TRAFFIC SIGNAL NEEDS STUDY

INTERSECTION OF E 104TH AVE (SH-44) AND JOLIET STREET COMMERCE CITY, COLORADO

SEPTEMBER 30, 2016
Revised NOVEMBER 1, 2016

Prepared for:
City of Commerce City
and
Diversified Transfer & Storage
1640 Monad Road
Billings, MT 59101

Prepared by:

1120 Lincoln Street
Denver, CO 80203
Ph: 303-623-6300

Harris Kocher Smith Project No. 160612

EXECUTIVE SUMMARY

The City of Commerce City, Colorado has initiated a request for an Traffic Signal Needs Study to evaluate the potential need of a traffic signal at the intersection of E 104th Avenue (CO SH-44) and Joliet Street, located in Commerce City, Colorado. This request was a result of the identification of Manual on Uniform Traffic Control Devices (MUTCD) Warrant 3 being satisfied using 2016 traffic counts taken as the result of a new development south of E 104th Ave.

Accordingly, the purpose of this Traffic Signal Needs Study is to evaluate safety and traffic operations at the above-mentioned intersection and determine the feasibility of installing a traffic signal at this location. This study includes a 24-hour turning movement count, intersection capacity analysis, crash history, and traffic signal warrant analysis.

The significant findings of this Traffic Signal Needs Study at the intersection E 104th Avenue (CO SH-44) and Joliet Street are:

- **Existing traffic volumes**: The traffic count that was conducted for this study showed that the peak hour of travel is 4:45 PM - 5:45 PM. The directional split of traffic on E 104th Avenue, the major street of the study intersection, was found to be 49% eastbound / 51% westbound during the PM peak hour and 45% eastbound / 55% westbound during the AM peak hour.

- **Existing intersection capacity:**
  - Operations as a two-way stop-controlled intersection create no operational issues for eastbound or westbound left turns with acceptable operations in 2035.
  - As would be expected with stop-controlled movements onto busy arterial roadways, northbound left-turns are currently projected with unacceptable operations in 2016. Southbound left-turns are projected to have unacceptable operations in 2018 and 2035 as a stop-controlled intersection.
  - The entire intersection was recently expanded (completed in March, 2016) with additional through lanes, turn lanes with extensive queue storage for eastbound and westbound left turns, and overall preparations for a future traffic signal.

- **Traffic signal warrant analysis**: Summary of MUTCD Traffic Signal Warrants:
  - **Warrant 1, Eight-Hour Vehicular Volume** **WARRANT MET**
  - **Warrant 2, Four-Hour Vehicular Volume** **WARRANT MET**
  - **Warrant 3, Peak Hour** **Not Applicable**
  - **Warrant 4, Pedestrian Volume** **Not Met**
  - **Warrant 5, School Crossing** **Not Met**
  - **Warrant 6, Coordinated Signal System** **Not Met**
  - **Warrant 7, Crash Experience** **Not Met**
  - **Warrant 8, Roadway Network** **Not Met**
  - **Warrant 9, Intersection Near a Grade Crossing** **Not Met**

- **Improvement Options**: Based on the results of the traffic signal warrant analysis, a traffic signal is **warranted** at the intersection of E 104th Avenue (CO SH-44) and Joliet Street due to Warrant 1 and Warrant 2 being satisfied.

Expected Benefits:

- Installing a traffic signal should reduce excessive delay experienced by vehicles approaching the intersection from the Joliet Street approaches
- Installing a traffic signal should reduce the number of angle crashes and left-turn crashes at the intersection that may occur in the future as compared to an unsignalized condition.

Possible Disadvantages:

- Increased delays to motorists on E 104th Ave
- Cost of operating and maintaining the traffic signal
- Cost of possible additional land acquisition
- Likely increase in number of rear-end crashes on E 104th Ave.

Table of Contents

FIGURES

APPENDICES

I. INTRODUCTION

The City of Commerce City, Colorado has initiated a request to evaluate the potential need of a traffic signal at the intersection of E 104th Avenue (CO SH-44) and Joliet Street, located in the City of Commerce City, Colorado. This request was a result of the identification of MUTCD Warrant 3 being satisfied in 2016 Traffic counts taken as the result of new development south of E 104th Ave.

Accordingly, the purpose of this traffic engineering study is to evaluate safety and traffic operations at the above-mentioned intersection and determine the feasibility of installing a traffic signal at this location. This study includes a 24-hour turning movement count, intersection capacity, crash history and traffic signal warrant analysis.

Figure 1 graphically depicts the location of the intersection of E 104th Ave and Joliet Street.

II. PREVIOUS STUDIES

No previous traffic signal warrant studies for the intersection of E 104th and Joliet Street were reviewed as part of this study due to unavailability.

III. ROADWAY AND SITE CHARACTERISTICS

The intersection of E 104th Avenue (CO SH-44) and Joliet Street is located in the City of Commerce City in Adams County (see Figure 1). E 104th Avenue (CO SH-44) serves as a major east-west roadway at the study intersection and the study segment of E 104th Avenue is classified as a Principal Arterial according to "City of Commerce City C3 Vison Transportation Plan". According to Denver Regional Council of Governments (DRCOG) E 104th Avenue has a 2015 Annual Average Daily Traffic (AADT) volume of 21,542 vehicles per day (VPD) at a count station just east of SH-2. E 104th Avenue is a two-way roadway consisting of two concrete lanes plus turn lanes in both the eastbound and westbound direction. E 104th Avenue serves as one of the major east-west connectors across the northern Denver metropolitan area.

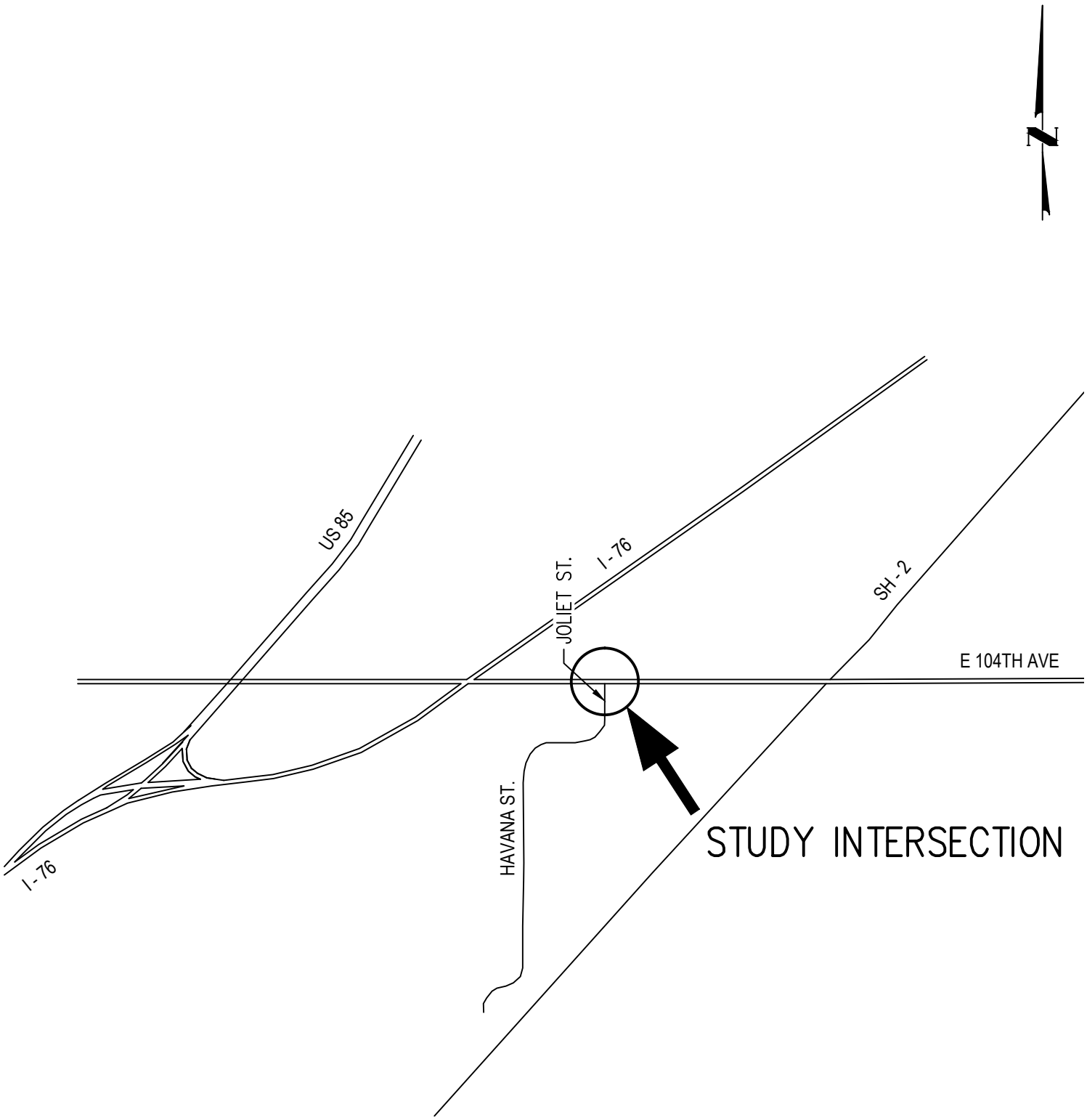
E 104th Avenue provides access to light industrial properties in the vicinity of the study intersection. There are separate left-turn lanes present on both the eastbound and the westbound E 104th Avenue installed recently (2016) as part of the overall widening of E 104th Avenue; there is a separate right-turn lane present on eastbound E 104th Avenue. The existing approximate storage length for left-turn lanes are 250 feet and 500 feet for the eastbound and the westbound approaches, respectively. The existing storage length for the eastbound right-turn lane is 250 feet.

Joliet Street serves as the minor roadway at the study intersection and consists of one lane in the northbound direction. Southbound Joliet Street on the north approach basically functions as a driveway for the business located on the northwest corner of the intersection. The study segment of Joliet Street is classified as a Major Collector according to "City of Commerce City C3 Vison Transportation Plan". Joliet Street provides access to light industrial properties in the vicinity of the study intersection. There are dedicated left-turn lanes on the Joliet Street approaches with queue storage of 225 feet for northbound and 75 feet for southbound.

Traffic signal pole foundations were observed already installed on the northeast, northwest, and southeast corners of the intersection. The anchor bolts on the southeast corner have been damaged and bent. No foundation was observed on the southwest corner. In-ground detector loops were observed already installed in the three northbound lanes on the south approach.

Horizontal and Vertical Alignment

The intersection of E 104th Avenue (CO SH-44) and Joliet Street is located within an area of relatively level terrain. The following geometric features were observed during the field study:



FILEPATH: P:\160612\ENGINEERING\EXHIBIT\TRAFFIC\E 104TH & JOLIET ST TRAFFIC.DWG LAYOUT: LAYOUT1
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ISSUE DATE: 09-30-2016	PROJECT #: 160612
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E 104TH AVE & JOLIET ST. TRAFFIC SIGNAL NEEDS STUDY

VICINITY MAP

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303-623-6300 F: 303-623-6311
HarrisKocherSmith.com

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CHK'D BY: MB
DRAWN BY: ER

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A1
1 OF 3

- There are no visible significant horizontal or vertical curves present on E 104th Avenue in the vicinity of the study intersection. The closest crest vertical curve to the east is the bridge over the O'Brian Canal approximately 1,100' east of the Joliet Street centerline. The closest crest vertical curve to the west is approximately 850' west of the Joliet centerline.
- There are no visible horizontal or vertical curves` present on the segment of Joliet Street from E 104th Ave to a point approximately 600 feet south.
- There is no discernible skew between E 104th Avenue and Joliet Street.

Sidewalks and Shoulders
There are 12'-wide shoulder lanes present on eastbound and westbound E 104th Ave. The eastbound shoulder lane becomes a right-turn lane near the E 104th Avenue and Joliet Street intersection. There are no shoulder lanes present on Joliet Street in the study area.

There are sidewalks present on E 104th Avenue on the north side (10' detached) and south side (6' detached). There is a sidewalk present on Joliet Street on the west side (6' detached).

Signing and Pavement Markings
The existing signing and pavement markings present on E 104th Avenue and Joliet Street Road appear to be in compliance to the standards mandated by the MUTCD and are in excellent condition due to their recent application.

Roadway Lighting
There is roadway lighting present along E 104th Avenue and Joliet Street adjacent to the travel lanes in the vicinity of the study intersection. Luminares are located only on the northwest and southwest corners of the intersection.

Adjacent Land Use
The adjacent land use surrounding the intersection of E 104th Avenue and Joliet Street consists of light industrial and agricultural. The northwest and southwest quadrants of the intersection are used for light industrial purposes and the northeast and southeast quadrants of the intersection appears to be used for agricultural purposes.

