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I: INTRODUCTION

US 84/285, also known as St. Francis Drive, is the primary north/south arterial street through the City of Santa Fe and is a critical roadway for the transportation network that serves the community. The St. Francis Drive corridor provides access to commercial, residential, historic and tourist centers in the City of Santa Fe. The proposed St. Francis Drive Corridor Study area between Rabbit Road and NM 599 is approximately six miles in length, containing 27 intersections and four interchanges, as well as the BNSF Railroad crossing at the intersection of St. Francis Drive at Cerrillos Road.

With the construction of the NM 599 bypass, there was some relief of the increasing congestion on St. Francis Drive; however, as the City and County continue to grow, this critical corridor has continued to experience increasing traffic volumes and again has begun to experience operational difficulties.

This study will require significant coordination and communication with the study teams overseeing the NM 599 and I-25 corridor studies, as well as with the adjacent development studies on the "Rail Trail", NW Quadrant, NMDOT's general office grounds and work/residential private development, and the Rail Runner depot.

I.A PROJECT PURPOSE

The purpose of this Existing/Horizon Year Conditions Analysis Report is to identify existing conditions on the St. Francis Drive corridor; report the findings of traffic operational analyses for existing and horizon year volumes, and perform a crash analysis of the corridor. The current conditions analysis will be used to identify possible improvements to be considered as part of the future analysis. This study is a sub report for the Phase I-A study report as required by the New Mexico Department of Transportation (NMDOT) Location Study Procedures. The Location Study Procedures is the process used by the NMDOT to comply with Federal Highway Administration (FHWA) requirements for federal funding.

There will be several portions to this analysis of the St. Francis Drive corridor:

- Existing 2006 conditions with three thru lanes for each direction of St. Francis Drive;
- Existing 2006 conditions with two thru lanes for each direction of St. Francis Drive south of West San Mateo Road; and three thru lanes for the remainder of the corridor between West San Mateo Road and NM 599;
- 2030 horizon-year "No-Build" condition

-
- 2030 horizon year with an additional (fourth) lane for each direction of St. Francis Drive through the study area corridor
 - 2030 horizon year with optimized traffic signal timings based on the City of Santa Fe's signal timing plans
 - Growth rate reduction for 2030 horizon year analysis (PM peak hour only) for existing conditions on St. Francis Drive (3 through lanes), and for a reduction to 2 lanes, to determine growth rate reductions needed to achieve acceptable LOS

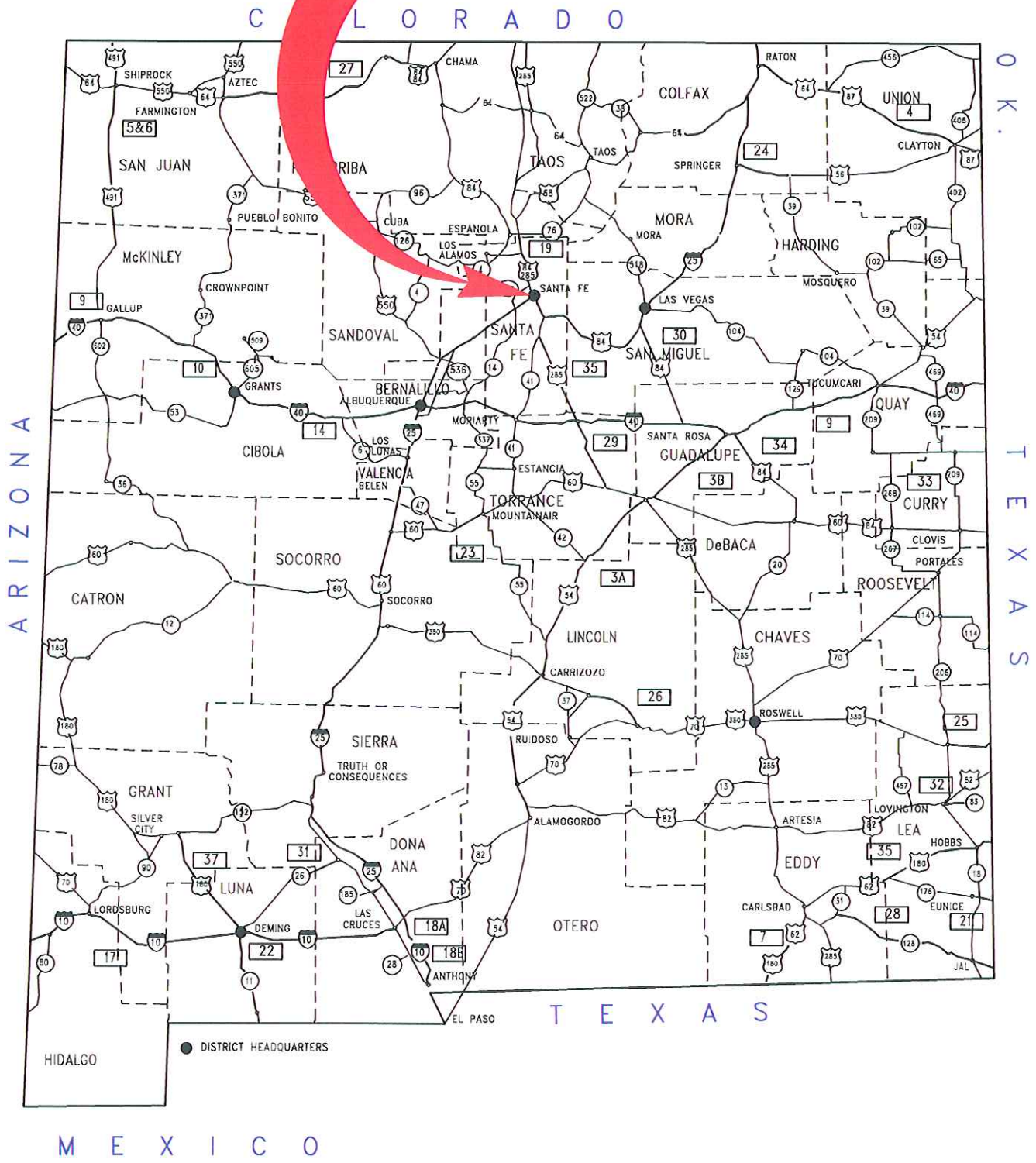
II: PROJECT DESCRIPTION

The segment of concern that this study discusses is from the intersection of Rabbit Road at St. Francis Drive to the NM 599/St. Francis Drive interchange. Refer to Figures I.A.1 and I.A.2 for Location and General Vicinity Maps of the project.

This existing/horizon year analysis study will provide the following for each of the scenarios listed in the Project Purpose:

- detailed field inventory of the corridor study area;
- analysis of existing conditions of signalized intersections along the corridor;
- analysis of existing conditions of roadway segments along the corridor;
- review historic crash data along the corridor to include intersection related collisions as well as midblock collisions

STUDY LOCATION



Date: May 27, 2009 - 8:44am
 Layout: FIG I.A1 LOCATION MAP
 Drawing Name: P:\55406 St. Francis Drive\5.0 PBEV\6.1 CAD\FIG 1-1 LOCATION MAP.dwg



St. Francis Drive Corridor Study

NM - 084 - 2(12) 161

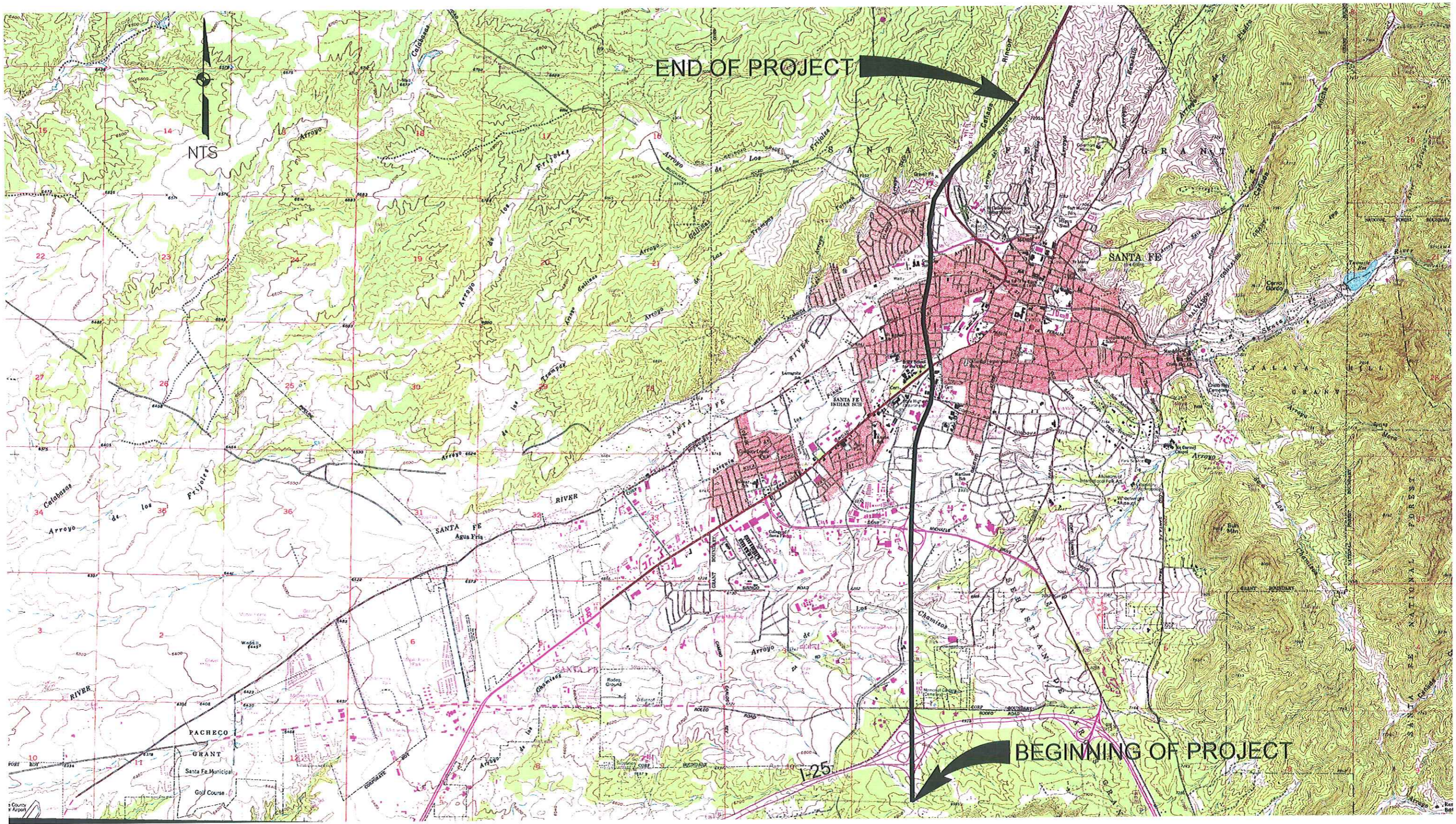
CN D5SF3

TRAFFIC ANALYSIS REPORT LOCATION MAP

Date
5/2009

Figure
I.A.1

Scale: May 27, 2009 = 6:47 PM. Source: LARSEN GIS AND VICINITY MAP
Drawing Name: 6-105460-St. Francis Drive Vicinity Map.dwg



St. Francis Drive Corridor Study
NM-084-2(12)161 CN D5SF3
EXISTING / HORIZON YEAR ANALYSIS
VICINITY MAP

Date 5/2009
Figure I.A.2

II.A EXISTING FUNCTIONAL CLASSIFICATIONS

The functional classification of roadways forms the framework of the transportation system and defines its function and use related to access and mobility. Design and operational parameters, such as roadway capacity and posted speed limits are designated relative to the roadway functional classification. A hierarchy of roadway functional classifications, provided by MRCOG, is described below:

Urban Principal Arterial Streets. This type of roadway constitutes the highest ranking of roadway within most jurisdictions, serving to connect various areas of a municipality. Principal arterials usually connect arterial and collector streets to larger regional facilities such as interstates, freeways and state highways.

Urban Minor Arterial Streets. Mobility is the main purpose of a minor arterial street. While they serve a secondary function of access to properties along the corridors, their primary function is servicing the most traffic; therefore, arterials typically have the most lanes and higher speeds in order to provide greater capacity.

Urban Collector Streets. These facilities serve as intermediate links between local and arterial streets, serving both access and mobility needs. Their primary function is to collect local traffic from adjacent neighborhoods and transport traffic to arterials where the lengthier trips are made. Some collectors are discontinuous; however, they provide good connectivity to the arterial streets.

Local Streets. The purpose of local streets is to provide access to adjacent land uses. Local streets comprise of highest number of lane-miles in a roadway network but carry the lowest volume of traffic. They are typically designed to discourage through traffic while providing access from adjacent properties to the roadway network via collector streets.

II.B INVENTORY OF EXISTING CONDITIONS

There are 27 intersections along the St. Francis Drive corridor study area. Twelve of the intersections have traffic signals, the remaining intersections are controlled by stop signs on the side streets. Also located within the corridor are interchanges with I-25, St. Michaels Drive, and Guadalupe Street, and the study area terminus at NM 599.

Beginning at the southerly terminus of St. Francis Drive, the intersections along the St. Francis Drive corridor are listed below (signalized intersections are in bold):

- St. Francis Drive at Rabbit Road
- *Interchange with Interstate 25*
- **St. Francis Drive at Sawmill Road**
- **St. Francis Drive at West Zia Road**
- **St. Francis Drive at Siringo Road**
- *Interchange with St. Michaels Drive*
- **St. Francis Drive at West San Mateo Road**
- St. Francis Drive at Camino Del Monte Rey
- St. Francis Drive at Calle Saragosa
- St. Francis Drive at Calle Anaya South
- St. Francis Drive at Columbia Street
- **St. Francis Drive at Alta Vista Street**
- **St. Francis Drive at West Cordova Road**
- St. Francis Drive at Pen Road
- **St. Francis Drive at Cerrillos Road**
- St. Francis Drive at Mercer Street
- St. Francis Drive at Camino Sierra Vista
- St. Francis Drive at Ninita Street
- **St. Francis Drive at Hickox Street/Paseo de Peralta (South)**
- St. Francis Drive at West Manhattan Avenue
- **St. Francis Drive at Agua Fria Street**
- St. Francis Drive at Dunlap Street
- St. Francis Drive at Roybal Street
- **St. Francis Drive at West Alameda Street**
- St. Francis Drive at Las Mascaras Street
- **St. Francis Drive at Camino de Las Crucitas/Paseo de Peralta (North)**
- St. Francis Drive at Sabino Street
- **St. Francis Drive at Alamo Drive**
- *Interchange with Guadalupe Street*
- St. Francis Drive at Viento Drive
- *Interchange with NM 599*

II.B.1 INTERSECTION AND INTERCHANGE DEFINITIONS

The American Association of State Highway and Transportation Officials (AASHTO) defines an intersection in *A Policy on Geometric Design of Highways and Streets* ("The Green Book") as 'The general area where two or more highways join or cross, including the roadway and roadside facilities for traffic movements within the area. The three general types of highway crossings are at-grade interchanges, grade separations without ramps and interchanges.'

'An Interchange is a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels.'

II.B.2 SEGMENT DESCRIPTIONS

The study area for the St. Francis Drive corridor is approximately six miles in length. Throughout the corridor, roadway and land use conditions change considerably. Although the existing and 2030 year analyses are for the entire length of the St. Francis Drive corridor, it is beneficial to break down the study area into five separate segments in order to provide an adequate description of the corridor, since each segment has unique roadway and surrounding land use characteristics.

