

BEFORE THE BOARD OF COMMISSIONERS
OF LANCASTER COUNTY, NEBRASKA

ESTABLISHING THE MAXIMUM SPEED LIMIT)
AND AUTHORIZING THE INSTALLATION OF)
TRAFFIC CONTROL DEVICES ON SALTILLO)
RD. FROM 27TH STREET TO 68TH STREET IN)
LANCASTER COUNTY)

RESOLUTION NO. R-18-0037

WHEREAS, NEB. REV. STAT. § 60-6,121 provides that Lancaster County (“County”) shall place and maintain such traffic control devices upon highways within its jurisdiction to carry out the provisions of the Nebraska Rules of the Road or to regulate, warn, or guide traffic;

WHEREAS, NEB. REV. STAT. § 60-670 provides that traffic control devices include any sign, signal, marking, or other device not inconsistent with the Nebraska Rules of the Road placed or erected by authority of the County for the purpose of regulating, warning, or guiding traffic;

WHEREAS, NEB. REV. STAT. § 60-680(1)(k) provides a local authority may alter or establish speed limits authorized in the Nebraska Rules of the Road upon highways within its jurisdiction;

WHEREAS, NEB. REV. STAT. §60-628 provides: “Local authority shall mean every county . . . having power to enact laws, rules, or regulations relating to traffic under the Constitution of Nebraska and the laws of this state. . . .”

WHEREAS, NEB. REV. STAT. § 60-6,186 provides: “Except when a special hazard exists that requires lower speed for compliance with section 60-6,185, the limits set forth in this section and sections 60-6,187, 60-6,188, 60-6,305, and 60-6,313 shall be the maximum lawful speeds unless reduced pursuant to subsection (2) of this section...;”

WHEREAS, NEB. REV. STAT. § 60-6,186 further provides: “The maximum speed limits established in subsection (1) of this section may be reduced by the Department of Transportation [“Department”] or by local authorities pursuant to section 60-6,188 [special provisions regarding construction zones] or 60-6,190;”

WHEREAS, NEB. REV. STAT. § 60-6,190(3) provides: “On county highways ... county boards shall have the same power and duty to alter the maximum speed limits as the [Department] if the change is based on an engineering and traffic investigation comparable to that made by the [Department];”

WHEREAS, NEB. REV. STAT. § 60-6,190(2) provides: “Whenever the [Department] determines, upon the basis of an engineering and traffic investigation, that any maximum speed limit is greater or less than is reasonable or safe under the conditions found to exist at any intersection, place, or part of the state highway system ... it may determine and set a reasonable and safe maximum speed limit for such intersection, place, or part of such highway which shall be the lawful speed limit when appropriate signs giving notice thereof are erected at such intersection, place, or part of the highway, Such a maximum speed limit may be set to be effective at all times or at such times as are indicated upon such signs;”

WHEREAS, NEB. REV. STAT. § 39-1503(5) provides: “It shall be the duty of the county board in commissioner-type counties having a county highway superintendent . . . to: . . . Cause investigations, studies, and inspections to be made, hold public hearings, and do all other things necessary to carry out the duties imposed upon it by law;”

WHEREAS, the Lancaster County Board of County Commissioners (“Board”) caused an engineering and traffic investigation to be conducted by an external engineering firm on Saltillo

Road from 27th Street to 68th Street in Lancaster County, on April 26th, May 3rd, and May 17th of 2018. Based on the speed study results, the roadway cross-section, crash history, engineering judgment, and Federal Highway Administration's guidance, the firm recommended the posted speed limit be reduced from 55 mph to 50 mph. A copy of the engineering and traffic investigation is attached hereto as Exhibit A to this Resolution and is hereby incorporated herein by this reference;

WHEREAS, the Lancaster County Engineer ("Engineer") in the Engineer's capacity as County Highway Superintendent, has control, government, and supervision of all the public roads and bridges in the County under the general supervision and control of the ("Board") pursuant to NEB. REV. STAT. § 39-1507; and

WHEREAS, the Engineer has informed the Board of the results of the completed engineering and traffic investigation;

NOW, THEREFORE, BE IT RESOLVED, by the Board of County Commissioners of Lancaster County, Nebraska, as follows;

1. The Board hereby determines, upon the basis of an engineering and traffic investigation, that:
 - a. The current maximum speed limit of fifty-five miles per hour (55 m.p.h.) on Saltillo Road from 27th Street to 68th Street in Lancaster County is greater than is reasonable or safe under the conditions found to exist as a result of the traffic and engineering study; and

- b. The reasonable and safe maximum speed limit on Saltillo Road from 27th Street to 68th Street in Lancaster County should be, and hereby is, set at fifty miles per hour (50 m.p.h.); and
- 2. The Board hereby authorizes the Lancaster County Engineer to take all actions necessary with respect to the following traffic control devices (Exhibit B) to carry out the provisions of this Resolution:
 - a. R2-1 located on Saltillo Road, currently posted at 55 m.p.h. Replace with 50 m.p.h. R2-1 sign for westbound traffic.
 - b. R2-1 located on Saltillo Road, currently posted at 55 m.p.h. Replace with 50 m.p.h. R2-1 sign for eastbound traffic

DATED this 5 day of June, 2018, at the County-City Building, Lincoln,

Lancaster County, Nebraska.

BY THE BOARD OF COUNTY
COMMISSIONERS OF LANCASTER
COUNTY, NEBRASKA

APPROVED AS TO FORM
this 5 day of June, 2018.


Deputy County Attorney
For PAT CONDON
Lancaster County Attorney





BRINKMAN ABSENT



MEMORANDUM

TO: Pam Dingman, County Engineer
Lancaster County, Nebraska

FROM: Adam Denney, PE, Mark Meisinger, PE, PTOE & Rick Haden
Felsburg Holt & Ullevig

DATE: May 29, 2018

SUBJECT: Saltillo Road Speed Studies Memo

This memo summarized the results of the speed study analysis completed by Felsburg Holt & Ullevig (FHU). The study identified the 85th percentile speeds along Saltillo Road and provide a comparison to the posted speed limit. In the study area, Saltillo Road is a two-lane undivided roadway with a posted speed limit of 55 miles per hour (mph). Eleven-foot lanes are provided in both the eastbound and westbound directions with 2' - 3' dirt shoulders, open drainage ditches, and steep sideslopes on both sides of the roadway.

FHU used data collection vendor MNRG to collect speed data at three locations on Saltillo Road: 2,000 feet west of S. 38th Street, 1,500 feet west of S. 54th Street, and 2,378 feet east of S. 56th Street. Data was collected for a 13-hour period from 6:00 AM – 7:00 PM. Each location was counted on a sperate day (April 26th, May 3rd, and May 17th). This provided both off-peak and peak hour vehicle speeds to develop the 85th percentile speed for the corridor.

Methodology

To collect speed data at the three study locations, MNRG utilized Miovision Scout Connect. Two data collection units were set up approximately 2,000 to 3,000 feet apart depending on location. Each data collection unit is set up to track unique media access control (MAC) addresses from wi-fi connected devices (typically a cell phone) over a wi-fi network. A time stamp is created at each station for every MAC address detected. The time between stations and distance traveled are used to determine the space mean speed of the vehicle. The equation for space mean speed is as follows:

$$\text{Space mean speed: } \text{Distance} / \text{Median Travel Time in minutes} \times 60 \text{ minutes/hour}$$

85th Percentile & Median Speed

The table below display the results of the speed study. Additional data including graphs and charts for each location are attached to this memo. Please note that these graphics display travel time and not speeds.

Roadway	Location	85 th Percentile Speed (mph)		Median Speed (mph)	
		EB	WB	EB	WB
Saltillo Rd.	2,378 feet east of S. 56th St.	61.80	65.92	45.99	54.94
Saltillo Rd.	1,500 feet west of S. 54th St.	54.11	63.66	49.38	51.03
Saltillo Rd.	2,000 feet west of S. 38th St.	61.78	64.87	43.25	48.08
Directional Average		59.23	64.82	46.21	51.35
Overall Roadway Average		62.02		48.78	

The calculated 85th percentile speed over the analysis period ranged from right at the speed limit (55 mph) to segments with vehicles traveling at 10 mph over the posted speed limit. Overall, the average 85th percentile speed for the corridor was calculated to be 62.02 mph, over 7 mph the posted speed limit. The median speed or 50th percentile speed was calculated to be 48.78 mph. The range of travel speeds on Saltillo Road varied widely depending on level of traffic. The speed of the slowest vehicle can also impact overall travel speeds since there is little opportunity to pass east of 40th Street due to the vertical alignment.

Recommendation

Typically, a good indicator of what the posted speed limit should set at is the 85th percentile speed. However, that is not the only factor that should be considered when recommending the speed limit for a roadway. Other factors that should be evaluated are grades, cross-sections, median or 50th percentile speed, traffic volume, crash history, and engineering judgment.

As a tool to help assist in determining the appropriate posted speed limit for Saltillo Road, FHU utilized the Federal Highway Administration's (FHWA) USLIMIT2 tool. The tool completes a statistical analysis based on several roadway specific inputs including current speed limit, roadway features, ADT volumes, and crash statistics to develop a recommended posted speed limit. The results of the USLIMIT2 analysis are attached to this memo.

