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ITERIS

MID-AMERICA TRANSPORTATION CENTER

"What I Did During My MATC Summer Internship"

Final Report

Prepared For:

Mid-America Transportation Center

August 8th, 2011

The summer of 2011 marks my second year of involvement in the Mid-America Transportation Center (MATC) summer Internship Program. Both last summer and this summer I have interned with Iteris, Inc in Lincoln, NE. Iteris provides traffic consulting services to Federal, State and City agencies, and assists private developers and businesses with traffic management needs. Iteris has a company mentality that:

"Success is a journey, not a destination."

Photo above: Iteris, Inc office in Lincoln, NE.

This mentality is a mindset of continuous learning and innovation. The learning aspect of this mindset entails understanding that engineering practices and technology are always changing, and embracing the pursuit of knowledge. The innovation aspect is applying learned practices and new technology to improve the safety and the efficiency of the transportation infrastructure.

During my first MATC summer internship I learned a lot about the fundamental principles and tools that Traffic Engineers utilize. This included exposure to reference material such as the Manual on Uniform Traffic Control Devices (MUTCD) 2009, the Highway Capacity Manual (HCM) 2000, the Institute of Transportation Engineers (ITE) Trip Generation 8th Edition manual and the Manual of Traffic Signal Design, and the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets (Green Book) 2004. Last summer also introduced me to much of the software applied in the traffic engineering profession

including Microsoft Office Suite, Adobe software, Microstation V8 XM, Jamar mechanical tube counting and turning movement counting software.

Photo above: reference material at Iteris, Inc office.

My second MATC summer internship created an opportunity to broaden my knowledge and experience even further. Since the summer of 2011 AASHTO has released the 1st Edition of the Highway Safety Manual (HSM). This publication documents the recommended methodologies for the evaluating and improving the safety of roadways and intersections. This resource has played an integral part in the work I have done at Iteris this summer.

The majority of my time this summer was focused on assisting senior engineers in completing the 2009 Lincoln Crash Study. The scope of this project involved the review of about 55 intersections with high crash rates and/or distinct crash patterns. The data for this project is generated from the Lincoln Police Department accident reports. The review process involved sorting the crash data at each selected intersection by Time of Day, Day of Week, by Crash Type, by Pavement Condition, and by Lighting Condition. Additionally all crashes at an intersection were drawn on Collision Diagrams to check for crash patterns at that location. The next step of the review process incorporated field visits to the intersections to check if the physical conditions were contributing to the crash pattern. Once an intersection review was complete Iteris staff provided recommended countermeasures that could potentially reduce the frequency of crashes at an intersection. My roles in this project primarily

consisted of creating detailed appendices for all of the intersections and taking photos at the locations Iteris reviewed (please see attachment for sample of work).

In addition to sorting and processing crash data, I had the opportunity to assist senior Iteris staff at progress meetings with the Lincoln Engineering Services staff (client for Lincoln Crash Study). This experience taught me the importance of taking thorough notes for meeting minutes and the importance of searching out a client's needs within a project. Senior Iteris staff provided an excellent example of tailoring the company skill set in a manner that maximized client benefit.

Photo above: meeting with City of Lincoln staff. From left to right: Shane Dostal, Virendra Singh, David McClintock, Scott Opfer, and Larry Jochum.

In conclusion, my second MATC summer internship was an experience of growth. I expanded my knowledge base and embraced new opportunities. I would like to thank the Mid-America Transportation Center and Iteris, Inc for the opportunity to further expand my knowledge and experience in the traffic engineering industry.

Photo right: Lonnie Burklund PE, PTOE on left and Steve Garbe, PE on right. Lonnie and I had a meeting with the City of Lincoln staff this day and we decided to wear slacks and polos. Neither of us thought we would both wear blue polos and black slacks. Steve got lucky with his clothing selection.