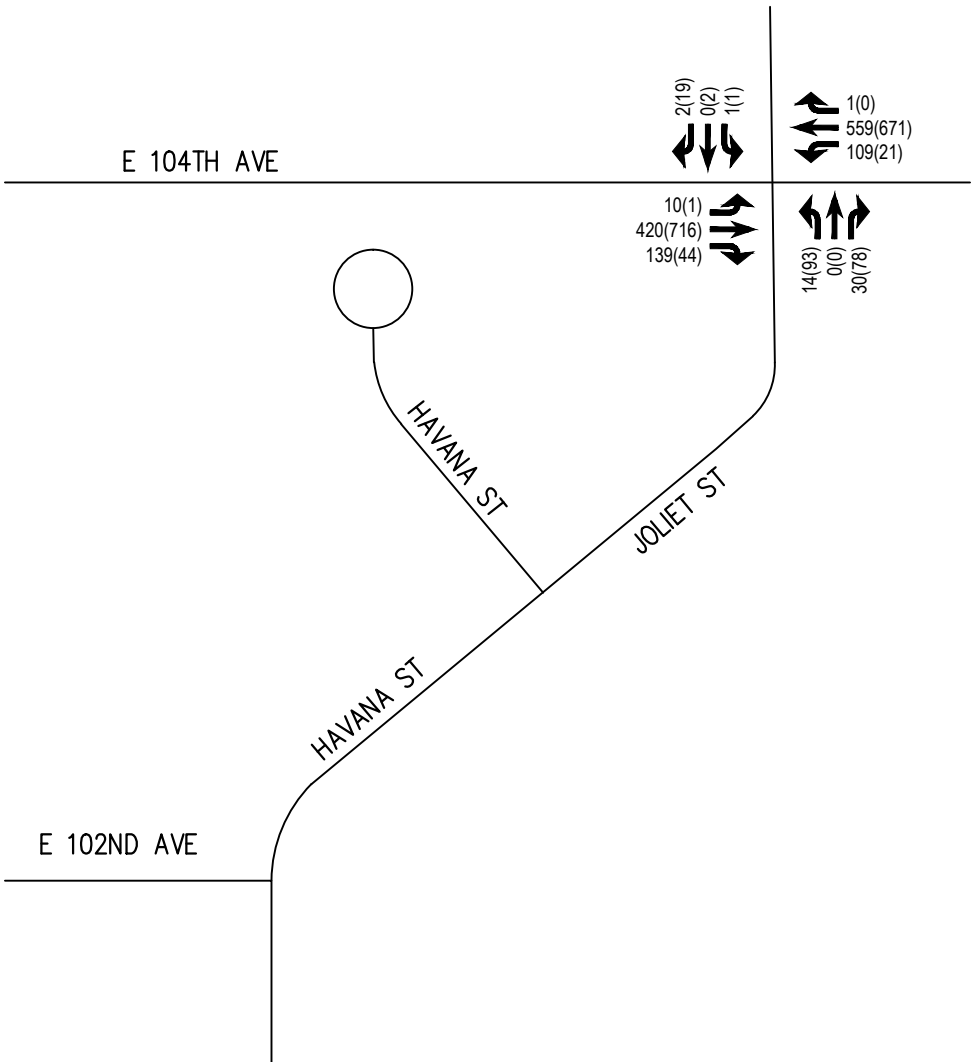
IV. TRAFFIC CHARACTERISTICS

Traffic Volumes
A 15-minute-increment turning movement count covering a 24-hour period was performed at the intersection of E 104th Avenue and Joliet Street on Thursday, September 22, 2016. The peak hour was identified as 4:45 PM – 5:45 PM. A summary of the peak-hour turning movement volumes for the intersection is graphically depicted in Figure 2. The complete results from the turning movement count are provided in Appendix A.

The directional split of traffic on E 104th Avenue, the major street of the study intersection was found to be 49% eastbound / 51% westbound during the PM peak hour which indicates that the traffic is distributed almost equally eastbound-westbound during PM peak hour on E 104th Avenue. The directional distribution of traffic during the AM peak hour of 6:45 AM – 7:45 AM is 45% eastbound / 55% westbound.

Of note are the 98 eastbound-to-westbound U-turns over the 24-hour count period that could cause traffic safety issues.

Existing Capacity
Capacity analyses were performed at the intersection of E 104th Avenue and Joliet Street using the traffic volumes from the original DTS Truck Terminal Traffic Impact Study dated August 22, 2016. These analyses were performed using Synchro 8 software. The Synchro software is based on the capacity analysis theories and methodologies that are provided in the 2010 version of the Highway Capacity



N

LEGEND

EXISTING ROADWAY

##(##) AM(PM) PEAK HR VOLUME

FILEPATH: P:\160612\ENGINEERING\EXHIBIT\TRAFFIC\E 104TH & JOLIET ST TRAFFIC.DWG LAYOUT: 2016 EXISTING VOLUMES
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ISSUE DATE: 09-30-2016	PROJECT #: 160612
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E 104TH AVE & JOLIET ST. TRAFFIC SIGNAL NEEDS STUDY 2016 EXISTING TRAFFIC VOLUMES

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303-623-6300 F: 303-623-6311
HarrisKocherSmith.com

DSN'D BY: MB
CHK'D BY: MB
DRAWN BY: ER

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A2
2 OF 3

Manual. Unsignalized intersection capacity is measured in terms of Levels of Service (LOS) and delay, primarily for vehicles on the stop-controlled approaches and vehicles turning left from the major street approaches. LOS "A" (delay ≤ 10 sec/veh) represents the best possible operating conditions or free flow operations, whereas LOS "F" (delay > 50 sec/veh) represents congested conditions, corresponding with traffic that has reached or exceeded available capacity, resulting in relatively high average delay per vehicle and a breakdown in the flow of traffic. The worksheets and software outputs for all of the capacity analyses are provided in Appendix B.

Figure 3 graphically depicts the results of the capacity analyses for the intersection of E 104th Avenue and Joliet Street in 2016. The results show that there are no delays (LOS "A") for traffic turning left from both eastbound and westbound E 104th Ave during the AM and PM peak-hour periods. The results also show that left turns approaching the intersection from the northbound Joliet Street approach operate with acceptable delay (LOS "D") during the AM peak-hour period and heavy delay (LOS "F") during the PM peak-hour period. The results also show that left-turns approaching the intersection from the southbound Joliet Street approach operate with minimal delay (LOS "D") during the AM and PM peak periods.

V. CRASH ANALYSIS

The City of Commerce City provided the most recent crash data available for the study area, covering the period from September, 2015 through September, 2016. According to the available data, there were two reported crashes occurring at or near the intersection of E 104th Avenue and Joliet Street. One crash was directly attributable to the intersection being under construction in December, 2015 and engineering judgment was used to eliminate its inclusion in the crash analysis.

Therefore, there was one (1) crash after the roadway construction was completed and it resulted in no personal injury. The analyzed crash occurred during daytime.

The single crash analyzed was a rear-end collision caused by a motorist not slowing for a motorist who had slowed for an ambulance going the opposite direction. The future installation of a traffic signal would not be predicted to eliminate this type of crash. Therefore, there were zero (0) crashes susceptible to correction by the installation of a traffic signal.

VI. OBSERVATIONS OF TRAFFIC OPERATIONS

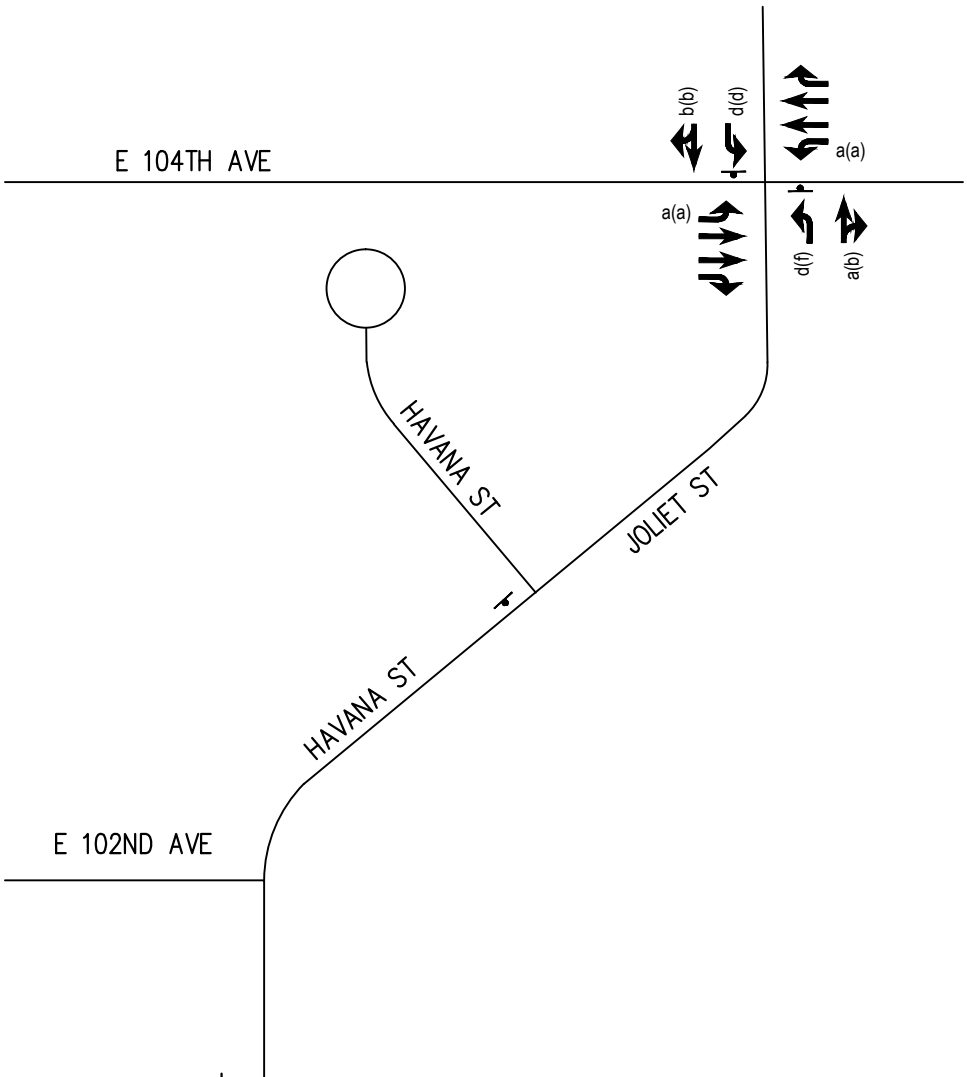
The following observations were recorded during visits to the study area during peak periods:

- Vehicles traveling on E 104th Ave arrive at this intersection in loosely organized platoons. The closest signalized intersection creating platoons for eastbound traffic is U.S. 85 located 1.13 miles west. The closest signalized intersection creating platoons for westbound traffic is SH-2 located 0.70 miles west.
- The front half of platoons regularly are in violation of the posted 45 mph speed limit as confirmed by pacing of platoons in a vehicle. A speed study would confirm this hypothesis but is beyond the scope of this report.
- A significant portion of traffic using Joliet street would be classified as heavy vehicles.

VII. IMPROVEMENT OPTIONS

Based on the results of the traffic observations, data obtained and analyses contained within this report, the City of Commerce City should consider the installation of a traffic signal at the intersection of E 104th Avenue and Joliet Street.

The MUTCD specifies nine (9) warrants that may be used in the process of determining whether a traffic signal is justified at an intersection. These warrants were reviewed using traffic volume information from the turning movement counts and the three year crash data for the intersection of E 104th Avenue and Joliet Street. Results of the signal warrant analyses are summarized in Table 6. The individual signal



LEGEND

EXISTING ROADWAY

a(a) LANE GROUP LOS am(pm)

STOP SIGN

FILEPATH: P:\160612\ENGINEERING\EXHIBIT\TRAFFIC\E 104TH & JOLIET ST TRAFFIC.DWG LAYOUT: 2016 CONDITIONS
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ISSUE DATE: 09-30-2016	PROJECT #: 160612
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E 104TH & JOLIET ST.
TRAFFIC SIGNAL NEEDS STUDY
2016 EXISTING TRAFFIC OPERATIONAL CONDITIONS

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303-623-6300 F: 303-623-6311
HarrisKocherSmith.com

DSN'D BY: MB
CHK'D BY: MB
DRAWN BY: ER

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3 OF 3

warrants are described in detail following the summary table. Results of the signal warrant study showed that **two** of the nine signal warrants were met at the intersection of E 104th Avenue and Joliet Street. The following is a detailed summary of the requirements for each of the warrants for traffic signal installation as specified by the MUTCD.

