

Traffic Signal Warrant Study

The Intersection of NM 599\
Via Veteranos \ NM 599
West Frontage Road Connector
Santa Fe, NM

Prepared by
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Signal Warrant Study

Location: NM 599 & Via Veteranos and W. Frontage Road Connector 4 legged intersection

City: Santa Fe

County: Santa Fe

NMDOT District: District Five

Report Prepared by: Javier A. Martinez, P.E.

Counts Performed By: NMDOT – District Five Traffic Section

Date of Counts and Times: 1/8/2015 and 1/15/2015; 7 AM to 10 AM, 11 AM to 2 PM, & 3 PM to 6 PM. A total of 9 hours of traffic turning movement counts was collected for this study. The turning movement counts are presented in Appendix A.

Major Street: NM 599 is a 4-Lane Divided Rural Principal Arterial running Northbound and Southbound with a left turn and right turn deceleration lane and left turn acceleration lanes each direction at this intersection.

Minor Street: East side approach is Via Veteranos and the West side approach is the NM 599 West Frontage Road Connector.

I. General:

In order for a signal installation to be recommended at a New Mexico Department of Transportation (NMDOT) intersection, a signal warrant study has to be conducted. In accordance with the Manual on Uniform Traffic Control Devices (MUTCD), at least one of the following traffic signal warrants has to be met in order for the intersection to be eligible for consideration for the placement of a traffic signal. The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

The warrants are listed below:

Warrant 1, Eight-Hour Vehicular Volume.

Warrant 2, Four-Hour Vehicular Volume.

Warrant 3, Peak Hour.

Warrant 4, Pedestrian Volume.

Warrant 5, School Crossing.

Warrant 6, Coordinated Signal System.

Warrant 7, Crash Experience.

Warrant 8, Roadway Network

Warrant 9, Intersection near a Grade Crossing

A traffic control signal will not be installed unless the engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection. In accordance with the MUTCD, this study may consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the above signal warrants. For this study, the right turn traffic on the minor streets were removed because the side streets provide an exclusive right turn lane and the movement enters the major street with minimal conflict. The side street approaches will be evaluated as one lane approaches with only the traffic volume in the through/left turn lane considered.

II. Purpose of Study:

The purpose of the traffic signal warrant study is to determine if the intersection of NM 599 and Via Veteranos / W. FR Connector, meets the necessary warrants to be considered by the NMDOT for placement of a traffic signal.

III. Location and Description:

NM 599 is a North/South 4-lane rural principal arterial roadway with two through lanes in each direction separated by a raised median with left turn and right turn deceleration lanes and left turn acceleration lanes in both directions. The East side approach is Via Veteranos and West side approach is W. FR Connector at this intersection.

The posted speed limit on NM 599 is 55 MPH.

The community of Santa Fe, NM has a population of more than 10,000. The state highway access category for NM 599 PRAR (Rural Principal Arterial) has a recommended signal spacing of 5280 feet based on the requirements of the *State Access Management Manual*. There are no traffic signals within a mile from the study intersection.

IV. Warrant Analysis:

A signal warrant analysis was performed for the intersection of NM 599\Via Veteranos\ NM 599 W. Frontage Road Connector from traffic data collected on January 8 and January 15, 2015. The traffic counts are presented in Appendix A. For this study, the right turn volumes were eliminated from the minor street.

The following are the finding of the signal warrant analyses:

1) Warrant 1, Eight-Hour Vehicular Volume

The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

It is intended that Warrant 1 be treated as a single warrant. If Condition A is satisfied, then the criteria for Warrant 1 are satisfied and Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then the criteria for Warrant 1 are satisfied and the combination of Conditions A and B is not needed.

The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exist for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or
- B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

In applying each condition the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

Combination of Warrants A& B:

The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

The need for a traffic control signal shall be considered if an engineering study finds that **both of the following conditions exist** for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the 80 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; and

- B. The vehicles per hour given in both of the 80 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

These major-street and minor-street volumes shall be for the same 8 hours for each condition; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Table 4C-1. Warrant 1. Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	500	400	350	280	150	120	105	84
2 or more ...	1.....	600	480	420	336	150	120	105	84
2 or more ...	2 or more ...	600	480	420	336	200	160	140	112
1.....	2 or more ...	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	750	600	525	420	75	60	53	42
2 or more ...	1.....	900	720	630	504	75	60	53	42
2 or more ...	2 or more ...	900	720	630	504	100	80	70	56
1.....	2 or more ...	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.

^b Used for combination of Conditions A and B after adequate trial of other remedial measures.

^c May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

Conclusion:

Warrant 1 was not met

For **Condition A**, the warrant volumes for a 2-lane approach on the major street and a 1-lane approach on the minor street entrance are 420 vph and 105 vph respectively. Zero hours met for 8 hours that were counted. The 70% factor was used since NM 599 has a speed limit over 40 MPH.

For **Condition B**, the warrant volumes for a 2-lane approach on the major street and a 1-lane approach on the minor street are 630 vph and 53 vph respectively. This target was

met for 2 hours which is less than the 8 hours needed to satisfy the warrant. The 70% factor was used.

Similarly the combination warrant for **Conditions A or B** were met for 5 hours which is less than the 8 hours needed to satisfy the warrant. The 56% factor was used. See Highway Capacity Software Warrants Summary in Appendix B.

2) Warrant 2, Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of 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 applicable curve in Figure 4C-1 for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours.

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

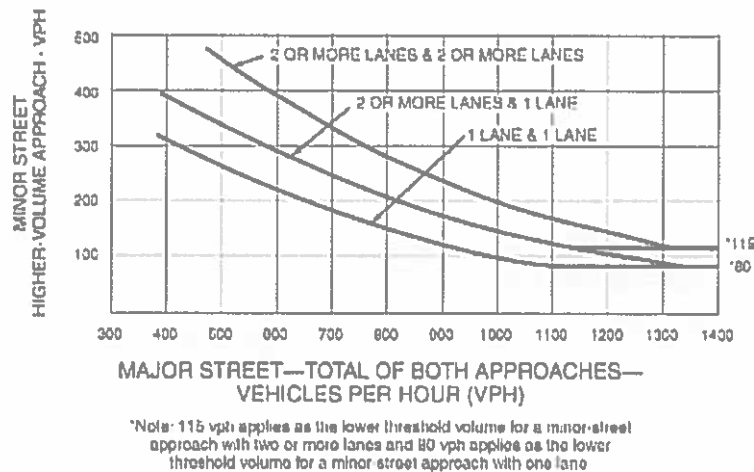
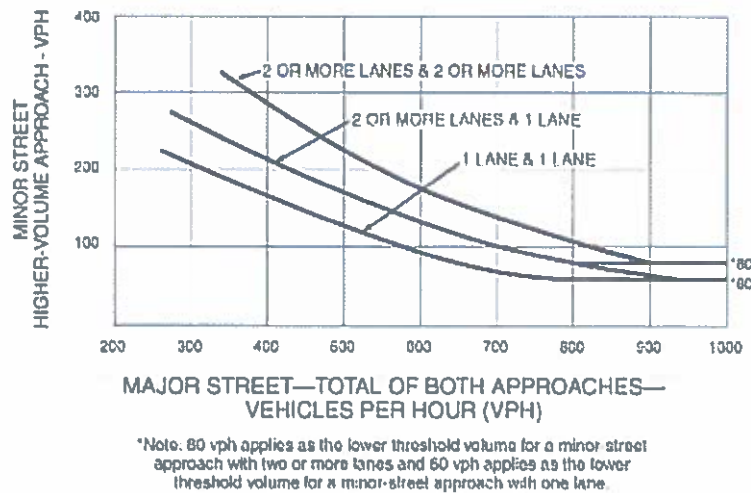
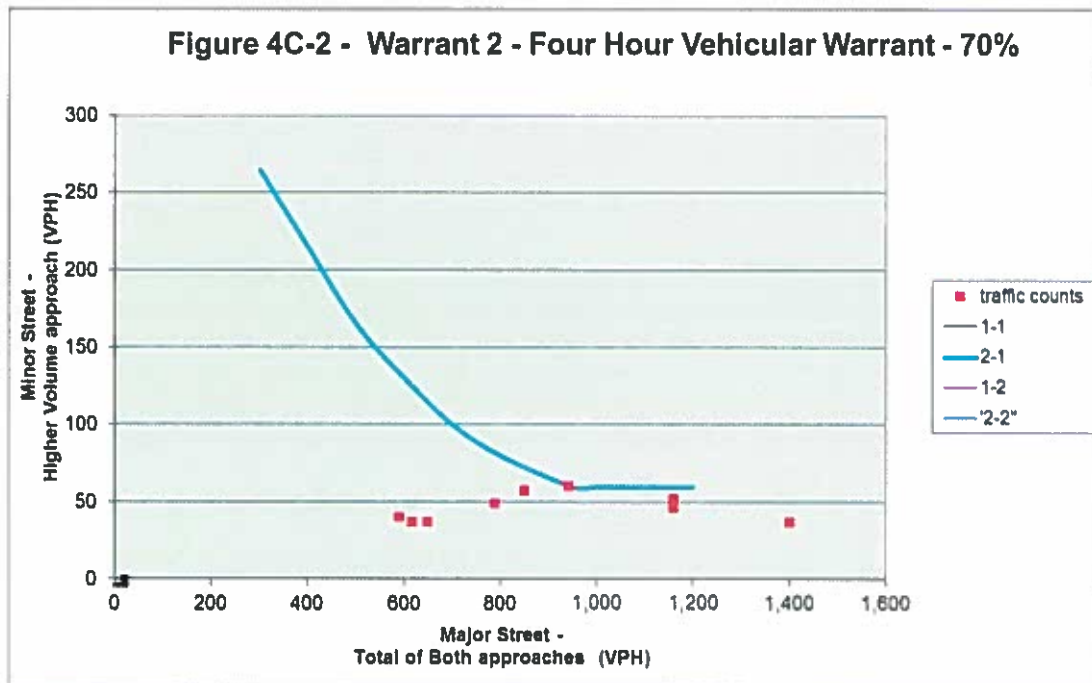


Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
 (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.