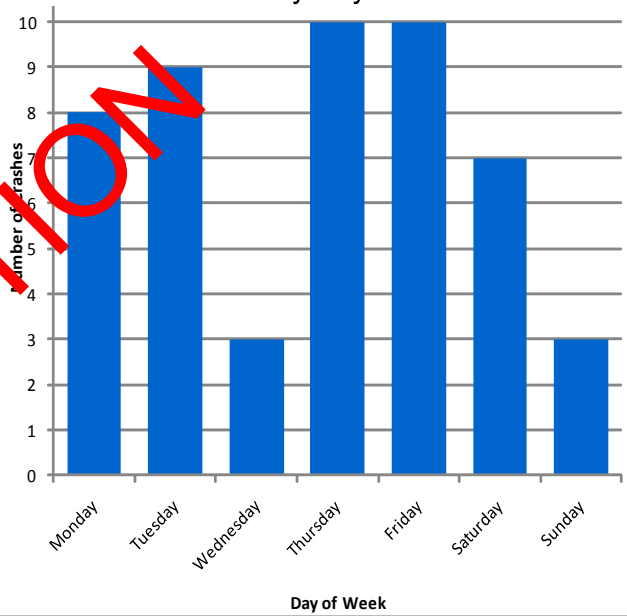
2009 Crash Study
City of Lincoln, NE

Crash Statistics

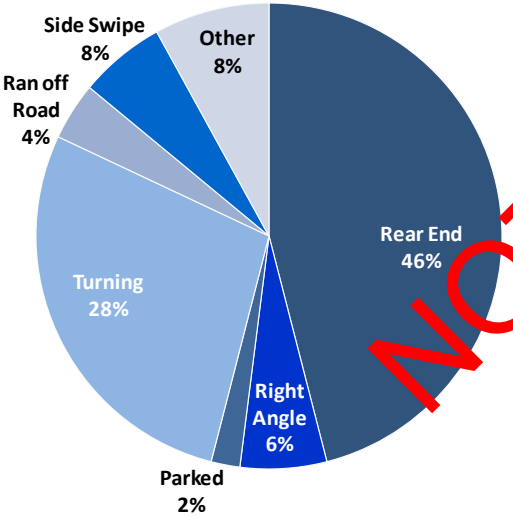
N 27th Street and Vine Street Intersection Crash Data	
Total Number of Crashes	50
Crash Rate (crashes/MEV)	2.6
EPDO Rate (crashes/MEV)	9.75
Intersection Ranking (Signalized Major-Major)	
Total Number of Crashes	1st of 29
Crash Rate (crashes/MEV)	1st of 29
EPDO Rate (crashes/MEV)	1st of 29
Similar Intersection Average (Signalized Major-Major)	
Total Number of Crashes	10.0
Crash Rate (crashes/MEV)	0.84
EPDO Rate (crashes/MEV)	2.3