Summary of MUTCD Traffic Signal Warrants:

o Warrant 1, Eight-Hour Vehicular Volume	**WARRANT MET**
o Warrant 2, Four-Hour Vehicular Volume	**WARRANT MET**
o Warrant 3, Peak Hour	Not Applicable
o Warrant 4, Pedestrian Volume	Not Met
o Warrant 5, School Crossing	Not Met
o Warrant 6, Coordinated Signal System	Not Met
o Warrant 7, Crash Experience	Not Met
o Warrant 8, Roadway Network	Not Met
o Warrant 9, Intersection Near a Grade Crossing	Not Met

Warrant 1, Eight-Hour Vehicular Volumes

This warrant is divided into three parts. The first part, Condition A, minimum vehicular volume, is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider signalization. The second part, Condition B, interruption of continuous traffic, is intended for use at locations where Condition A is not satisfied and where the traffic volume on the major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The third part of this warrant is the combination of Conditions A and B, which is intended for use at locations where Condition A or Condition B is not satisfied. The combination of A and B should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

The total of the traffic volumes on both E 104th Ave approaches must be at least 420 vph for Condition A and 630 vph for Condition B. The traffic volume on the most heavily traveled minor-street approach (Joliet Street) must be at least 140 vph for Condition A and 70 vph for Condition B.

The requirements for this warrant were satisfied by the existing conditions at this intersection. Hours met: 8 hours for Condition A or Condition B (8 required)

Warrant 2, Four-Hour Vehicular Volumes

This warrant is satisfied when, for each of any four hours on an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in Figure 4C-2 of the MUTCD for the existing combination of approach lanes. Figure 4C-2 is used because the 70% criterion applies to this location due to the speed limit on E 104th Ave being 45 MPH, which is greater than 40 MPH as required by the warrant.

The requirements for this warrant were satisfied by the existing conditions at this intersection. Hours met: 6 hours (4 required)

Warrant 3, Peak Hour

This warrant is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The MUTCD specifically states, “This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time”.

If the location meets these criteria, the peak hour warrant is satisfied when:

- The total stopped time delay experienced by the traffic on one minor street approach (Joliet Street) controlled by a stop sign equals or exceeds five vehicle hours for a two-lane approach, and;
- The volume on the same minor street approach (Joliet Street) equals or exceeds 150 vehicles per hour for two moving lanes of traffic, and;
- The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

The warrant can also be satisfied if the plotted point representing the vehicles per hour on the major (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-4 for the existing combination of approach lanes. Figure 4C-4 is used because the 70% criterion applies to this location.

The E 104th Avenue and Joliet Street cannot be considered an "unusual case" since the intersection does not experience high volumes of vehicles entering and exiting this facility during short periods of time. Therefore, this warrant does not apply to the intersection of E 104th Avenue and Joliet Street.

Warrant 4, Pedestrian Volume

This warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. Crosswalks are not contemplated with the new intersection expansion recently completed. The 24-hour count shows only one ped over a 24-hour period.

The requirements for this warrant were not satisfied by the existing conditions at the intersection of E 104th Avenue and Joliet Street

Warrant 5, School Crossing

A traffic control signal may be warranted at an established school crossing when a traffic engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at the school crossing shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period.

This warrant does not apply to the intersection of E 104th Avenue and Joliet Street and is therefore not met.

Warrant 6, Coordinated Signal System

The need for a traffic signal shall be considered if adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation on a two-way street. This warrant should not be applied if the resultant spacing of traffic control signals would be less than 1,000 ft.

This warrant would apply to the intersection of E 104th Avenue and Joliet Street if the intersection will be part of a coordinated signal system on E 104th Ave and platoon degradation occurs due to the distance to the nearest signals (0.70 miles to the east and 1.13 miles to the west). This decision will be made by the City of Commerce City and this warrant is therefore not shown as satisfied.

Warrant 7, Crash Experience

The following requirements must be met in order for this warrant to be satisfied:

- Other safety improvement alternatives have failed to produce adequate results; and
- Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and

- There exists a volume of vehicular and pedestrian traffic not less than 80 percent of the requirements specified in Warrant 1.

Only one crash has occurred since the construction was completed in March, 2016. Therefore, five crashes susceptible to correction by a traffic control signal have not occurred.

The requirements for this warrant were not satisfied by the existing conditions at the intersection of E 104th Avenue and Joliet Street.

Warrant 8, Roadway Network

The intent of this warrant is to encourage concentration and organization of traffic flow networks. For this reason, all elements of this warrant refer to intersections of two or more "major streets." A major street as used in this warrant has one or more of the following characteristics:

- It is part of the street or highway system that serves as the principal network for through traffic flow;
- It includes rural or suburban highways outside, entering or traversing a city;
- It appears as a major route on an official plan such as a major street plan in a transportation study.

For this warrant to be met, the junction of two of more major streets must:

- Have a total entering volume of at least 1,000 vehicles during the peak hours of a typical weekday and have five year projected volumes which meet one or more requirements of Warrants 1, 2 and 3 during an average weekday.
- Have a total of existing or immediately projected entering volume of at least 1,000 vehicles for each of any five hours on a Saturday and/or Sunday.

This warrant does not apply to the intersection of E 104th Avenue and Joliet Street, because the minor street (Joliet Street) approaches do not meet the requirements of a "major street" and is therefore not met.

Warrant 9, Intersection near a Grade Crossing

This warrant is applicable at locations where a grade crossing is located on an approach to an intersection and a traffic signal is needed in order to prevent vehicles from stopping on the tracks.

This warrant does not apply to the intersection of E 104th Avenue and Joliet Street, because there are no grade crossings in the vicinity of the intersection and is therefore not met.

Based on the results of the traffic signal warrant analysis, a traffic signal is warranted at the intersection of E 104th Avenue and Joliet Street.

VIII. CONCLUSIONS

The significant findings of this traffic engineering study at the intersection of E 104th Avenue and Joliet Street are:

Existing traffic volumes: The directional split of traffic on E 104th Avenue, the major street of the study intersection, was found to be 49% eastbound / 51% westbound during the PM peak hour which indicates that the traffic is distributed almost equally eastbound-westbound during PM peak hour on E 104th Avenue. The directional distribution of traffic during the AM peak hour of 6:45 AM – 7:45 AM is 45% eastbound / 55% westbound.

Existing intersection capacity: The results show that there are no delays (LOS A) for traffic turning left from both eastbound and westbound E 104th Ave during AM and PM peak periods. The results also show that traffic approaching the intersection from the Joliet Street northbound approach operate with heavy delay (LOS "F" for left turns) during the PM peak period.

Crash trend analysis: Crash data was obtained for this intersection covering the period from September, 2015 through September, 2016. The data showed that there were no crashes that are susceptible to correction by the installation of a traffic signal.

Improvement Options:
Based on the results of the traffic signal warrant analysis, a traffic signal is **warranted** at the intersection of E 104th Ave and Joliet Street.

IX. RECOMMENDATIONS

Based on the results of the traffic observations, data, and analysis contained within this report, the installation of a traffic signal would present the following expected benefits and possible disadvantages:

Expected Benefits:

- Installing a traffic signal should reduce excessive delay experienced by vehicles approaching the intersection from the Joliet Street approaches
- Installing a traffic signal should reduce the number of angle crashes and left-turn crashes at the intersection that may occur in the future

Possible Disadvantages:

- Increased delays to motorists on E 104th Ave
- Cost of operating and maintaining the traffic signal
- Cost of possible additional land acquisition
- Likely increase in number of rear-end crashes on E 104th Ave

APPENDIX “A”

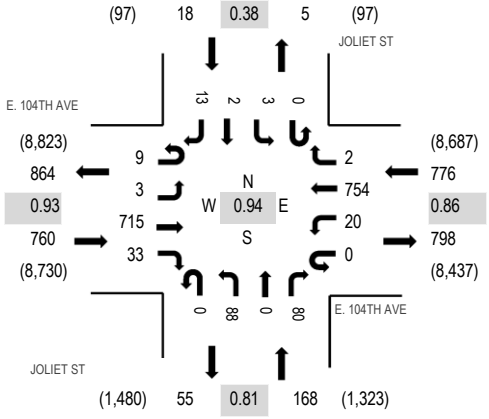
2016 EXISTING
TRAFFIC VOLUME COUNTS

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

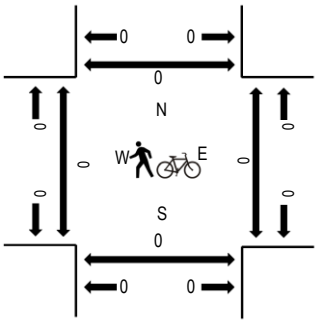
Location: 1 JOLIET ST & E. 104TH AVE AM
Date and Start Time: Thursday, September 22, 2016
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:30 PM - 05:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E. 104TH AVE Eastbound				E. 104TH AVE Westbound				JOLIET ST Northbound				JOLIET ST Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
12:00 AM	0	0	13	0	0	1	15	0	0	1	0	0	0	0	0	0	30	148	0	0	0	0
12:15 AM	0	0	10	0	0	0	17	0	0	4	0	2	0	0	0	0	33	155	0	0	0	0
12:30 AM	0	0	28	4	0	0	12	0	0	0	0	1	0	0	0	0	45	161	0	0	0	0
12:45 AM	1	0	14	4	0	5	14	0	0	1	0	1	0	0	0	0	40	155	0	0	0	0
1:00 AM	0	0	11	1	0	1	19	0	0	2	0	3	0	0	0	0	37	149	0	0	0	0
1:15 AM	0	0	11	6	0	2	15	0	0	4	0	1	0	0	0	0	39	132	0	0	0	0
1:30 AM	0	0	18	2	0	1	13	0	0	5	0	0	0	0	0	0	39	113	0	0	0	0
1:45 AM	0	0	11	5	0	0	12	0	0	5	0	1	0	0	0	0	34	99	0	0	0	0
2:00 AM	0	0	6	1	0	0	8	0	0	4	0	1	0	0	0	0	20	90	0	0	0	0
2:15 AM	0	1	8	1	0	0	10	0	0	0	0	0	0	0	0	0	20	87	0	0	0	0
2:30 AM	0	0	7	3	0	4	7	0	0	1	0	2	0	1	0	0	25	91	0	0	0	0
2:45 AM	0	0	13	2	0	4	6	0	0	0	0	0	0	0	0	0	25	106	0	0	0	0
3:00 AM	0	0	7	2	0	2	5	0	0	1	0	0	0	0	0	0	17	95	0	0	0	0
3:15 AM	0	0	11	0	0	1	11	0	0	1	0	0	0	0	0	0	24	112	0	0	0	0
3:30 AM	0	0	17	2	0	3	16	0	0	1	0	1	0	0	0	0	40	130	0	0	0	0
3:45 AM	0	0	9	1	0	2	2	0	0	0	0	0	0	0	0	0	14	165	0	0	0	0
4:00 AM	0	0	14	3	0	3	10	0	0	1	0	3	0	0	0	0	34	226	0	0	0	0
4:15 AM	0	0	20	4	0	2	15	0	0	1	0	0	0	0	0	0	42	263	0	0	0	0
4:30 AM	1	0	38	6	0	2	27	0	0	1	0	0	0	0	0	0	75	359	0	0	0	0
4:45 AM	0	1	28	7	0	8	28	0	0	2	0	1	0	0	0	0	75	432	0	0	0	0
5:00 AM	0	0	22	7	0	5	35	0	0	2	0	0	0	0	0	0	71	538	0	0	0	0
5:15 AM	0	1	60	8	0	8	56	0	0	3	0	2	0	0	0	0	138	636	0	0	0	0
5:30 AM	0	0	52	14	0	9	67	0	0	4	0	2	0	0	0	0	148	769	0	0	0	0
5:45 AM	0	4	61	18	0	14	74	2	0	3	0	4	0	0	0	1	181	894	0	0	0	0
6:00 AM	0	1	74	11	0	9	67	0	0	3	0	4	0	0	0	0	169	1,097	0	0	0	0
6:15 AM	0	3	103	15	0	14	127	2	0	4	0	1	0	0	0	2	271	1,276	0	0	0	0
6:30 AM	0	5	87	21	0	24	128	0	0	4	0	4	0	0	0	0	273	1,306	0	0	0	0
6:45 AM	2	8	144	42	0	33	143	9	0	3	0	0	0	0	0	0	384	1,349	0	0	0	0
7:00 AM	0	2	130	34	1	14	162	0	0	2	0	3	0	0	0	0	348	1,257	0	0	0	0
7:15 AM	1	1	104	35	0	23	125	0	0	8	0	4	0	0	0	0	301	1,273	0	0	0	0
7:30 AM	1	0	84	32	0	37	135	0	0	11	0	15	0	0	0	1	316	1,329	0	0	0	0
7:45 AM	0	1	63	22	0	33	165	1	0	4	0	3	0	0	0	0	292	1,278	0	0	0	0
8:00 AM	5	1	164	37	3	17	122	2	0	3	0	9	0	0	0	1	364	1,222	0	0	0	0
8:15 AM	0	1	150	15	0	10	162	0	0	5	0	14	0	0	0	0	357	1,053	0	0	0	0
8:30 AM	1	1	94	18	0	10	127	0	0	2	0	10	0	0	0	2	265	916	0	0	0	0