II.B.2.1 ST. FRANCIS DRIVE CORRIDOR SEGMENT (RABBIT ROAD TO WEST SAN MATEO ROAD)

St. Francis Drive in this segment is an urban principal arterial roadway. There are two through lanes for both directions of St. Francis Drive between Rabbit Road and the I-25 interchange, then three through lanes for each direction between the I-25 interchange and intersection with West San Mateo Road. There are unimproved medians separating the northbound and southbound directions of traffic. Each intersection within this segment has exclusive left-turn and right-turn lanes from St. Francis Drive. Aside from the three signalized intersections within this segment access to St. Francis Drive is limited with no driveway access; however, this segment does contain the I-25 and St. Michaels Drive interchanges. There are no sidewalks or bike lanes and parking is prohibited. The posted speed limit within this segment of St. Francis Drive is 45 mph.

The signalized intersections of Sawmill Road at St. Francis Drive, West Zia Road at St. Francis Drive and Siringo Road at St. Francis Drive are experiencing intersection delays. These signals are currently timed with 110 second cycle lengths throughout most of each day without coordination. Additionally, the southbound on-ramp at St. Michaels Drive has been showing signs of congestion during peak periods; there is merging traffic from the southbound on-ramp from St. Michaels Drive that conflicts with south-bound through traffic on St. Francis Drive, particularly in the peak periods.

As part of the future conditions analysis for this segment, an optimized signal timing system will be evaluated, and possible geometric modifications will be considered for the signalized intersections to allow for improved traffic flow through this segment.

II.B.2.2 SEGMENT 2 - ST. FRANCIS DRIVE CORRIDOR SEGMENT (WEST SAN MATEO ROAD TO CERILLOS ROAD)

This segment of the St. Francis Drive corridor is more densely populated with residential and commercial areas. There are 48 driveway access points entering St. Francis Drive from adjacent business and residential uses between West San Mateo Road and Cerrillos Road. Additionally, there are several unsignalized intersections entering St. Francis Drive in this segment, increasing congestion in the corridor.

The minimum intersection spacing of major intersections with St. Francis Drive is 2,000 feet. Parking is prohibited and there are no bike lanes. Sidewalks are in place on both sides of St. Francis Drive; however, in some areas there is need of repairs or upgrades.

The posted speed limits in this segment of St. Francis Drive are 45 MPH from West San Mateo Road to approximately 300 feet south of the intersection with Alta Vista Street, and 35 MPH between Alta Vista Street and Cerrillos Road.

II.B.2.3 SEGMENT 3 - ST. FRANCIS DRIVE CORRIDOR SEGMENT (CERILLOS ROAD TO PASEO DE PERALTA/CAMINO DE LAS CRUCITAS)

The segment of St. Francis Drive between Cerrillos Road and Paseo de Peralta/Camino de Las Crucitas is very similar to the previous segment, with densely spaced commercial and residential infrastructure. Raised medians divide each direction of St. Francis Drive throughout this segment. A significant difference between this segment and much of the remaining St. Francis Drive corridor is that the major signalized intersections are spaced less than 2,000 feet apart. This intersection spacing sometimes results in severe congestion within the segment due to the fact that this segment carries the highest traffic volumes (reaching 49,410 ADT) within the St. Francis Drive corridor.

In addition to the shorter intersection spacing, there are 43 driveway entrances onto St. Francis Drive. Existing sidewalks are on both sides of St. Francis Drive; however, some areas need repairs or upgrades. The posted speed limit for both directions of St. Francis Drive within this segment is 35 MPH.

II.B.2.4 SEGMENT 4 - ST. FRANCIS DRIVE CORRIDOR SEGMENT (PASEO DE PERALTA/CAMINO DE LAS CRUCITAS TO GUADALUPE STREET INTERCHANGE)

This segment of St. Francis Drive transitions from a six-lane, mixed land use arterial to a four-lane interceptor for the Guadalupe Street interchange. This segment of St. Francis Drive is a divided highway, with limited street access and no driveway access points. The posted speed limit on this segment of St. Francis Drive is 45 MPH. Existing sidewalks are on both sides of St. Francis Drive; however, some areas need repairs or upgrades. Parking is prohibited and there are no bike lanes. There are three access points to St. Francis Drive within this segment: Sabino Street, Alamo Drive and the Guadalupe Street interchange.

As part of the future analysis, the St. Francis Drive/Guadalupe St. interchange will require possible re-configuration for the anticipated “North West Quadrant” development access to this location. The Master Plan for North West Quadrant identifies two access points to St. Francis Drive – one at the NM 599 interchange and one at the Guadalupe St. interchange.

A previous traffic study commissioned by the City of Santa Fe will be reviewed to determine that the analysis of this corridor segment of St. Francis Drive will be consistent with that study.

II.B.2.5 SEGMENT 5 - ST. FRANCIS DRIVE CORRIDOR SEGMENT (GUADALUPE ST. INTERCHANGE TO NM 599 INTERCHANGE)

St. Francis Drive from the Guadalupe Street interchange to the NM 599 interchange is an access-controlled four-lane roadway, with one northbound auxiliary lane beginning at Guadalupe Street. The St. Francis Drive designation terminates within this segment, but continues north out of the city as US 84/285. The posted speed limit through this segment is 55 MPH. There is one access point between the two interchanges – Viento Drive – which is a local street connecting to a residential area west of St. Francis Drive.

II.B.3 INTERSECTION INVENTORY

The analysis of the signalized intersections includes pictures of each approach to the intersection as well as lane configuration exhibits illustrating the existing lane widths and turn lane storage lengths. Beginning at the southerly terminus of the corridor, the following are descriptions of each intersection along St. Francis Drive:

II.B.3.1 RABBIT ROAD

This intersection is the southerly terminus of St. Francis Drive. The two streets form a three-way intersection controlled by a stop sign for southbound St. Francis Drive, assigning the right-of-way to Rabbit Road. Field observations of traffic at this intersection indicate low to moderate volumes with little congestion, and that the existing southbound stop sign on provides adequate traffic control at this location.

II.B.3.2 I-25 INTERCHANGE

There are existing on/off ramps from I-25 onto northbound and southbound St. Francis Drive. Much of the St. Francis Drive traffic volumes within this area are the result of motorists coming to and from I-25. Further analysis of this interchange will be included in the future I-25 corridor study.

II.B.3.3 SAWMILL ROAD

Sawmill Road is a collector street that serves an adjacent industrial/commercial area to the west of St. Francis Drive and a residential area to the east. The Sawmill Road/St. Francis Drive intersection is controlled by an 8-phase traffic signal with daytime cycle lengths of 110 seconds. There are protected/permissive left-turn phases for the left turn movements from St. Francis Drive.

The intersection configuration is as follows:

NB St. Francis Drive: 1 LT lane; 3 thru lanes; 1 RT lane
SB St. Francis Drive: 1 LT lane; 3 thru lanes; 1 RT lane
EB Sawmill Road: 2 LT lanes; 1 shared thru/RT lane
WB Sawmill Road: 1 LT lane; 1 thru lane; 1 RT lane

Below are approach pictures of this location:



NB St. Francis Dr. at Sawmill Rd.



SB St. Francis Dr. at Sawmill Rd.



EB Sawmill Rd. at St. Francis Dr.



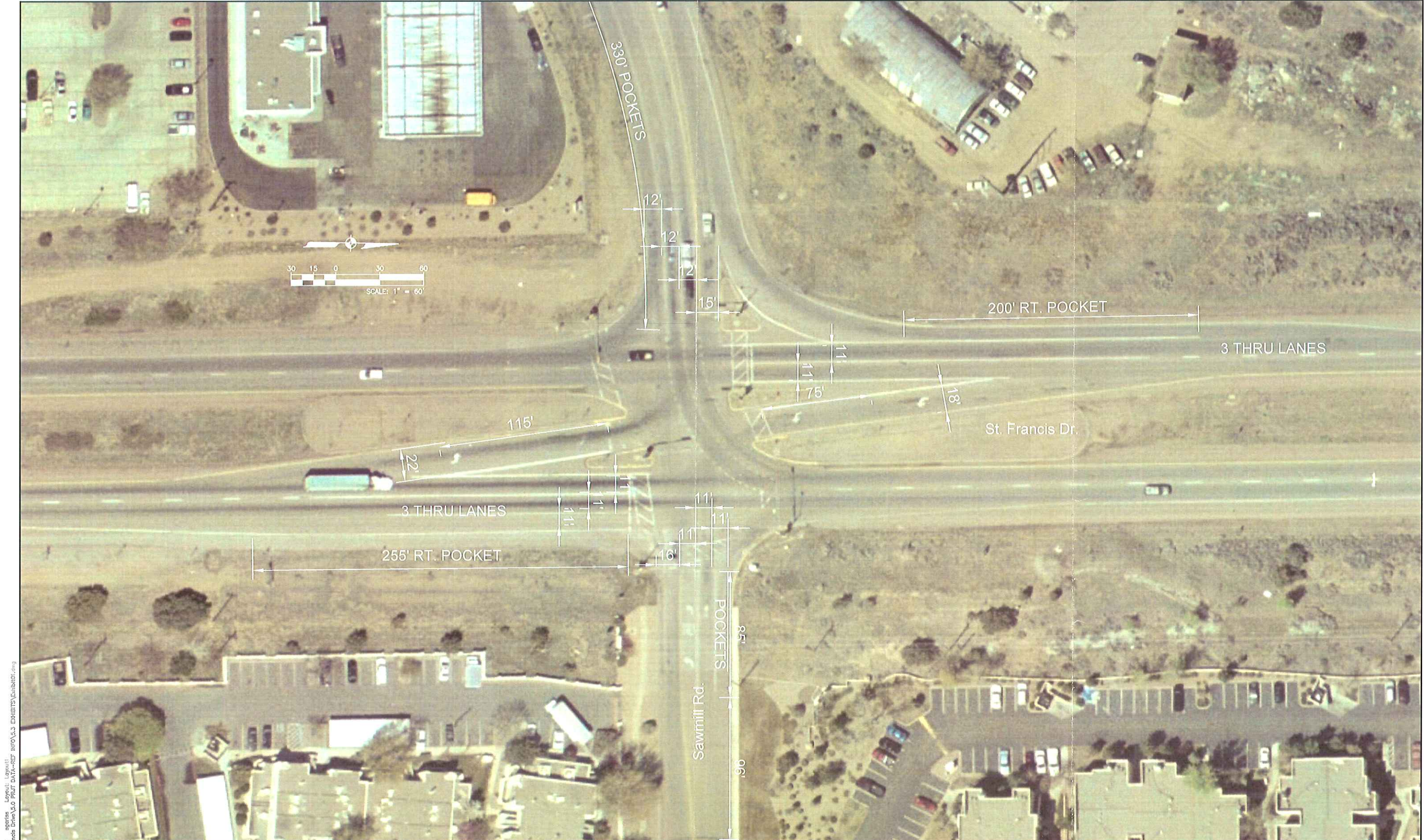
WB Sawmill Rd. at St. Francis Dr.

Please refer to Figure IIB.3.1 which shows the lane widths and turn pocket lengths at this location.

II.B.3.4 WEST ZIA ROAD

West Zia Road is a collector street that serves adjacent commercial and residential areas. The West Zia Road/St. Francis intersection is controlled by an 8-phase traffic signal with daytime cycle lengths of 110 seconds, with protected left-turn phases for the left turn movements from St. Francis Drive.

West Zia Road serves as an important connection between other arterial roadways in southern Santa Fe, carrying approximately 14,000 ADT. It has been reported by the City of Santa Fe staff that this intersection experiences severe congestion during peak periods. Field observation by HDR staff of this intersection confirms this assertion.



Date: May 27, 2009 - 7:57am
 Drawing Name: P:\5408 St. Francis Drive\3.0 PRJT DATA-REF INFO\3.3 Exhibits\Exhibit01.dwg

St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 SAWMILL AT ST. FRANCIS DR.

Date
 5/2009
 Figure
 II.BE.1

The intersection configuration is as follows:

NB St. Francis Drive: 2 LT lanes; 3 thru lanes; 1 RT lane

SB ST. Francis Drive: 2 LT lanes; 3 thru lanes; 1 RT lane

EB West Zia Road: 2 LT lanes; 1 thru lane; 1 RT lane

WB West Zia Road: 2 LT lanes; 2 thru lanes; 1 RT lane

Below are approach pictures of West Zia Road at St. Francis Drive:



NB St. Francis Dr. at W. Zia Rd.



SB St. Francis Dr. at W. Zia Rd.

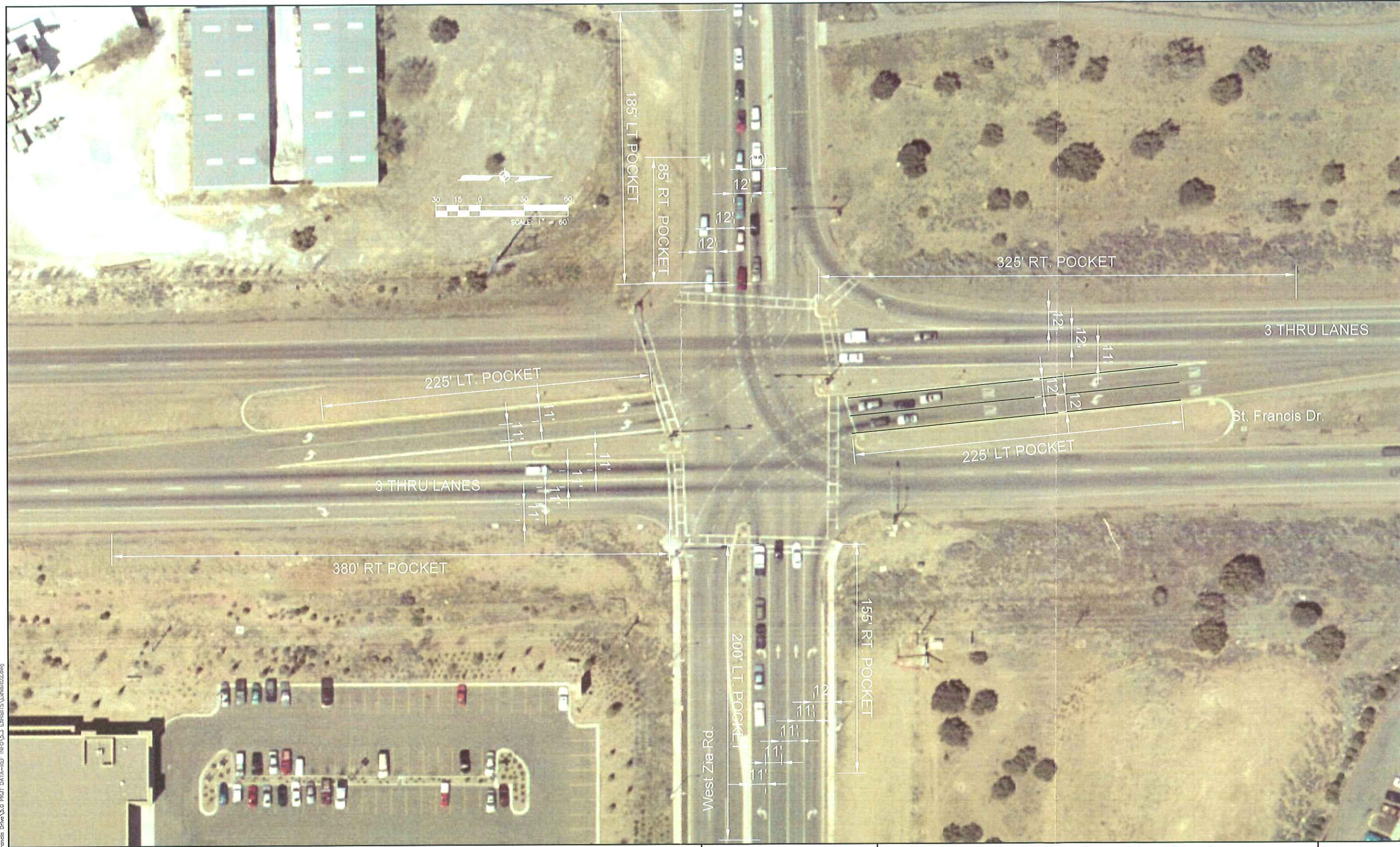


EB W. Zia Rd. at St. Francis Dr.