Crashes by Time of Day

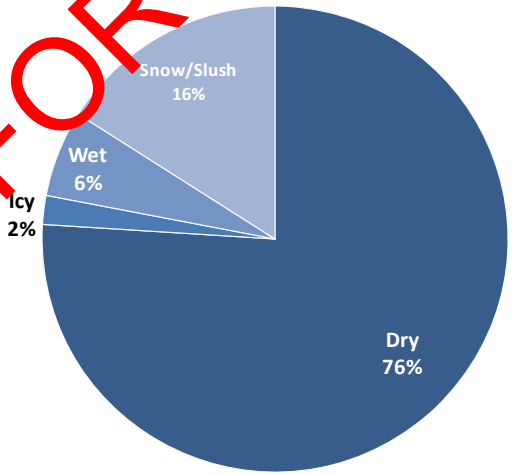
Crashes by Day of Week



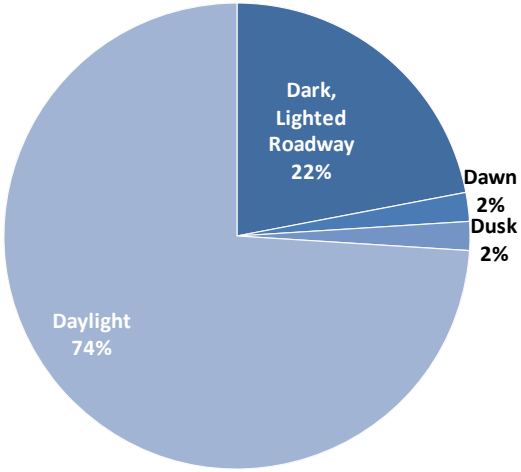
Crashes by Type



Crashes by Pavement Condition

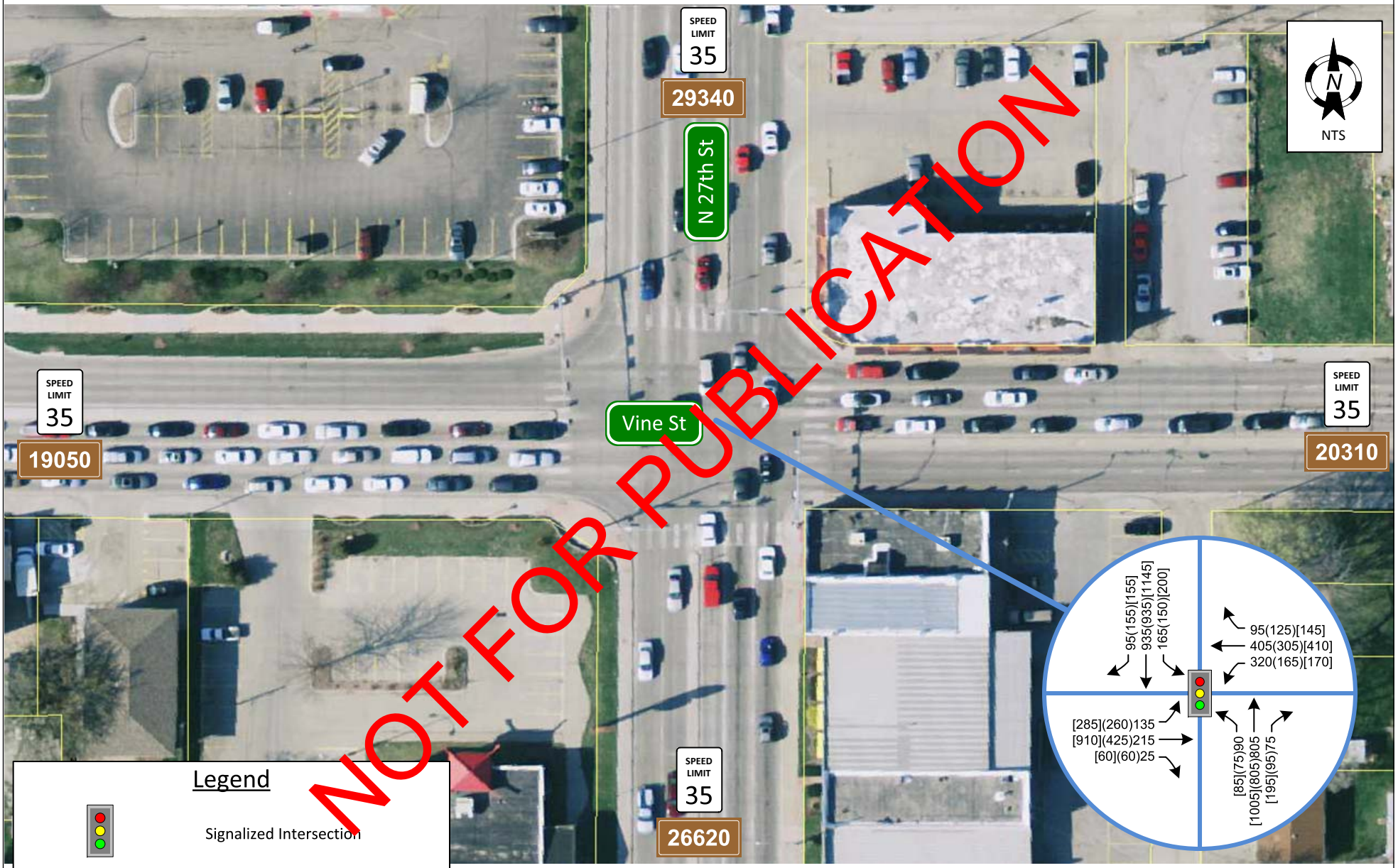


Crashes by Lighting Condition



2009 Summary
N 27th Street and Vine Street

2009 Crash Study
City of Lincoln, NE



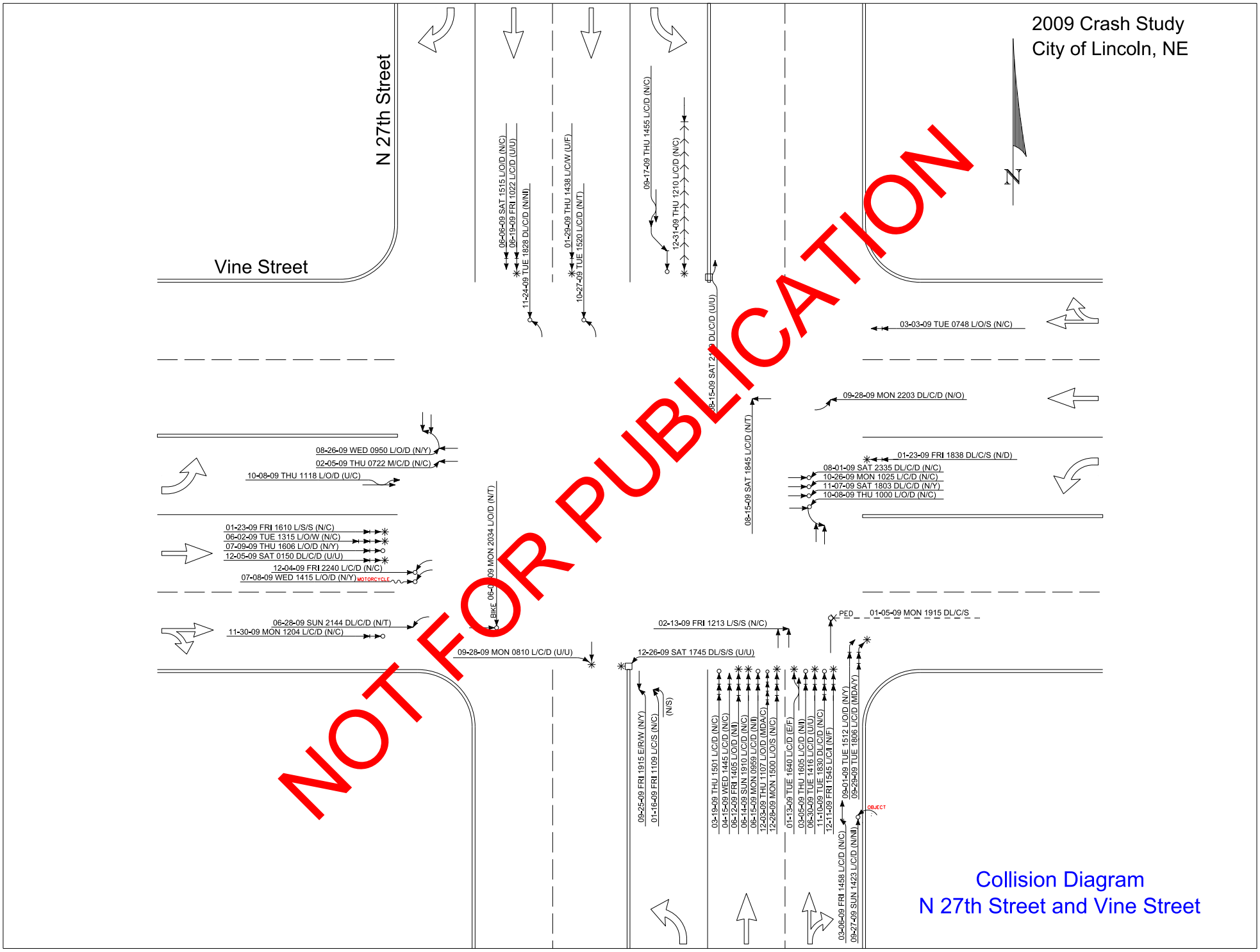
Legend

Signalized Intersection

XXXX Average Daily Traffic

XXX(XXX)[XXX] AM(MD)[PM] Peak Hour Volumes

Aerial Photo
N 27th Street and Vine Street


2009 Crash Study
City of Lincoln, NE
N 27th Street
Vine Street
N
06-06-09 SAT 1515 L/O/D (N/C)
06-19-09 FRI 1022 L/C/D (U/U)
11-24-09 TUE 1828 DL/C/D (N/NI)
01-29-09 THU 1438 L/C/W (U/F)
10-27-09 TUE 1520 L/C/D (N/T)
09-17-09 THU 1455 L/C/D (N/C)
12-31-09 THU 1210 L/C/D (N/C)
08-15-09 SAT 2140 DL/C/D (U/U)
08-15-09 SAT 1845 L/C/D (N/T)
03-03-09 TUE 0748 L/O/S (N/C)
09-28-09 MON 2203 DL/C/D (N/O)