Conclusion:

Warrant 2 was not met for 70% factor above 40 MPH 2 and 1 lane approach (figure: 4C- 2).

3) Warrant 3, Peak Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. 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.

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. If **all three of the following conditions exist** for the same 1 hour (any four consecutive 15-minute periods) of an average day:
 - 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
 - 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 - 3. 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.
- B. The plotted point 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) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

Figure 4C-3. Warrant 3, Peak Hour

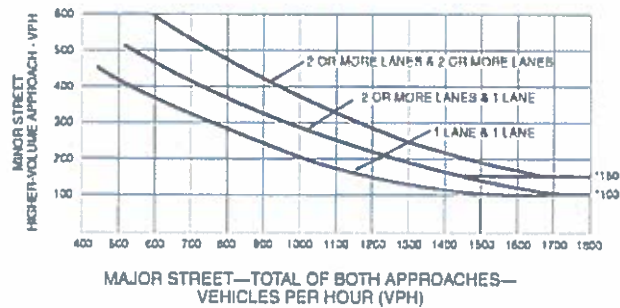


Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)

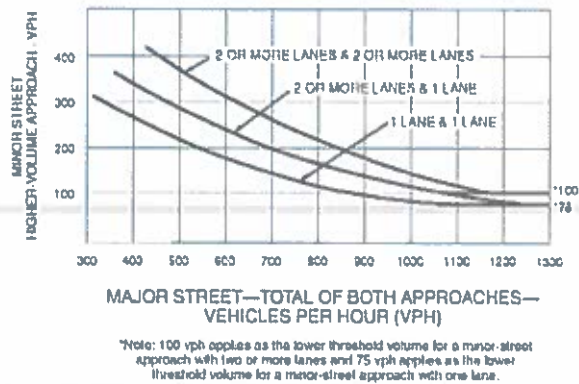
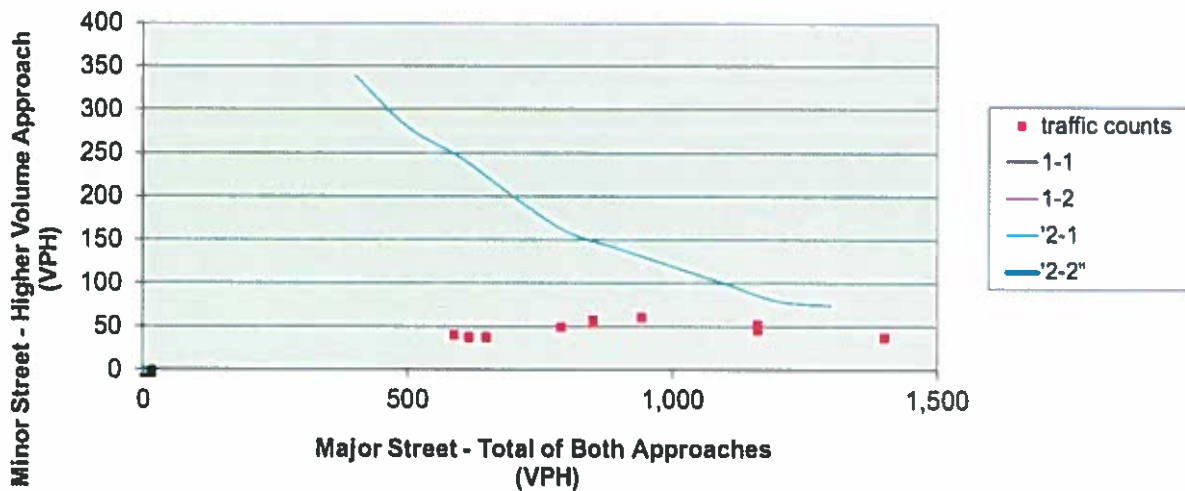


Figure 4C-4.
Warrant 3, Peak Hour (70%)



Conclusion:

Warrant 3 was not met for 70% factor above 40 MPH for a 2 and 1 lane approach (figure: 4C- 4) and is not considered an unusual case as described by MUTCD.

4) Warrant 4, Pedestrian Volume

The Pedestrian Volume signal 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.

The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

- A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and there are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

The Pedestrian Volume signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

If this warrant is met and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads conforming to requirements set forth in the MUTCD.

Conclusion:

Warrant 4 was not met.

From observation, there were no pedestrian volumes at this intersection.

5) Warrant 5, School Crossing

The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

The need for a traffic control signal shall be considered when an 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 an established school crossing across the major street 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 (see Section 7A.03 of the MUTCD) and there are a minimum of 20 students during the highest crossing hour.

Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

The School Crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Conclusion:

Warrant 5 was not met.

There are no school crossings along NM 599.

6) Warrant 6, Coordinated Signal System

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

- A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.
- B. On a two-way street, 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.

Conclusion:

Warrant 6 was not met.

There is no coordinated signal system on this route. Therefore, this warrant is not satisfied.

7) Warrant 7, Crash Experience

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
- B. 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

- C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours

Conclusion:

Warrant 7 was not met.

Condition A is met as intersection ahead flashers have been installed. Condition B was not met with the Crash history gathered for the years; 2011, 2012 & 2013. There were seven reported accidents at the subject intersection, however none of the crashes would be susceptible to correction by the addition of a traffic signal. We are in the process of gathering reported crashes for 2014. Condition C was not met for the 8 hours required to satisfy this warrant. See Appendix E for crash data reports.

8) Warrant 8, Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

- A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or
- B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a normal business day (Saturday or Sunday).

A major route as used in this signal warrant shall have one or more of the following characteristics:

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

Conclusion:

Warrant 8 is not met.

9) WARRANT 9, Intersection Near a Grade Crossing

The Intersection Near a Grade Crossing signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal.

The need for a traffic control signal shall be considered if an engineering study finds both of the following criteria are met:

- A. A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach; and
- B. During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor-street approach that crosses the track (one direction only, approaching the intersection) falls above the applicable curve in Figure 4C-9 or 4C-10 for the existing combination of approach lanes over the track and the distance D, which is the clear storage distance of defined in Section 1A.13.

Conclusion:

Warrant 9 is not met.

There is no Grade Crossing.

Study Conclusions:

The intersection of NM 599/ Via Veteranos/ NM 599 West Frontage Road Connector met zero warrants based on 2015 traffic counts. It is recommended that a traffic signal not be installed at this time for this intersection. See Appendix B for Signal Warrant Results.

Appendix A

Turning Movement

Traffic Counts

*NMDOT D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502*

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

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Site Code : 00010815
Start Date : 1/8/2015
Page No : 1