WB W. Zia Rd. at St. Francis Dr.

Please refer to Figure II.B.3.2 which shows the lane widths and turn lane lengths at this intersection.



Date: May 27, 2009 - 7:52am
 Drawing Name: P:\54508 St. Francis Drive\3.0 PRJUT DATA-REF INFO\5.3 EXHIBITS\Exhibit02.dwg

St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 WEST ZIA RD. AT ST. FRANCIS DR.

Date	5/2009
Figure	II.B3.2

II.B.3.5 SIRINGO ROAD

Siringo Road is a collector street that serves adjacent commercial and residential areas. The intersection of Siringo Road/St. Francis Drive is controlled by an 8-phase traffic signal with daytime cycle lengths of 110 seconds. There are protected/permissive left-turn phases for the left turn movements from St. Francis Drive. The intersection configuration is as follows:

- NB St. Francis Drive: 1 LT lane; 3 thru lanes; 1 RT lane
- SB St. Francis Drive: 1 LT lane; 3 thru lanes; 1 RT lane
- EB Siringo Road: 2 LT lanes; 1 thru lane; 1 RT lane
- WB Siringo Road: 1 LT lanes; 1 thru lane; 1 RT lane

Below are approach pictures of this location:



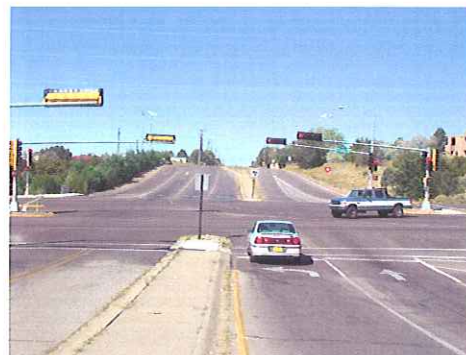
NB St. Francis Dr. at Siringo Rd.



SB St. Francis Dr. at Siringo Rd.



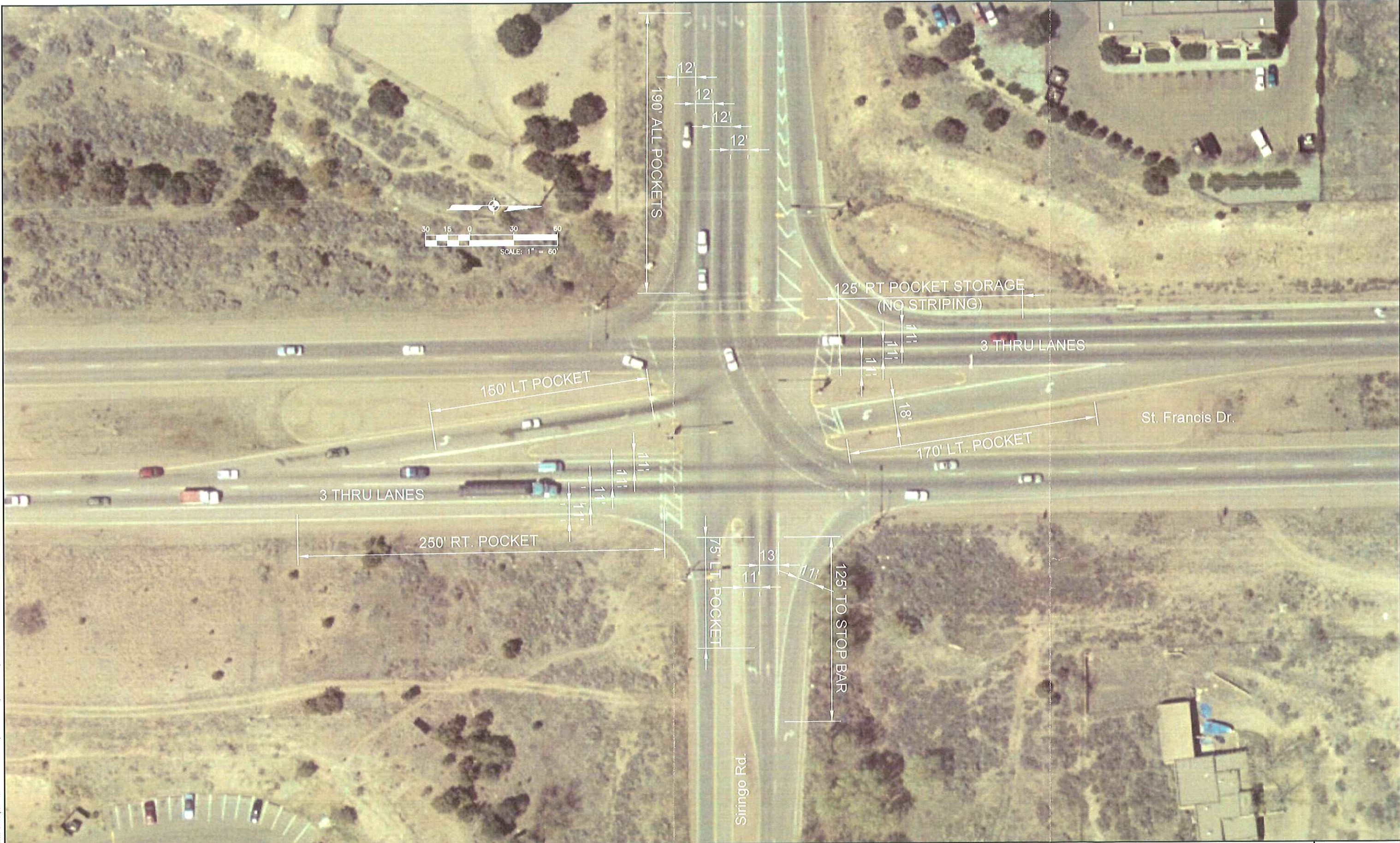
EB Siringo Rd. at St. Francis Dr.



WB Siringo Rd. at St. Francis Dr.

Please refer to Figure II.B.3.3 which shows the lane widths and turn pocket lengths at this intersection.

Date: May 27, 2009 - 7:53am Expires Layout: Layout1
 Drawing Name: P:\545400 St. Francis Drive\5.0 PRJT DATA-REP INFO\5.3 EXHIBITS\Exhibit03.dwg



St. Francis Drive Corridor Study

NM - 084 - 2(12) 161 CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 SIRINGO RD. AT ST. FRANCIS DR.

Date	5/2009
Figure	II.B3.3

II.B.3.6 ST. MICHAELS DRIVE INTERCHANGE

St. Michaels Drive is a major east-west arterial with two through lanes for each direction that serves the southern area of the City of Santa Fe. There is a traffic signal on St. Michaels Drive at the southbound on/off ramps from St. Francis Drive.

The northbound off-ramp from St. Michaels Drive to St. Francis Drive is controlled by stop signs, assigning intersection right-of-way to St. Michaels Drive.

The southbound on-ramp at St. Michaels Drive has been showing signs of congestion during peak periods. There is a short transition length on southbound St. Francis Drive for vehicles coming from the on-ramp from St. Michaels Drive, and there is merging traffic coming from the southbound on ramp from St. Michaels Drive that conflict with southbound through traffic on St. Francis Drive, particularly in the peak periods - as shown below:



Southbound St. Francis Drive at on-ramp from St. Michaels Drive

II.B.3.7 WEST SAN MATEO ROAD

West San Mateo Road is a collector street that serves an adjacent industrial/commercial area to the west and a residential area to the east. The West San Mateo Road/St. Francis Drive intersection is controlled by an 8-phase traffic signal with a daytime cycle length of 110 seconds. Left turn movements from all approaches are controlled by protected/permissive phases. The intersection configuration is as follows:

NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
 SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
 EB West San Mateo Road: 1 LT lane; 1 thru lane; 1 RT lane
 WB San Mateo Road Road: 1 LT lane; 1 shared thru/RT lane

Below are pictures of each approach to this intersection:



NB St. Francis at W. San Mateo Rd.



SB St. Francis at W. San Mateo Rd.



EB W. San Mateo Rd. at St. Francis



WB W. San Mateo Rd. at St. Francis

Please refer to Figure II.B.3.4 which shows the lane widths and turn pocket lengths at the St. Francis Drive/West San Mateo Road intersection.



Date: May 27, 2009 - 7:54am
 Project Name: St. Francis Drive IAD PROJECT DATA SHEET INFO\5.3 EXHIBITS\Exhibit04.dwg
 User: jay@hdr.com



St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 W. SAN MATEO RD. AT ST. FRANCIS DR.

Date
 5/2009
 Figure
 II.B3.4

II.B.3.8 CAMINO DEL MONTE REY/CALLE SARAGOSA/CALLE ANAYA

Camino Del Monte Rey, Calle Saragosa and Calle Anaya South are minor local streets with low traffic volumes that serve adjacent industrial and residential areas. Each of these streets enters St. Francis Drive from the west side, forming three-way intersections with St. Francis Drive. Each side street is controlled by a stop sign, assigning the right-of way to St. Francis Drive.

II.B.3.9 COLUMBIA STREET

Columbia Street is a local street, with light to moderate traffic, serving mostly residential land uses. St. Francis Drive at Columbia Street is a four-way intersection controlled by stop signs on Columbia Street.

This intersection is located approximately 980 feet south of the St. Francis Drive/Alta Vista Street intersection.

II.B.3.10 ALTA VISTA STREET

Alta Vista Street is a collector street that serves an adjacent commercial areas to the west and commercial and residential areas to the east. The Alta Vista Street/St. Francis Drive intersection is controlled by an 8-phase traffic signal with a typical cycle length of 110 seconds, with protected/permissive phases for all left turn approaches to the intersection.

The intersection configuration is as follows:

NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
EB Alta Vista Street: 1 LT lane; 1 thru lane; 1 RT lane
WB Alta Vista Street: 1 LT lane; 1 shared thru/RT lane

Below are pictures of each approach to this intersection:



NB St. Francis Dr. at Alta Vista St.



SB St. Francis Drive at Alta Vista St.



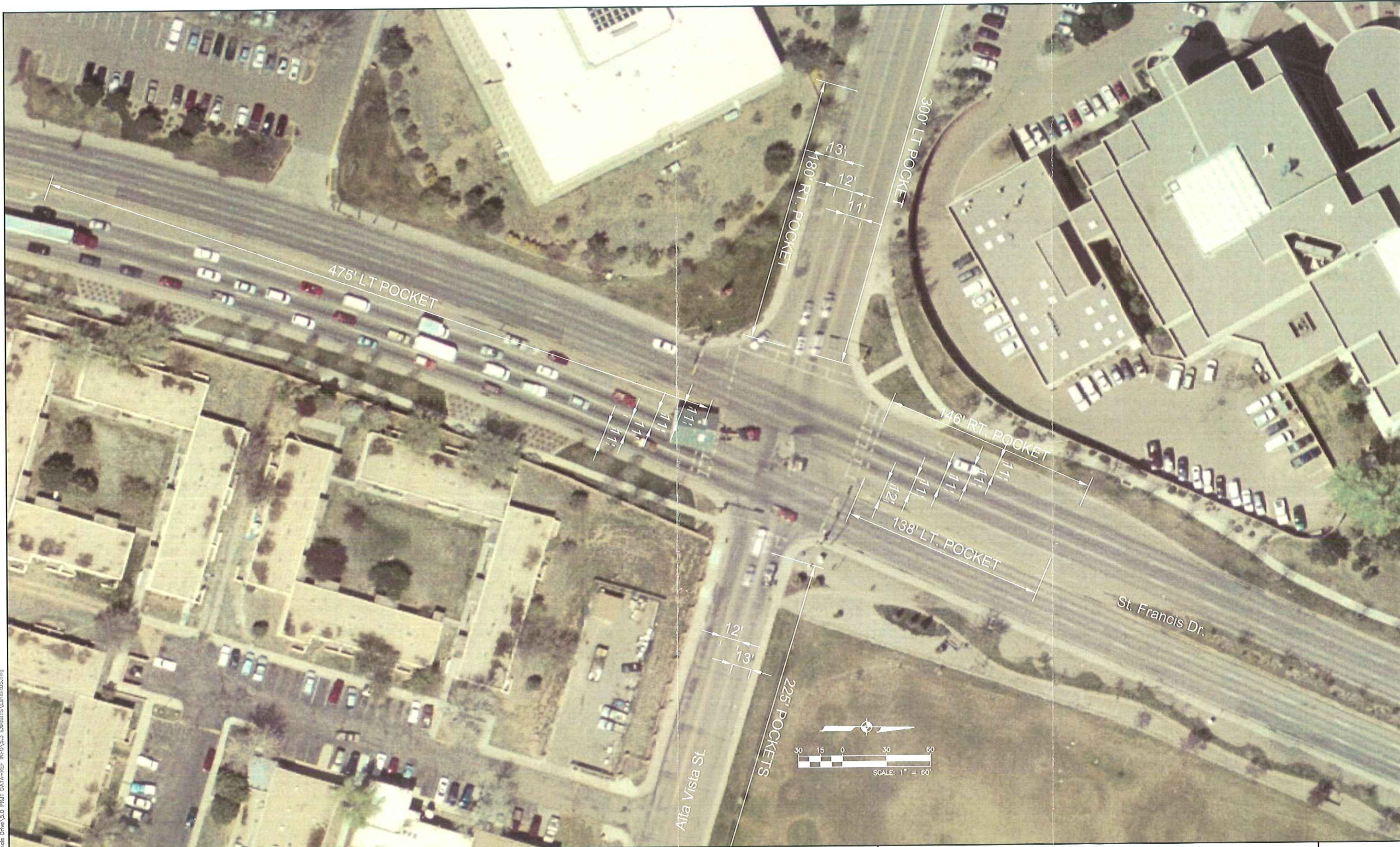
EB Alta Vista St. at St. Francis Dr.



WB Alta Vista St. at St. Francis Dr.

Please refer to Figure II.B.3.5 which shows the lane widths and turn pocket lengths at this intersection.

Date: May 27, 2009 - 7:54am
Drawing Name: P:\55400 St. Francis Drive\5.0 PRJ\DATA\REF INFO\5.3 EXHIBITS\Exhibit5.dwg



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EXISTING / HORIZON YEAR ANALYSIS
LANE WIDTHS AND TURN POCKET LENGTHS
ALTA VISTA ST. AT ST. FRANCIS DR.

Date: 5/2009
Figure: II.B3.5

II.B.3.11 WEST CORDOVA ROAD

St. Francis Drive at West Cordova Road is a critical intersection along the St. Francis corridor. This area is primarily commercial, with numerous business driveway entrances onto St. Francis Drive. The intersection is controlled by an 8-phase traffic signal, with a typical cycle length of 110 seconds. Left turn movements from all approaches are controlled by protected/permissive phases.

Below are the lane configurations for this intersection:

- NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
- SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
- EB West Cordova Road: 1 LT lane; 2 thru lanes; 1 RT lane
- WB West Cordova Road: 1 LT lane; 2 thru lanes, 1 RT lane

Intersection approach pictures are shown below:



NB St. Francis Dr. at W. Cordova Rd.



SB St. Francis Drive at W. Cordova Rd.