01-23-09 FRI 1838 DL/C/S (N/D)
08-01-09 SAT 2335 DL/C/D (N/C)
10-26-09 MON 1025 L/C/D (N/C)
11-07-09 SAT 1803 DL/C/D (N/Y)
10-08-09 THU 1000 L/O/D (N/C)
08-26-09 WED 0950 L/O/D (N/Y)
02-05-09 THU 0722 M/C/D (N/C)
10-08-09 THU 1118 L/O/D (U/C)
01-23-09 FRI 1610 L/S/S (N/C)
06-02-09 TUE 1315 L/O/W (N/C)
07-09-09 THU 1606 L/O/D (N/Y)
12-05-09 SAT 0150 DL/C/D (U/U)
12-04-09 FRI 2240 L/C/D (N/C)
07-08-09 WED 1415 L/O/D (N/Y) MOTORCYCLE
06-28-09 SUN 2144 DL/C/D (N/T)
11-30-09 MON 1204 L/C/D (N/C)
06-09-09 MON 2034 L/O/D (N/T)
BIKE
09-28-09 MON 0810 L/C/D (U/U)
02-13-09 FRI 1213 L/S/S (N/C)
12-26-09 SAT 1745 DL/S/S (U/U)
PED
01-05-09 MON 1915 DL/C/S
09-25-09 FRI 1915 E/R/W (N/Y)
01-16-09 FRI 1109 L/C/S (N/C)
(N/S)
03-19-09 THU 1501 L/C/D (N/C)
04-15-09 WED 1445 L/O/D (N/C)
06-12-09 FRI 1405 L/O/D (N/I)
06-14-09 SUN 1910 L/C/D (N/C)
06-15-09 MON 0959 L/C/D (N/I)
12-03-09 THU 1107 L/O/D (MDA/C)
12-28-09 MON 1500 L/O/S (N/C)