Groups Printed- Unshifted - Bank 1

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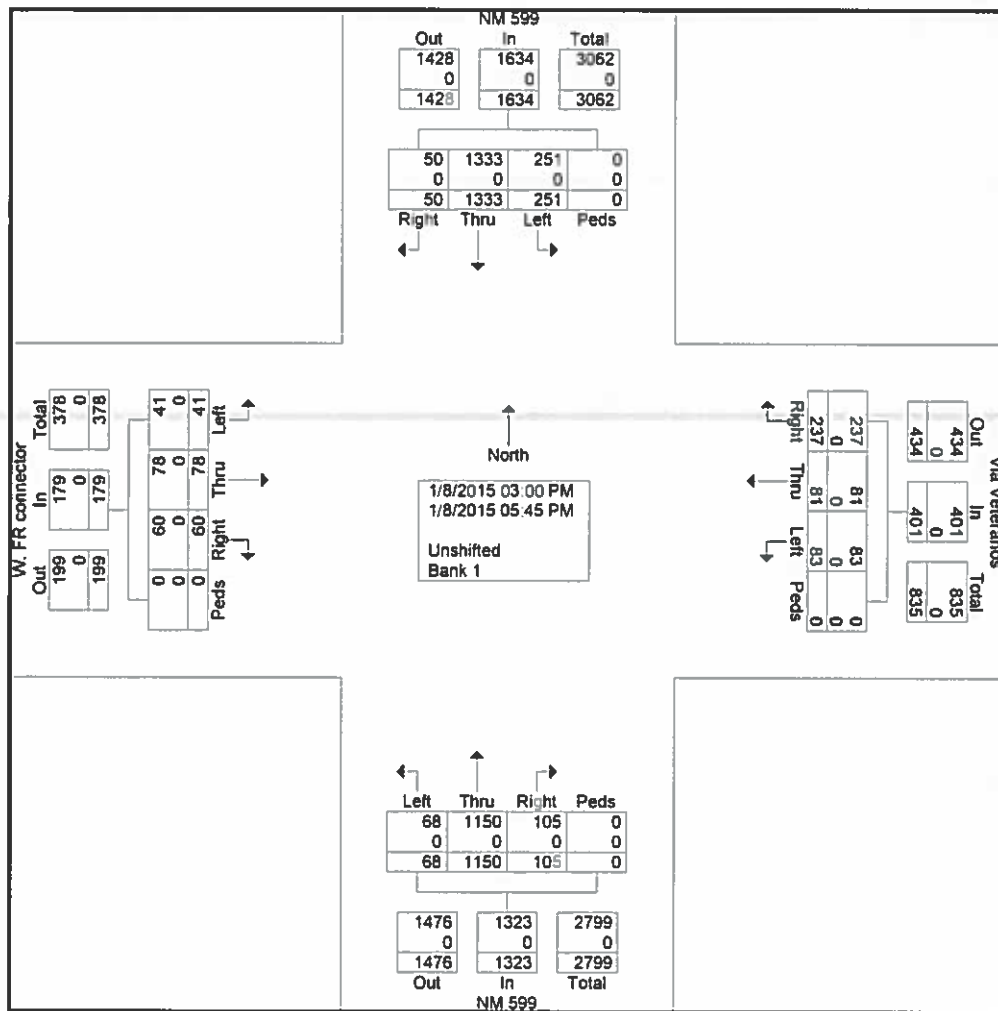
NMDO5 D-5

7315 Cerrillos RD.

Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
 Conducted by : Kyle B.
 Weather: Clear

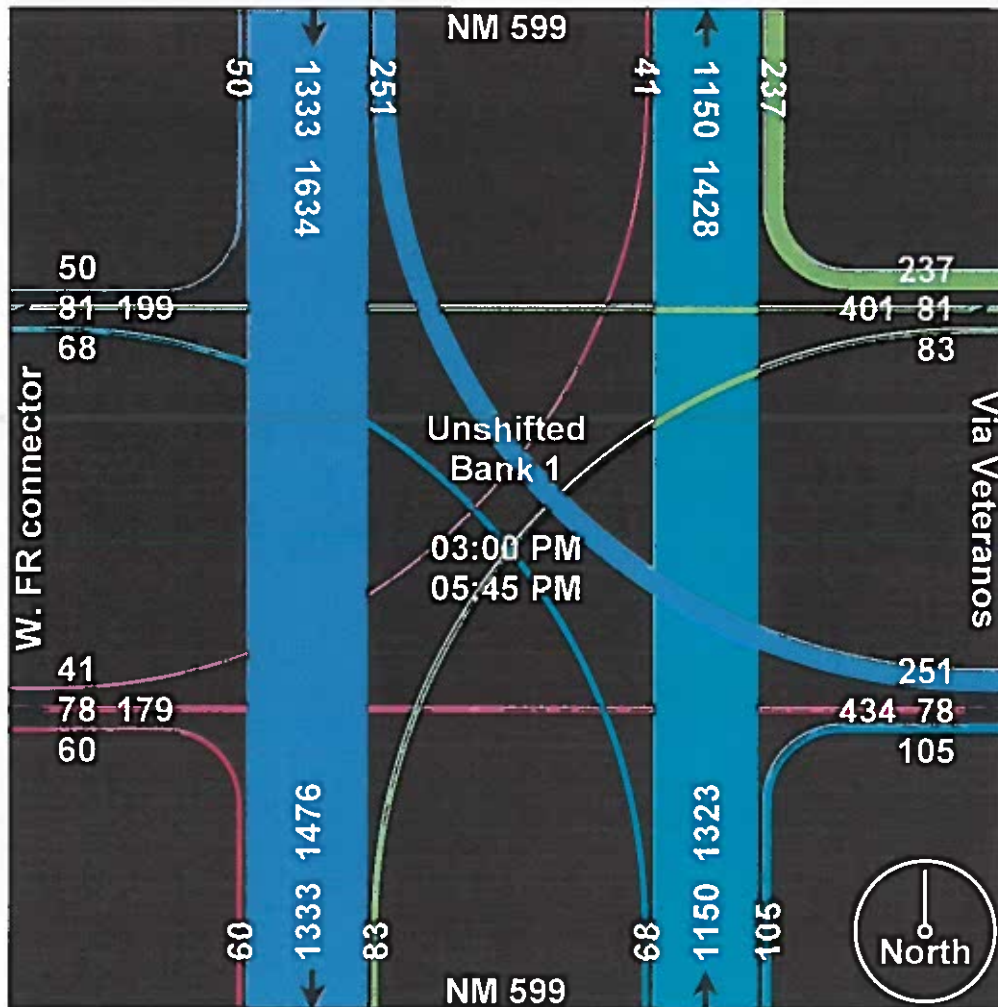
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 Start Date : 1/8/2015
 Page No : 2



NMDO5 D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector
Site Code : 00010815
Start Date : 1/8/2015
Page No : 3



NMDOT D-5

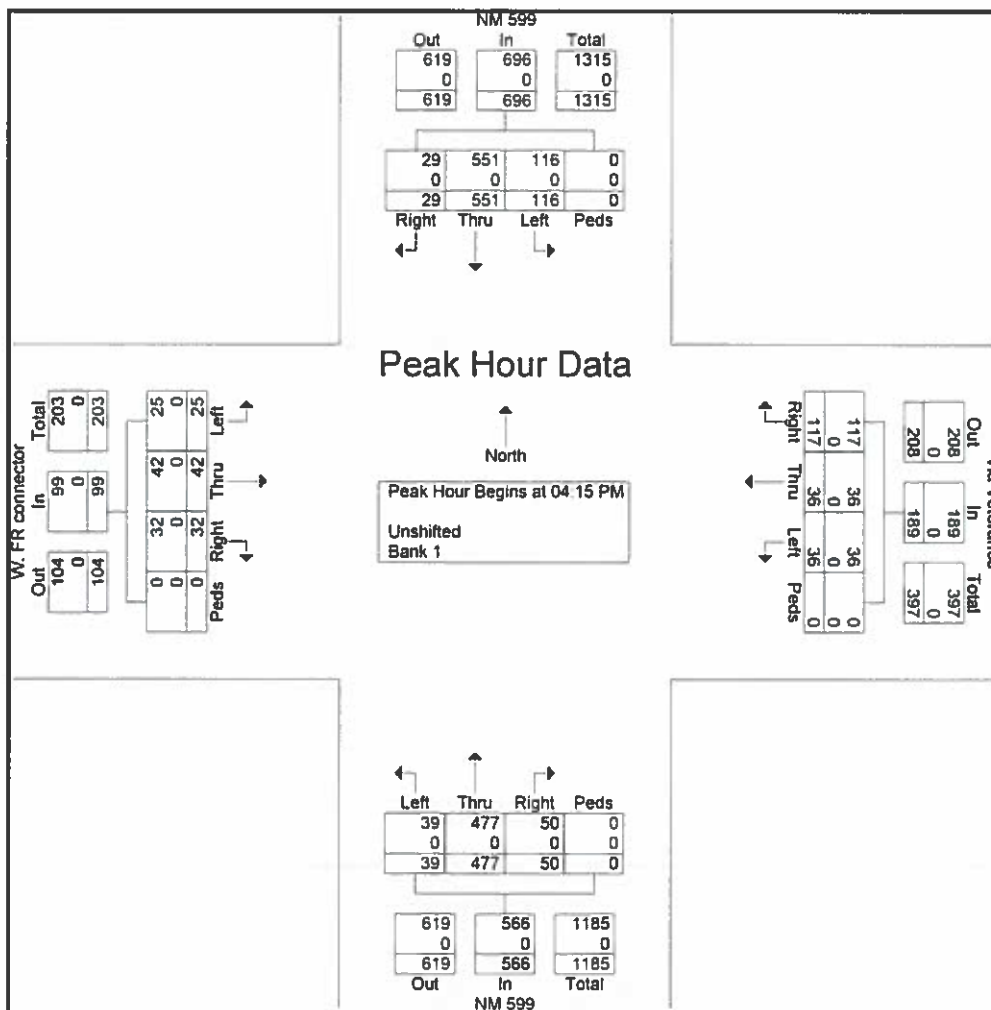
7315 Cerrillos RD.

Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
 Conducted by : Kyle B.
 Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector
 Site Code : 00010815
 Start Date : 1/8/2015
 Page No : 4

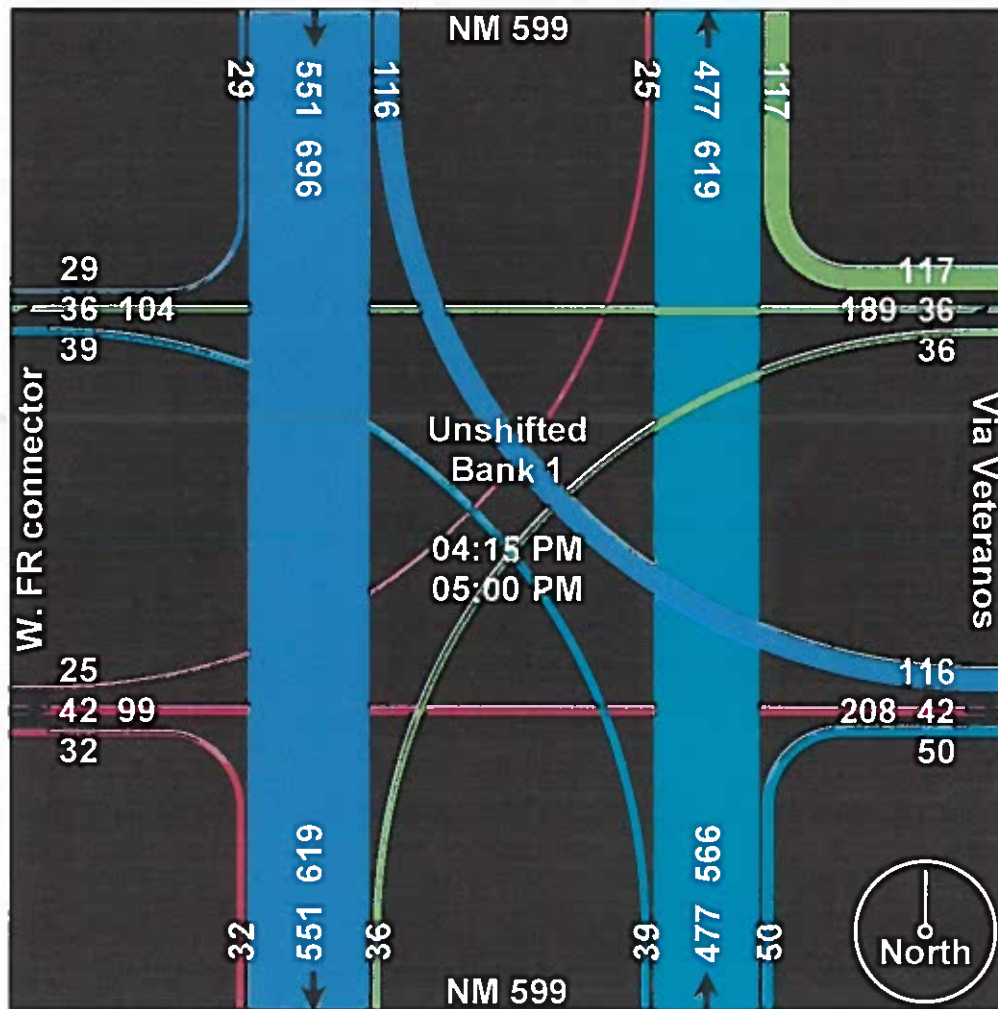
	NM 599 From North					Via Veteranos From East					NM 599 From South					W. FR connector From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	125	20	0	149	21	4	4	0	29	6	93	5	0	104	6	3	3	0	12	294
04:30 PM	8	146	33	0	187	30	8	6	0	44	11	127	9	0	147	10	11	6	0	27	405
04:45 PM	9	143	30	0	182	28	5	9	0	42	13	131	8	0	152	9	13	7	0	29	405
05:00 PM	8	137	33	0	178	38	19	17	0	74	20	126	17	0	163	7	15	9	0	31	446
Total Volume	29	551	116	0	696	117	36	36	0	189	50	477	39	0	566	32	42	25	0	99	1550
% App. Total	4.2	79.2	16.7	0		61.9	19	19	0		8.8	84.3	6.9	0		32.3	42.4	25.3	0		
PHF	.806	.943	.879	.000	.930	.770	.474	.529	.000	.639	.625	.910	.574	.000	.868	.800	.700	.694	.000	.798	.869
Unshifted	29	551	116	0	696	117	36	36	0	189	50	477	39	0	566	32	42	25	0	99	1550
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



NMDO5 D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector
Site Code : 00010815
Start Date : 1/8/2015
Page No : 5



NMDOT D-5

7315 Cerrillos RD.

Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
 Conducted by : Kyle B.
 Weather: Clear

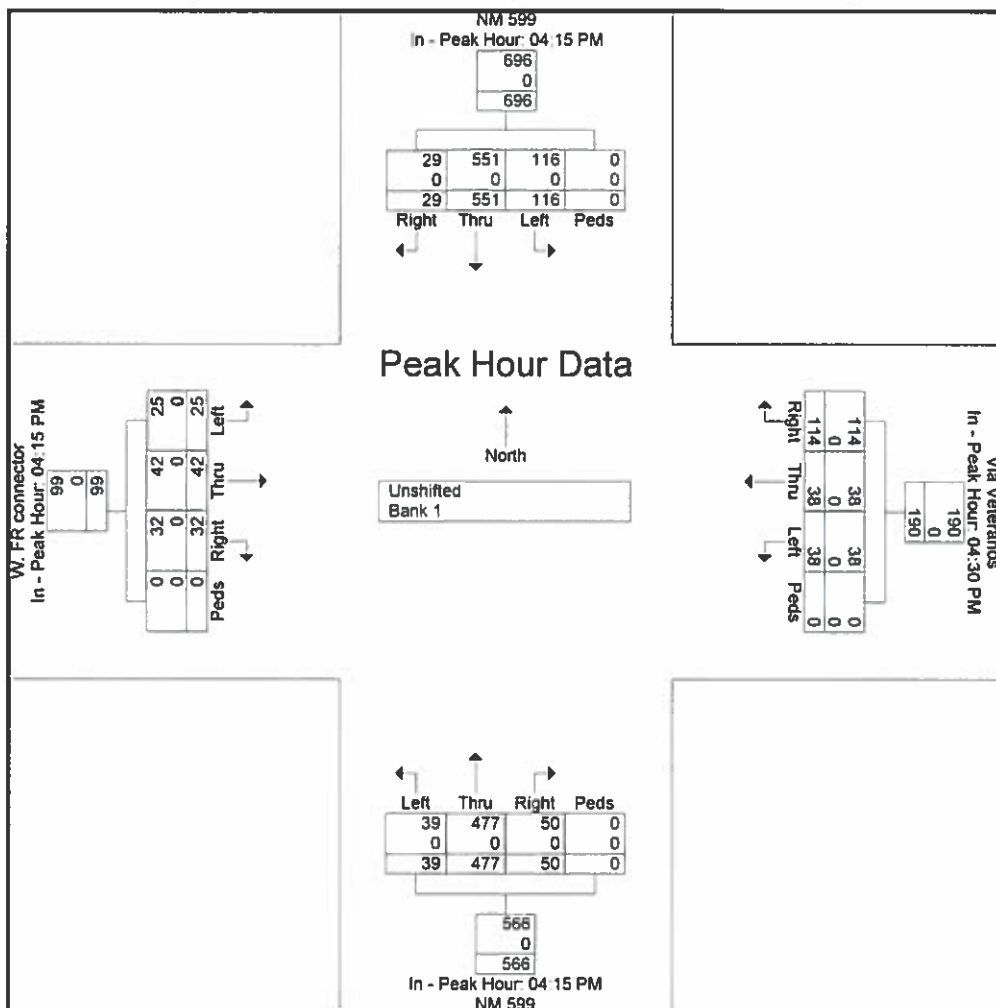
File Name : nm 599 & via veteranos & w. fr connector
 Site Code : 00010815
 Start Date : 1/8/2015
 Page No : 6

	NM 599 From North					Via Veteranos From East					NM 599 From South					W. FR connector From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