8:45 AM	1	0	84	19	0	12	103	0	0	10	0	7	0	0	0	0	236	889	0	0	0	0
9:00 AM	1	0	65	6	0	11	93	0	0	8	0	8	0	0	0	3	195	878	0	0	0	0
9:15 AM	2	2	72	8	1	9	115	0	0	4	0	6	0	0	0	1	220		0	0	0	0
9:30 AM	1	4	77	12	0	1	124	1	0	13	0	4	0	1	0	0	238		0	0	0	0
9:45 AM	5	1	85	8	0	12	90	0	0	12	0	11	0	0	0	1	225		0	0	0	0
10:00 AM	3	0	51	7	0	1	84	0	0	9	0	5	0	0	0	0	160	750	0	0	0	0
10:15 AM	0	1	59	7	0	8	97	0	0	6	0	6	0	0	0	0	184	792	0	0	0	0
10:30 AM	0	1	61	7	0	8	102	0	0	8	1	10	0	0	0	2	200	858	0	0	0	0
10:45 AM	0	0	74	10	0	6	87	1	0	13	0	13	0	1	0	1	206	936	0	0	0	0
11:00 AM	2	1	72	7	0	6	87	0	0	13	0	13	0	1	0	0	202	973	0	0	0	0
11:15 AM	6	0	96	13	0	8	97	0	0	18	0	10	0	0	0	2	250	998	0	0	0	0
11:30 AM	3	2	90	19	0	16	111	1	0	22	0	10	0	2	1	1	278	984	0	0	0	0
11:45 AM	4	0	90	11	0	10	98	1	0	11	1	15	0	1	0	1	243	973	0	0	0	0
12:00 PM	5	0	77	20	0	12	88	0	0	8	0	14	0	1	0	2	227	986	0	0	0	0
12:15 PM	0	1	91	11	0	9	99	1	0	11	0	13	0	0	0	0	236	1,005	0	0	0	0
12:30 PM	4	2	83	24	0	11	120	0	0	11	0	10	0	1	0	1	267	992	0	0	0	0
12:45 PM	2	4	103	14	0	16	98	1	0	10	0	7	0	0	0	1	256	940	0	0	0	0
1:00 PM	1	0	86	13	0	19	113	0	0	6	0	6	0	0	0	2	246	923	0	0	0	0
1:15 PM	1	2	97	12	0	9	84	0	0	12	0	5	0	0	0	1	223	892	0	0	0	0
1:30 PM	1	1	87	9	0	10	93	0	0	4	0	9	0	0	0	1	215	936	0	0	0	0
1:45 PM	1	0	105	11	0	4	101	0	0	5	1	11	0	0	0	0	239	1,003	0	0	0	0
2:00 PM	2	1	88	10	0	6	97	0	0	6	0	3	0	0	1	1	215	1,068	0	0	0	0
2:15 PM	3	1	127	6	0	9	100	0	0	9	0	9	0	1	0	2	267	1,183	0	0	0	0
2:30 PM	0	1	120	13	0	5	116	0	0	7	1	17	0	0	1	1	282	1,203	0	0	0	0
2:45 PM	2	1	158	11	0	10	106	0	0	5	0	11	0	0	0	0	304	1,350	0	0	0	0
3:00 PM	0	1	152	8	0	6	138	0	0	13	0	11	0	0	0	1	330	1,455	0	0	0	0
3:15 PM	0	0	152	8	0	3	98	1	0	12	0	7	0	1	0	5	287	1,535	0	0	0	0
3:30 PM	4	1	165	9	1	8	197	0	0	9	0	19	0	8	0	8	429	1,648	0	0	0	0
3:45 PM	2	0	193	4	0	8	173	0	0	17	0	11	0	0	0	1	409	1,620	0	0	0	0
4:00 PM	1	0	167	6	0	3	193	1	1	25	0	13	0	0	0	0	410	1,644	0	0	0	0
4:15 PM	0	0	193	9	0	3	165	0	0	15	0	13	0	1	0	1	400	1,666	0	0	0	0
4:30 PM	12	1	175	10	1	6	157	0	0	20	0	18	0	0	0	1	401	1,665	0	0	0	1
4:45 PM	7	2	193	9	0	5	170	0	0	28	0	16	0	0	0	3	433	1,722	0	0	0	0
5:00 PM	2	0	170	4	0	4	186	1	0	28	0	25	0	3	2	7	432	1,660	0	0	0	0
5:15 PM	0	1	170	6	0	7	177	0	0	18	0	18	0	0	0	2	399	1,581	0	0	0	0
5:30 PM	0	0	182	14	0	4	221	1	0	14	0	21	0	0	0	1	458	1,498	0	0	0	0
5:45 PM	2	0	167	2	0	5	172	0	0	16	0	6	0	0	0	1	371	1,338	0	0	0	0
6:00 PM	2	0	160	4	0	2	152	0	0	17	0	16	0	0	0	0	353	1,223	0	0	0	0
6:15 PM	0	0	150	3	0	5	134	0	0	11	0	12	0	0	0	1	316	1,084	0	0	0	0
6:30 PM	0	0	137	7	0	3	134	0	0	13	0	4	0	0	0	0	298	988	0	0	0	0
6:45 PM	0	0	128	7	0	6	104	0	0	4	0	7	0	0	0	0	256	927	0	0	0	0
7:00 PM	0	1	92	7	0	2	103	0	0	1	0	8	0	0	0	0	214	863	0	0	0	0
7:15 PM	0	0	98	5	0	7	91	0	0	5	0	11	0	1	0	2	220	832	0	0	0	0
7:30 PM	1	0	112	3	0	10	83	0	0	2	0	26	0	0	0	0	237	770	0	0	0	0
7:45 PM	0	0	76	2	0	9	83	0	0	7	0	15	0	0	0	0	192	674	0	0	0	0
8:00 PM	0	0	105	4	0	0	70	0	0	0	0	4	0	0	0	0	183	589	0	0	0	0
8:15 PM	0	0	78	4	0	0	66	0	0	4	0	6	0	0	0	0	158	548	0	0	0	0
8:30 PM	0	1	66	1	0	3	60	0	0	2	0	8	0	0	0	0	141	534	0	0	0	0
8:45 PM	0	0	64	0	0	1	32	0	0	4	0	5	0	1	0	0	107	524	0	0	0	0
9:00 PM	0	0	88	2	0	1	44	0	0	3	0	4	0	0	0	0	142	528	0	0	0	0
9:15 PM	1	0	81	4	0	2	50	1	0	3	0	2	0	0	0	0	144	457	0	0	0	0
9:30 PM	0	0	53	1	0	1	67	0	0	2	0	6	0	1	0	0	131	384	0	0	0	0
9:45 PM	0	0	60	2	0	3	38	0	0	3	0	5	0	0	0	0	111	328	0	0	0	0
10:00 PM	0	0	32	1	0	0	32	0	0	3	0	3	0	0	0	0	71	276	0	0	0	0
10:15 PM	0	0	42	1	0	0	24	0	0	2	0	2	0	0	0	0	71	275	0	0	0	0
10:30 PM	0	0	40	1	0	1	32	0	0	1	0	0	0	0	0	0	75	261	0	0	0	0
10:45 PM	0	0	29	0	0	0	24	0	0	3	0	3	0	0	0	0	59	226	0	0	0	0
11:00 PM	0	0	29	0	0	1	29	1	0	4	0	6	0	0	0	0	70	199	0	0	0	0
11:15 PM	1	0	34	0	0	0	16	0	0	5	0	0	0	0	1	0	57		0	0	0	0
11:30 PM	0	0	17	2	0	1	13	0	0	7	0	0	0	0	0	0	40		0	0	0	0
11:45 PM	1	0	11	1	0	2	13	0	0	1	0	3	0	0	0	0	32		0	0	0	0

Count Total	98	65	7,745	822	7	651	8,001	28	1	659	4	659	0	26	6	65	18,837	0	0	0	1
Peak Hour	9	3	715	33	0	20	754	2	0	88	0	80	0	3	2	13	1,722	0	0	0	0

APPENDIX “B”

INTERSECTION CAPACITY ANALYSIS WORKSHEETS

2016 EXISTING TRAFFIC
AM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		250	500		0	225		0	75		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	0	1770	1583	0	1770	1583	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	0	1770	1583	0	1770	1583	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		645			652			900			435	
Travel Time (s)		14.7			14.8			20.5			9.9	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	420	139	109	559	1	14	0	30	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	250	500	-	-	225	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	457	151	118	608	1	15	0	33	1	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	609	0	0	457	0	0	1019	1324	228	1095	1323	304
Stage 1	-	-	-	-	-	-	478	478	-	845	845	-
Stage 2	-	-	-	-	-	-	541	846	-	250	478	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	966	-	-	1100	-	-	191	155	775	168	155	692
Stage 1	-	-	-	-	-	-	537	554	-	324	377	-
Stage 2	-	-	-	-	-	-	493	377	-	732	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	966	-	-	1100	-	-	173	137	775	146	137	692
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	137	-	146	137	-
Stage 1	-	-	-	-	-	-	531	548	-	320	337	-
Stage 2	-	-	-	-	-	-	439	337	-	693	548	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.4	15.5	16.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	173	775	966	-	-	1100	-	-	146	692
HCM Lane V/C Ratio	0.088	0.042	0.011	-	-	0.108	-	-	0.007	0.003
HCM Control Delay (s)	27.8	9.8	8.8	-	-	8.7	-	-	29.8	10.2
HCM Lane LOS	D	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.3	0.1	0	-	-	0.4	-	-	0	0

2016 EXISTING TRAFFIC
PM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		250	500		0	225		0	75		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.850			0.863	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	0	1770	1583	0	1770	1608	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	0	1770	1583	0	1770	1608	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		645			652			900			435	
Travel Time (s)		14.7			14.8			20.5			9.9	

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	716	44	21	671	0	93	0	87	1	2	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	250	500	-	-	225	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	778	48	23	729	0	101	0	95	1	2	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	729	0	0	778	0	0	1191	1555	389	1166	1555	365
Stage 1	-	-	-	-	-	-	780	780	-	775	775	-
Stage 2	-	-	-	-	-	-	411	775	-	391	780	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	871	-	-	834	-	-	143	112	610	149	112	632
Stage 1	-	-	-	-	-	-	354	404	-	357	406	-
Stage 2	-	-	-	-	-	-	589	406	-	605	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	871	-	-	834	-	-	133	109	610	123	109	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	109	-	123	109	-
Stage 1	-	-	-	-	-	-	354	404	-	357	395	-
Stage 2	-	-	-	-	-	-	551	395	-	511	404	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	51.5	14.7
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	133	610	871	-	-	834	-	-	123	434
HCM Lane V/C Ratio	0.76	0.155	0.001	-	-	0.027	-	-	0.009	0.053
HCM Control Delay (s)	88.4	12	9.1	-	-	9.4	-	-	34.5	13.8
HCM Lane LOS	F	B	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	4.5	0.5	0	-	-	0.1	-	-	0	0.2

APPENDIX “C”

CRASH DATA

DR 2447 (03/03/06)
COLORADO DEPARTMENT OF REVENUE

MAIL TO: STATE OF COLORADO MOTOR VEHICLE TRAFFIC RECORDS DENVER, CO 80261-0016

STATE OF COLORADO TRAFFIC ACCIDENT REPORT

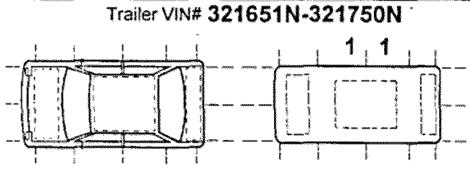
☐ AMENDED/SUPPL. ☐ UNDER $1,000 ☐ COUNTER REPORT ☐ PRIVATE PROPERTY