01-13-09 TUE 1640 L/C/D (E/F)
03-05-09 THU 1605 L/C/D (N/I)
06-30-09 TUE 1416 L/C/D (U/U)
11-10-09 TUE 1830 DL/C/D (N/C)
12-11-09 FRI 1545 L/C/I (N/F)
09-01-09 TUE 1512 L/O/D (N/Y)
09-29-09 TUE 1806 L/C/D (MDA/Y)
03-06-09 FRI 1458 L/C/D (N/C)
09-27-09 SUN 1423 L/C/D (N/NI)
OBJECT
NOT FOR PUBLICATION
Collision Diagram
N 27th Street and Vine Street

Crash Pattern	Correctable EPDO		Countermeasure	% Crash Reduction	Uniform Annual Benefit	Benefit/Cost Ratio
NB & SB Rear End Crashes	66.24	1	Update signal timing to improve signal coordination along N 27th Street (Top Countermeasure recommended for this intersection).	10 %	$52,885	149.6
Left Turn Crashes	101.92	2	Implement flashing yellow arrow signal.	10 %	$88,495	132.0
	101.92	3	Review signal timings for clearance intervals.	10 %	$81,370	460.4

Countermeasures
N 27th Street and Vine Street

NB Approach

SB Approach

EB Approach

WB Approach

Approach Photos
N 27th Street and Vine Street