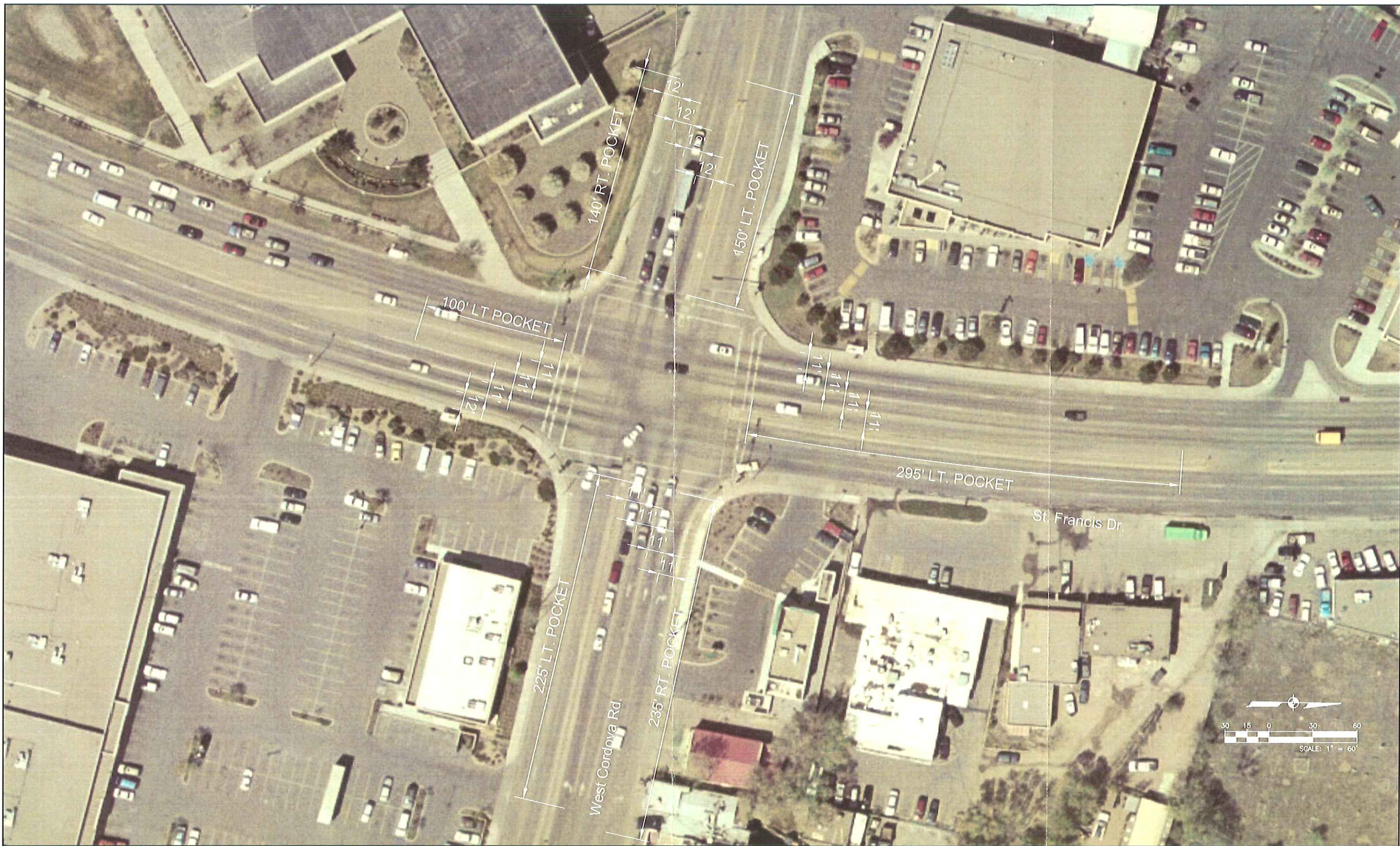
EB W. Cordova Rd. at St. Francis Dr.



WB W. Cordova Rd. at St. Francis Dr.

Please refer to Figure II.B.3.6 which shows the lane widths and turn pocket lengths at this location.

Drawn: May 27, 2009 - 7:55am - 8:00am
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St. Francis Drive Corridor Study

NM-084 - 2(12) 161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
LANE WIDTHS AND TURN POCKET LENGTHS
W. CORDOVA RD. AT ST. FRANCIS DR.

Date
5/2009

Figure
II.B3.6

II.B.3.12 PEN ROAD

Pen Road is a minor local street that serves the commercial area west of St. Francis Drive. The intersection of Pen Road and St. Francis Drive is a three-way intersection located approximately 500 feet south of the St. Francis Drive/Cerrillos Road intersection, and is controlled by a stop sign on Pen Road.

Traffic volumes are fairly light from Pen Road and do not contribute much traffic to the St. Francis Drive corridor.

II.B.3.13 CERRILLOS ROAD

Cerrillos Road (NM 14) forms the largest intersection along the St. Francis Drive corridor. Cerrillos Road is an urban principal arterial that extends the full length of the City of Santa Fe. It serves large commercial areas along much of its length, connecting to I-25 at its southerly terminus. The intersection is skewed, with the two streets intersecting at an approximate 45 degree angle. For both northbound and southbound St. Francis Drive, left turns are prohibited onto Cerrillos Road, and there are free right turns onto Cerrillos Road. Also, there is a railroad track running northeasterly through the middle of the intersection, with railroad crossing devices in place for all intersection approaches.

This intersection has experienced significant accident history. The accident history will be reviewed in the Crash Analysis section of this report. The accident history combined with the confined right-of-way conditions will require geometric improvements to be reviewed as part of the future analysis of the St. Francis Drive/Cerrillos Road intersection. A possible alternative that has been discussed is a grade-separated intersection, to allow for improved progression and general operation of the intersection and along the corridor.

The intersection configuration is as follows:

NB St. Francis Drive: No LT lanes; 3 thru lanes; 1 free RT lane
SB ST. Francis Drive: No LT lanes; 2 thru lanes; 2 free RT lanes
EB Cerrillos Road: 2 LT lanes; 1 thru lane; 1 shared thru/RT lane
WB Cerrillos Road: 2 LT lanes; 2 thru lanes, 1 free RT lane

The intersection is controlled by a 5-phase traffic signal with a typical cycle length of 110 seconds. Below are pictures of each approach to the intersection:



NB St. Francis Dr. at Cerrillos Rd.



SB St. Francis Dr. at Cerrillos Rd.



EB Cerrillos Rd. at St. Francis Dr.



WB Cerrillos Rd. at St. Francis Dr.

Please refer to Figure II.B.3.7 which shows the lane widths and turn pocket lengths at the St. Francis Drive/Cerrillos Road intersection.

II.B.3.14 MERCER STREET/CAMINO SIERRA VISTA/NINITA STREET

Mercer Street and Ninita Street are minor local streets that serve residential neighborhoods. Both of these streets are relatively short in length, each forming a 4-way intersection with St. Francis Drive and generating very little traffic onto the St. Francis Drive corridor. These streets are controlled by stop signs at St. Francis Drive.

Camino Sierra Vista is also a local street that also forms a 4-way intersection with St. Francis Drive, but is much longer than Mercer Street and Ninita Street and serves more residences, thus adding moderate traffic to the St. Francis Drive corridor. This street also has stop control at the intersection with St. Francis Drive.

II.B.3.15 HICKOX ST. /PASEO DE PERALTA (SOUTH)

Hickox Street west of St. Francis Drive, and Paseo De Peralta South (NM 589) to the east, are collector level roadways which serve mostly residential areas, as well as some commercial uses.

The intersection is controlled by an 8-phase traffic signal with a typical cycle length of 110 seconds throughout most of the day, with left turn movements from all approaches being controlled by protected/permissive phases.

The lane configuration at this location is as follows:

NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/ RT lane
EB Hickox Street: 1 LT lane; 1 shared thru/RT lane
WB Paseo de Peralta: 1 LT lane; 1 shared thru/RT lane

Pictures of each intersection approach are shown below:



NB St. Francis Dr. at Hickox St./
Paseo de Peralta



SB St. Francis Dr. at Hickox St./
Paseo de Peralta



EB Hickox St. at St. Francis Dr.



WB Paseo de Peralta at St. Francis

Please refer to Figure II.B.3.8 which shows the lane widths and turn pocket lengths at this intersection.



Date: May 27, 2009 - 7:57am
 Drawing Name: F:\55406 St. Francis Drive\3.0 PROJ DATA-REF\INFO\3.3 EXHIBITS\Exhibit08.dwg



St. Francis Drive Corridor Study
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 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 HICKOCK ST. AT ST. FRANCIS DR.

Date
 5/2009
 Figure
 II.B3.8

II.B.3.16 WEST MANHATTAN AVENUE

West Manhattan Avenue is a local residential street that intersects with St. Francis Drive on the east side only, approximately 300 feet south of the signalized intersection of St. Francis Drive and Agua Fria Street. West Manhattan Avenue is controlled by a stop sign at St. Francis Drive.

Field observation of West Manhattan Avenue shows low traffic volumes entering the St. Francis corridor.

II.B.3.17 AGUA FRIA STREET

Agua Fria Street (NM 588) is a collector street that traverses much of the width of the City of Santa Fe and serves commercial as well as residential areas. The land use along Agua Fria Street in the immediate areas surrounding St. Francis Drive is primarily residential. The intersection is controlled by an 8 phase traffic signal with a typical cycle length of 110 seconds. Left turn movements from all approaches are controlled by protected/permissive phases.

The lane configurations for this location are shown below:

NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/ RT lane
EB Agua Fria Street: 1 LT lane; 1 shared thru/RT lane
WB Agua Fria Street: 1 LT lane; 1 shared thru/RT lane

Pictures of each intersection approach are shown below:



NB St. Francis Dr. at Agua Fria St.



SB St. Francis Dr. at Agua Fria St.



EB Agua Fria St. at St. Francis Dr.



WB Agua Fria St. at St. Francis Dr.

Please refer to Figure II.B.3.9 which shows the lane widths and turn pocket lengths at this intersection.

II.B.3.18 DUNLAP STREET/ROYBAL STREET

Dunlap and Roybal Streets are local residential streets that form four-way intersections with St. Francis Drive. Both streets have stop controls at St. Francis Drive, and contribute low traffic volumes onto the St. Francis Drive corridor.

The intersection of Dunlap Street at St. Francis Drive has experienced some accident history, and access restrictions from Dunlap Street onto St. Francis Drive will be evaluated as part of the future analysis.

Date: May 27, 2009 - 7:57am
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St. Francis Drive Corridor Study

NM - 084 - 2(12) 161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
LANE WIDTHS AND TURN POCKET LENGTHS
AGUA FRIA AT ST. FRANCIS DR.

Date
5/2009

Figure
II.B3.9

II.B.3.19 WEST ALAMEDA STREET

West Alameda Street is a key arterial in the City of Santa Fe street system. It traverses the full width of the city and serves as access to collector roadways across the city. The intersection of West Alameda Street at St. Francis Drive is controlled by an 8-phase traffic signal with a typical cycle length of 110 seconds, with left turn movements from all approaches controlled by protected/permissive phases.

In the AM and PM peak periods, southbound St. Francis Drive traffic was observed to back up to the next signalized intersection to the north (Paseo de Peralta). This queuing of traffic sometimes led to increased congestion at the St. Francis Drive/Paseo de Peralta intersection. Below are the lane configurations for this location:

- NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
- SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
- EB West Alameda Street: 1 LT lane; 1 thru lane; 1 RT lane
- WB West Alameda Street: 1 LT lane; 1 thru lane; 1 RT lane

Following are pictures of the intersection approaches at this intersection:



NB St. Francis Dr. at W. Alameda St.



SB St. Francis Dr. at W. Alameda St.



EB W. Alameda St. at St. Francis Dr.



WB W. Alameda St. at St. Francis Dr.

Please refer to Figure II.B.3.10 which shows the lane widths and turn pocket lengths at the St. Francis Drive/West Alameda Street intersection.

II.B.3.20 LAS MASCARAS STREET

Las Mascaras Street is a cul-de-sac that serves residential and business uses. This street was observed to have minimal traffic volumes, and intersects St. Francis Drive on the east side only, forming a three-way intersection controlled by a stop sign on Las Mascaras Street. There are three access points from this area to West Alameda Street, allowing motorists to exit the neighborhood from other access points than Las Mascaras Street.



Date: May 27, 2009 - 7:56am - egras - Layout: Layout1
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 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 WEST ALAMEDA AT ST. FRANCIS DR.

Date
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 Figure
 II.B3.10

II.B.3.21 PASEO DE PERALTA (NORTH)/CAMINO DE LAS CRUCITAS

Paseo de Peralta North (NM 589) east of its intersection with St. Francis Drive is an arterial roadway serving residential, commercial and industrial areas in the northern portion of Santa Fe. The westerly leg of this intersection is Camino de Las Crucitas, a local street serving a residential neighborhood.

During peak periods, Paseo de Peralta has extremely heavy westbound traffic approaching the intersection with St. Francis Drive. Most of the approaching traffic turns left onto St. Francis Drive to head south. This heavy left-turn movement, in conjunction with queuing southbound through traffic frequently stopped at the West Alameda Street intersection, often results in congestion for St. Francis Drive within this segment.

As part of the future analysis of this corridor, the intersection of St. Francis Drive and Paseo de Peralta will be evaluated for possible signal timing improvements, including coordination with adjacent signals, in order to improve traffic flow along this segment of the St. Francis Drive corridor. Also, a triple left turn pocket will be considered for westbound Paseo de Peralta due to the heavy left turn movement.

Listed below are the lane configurations for this intersection:

NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
EB Camino de Las Crucitas: 1 LT lane; 1 thru lane; 1 RT lane
WB Paseo de Peralta: 2 LT lanes; 1 thru lane; 1 RT lane

The intersection is controlled by a 7-phase traffic signal, with a typical daytime cycle length of 110 seconds. The side streets are split-phased so that they do not have concurring green indications, primarily because of the very heavy westbound left-turn movement. Westbound Paseo de Peralta is served first, then eastbound Camino de Las Crucitas.

Pictures of all intersection approaches are shown below:



NB St. Francis Dr. at Paseo de Peralta



SB St. Francis Dr. at Paseo de Peralta



EB Camino de Las Crucitas/St. Francis Dr.

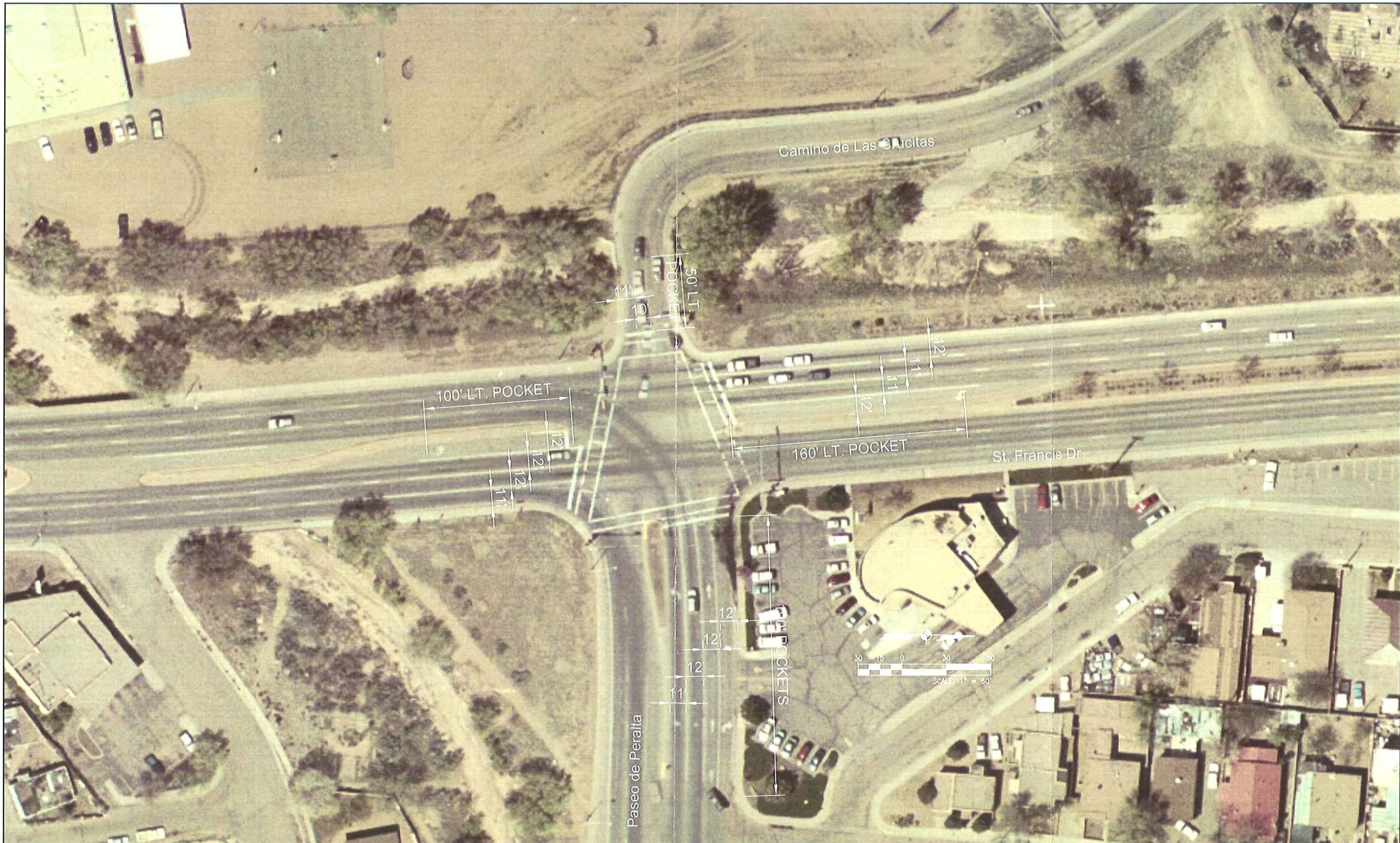


WB Paseo de Peralta at St. Francis Dr.