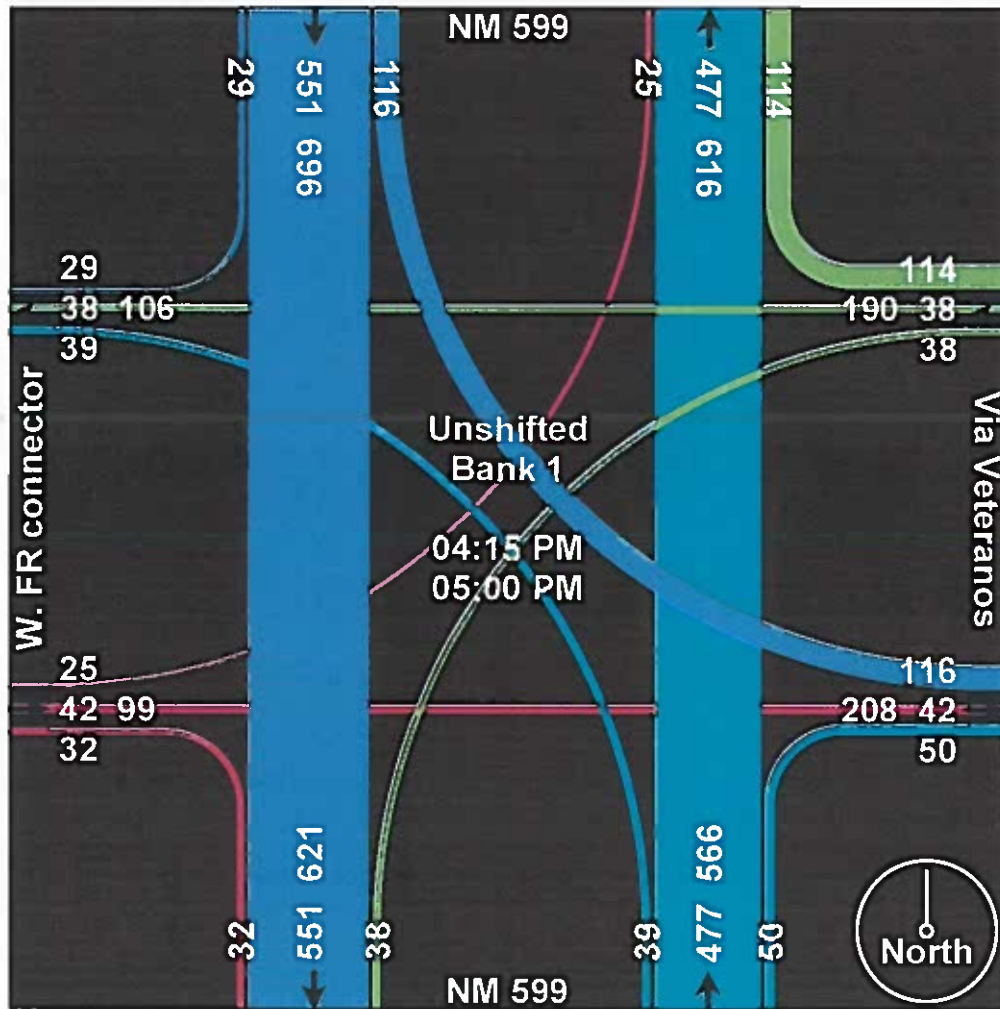
	04:15 PM					04:30 PM					04:15 PM					04:15 PM				
+0 mins.	4	125	20	0	149	30	8	6	0	44	6	93	5	0	104	6	3	3	0	12
+15 mins.	8	146	33	0	187	28	5	9	0	42	11	127	9	0	147	10	11	6	0	27
+30 mins.	9	143	30	0	182	38	19	17	0	74	13	131	8	0	152	9	13	7	0	29
+45 mins.	8	137	33	0	178	18	6	6	0	30	20	126	17	0	163	7	15	9	0	31
Total Volume	29	551	116	0	696	114	38	38	0	190	50	477	39	0	566	32	42	25	0	99
% App. Total	4.2	79.2	16.7	0		6.0	2.0	2.0	0		8.8	84.3	6.9	0		32.3	42.4	25.3	0	
PHF	.806	.943	.879	.000	.930	.750	.500	.559	.000	.642	.625	.910	.574	.000	.868	.800	.700	.694	.000	.798
Unshifted	29	551	116	0	696	114	38	38	0	190	50	477	39	0	566	32	42	25	0	99
% Unshifted																				
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



NMDO5 D-5
7315 Cerrillos RD.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

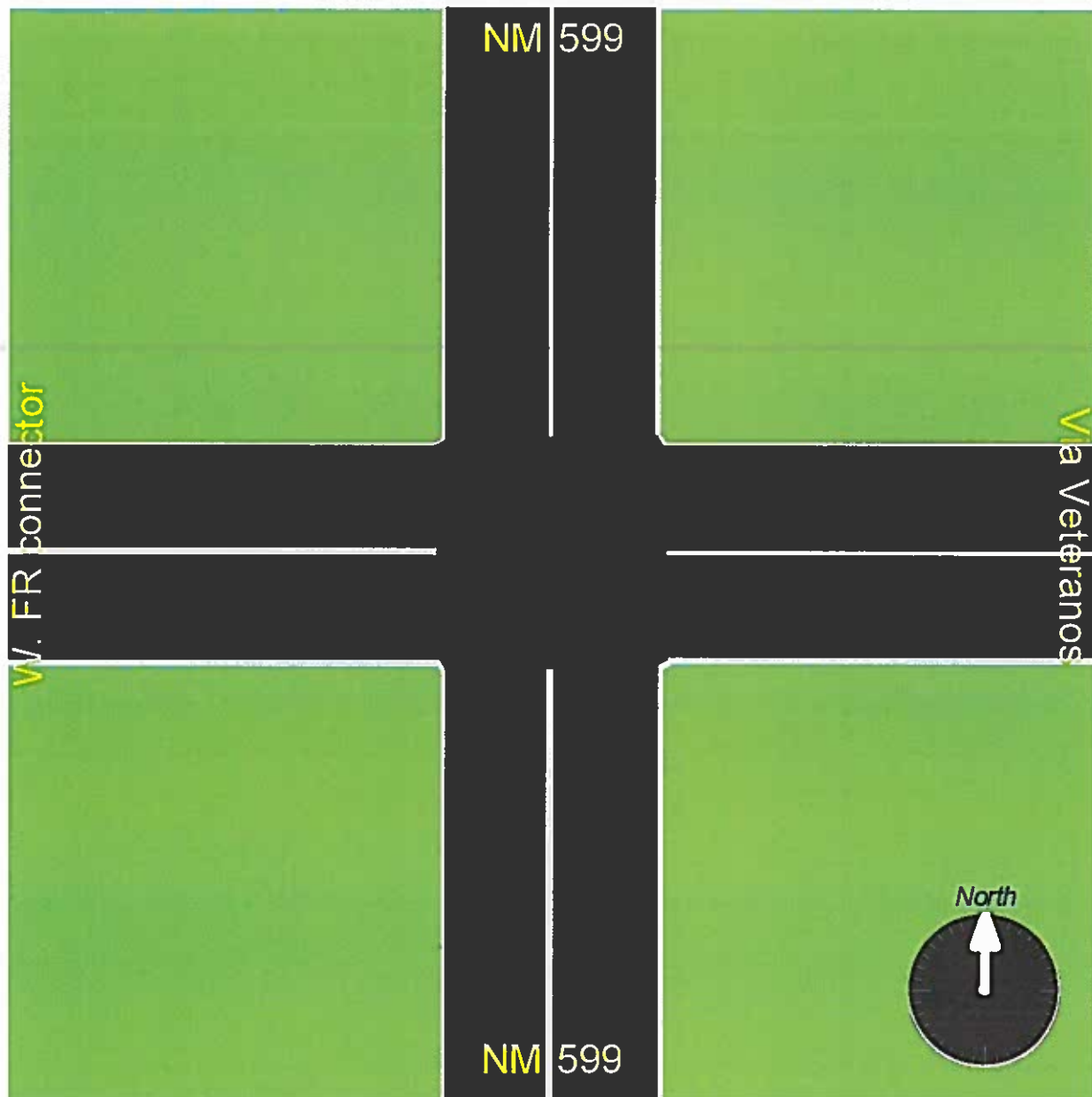
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Site Code : 00010815
Start Date : 1/8/2015
Page No : 7



NMDCS D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector
Site Code : 00010815
Start Date : 1/8/2015
Page No : 8