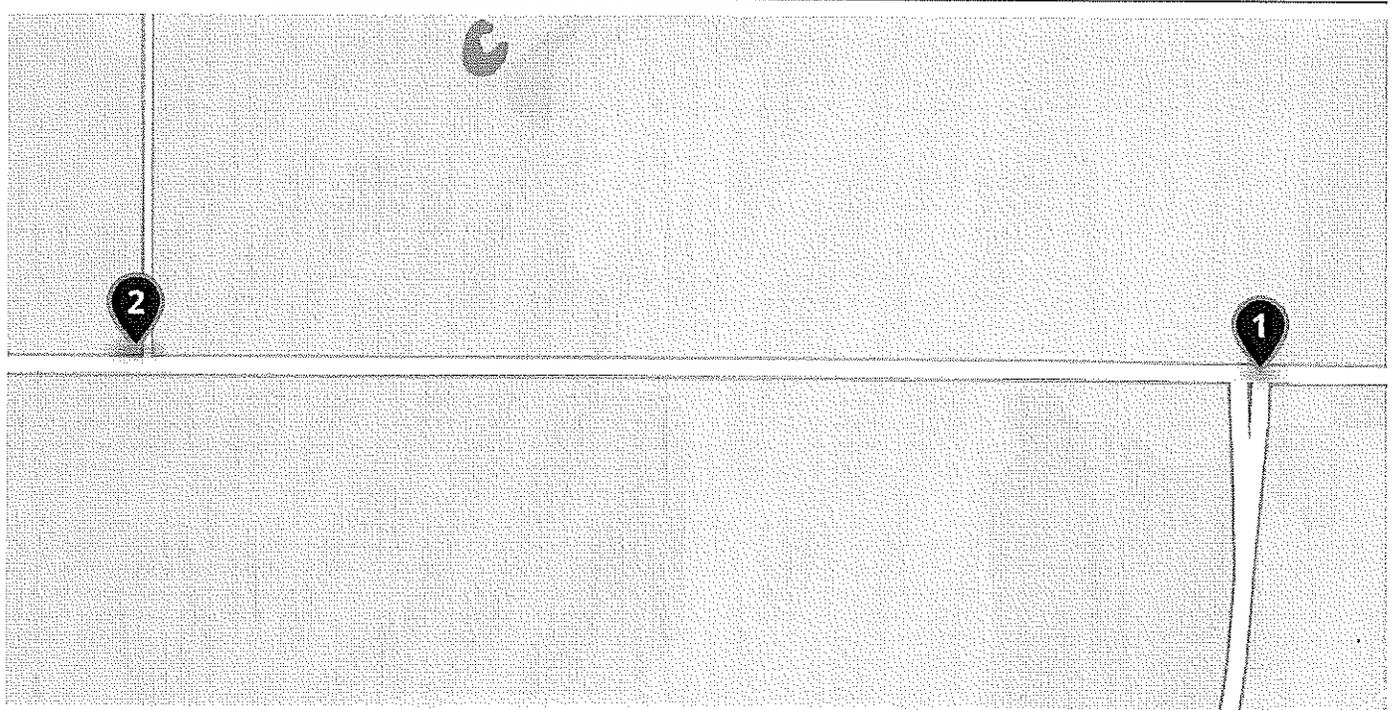
Based on speed study results, the roadway cross-section, crash history, engineering judgment, and FHWA guidance, it is recommended that posted speed limit on Saltillo Road from 27th Street to 68th Street be reduced from 55 mph to 50 mph.

May 29, 2018
Saltillo Road Speed Studies Memo
Attachments

2,000 feet west of S. 38th Street

Travel Time Summary

2 Locations | Lincoln, NE | Thu Apr 26, 2018 | 6:00AM - 7:00PM (13.0h)



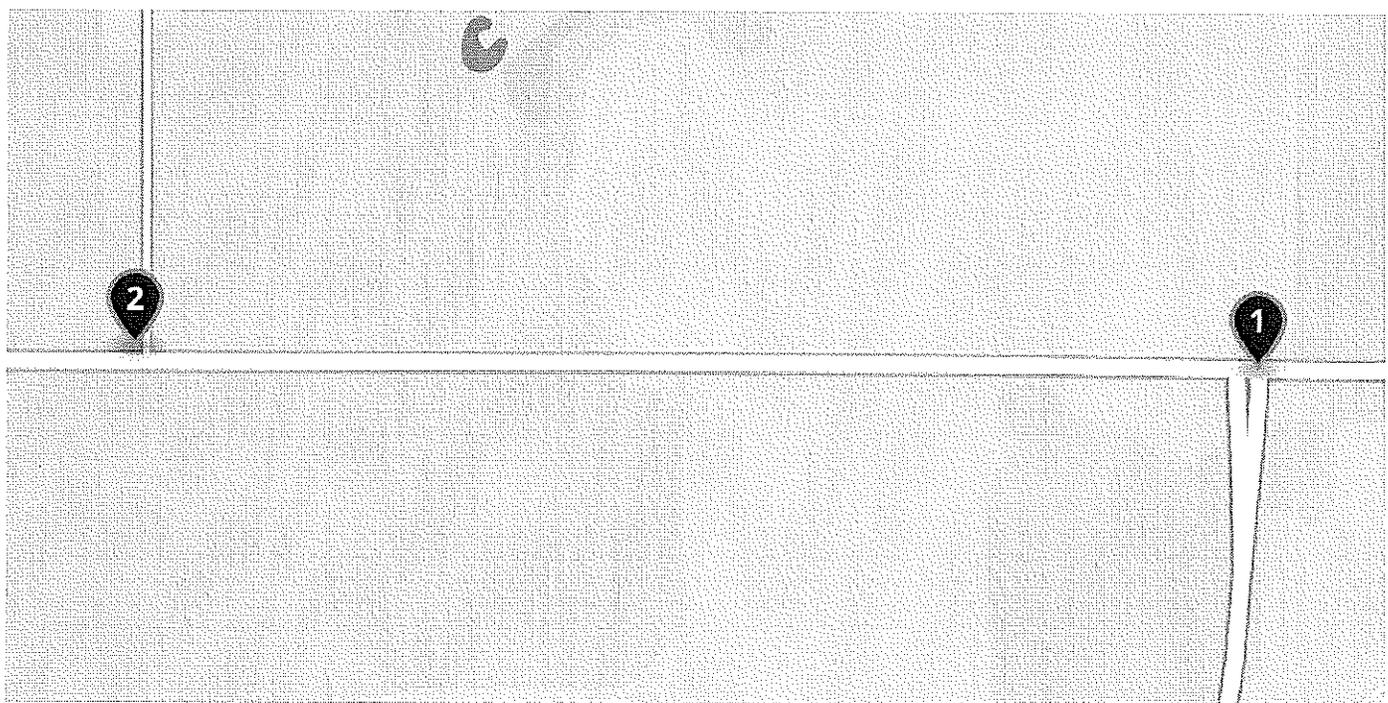
Start Location	End Location	# of Trips	Travel Time (minutes)							Distance (mis) ¹	Speed (mph) ²						
			Median	85th Percentile	95th Percentile	Mean	Min	Max	Median		85th Percentile	95th Percentile	Mean	Min	Max		
1	68th St & Saltillo Rd	2	11201-11499 South 60th Street	201	0.60	0.75	0.77	0.61	0.37	0.92	0.5*	54.94	65.92	70.63	55.71	35.96	89.90
2	11201-11499 South 60th Street	1	68th St & Saltillo Rd	182	0.72	0.80	0.85	0.69	0.47	0.95	0.5*	45.99	61.80	65.92	49.33	34.70	70.63

¹ Distance is the length of the Fastest Route between the locations in Google Maps. If Google Maps is unavailable or if Google Maps reports a distance longer than twice the aerial (as the bird flies) distance, the aerial distance is used and is denoted by an asterisk (*). See help.miovision.com/kb/distance for more information.

² Speed is the distance between the points divided by the travel time. This value is known as the space mean speed. This report was configured to include trips with calculated speeds between 1.0 mph and 90.0 mph. If you want a report that includes trips with a different range of speeds, or all trips, contact the person who generated the report.