Please refer to Figure II.B.3.11 which shows the lane widths and turn pocket lengths at this location.

II.B.3.22 SABINO STREET

Sabino Street is a local street that serves a predominantly residential area. It ultimately connects to Guadalupe Street to the east, as well as Paseo de Peralta to the southeast. Sabino Street intersects St. Francis Drive on the east side only, forming a three-way intersection with St. Francis Drive controlled by a stop sign on Sabino Street. Field observation of Sabino Street showed very light traffic entering St. Francis Drive, resulting in little to no effects to the corridor.



Date: May 27, 2009 - 7:58am - 8:00am
 Drawing Name: P:\45400 St. Francis Drive\5.0 PRINT DATA-REF INFO\5.3 EXHIBITS\Exhibit11.dwg



St. Francis Drive Corridor Study
 NM-084-2(12) 161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 LANE WIDTHS AND TURN POCKET LENGTHS
 PASEO DE PERALTA AT ST. FRANCIS DR.

Date
 5/2009
 Figure
 II.B3.11

II.B.3.23 ALAMO DRIVE

Alamo Drive is a collector roadway serving a residential area located west of St. Francis Drive, and connects with Guadalupe Street to the east. The St. Francis Drive/Alamo Drive intersection is controlled by a 5-phase traffic signal with daytime cycle lengths of 110 seconds. The eastbound and westbound Alamo Drive approaches to the intersection are split-phased, with westbound traffic being served first, then eastbound traffic. The lane configuration for this location is as follows:

- NB St. Francis Drive: 1 LT lane; 2 thru lanes; 1 RT lane
- SB ST. Francis Drive: 1 LT lane; 2 thru lanes; 1 shared thru/RT lane
- EB Alamo Drive: 1 shared LT/thru lane; 1 RT lane
- WB Alamo Drive: 1 LT lane; 1 shared thru/RT lane

This intersection has clear visibility from all approaches, as shown below:



NB St. Francis Dr. at Alamo Dr.



SB St. Francis Dr. at Alamo Dr.



EB Alamo St. at St. Francis Dr.



WB Alamo St. at St. Francis Dr.

Please refer to Figure II.B.3.12 which shows the lane widths and turn pocket lengths at this intersection.

Date: May 27, 2009 - 7:58am
Drawing Name: P:\45408 St. Francis Drive\5.0 PRINT DATA-REF INFO\3 Exhibits\Exhibit12.dwg



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EXISTING / HORIZON YEAR ANALYSIS
LANE WIDTHS AND TURN POCKET LENGTHS
ALAMO DR. AT ST. FRANCIS DR.

Date 5/2009
Figure II.B3.12

II.B.3.24 GUADALUPE STREET INTERCHANGE

This section of St. Francis Drive is a four-lane divided highway with a posted speed limit of 45 MPH. On St. Francis Drive at the Guadalupe Street interchange, there is one southbound off-ramp to Guadalupe Street and one northbound on-ramp from Guadalupe Street. Traffic flow is basically uninterrupted though this area of St. Francis Drive, although travel speeds normally decrease during peak periods due to increased congestion as St. Francis Drive enters more densely populated areas.

Below are pictures of each St. Francis Drive approach to the interchange:



NB St. Francis Drive at Guadalupe Street



SB St. Francis Drive at Guadalupe Street

II.B.3.25 VIENTO DRIVE

Viento Drive is a local street connecting to a residential area west of St. Francis Drive. Viento Drive intersects with St. Francis Drive on the west side only, forming a three-way intersection with St. Francis Drive, and is controlled by a stop sign. Viento Drive is the only access point to St. Francis Drive between the Guadalupe Street and NM 599 interchanges with St. Francis Drive.

Left turns are not permitted from Viento Drive onto St. Francis Drive; however, safety concerns have been reported regarding eastbound Viento Drive motorists turning south onto St. Francis Drive.

Sight distance for the eastbound Viento Drive approach is adequate, with over 1,000 feet of visibility looking north onto St. Francis Drive. The high travel speeds on southbound St. Francis Drive can make access from Viento Drive difficult.

A 9-hour turning movement count taken at this intersection showed 368 vehicles turning right from Viento Drive onto southbound St. Francis Drive, with a peak hourly volume of 56 vehicles.

Below is a picture from Viento Drive looking north onto St. Francis Drive:



EB Viento Drive looking north onto St. Francis Dr.

III: TRAFFIC ANALYSIS

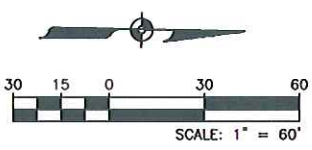
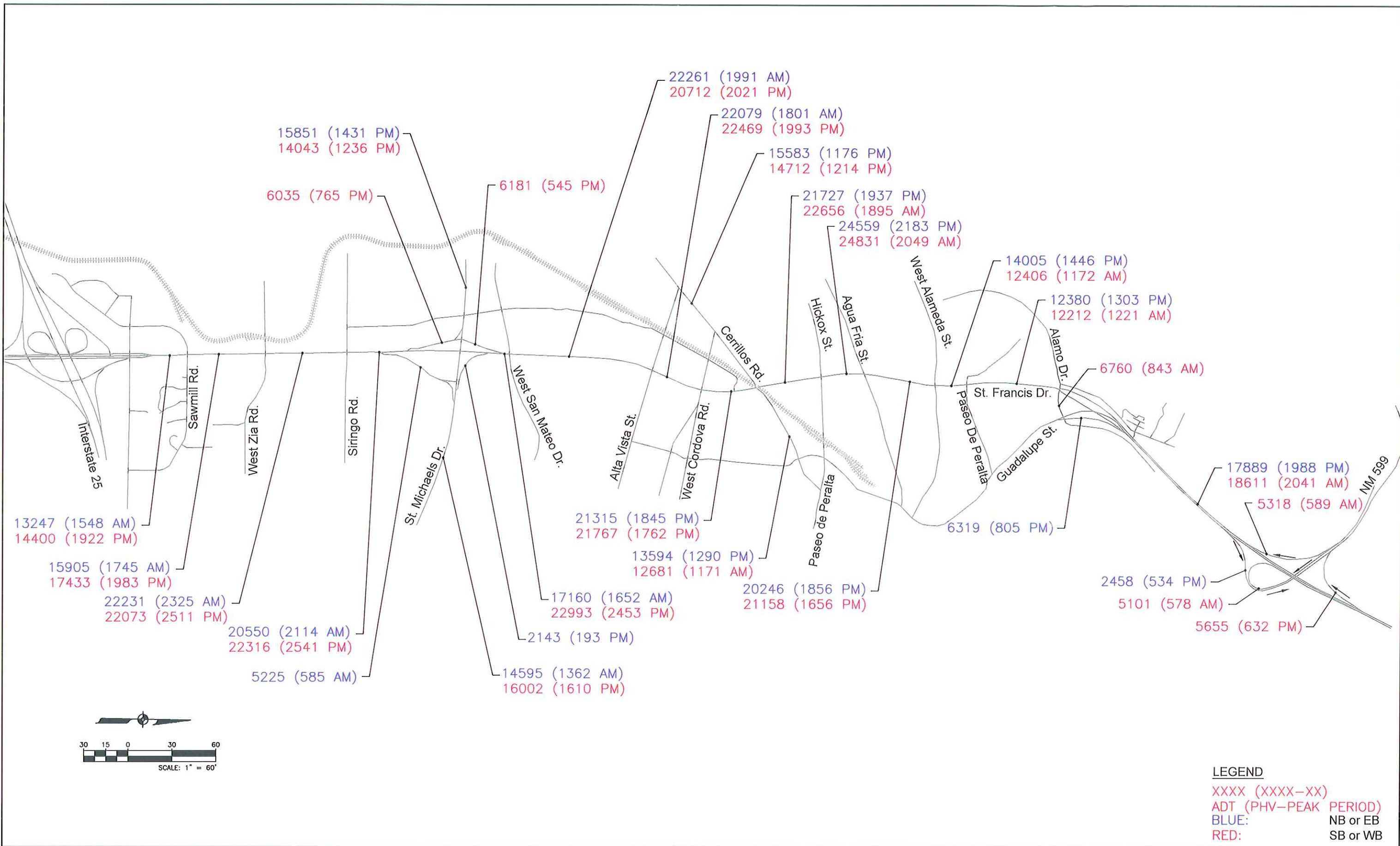
The primary purpose of performing a traffic analysis is to determine the operating characteristics of an identified transportation facility for existing and future conditions and to identify any deficient results. If any deficient results exist, recommendations to geometrics and/or traffic control devices of that facility can be made to improve the performance of it. The two primary elements of a transportation facility that are analyzed are the highway segments and the intersections.

III.A TRAFFIC DATA

Prior to analyzing any facility, traffic data in the form of traffic volume counts must be obtained. Typically there are two forms of data collected: Average Daily Traffic (ADT) in vehicles per day (VPD) and 9-hour or 12-hour volume counts in vehicles per hour (VPH). ADT counts are usually counted for a period of 48-hours during weekdays along roadway segments using tube counters or other approved electronic counting devices. The 48-hour counts are then averaged to obtain a 24-hour count. The ADT data collection criteria must comply with the NMDOT Data Collection Bureau's Traffic Monitoring Standards and FHWA requirements.

9-Hour or 12-Hour manual counts are usually performed at intersections during the highest used weekday hourly intervals to obtain the vehicle movements for each lane at each approach. The highest hourly intervals refer to the heaviest utilized time periods for a given intersection. These are more typically known as the peak hours and normally, but not always, occur during the 7:00 – 9:00 am hours; 11:00 am – 1:00 pm hours and 4:00 pm – 6:00 pm hours of a given weekday. For this project, actual ADT and 9-hour intersection turn counts at the twelve signalized intersections were taken at key locations throughout the corridor – the counts are included in Appendix A.

Figure III.A.1 shows the existing ADT count locations, and Figures III.A.2 to III.A.5 show the existing intersection turn movement volumes in the AM and PM peak hours.



LEGEND
 XXXX (XXXX-XX)
 ADT (PHV-PEAK PERIOD)
 BLUE: NB or EB
 RED: SB or WB

Date: May 27, 2009 - 8:00am; agenda; Layout; Layout1
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St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 ADT MAP 2 DAY AVERAGES (TUE/WED)
 ST. FRANCIS DR. INTERSTATE 25 TO NM 599

Date: 5/2009
 Figure: III.A.1



Date: May 28, 2009 -- 8:45am
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St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 EXISTING INTERSECTION
 TURN MOVEMENT VOLUMES

Date: 5/2009
 Figure: III.A.2



Date: May 26, 2009 - 8:47am - gregorio - Layout - Layout1
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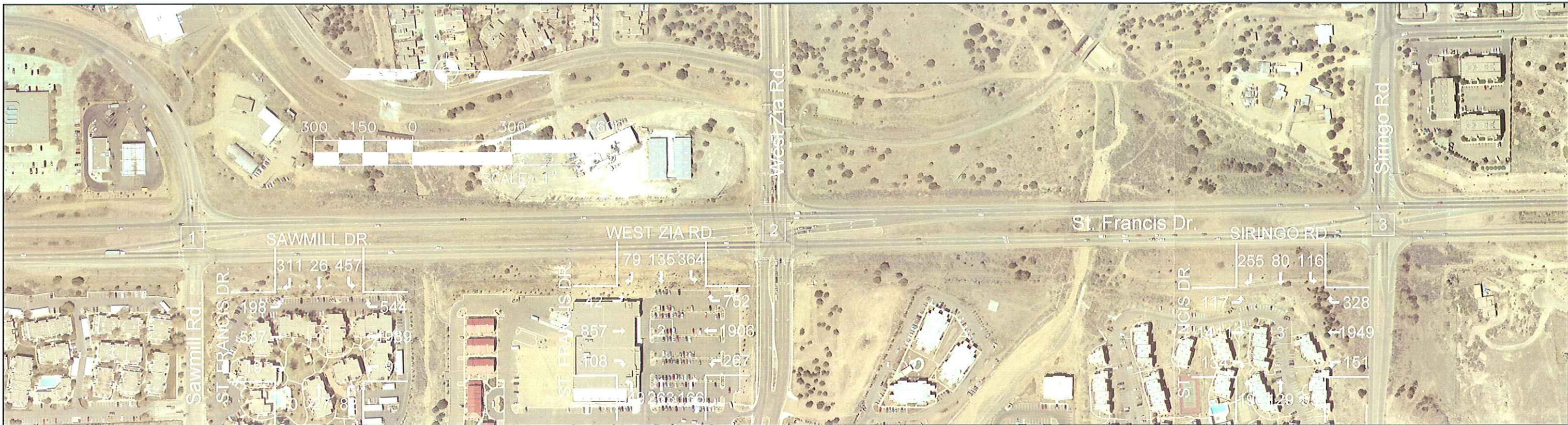
St. Francis Drive Corridor Study

NM-084-2(12)161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
 EXISTING INTERSECTION
 TURN MOVEMENT VOLUMES

Date	5/2009
Figure	III.A.3



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St. Francis Drive Corridor Study

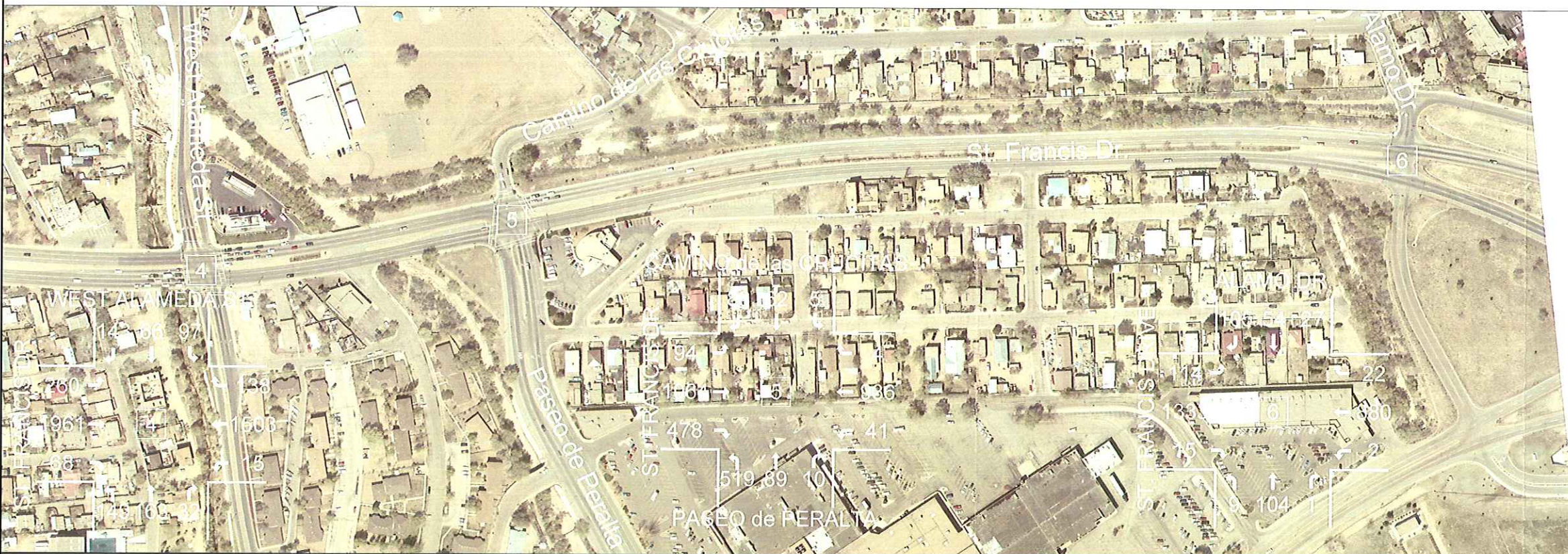
NM - 084 - 2(12) 161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
 EXISTING INTERSECTION
 TURN MOVEMENT VOLUMES

Date
5/2009

Figure
III.A.4



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St. Francis Drive Corridor Study

NM-084-2(12) 161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
 EXISTING INTERSECTION
 TURN MOVEMENT VOLUMES

Date
5/2009

Figure
III.A.5

III.B TRAFFIC OPERATIONAL ANALYSIS

As traffic volumes along roadway segments continue to increase over time, the flow rate of the vehicles tends to also increase causing the mean speed of passenger cars to decrease. This ultimately causes delay and congestion along highways. Intersections, both signalized and un-signalized, are analyzed to determine the approach delay and capacity for existing and future conditions. The future conditions scenarios take into account the projected peak hour volumes utilizing existing, as well as, proposed roadway or intersection improvements.

