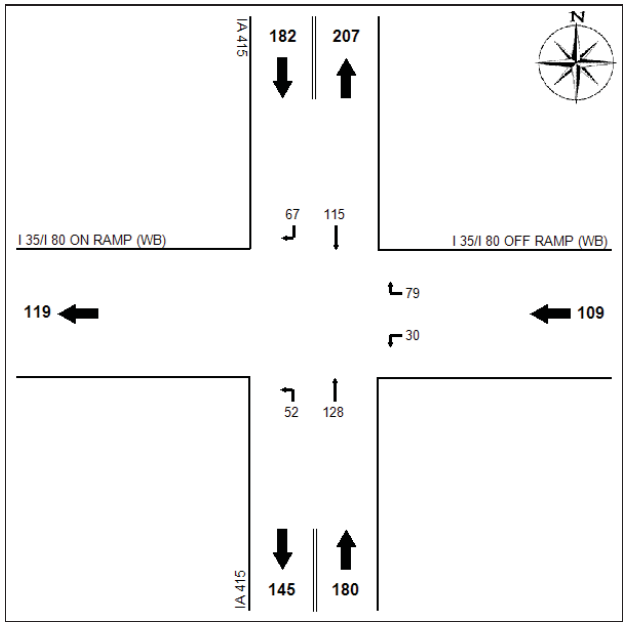
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	2	1	1	1	1	5
07:15	4	7	3	6	2	3
07:30	2	4	2	4	4	4
07:45	5	2	1	2	2	4
08:00	6	2	1	2	4	1
08:15	7	4	1	0	5	8
08:30	4	5	0	5	2	7
08:45	8	1	1	6	2	4
11:00	5	3	1	6	4	7
11:15	3	2	1	4	0	6
11:30	4	3	3	3	1	5
11:45	7	2	2	7	4	5
12:00	3	0	0	2	2	8
12:15	7	3	1	1	1	3
12:30	5	6	0	4	1	6
12:45	3	2	1	4	3	2
15:00	2	1	0	1	0	6
15:15	5	3	0	1	1	9
15:30	4	2	5	1	1	10

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	5	5	0	2	1	6
16:00	3	0	2	2	4	8
16:15	6	2	1	4	1	4
16:30	3	4	0	2	0	2
16:45	2	2	0	0	3	0
17:00	1	0	3	3	0	2
17:15	3	0	0	1	1	1
17:30	2	1	0	1	2	2
17:45	4	0	0	4	0	0

Iowa Department of Transportation
Turning Movement Traffic Count Summary
Vehicle Type: Combination Trucks

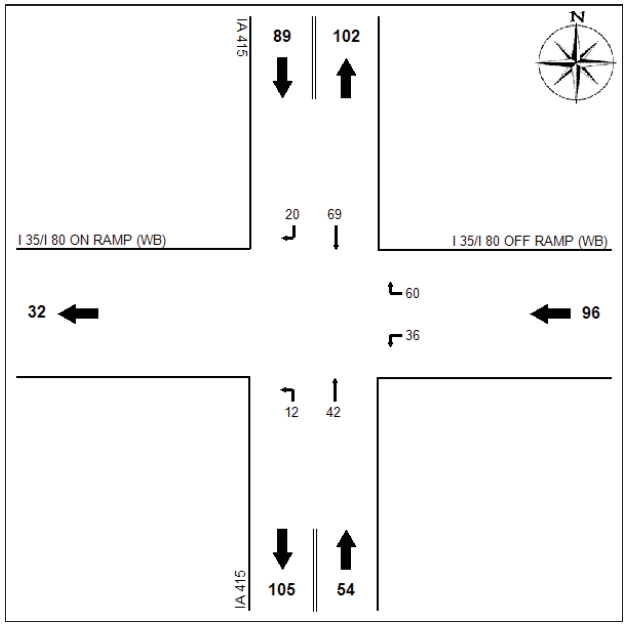
Station Number:
77225465199

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I 35, I 80 & IA 415

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	
	T	*R*	*L*	*R*	*L*	*T*
07:00	2	0	2	2	0	2
07:15	1	0	1	1	1	2
07:30	1	0	3	1	0	0
07:45	5	1	5	2	2	1
08:00	1	0	2	3	1	4
08:15	4	0	1	2	1	2
08:30	5	2	2	1	1	0
08:45	2	2	1	5	0	5
11:00	5	1	1	2	0	2
11:15	4	0	2	2	0	3
11:30	2	0	1	4	0	1
11:45	2	2	3	4	0	2
12:00	4	0	0	2	1	1
12:15	6	0	1	2	3	1
12:30	2	2	1	4	0	1
12:45	2	3	1	2	1	3
15:00	1	0	0	2	0	2
15:15	4	0	2	2	0	1
15:30	3	1	1	2	0	3

	N Leg		E Leg		S Leg	
	T	*R*	*L*	*R*	*L*	*T*
15:45	2	2	0	2	0	1
16:00	0	1	1	3	0	0
16:15	1	0	2	1	0	0
16:30	2	0	0	0	1	1
16:45	2	3	1	2	0	0
17:00	1	0	0	1	0	1
17:15	2	0	1	2	0	1
17:30	1	0	0	3	0	1
17:45	2	0	1	1	0	1

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

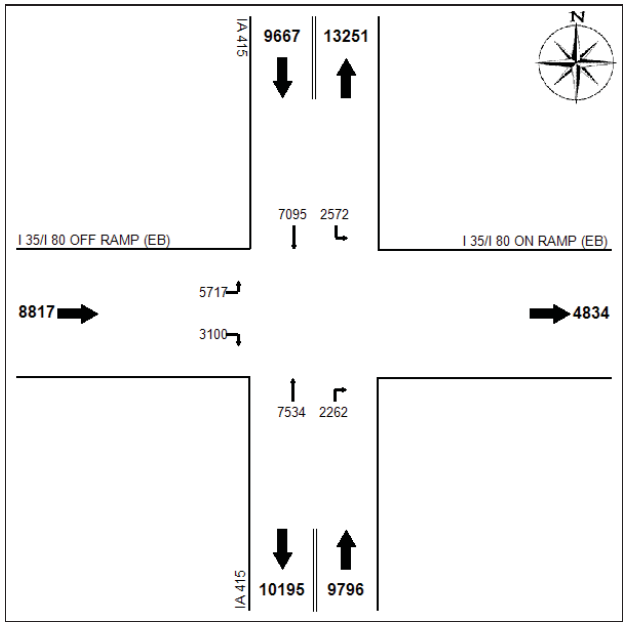
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

Volume Factor: 1.860
Pass Class Factor: 1.874
SU Class Factor: 1.505
Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	69	188	100	37	76	68
07:15	89	239	110	33	94	78
07:30	71	243	171	48	102	87
07:45	79	217	120	30	134	92
08:00	62	137	105	36	82	70
08:15	61	117	98	42	76	60
08:30	42	147	99	26	67	48
08:45	28	106	113	20	74	49
11:00	25	98	102	25	63	45
11:15	24	72	105	28	71	40
11:30	25	87	124	35	94	49
11:45	34	101	126	34	70	64
12:00	33	99	98	32	79	48
12:15	39	80	118	30	93	52
12:30	30	100	114	27	79	43
12:45	35	95	117	30	92	51
15:00	27	106	130	53	70	43
15:15	52	99	129	70	106	61
15:30	67	140	168	63	111	76

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	67	144	160	48	132	63
16:00	47	149	207	66	137	55
16:15	56	132	211	68	156	62
16:30	52	155	206	85	168	52
16:45	65	172	287	63	165	66
17:00	67	124	194	62	189	64
17:15	38	163	237	49	155	59
17:30	62	153	166	52	180	58
17:45	56	141	131	34	155	70

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

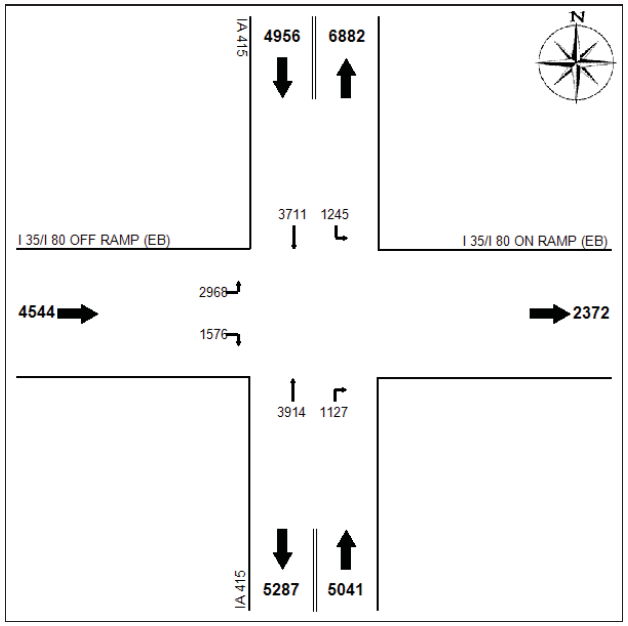
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	68	185	97	34	75	67
07:15	84	236	107	31	91	75
07:30	65	238	164	45	100	83
07:45	69	210	110	28	130	89
08:00	54	132	95	30	79	66
08:15	52	115	94	39	68	59
08:30	35	142	93	22	61	45
08:45	21	103	110	13	67	47
11:00	14	92	93	21	60	38
11:15	18	69	102	26	65	34
11:30	24	79	119	34	91	46
11:45	30	94	118	31	67	60
12:00	26	99	93	25	74	46
12:15	28	76	114	25	89	50
12:30	26	98	106	19	76	43
12:45	29	92	113	24	88	47
15:00	18	105	119	49	65	41
15:15	45	95	127	66	100	56
15:30	62	136	166	59	103	68

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	65	142	156	45	129	58
16:00	47	145	201	62	133	48
16:15	52	129	209	65	155	54
16:30	48	152	204	81	167	47
16:45	60	169	282	61	162	64
17:00	60	123	193	62	187	62
17:15	34	163	235	47	154	58
17:30	59	152	165	51	179	58
17:45	52	140	129	32	153	67

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

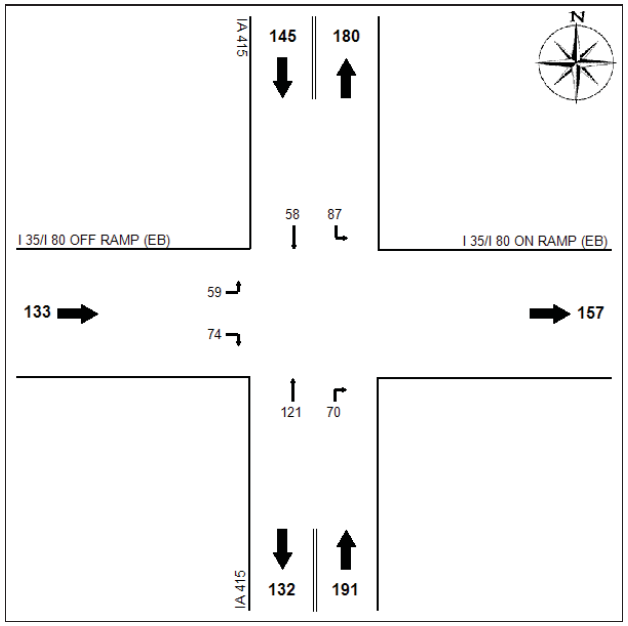
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	1	1	3	2	0	1
07:15	2	2	2	1	1	2
07:30	3	2	6	3	1	4
07:45	7	2	10	2	2	1
08:00	6	2	9	4	2	4
08:15	7	1	4	3	2	1
08:30	3	2	5	3	5	1
08:45	5	2	3	2	3	2
11:00	4	4	9	2	2	6
11:15	3	2	3	1	2	3
11:30	1	6	4	1	2	3
11:45	1	5	8	2	2	2
12:00	3	0	4	5	4	2
12:15	5	2	2	4	1	2
12:30	3	1	8	6	2	0
12:45	4	2	4	2	1	4
15:00	5	1	11	2	3	2
15:15	3	4	2	4	3	4
15:30	2	3	2	4	7	6

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	1	2	4	3	2	4
16:00	0	3	6	2	3	7
16:15	3	2	2	3	1	5
16:30	2	3	2	4	1	5
16:45	2	2	5	1	2	1
17:00	4	1	1	0	2	1
17:15	3	0	1	2	1	1
17:30	3	1	0	1	0	0
17:45	1	0	1	1	2	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

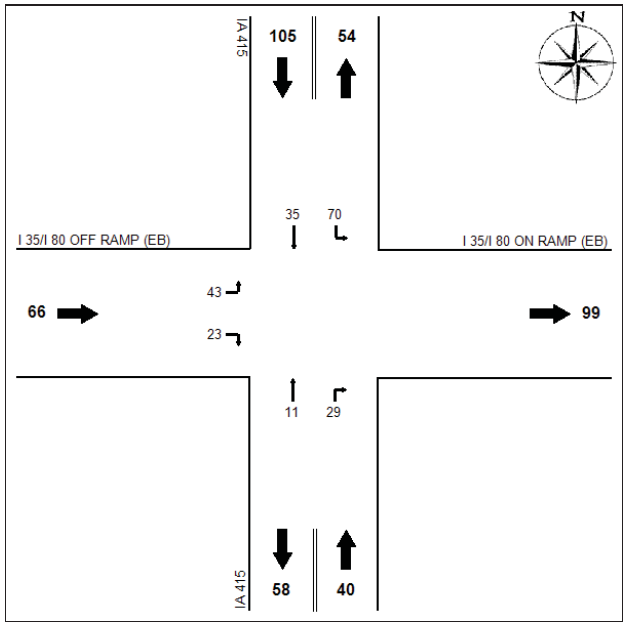
Station Number:
77225465599

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
I-35/I-80 & IA 415

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		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
07:00	0	2	0	1	1	0
07:15	3	1	1	1	2	1
07:30	3	3	1	0	1	0
07:45	3	5	0	0	2	2
08:00	2	3	1	2	1	0
08:15	2	1	0	0	6	0
08:30	4	3	1	1	1	2
08:45	2	1	0	5	4	0
11:00	7	2	0	2	1	1
11:15	3	1	0	1	4	3
11:30	0	2	1	0	1	0
11:45	3	2	0	1	1	2
12:00	4	0	1	2	1	0
12:15	6	2	2	1	3	0
12:30	1	1	0	2	1	0
12:45	2	1	0	4	3	0
15:00	4	0	0	2	2	0
15:15	4	0	0	0	3	1
15:30	3	1	0	0	1	2