PAGE 1 OF 2 PAGES

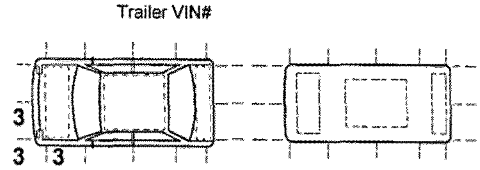
Field	Value
CDOT Code	
Case #	13CN15009787
Road type	☐ INTERSTATE HWY ☐ STATE HWY ☑ CITY ST/CNTY RD
HWY NUMBER	
MILEPOINT	
DOR Code	
Date of Accident	12/28/2015
City	COMMERCE_CITY
Agency	COMMERCE CITY POLICE DEPA
County	12 ADAMS
County #	12
Time (24 Hr.)	1047
Officer Number	CC4386
Officer Name	M PASKO
Signature	
Detail	P
Number Killed	0
Number Injured	0
Location Route Street, Road	JOLIET ST
Miles / Feet / N S E W OF	
☑ At	E 104TH AVE
Date of Report	12/28/2015
Latitude	00:00:00.0000
Longitude	000:00:00.0000
Agency Code	C104109
Investigated @ Scene	☑
Total Vehicles	2
District Number	3
Public Property/Employee	☐
Photos Taken	☑
Railroad Crossing Related	☐
Const. Zone Related	☑
Highway Interchg.	☐
Bridge Related	☐

Right margin codes: K 01, K 01, L 03, L 03, M 04, M 04, N 35, N 35, P 0, P 0, Q 08, Q 00, R 16, R 00, S, S, T 00, T 00
Left margin codes: A 01, B 11, B, B 11, C 02, D 01, E 01, F 02, G 01, H 01, J 00

Field	Traffic Unit # 1 of 1	Traffic Unit # 2 of 2
Type	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.
Last Name	PARA	JIMENEZ
First	YEVGENIY	ENRIQUE
MI	I	
Street Address	12555 LOCUST WAY	3229 OCONNOR AVE
Personal Phone		(970) 978-0709
City	THORNTON	EVANS
State	CO	CO
ZIP	80602	80620
Bus. Phone		
Driver License Number	000560966	983450389
CDL	A	A
State	CO	CO
Sex	M	M
DOB	05-24-1973	01-22-1968
Primary Violation	☐ DUI FAILED TO TURN FROM "TURN ONLY" LANE	☐ DUI
Violation Code	901(1)(c)	
Citation Number	CM00256518	
Common Code	276	
Year	2016	1999
Make	VOLVO	INTERNATIONAL COA
Model		
Body Type	DS	SE
License Plate Number	718XAP	10070556
State or Country	CO	IN
Color	BGE	BGE
Vehicle Identification Number	4V4NC9EJ6GN950657	IHSHBAHN0XH648709
Vehicle Owner Last Name ☐ Same	SIM TRANSPORT	UNITED PARCEL SERVICE
First / MI		
Address ☐ Same	16405 E 99TH AVE	5020 IVY ST
City	COMMERCE_CITY	COMMERCE_CITY
State	CO	
ZIP	80022	80022
Towed Due to Damage ☐ By: / To:		
Trailer VIN#	321651N-321750N	
Insurance Company ☐ None ☐ No Proof	ACORD	LIBERTY MUTUAL
Exp. Date	08/16/2016	01/01/2016
Policy Number	CAC000010432815	AI2-C21-092036-025



1 - Slight
2 - Moderate
3 - Severe



1 - Slight
2 - Moderate
3 - Severe

Owner Damaged Prop. Last Name	First	MI	Address	City	State	ZIP

T.U. #	POS.	REST	ENDO	SAFETY EQUIP.		AIR BAG		EJECT	SUSPECTED ALCO	SUSPECTED DRUG	INJ. SEV.	AGE	SEX	NAME / ADDRESS
1	01	00	00	B	01	A	01	B	00	00	00	42	M	SAME AS DRIVER
2	01	00	00	B	01	A	01	B	00	00	00	47	M	SAME AS DRIVER

Approved By	I. D. #	Date

Case #	DOR CODE	Accident Date	Agency
13CN15009787		12/28/2015	COMMERCE CITY POLICE DEPARTMENT

Describe Accident

V1 pulled into painted median to make wide right turn. V2 pulled into right turn pocket to turn right. V1 and V2 both turned right at same time. V1 semi trailer struck V2 semi cab side to side.

	Carrier Name	US DOT	ICC	State DOT
1 T.U. #	SIM TRANSPORT LLC	☑	☐	☐
	Address	Carrier Identification #		
	16405 E 99TH AVE	2088157		
2 T.U. #	Carrier Name	US DOT	ICC	State DOT
	UPS FREIGHT	☑	☐	☐
	Address	Carrier Identification #		
	5020 IVY ST	121058		

DR 2447 (03/03/06)
COLORADO DEPARTMENT OF REVENUE

MAIL TO: STATE OF COLORADO
MOTOR VEHICLE
TRAFFIC RECORDS
DENVER, CO 80261-0016

STATE OF COLORADO TRAFFIC ACCIDENT REPORT

☐ AMENDED/SUPPL. ☐ UNDER $1,000 ☐ COUNTER REPORT ☐ PRIVATE PROPERTY

CDOT Code:
Case #: 13CN15009787
☐ INTERSTATE HWY ☐ STATE HWY ☑ CITY ST/CNTY RD
HWY NUMBER:
MILEPOINT:
DOR Code:

Date of Accident	City	Agency	County	County #
12/28/2015	COMMERCE_CITY	COMMERCE CITY POLICE DEPA	12 ADAMS	12

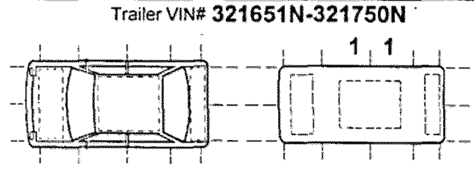
Time (24 Hr.)	Officer Number	Officer Name	Signature	Detail
1047	CC4386	M PASKO		P

Number Killed	Number Injured	Date of Report
0	0	12/28/2015

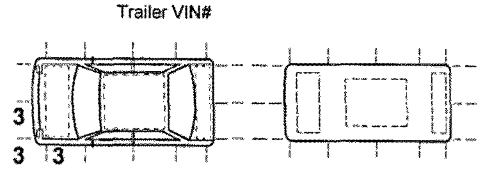
Location Route Street, Road: JOLIET ST — Miles ___ Feet ___ N☐ S☐ E☐ W☐ OF: ☑ At: E 104TH AVE
Latitude 00:00:00.0000 Longitude 000:00:00.0000

Agency Code	Investigated @ Scene	Total Vehicles	District Number	Public Property/Employee	Photos Taken	Railroad Crossing Related	Const. Zone Related	Highway Interchg.	Bridge Related
C104109	☑	2	3	☐	☑	☐	☑	☐	☐

Field	Traffic Unit # 1 of 1	Traffic Unit # 2 of 2
Type	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.
Last Name / First / MI	PARA / YEVGENIY / I	JIMENEZ / ENRIQUE /
Street Address	12555 LOCUST WAY	3229 OCONNOR AVE
Personal Phone		(970) 978-0709
City / State / ZIP	THORNTON / CO / 80602	EVANS / CO / 80620
Bus. Phone		
Driver License Number	000560966	983450389
CDL / State / Sex / DOB	A / CO / M / 05-24-1973	A / CO / M / 01-22-1968
Primary Violation	☐ DUI FAILED TO TURN FROM "TURN ONLY" LANE	☐ DUI
Violation Code	901(1)(c)	
Citation Number	CM00256518	
Common Code	276	
Year / Make / Model / Body Type	2016 / VOLVO / / DS	1999 / INTERNATIONAL COA / / SE
License Plate Number / State or Country / Color	718XAP / CO / BGE	10070556 / IN / BGE
Vehicle Identification Number	4V4NC9EJ6GN950657	IHSHBAHN0XH648709
Vehicle Owner Last Name / First / MI	☐ Same SIM TRANSPORT	☐ Same UNITED PARCEL SERVICE
Address / City / State / ZIP	☐ Same 16405 E 99TH AVE / COMMERCE_CITY / CO / 80022	☐ Same 5020 IVY ST / COMMERCE_CITY / / 80022
Towed Due to Damage / By / To	☐	☐
Trailer VIN#	321651N-321750N	
Insurance Company	☐ None ☐ No Proof ACORD	☐ None ☐ No Proof LIBERTY MUTUAL
Exp. Date	08/16/2016	01/01/2016
Policy Number	CAC000010432815	AI2-C21-092036-025



1 - Slight
2 - Moderate
3 - Severe



1 - Slight
2 - Moderate
3 - Severe

Owner Damaged Prop. Last Name	First	MI	Address	City	State	ZIP

T.U. #	POS.	REST	ENDO	SAFETY EQUIP.			AIR BAG		EJECT	SUSPECTED ALCO	SUSPECTED DRUG	INJ. SEV.	AGE	SEX	NAME / ADDRESS
1	01	00	00	B	01	A	01	B	00	00	00	00	42	M	SAME AS DRIVER
2	01	00	00	B	01	A	01	B	00	00	00	00	47	M	SAME AS DRIVER

Approved By	I. D. #	Date

Left margin codes: A 01; B 11; B; B 11; C 02; D 01; E 01; F 02; G 01; H 01; J 00
Right margin codes: K 01; K 01; L 03; L 03; M 04; M 04; N 35; N 35; P 0; P 0; Q 08; Q 00; R 16; R 00; S; S; T 00; T 00

Case #	DOR CODE	Accident Date	Agency
13CN15009787		12/28/2015	COMMERCE CITY POLICE DEPARTMENT

Describe Accident

V1 pulled into painted median to make wide right turn. V2 pulled into right turn pocket to turn right. V1 and V2 both turned right at same time. V1 semi trailer struck V2 semi cab side to side.

	Carrier Name	US DOT	ICC	State DOT
1 T.U. #	SIM TRANSPORT LLC	☑	☐	☐
	Address	Carrier Identification #		
	16405 E 99TH AVE	2088157		
2 T.U. #	Carrier Name	US DOT	ICC	State DOT
	UPS FREIGHT	☑	☐	☐
	Address	Carrier Identification #		
	5020 IVY ST	121058		

DR 2447 (03/03/06)
COLORADO DEPARTMENT OF REVENUE

MAIL TO: STATE OF COLORADO MOTOR VEHICLE TRAFFIC RECORDS DENVER, CO 80261-0016

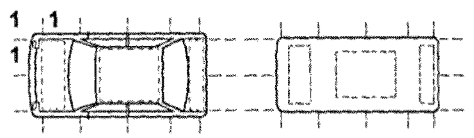
STATE OF COLORADO TRAFFIC ACCIDENT REPORT

☐ AMENDED/SUPPL. ☐ UNDER $1,000 ☐ COUNTER REPORT ☐ PRIVATE PROPERTY

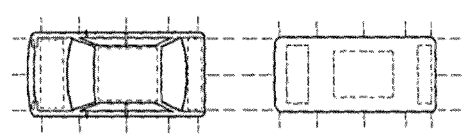
Field	Value
CDOT Code	
Case #	13CN16004154
☐ INTERSTATE HWY ☐ STATE HWY ☑ CITY ST/CNTY RD	HWY NUMBER / MILEPOINT:
DOR Code	
Date of Accident	05/21/2016
City	COMMERCE_CITY
Agency	COMMERCE CITY POLICE DEPA
County	12 ADAMS
County #	12
Time (24 Hr.)	1432
Officer Number	CC3352
Officer Name	J QUEISNER
Signature	
Detail	P
Number Killed	0
Number Injured	0
Location Route Street, Road	E 104TH AVE; Miles 100 Feet; N☐ S☐ E☑ W☐ OF: ☐ At: JOLIET ST
Date of Report	05/21/2016
Latitude	00:00:00.0000
Longitude	000:00:00.0000
Agency Code	C104108
Investigated @ Scene	☑
Total Vehicles	2
District Number	2
Public Property/Employee	☐
Photos Taken	☑
Railroad Crossing Related	☐
Const. Zone Related	☐
Highway Interchg.	☐
Bridge Related	☐

Margin codes: A 01; B 07; B; B 07; C 03; D 04; E 02; F 01; G 01; H 01; J 00; K 05; K 05; L 07; L 07; M 01; M 02; N 0; N 0; P 0; P 0; Q 03; Q 00; R 04; R 00; T 00; T 00

Field	Traffic Unit # 1 of 1	Traffic Unit # 2 of 2
Type	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.	☑ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.
Last Name	RUIZ	CHUDZIAK
First	OSWALDO	ANNA
MI		
Street Address	14155 MONTVIEW BLVD Apt. 18	17022 E 104TH WAY
Personal Phone	(720) 589-6675	
City	AURORA	COMMERCE_CITY
State	CO	CO
ZIP	80011	80022
Bus. Phone		
Driver License Number	142121233	973580529
CDL		
State	CO	CO
Sex	M	F
DOB	07-03-1998	10-27-1956
Primary Violation	☐ DUI CARELESS DRIVING MTC	☐ DUI
Violation Code	1402(1)	
Citation Number	AC95564	
Common Code	141	
Year	1994	2015
Make	ACURA	TOYOTA
Model	INTEGRA	COROLLA
Body Type	2D	4D
License Plate Number	670789P	NJA938
State or Country	CO	NM
Color	GRN	WHI
Vehicle Identification Number	JH4DC4356RS020423	2TBURHE7FC396427
Vehicle Owner Last Name ☐ Same	QUEZADA	ALAMO CAR RENTAL
First	MARIE	
MI		
Address ☐ Same	2469 DEVONSHIRE CT Apt. 32	24530 E 78TH AVE
City	ADAMS_COUNTY	DENVER
State	CO	CO
ZIP	80229	
Towed Due to Damage ☐ By:		
To:		
Trailer VIN#		