Travel Time Reliability Summary

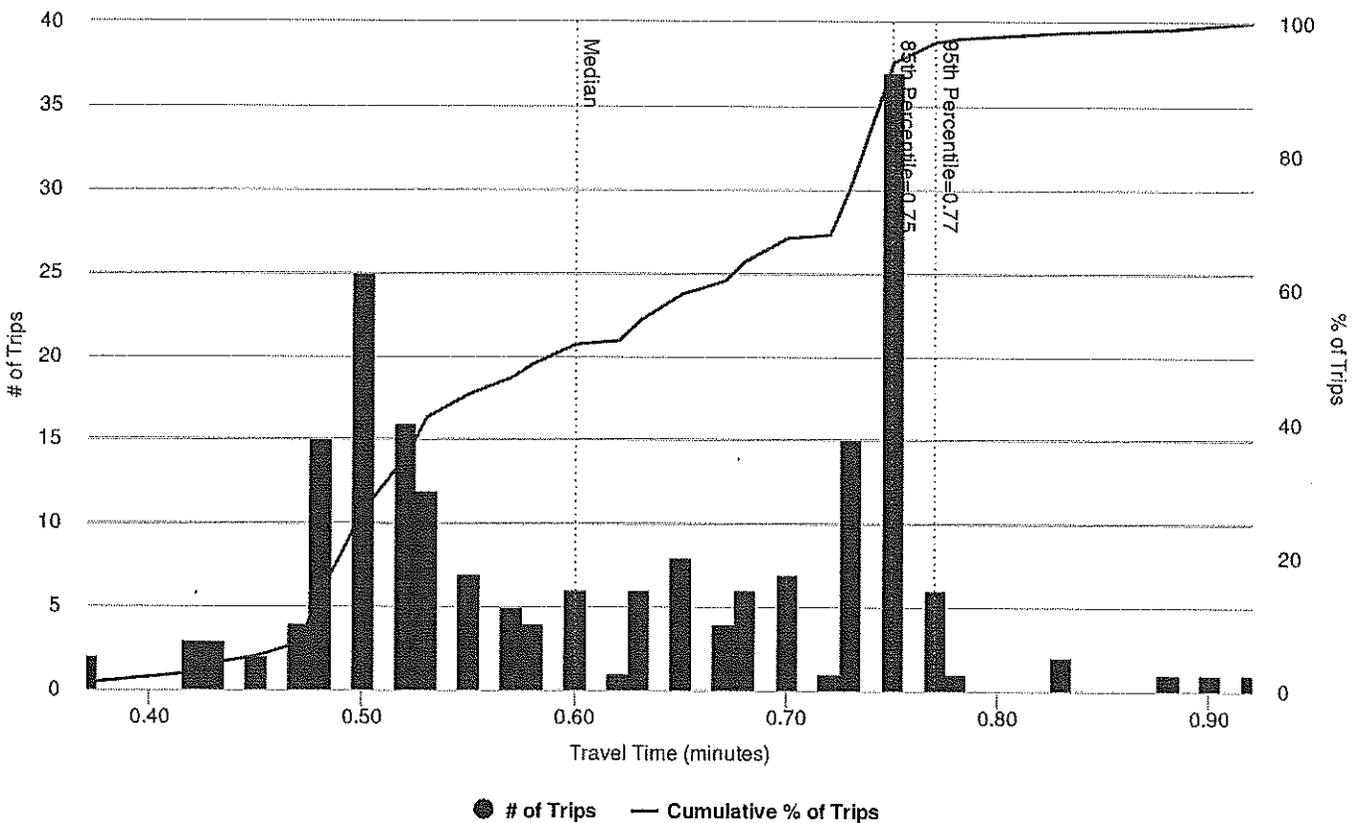
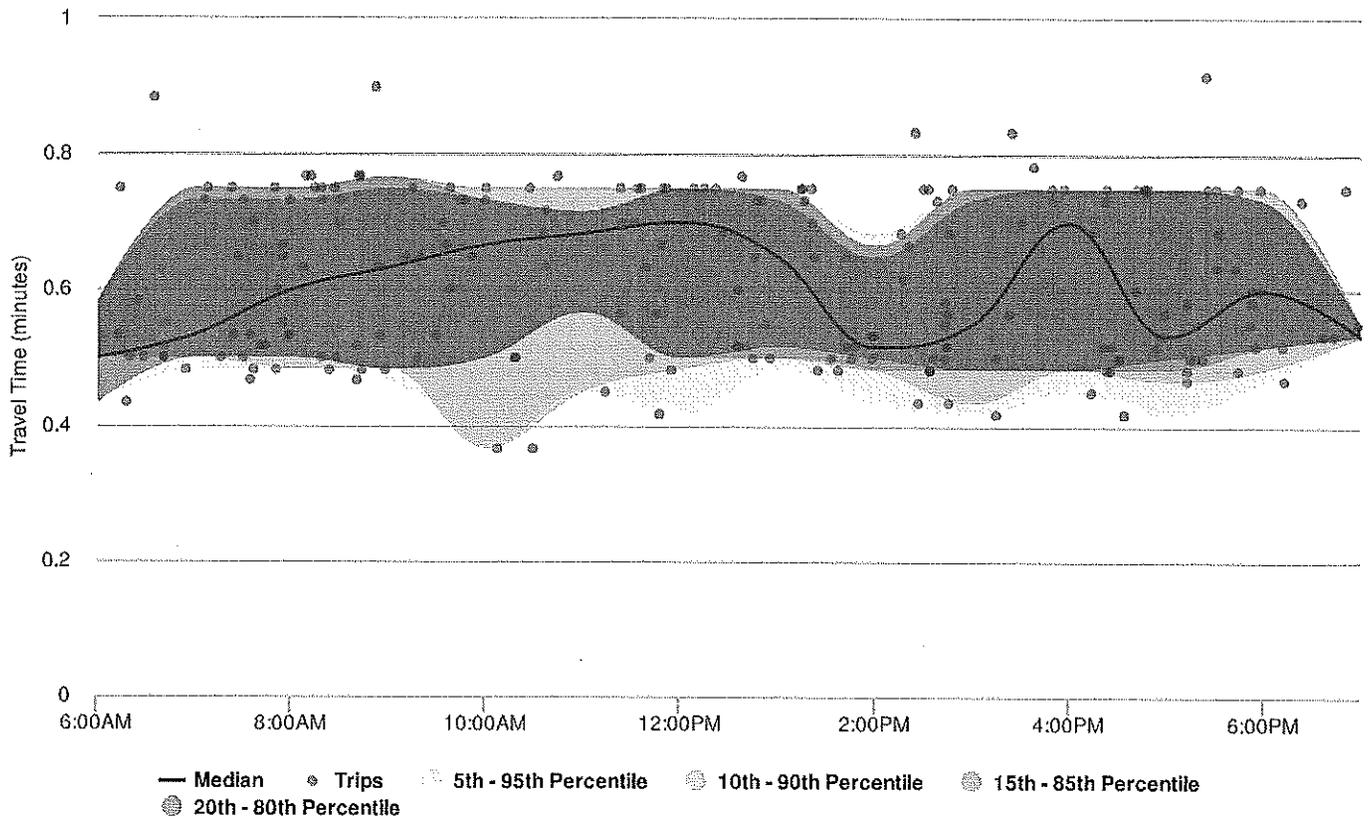
2 Locations | Lincoln, NE | Thu Apr 26, 2018 | 6:00AM - 7:00PM (13.0h)



Start Location	End Location	Planning Time Index AM (6am - 9am)	Planning Time Index PM (4pm - 7pm)	Travel Time Index AM (6am - 9am)	Travel Time Index PM (4pm - 7pm)	Buffer Time Index AM (6am - 9am)	Buffer Time Index PM (4pm - 7pm)
1 68th St & Saltillo Rd	2 11201-11499 South 60th Street	1.56	1.50	1.23	1.20	0.27	0.25
2 11201-11499 South 60th Street	1 68th St & Saltillo Rd	1.34	1.44	1.12	1.19	0.20	0.22

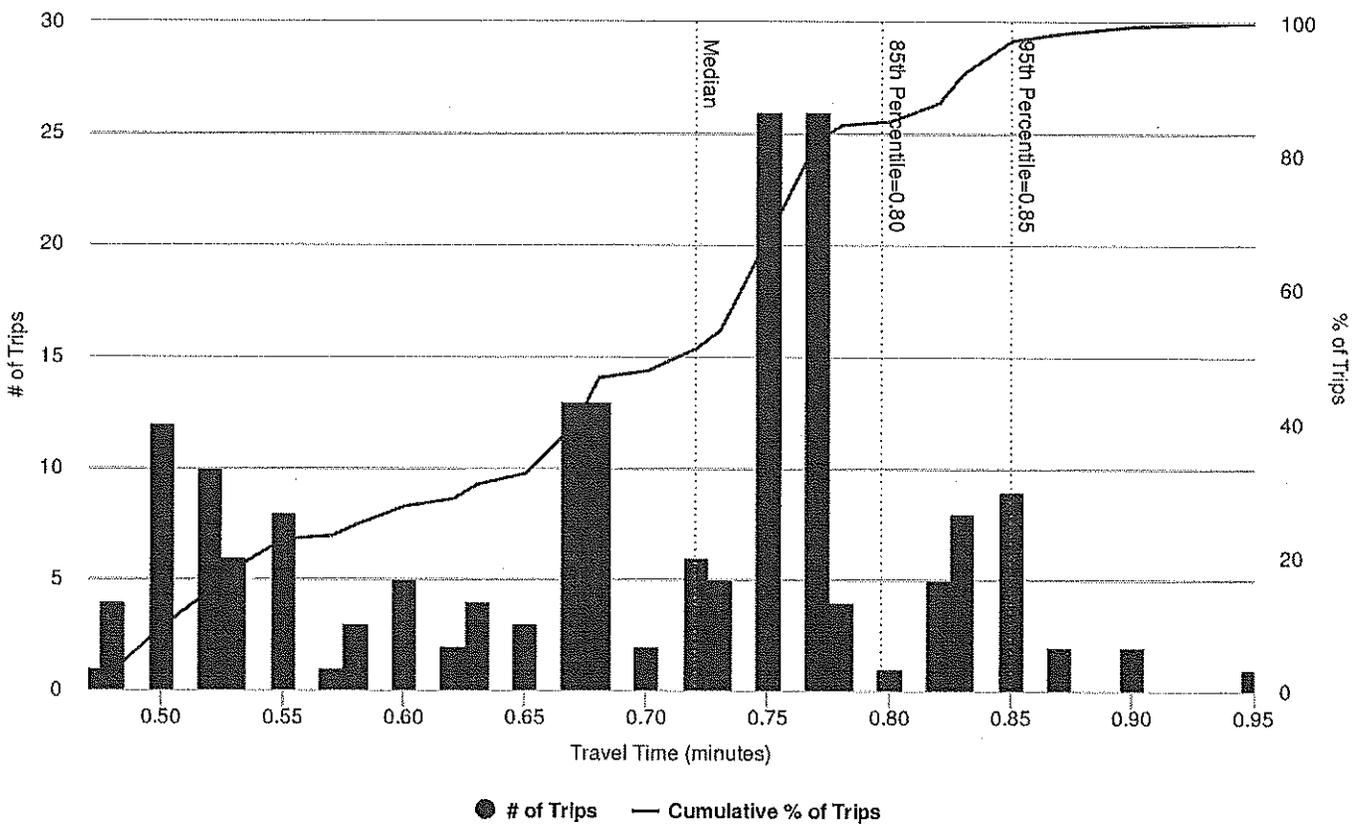
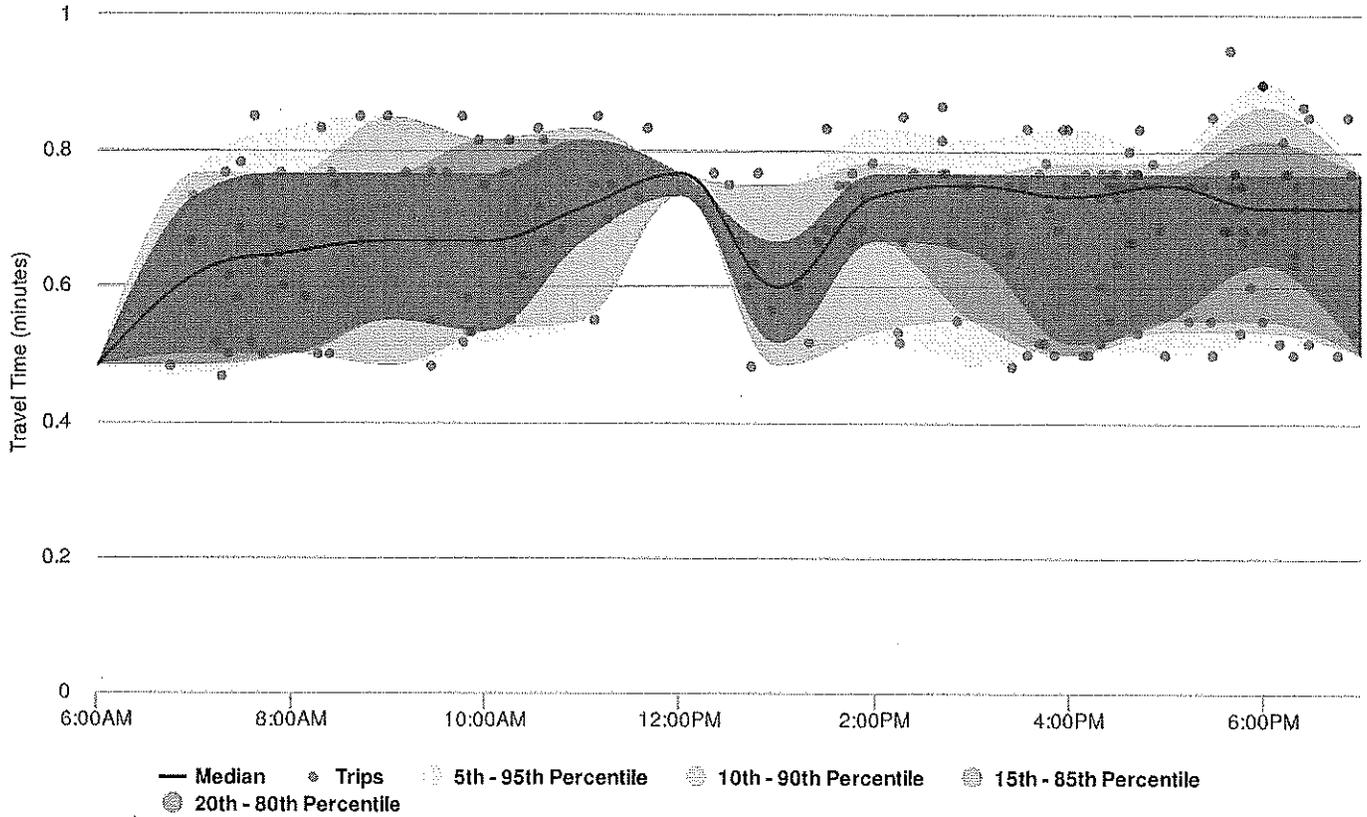
68th St & Saltillo Rd to 11201-11499 South 60th Street