	N Leg		S Leg		W Leg	
	L	*T*	*T*	*R*	*L*	*R*
15:45	1	0	0	0	1	1
16:00	0	1	0	2	1	0
16:15	1	1	0	0	0	3
16:30	2	0	0	0	0	0
16:45	3	1	0	1	1	1
17:00	3	0	0	0	0	1
17:15	1	0	1	0	0	0
17:30	0	0	1	0	1	0
17:45	3	1	1	1	0	3

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77224965099

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

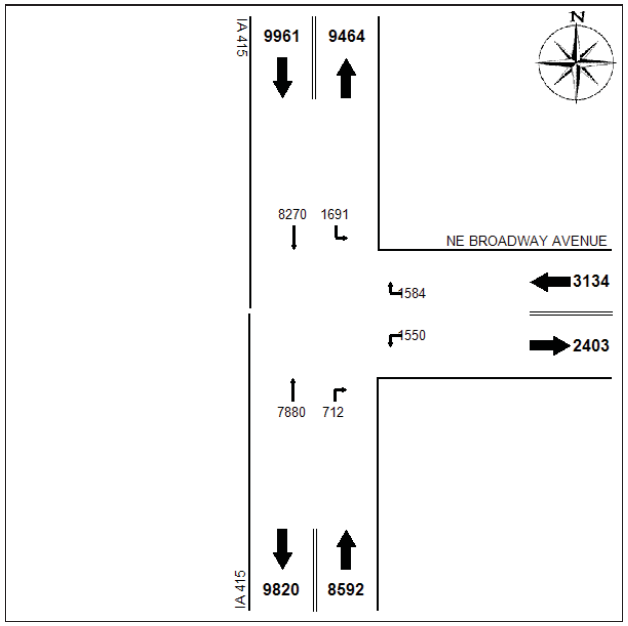
IA 415 & NW Broadway Ave

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
07:00	36	208	25	25	114	8
07:15	52	276	36	19	114	17
07:30	29	268	32	38	166	19
07:45	44	252	25	24	127	14
08:00	14	182	23	26	101	16
08:15	23	155	23	25	104	9
08:30	21	159	24	28	98	7
08:45	27	118	18	21	111	6
11:00	19	115	25	22	109	9
11:15	26	93	23	27	100	17
11:30	34	113	40	28	124	13
11:45	31	133	25	30	112	7
12:00	31	124	41	19	122	11
12:15	19	112	22	31	128	13
12:30	20	114	28	30	112	12
12:45	27	126	23	21	120	13
15:00	38	119	41	18	141	20
15:15	36	129	27	29	158	19
15:30	40	184	43	22	186	15

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	32	168	25	37	164	18
16:00	39	171	43	37	196	12
16:15	40	164	34	34	225	23
16:30	26	156	46	41	225	22
16:45	74	182	26	37	263	12
17:00	30	131	40	39	223	22
17:15	53	170	25	67	239	13
17:30	25	163	22	50	211	9
17:45	34	153	30	36	140	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

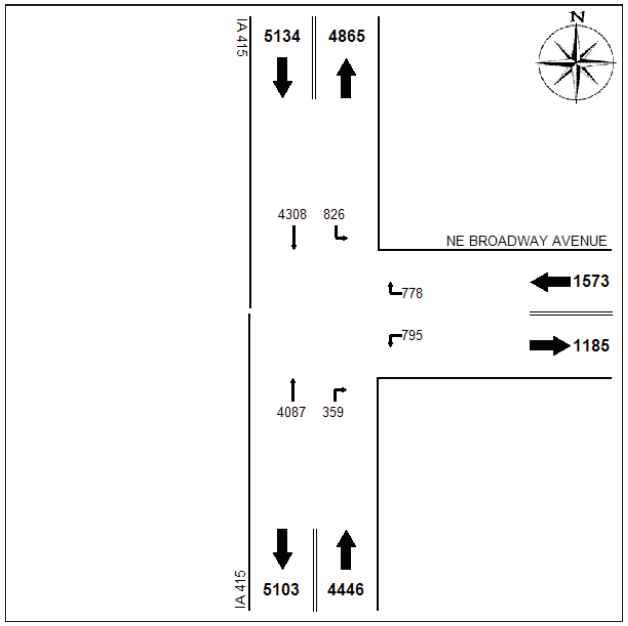
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	32	205	21	20	111	8
07:15	48	271	33	14	114	17
07:30	27	262	31	33	163	18
07:45	35	247	22	21	121	11
08:00	12	173	20	21	87	14
08:15	23	151	20	23	100	9
08:30	19	154	24	25	93	7
08:45	20	114	18	19	103	4
11:00	14	109	24	21	98	7
11:15	20	90	21	23	97	16
11:30	32	103	35	27	118	12
11:45	28	122	23	25	108	7
12:00	30	122	39	16	115	9
12:15	17	107	21	26	121	10
12:30	18	112	26	23	105	10
12:45	23	121	22	17	112	12
15:00	37	116	40	14	132	20
15:15	32	123	27	27	155	17
15:30	36	178	42	19	185	14

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	29	163	25	30	158	18
16:00	36	166	43	34	189	11
16:15	30	159	33	34	225	23
16:30	24	152	45	40	217	21
16:45	71	181	26	36	259	11
17:00	28	126	39	38	221	22
17:15	51	169	24	67	234	13
17:30	23	163	22	49	208	9
17:45	31	149	29	36	138	9

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

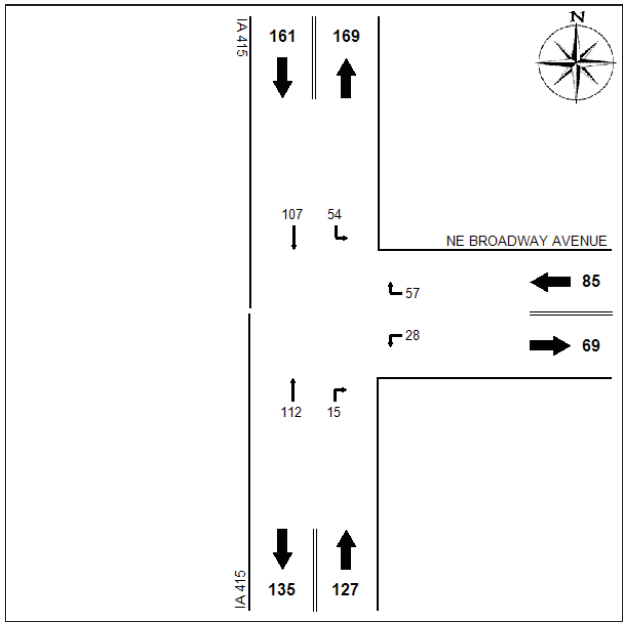
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	1	3	4	3	3	0
07:15	4	5	1	4	0	0
07:30	2	4	1	2	3	1
07:45	4	3	2	2	5	1
08:00	1	8	2	3	13	1
08:15	0	3	2	2	4	0
08:30	0	3	0	1	4	0
08:45	6	3	0	0	5	2
11:00	4	4	1	0	8	0
11:15	3	2	2	3	2	1
11:30	2	9	4	1	5	1
11:45	0	9	0	4	3	0
12:00	1	2	1	2	5	0
12:15	1	4	1	2	6	2
12:30	1	2	1	6	5	1
12:45	3	3	0	2	5	1
15:00	0	3	1	3	7	0
15:15	2	6	0	2	2	1
15:30	3	5	1	3	0	0

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	1	5	0	6	2	0
16:00	2	5	0	3	6	1
16:15	5	4	1	0	0	0
16:30	2	3	0	1	7	1
16:45	3	0	0	1	3	1
17:00	1	5	1	1	2	0
17:15	1	1	1	0	4	0
17:30	1	0	0	0	2	0
17:45	0	3	1	0	1	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

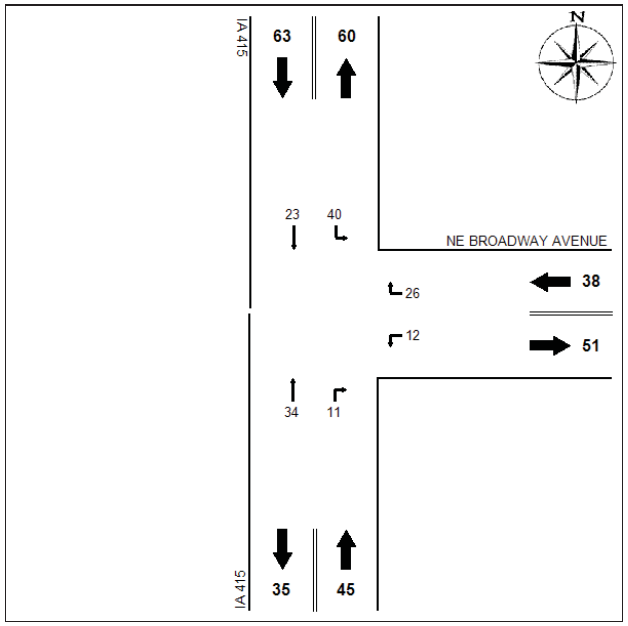
Station Number:
77224965099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Broadway Ave

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	
	L	*T*	*L*	*R*	*T*	*R*
07:00	3	0	0	2	0	0
07:15	0	0	2	1	0	0
07:30	0	2	0	3	0	0
07:45	5	2	1	1	1	2
08:00	1	1	1	2	1	1
08:15	0	1	1	0	0	0
08:30	2	2	0	2	1	0
08:45	1	1	0	2	3	0
11:00	1	2	0	1	3	2
11:15	3	1	0	1	1	0
11:30	0	1	1	0	1	0
11:45	3	2	2	1	1	0
12:00	0	0	1	1	2	2
12:15	1	1	0	3	1	1
12:30	1	0	1	1	2	1
12:45	1	2	1	2	3	0
15:00	1	0	0	1	2	0
15:15	2	0	0	0	1	1
15:30	1	1	0	0	1	1

	N Leg		E Leg		S Leg	
	L	*T*	*L*	*R*	*T*	*R*
15:45	2	0	0	1	4	0
16:00	1	0	0	0	1	0
16:15	5	1	0	0	0	0
16:30	0	1	1	0	1	0
16:45	0	1	0	0	1	0
17:00	1	0	0	0	0	0
17:15	1	0	0	0	1	0
17:30	1	0	0	1	1	0
17:45	3	1	0	0	1	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:

77224165099

Count Date:

Thursday, July 19, 2012

County:

Polk

Location Description:

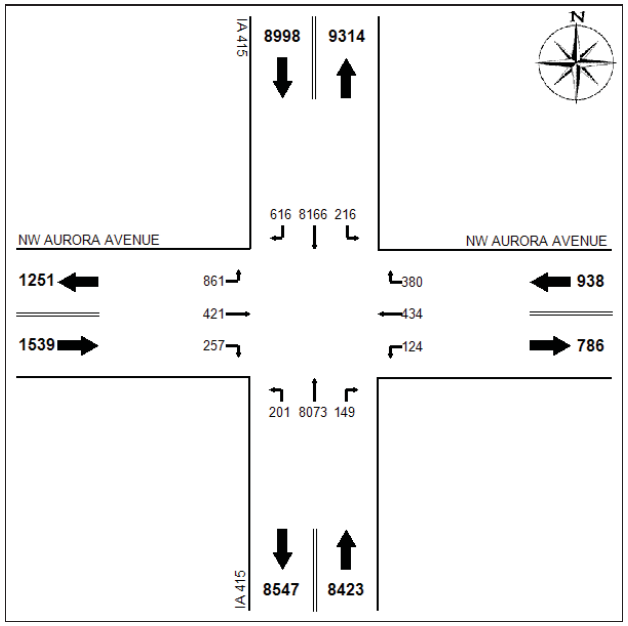
IA 415 & NW Aurora Ave

Volume Factor: 1.860

Pass Class Factor: 1.874

SU Class Factor: 1.505

Combo Class Factor: 1.537



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	4	189	10	0	10	12	2	112	1	13	5	6
07:15	2	281	14	5	7	3	1	129	1	17	12	11
07:30	1	286	15	2	10	15	2	162	3	41	9	11
07:45	8	275	7	4	6	10	2	115	3	35	9	12
08:00	1	174	8	1	5	10	3	101	3	18	4	6
08:15	3	158	9	1	1	9	1	97	3	17	11	12
08:30	5	156	7	0	3	5	1	100	1	10	3	7
08:45	4	140	5	2	3	3	1	110	3	9	4	8
11:00	6	122	9	0	9	1	2	92	2	10	7	4
11:15	4	89	3	2	9	5	3	113	9	12	7	1
11:30	4	120	11	4	12	5	5	128	2	8	6	0
11:45	1	142	11	2	9	5	4	112	1	19	11	3
12:00	4	145	16	0	13	7	2	138	1	11	9	2
12:15	12	100	8	4	8	9	2	125	4	14	11	4
12:30	3	128	9	4	3	6	3	113	2	13	4	4
12:45	1	122	7	1	9	7	3	140	3	11	4	3
15:00	4	109	5	2	11	8	4	154	1	14	5	3
15:15	7	125	9	1	7	4	7	166	4	18	17	1
15:30	2	190	14	1	11	3	1	201	2	24	7	5