*NMDOT D-5
7315 Cerrillos RD.
Santa Fe, NM 87502*

File Name : nm 599 & via veteranos & w. fr connector # 2

Site Code : 00011515

Start Date : 1/15/2015

Page No : 1

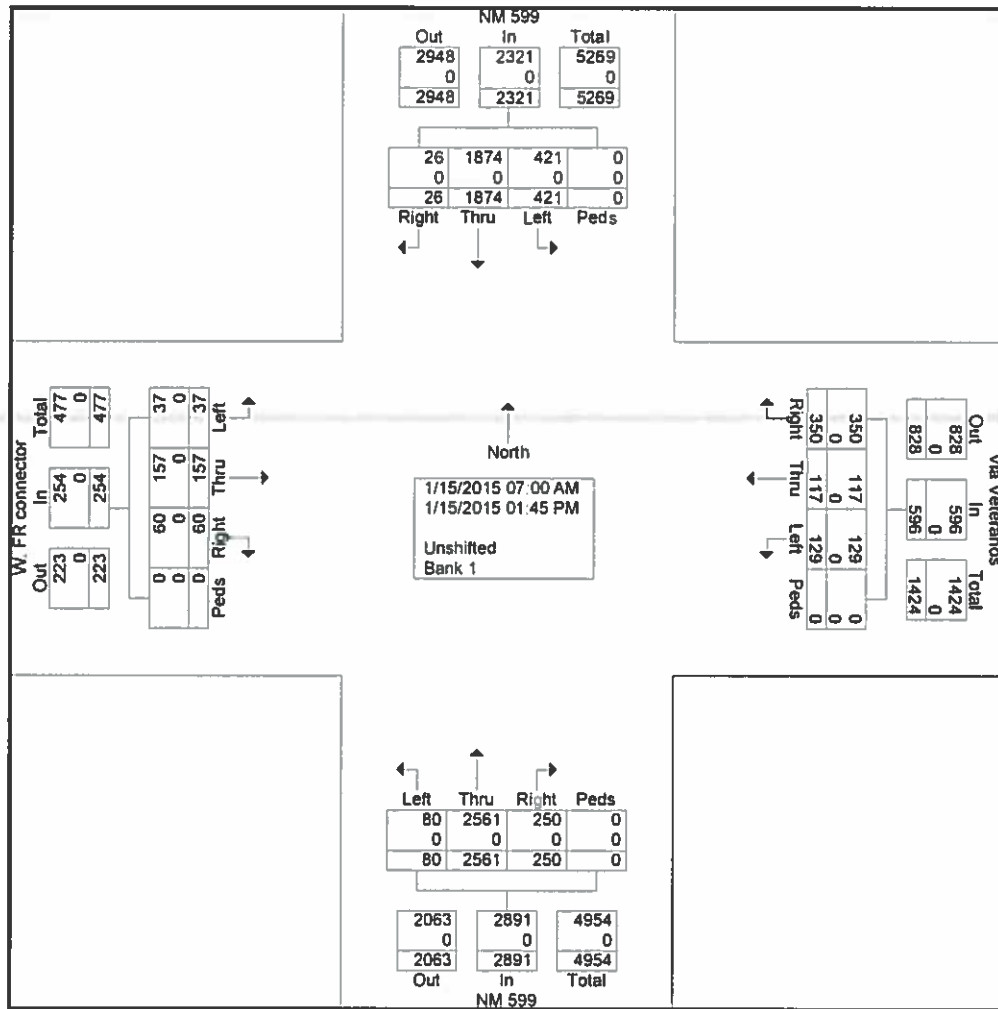
Groups Printed- Unshifted - Bank 1

	NM 599 From North					Via Veteranos From East					NM 599 From South					W. FR connector From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int. Total
07:00 AM	0	75	16	0	91	7	2	4	0	13	7	126	0	0	133	2	2	2	0	6	243
07:15 AM	0	80	14	0	94	12	0	7	0	19	12	162	2	0	176	0	6	2	0	8	297
07:30 AM	0	106	19	0	125	18	1	5	0	24	26	247	1	0	274	3	5	6	0	14	437
07:45 AM	1	140	36	0	177	12	4	14	0	30	51	271	10	0	332	7	6	0	0	13	552
Total	1	401	85	0	487	49	7	30	0	86	96	806	13	0	915	12	19	10	0	41	1529
08:00 AM	2	108	31	0	141	25	4	8	0	37	23	212	4	0	239	2	5	2	0	9	426
08:15 AM	1	90	21	0	112	25	4	8	0	37	15	178	1	0	194	1	11	1	0	13	356
08:30 AM	1	84	12	0	97	12	6	4	0	22	19	110	5	0	134	4	7	0	0	11	264
08:45 AM	0	77	21	0	98	14	10	2	0	26	9	128	10	0	147	1	4	2	0	7	278
Total	4	359	85	0	448	76	24	22	0	122	66	628	20	0	714	8	27	5	0	40	1324
09:00 AM	2	54	12	0	68	17	2	9	0	28	9	83	2	0	94	2	9	1	0	12	202
09:15 AM	1	58	14	0	73	17	5	6	0	28	5	78	9	0	92	2	8	1	0	11	204
09:30 AM	0	63	15	0	78	6	5	1	0	12	3	89	2	0	94	1	6	2	0	9	193
09:45 AM	1	61	10	0	72	10	6	3	0	19	4	73	2	0	79	5	8	1	0	14	184
Total	4	236	51	0	291	50	18	19	0	87	21	323	15	0	359	10	31	5	0	46	783
*** BREAK ***																					
11:00 AM	1	100	18	0	119	20	2	5	0	27	5	106	3	0	114	1	7	2	0	10	270
11:15 AM	1	84	14	0	99	7	6	7	0	20	7	84	2	0	93	3	9	1	0	13	225
11:30 AM	1	1	20	0	22	14	5	5	0	24	0	0	2	0	2	5	4	0	0	9	57
11:45 AM	3	75	17	0	95	13	2	5	0	20	5	67	1	0	73	5	5	2	0	12	200
Total	6	260	69	0	335	54	15	22	0	91	17	257	8	0	282	14	25	5	0	44	752
12:00 PM	1	86	14	0	101	15	8	9	0	32	4	76	2	0	82	3	9	2	0	14	229
12:15 PM	1	97	14	0	112	9	5	2	0	16	5	88	3	0	96	3	4	1	0	8	232
12:30 PM	1	77	22	0	100	13	6	3	0	22	6	82	6	0	94	2	10	1	0	13	229
12:45 PM	3	85	15	0	103	21	12	4	0	37	7	95	1	0	103	2	11	2	0	15	258
Total	6	345	65	0	416	58	31	18	0	107	22	341	12	0	375	10	34	6	0	50	948
01:00 PM	1	69	15	0	85	20	6	2	0	28	8	51	3	0	62	3	6	1	0	10	185
01:15 PM	1	69	16	0	86	9	4	4	0	17	4	58	3	0	65	0	8	2	0	10	178
01:30 PM	1	68	20	0	89	14	6	9	0	29	8	52	3	0	63	2	2	1	0	5	186
01:45 PM	2	67	15	0	84	20	6	3	0	29	8	45	3	0	56	1	5	2	0	8	177
Total	5	273	66	0	344	63	22	18	0	103	28	206	12	0	246	6	21	6	0	33	726
Grand Total	26	1874	421	0	2321	350	117	129	0	596	250	2561	80	0	2891	60	157	37	0	254	6062
Apprch %	1.1	80.7	18.1	0		58.7	19.6	21.6	0		8.6	88.6	2.8	0		23.6	61.8	14.6	0		
Total %	0.4	30.9	6.9	0	38.3	5.8	1.9	2.1	0	9.8	4.1	42.2	1.3	0	47.7	1	2.6	0.6	0	4.2	
Unshifted	26	1874	421	0	2321	350	117	129	0	596	250	2561	80	0	2891	60	157	37	0	254	6062
% Unshifted	100	100	100	0	100	100	100	100	0	100	100	100	100	0	100	100	100	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NMDO5 D-5 *7315 Cerrillos Rd.* *Santa Fe, NM 87502*

NM 599 & Via Veteranos & W. FR connector
 Conducted by : Kyle B.
 Weather: Clear

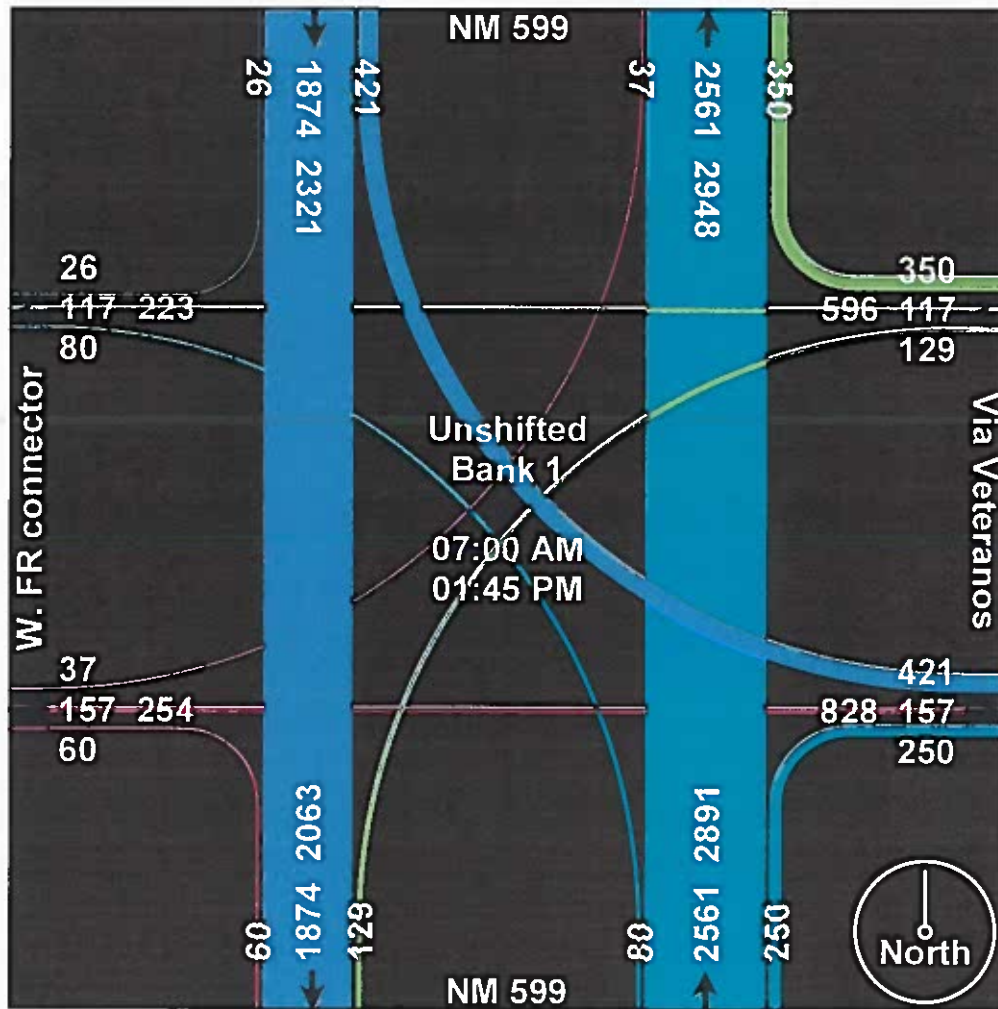
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 Site Code : 00011515
 Start Date : 1/15/2015
 Page No : 2