1 to 2 | (40.6973, -96.628483) to (40.697426, -96.638969)



11201-11499 South 60th Street to 68th St & Saltillo Rd

2 to 1 | (40.697426, -96.638969) to (40.6973, -96.628483)

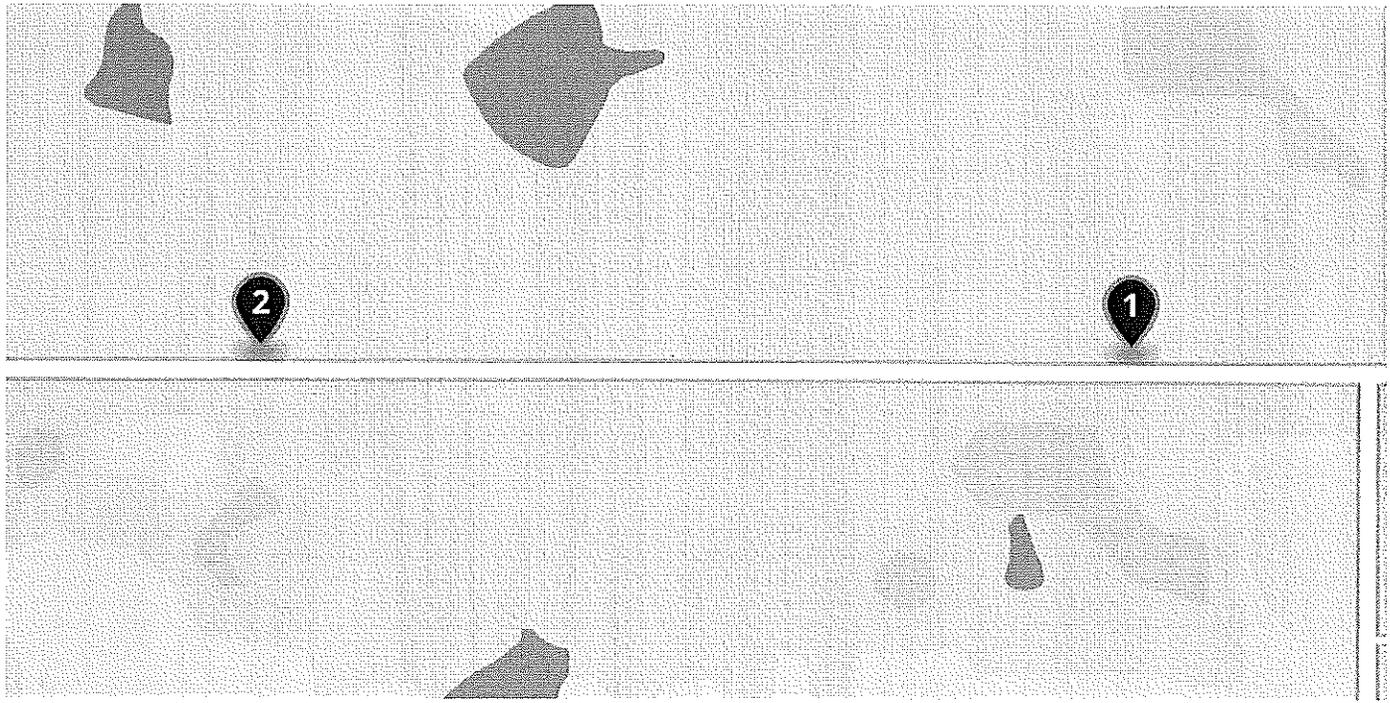


May 29, 2018
Saltillo Road Speed Studies Memo
Attachments

1,500 feet west of S. 54th Street

Travel Time Summary

2 Locations | Lincoln, NE, Roca, NE | Thu May 17, 2018 | 6:00AM - 7:00PM (13.0h)



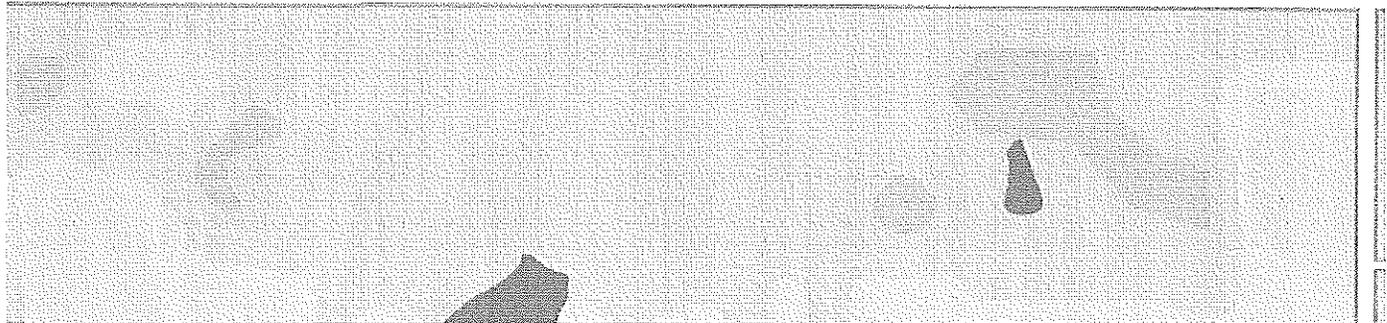
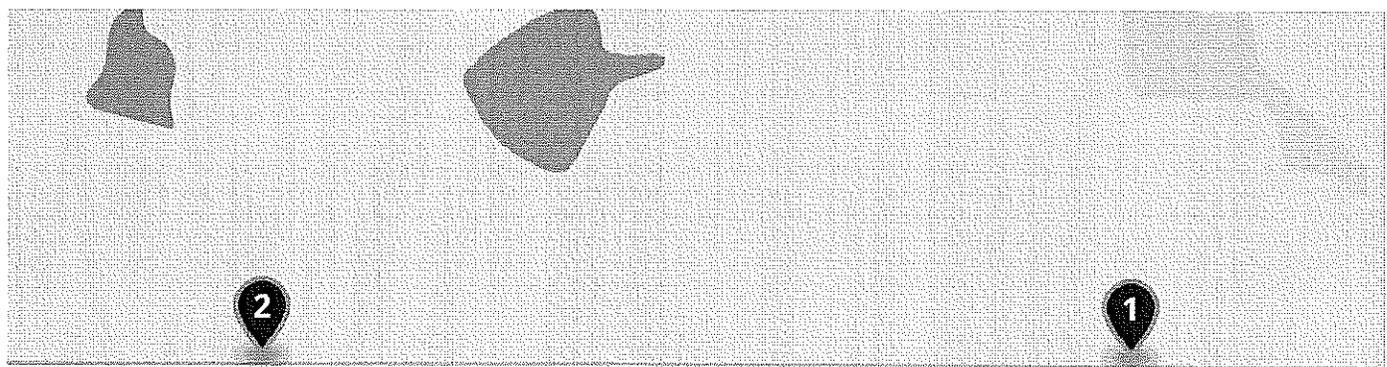
Start Location	End Location	# of Trips	Travel Time (minutes)							Distance (mis) ¹	Speed (mph) ²					
			Median	85th Percentile	95th Percentile	Mean	Min	Max	Median		85th Percentile	95th Percentile	Mean	Min	Max	
1 5220 Saltillo Road	2 4500 Saltillo Road	68	0.50	0.58	0.73	0.50	0.35	0.77	0.4*	51.03	63.66	72.90	52.60	33.28	72.90	
2 4500 Saltillo Road	1 5220 Saltillo Road	123	0.52	0.67	0.73	0.54	0.35	0.77	0.4*	49.38	54.11	72.57	48.91	33.28	72.90	

¹ Distance is the length of the Shortest Route between the locations in Google Maps. If Google Maps is unavailable or if Google Maps reports a distance longer than twice the aerial (as the bird flies) distance, the aerial distance is used and is denoted by an asterisk (*). See help.miovision.com/kb/distance for more information.

² Speed is the distance between the points divided by the travel time. This value is known as the space mean speed. This report was configured to include trips with calculated speeds between 1.0 mph and 75.0 mph. If you want a report that includes trips with a different range of speeds, or all trips, contact the person who generated the report.