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	3	124	16	1	11	5	1	163	3	11	7	4
16:00	6	160	14	2	7	13	7	208	4	15	10	2
16:15	3	144	15	2	9	12	2	210	3	22	12	3
16:30	4	161	15	5	9	10	5	230	3	23	12	2
16:45	5	165	14	3	10	7	10	269	2	15	12	0
17:00	7	140	27	7	12	9	15	265	3	16	9	5
17:15	2	148	19	4	15	8	12	232	3	25	7	9
17:30	5	151	16	3	7	9	4	201	3	11	6	5
17:45	5	134	17	3	7	3	3	142	7	9	6	5

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Passenger Vehicles

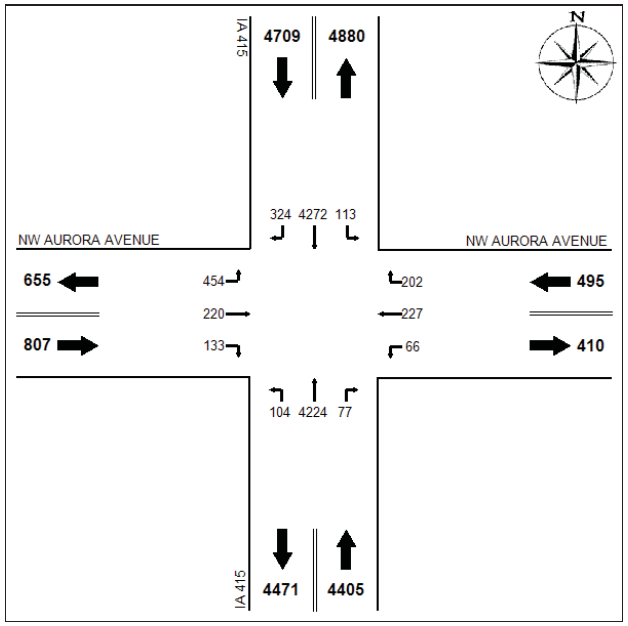
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

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	4	186	9	0	10	12	2	108	1	13	5	6
07:15	2	276	14	5	7	3	1	127	1	17	12	11
07:30	1	280	15	2	10	15	2	159	3	41	9	11
07:45	8	270	7	4	6	10	1	111	3	35	9	12
08:00	1	167	7	1	5	10	3	93	3	16	4	6
08:15	3	153	9	1	1	9	1	92	3	16	11	12
08:30	4	152	7	0	2	5	1	97	1	8	3	5
08:45	3	137	4	2	3	3	0	105	3	9	4	7
11:00	6	115	9	0	8	1	2	84	1	10	7	4
11:15	4	85	3	2	8	5	2	109	9	12	7	1
11:30	4	113	11	4	12	5	5	126	2	8	6	0
11:45	1	133	11	2	8	5	4	110	1	19	11	3
12:00	4	143	15	0	13	7	2	131	1	11	9	2
12:15	12	96	8	4	8	9	1	119	4	13	10	4
12:30	3	125	9	4	3	6	3	105	2	13	4	4
12:45	1	120	7	1	8	7	3	136	3	11	4	3
15:00	4	108	5	2	11	8	4	150	1	14	5	3
15:15	7	121	9	1	7	4	7	164	4	18	14	1
15:30	2	185	13	1	11	3	1	199	2	24	7	5

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	3	121	16	1	11	5	1	159	3	11	7	4
16:00	6	156	14	2	7	13	7	202	4	15	10	2
16:15	2	142	15	2	9	12	2	210	3	22	11	3
16:30	4	155	15	5	8	10	5	227	2	22	12	2
16:45	5	164	14	3	10	7	10	266	2	15	12	0
17:00	7	139	26	7	12	9	15	261	3	16	9	3
17:15	2	148	19	4	15	7	12	232	3	25	7	9
17:30	5	150	16	3	7	9	4	201	3	11	5	5
17:45	5	132	17	3	7	3	3	141	6	9	6	5

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Single-Unit Trucks

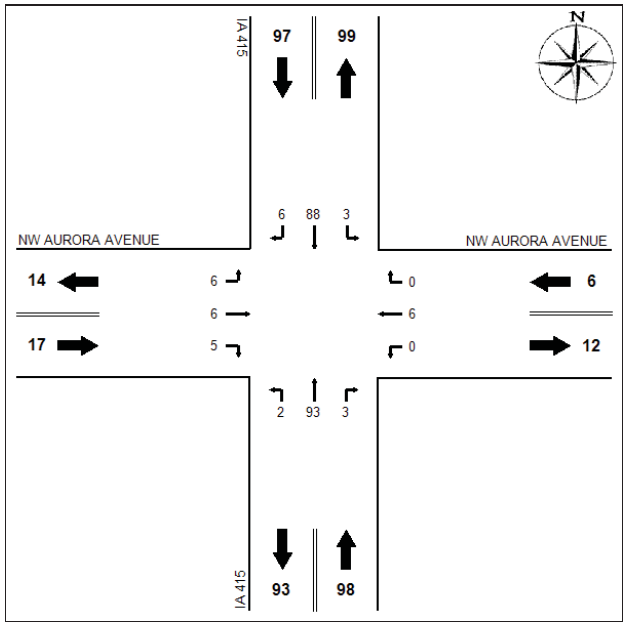
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

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	0	2	1	0	0	0	0	4	0	0	0	0
07:15	0	4	0	0	0	0	0	2	0	0	0	0
07:30	0	6	0	0	0	0	0	3	0	0	0	0
07:45	0	4	0	0	0	0	0	4	0	0	0	0
08:00	0	7	1	0	0	0	0	6	0	2	0	0
08:15	0	3	0	0	0	0	0	5	0	1	0	0
08:30	1	3	0	0	1	0	0	3	0	2	0	2
08:45	1	2	1	0	0	0	1	4	0	0	0	1
11:00	0	6	0	0	1	0	0	8	1	0	0	0
11:15	0	4	0	0	1	0	0	4	0	0	0	0
11:30	0	7	0	0	0	0	0	2	0	0	0	0
11:45	0	7	0	0	1	0	0	2	0	0	0	0
12:00	0	2	1	0	0	0	0	7	0	0	0	0
12:15	0	2	0	0	0	0	1	5	0	1	1	0
12:30	0	2	0	0	0	0	0	5	0	0	0	0
12:45	0	1	0	0	1	0	0	4	0	0	0	0
15:00	0	1	0	0	0	0	0	4	0	0	0	0
15:15	0	2	0	0	0	0	0	1	0	0	3	0
15:30	0	5	1	0	0	0	0	2	0	0	0	0

880

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	3	0	0	0	0	0	2	0	0	0	0
16:00	0	4	0	0	0	0	0	6	0	0	0	0
16:15	1	2	0	0	0	0	0	0	0	0	1	0
16:30	0	5	0	0	1	0	0	3	1	0	0	0
16:45	0	0	0	0	0	0	0	3	0	0	0	0
17:00	0	1	1	0	0	0	0	4	0	0	0	2
17:15	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	1	0	0	0	0	0	0	0	0	1	0
17:45	0	2	0	0	0	0	0	0	1	0	0	0

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Vehicle Type: Combination Trucks

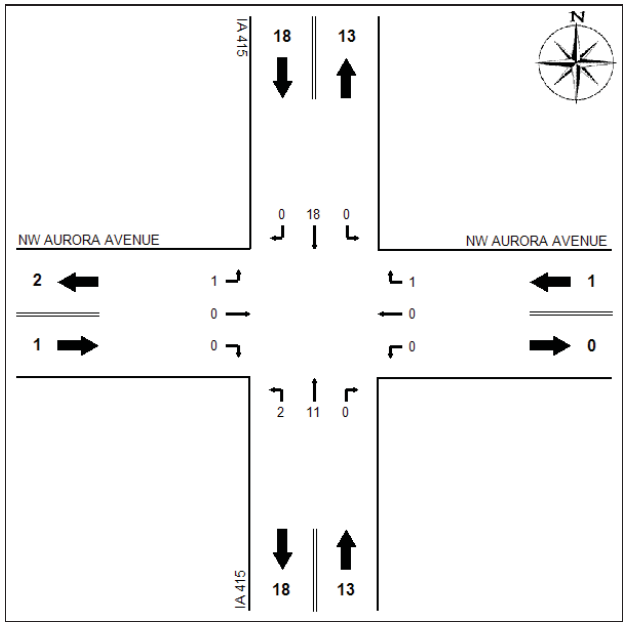
Station Number:
77224165099

Count Date:
Thursday, July 19, 2012

County:
Polk

Location Description:
IA 415 & NW Aurora Ave

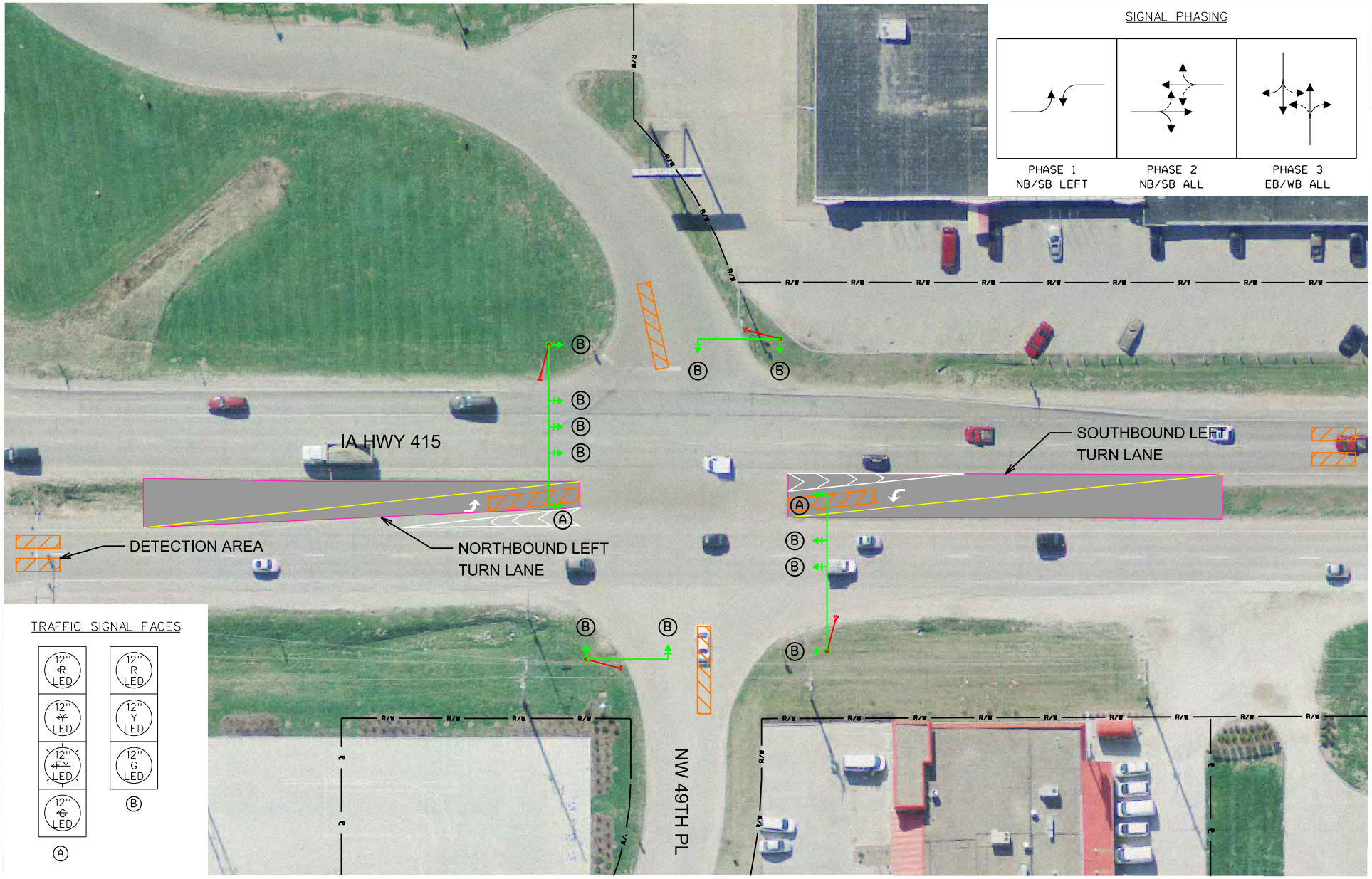
Volume Factor: N/A
Pass Class Factor: N/A
SU Class Factor: N/A
Combo Class Factor: N/A



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	0	1	0	0	0	0	0	0	0	0	0	0
07:15	0	1	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	1	0	0	0	0	1	0	0	0	0	0
08:00	0	0	0	0	0	0	0	2	0	0	0	0
08:15	0	2	0	0	0	0	0	0	0	0	0	0
08:30	0	1	0	0	0	0	0	0	0	0	0	0
08:45	0	1	0	0	0	0	0	1	0	0	0	0
11:00	0	1	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	1	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	2	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	2	0	0	0	0	0	1	0	0	0	0
12:30	0	1	0	0	0	0	0	3	0	0	0	0
12:45	0	1	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	2	0	0	0	0	0	1	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
15:45	0	0	0	0	0	0	0	2	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	1	0	0	0	0	0	0	0	1	0	0
16:45	0	1	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	1	0	0	0	0



NW 49th PL & IA HWY 415
INTERSECTION AND TRAFFIC SIGNAL IMPROVEMENTS
POLK COUNTY, IOWA

0 30
SCALE (FEET)

K

BENEFIT/COST ANALYSIS
IA HWY 415 IMPROVEMENTS PROJECT
POLK COUNTY, IA

Per Iowa DOT TSIP Benefit/Cost Analysis instructions, an estimated improvement life of 20 years was selected for turn lane and traffic signal improvements. Because the proposed improvements are intersection improvements, a benefit/cost analysis was performed for each intersection. The methodology used per benefit/cost analysis is listed below. *Crash Modification Factors Clearinghouse* website was utilized to obtain crash reduction factors (CRF) for each improvement. The projected traffic growth of 2% was chosen given the development trend of western Ankeny and at this point, no additional accesses planned for I-80/35 west of 2nd Avenue.