1 - Slight
2 - Moderate
3 - Severe



1 - Slight
2 - Moderate
3 - Severe

Field	Unit 1	Unit 2
Insurance Company ☐ None ☐ No Proof	SAFEWAY	ALAMO INS
Exp. Date	08/06/2016	
Policy Number	2276991-CO-PP-001	UNK

Owner Damaged Prop. Last Name	First	MI	Address	City	State	ZIP

T.U. #	POS.	REST	ENDO	SAFETY EQUIP.		AIR BAG		EJECT	SUSPECTED ALCO	SUSPECTED DRUG	INJ. SEV.	AGE	SEX	NAME / ADDRESS
1	01	00	00	B	01	A	01	B	00	00	00	17	M	SAME AS DRIVER
2	01	00	00	B	01	A	01	A	00	00	00	59	F	SAME AS DRIVER

Approved By	I. D. #	Date

Case #	DOR CODE	Accident Date	Agency
13CN16004154		05/21/2016	COMMERCE CITY POLICE DEPARTMENT

Describe Accident

Vehicle #2 was traveling westbound in the in the 10800 block of E 104th Ave and was slowing for an ambulance traveling eastbound. The front of vehicle #1 which was directly behind vehicle #2 then struck the rear of vehicle #2 causing damage due to not slowing for the ambulance.

N	Carrier Name	US DOT ☐ ICC ☐ State DOT ☐	
T.U. #	Address	Carrier Identification #	
N	Carrier Name	US DOT ☐ ICC ☐ State DOT ☐	
T.U. #	Address	Carrier Identification #	

APPENDIX “D”

TRAFFIC SIGNAL WARRANT WORKSHEETS

Warrants Summary Report

3: Joliet Street & E 104th Ave

Intersection Information:

	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

Warrant	Met?	Notes
Warrant 1, Eight-Hour Vehicular Volume		
	Yes	
Condition A or B Met?	Yes	8 Hours met (8 required)
Condition A and B Met?	No	3 Hours met (8 required)
Warrant 2, Four-Hour Vehicular Volume		
	Yes	6 Hours met (4 required)
Warrant 3, Peak Hour		
	Yes	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	Yes	3 Hours met (1 required)
Warrant 4, Pedestrian Volume		
	No	
Condition A Met?	No	0 Hours met (4 required)
Condition B Met?	No	0 Hours met (1 required)

Intersection Information:

	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

Warrant	Met?	Notes
Warrant 5, School Crossing		
	No	
Warrant 6, Coordinated Signal System		
	No	
Warrant 7, Crash Experience		
	No	
Traffic Volume Condition?	No	0 Hours met (8 required)
Ped Condition?	Yes	13 Hours met (8 required)
Warrant 8, Roadway Network		
	No	
Warrant 9, Intersection Near a Grade Crossing		
	No	

Warrant 1: Eight-hour Vehicular Volume

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street	E 104th Ave
Major Direction	EB/WB
Minor Direction	NB/SB

Warrant 1 Met? **Yes**

Details:

Condition A or B Met?	**Yes**	8 Hours met (8 required)
Condition A and B Met?	**No**	3 Hours met (8 required)

Hour	Major Street Vehicles (total of both approaches)	Condition A		Condition B		High-volume Minor Approach Vehicles	Condition A		Condition B		70% Standard Met? Cond. A OR Cond. B		56% Standard Met? Cond. A AND Cond. B	
		Volume >= 70% column (420)?	Volume >= 56% column (336)?	Volume >= 70% column (630)?	Volume >= 56% column (504)?		Volume >= 70% column (140)?	Volume >= 56% column (112)?	Volume >= 70% column (70)?	Volume >= 56% column (56)?	Condition A 70% Column	Condition B 70% Column	Condition A 56% Column	Condition B 56% Column
00:00 to 01:00	138	No	No	No	No	12	No	No	No	No	No	No	No	No
00:15 to 01:15	141	No	No	No	No	14	No	No	No	No	No	No	No	No
00:30 to 01:30	148	No	No	No	No	13	No	No	No	No	No	No	No	No
00:45 to 01:45	138	No	No	No	No	17	No	No	No	No	No	No	No	No
01:00 to 02:00	128	No	No	No	No	21	No	No	No	No	No	No	No	No
01:15 to 02:15	111	No	No	No	No	20	No	No	No	No	No	No	No	No
01:30 to 02:30	97	No	No	No	No	15	No	No	No	No	No	No	No	No
01:45 to 02:45	84	No	No	No	No	13	No	No	No	No	No	No	No	No
02:00 to 03:00	81	No	No	No	No	7	No	No	No	No	No	No	No	No
02:15 to 03:15	82	No	No	No	No	4	No	No	No	No	No	No	No	No

02:30 to 03:30	85	No	No	No	No	5	No	No	No	No	No	No	No	No	No
02:45 to 03:45	102	No	No	No	No	4	No	No	No	No	No	No	No	No	No
03:00 to 04:00	91	No	No	No	No	4	No	No	No	No	No	No	No	No	No
03:15 to 04:15	105	No	No	No	No	7	No	No	No	No	No	No	No	No	No
03:30 to 04:30	123	No	No	No	No	7	No	No	No	No	No	No	No	No	No
03:45 to 04:45	159	No	No	No	No	6	No	No	No	No	No	No	No	No	No
04:00 to 05:00	217	No	No	No	No	9	No	No	No	No	No	No	No	No	No
04:15 to 05:15	256	No	No	No	No	7	No	No	No	No	No	No	No	No	No
04:30 to 05:30	348	No	Yes	No	No	11	No	No	No	No	No	No	No	No	No
04:45 to 05:45	416	No	Yes	No	No	16	No	No	No	No	No	No	No	No	No
05:00 to 06:00	517	Yes	Yes	No	Yes	20	No	No	No	No	No	No	No	No	No
05:15 to 06:15	610	Yes	Yes	No	Yes	25	No	No	No	No	No	No	No	No	No
05:30 to 06:30	741	Yes	Yes	Yes	Yes	25	No	No	No	No	No	No	No	No	No
05:45 to 06:45	864	Yes	Yes	Yes	Yes	27	No	No	No	No	No	No	No	No	No
06:00 to 07:00	1072	Yes	Yes	Yes	Yes	23	No	No	No	No	No	No	No	No	No
06:15 to 07:15	1253	Yes	Yes	Yes	Yes	21	No	No	No	No	No	No	No	No	No
06:30 to 07:30	1278	Yes	Yes	Yes	Yes	28	No	No	No	No	No	No	No	No	No
06:45 to 07:45	1302	Yes	Yes	Yes	Yes	46	No	No	No	No	No	No	No	No	No
07:00 to 08:00	1206	Yes	Yes	Yes	Yes	50	No	No	No	No	No	No	No	No	No
07:15 to 08:15	1214	Yes	Yes	Yes	Yes	57	No	No	No	Yes	No	No	No	Yes	
07:30 to 08:30	1263	Yes	Yes	Yes	Yes	64	No	No	No	Yes	No	No	No	Yes	
07:45 to 08:45	1225	Yes	Yes	Yes	Yes	50	No	No	No	No	No	No	No	No	No
08:00 to 09:00	1159	Yes	Yes	Yes	Yes	60	No	No	No	Yes	No	No	No	Yes	
08:15 to 09:15	984	Yes	Yes	Yes	Yes	64	No	No	No	Yes	No	No	No	Yes	
08:30 to 09:30	855	Yes	Yes	Yes	Yes	55	No	No	No	No	No	No	No	No	No
08:45 to 09:45	824	Yes	Yes	Yes	Yes	60	No	No	No	Yes	No	No	No	Yes	
09:00 to 10:00	806	Yes	Yes	Yes	Yes	66	No	No	No	Yes	No	No	No	Yes	
09:15 to 10:15	776	Yes	Yes	Yes	Yes	64	No	No	No	Yes	No	No	No	Yes	

09:30 to 10:30	739	Yes	Yes	Yes	Yes	66	No	No	No	Yes	No	No	No	Yes
09:45 to 10:45	698	Yes	Yes	Yes	Yes	68	No	No	No	Yes	No	No	No	Yes
10:00 to 11:00	675	Yes	Yes	Yes	Yes	71	No	No	Yes	Yes	No	Yes*	No	Yes
10:15 to 11:15	704	Yes	Yes	Yes	Yes	83	No	No	Yes	Yes	No	Yes	No	Yes
10:30 to 11:30	752	Yes	Yes	Yes	Yes	99	No	No	Yes	Yes	No	Yes	No	Yes
10:45 to 11:45	815	Yes	Yes	Yes	Yes	101	No	No	Yes	Yes	No	Yes	No	Yes
11:00 to 12:00	851	Yes	Yes	Yes	Yes	102	No	No	Yes	Yes	No	Yes*	No	Yes
11:15 to 12:15	878	Yes	Yes	Yes	Yes	98	No	No	Yes	Yes	No	Yes	No	Yes
11:30 to 12:30	870	Yes	Yes	Yes	Yes	94	No	No	Yes	Yes	No	Yes	No	Yes
11:45 to 12:45	872	Yes	Yes	Yes	Yes	94	No	No	Yes	Yes	No	Yes	No	Yes
12:00 to 13:00	896	Yes	Yes	Yes	Yes	84	No	No	Yes	Yes	No	Yes*	No	Yes
12:15 to 13:15	926	Yes	Yes	Yes	Yes	74	No	No	Yes	Yes	No	Yes	No	Yes
12:30 to 13:30	919	Yes	Yes	Yes	Yes	67	No	No	No	Yes	No	No	No	Yes
12:45 to 13:45	876	Yes	Yes	Yes	Yes	59	No	No	No	Yes	No	No	No	Yes
13:00 to 14:00	860	Yes	Yes	Yes	Yes	59	No	No	No	Yes	No	No	No	Yes
13:15 to 14:15	832	Yes	Yes	Yes	Yes	56	No	No	No	Yes	No	No	No	Yes
13:30 to 14:30	873	Yes	Yes	Yes	Yes	57	No	No	No	Yes	No	No	No	Yes
13:45 to 14:45	927	Yes	Yes	Yes	Yes	69	No	No	No	Yes	No	No	No	Yes
14:00 to 15:00	993	Yes	Yes	Yes	Yes	68	No	No	No	Yes	No	No	No	Yes
14:15 to 15:15	1094	Yes	Yes	Yes	Yes	83	No	No	Yes	Yes	No	Yes*	No	Yes
14:30 to 15:30	1110	Yes	Yes	Yes	Yes	84	No	No	Yes	Yes	No	Yes	No	Yes
14:45 to 15:45	1240	Yes	Yes	Yes	Yes	87	No	No	Yes	Yes	No	Yes	No	Yes
15:00 to 16:00	1332	Yes	Yes	Yes	Yes	99	No	No	Yes	Yes	No	Yes	No	Yes
15:15 to 16:15	1398	Yes	Yes	Yes	Yes	114	No	Yes	Yes	Yes	No	Yes*	Yes*	Yes*
15:30 to 16:30	1506	Yes	Yes	Yes	Yes	123	No	Yes	Yes	Yes	No	Yes	Yes	Yes
15:45 to 16:45	1483	Yes	Yes	Yes	Yes	133	No	Yes	Yes	Yes	No	Yes	Yes	Yes
16:00 to 17:00	1489	Yes	Yes	Yes	Yes	149	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
16:15 to 17:15	1485	Yes	Yes	Yes	Yes	163	Yes	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes*