Travel Time Reliability Summary

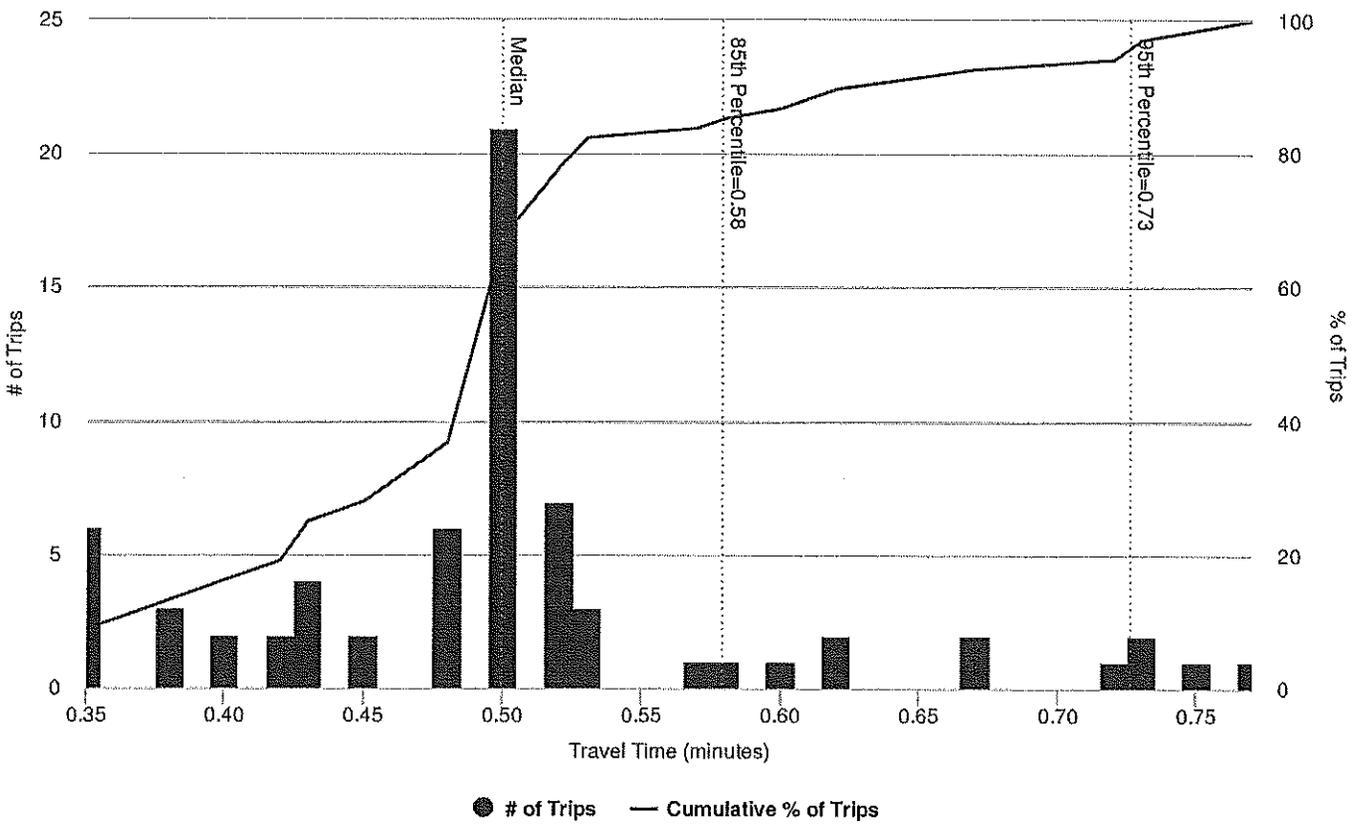
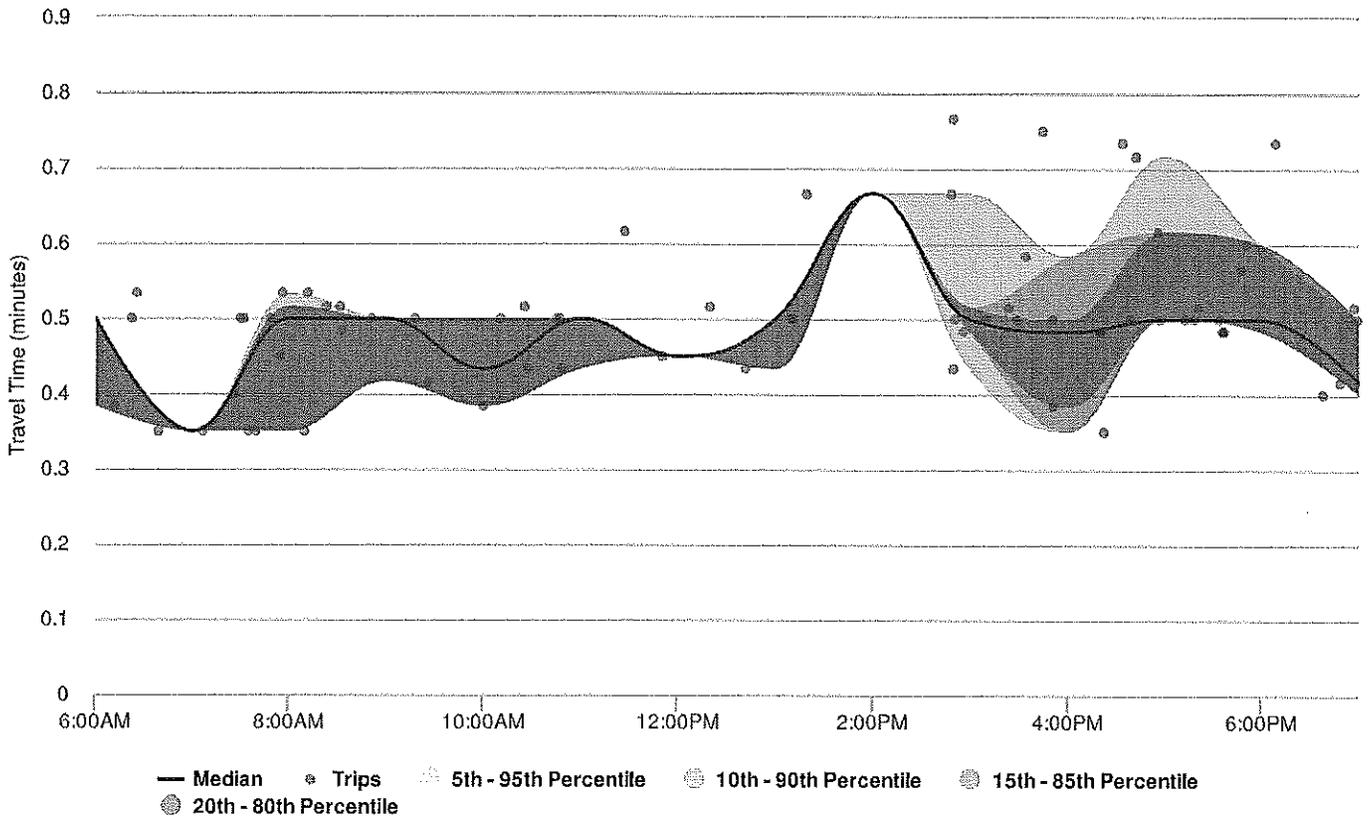
2 Locations | Lincoln, NE, Roca, NE | Thu May 17, 2018 | 6:00AM - 7:00PM (13.0h)



Start Location	End Location	Planning Time Index AM (6am - 9am)	Planning Time Index PM (4pm - 7pm)	Travel Time Index AM (6am - 9am)	Travel Time Index PM (4pm - 7pm)	Buffer Time Index AM (6am - 9am)	Buffer Time Index PM (4pm - 7pm)
1 5220 Saltillo Road	2 4500 Saltillo Road	1.15	1.46	0.99	1.16	0.16	0.26
2 4500 Saltillo Road	1 5220 Saltillo Road	1.38	1.52	1.15	1.19	0.20	0.28