NW 49th Place

- 45% CRF – 20% traffic signalization & 35% for positive offset left turn lanes. Both crash reductions factors are conservative given the nature of reported crashes and mitigations of those crashes with proposed improvements.
- Requested amount $150,000 resulting in benefit/cost ratio of 1.72.

I-80/35 North Ramp

- 30% CRF- Physical channelization of right turn lane and signal coordination combined.
- Requested amount $130,000 resulting in benefit/cost ratio of 2.24.

NW 47th Place

- 20% CRF since south approach already has a dedicated left turn-lane.
- Requested amount $40,000 resulting in benefit/cost ratio of 2.44.

The County is requesting $320,000 in TSIP funding assistance for this entire project.

NW 49th Place Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Jul 25, 2014

Intersection: IA Hwy 415 @ 49th Pl

Improvement

Proposed Improvement(s): Traffic signalization, IA Hwy 415 left turn lanes

$ 150,000	Estimated Improvement Cost, **EC**	20	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**
		$ 150,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: DOT 2011 Date of traffic coun

Daily Entering Vehicles by Approach (or AADT / 2)

13,480

500 → ✱ ← 950

14,140

10,610,550	Current Annual Entering Veh., **AEV** = DEV * 365
43,196	veh / day, Final Year DEV, **FDEV**
257.81	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
29,070	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes →		Fatalities @	$4,500,000	$ -
			Major Injuries @	$325,000	$ -
2	Injury Crashes →		Minor Injuries @	$65,000	$ -
		2	Possible Injuries @	$35,000	$ 70,000
15	Property Damage Only		(assumed cost per crash)	$7,400	$ 125,800
		-OR-	enter all Property Costs of all crashes:		
17	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 195,800

3.09	Current Crashes / Year, **AA** = TA / T	0.29	Crashes / MEV, Crash Rate, **CR**
$ 11,518	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
75.1	Total Expected Crashes, **TECR** = CR x TMEV	$ 257,788	Present Value of Avoided Crashes, **BENEFIT**
1.39	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 16,020	Crash Costs Avoided in First Year, AAR x AVC		
33.8	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 = $257,788 : $150,000 = **1.72** : 1

I-80/35 North Ramp Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Jul 25, 2014

Intersection: IA Hwy 415 @ I-80/35 North Ramp

Improvement

Proposed Improvement(s): Southbound channelized free right lane, entrance ramp widening, traffic signal modifications

$ 130,000	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**
		$ 130,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: DOT 2012 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

10,850

3,660

9,090

8,614,000	Current Annual Entering Veh., **AEV** = DEV * 365
35,068	veh / day, Final Year DEV, **FDEV**
209.30	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
23,600	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
4	Injury Crashes		Minor Injuries @	$65,000	$	-
		4	Possible Injuries @	$35,000	$	140,000
22	Property Damage Only		(assumed cost per crash)	$7,400	$	192,400
			-OR- enter all Property Costs of all crashes:			
26	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	332,400

4.73	Current Crashes / Year, **AA** = TA / T	0.55	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 12,785	Cost per Crash, **AVC** = LOSS / TA		
114.9	Total Expected Crashes, **TECR** = CR x TMEV	$ 291,756	Present Value of Avoided Crashes, **BENEFIT**
1.42	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 18,131	Crash Costs Avoided in First Year, AAR x AVC		
34.5	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 = $291,756 : $130,000 = 2.24 : 1

NW 47th Place Intersection Benefit / Cost Safety Analysis

Rev. 5/14

Iowa DOT Office of Traffic & Safety

County: Polk Prepared by: Justin Jackson Date Prepared: Aug 13, 2014

Intersection: IA Hwy 415 @ 47th Place

Improvement

Proposed Improvement(s): IA Hwy 415 Positive Offset Left Turn Lane

$ 40,000	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 (time value of $), **INT**
		$ 40,000	Present Value Cost, **COST** = EC + OC

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

Traffic Volume Data

Source: Polk County 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)

10,850

1,130 → ← 500

9,090

7,873,050	Current Annual Entering Veh., **AEV** = DEV * 365
32,052	veh / day, Final Year DEV, **FDEV**
191.29	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
2.0%	Projected Traffic Growth (0%-10%), **G**
21,570	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2009 First full year --> 2013 Last full year 5.5 years, Time Period, **T**

6 Additional months values as of May 2014

	Fatal Crashes →		Fatalities @	$4,500,000	$	-
			Major Injuries @	$325,000	$	-
2	Injury Crashes →	1	Minor Injuries @	$65,000	$	65,000
		1	Possible Injuries @	$35,000	$	35,000
7	Property Damage Only		(assumed cost per crash)	$7,400	$	66,600
		-OR-	enter all Property Costs of all crashes:			
9	Total Crashes, **TA**			Total $ Loss, **LOSS**	$	166,600

1.64	Current Crashes / Year, **AA** = TA / T	0.21	Crashes / MEV, Crash Rate, **CR** CR = TA x 10^6 / (DEV x 365 x T)
$ 18,511	Cost per Crash, **AVC** = LOSS / TA		
39.8	Total Expected Crashes, **TECR** = CR x TMEV	$ 97,486	Present Value of Avoided Crashes, **BENEFIT**
0.33	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 6,058	Crash Costs Avoided in First Year, AAR x AVC		
8.0	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 = $97,486 : $40,000 = 2.44 : 1

Appendix

- Crash Location Map (2009 - May 2014)
- Crash Summaries (2009 - May 2014)
- Crash Diagrams (2009 - May 2014)
- Traffic Signal Warrant Analysis Sheets

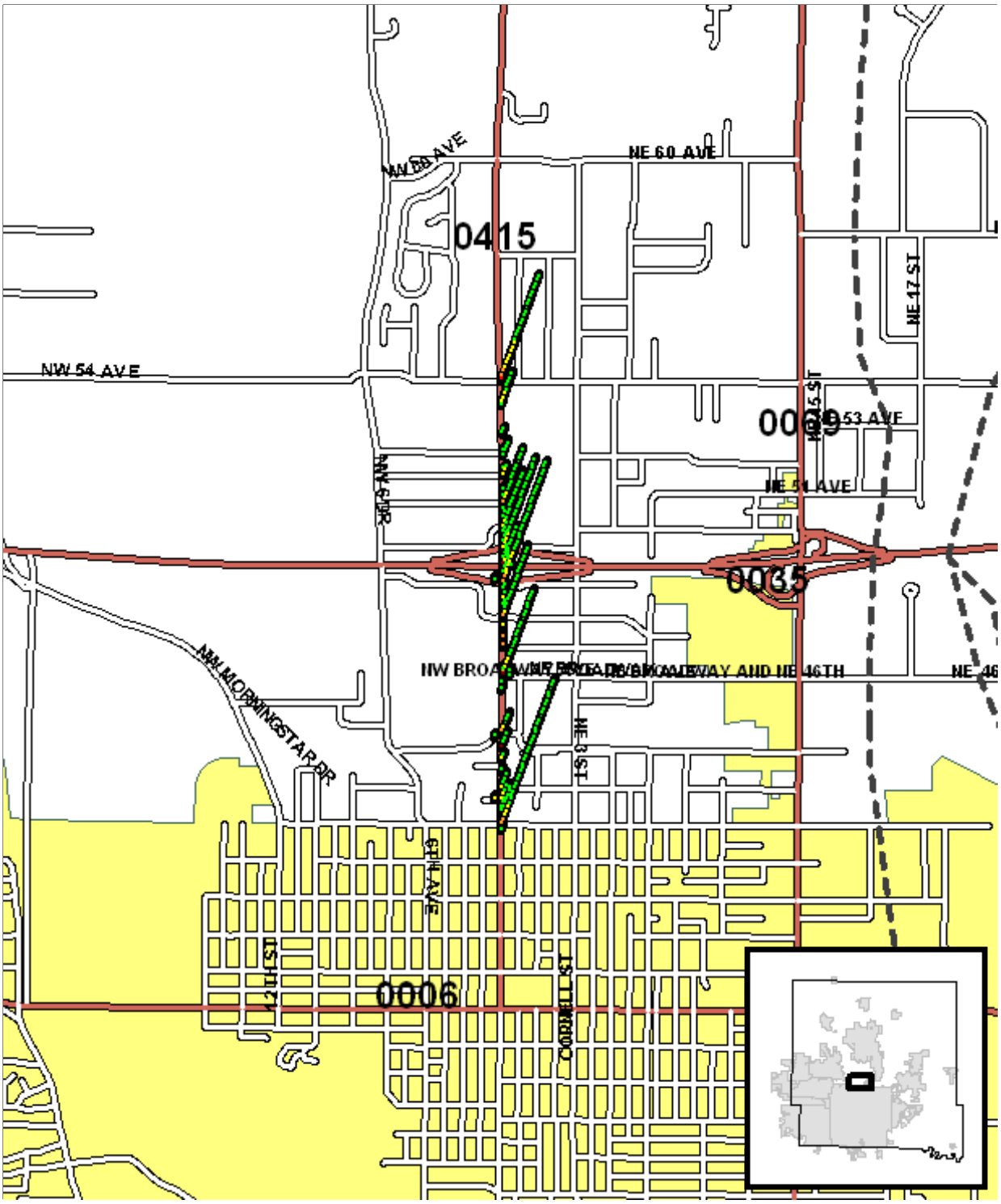
Iowa Department of Transportation

Location Map

IA 415 (NE 54th Ave to Aurora Ave)

Incidents: 286

Report Version 1.1 Mar 2005



Analyst:	Notes:

Iowa Department of Transportation

Major Cause Summary

IA 415 (NE 54th Ave to Aurora Ave)

Report Version 1.1 Jan 2005

Analysis Years: 2009 [43], 2010 [58], 2011 [55], 2012 [48], 2013 [51], 2014 [31]

Crash Summary:

Fatal	1
Major Injury	3
Minor Injury	12
Possible/Unknown	42
PDO	228
Total Crashes	286

Injury Summary:

Fatal	1
Major Injury	4
Minor Injury	19
Possible	49
Unknown	4
Total Injuries	77

TOT Property Damage: $1,750,634

AVG Property Damage: $6,121

Surface Condition Summary:

Dry	214
Wet	52
Ice	9
Snow	8
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	1
Other	-
Unknown	-
Not Reported	1
Total Crashes	286

Major Cause Summary:

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

Selection Filter:

((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

Iowa Department of Transportation

Major Cause Summary

IA 415 & 47th Pl

Report Version 1.1 Jan 2005

Analysis Years: 2009 [4], 2010 [2], 2011 [4], 2012 [3], 2013 [3], 2014 [3]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	1
Possible/Unknown	1
PDO	17
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	1
Possible	1
Unknown	-
Total Injuries	2

TOT Property Damage: $111,895

AVG Property Damage: $5,889

Surface Condition Summary:

Dry	13
Wet	6
Ice	-
Snow	-
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	19

Major Cause Summary:

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

Selection Filter:

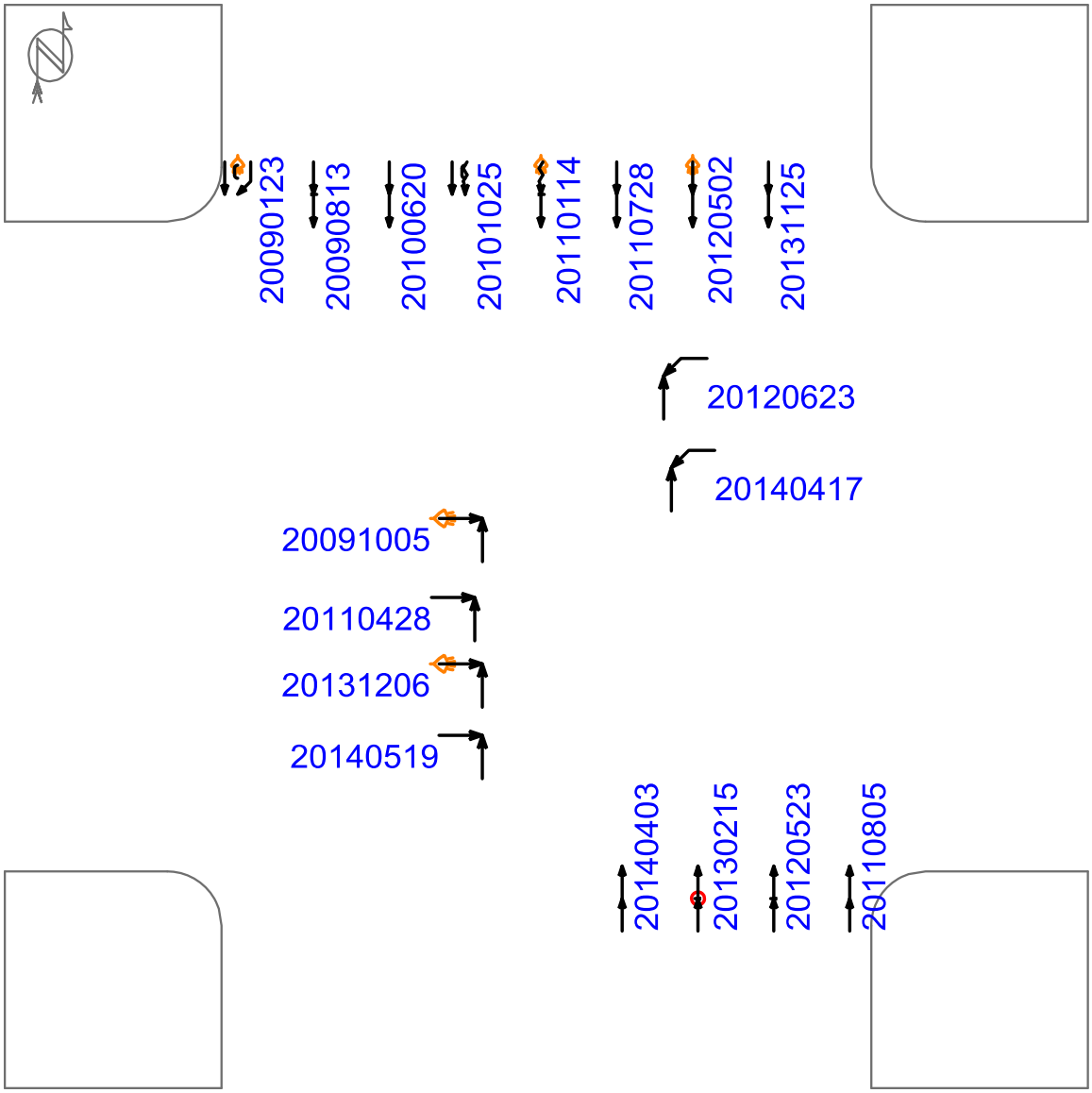
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & 47th Pl