III.B.1 OPERATIONAL ANALYSIS DEFINITIONS

The operational performance of an intersection or a highway facility is based on Level of Service (LOS) criteria. LOS is a term used to qualitatively describe roadway and intersection traffic operations and is expressed in letter grade format from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. Per the NMDOT *State Access Management Manual*, LOS C for rural conditions and LOS D for urban conditions are acceptable LOS. In either case, a LOS F is never accepted for any individual movements. A general description of LOS is as follows:

- LOS A:** Travel time is as efficient as the roadway or intersection facility can provide. Individual users virtually travel unaffected by the presence of others in the traffic stream.
- LOS B:** Travel time remains efficient. Motorists have a high degree of freedom to select speed and operating conditions, but are slightly influenced by other road users.
- LOS C:** The efficiency of travel is reduced, but delays are well within reasonable limits. Traffic flow is becoming more restricted as individual users interact substantially with other road users.
- LOS D:** Travel time continues to increase, and motorist delay approaches but still within reasonable limits. Motorists are able to travel at designated speeds for the facility, but freedom to maneuver in the traffic stream is restricted.
- LOS E:** Travel time is substantially affected. Delays have reached and may exceed reasonable limits. The capacity of the facility is fully utilized.
- LOS F:** Travel along the roadway or through an intersection is very inefficient. Traffic flow is forced in that the amount of traffic approaching a point exceeds the amount that can be served. The roadway facility fails.

III.B.2 LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS CRITERIA FOR SIGNALIZED INTERSECTIONS	
LOS	Delay per Vehicle (sec/veh)
A	Less than or equal to 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	>80

TABLE III.B.1

sec/veh = seconds of delay per vehicle

III.B.3 LOS CRITERIA FOR ROUNDABOUTS

Roundabout alternatives within the United States are a relatively new accepted practice to intersection design. Roundabout LOS is based on approach and geometric delay, similar to signalized control delay criteria. As part of the future analysis, a roundabout design will be evaluated at the intersections of St. Francis Drive at Sawmill Road and Alamo Drive.

III.B.4 STUDY METHODOLOGY

In order to efficiently analyze the volumes of operation elements previously described, the use of various traffic analysis computer software packages is required. These software programs are all developed using the *Highway Capacity Manual 2000* accepted concepts.

Standard commercial software programs such as the *Highway Capacity Software* (HCS) by *McTrans*, *Synchro 7.0/Simtraffic* by *Trafficware* and *aaSIDRA* by *Akcelik & Associates* are used for a variety of analyses.

The HCS is used to analyze freeway, multi-lane and two-lane segments, freeway ramp merge/diverge areas, lane weaving, and unsignalized intersections.

Synchro/Simtraffic is utilized for signalized intersections and corridor progression and simulation analysis.

aaSIDRA is used for the analysis and circle design of roundabouts.

III.C EXISTING CONDITION (2006) OPERATIONAL ANALYSIS WITH THREE THRU LANES THROUGHOUT THE ST. FRANCIS DRIVE CORRIDOR

III.C.1 ROADWAY OPERATIONS

The 2006 current AM and PM peak hour conditions for the St. Francis Drive corridor were analyzed for this study. The results of the capacity analyses are summarized in Table III.C.1 and Table III.C.2. All HCS arterial segment capacity analysis runs have been provided in Appendix B – Existing Capacity Analysis.

St. Francis Drive Corridor Segment Existing Condition (2006)		NB LOS		SB LOS	
		AM	PM	AM	PM
1	Sawmill Road to West Zia Road	E	D	C	D
2	West Zia Road to Siringo Road	D	C	C	D
3	Siringo Road to West San Mateo Road	B	A	B	B
4	West San Mateo Road to Alta Vista St.	B	C	B	B
5	Alta Vista St. to West Cordova Rd.	E	E	D	E
6	West Cordova Road to Cerrillos Road	D	D	D	E
7	Cerrillos Road to Hickox St./PdP (N)	D	E	E	D
8	Hickox St./PdP (N) to Agua Fria St.	E	E	E	E
9	Agua Fria St. to West Alameda St.	D	D	E	E
10	West Alameda St. to Paseo de Peralta (N)	F	E	F	F
11	Paseo de Peralta (N) to Alamo Drive	A	B	C	C
CORRIDOR LOS		C	C	D	D

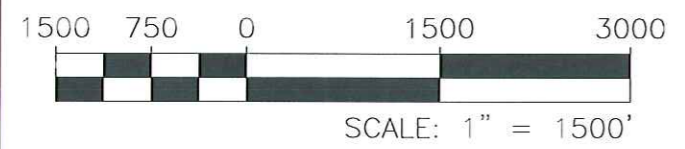
TABLE III.C.1

III.C.2 INTERSECTION OPERATIONS

A signalized intersection operational analysis for the existing conditions was completed for each intersection at along the St. Francis Drive corridor. The operational analyses were completed for the current 2006 AM & PM Peak Hours of a typical weekday for the facility.

The following Table III.C.3 summarizes the existing traffic operations for the intersections. The Synchro analyses runs for AM and PM Peak Hours can be found in Appendix B – Existing Capacity Analysis.

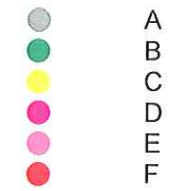
Figures III.C.1 and III.C.2 illustrate the LOS for existing 2006 peak hour conditions for roadway segments and signalized intersections.



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS

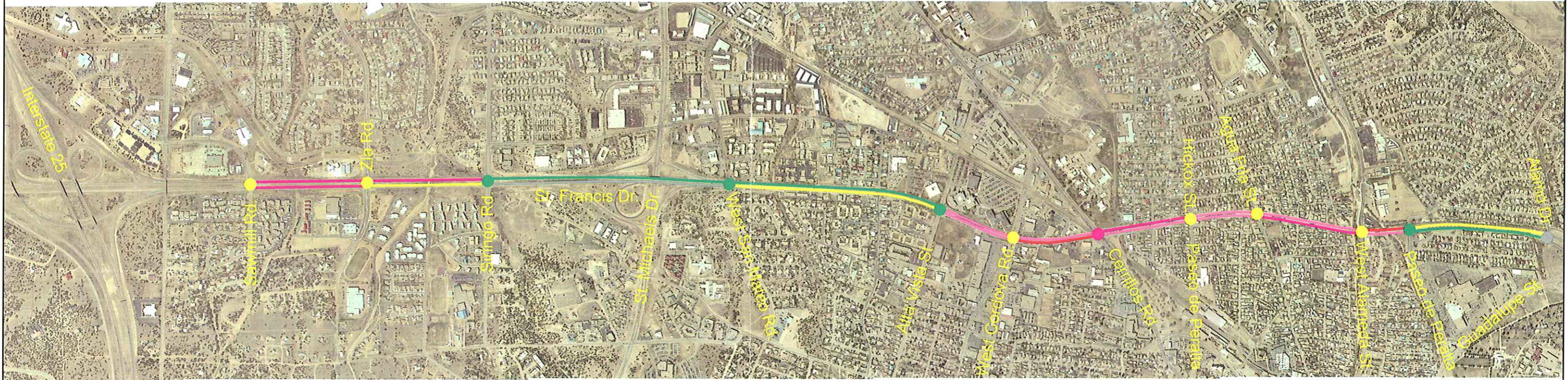
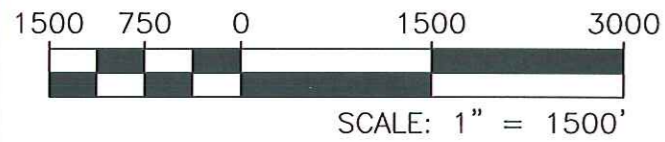
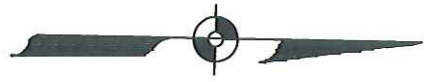


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St. Francis Drive Corridor Study
 NM-084-2(12) 161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 EXISTING CONDITIONS (2006) ROADWAY AND INTERSECTIONS LEVELS
 OF SERVICE (LOS) AM PEAK HOUR ST. FRANCIS DR. I-25 TO NM599

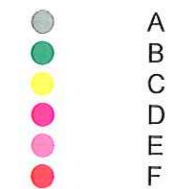
Date	5/2009
Figure	III.C.1



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS



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St. Francis Drive Corridor Study

NM - 084 - 2(12) 161

CN D5SF3

EXISTING / HORIZON YEAR ANALYSIS
 EXISTING CONDITIONS (2006) ROADWAY AND INTERSECTIONS LEVELS
 OF SERVICE (LOS) PM PEAK HOUR ST. FRANCIS DR. I-25 TO NM599

Date
5/2009

Figure
III.C.2

SIGNALIZED INTERSECTION OPERATIONS ANALYSIS SUMMARY – EXISTING CONDITIONS PEAK HOURS																	
INTERSECTION	PEAK PERIOD	MAXIMUM V/C RATIO	LEVEL OF SERVICE & DELAY BY APPROACH MOVEMENT												INTERSECTION		
			EB			WB			NB			SB			DELAY (sec/veh)	LOS	
			L	T	R	L	T	R	L	T	R	L	T	R			
St. Francis Dr. at Sawmill Road	AM	0.71	D	B	B	D	D	C	B	C	A	B	A	A	19.7	B	
	PM	0.93	D	B	B	D	D	B	D	B	A	A	C	A	22.3	C	
St. Francis Dr. at West Zia Road	AM	1.02	D	F	F	C	D	B	D	C	A	D	C	A	34.8	C	
	PM	0.91	D	C	C	D	D	A	D	B	A	E	C	B	26.6	C	
St. Francis Dr. at Siringo Road	AM	0.73	C	D	B	C	D	C	B	B	A	B	A	A	16.6	B	
	PM	0.78	C	D	C	C	D	B	C	C	A	C	B	A	18.3	B	
St. Francis Dr. at West San Mateo Road	AM	0.76	D	D	B	C	D	B	C	A	A	D	A	A	10.4	B	
	PM	0.75	D	D	B	D	D	B	D	A	A	A	A	A	11.2	B	
St. Francis Dr. at Alta Vista St.	AM	0.68	C	D	B	C	C	C	C	A	A	C	A	A	11.4	B	
	PM	0.80	C	D	B	D	B	B	B	C	C	D	B	A	19.5	B	
St. Francis Dr. at West Cordova Road	AM	0.73	C	D	B	D	D	A	D	C	C	D	C	C	24.9	C	
	PM	0.83	D	D	C	D	D	B	D	C	C	C	B	B	28.7	C	
St. Francis Dr. at Cerrillos Road	AM	0.86	D	D	D	D	D	D	-	B	C	-	C	C	30.9	C	
	PM	1.19	F	D	D	D	D	D	-	C	B	-	E	C	53.9	D	
St. Francis Dr. at Hickox St./PdP (South)	AM	0.70	C	D	D	C	C	C	B	B	B	B	B	B	18.6	B	
	PM	0.82	D	D	D	C	D	D	C	B	B	C	C	C	22.5	C	
St. Francis Dr. at Agua Fria St.	AM	0.83	C	D	D	C	D	D	C	B	B	A	C	C	21.2	C	
	PM	0.93	C	D	D	C	D	D	D	C	C	A	C	C	26.5	C	
St. Francis Dr. at West Alameda St.	AM	0.80	D	D	A	C	D	B	D	B	B	A	C	C	21.4	C	
	PM	0.88	C	D	A	C	D	B	D	C	C	B	D	D	30.3	C	
St. Francis Dr. at Paseo de Peralta (North)	AM	0.57	D	D	B	D	C	B	A	A	A	A	B	B	12.7	B	
	PM	0.72	D	D	B	D	C	A	B	B	A	B	B	B	20.0	B	
St. Francis Dr. at Alamo Drive	AM	0.64	D	D	D	D	D	D	A	A	A	A	A	A	11.5	B	
	PM	0.54	D	C	C	D	D	D	A	A	A	A	A	A	8.8	A	

TABLE III.C.2

III.D EXISTING CONDITION (2006) OPERATIONAL ANALYSIS WITH TWO THRU LANES ON ST. FRANCIS DRIVE SOUTH OF WEST SAN MATEO ROAD AND THREE THRU LANES THROUGH THE REMAINDER OF THE CORRIDOR

III.D.1 ROADWAY OPERATIONS

The 2006 current AM and PM peak hour conditions for the St. Francis Drive corridor were analyzed for this study. The difference between this analysis and the existing 2006 analysis is that the intersections with St. Francis Drive south of West San Mateo Road are evaluated with two through lanes on St. Francis Drive instead of three. The results of the capacity analysis is summarized in Table III.D.1. All HCS arterial segment capacity analysis runs have been provided in Appendix C – Existing Capacity Analysis (with 2 lanes south of West San Mateo Road).

ST. FRANCIS DRIVE CORRIDOR EXISTING CONDITIONS (2006) WITH 2 THRU LANES ON ST. FRANCIS DRIVE SOUTH OF WEST SAN MATEO ROAD					
ROADWAY SEGMENT		NB LOS		SB LOS	
		AM	PM	AM	PM
1	Sawmill Road to West Zia Road	F	D	C	F
2	West Zia Road to Siringo Road	F	F	F	F
3	Siringo Road to West San Mateo Road	E	D	E	F
4	West San Mateo Road to Alta Vista St.	B	C	F	D
5	Alta Vista St. to West Cordova Rd.	E	E	D	E
6	West Cordova Road to Cerrillos Road	D	D	D	E
7	Cerrillos Road to Hickox St./PdP (North)	D	E	E	D
8	Hickox St./PdP (North) to Agua Fria St.	E	E	E	E
9	Agua Fria St. to West Alameda St.	D	D	E	E
10	West Alameda St. to Paseo de Peralta (N)	F	E	F	E
11	Paseo de Peralta (N) to Alamo Drive	A	B	C	E
CORRIDOR LOS		E	E	E	F

TABLE III.D.1

The removal of a third thru lane for both directions of St. Francis Drive south of West San Mateo Road results in a significant loss of levels of service (LOS) for roadway segments within that portion of the corridor; in fact, the removal of the third thru lane for the southern portion St. Francis Drive results in a lower LOS for the entire corridor.