16:30 to 17:30	1476	Yes	Yes	Yes	Yes	171	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16:45 to 17:45	1536	Yes	Yes	Yes	Yes	168	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17:00 to 18:00	1498	Yes	Yes	Yes	Yes	146	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
17:15 to 18:15	1451	Yes	Yes	Yes	Yes	126	No	Yes	Yes	Yes	No	Yes*	Yes*	Yes*
17:30 to 18:30	1382	Yes	Yes	Yes	Yes	113	No	Yes	Yes	Yes	No	Yes	Yes	Yes
17:45 to 18:45	1241	Yes	Yes	Yes	Yes	95	No	No	Yes	Yes	No	Yes	No	Yes
18:00 to 19:00	1138	Yes	Yes	Yes	Yes	84	No	No	Yes	Yes	No	Yes	No	Yes
18:15 to 19:15	1023	Yes	Yes	Yes	Yes	60	No	No	No	Yes	No	No	No	Yes
18:30 to 19:30	932	Yes	Yes	Yes	Yes	53	No	No	No	No	No	No	No	No
18:45 to 19:45	860	Yes	Yes	Yes	Yes	64	No	No	No	Yes	No	No	No	Yes
19:00 to 20:00	785	Yes	Yes	Yes	Yes	75	No	No	Yes	Yes	No	Yes*	No	Yes
19:15 to 20:15	759	Yes	Yes	Yes	Yes	70	No	No	Yes	Yes	No	Yes	No	Yes
19:30 to 20:30	706	Yes	Yes	Yes	Yes	64	No	No	No	Yes	No	No	No	Yes
19:45 to 20:45	628	Yes	Yes	No	Yes	46	No	No	No	No	No	No	No	No
20:00 to 21:00	555	Yes	Yes	No	Yes	33	No	No	No	No	No	No	No	No
20:15 to 21:15	511	Yes	Yes	No	Yes	36	No	No	No	No	No	No	No	No
20:30 to 21:30	502	Yes	Yes	No	No	31	No	No	No	No	No	No	No	No
20:45 to 21:45	493	Yes	Yes	No	No	29	No	No	No	No	No	No	No	No
21:00 to 22:00	498	Yes	Yes	No	No	28	No	No	No	No	No	No	No	No
21:15 to 22:15	428	Yes	Yes	No	No	27	No	No	No	No	No	No	No	No
21:30 to 22:30	356	No	Yes	No	No	26	No	No	No	No	No	No	No	No
21:45 to 22:45	308	No	No	No	No	19	No	No	No	No	No	No	No	No
22:00 to 23:00	259	No	No	No	No	17	No	No	No	No	No	No	No	No
22:15 to 23:15	254	No	No	No	No	21	No	No	No	No	No	No	No	No
22:30 to 23:30	238	No	No	No	No	22	No	No	No	No	No	No	No	No
22:45 to 23:45	197	No	No	No	No	28	No	No	No	No	No	No	No	No
23:00 to 00:00	172	No	No	No	No	26	No	No	No	No	No	No	No	No
23:15 to 00:15	141	No	No	No	No	19	No	No	No	No	No	No	No	No

23:30 to 00:30	117	No	No	No	No	20	No	No	No	No	No	No	No	No
23:45 to 00:45	128	No	No	No	No	14	No	No	No	No	No	No	No	No

Warrant 2: Four-hour Vehicular Volume

3: Joliet Street & E 104th Ave

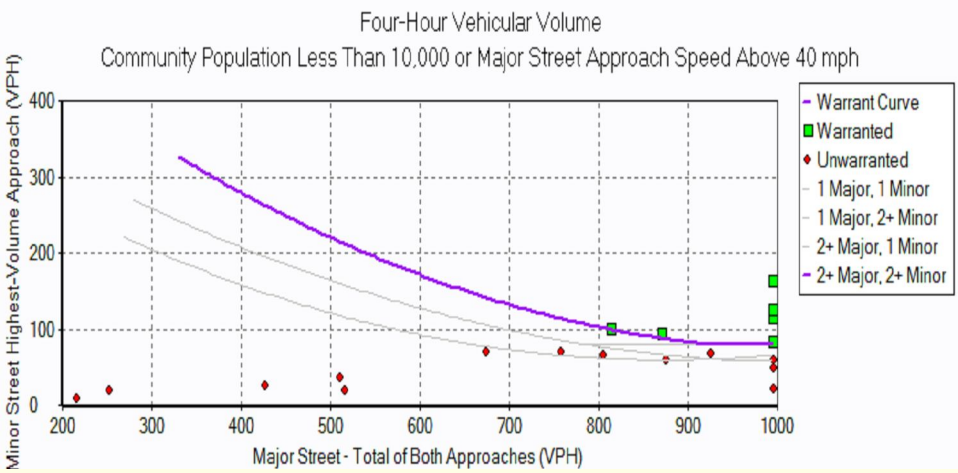
Intersection Informatior

	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

Warrant 2 Met? **Yes**

Details:

Notes:	6 Hours met (4 required)
Low Population?	**No**



Hourly Volumes		
Hour	Major Street Total of both approaches (VPH)	Minor Street Highest volume approach (VPH)
00:00:00 - 01:00:00	138.00	12.00
01:00:00 - 02:00:00	128.00	21.00
02:00:00 - 03:00:00	81.00	7.00
03:00:00 - 04:00:00	91.00	4.00
04:00:00 - 05:00:00	217.00	9.00
05:00:00 - 06:00:00	517.00	20.00
06:00:00 - 07:00:00	1,072.00	23.00
07:00:00 - 08:00:00	1,206.00	50.00
08:00:00 - 09:00:00	1,159.00	60.00
09:00:00 - 10:00:00	806.00	66.00
10:00:00 - 11:00:00	675.00	71.00
11:00:00 - 12:00:00	851.00	102.00
12:00:00 - 13:00:00	896.00	84.00
13:00:00 - 14:00:00	860.00	59.00
14:00:00 - 15:00:00	993.00	68.00
15:00:00 - 16:00:00	1,332.00	99.00
16:00:00 - 17:00:00	1,489.00	149.00
17:00:00 - 18:00:00	1,498.00	146.00
18:00:00 - 19:00:00	1,138.00	84.00
19:00:00 - 20:00:00	785.00	75.00
20:00:00 - 21:00:00	555.00	33.00
21:00:00 - 22:00:00	498.00	28.00
22:00:00 - 23:00:00	259.00	17.00
23:00:00 - 00:00:00	172.00	26.00

Warranted Hours		
Hour	Major Volume	Minor Volume
10:45:00 - 11:45:00	815.00	101.00
11:45:00 - 12:45:00	872.00	94.00
14:15:00 - 15:15:00	1,094.00	83.00
15:15:00 - 16:15:00	1,398.00	114.00
16:15:00 - 17:15:00	1,485.00	163.00
17:15:00 - 18:15:00	1,451.00	126.00

Note: Only data of hours warranted is represented in the above table.

Warrant 3: Peak Hour

3: Joliet Street & E 104th Ave

Intersection Information:

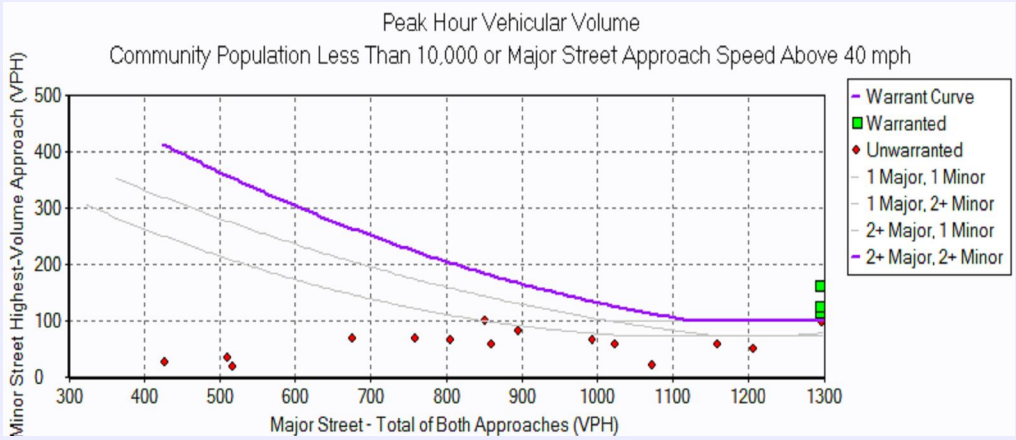
	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

Warrant 3 Met? **Yes**

Details:

Low Population?	No
Condition A Met?	No
Notes:	0 Hours met (1 required)
Minor Approach Time Delay Condition	Not Met
Minor Approach Volume Condition	Met
Total Entering Intersection Volume Condition	Not Met
Condition B Met?	Yes
Notes:	3 Hours met (1 required)

Warrant 3



Note: Please turn over for volume information.

Warranted / Unwarranted

Hour	Major Street Total of both approaches (VPH)	Minor Street Highest volume approach (VPH)
0:00	138	12
1:00	128	21
2:00	81	7
3:00	91	4
4:00	217	9
5:00	517	20
6:00	1072	23
7:00	1206	50
8:00	1159	60
9:00	806	66
10:00	675	71
11:00	851	102
12:00	896	84
13:00	860	59
14:00	993	68
15:00	1332	99
15:15	1398	114
16:15	1485	163
17:15	1451	126
18:15	1023	60
19:15	759	70
20:15	511	36
21:15	428	27
22:15	254	21
23:15	141	19

Warrant 4: Pedestrian Volume
3: Joliet Street & E 104th Ave

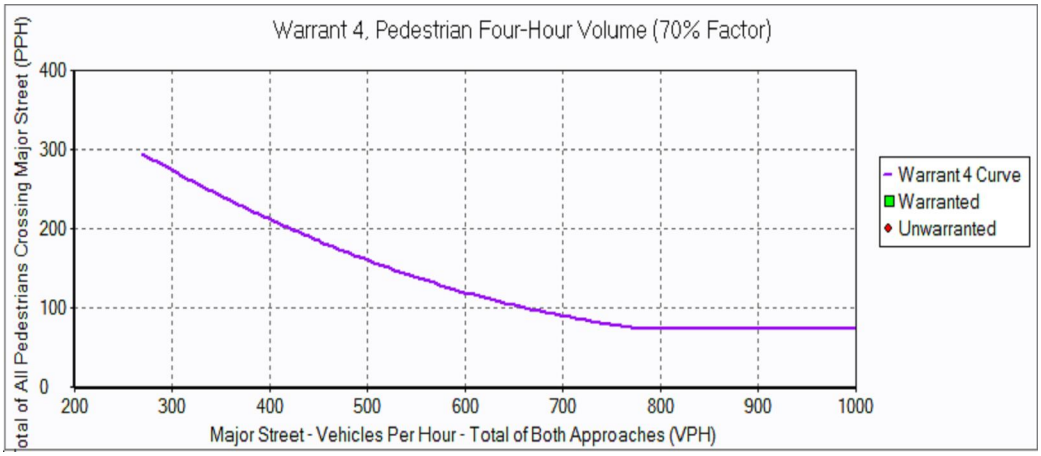
Intersection Information:

	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

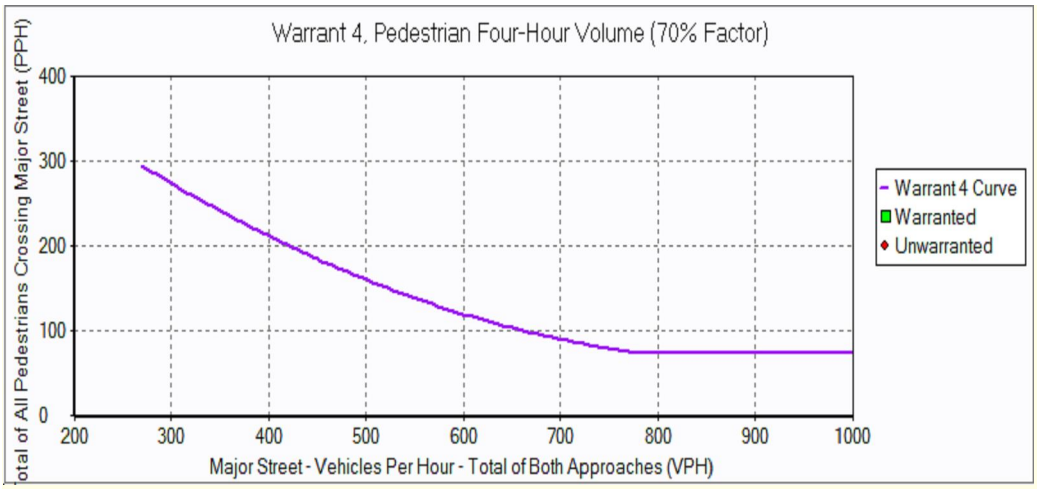
Warrant 4 Met? **No**

Details:

Pedestrian Four-Hour Volume Warrant met?	**No**
Pedestrian Peak Hour Warrant Met?	**No**
Notes:	0 Hours met (4 required)
Speed limit or 85th-percentile speed on the major street > 35 mph, or intersection lies within an isolated community with population < 10,000	**Yes**



Warranted / Unwarranted		
Hour	Major Street Vehicle Volume (VPH)	Volume of Pedestrians Crossing Major Street (VPH)