2009 - 2014 May 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. 07/29/2014

Iowa Department of Transportation

Major Cause Summary

IA 415 & I-80/35 North Ramp

Report Version 1.1 Jan 2005

Analysis Years: 2009 [7], 2010 [2], 2011 [5], 2012 [4], 2013 [3], 2014 [5]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	4
PDO	22
Total Crashes	26

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible	4
Unknown	-
Total Injuries	4

TOT Property Damage: $143,470

AVG Property Damage: $5,518

Surface Condition Summary:

Dry	16
Wet	5
Ice	2
Snow	3
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	26

Major Cause Summary:

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

Selection Filter:

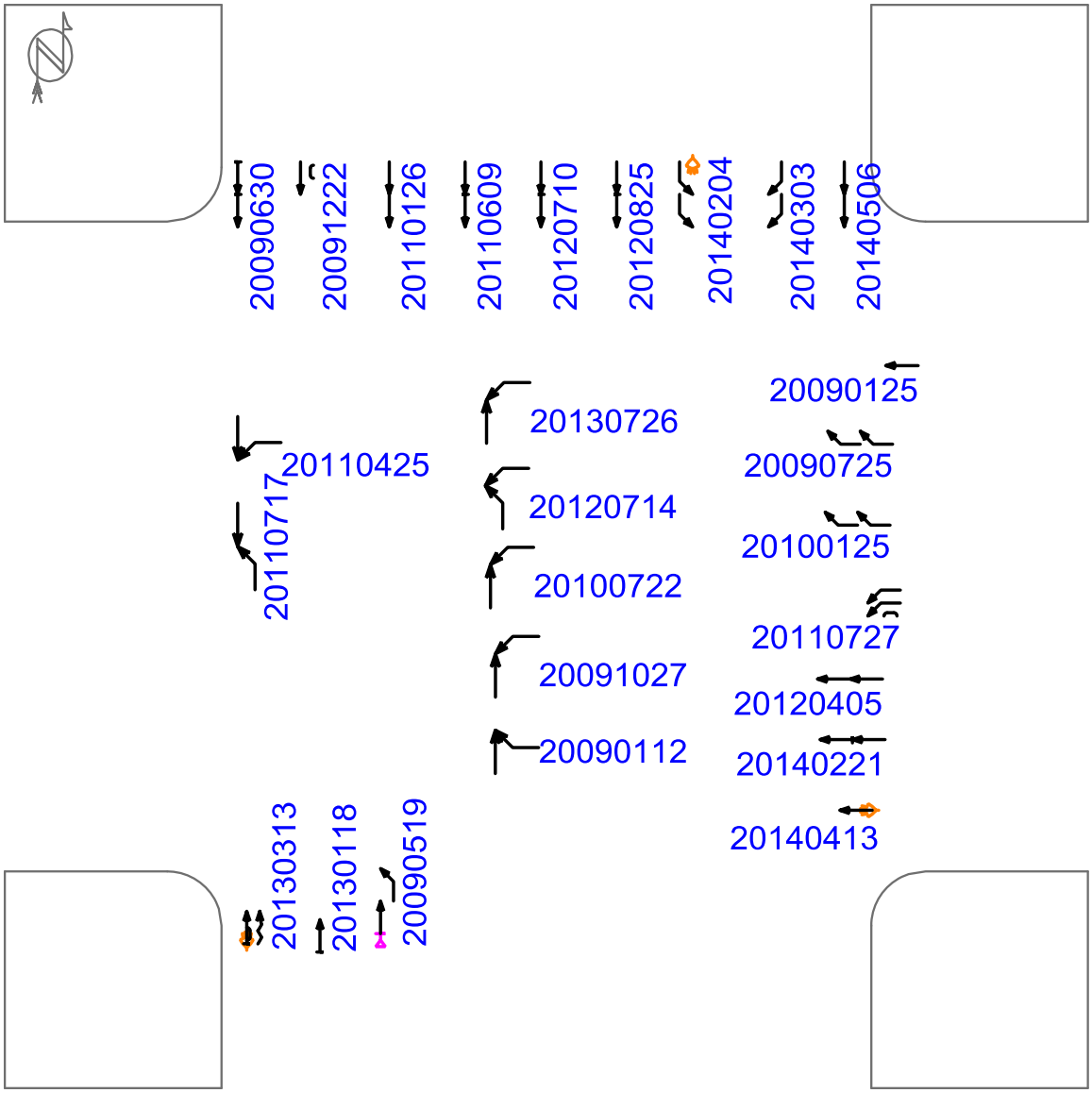
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & I-80/35 North Ramp

2009 - May 2014 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

Pd' Programming, Inc. 07/29/2014

Iowa Department of Transportation

Major Cause Summary

IA 415 & 49th Pl

Report Version 1.1 Jan 2005

Analysis Years: 2009 [3], 2010 [2], 2011 [4], 2012 [2], 2013 [5], 2014 [1]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	-
Possible/Unknown	2
PDO	15
Total Crashes	17

Injury Summary:

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

TOT Property Damage: $86,350

AVG Property Damage: $5,079

Surface Condition Summary:

Dry	15
Wet	1
Ice	-
Snow	1
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	17

Major Cause Summary:

	Animal
	Ran Traffic Signal
	Ran Stop Sign
	Crossed Centerline
1	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
3	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
1	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	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
2	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
3	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
1	Ran Off Road - Right
1	Ran Off Road - Straight
	Ran Off Road - Left
	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
2	Other: Other Improper Action
1	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

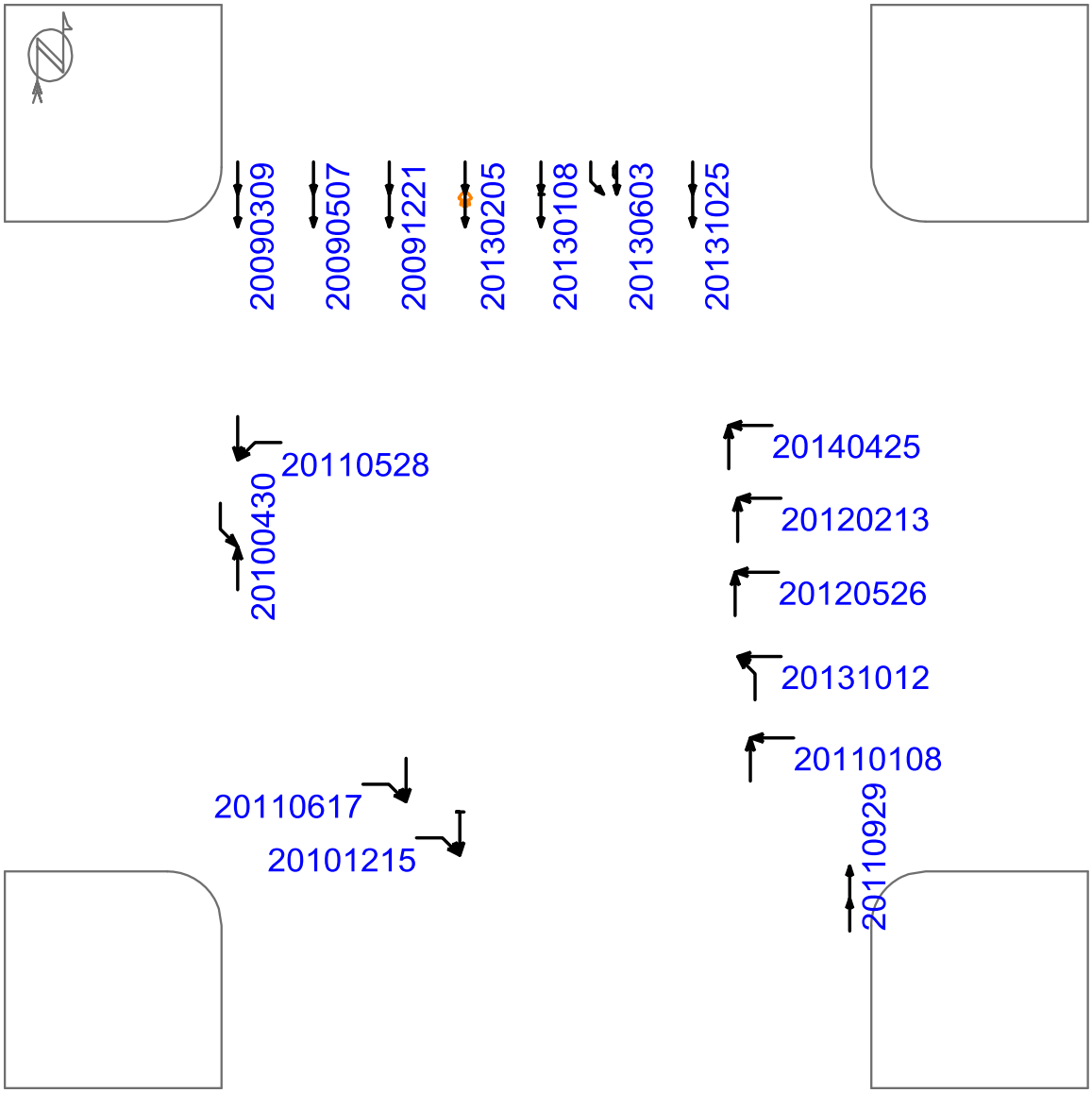
((YEAR <> 2004 and YEAR <> 2005 and YEAR <> 2006 and YEAR <> 2007 and YEAR <> 2008))

Analyst:

Notes:

IA Hwy 415 & 49th Pl

2009 - May 2014 Reportable Crashes



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Fixed objects:

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

- 3rd vehicle
- Extra data

Pd' Programming, Inc. 07/29/2014

Snyder & Associates, Inc.
Ankeny, Iowa

Study Name **: IA415-49thPl_Warrant**

Signal Warrants - Summary

Major Street Approaches

Northbound: **IA 415**
Number of Lanes: **2**
Approach Speed: **41**
Total Approach Volume: **15,619**

Southbound: **IA 415**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **14,187**

Minor Street Approaches

Eastbound: **NW 49th Pl**
Number of Lanes: **1**

Total Approach Volume: **831**

Westbound: **NW 49th Pl**
Number of Lanes: **1**

Total Approach Volume: **934**

Warrant Summary **(Rural values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Not Satisfied**
Required volumes reached for 1 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Satisfied**
Required volumes reached for 11 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Not Satisfied**
Required volumes reached for 5 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (9) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes ..... **Satisfied**
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (2) is less than minimum (5). Volume minimums are met.

Warrant 8 - Roadway Network ..... **Not Evaluated**

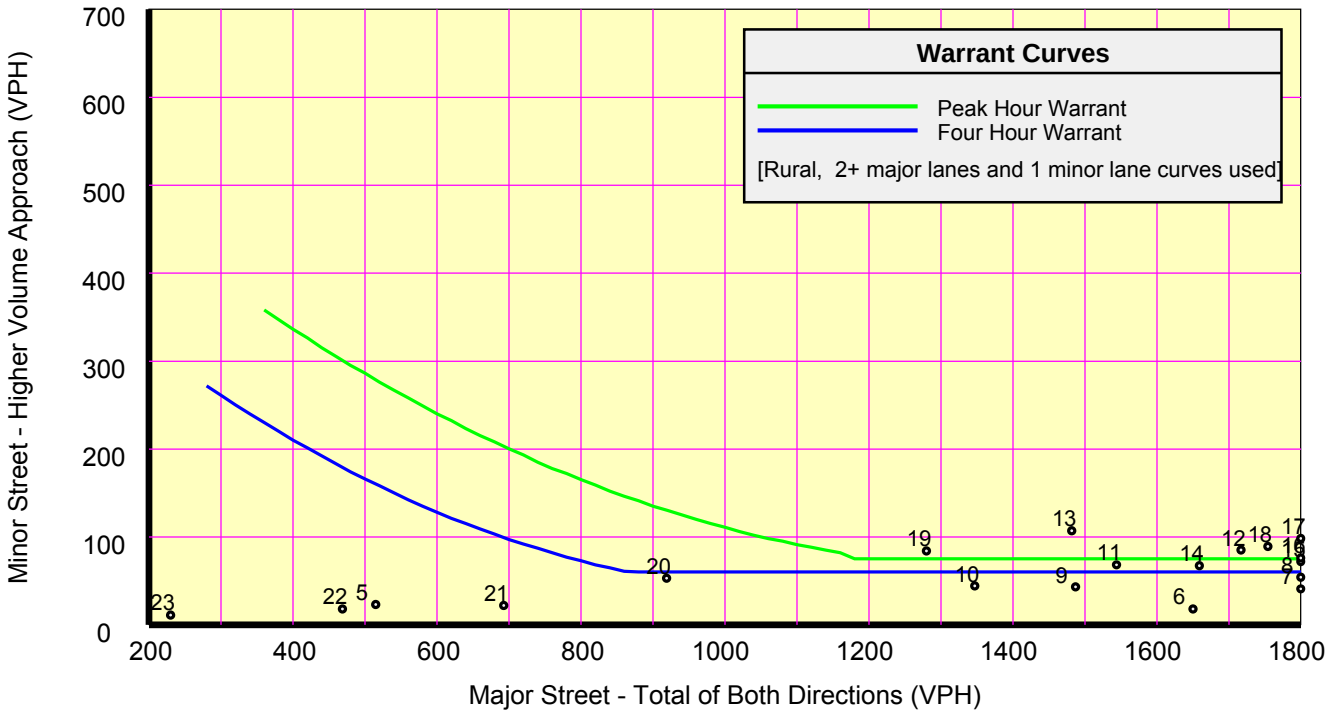
Warrant 9 - Intersection Near a Grade Crossing ..... **Not Evaluated**

Snyder & Associates, Inc.