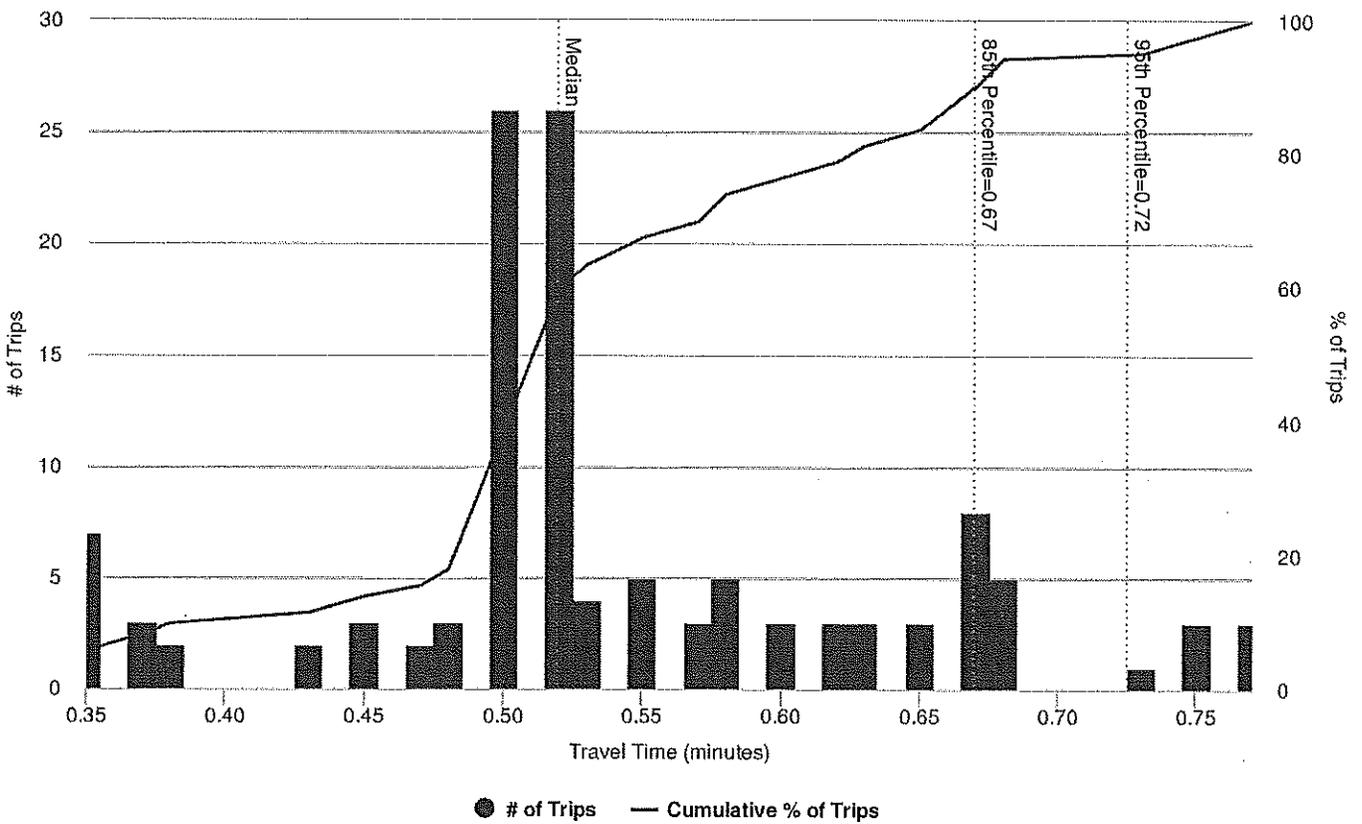
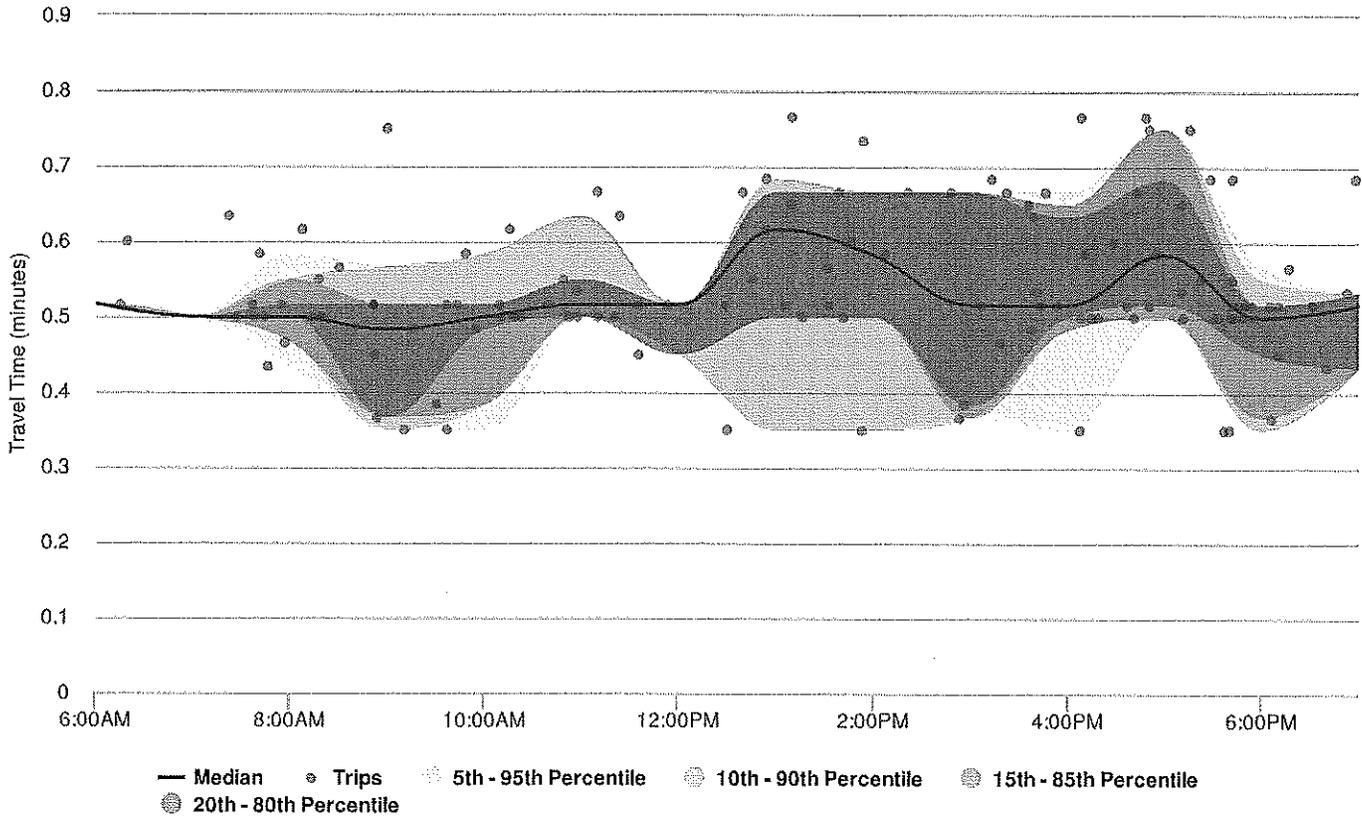
5220 Saltillo Road to 4500 Saltillo Road

1 to 2 | (40.697479, -96.650528) to (40.697483, -96.658646)



4500 Saltillo Road to 5220 Saltillo Road

2 to 1 | (40.697483, -96.658646) to (40.697479, -96.650528)

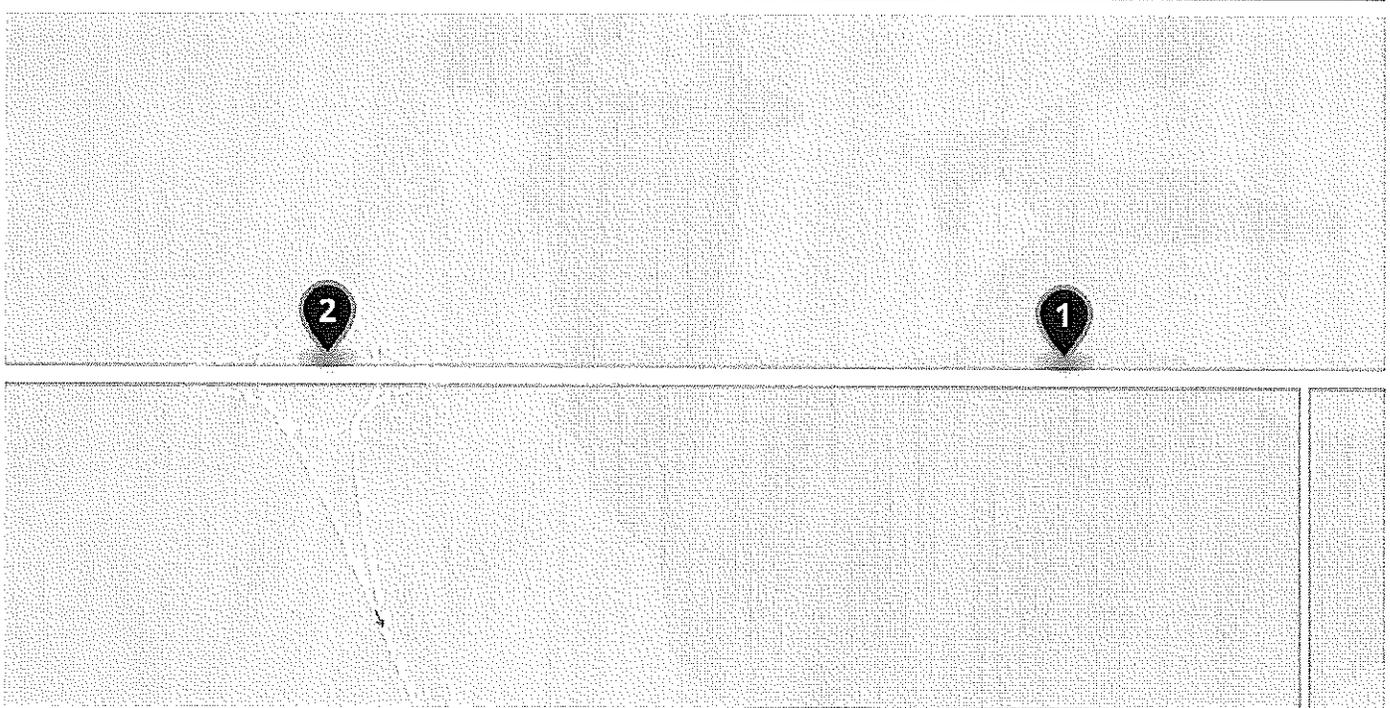


May 29, 2018
Saltillo Road Speed Studies Memo
Attachments

2,378 feet east of S. 56th Street

Travel Time Summary

2 Locations | Roca, NE | Thu May 3, 2018 | 6:00AM - 7:00PM (13.0h)



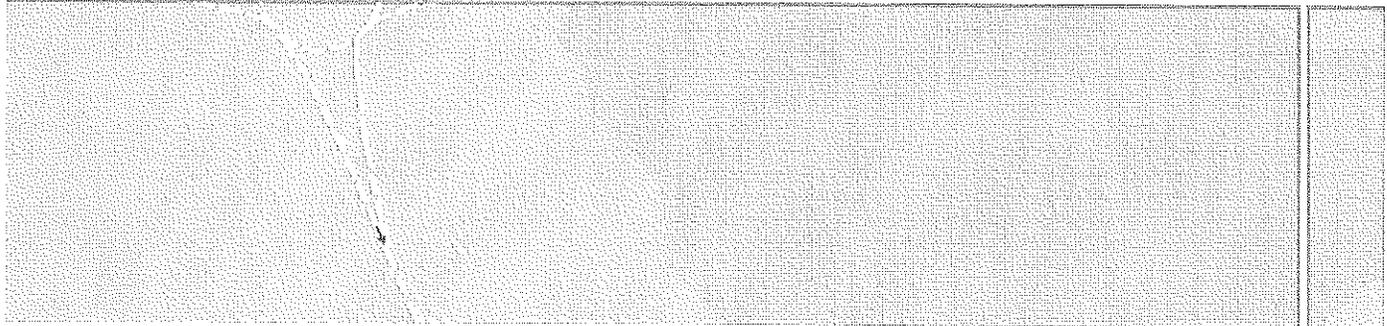
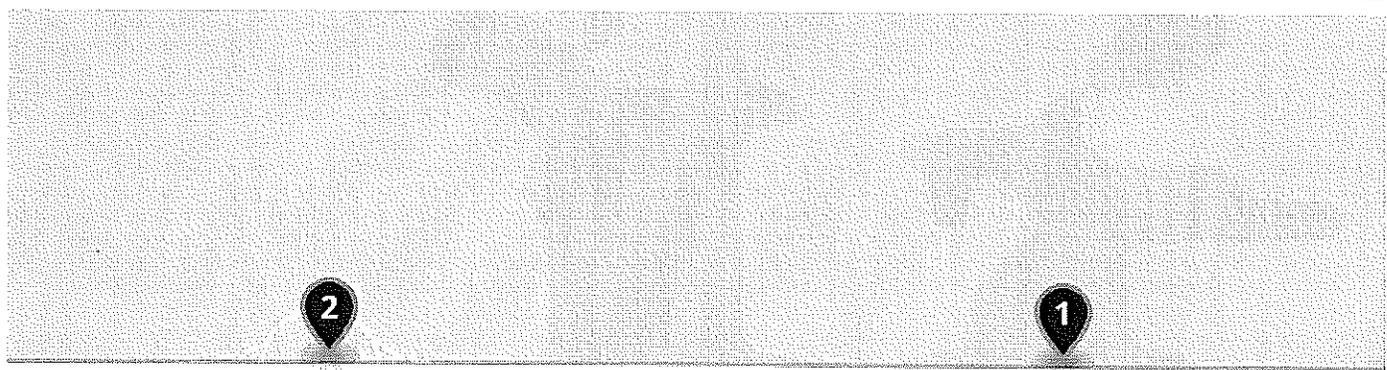
Start Location	End Location	# of Trips	Travel Time (minutes)						Distance (mis) ¹	Speed (mph) ²					
			Median	85th Percentile	95th Percentile	Mean	Min	Max		Median	85th Percentile	95th Percentile	Mean	Min	Max
1 3330 Saltillo Road	2 3330 Saltillo Road	130	0.50	0.67	0.77	0.51	0.27	0.88	0.4	43.25	61.78	70.37	45.61	24.48	81.09
2 3330 Saltillo Road	1 3330 Saltillo Road	101	0.45	0.55	0.72	0.45	0.25	0.75	0.4	48.05	64.87	68.29	51.51	28.83	86.50