NMDO5 D-5
7315 Cerrillos RD.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector # 2
Site Code : 00011515
Start Date : 1/15/2015
Page No : 3



*NMDOT D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502*

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector # 2
Site Code : 00011515
Start Date : 1/15/2015
Page No : 4

[illegible]

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

[illegible]

*NMDOT D-5
7315 Cerrillos RD.
Santa Fe, NM 87502*

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector # 2
Site Code : 00011515
Start Date : 1/15/2015
Page No : 5

[illegible]

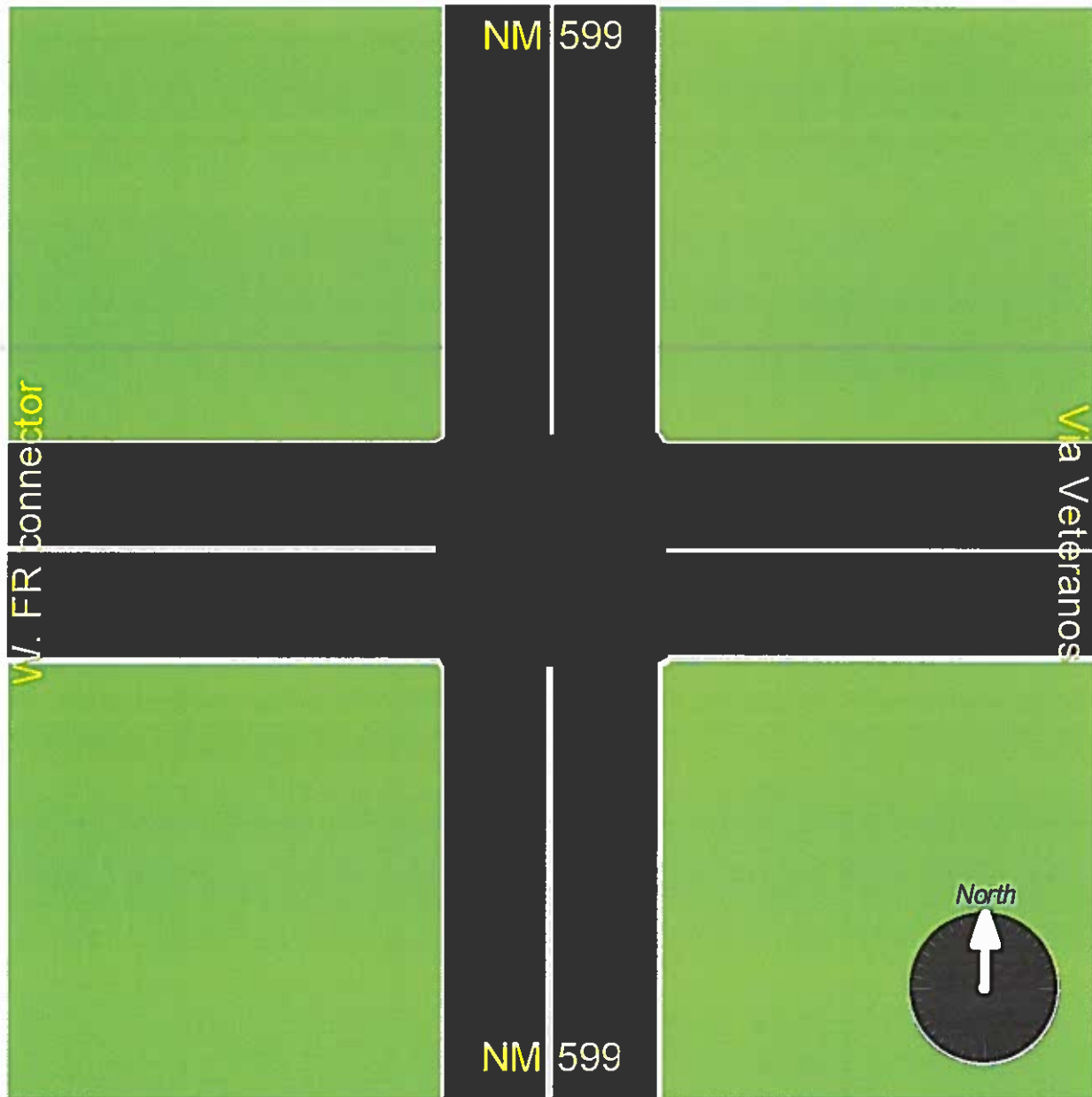
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

[illegible]

NM005 D-5
7315 Cerrillos Rd.
Santa Fe, NM 87502

NM 599 & Via Veteranos & W. FR connector
Conducted by : Kyle B.
Weather: Clear

File Name : nm 599 & via veteranos & w. fr connector # 2
Site Code : 00011515
Start Date : 1/15/2015
Page No : 6



Appendix B

Highway Capacity Software

Warrant Results

Warrants Summary													
Information													
Analyst	Javier Martinez			Intersection		NM 599 / Via Veteranos							
Agency/Co	NMDOT			Jurisdiction		NMDOT							
Date Performed	1/20/2015			Units		U.S. Customary							
Project ID	2015 Signal Warrant Analysis			Time Period Analyzed		Peak Hours							
East/West Street	Via Veteranos / WFR			North/South Street		NM 599							
File Name	NM 599 Right turns out			Major Street		North-South							
Project Description 2015 Signal Warrant Analysis													
General				Roadway Network									
Major Street Speed (mph)	55	<input type="checkbox"/>	Population < 10,000			Two Major Routes				<input type="checkbox"/>			
Nearest Signal (ft)	9999	<input type="checkbox"/>	Coordinated Signal System			Weekend Count				<input type="checkbox"/>			
Crashes (per year)	1	<input checked="" type="checkbox"/>	Adequate Trials of Alternatives			5-yr Growth Factor				0			
Geometry and Traffic	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of lanes, N	0	1	0	0	1	0	1	2	1	1	2	1	
Lane usage		LT			LT		L	T	R	L	T	R	
Vehicle Volume Averages (vph)	6	19	0	17	16	0	12	309	29	56	267	6	
Peds (ped/h) / Gaps (gaps/h)	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	
Delay (s/veh) / (veh-hr)	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	
Warrant 1: Eight-Hour Vehicular Volume													<input type="checkbox"/>
1 A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--													<input type="checkbox"/>
1 B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--													<input type="checkbox"/>
1 80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)													<input type="checkbox"/>
Warrant 2: Four-Hour Vehicular Volume													<input type="checkbox"/>
2 A. Four-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)													<input type="checkbox"/>
Warrant 3: Peak Hour													<input type="checkbox"/>
3 A. Peak-Hour Conditions (Minor delay --and-- minor volume --and-- total volume) --or--													<input type="checkbox"/>
3 B. Peak- Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)													<input type="checkbox"/>
Warrant 4: Pedestrian Volume													<input type="checkbox"/>
4 A. Four Hour Volumes --or--													<input type="checkbox"/>
4 B. One-Hour Volumes													<input type="checkbox"/>
Warrant 5: School Crossing													<input type="checkbox"/>
5. Student Volumes --and--													<input type="checkbox"/>
5. Gaps Same Period													<input type="checkbox"/>
Warrant 6: Coordinated Signal System													<input type="checkbox"/>
6. Degree of Platooning (Predominant direction or both directions)													<input type="checkbox"/>
Warrant 7: Crash Experience													<input type="checkbox"/>
7 A. Adequate trials of alternatives, observance and enforcement failed --and--													<input checked="" type="checkbox"/>
7 B. Reported crashes susceptible to correction by signal (12-month period) --and--													<input type="checkbox"/>