Ankeny, Iowa

Study Name : **IA415-49thPl_Warrant**

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War 1A			War 1B			War 1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	126	7	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
01:00	70	7	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
02:00	73	5	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
03:00	68	6	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
04:00	172	9	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
05:00	515	23	EB	420-Yes	105-No	Major	630-No	53-No	---	504-Yes	84-No	Major
06:00	1,650	18	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
07:00	3,129	41	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
08:00	1,807	54	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
09:00	1,487	43	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
10:00	1,347	44	WB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
11:00	1,544	68	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
12:00	1,717	85	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
13:00	1,482	107	WB	420-Yes	105-Yes	Both	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
14:00	1,659	67	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
15:00	2,122	72	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
16:00	2,718	76	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
17:00	2,775	98	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
18:00	1,754	89	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
19:00	1,280	84	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
20:00	919	53	WB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
21:00	693	22	WB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
22:00	469	18	EB	420-Yes	105-No	Major	630-No	53-No	---	504-No	84-No	---
23:00	230	11	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Reconstruction of South Fulton St & IA 7 Intersection.

Applicant: Buena Vista County

Contact Person: Jon Ites Title: County Engineer

Complete Mailing Address: P.O. Box 368
Storm Lake, IA 50588

Phone: (712) 749-2540 (Area Code) E-Mail: jites@co.buena-vista.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): City of Newell

Contact Person: Dick Christensen Title: Mayor

Complete Mailing Address: P.O. Box 315
Newell, IA 50568

Phone: (712) 272-4410 (Area Code) E-Mail:

PLEASE COMPLETE THE FOLLOWING PROJECT INFORMATION:

Application Type

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

Funding Amount

Total Project Cost $ 450,000

Safety Funds Requested $ 450,000

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 Buena Vista County

Signed: _____ 8/4/14
Signature Date Signed

Jon Ites
Typed Name

Attest: _____ 8/4/14
Signature Date Signed

Preston Jacobs
Typed Name

Office of
Buena Vista County Engineer
P.O. Box 368
Storm Lake, Iowa 50588
712-749-2540 (Fax 712-749-2704)

Jon L. Ites, P.E./L.S.
County Engineer
Karen Crilly
Administrative Assistant

August 4, 2014

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

Dear Sir/Madam:

We are applying for Traffic Safety Improvement Funds for the Intersection of South Fulton Street and Iowa Highway 7 on the south edge of Newell, IA. We are proposing to reconstruct the intersection from its current configuration with three different intersections coming off IA 7 at different angles to one intersection connecting to IA 7 at a 90° angle. Removal and replacement of an existing drainage cross pipe will also be done.

The current traffic map shows 340 vehicles per day. This is one of the major truck routes into town. Much of the current traffic is farm equipment, which includes tractors, semis, trucks w/ grain wagons and feed trucks. The existing shoulders are between 2'-5' wide. The slopes are at a 3:1 for the length of the project. Except at the north end by the cross pipe, here the slopes are 2:1 at best. The only additional Right-of-Way that will be required will be at the Northwest side for clear zone of the cross pipe, the realignment will take place on existing state / city Right-of-Way at the intersection.

The current configuration of the intersection is very much a hazard when you are the south bound traffic trying to get onto east bound IA 7. A driver must pull up far enough to turn around and look out their back window to see if traffic from the west is clear. This is made even more difficult if a vehicle is in the middle gravel portion trying to go south onto 205th Ave. This project will help with these problems by giving better sight lines at the intersection.

If you have any questions please feel free to call.

Sincerely,

Jon L. Ites, P.E./L.S.
Buena Vista County Engineer

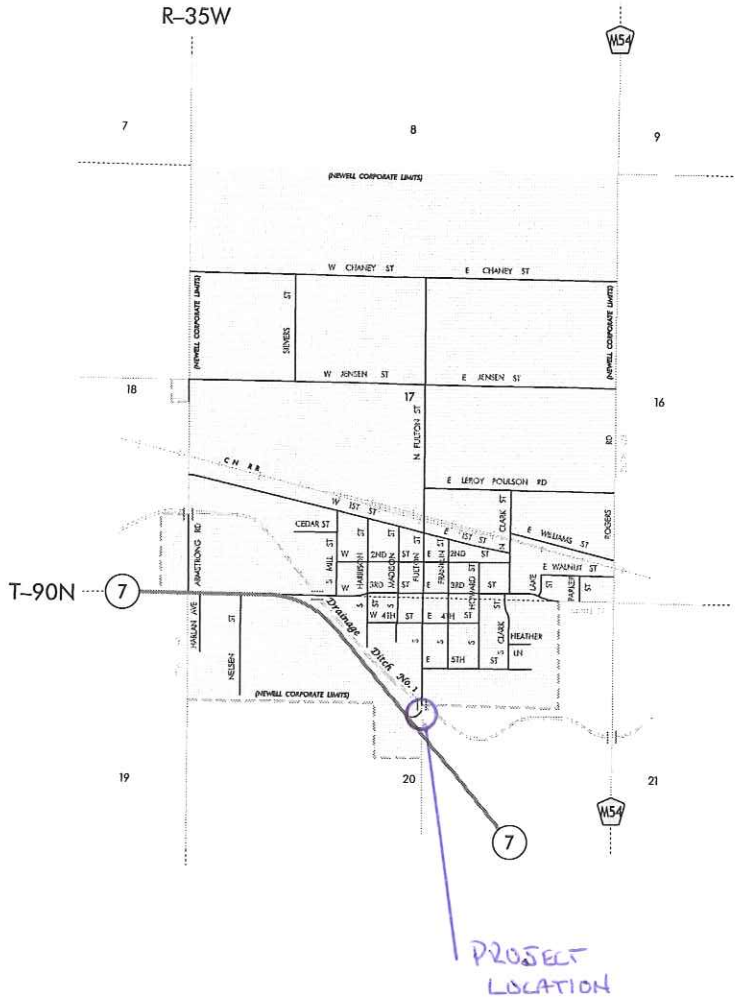
Buena Vista County / City of Newell - S. Fulton / IA 7 Intersection Re-Construciton Estimate

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	ENG. PRICE	ESTIMAT TOTAL
1	2102-2710070	EXCAVATION, CL 10, RDWY+BORROW	CY	4000	$ 15.00	$ 60,000.00
2	2104-2710020	EXCAVATION, CL 10, CHANNEL	CY	113	$ 10.00	$ 1,130.00
3	2107-0875000	COMPACTION W/MOISTURE+DENSITY CONTROL	CY	540	$ 26.00	$ 14,040.00
4	2110-3825010	GRANULAR MATERIAL	TON	100	$ 24.00	$ 2,400.00
5	2111-8174100	GRANULAR SUBBASE	SY	1600	$ 30.00	$ 48,000.00
6	2121-7425021	GRANULAR SHLD, TYPE B	STA	10	$ 420.00	$ 4,200.00
7	2123-7450000	SHLD CONSTRUCTION, EARTH	STA	10	$ 325.00	$ 3,250.00
8	2301-1003100	STD/S-F PCC PAV'T, QM-C CL 3, 10"	SY	1600	$ 100.00	$ 160,000.00
9	2301-6911722	PCC PAV'T SAMPLE	LS	1	$ 1,000.00	$ 1,000.00
10	2401-6745650	RMVL OF EXIST STRUCT	LS	1	$ 5,000.00	$ 5,000.00
11	2402-0425030	GRANULAR BACKFILL	CY	55	$ 35.00	$ 1,925.00
12	2402-2720100	EXCAVATION, CL 20, RDWY PIPE CULV	CY	100	$ 10.00	$ 1,000.00
13	2415-2111208	PRECAST CONC BOX CULV, 12'X8'	LF	40	$ 1,000.00	$ 40,000.00
14	2415-2201208	PRECAST CONC BOX CULV ST END SEC, 12'X8'	EACH	2	$ 20,000.00	$ 40,000.00
15	2505-4008130	RMVL OF CABLE G'RAIL	LF	120	$ 10.00	$ 1,200.00
16	2510-6745850	RMVL OF PAV'T	SY	1882	$ 7.00	$ 13,174.00
17	2518-6910000	SAFETY CLOSURE	EACH	4	$ 500.00	$ 2,000.00
18	2526-8285000	CONSTRUCTION SURVEY	LS	1	$ 3,500.00	$ 3,500.00
19	2527-9263109	PAINTED PAV'T MARK, WATERBORNE/SOLVENT	STA	20	$ 30.00	$ 600.00
20	2528-8445110	TRAFFIC CONTROL	LS	1	$ 5,000.00	$ 5,000.00
21	2533-4980005	MOBILIZATION	LS	1	$ 40,000.00	$ 40,000.00
22	2601-2634100	MULCH	ACRE	1	$ 1,100.00	$ 1,100.00
23	2601-2636043	SEED+FERTILIZE (RURAL)	ACRE	1	$ 1,100.00	$ 1,100.00
24	2602-0000309	PERIMETER+SLOPE SEDIMENT CNTL DEVICE, 9"	LF	100	$ 5.00	$ 500.00
						$ 450,119.00

PROPOSED PROJECT SCHEDULE
S. FULTON & IA 7 INTERSECTION IMPROVEMENTS
NEWELL, IA

August 2014	TSIP Application
December 2014	Iowa DOT Approval
January 2015	TSIP Agreement
Jan. 2015 - Jan. 2016	Project Engineering & Permits
February 2016	Project Letting
March 2016 – November 2016	Project Construction



N

TRANSPORTATION DATA
01 - 13 - 11

LEGEND

INTERSTATE ROUTE	35
FREEWAY OR EXPRESSWAY ROUTE	30
U.S. NUMBERED ROUTE	6
BUSINESS ROUTE	61
STATE NUMBERED ROUTE	44
UNSIGNED ROUTE	461
COUNTY NUMBERED ROUTE	R38
SECONDARY ROAD OR ADJOINING CITY STREET	
CITY STREET	
PARK, INSTITUTION, OR FEDERAL ROAD	
RAILROAD	
CORPORATION LINE	
SECTION LINE	
CUL-DE-SAC	
SECTION, TOWNSHIP & RANGE NUMBERS	9, T-81N, R-30W

SCALE IN MILES

0 0.1 0.2 0.3 0.4 0.5 0.75 1.0

0 0.1 0.2 0.3 0.4 0.5 1.0 1.5 2.0

SCALE IN KILOMETERS

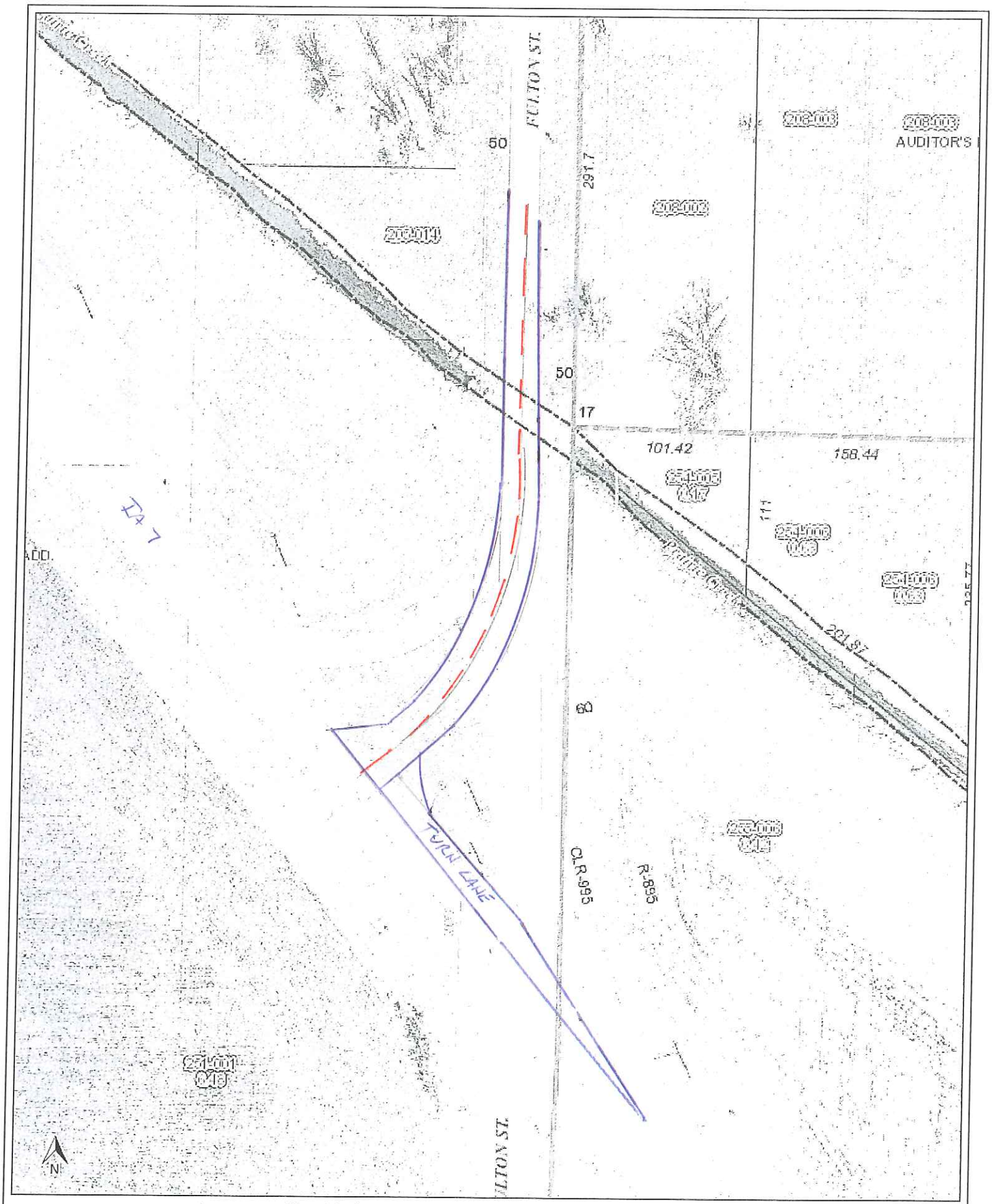
HIGHWAY AND STREET MAP OF

NEWELL
IOWA

PREPARED BY

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING, PROGRAMMING, AND MODAL DIVISION
OFFICE OF TRANSPORTATION DATA
PHONE (515) 239-1289
IN COOPERATION WITH
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

11-5470



Buena Vista, IA

Date Printed: 07/15/2014

This map is for illustrative purposes only and does not represent a survey. It is provided 'as is' without warranty or any representation of accuracy, timeliness or completeness. The user acknowledges and accepts all inherent limitations of the maps and data, including the fact that the maps and data are dynamic and in a constant state of maintenance, correction and revision. No liability is assumed by Buena Vista County as to the accuracy of the data delineated hereon.