¹ Distance is the length of the Fastest Route between the locations in Google Maps. If Google Maps is unavailable or if Google Maps reports a distance longer than twice the aerial (as the bird flies) distance, the aerial distance is used and is denoted by an asterisk (*). See help.miovision.com/kb/distance for more information.

² Speed is the distance between the points divided by the travel time. This value is known as the space mean speed. This report was configured to include trips with calculated speeds between 1.0 mph and 90.0 mph. If you want a report that includes trips with a different range of speeds, or all trips, contact the person who generated the report.

Travel Time Reliability Summary

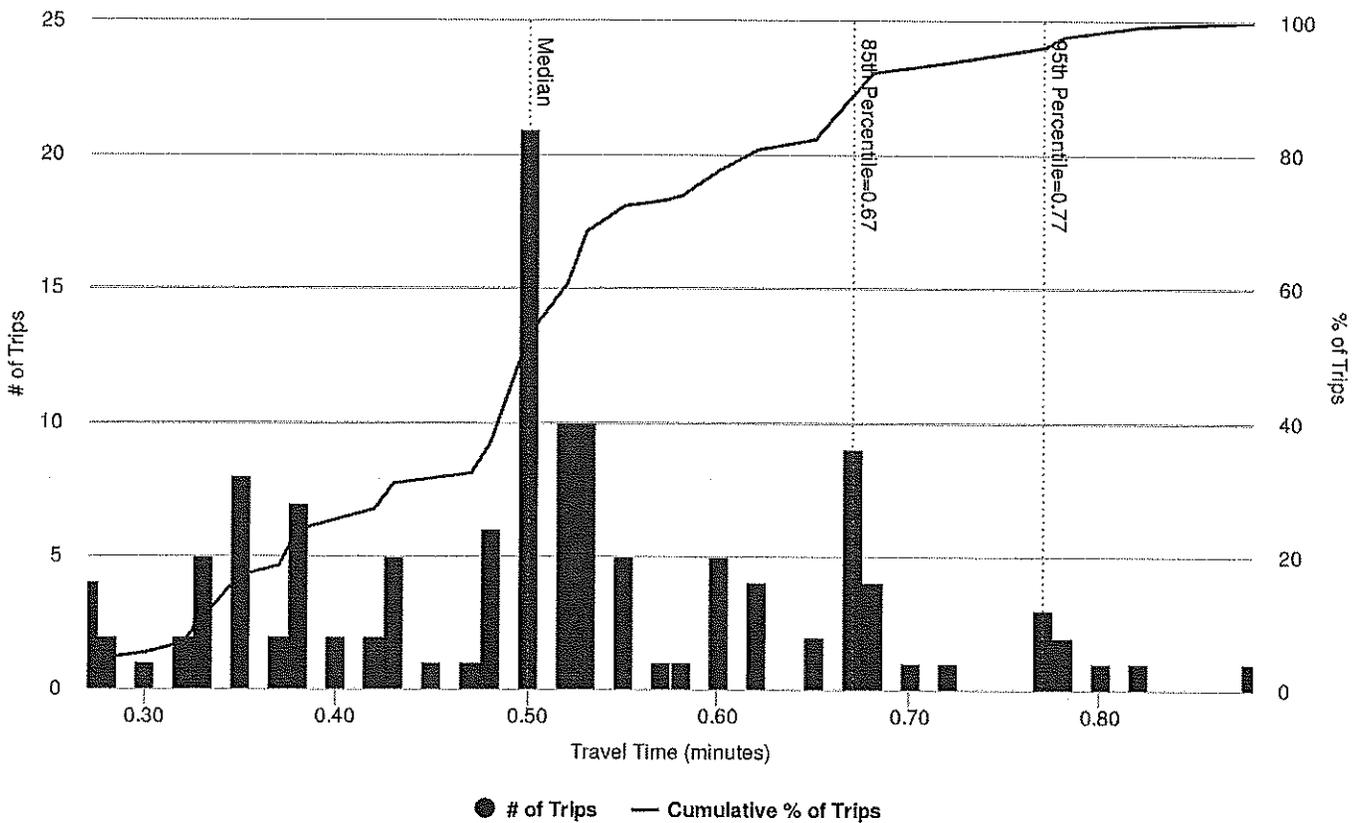
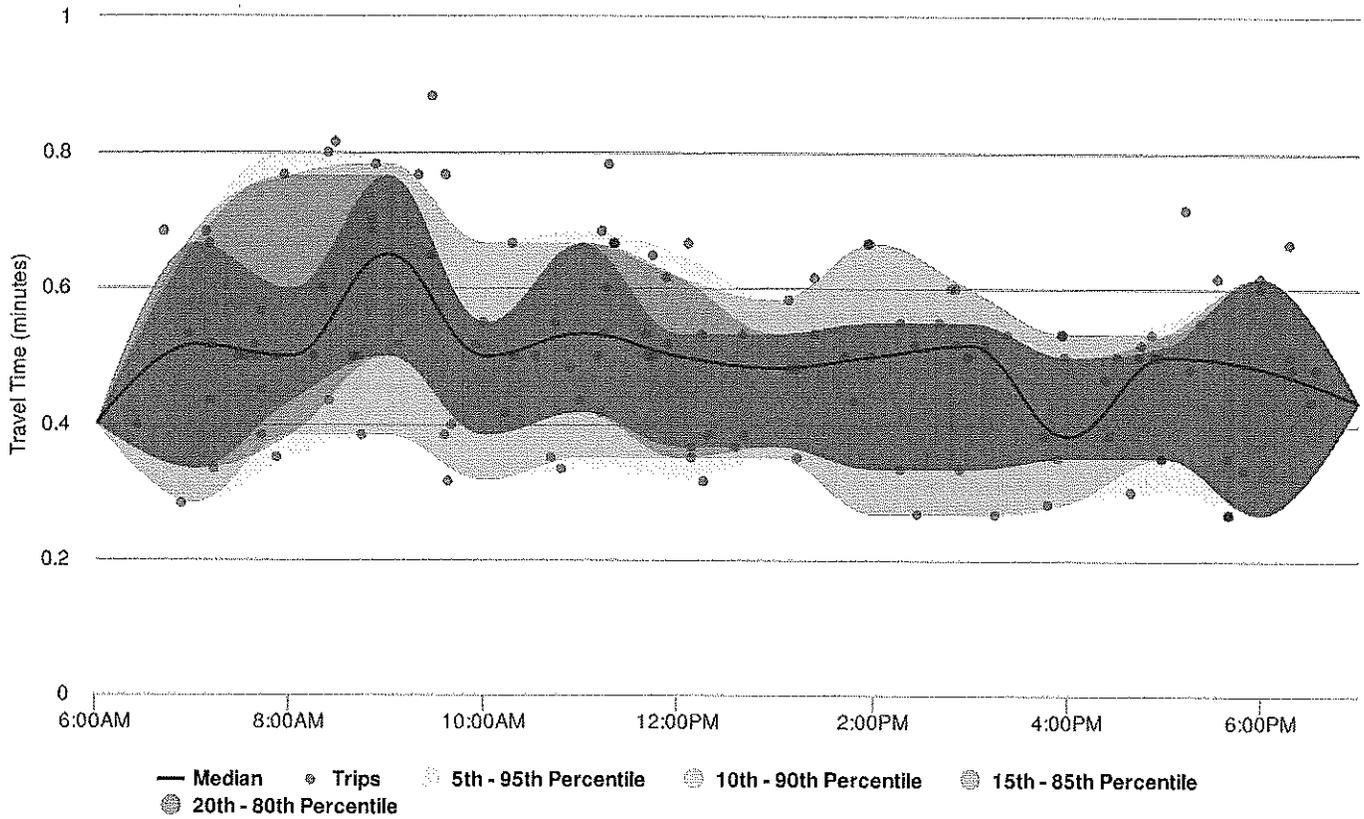
2 Locations | Roca, NE | Thu May 3, 2018 | 6:00AM - 7:00PM (13.0h)



Start Location	End Location	Planning Time Index AM (6am - 9am)	Planning Time Index PM (4pm - 7pm)	Travel Time Index AM (6am - 9am)	Travel Time Index PM (4pm - 7pm)	Buffer Time Index AM (6am - 9am)	Buffer Time Index PM (4pm - 7pm)
1 3330 Saltillo Road	2 3330 Saltillo Road	1.88	1.58	1.41	1.23	0.34	0.29
2 3330 Saltillo Road	1 3330 Saltillo Road	1.51	1.40	1.17	1.12	0.30	0.25