Table III.D.2 summarizes the changes in the LOS for the affected roadway segments and the overall corridor:

Changes in Roadway Segment LOS Resulting from Loss of Third Thru Lane on St. Francis Dr.		
St. Francis Drive Roadway Segments	NB LOS	
	AM	PM
1 - Sawmill Road to West Zia Road	E to F	D (no chg)
2 - West Zia Road to Siringo Road	D to F	C to F
3 - Siringo Road to West San Mateo Rd.	B to E	A to D
NB CORRIDOR LOS	D to E	D to E
St. Francis Drive Roadway Segments	SB LOS	
	AM	PM
1 - Alta Vista St. to West San Mateo Rd.	B to F	B to D
2 - West San Mateo Rd. to Siringo Road	B to E	B to F
3 - Siringo Road to West Zia Road	C to F	D to F
4 - West Zia Road to Sawmill Road	C (no chg)	D to F
SB CORRIDOR LOS	D to E	D to F

TABLE III.D.2

III.D.2 INTERSECTION OPERATIONS

A signalized intersection operational analysis for the existing conditions was completed for each intersection at along the St. Francis Drive corridor. The operational analyses were completed for the current 2006 AM & PM Peak Hours of a typical weekday for the facility.

The following Table III.D.3 summarizes the existing traffic operations for the intersections. The Synchro analyses runs for AM and PM Peak Hours can be found in Appendix C – Existing Capacity Analysis with Two Lanes South of San Mateo Road.

SIGNALIZED INTERSECTION OPERATIONS ANALYSIS SUMMARY – EXISTING CONDITIONS PEAK HOURS (2 Thru Lanes South of West San Mateo Road)																		
INTERSECTION	PEAK PERIOD	MAXIMUM V/C RATIO	LEVEL OF SERVICE & DELAY BY APPROACH MOVEMENT												INTERSECTION			
			EB			WB			NB			SB			DELAY (sec/veh)	LOS		
			L	T	R	L	T	R	L	T	R	L	T	R				
St. Francis Dr. at Sawmill Road	AM	0.84	D	B	B	D	D	D	B	C	B	B	B	A	23.4	C		
	PM	1.33	D	B	B	D	D	B	D	B	A	A	F	A	80+	F		
St. Francis Dr. at West Zia Road	AM	1.17	D	F	F	C	D	B	D	F	B	D	B	A	61.0	E		
	PM	1.25	D	C	C	D	D	A	D	C	A	E	F	C	68.4	E		
St. Francis Dr. at Siringo Road	AM	1.05	C	D	B	C	D	C	B	D	A	B	A	A	33.5	C		
	PM	1.12	C	D	C	C	D	B	C	C	A	D	E	A	45.4	D		
St. Francis Dr. at West San Mateo Road	AM	1.09	D	D	B	C	D	B	B	E	E	D	A	A	36.4	D		
	PM	0.75	D	D	B	D	D	B	D	A	A	A	A	-	11.3	B		
St. Francis Dr. at Alta Vista St.	AM	0.68	C	D	B	C	C	C	B	A	A	C	A	A	10.3	B		
	PM	0.80	C	D	B	D	B	B	B	C	C	D	B	A	18.7	B		
St. Francis Dr. at West Cordova Road	AM	0.73	C	D	B	D	D	A	D	C	C	C	C	C	25.7	C		
	PM	0.83	D	D	C	D	D	B	D	C	C	C	B	B	28.7	C		
St. Francis Dr. at Cerrillos Road	AM	0.86	D	D	D	D	D	D	-	B	C	-	C	C	31.2	C		
	PM	1.19	F	D	D	D	D	D	-	C	B	-	E	C	53.9	D		
St. Francis Dr. at Hickox St./PdP (South)	AM	0.70	C	D	D	C	C	C	B	B	B	B	B	B	18.6	B		
	PM	0.82	D	D	D	C	D	D	C	B	B	C	C	C	22.5	C		
St. Francis Dr. at Agua Fria St.	AM	0.83	C	D	D	C	D	D	C	B	B	A	C	C	21.2	C		
	PM	0.93	C	D	D	C	D	D	D	C	C	A	C	C	26.5	C		
St. Francis Dr. at West Alameda St.	AM	0.80	D	D	A	C	D	B	D	B	B	A	C	C	21.4	C		
	PM	0.88	C	D	A	C	D	B	D	C	C	B	D	D	30.3	C		
St. Francis Dr. at Paseo de Peralta (North)	AM	0.57	D	D	B	D	C	B	A	A	A	A	B	B	12.7	B		
	PM	0.72	D	D	B	D	C	A	A	B	B	A	B	B	20.0	B		
St. Francis Dr. at Alamo Drive	AM	0.64	D	D	D	D	D	D	A	A	A	A	A	A	11.5	B		
	PM	0.54	D	C	C	D	D	D	A	A	A	A	A	A	8.8	A		

TABLE III.D.3

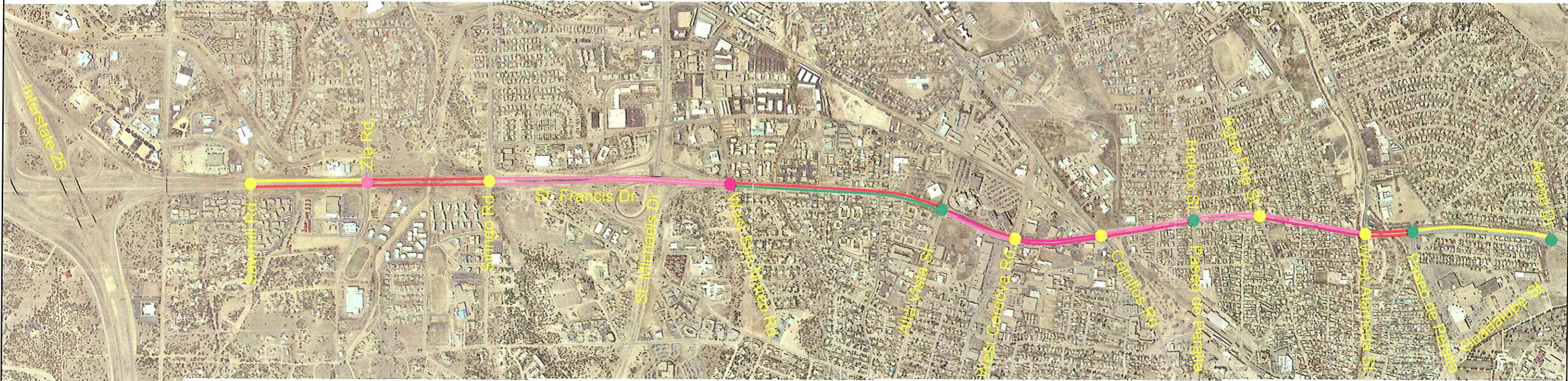
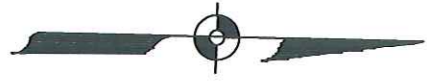
The removal of a third thru lane for both directions of St. Francis Drive results in a significant loss of levels of service (LOS) for four signalized intersections within that segment of the corridor. Table III.D.5 summarizes the changes in the intersection LOS in that segment:

Changes in Intersection LOS Resulting from Loss of Third Thru Lane on St. Francis Drive

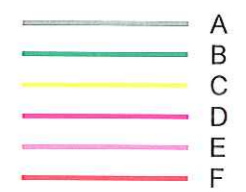
Intersection		AM LOS		PM LOS	
		AM LOS	PM LOS	AM LOS	PM LOS
1	- St. Francis Dr at Sawmill Road	B to C	C to F	C to F	C to F
2	- St. Francis Dr. at West Zia Road	C to E	C to E	C to E	C to E
3	- St. Francis Dr. at Siringo Road	B to C	B to D	B to D	B to D
4	- St. Francis Dr. at West San Mateo Road	B to D	B (no chg)	B (no chg)	B (no chg)

TABLE III.D.4

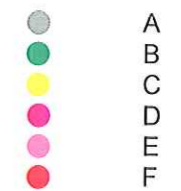
Figures III.D.1 and III.D.2 show the LOS along the St. Francis Drive corridor:



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS

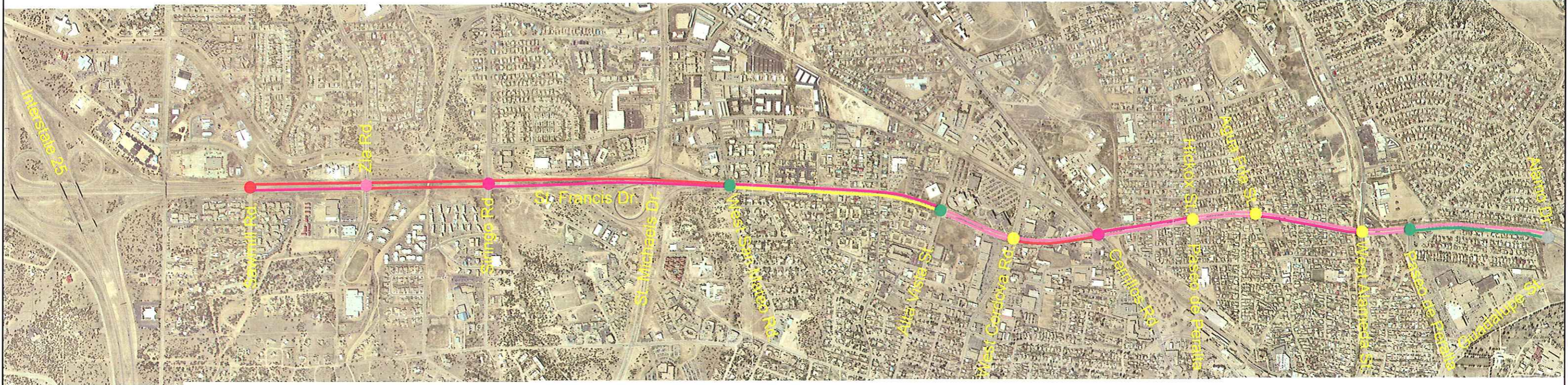
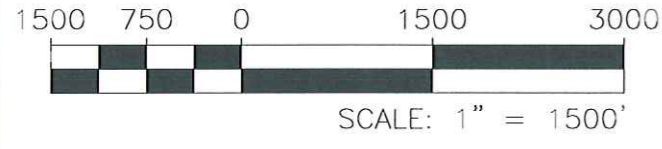


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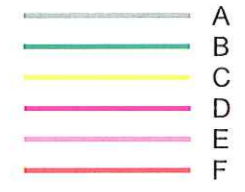


St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 EXISTING CONDITIONS (2006) WITH 2 LANES SOUTH OF SAN MATEO RD.
 ROADWAY AND INTERSECTION LEVELS OF SERVICE (LOS) AM PEAK HOUR

Date 5/2009
 Figure III.D.1



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS



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St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 EXISTING CONDITIONS (2006) WITH 2 LANES SOUTH OF SAN MATEO RD.
 ROADWAY AND INTERSECTION LEVELS OF SERVICE (LOS) PM PEAK HOUR

Date: 5/2009
 Figure: III.D.2



III.E 2030 NO-BUILD CONDITION OPERATIONAL ANALYSIS

With every transportation analysis, comparisons between existing and projected volumes for the horizon year utilizing the existing geometric conditions need to be made. This evaluation is often referred to as the “No-Build” alternative. The No-Build scenario assumes no transportation improvements are made, but traffic volumes continue to increase to the horizon year. The resulting operational analyses may predict future deficiencies in lane capacity to roadway and ramp segments and capacity and delay to existing intersections. In some cases there may be no deficiencies observed with the No-Build alternative.

III.E.1 2030 NO-BUILD ROADWAY OPERATIONS

As with the existing conditions analysis, the Roadway Level of Service for the No-Build condition was determined using the methods and procedures presented in the 2000 Highway Capacity Manual and modeled using 2000 Highway Capacity Software, version 4.1e. The projected 2030 AM and PM peak hour conditions for the existing St. Francis Drive corridor were utilized and analyzed for the No-Build condition. The results of the analyses are summarized in Table III.D.1. All HCS freeway segment capacity analyses output runs have been provided in Appendix D – No-Build Analysis.

III.E.2 2030 NO-BUILD INTERSECTION OPERATIONS

Signalized intersection operational analysis for the No-Build conditions was completed for each of the intersections at each diamond interchange within the I-10 project limits. The operational analysis was evaluated using the 2000 Highway Capacity Manual criteria and modeled using HCS. The operational analyses were completed for the No-Build AM & PM Peak Hours of a typical weekday for the facility. Figure III.E.1 shows the Projected Turn Movements for the intersections.

The following Table III.E.1 summarizes the No-Build traffic operations for the signalized intersections along the St. Francis Drive corridor. The HCS analyses output runs for AM and PM Peak Hours can be found in Appendix D – Projected 2030 Horizon Year Analysis (No-Build).

St. Francis Drive Corridor Segment 2030 Horizon Year No-Build Alternative		NB LOS		SB LOS	
		AM	PM	AM	PM
1	Sawmill Road to West Zia Road	F	D	D	F
2	West Zia Road to Siringo Road	C	D	C	E
3	Siringo Road to West San Mateo Road	B	B	B	B
4	West San Mateo Road to Alta Vista St.	B	B	B	B
5	Alta Vista St. to West Cordova Rd.	E	E	E	D
6	West Cordova Road to Cerrillos Road	F	E	D	D
7	Cerrillos Road to Hickox St./PdP (North)	C	D	D	D
8	Hickox St./PdP (North) to Agua Fria St.	E	E	E	E
9	Agua Fria St. to West Alameda St.	C	D	D	E
10	West Alameda St. to Paseo de Peralta (N)	F	F	F	F
11	Paseo de Peralta (N) to Alamo Drive	A	B	C	C
CORRIDOR LOS		D	D	C	D

TABLE III.E.1

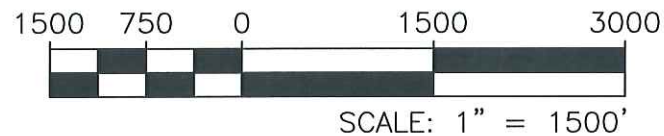
The following Table III.E.2 summarizes the existing traffic operations for the intersections. The Synchro analyses runs for AM and PM Peak Hours can be found in Appendix D – Projected 2030 Horizon Year Analysis (No-Build).

The analysis shows that there are two intersections, as well as assorted individual movements, that will operate at unacceptable LOS during peak hours. The deficient locations will be identified and discussed in Section III.F of this report.