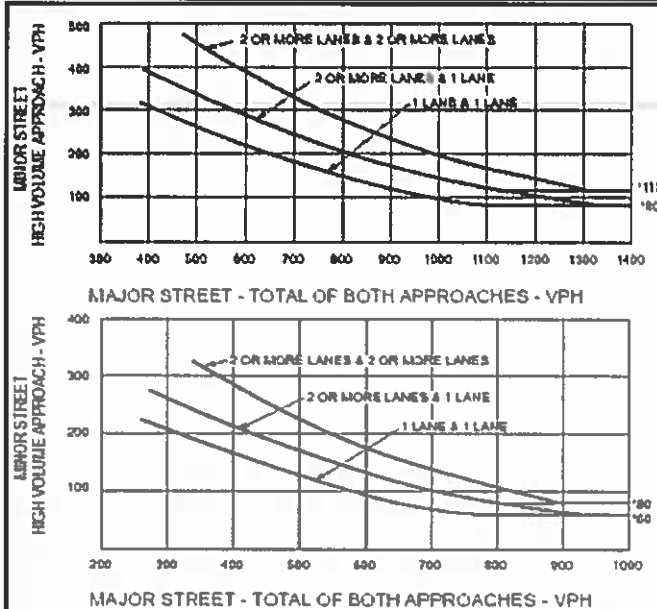
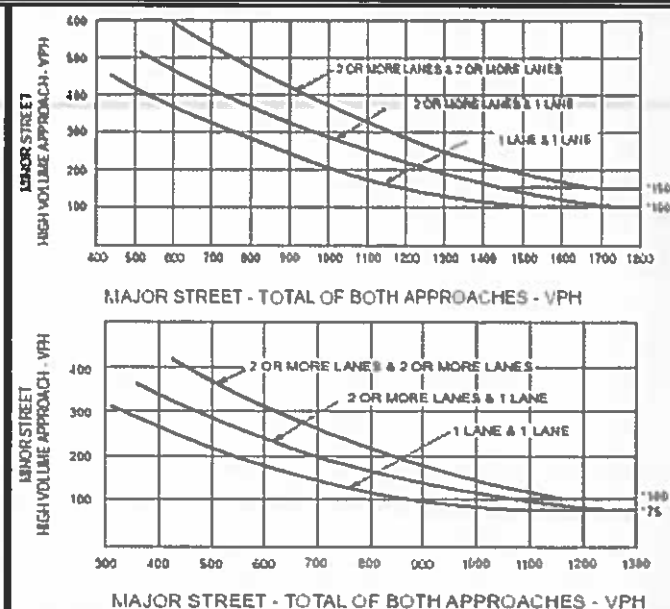
7 C. 80% Volumes for Warrants 1A, 1B --or-- 4 are satisfied	<input type="checkbox"/>
Warrant 8: Roadway Network	<input type="checkbox"/>
8 A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2 or 3) --or--	<input type="checkbox"/>
8 B. Weekend Volume (Five hours total)	<input type="checkbox"/>
Warrant 9: Grade Crossing	<input type="checkbox"/>
9 A. Grade Crossing within 140 ft --and--	<input type="checkbox"/>
9 B. Peak-Hour Vehicular Volumes	<input type="checkbox"/>

Warrants Volume			
Information			
Analyst	Javier Martinez	Intersection	NM 599 / Via Veteranos
Agency/Co	NMDOT	Jurisdiction	NMDOT
Date Performed	1/20/2015	Units	U.S. Customary
Project ID	2015 Signal Warrant Analysis	Time Period Analyzed	Peak Hours
East/West Street	Via Veteranos / WFR Connector	North/South Street	NM 599
File Name	NM 599 Right turns out	Major Street	North-South
Project Description 2015 Signal Warrant Analysis			

Warrant 1

Condition A - Minimum Vehicular Volume						
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)	
Major Street	Minor Street	100%*	80%*	70%	100%*	80%* 70%
1	1	500	400	350	150	120 105
2 or more	1	600	480	420	150	120 105
2 or more	2 or more	600	480	420	200	160 140
1	2 or more	500	400	350	200	160 140

Condition B - Interruption of Continuous Traffic						
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)	
Major Street	Minor Street	100%*	80%*	70%	100%*	80%* 70%
1	1	750	600	525	75	60 53
2 or more	1	900	720	630	75	60 53
2 or more	2 or more	900	720	630	100	80 70
1	2 or more	750	600	525	100	80 70

Warrant 2**Warrant 3****Volume Summary**

Major Street Lanes 2+				Minor Street Lanes 1		Speed		55	Population		10000+
Hours	Major Volume	Minor Volume	Total Volume	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	
07-08	1402	37	1468	No	No	No	No	No	No	No	
08-09	1162	46	1240	No	No	No	Yes	No	No	No	
09-10	650	37	723	No	No	No	No	No	No	No	
10-11	0	0	0	No	No	No	No	No	No	No	
11-12	617	37	684	No	No	No	No	No	No	No	
12-13	791	49	880	No	No	No	Yes	No	No	No	
13-14	590	40	657	No	No	No	No	No	No	No	
14-15	0	0	0	No	No	No	No	No	No	No	
15-16	852	57	932	No	No	Yes	Yes	No	No	No	
16-17	1162	52	1261	No	No	Yes	Yes	No	No	No	
17-18	943	60	1047	No	No	Yes	Yes	Yes	No	No	
18-19	0	0	0	No	No	No	No	No	No	No	
Totals	8169	415	8892	0	0	3	5	1	0	0	

Appendix C

Crash History



3 Year Crash Data

NM 599 & Via Veteranos

YEAR	
2011	3
2012	2
2013	2
Total	7

Notes:

Source: 2002-2012 NMDOT Crash File, as of 07/17/2014. 2013 Crash File, as of 11/12/14 is Preliminary.

NMDOT/ TRU

CRASH REPORT NUMBER	CRASH DATE	TIME OF CRASH	COUNTY	CRASH LOCATION (CITY OR RURAL)
23271516	6/5/2011	1625	Santa Fe	Rural (Non-Urban)
23158743	6/17/2011	1130	Santa Fe	Rural (Non-Urban)
23158460	7/26/2011	658	Santa Fe	Rural (Non-Urban)

PRIMARY STREET	SECONDARY STREET	ROUTE NAME	MILE POST
NM 599	CR 70 CONNECTOR		
NM 599	CAMINO LA TIERRA	NM 599	9.799995422
NM 599		NM 599	9.099998474

REPORTING AGENCY	NUMBER OF PEOPLE IN CRASH	NUMBER OF PEOPLE KILLED
County Sheriff	7	0
County Sheriff	2	0
County Sheriff	2	0

NUMBER OF PEOPLE WITH INCAPACITATING INJURIES	NUMBER OF PEOPLE WITH VISIBLE INJURIES
0	2
0	1
0	0

NUMBER OF PEOPLE WITH POSSIBLE INJURIES	NUMBER OF PEOPLE NOT INJURED
0	5
0	1
2	0

NUMBER OF VEHICLES, BICYCLISTS, ETC. INVOLVED	WEATHER	LIGHTING	CRASH SEVERITY
	2 Clear	Daylight	Injury Crash
	2 Clear	Daylight	Injury Crash
	1 Clear	Daylight	Injury Crash

CRASH CLASSIFICATION	HIGHEST CONTRIBUTING FACTOR TO CRASH	CRASH ANALYSIS
Other Vehicle Other Vehicle Overturn	Improper Turn None Excessive Speed	Sd-Rear End Sd-Sideswipe Overturn-Right

Crash Report Number	Crash date	Time of Crash	County	Urban/Rural
23350543	3/28/2012	15:50	SANTA FE	U
30059861	12/5/2012	15:02	SANTA FE	U

City	Primary Street	Second Street	Location/Landmark
------	----------------	---------------	-------------------

SANTA FE	NM 599	MILE POST 9	
	NM 599	NONE	

Route	Milepost	Reporting Agency	Fatal/Injury
NM 599	9	SANTA FE COUNTY SHERIFFS OFFICE	
NM 599S	9	NEW MEXICO STATE POLICE (NMSP)	INJURY

Number of People Killed	Number of People Injured	NUMBER OF PEOPLE WITH INCAPACITATING INJURIES
0	0	0
0	4	0

NUMBER OF PEOPLE WITH VISIBLE INJURIES	NUMBER OF PEOPLE WITH POSSIBLE INJURIES	NUMBER OF PEOPLE NOT INJURED
0	0	1
0	4	0

Total Number of People in Crash	Analysis Code	Analysis	Crash Classification
1	16	1016	FIXED OBJECT
4	8	408	OTHER VEHICLE

Hit Run	Lighting	Number of Vehicles	Road Character	Road Grade	Weather	pType
N	DAYLIGHT	1	STRAIGHT	LEVEL	CLEAR	GUARDRAIL
N	DAYLIGHT	2	STRAIGHT	LEVEL	CLEAR	

Crash Report Number	Crash Date	Time of Crash	County	Urban/ Rurl	City
233719411	12/3/2013	11:37	SANTA FE	R	Left Bl

Primary Street	Secondary Street	Location/Landmark	Route	Mile Post
NM 599 NORTH BOUND		NM 599 @ MP 8	NM 599	8

Reporting Agency	Fatal/Injury	Number Of People Killed
SANTA FE COUNTY SHERIFFS OFFICE	INJURY	0

Number of People Injured	NUMBER OF PEOPLE WITH INCAPACITATING INJURIES
1	0

**NUMBER OF PEOPLE WITH
VISIBLE INJURIES**

**NUMBER OF PEOPLE WITH
POSSIBLE INJURIES**

0

1

NUMBER OF PEOPLE NOT INJURED	Total Number people in crash	Analysis
2	3	SD-BOTH STRAIGHT

Analysis Name	CrashClassification	Hit and Run
08 BOTH GOING STRAIGHT/FROM SAME DIR	OTHER VEHICLE	Y