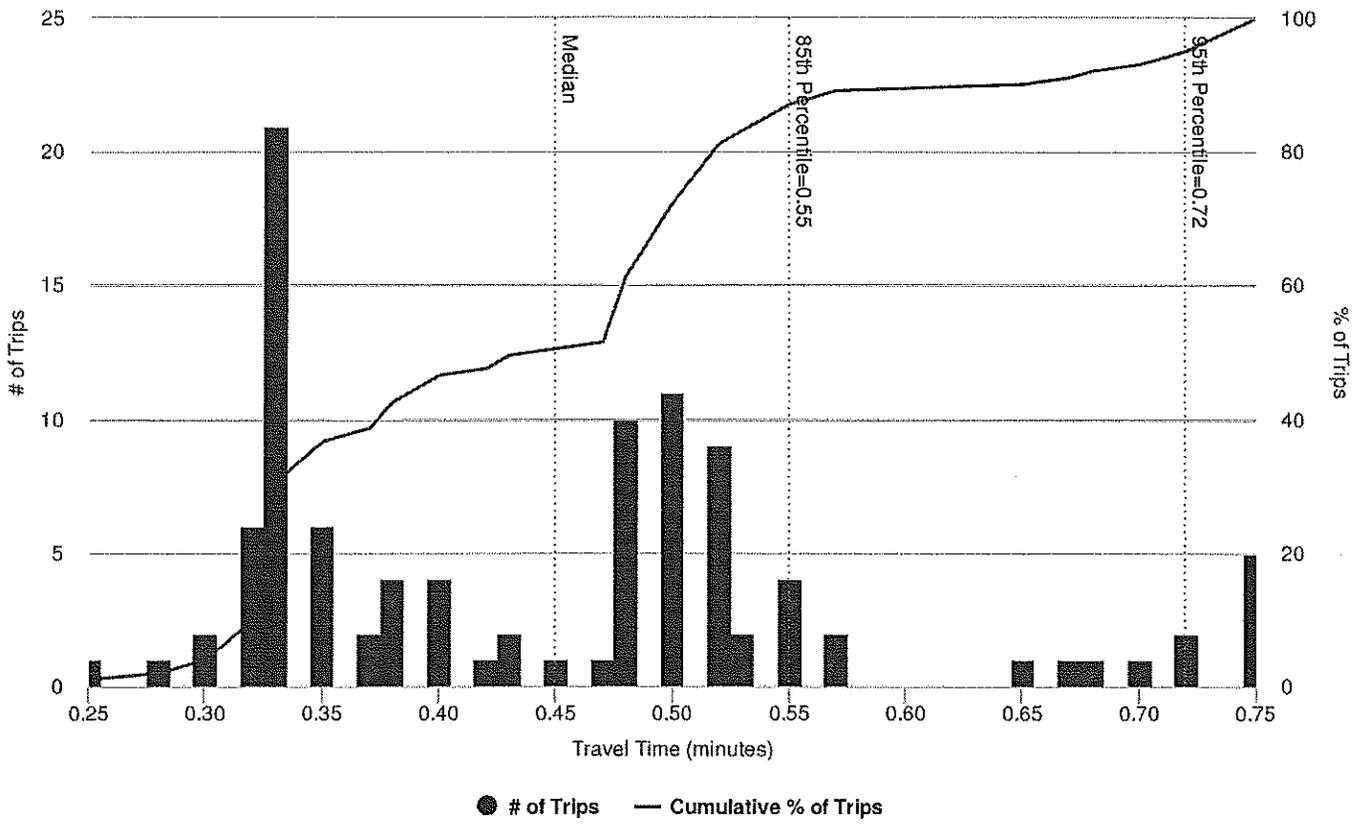
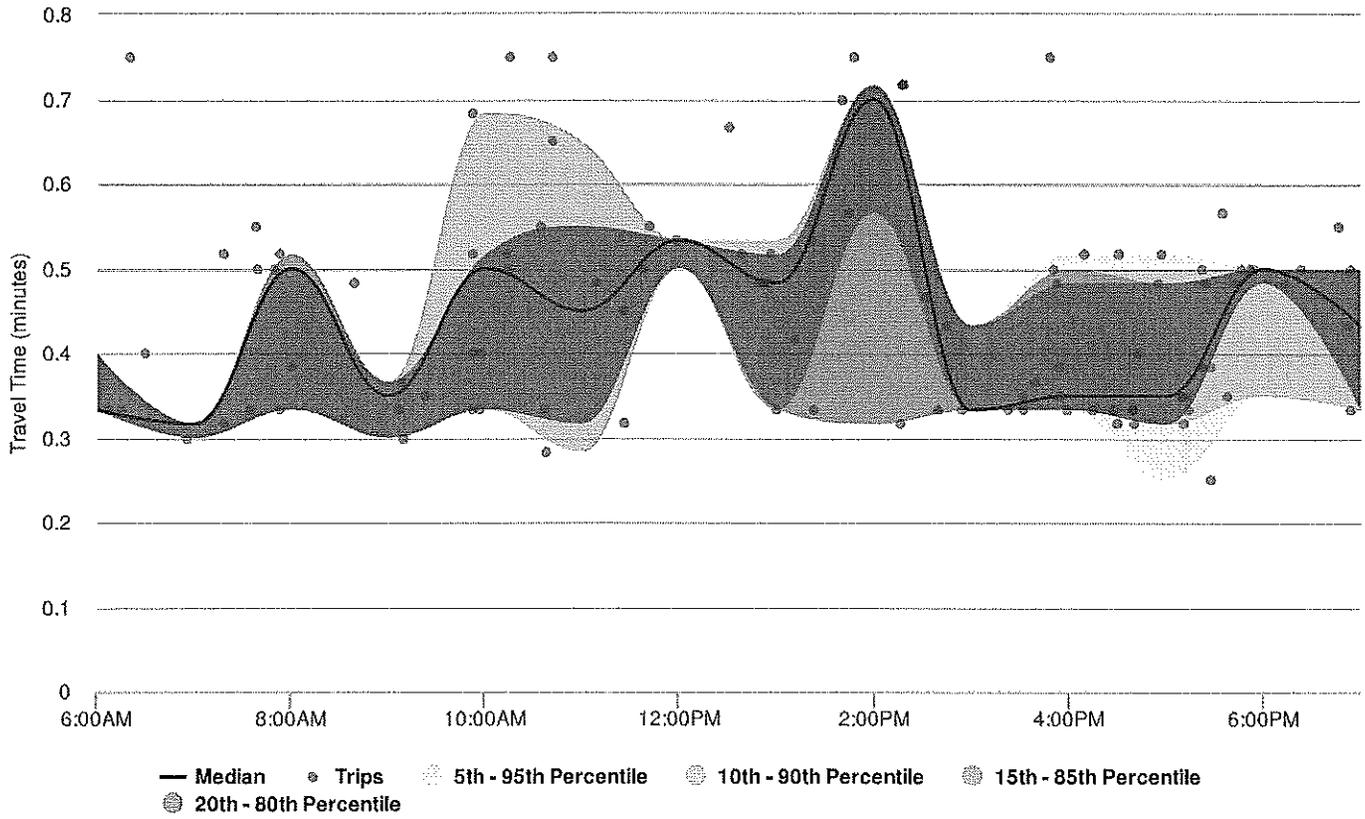
3330 Saltillo Road to 3330 Saltillo Road

1 to 2 | (40.697472, -96.669846) to (40.697483, -96.67672)



3330 Saltillo Road to 3330 Saltillo Road

2 to 1 | (40.697483, -96.67672) to (40.697472, -96.669846)



May 29, 2018
Saltillo Road Speed Studies Memo
Attachments

USLIMITS2 Report

USLIMITS2 Speed Zoning Report

Project Name: Saltillo Road Speed Limit

Analyst: Adam

Date: 05-21-2018

Basic Project Information

Project Number: 17-120-01
Route Name: Saltillo Road
From: 27th Street
To: 68th Street
State: Nebraska
County: Lancaster County
City: Rural
Route Type: Road Section in Undeveloped Area
Route Status: Existing

Crash Data Information

Crash Data Years: 10.83
Crash AADT: 6800 veh/day
Total Number of Crashes: 152
Total Number of Injury Crashes: 59
Section Crash Rate: 206 per 100 MVM
Section Injury Crash Rate: 80 per 100 MVM
Crash Rate Average for Similar Roads: 721
Injury Rate Average for Similar Roads: 41

Roadway Information

Section Length: 2.75 mile(s)
Statutory Speed Limit: 55 mph
Existing Speed Limit: 55 mph
Adverse Alignment: No
Divided/Undivided: Undivided
Number of Lanes: 2
Roadside Hazard Rating: 5
Transition Zone: No

Traffic Information

85th Percentile Speed: 62 mph
50th Percentile Speed: 49 mph
AADT: 6800 veh/day

Project Description: Analysis to verify Speed Limit on Saltillo Road

Recommended Speed Limit:



Note: The injury crash rate for the section of 80 per 100 MVM is above the critical rate (54). A comprehensive crash study should be undertaken to identify engineering and traffic control deficiencies and appropriate corrective actions. The speed limit should only be reduced as a last measure after all other treatments have either been tried or ruled out.

Disclaimer: The U.S. Government assumes no liability for the use of the information contained in this report. This report does not constitute a standard, specification, or regulation.

Equations Used in Crash Data Calculations

Exposure (M)

$$M = (\text{Section AADT} * 365 * \text{Section Length} * \text{Duration of Crash Data}) / (100000000)$$
$$M = (6800 * 365 * 2.75 * 10.83) / (100000000)$$
$$M = 0.7394$$

Crash Rate (Rc)

$$Rc = (\text{Section Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$
$$Rc = (14.03 * 100000000) / (6800 * 365 * 2.75)$$
$$Rc = 205.56 \text{ crashes per 100 MVM}$$

Injury Rate (Ri)

$$Ri = (\text{Section Injury Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$

$$Ri = (5.45 * 100000000) / (6800 * 365 * 2.75)$$

$$Ri = 79.79 \text{ injuries per 100 MVM}$$

Critical Crash Rate (Cc)

$$Cc = \text{Crash Average of Similar Sections} + 1.645 * (\text{Crash Average of Similar Sections} / \text{Exposure}) ^ {1/2} + (1 / (2 * \text{Exposure}))$$

$$Cc = 721.00 + 1.645 * (721.00 / 0.7394) ^ {1/2} + (1 / (2 * 0.7394))$$

$$Cc = 773.04 \text{ crashes per 100 MVM}$$

Critical Injury Rate (Ic)

$$Ic = \text{Injury Crash Average of Similar Sections} + 1.645 * (\text{Injury Crash Average of Similar Sections} / \text{Exposure}) ^ {1/2} + (1 / (2 * \text{Exposure}))$$

$$Ic = 41.46 + 1.645 * (41.46 / 0.7394) ^ {1/2} + (1 / (2 * 0.7394))$$

$$Ic = 54.45 \text{ injuries per 100 MVM}$$