Pedestrian Peak Hour		
Hour	Vehicular Volume	Pedestrain Volume
N/A	N/A	N/A

Warrant 5: School Crossing

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street Name	E 104th Ave
Major Direction	EB/WB

Warrant 5 Met? **No**

Details:

Time Period Interval for Students Crossing (min)	**0**
Number of Students Crossing in Time Period	**0**
Number of Adequate Gaps in Time Period	**0**
Other Remedial Measures Attempted?	**No**
Adjacent Signal on EB approach?	**No**
Distance to signal on EB Approach (ft)	**-**
Adjacent Signal on WB approach?	**No**
Distance to signal on WB Approach (ft)	**-**
Will New Signal Restrict Progressive Traffic?	**No**

Warrant 6: Coordinated Signal System

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street Name	E 104th Ave
Major Direction	EB/WB

Warrant 6 Met? **No**

Details:

Approach Dir/Name	Acceptable Platooning?	Adjacent Coordinating Signal?	Adjacent Intersection Distance
EB Approach (E 104th Ave)	Yes	No	N/A
WB Approach (E 104th Ave)	Yes	No	N/A
NB Approach (Joliet Street)	Yes	No	N/A
SB Approach (Joliet Street)	Yes	No	N/A

Unacceptable Platooning? (At least one approach)	**Distance to Closest Signal** (Must be N/A or >= 1000)
No	**N/A**

Warrant 7: Crash Experience

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street Name	E 104th Ave
Major Direction	EB/WB
Minor Direction	NB/SB

Warrant 7 Met? **No**

Details:

Low Population?	**No**	
Major Street Speed Limit	**45**	
Major Street 85th-Percentile Speed	**0.00**	
Qualifying Crashes	**0**	
Adequate Alternative Trials?	**No**	
Traffic Volume Condition Met?	**Yes**	13 Hours Met (8 Required)
Ped Volume Condition Met?	**No**	0 Hours Met (8 Required)

Hour	Traffic Volumes				Pedestrian Volumes			
			56% Standard Met? A OR B		Northbound Ped Volumes		Southbound Ped Volumes	
	Major Street Vehicles	Minor Street Vehicles	Condition A	Condition B	Peds	> 80?	Peds	> 80?
00:00 to 01:00	138	0	No	No	0	No	0	No
00:15 to 01:15	141	0	No	No	0	No	0	No
00:30 to 01:30	148	0	No	No	0	No	0	No
00:45 to 01:45	138	0	No	No	0	No	0	No
01:00 to 02:00	128	0	No	No	0	No	0	No
01:15 to 02:15	111	0	No	No	0	No	0	No
01:30 to 02:30	97	0	No	No	0	No	0	No
01:45 to 02:45	84	0	No	No	0	No	0	No

02:00 to 03:00	81	0	No	No	0	No	0	No
02:15 to 03:15	82	0	No	No	0	No	0	No
02:30 to 03:30	85	0	No	No	0	No	0	No
02:45 to 03:45	102	0	No	No	0	No	0	No
03:00 to 04:00	91	0	No	No	0	No	0	No
03:15 to 04:15	105	0	No	No	0	No	0	No
03:30 to 04:30	123	0	No	No	0	No	0	No
03:45 to 04:45	159	0	No	No	0	No	0	No
04:00 to 05:00	217	0	No	No	0	No	0	No
04:15 to 05:15	256	0	No	No	0	No	0	No
04:30 to 05:30	348	0	No	No	0	No	0	No
04:45 to 05:45	416	0	No	No	0	No	0	No
05:00 to 06:00	517	0	No	No	0	No	0	No
05:15 to 06:15	610	0	No	No	0	No	0	No
05:30 to 06:30	741	0	No	No	0	No	0	No
05:45 to 06:45	864	0	No	No	0	No	0	No
06:00 to 07:00	1072	0	No	No	0	No	0	No
06:15 to 07:15	1253	0	No	No	0	No	0	No
06:30 to 07:30	1278	0	No	No	0	No	0	No
06:45 to 07:45	1302	0	No	No	0	No	0	No
07:00 to 08:00	1206	0	No	No	0	No	0	No
07:15 to 08:15	1214	0	No	No	0	No	0	No
07:30 to 08:30	1263	0	No	No	0	No	0	No
07:45 to 08:45	1225	0	No	No	0	No	0	No
08:00 to 09:00	1159	0	No	No	0	No	0	No
08:15 to 09:15	984	0	No	No	0	No	0	No
08:30 to 09:30	855	0	No	No	0	No	0	No

08:45 to 09:45	824	0	No	No	0	No	0	No
09:00 to 10:00	806	0	No	No	0	No	0	No
09:15 to 10:15	776	0	No	No	0	No	0	No
09:30 to 10:30	739	0	No	No	0	No	0	No
09:45 to 10:45	698	0	No	No	0	No	0	No
10:00 to 11:00	675	0	No	No	0	No	0	No
10:15 to 11:15	704	0	No	No	0	No	0	No
10:30 to 11:30	752	0	No	No	0	No	0	No
10:45 to 11:45	815	0	No	No	0	No	0	No
11:00 to 12:00	851	0	No	No	0	No	0	No
11:15 to 12:15	878	0	No	No	0	No	0	No
11:30 to 12:30	870	0	No	No	0	No	0	No
11:45 to 12:45	872	0	No	No	0	No	0	No
12:00 to 13:00	896	0	No	No	0	No	0	No
12:15 to 13:15	926	0	No	No	0	No	0	No
12:30 to 13:30	919	0	No	No	0	No	0	No
12:45 to 13:45	876	0	No	No	0	No	0	No
13:00 to 14:00	860	0	No	No	0	No	0	No
13:15 to 14:15	832	0	No	No	0	No	0	No
13:30 to 14:30	873	0	No	No	0	No	0	No
13:45 to 14:45	927	0	No	No	0	No	0	No
14:00 to 15:00	993	0	No	No	0	No	0	No
14:15 to 15:15	1094	0	No	No	0	No	0	No
14:30 to 15:30	1110	0	No	No	0	No	0	No
14:45 to 15:45	1240	0	No	No	0	No	0	No
15:00 to 16:00	1332	0	No	No	0	No	0	No
15:15 to 16:15	1398	0	No	No	0	No	0	No

15:30 to 16:30	1506	0	No	No	0	No	0	No
15:45 to 16:45	1483	0	No	No	0	No	0	No
16:00 to 17:00	1489	0	No	No	0	No	0	No
16:15 to 17:15	1485	0	No	No	0	No	0	No
16:30 to 17:30	1476	0	No	No	0	No	0	No
16:45 to 17:45	1536	0	No	No	0	No	0	No
17:00 to 18:00	1498	0	No	No	0	No	0	No
17:15 to 18:15	1451	0	No	No	0	No	0	No
17:30 to 18:30	1382	0	No	No	0	No	0	No
17:45 to 18:45	1241	0	No	No	0	No	0	No
18:00 to 19:00	1138	0	No	No	0	No	0	No
18:15 to 19:15	1023	0	No	No	0	No	0	No
18:30 to 19:30	932	0	No	No	0	No	0	No
18:45 to 19:45	860	0	No	No	0	No	0	No
19:00 to 20:00	785	0	No	No	0	No	0	No
19:15 to 20:15	759	0	No	No	0	No	0	No
19:30 to 20:30	706	0	No	No	0	No	0	No
19:45 to 20:45	628	0	No	No	0	No	0	No
20:00 to 21:00	555	0	No	No	0	No	0	No
20:15 to 21:15	511	0	No	No	0	No	0	No
20:30 to 21:30	502	0	No	No	0	No	0	No
20:45 to 21:45	493	0	No	No	0	No	0	No
21:00 to 22:00	498	0	No	No	0	No	0	No
21:15 to 22:15	428	0	No	No	0	No	0	No
21:30 to 22:30	356	0	No	No	0	No	0	No
21:45 to 22:45	308	0	No	No	0	No	0	No
22:00 to 23:00	259	0	No	No	0	No	0	No

22:15 to 23:15	254	0	No	No	0	No	0	No
22:30 to 23:30	238	0	No	No	0	No	0	No
22:45 to 23:45	197	0	No	No	0	No	0	No
23:00 to 00:00	172	0	No	No	0	No	0	No
23:15 to 00:15	141	0	No	No	0	No	0	No
23:30 to 00:30	117	0	No	No	0	No	0	No
23:45 to 00:45	128	0	No	No	0	No	0	No

Warrant 8: Roadway Network

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street Name	E 104th Ave
Major Direction	EB/WB
Minor Direction	NB/SB

Warrant 8 Met? (A or B) **No**

Details:

Growth Rates (per year)

NB		SB		EB		WB	
L	0.00%	L	0.00%	L	0.00%	L	0.00%
T	0.00%	T	0.00%	T	0.00%	T	0.00%
R	0.00%	R	0.00%	R	0.00%	R	0.00%

Condition A, Total Entering Volume

Existing Peak Hour	1722
Years	0.00
Future Peak Hour	1722
Warrant 1 in 5 Years?	No
Warrant 2 in 5 Years?	No
Warrant 3 in 5 Years?	No

Condition B, Non-normal Business Day

Existing

Highest Hour	0
Second Highest Hour	0
Third Highest Hour	0
Fourth Highest Hour	0
Fifth Highest Hour	0
Yearly Growth Rate	0.00%
Years	0.00

Future

Highest Hour	0
Second Highest Hour	0
Third Highest Hour	0
Fourth Highest Hour	0
Fifth Highest Hour	0

Condition A Met? **No** Condition B Met? **No**

Warrant 9: Intersection Near a Grade Crossing

3: Joliet Street & E 104th Ave

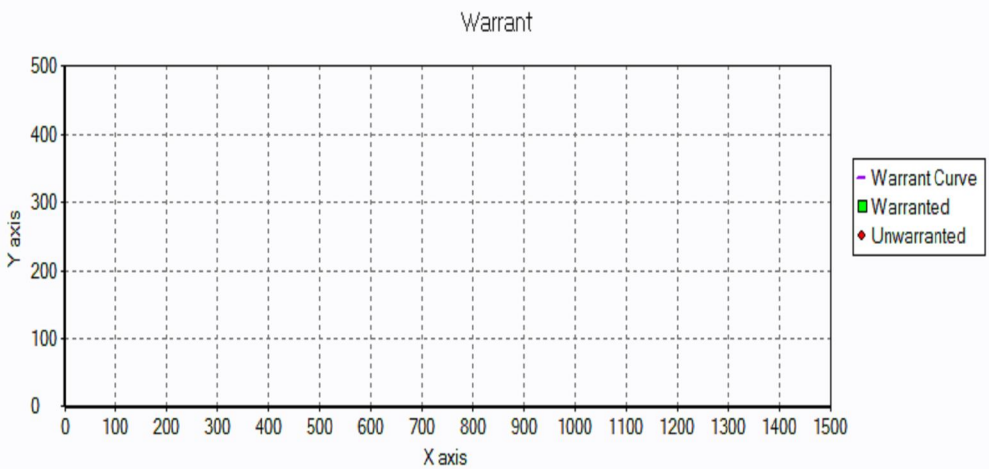
Intersection Information:

	Major Street	Minor Street
Street Name	E 104th Ave	Joliet Street
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	45	35

Warrant 9 Met? **No**

Details:

Note: No approach with a railroad grade crossing		
Minor-street approach having a grade crossing		
Distance from the center of the track to the stop or yield line		interpolated
Number of occurences of rail traffic per day		Adjustment factor
Percentage of high-occupancy buses crossing the track	%	Adjustment factor
Percentage of tractor-trailer trucks crossing the track	%	Adjustment factor
The rail traffic arrival times are uknown, the highest traffic volume hour of the day is used		



Warranted / Unwarranted		
Hour	**Major Street Total of Both Approaches (VPH)**	**Adjusted Volume of Minor Approach Crossing the Track (VPH)**

All-Way Stop Control Warrant : Multiway Stop Applications

3: Joliet Street & E 104th Ave

Intersection Information:

Major Street Name	E 104th Ave
Major Direction	EB/WB
Minor Direction	NB/SB

AWSC Warrant Met? **Yes**

Details:

Condition A Met?	**Yes**	
Condition B Met?	**No**	
Condition C Met?	**No**	0 Hours Met (8 Required)

Qualifying Crashes	0
Major Street 85th-Percentile Speed	0.00
Major Street Speed Limit	45

Hour	Traffic Volumes		Bicycle Volumes		Ped Volumes		Condition C	
	Major Street Vehicles	Minor Street Vehicles	Northbound Bicycle Volumes	Southbound Bicycle Volumes	Northbound Bicycle Volumes	Southbound Bicycle Volumes	**Major Street**	**Minor Street**
							(Total Vehicle Volume) >= 300	Avg(Veh + Ped + Bicycle) >= 200 Delay >= 30