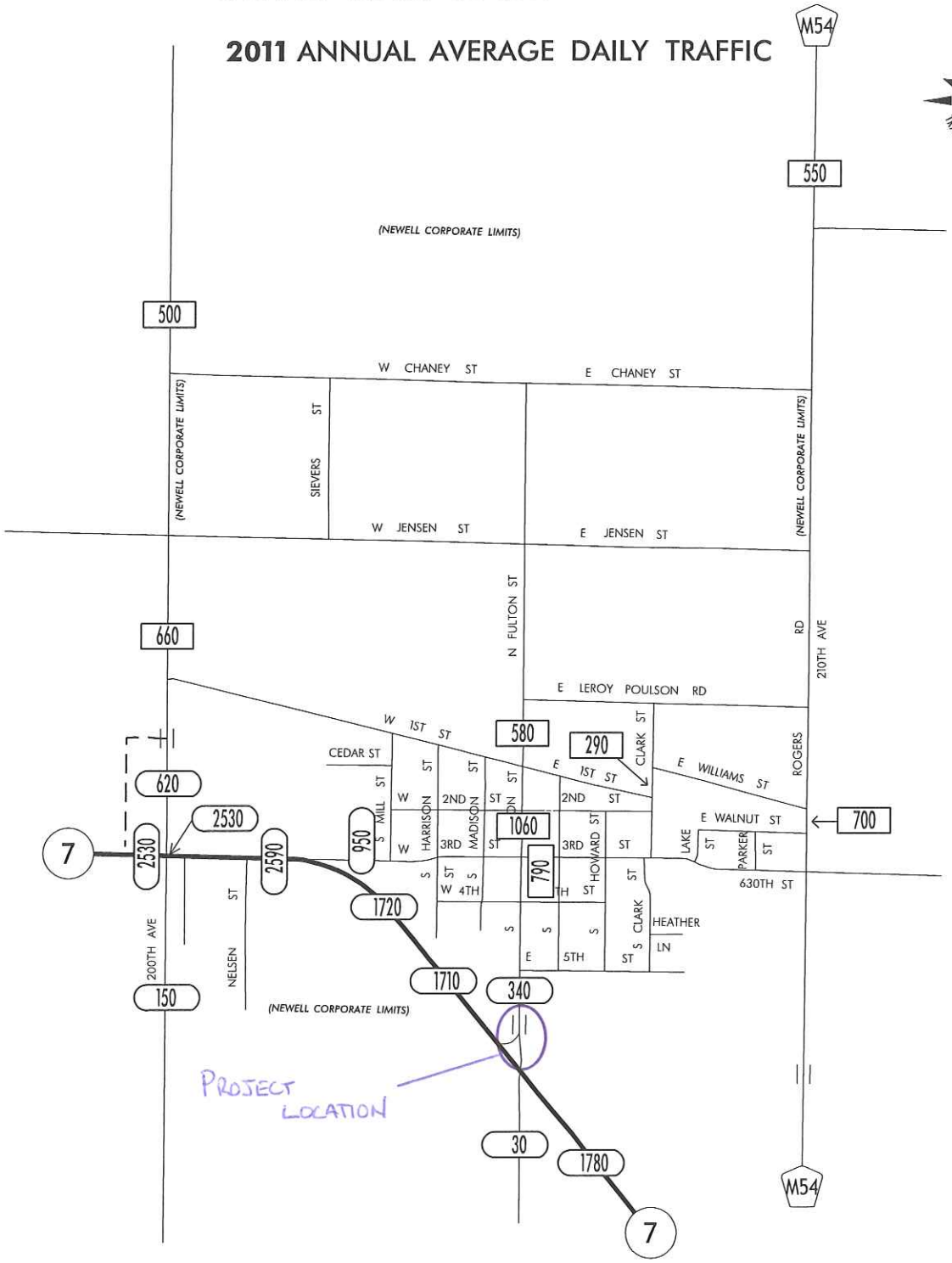
Iowa Department of Transportation

TRAFFIC FLOW MAP OF

NEWELL

BUENA VISTA COUNTY

2011 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

Intersection or Spot Benefit / Cost Safety Analysis

Rev. 7/10

Iowa DOT Office of Traffic & Safety

County: Buena Vista Prepared by: P. Jacobs Date Prepared: Aug 4, 2014

Intersection: The intersection of Iowa Highway 7 and South Fulton Street in Newell, Iowa

Improvement

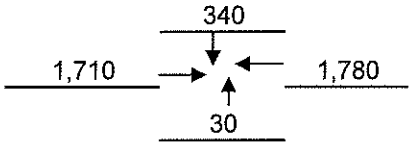
Proposed Improvement(s): Re-alignment and paving of the intersection of South Fulton Street from East 5th Street south to Iowa Highway 7

$ 450,000	Estimated Improvement Cost, **EC**	50	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**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 450,000	Present Value Cost, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT 2011 Date of traffic count

Daily Entering Vehicles by Approach (or AADT / 2)



1,408,900	Current Annual Entering Veh., **AEV** = DEV * 365
44,264	veh / day, Final Year DEV, **FDEV**
294.95	MEV, Total Million Entering Veh. Over life of Project, **TMEV**
5.0%	Projected Traffic Growth (0%-10%), **G**
3,860	Current Daily Entering Vehicles, **DEV**

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

Crash Data

2005 First full year --> 2013 Last full year 9.6 years, Time Period, **T**

7 Additional months values as of Dec. 2007

1	Fatal Crashes →	1	Fatalities @	$3,500,000	$ 3,500,000
		0	Major Injuries @	$240,000	$ -
1	Injury Crashes →	0	Minor Injuries @	$48,000	$ -
		2	Possible Injuries @	$25,000	$ 50,000
1	Property Damage Only		(assumed cost per crash)	$2,700	$ 8,100
		-OR-	enter all Property Costs of all crashes:		
3	Total Crashes, **TA**		Total $ Loss, **LOSS**		$ 3,558,100

0.31	Current Crashes / Year, **AA** = TA / T	**0.22**	Crashes / MEV, Crash Rate, **CR**
$1,186,033	Cost per Crash, **AVC** = LOSS / TA		CR = TA x 10^6 / (DEV x 365 x T)
65.5	Total Expected Crashes, **TECR** = CR x TMEV	##########	Present Value of Avoided Crashes, **BENEFIT**
0.16	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 185,640	Crash Costs Avoided in First Year, AAR x AVC		
32.8	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 = ######### : $450,000 = **25.31** : 1

A)

Iowa Department of Transportation

Rev. 3/08

Application for TRAFFIC SAFETY FUNDS

GENERAL INFORMATION

Location / Title of Project: Shoulder Paving and rumbles. Jesup to Frost Ave.

Applicant: Buchanan County Secondary Roads

Contact Person: Brian Keierleber Title: Buchanan County Engineer

Complete Mailing Address: Buchanan County Secondary Roads 1511 1st St. East
Independence, Iowa 50644

Phone: 319-334-6031 (Area Code) E-Mail: engineer@co.buchanan.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 $ 549,687.

Safety Funds Requested $ 300,000.

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 Buchanan County Secondary Roads

Signed: Brian P. Keierleber 8/26/14

Signature Date Signed

Brian P. Keierleber

Typed Name

Attest: Janet Payne 8/26/14

Signature Date Signed

Janet Payne

Typed Name

Application For TSIP Funds Buchanan County Jesup to Frost Avenue.

B) Buchanan County is requesting funds to place 4 ft. paved shoulders, center rumbles , edge rumbles, and safety edges from the East corporate limits of Jesup to the center of Frost Avenue along D-22 . D-22 was formerly IA 939 and prior to that was US 20. Buchanan County was transferred IA 939 and since that has diligently worked on creating a safer road. This route is carrying from 2460 to 2650 VPD. We acquired approximately 20 ft. of right of way on each side to flatten the fore slopes and widen the shoulders to 10 ft. At that time we were not familiar with placing safety edges on concrete or we would have done so. Now the economical method to place a safety edge is to pave the shoulder. The speed limit is 55mph. Placing centerline rumbles, edge rumbles, paved shoulders, and safety edges are proven methods of reducing cross over accidents and run off road accidents.

C)See Attachment

D)Time Schedule

Approval of Application January 2015

Concept Statement Submittal February 2015

Plan Development February 2015

Letting August 2015.

Due to the Late letting Date a late start date for construction of June 2016 may be assigned by the Iowa Department of Transportation.

ESTIMATED PROJECT QUANTITIES								
PROJECT NUMBER:								
PAVED SHOULDERS								
REF.#	ITEM CODE	ITEM DESCRIPTION	UNIT	TOTAL	UNIT PRICE	ITEM COST		x.535
1	2102-2710090	EXCAVATION, CLASS 10, WASTE	C.Y.	12711.00	$ 4.97	$ 63,173.67		33,797
2	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	13213.00	$ 17.95	$ 237,173.35		126,887
3	2122-5190006	PAVED SHOULDER, P.C. CONCRETE, 6 IN.	S.Y.	38133.33	$ 22.06	$ 841,221.26		450,053
4	2518-6910000	SAFETY CLOSURE	EACH	30.00	$ 110.00	$ 3,300.00		1,765
5	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	987.40	$ 9.48	$ 9,360.55		5007
6	2528-8445110	TRAFFIC CONTROL	L.S.	1.00	$ 10,000.00	$ 10,000.00		5350
7	2533-4980005	MOBILIZATION	L.S.	1.00	$ 20,000.00	$ 20,000.00		10,700
8	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	686.40	$ 22.38	$ 15,361.63		8,218
9	2548-0000320	MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE	STA	343.20	$ 24.82	$ 8,518.22		4,557
TOTAL COST						$ 1,208,108.69		646,337

~~17,187~~ 90 ft
18,458
16,050 ft = 53.48%
~~33,239~~ ft.
34,500

TOTAL COST FOR SEGMENT
= $ 646,337.

Requested TSIP = $300,000
FM FUNDS = $346,337

E)

PROPOSED TSIP PROJECT
PAVED & SHOULDERS
& rumbles, Edge Rumbles, SAFETY Edge

HIGHWAY AND TRANSPORTATION MAP

BUCHANAN COUNTY

IOWA

Prepared By
Iowa Department of Transportation
Phone (515) 239-1282
In Cooperation With
United States Department of Transportation

SCALE IN MILES
SCALE IN KILOMETERS

JANUARY 1, 2009

TRANSPORTATION DATA
10 - 31 - 09

LEGEND

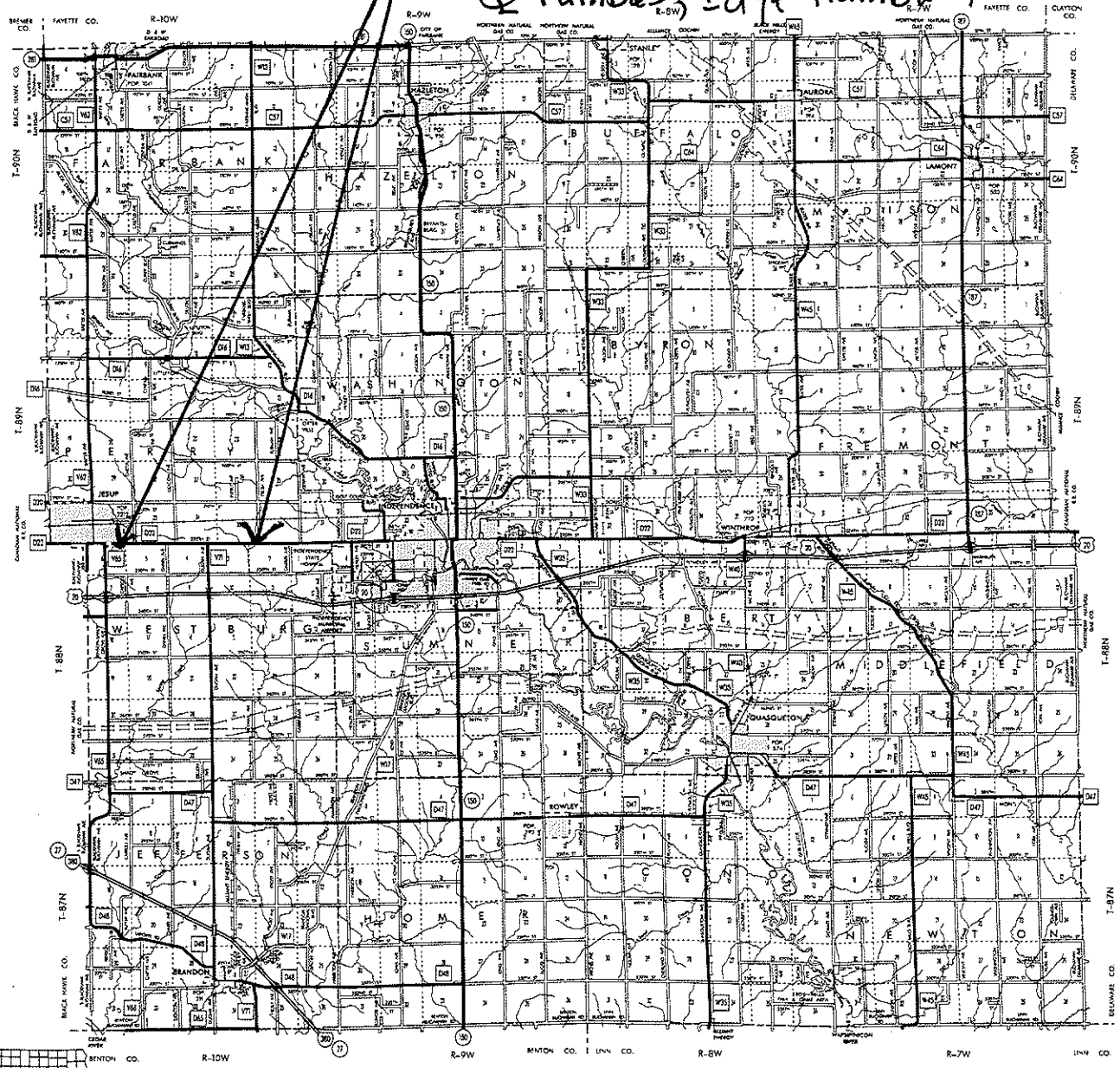
DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTH ROAD

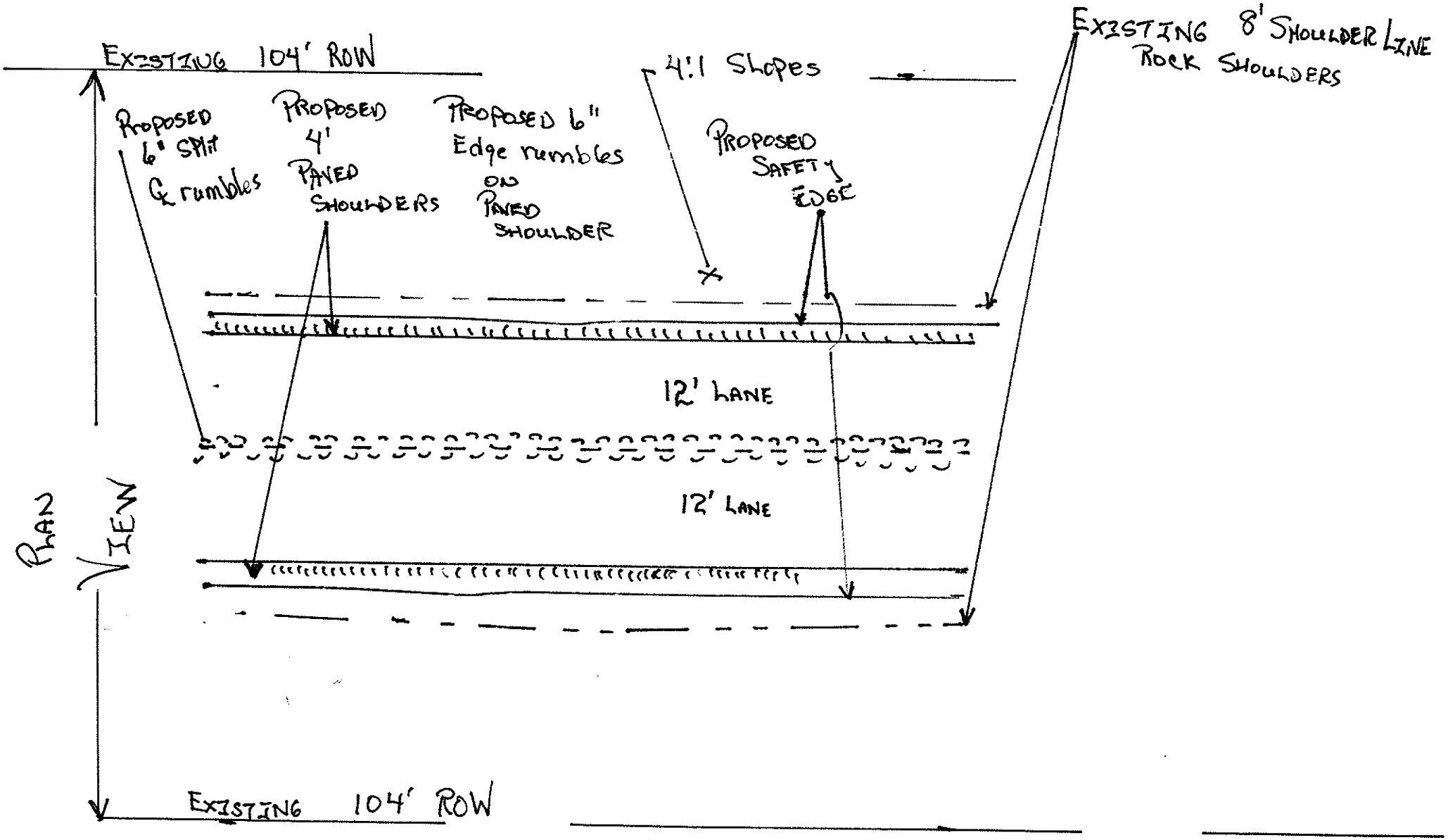
INTERSTATE HIGHWAY
UNITED STATES HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY

RAILROAD
PIPELINE
AIRPORT
HYDROLOGY
BRIDGE

STATE BOUNDARY
COUNTY BOUNDARY
CORPORATE LIMIT LINE
TOWNSHIP LINE
SECTION LINE
ROAD NAMES

STATE PARKS
INSTITUTIONS




EXISTING 104' ROW
4:1 SLOPES
EXISTING 8' SHOULDER LINE
ROCK SHOULDERS
PROPOSED 6" SPIT & rumbles
PROPOSED 4' PAVED SHOULDERS
PROPOSED 6" Edge rumbles ON PAVED SHOULDER
PROPOSED SAFETY EDGE
12' LANE
12' LANE
PLAN VIEW
EXISTING 104' ROW

H

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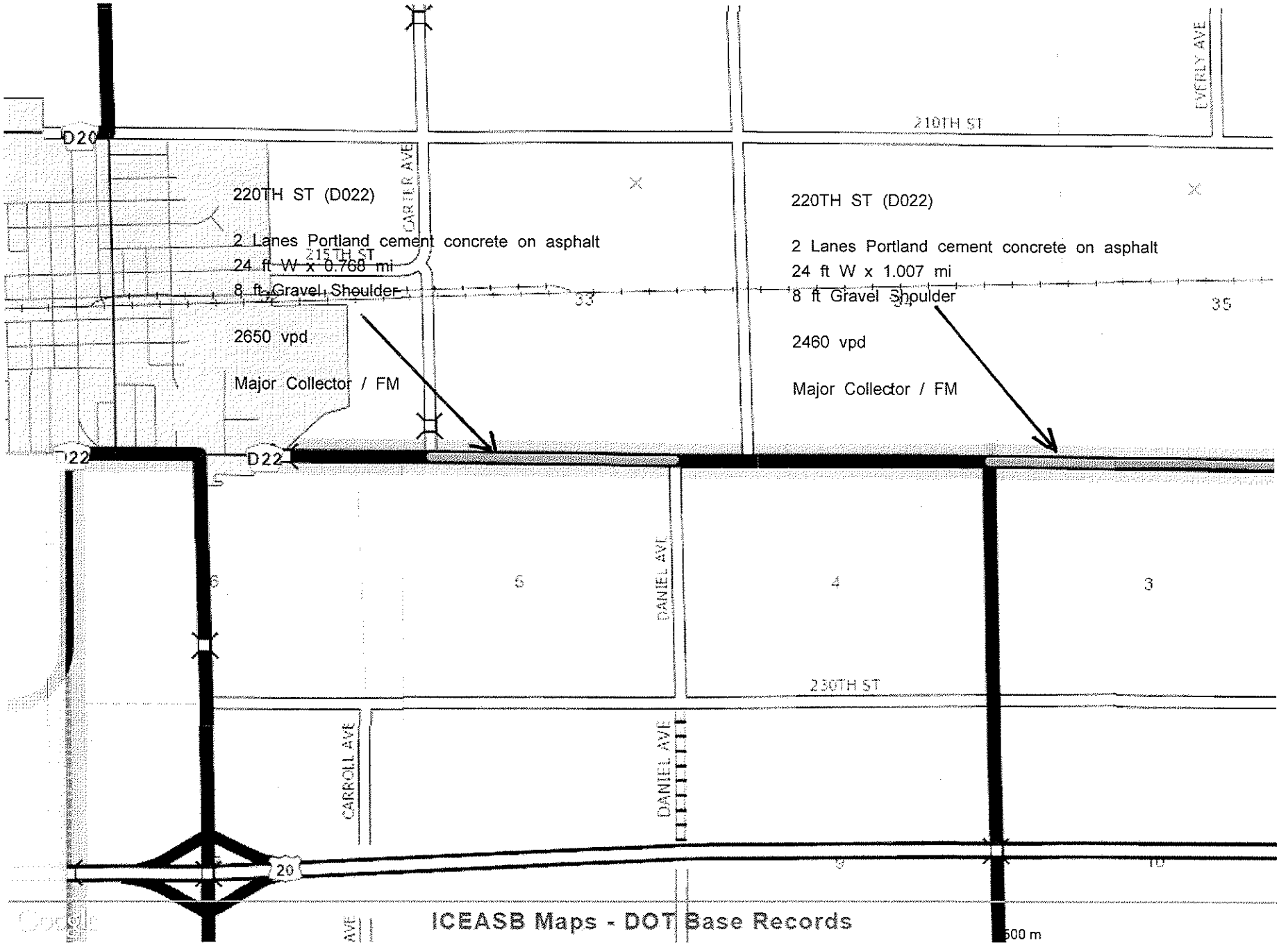
D20
210TH ST
EVERLY AVE
CARTER AVE
215TH ST
220TH ST (D022)
2 Lanes Portland cement concrete on asphalt
24 ft W x 0.768 mi
8 ft Gravel Shoulder
2650 vpd
Major Collector / FM
220TH ST (D022)
2 Lanes Portland cement concrete on asphalt
24 ft W x 1.007 mi
8 ft Gravel Shoulder
2460 vpd
Major Collector / FM
D22
D22
33
34
35
6
5
4
3
DANIEL AVE
230TH ST
CARROLL AVE
DANIEL AVE
20
9
10
AVE
ICEASB Maps - DOT Base Records
500 m

J

Rev. 5/14

Road Segment Benefit / Cost Safety Analysis

Iowa DOT Office of Traffic & Safety

County: BUCHANAN Co. Prepared by: _____ Date Prepared: _____

Location: JESUP TO FROST AVE.

Improvement

Proposed Improvement(s): _____

$ 300,000	Estimated Improvement Cost, **EC**	20	Est. Improvement Life, years, **Y**
$ -	Other Annual Cost (after initial year), **AC**	26	Crash Reduction Factor (integer), **CRF**
$ -	Present Value Other Annual Costs, **OC**	4.0%	Discount Rate, **INT**
	$$OC = \frac{AC}{INT}\left(1 - \frac{1}{(1+INT)^Y}\right)$$	$ 300,000	Present Value All Costs, **COST** = EC + OC

Traffic Volume Data

Source: Iowa DOT Traffic Maps 2013 Date of traffic count

Length (mi.)	Two-way veh/day	Description
3.50	2,650	
3.50	miles total	

9,275	Current Vehicle Miles / Day, **VM**
11,317	End of Life Veh. Miles / Day
3,385,375	Current Veh. Miles / Year, **AM**
74,542,586	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 --> 2013 Last full year 9.0 years, Time Period, **T**

_____ Additional months values as of May 2014

_____	Fatal Crashes →	0	Fatalities @	$4,500,000	$ -
		2	Major Injuries @	$325,000	$ 650,000
10	Injury Crashes →	4	Minor Injuries @	$65,000	$ 260,000
		7	Possible Injuries @	$35,000	$ 245,000
8	Property Damage Only		(assumed cost per crash)	$7,400	$ 133,200
			-OR- enter all Property Costs of all crashes:		
18	Total Crashes, **TA**			Total $ Loss, **LOSS**	$ 1,288,200

2.00	Current Crashes / Year, **AA** = TA / T	**59.1**	Crashes / HMVM, Crash Rate, **CR** CR = TA x 10^8 / (AM x T)
$ 71,567	Cost per Crash, **AVCR** = LOSS / TA	$ 549,687	Present Value of Avoided Crashes, **BENEFIT**
44.0	Total Expected Crashes, **TCR** = CR x TVMT/10^8		
0.52	Crashes Avoided First Year **AAR** = AA x CRF / 100		
$ 37,215	Crash Costs Avoided in First Year, AAR x AVCR		
11.4	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 = $549,687 : $300,000 = **1.83** : 1