SIGNALIZED INTERSECTION OPERATIONS ANALYSIS SUMMARY - 2030 Horizon Year Volumes																	
INTERSECTION	PEAK PERIOD	MAXIMUM V/C RATIO	LEVEL OF SERVICE & DELAY BY APPROACH MOVEMENT												INTERSECTION		
			EB			WB			NB			SB			DELAY (sec/veh)	LOS	
			L	T	R	L	T	R	L	T	R	L	T	R			
St. Francis Dr. at Sawmill Road	AM	1.07	D	B	B	D	B	B	F	D	A	B	A	A	33.6	C	
	PM	1.53	D	F	F	D	D	B	F	B	A	A	F	A	80+	F	
St. Francis Dr. at West Zia Road	AM	1.68	D	F	F	C	D	C	D	F	C	D	B	A	80+	F	
	PM	1.26	D	D	D	D	D	A	D	C	A	E	F	C	74.5	E	
St. Francis Dr. at Siringo Road	AM	1.06	C	D	B	C	D	B	E	C	A	B	A	A	25.3	C	
	PM	1.09	C	D	D	C	D	B	D	C	A	D	E	A	41.5	D	
St. Francis Dr. at West San Mateo Road	AM	0.99	D	D	B	D	D	B	B	D	B	C	B	B	20.4	C	
	PM	0.93	D	D	B	D	E	B	D	A	A	B	B	B	14.2	B	
St. Francis Dr. at Alta Vista St.	AM	0.80	C	D	B	C	C	C	C	B	B	D	A	A	13.0	B	
	PM	0.87	C	D	B	D	C	C	B	C	C	D	B	A	20.3	C	
St. Francis Dr. at West Cordova Road	AM	0.86	C	D	B	D	D	A	D	D	D	C	C	C	32.6	C	
	PM	0.94	D	D	C	E	D	A	D	D	D	D	C	C	33.3	C	
St. Francis Dr. at Cerrillos Road	AM	1.10	D	D	D	D	D	D	-	B	E	-	E	D	49.7	D	
	PM	1.29	F	D	D	D	D	D	-	C	B	-	C	C	50.9	D	
St. Francis Dr. at Hickox St./PdP (South)	AM	0.81	C	D	D	C	C	C	B	B	B	D	B	B	22.0	C	
	PM	1.04	D	D	D	C	D	D	C	D	D	C	C	C	33.4	C	
St. Francis Dr. at Agua Fria St.	AM	0.91	C	C	C	C	D	D	C	B	B	A	C	C	21.0	C	
	PM	1.02	C	D	D	C	D	D	D	C	C	B	D	D	33.3	C	
St. Francis Dr. at West Alameda St.	AM	0.91	D	D	A	C	D	B	D	B	B	B	C	C	24.7	C	
	PM	1.09	C	D	A	C	D	B	D	C	C	B	E	E	47.4	D	
St. Francis Dr. at Paseo de Peralta (North)	AM	0.85	-	D	C	D	C	A	D	C	A	A	B	C	23.6	C	
	PM	1.04	-	E	C	D	C	A	D	D	A	C	B	B	31.5	C	
St. Francis Dr. at Alamo Drive	AM	1.22	D	F	F	D	C	C	C	A	A	C	C	C	40.9	D	
	PM	1.01	E	C	C	D	F	F	B	B	A	C	C	C	28.5	C	

TABLE III.E.2

Figures III.E.1 and III.E.2 show the 2030 No-Build LOS for the corridor:



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS



Date: May 27, 2009 - 8:59am - 8:59am
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St. Francis Drive Corridor Study

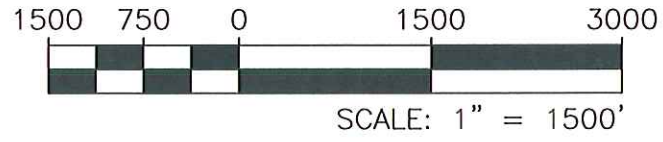
NM - 084 - 2(12) 161



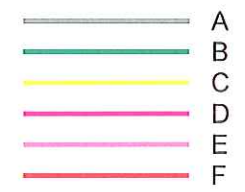
EXISTING / HORIZON YEAR ANALYSIS
 2030 CONDITIONS - NO-BUILD CONDITION
 ROADWAY AND INTERSECTION LEVELS OF SERVICE (LOS) AM PEAK HOUR

Date
5/2009

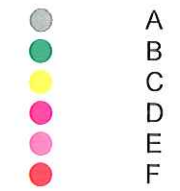
Figure
III.E.1



ROADWAY SEGMENT LOS



SIGNALIZED INTERSECTION LOS



Date: May 27, 2009 - 8:56am
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 User: L...
 Plotter: HPGL
 Scale: 1" = 1500'
 Plot Size: 11x17



St. Francis Drive Corridor Study
 NM-084-2(12)161 CN D5SF3
 EXISTING / HORIZON YEAR ANALYSIS
 2030 CONDITIONS - NO-BUILD CONDITION
 ROADWAY AND INTERSECTION LEVELS OF SERVICE (LOS0 PM PEAK HOUR)

Date: 5/2009
 Figure: III.E.2

III.F – 2030 BUILD CONDITION OPERATIONAL ANALYSIS

The 2030 no-build operational analysis identified intersections, individual intersection movements and roadway segments that will operate at deficient LOS (E or F).

Intersections that have overall deficient LOS:

- St. Francis Drive at Sawmill Road: LOS F in PM Peak
- St. Francis Drive at Zia Road: LOS F in AM Peak, LOS E in PM Peak

Deficient individual intersection movements (LOS E or F):

St. Francis Dr. at Sawmill Rd:

- AM - NB left turns
- PM - EB through and right turns, NB left turns, SB through

St. Francis Dr. at Zia Rd:

- AM - EB through and right turn, NB through
- PM - SB left turns, SB through

St. Francis Dr. at Siringo Rd:

- AM - NB left turns
- PM - SB through

St. Francis Dr. at W. San Mateo Rd:

- PM - WB through

St. Francis Dr. at Cordova Rd:

- PM - WB left turns

St. Francis Dr. at Cerrillos Rd:

- AM - NB right turns, SB through
- PM - EB left turns

St. Francis Dr. at Alameda St:

- PM - SB through, SB right turns

St. Francis Dr. at Paseo de Peralta (N):

- PM - EB through

St. Francis Dr. at Alamo Dr:

- AM - EB through, EB right turns
- PM - EB left turns, WB through, WB right turns

Based on the above deficiencies, several potential improvements have been identified for St. Francis Drive. These include:

- optimization of the City of Santa Fe signal timing plans
- roundabouts on St. Francis Drive at Alamo Drive and at Sawmill Road
- grade separation (underpass) of St. Francis Drive at Cerrillos Road
- intersection improvements at locations where LOS is unacceptable, such as signal timing modifications, additional turn lanes, or lengthening turn lane storage

Optimization of the City of Santa Fe Signal Timing Plans

This option is by far the most cost effective of all the possible alternatives. We have conducted a Synchro analysis of the signalized intersections along the corridor using an optimized version of the City of Santa Fe's signal timing plan for the AM and PM peak hours (the results are shown in Table III.F.1). The Synchro runs for this scenario are located in Appendix E – Optimized Traffic Signal Timings.

The signal timing optimization shows marginal improvements in intersection delays; however, it does not significantly affect the LOS for the signalized intersections. The LOS between 2030 conditions with the City's existing timing plan and the optimized plan is compared in Table III.F.2. Optimization of signal timings can sometimes allow for increased LOS for mainline improvements at the expense of side street or mainline left turn demands. – at several intersections, the LOS for the mainline improvements improve but the side street LOS decreases to the point that the overall intersection delay and LOS are worsened.

Effective traffic signal timing optimization is an ongoing effort and should be conducted on a periodic basis, so that changing traffic conditions can be accounted for.

**SIGNALIZED INTERSECTION OPERATIONS ANALYSIS SUMMARY - 2030 Horizon Year Volumes
OPTIMIZED TRAFFIC SIGNAL TIMINGS**

INTERSECTION	PEAK PERIOD	MAXIMUM V/C RATIO	LEVEL OF SERVICE & DELAY BY APPROACH MOVEMENT												INTERSECTION				
			EB			WB			NB			SB			DELAY (sec/veh)	LOS			
			L	T	R	L	T	R	L	T	R	L	T	R					
St. Francis Dr. at Sawmill Road	AM	1.02	F	B	B		D	D	B		D	D	A		B	C	A	35.5	D
	PM	1.44	E	F	F		E	E	B		F	B	A		B	F	C	80.0+	F
St. Francis Dr. at West Zia Road	AM	1.26	F	E	E		E	E	F		D	F	A		F	D	A	78.0	E
	PM	1.01	F	E	E		F	F	B		E	C	A		E	D	B	42.3	D
St. Francis Dr. at Siringo Road	AM	1.01	C	D	B		C	D	B		E	D	A		B	C	B	35.5	D
	PM	0.99	C	D	E		D	D	B		F	C	A		D	D	B	34.2	C
St. Francis Dr. at West San Mateo Road	AM	0.96	D	D	B		C	D	B		B	D	D		C	B	B	30.4	C
	PM	0.94	D	D	C		D	E	B		C	B	B		B	D	D	29.5	C
St. Francis Dr. at Alta Vista St.	AM	0.74	C	D	B		C	C	C		B	B	B		B	B	A	17.4	B
	PM	0.84	C	D	B		D	C	C		B	D	D		C	C	A	28.5	C
St. Francis Dr. at West Cordova Road	AM	0.87	C	D	B		D	C	A		C	C	C		C	B	B	24.8	C
	PM	1.05	C	D	D		F	C	A		C	C	C		D	C	C	29.6	C
St. Francis Dr. at Cerrillos Road	AM	1.00	E	E	E		D	D	D		-	B	D		-	D	B	39.0	D
	PM	1.17	F	D	D		E	E	E		-	C	B		-	C	A	44.6	D
St. Francis Dr. at Hickox St./PdP (South)	AM	0.84	C	D	D		C	C	C		B	C	C		B	C	C	26.2	C
	PM	0.98	E	D	D		C	E	E		C	D	D		B	C	C	33.4	C
St. Francis Dr. at Agua Fria St.	AM	0.86	D	D	D		C	D	D		A	B	B		A	C	C	21.4	C
	PM	0.92	D	D	D		C	E	E		C	B	B		B	C	C	26.6	C
St. Francis Dr. at West Alameda St.	AM	0.88	E	D	A		C	E	B		D	B	B		A	C	C	25.7	C
	PM	0.96	E	D	B		D	F	B		D	C	C		A	C	C	32.5	C
St. Francis Dr. at Paseo de Peralta (North)	AM	0.93	D	D	D		D	B	A		B	C	A		A	A	B	24.1	C
	PM	0.97	F	F	C		E	C	A		B	C	A		B	C	C	32.4	C
St. Francis Dr. at Alamo Drive	AM	0.95	B	D	D		C	B	B		C	B	A		C	C	C	26.3	C
	PM	0.94	C	A	A		B	D	D		D	B	A		B	B	B	22.8	C

TABLE III.F.1

St. Francis Drive Corridor Segment 2030 Horizon Year	2030 Conditions City Timings		2030 Conditions Optimized	
	AM	PM	AM	PM
Sawmill Road	C	F	D	F
West Zia Road	F	E	E	D
Siringo Road	C	D	D	C
West San Mateo Road	C	B	C	C
Alta Vista Street	B	C	B	C
West Cordova Road	C	C	C	C
Cerrillos Road	D	D	D	D
Hickox Street	C	C	C	C
Agua Fria Street	C	C	C	C
West Alameda Street	C	D	C	C
Paseo de Peralta (N)	C	C	C	C
Alamo Drive	D	C	C	C

TABLE III.F.2

Improvements to Deficient Individual Movements at Intersections:

The optimized signal timings reveal deficient individual movements at several intersections during either the AM or PM peak hour, or in some cases during both peak periods, as shown on Table III.F.1. In order to achieve acceptable LOS (D or better) at these movements, intersection improvements are required; in most instances, the improvements involve construction of additional lanes to improve capacity.

As shown in Table III.F.2, the two worst intersections are Sawmill Road at St. Francis Drive and West Zia Road at St. Francis Drive. These two intersections present the most challenges to establish acceptable individual movement LOS. Improvements to intersections with at least one deficient movement are summarized below:

Sawmill Road at St. Francis Drive:

The PM peak hour is projected to have several movements with deficient LOS; to achieve acceptable LOS at this intersection the following improvements are needed:

- EB left turns: even with the addition of a third left turn lane, LOS remains at F
- EB through: signal timing improvements improves LOS from F to D

- EB right turns: addition of exclusive right turn lane improves LOS from F to D
- WB left turns/WB through: these movements have little traffic, and remain at LOS E because of majority of cycle length is assigned to major intersection movements
- NB left turns: adding a second left turn lane improves LOS from F to E
- SB through: construction of additional (fourth) through lane improves LOS for this movement from F to D

Although there are still deficient movements, the overall intersection LOS for the Sawmill Road/St. Francis Drive intersection improves considerably in the PM peak, from F to D. Overall intersection delay also improves, from 80.0+ to 38.7 seconds.

Zia Road at St. Francis Drive:

Both the AM and PM peak hours will have several movements with deficient LOS; to achieve acceptable LOS at this intersection the following improvements are needed:

- EB left turns: even with the addition of a third left turn lane, the LOS only improves to E in AM peak (it improves from F to D in PM peak). The AM peak hour has a very heavy left turn movement with 580 vehicles
- EB through: adding a third through lane improves this movement LOS from E to C in both the AM and PM peak hours
- WB left turns: construction of a third left turn lane improves LOS in the AM peak hour from E to D, and in the PM peak hour from F to D
- WB through: signal timing adjustments improve LOS from E to D in the AM peak hour and from F to D in PM peak hour
- NB left turns: signal timing adjustments improve LOS from E to D in the PM peak hour
- NB through: addition of a fourth through lane improves the LOS from F to C in the AM peak hour
- SB left turns: signal timing adjustments/other intersection improvements results in LOS improving from F to B in the AM peak hour and from E to D in the PM peak hour

With the above improvements, overall intersection LOS in the AM peak hour decreases from E to D and intersection delay improves from 78.0 seconds to 38.4 seconds. During the PM peak hour, the intersection LOS improves from D to C and overall intersection delay decreases from 42.3 to 26.6 seconds.

Siringo Road at St. Francis Drive:

To achieve acceptable LOS at the deficient movements at this intersection, the following improvements are needed:

- WB right turns: construct an additional right turn lane (improves LOS from E to B during PM peak)
- NB left turns: construct an additional left turn lane (improves LOS from F to B in PM peak and from E to B in AM peak)

Intersection LOS is acceptable in both AM and PM peak hours.

West San Mateo Road at St. Francis Drive:

The WB through movement during the PM peak hour is projected to have a deficient LOS; to achieve acceptable LOS for this movement, construction or re-striping of a second through lane would result in LOS improving from E to D.

Cordova Road at St. Francis Drive:

The WB left turn movement during the PM peak hour is projected to have a deficient LOS; to achieve acceptable LOS for this movement, construction or re-striping of a second left-turn lane would result in LOS improving from F to C.

Cerrillos Road at St. Francis Drive:

Both the AM and PM peak hours are projected to have several movements with deficient LOS; to achieve acceptable LOS at this intersection the following improvements are needed:

- EB left turns: construction of a third left turn lane improves AM peak hour LOS from E to D and PM peak hour LOS from F to D
- EB through/right turns: construction of a third EB through lane improves AM peak hour LOS from E to D
- WB left turns: construction of a third left turn lane improves AM peak hour LOS from E to D
- WB through/right turns: construction of additional (third) through lane improves AM peak hour LOS from E to C

Also, these improvements result in overall intersection LOS improving from D to C during both AM and PM peak hours.

Hickox Street at St. Francis Drive:

The PM peak hour is projected to have several movements with deficient LOS; to achieve acceptable LOS at this intersection the following improvements are needed:

- EB left turns: re-striping of a second left turn lane improves PM peak hour LOS from E to C
- WB through and right turns: re-striping of a second through lane improves to PM peak hour LOS from E to C

Agua Fria Street at St. Francis Drive:

During the PM peak hour, the WB through and right turn movements are projected to have deficient LOS; to achieve acceptable LOS for these movements, the construction/re-striping of a second through lane results in these movements improving from LOS E to LOS C.

Alameda Street at St. Francis Drive:

The EB left turn and WB through movements will deficient LOS during the AM and PM peak periods; to achieve acceptable LOS the following improvements are needed:

- EB left turns: construction or re-striping of a second left turn lane improves the LOS for this movement from E to C during both the AM and PM peak hours
- WB through: construction or re-striping of a second WB through lane improves the LOS for this movement from E to D for both the AM and PM peak hours

Paseo de Peralta (North) at St. Francis Drive:

The PM peak hour is projected to have movements with deficient LOS; to achieve acceptable LOS at for these movements the following improvements are needed:

- EB left turns: the addition of a second through lane improves PM peak hour LOS from F to D for EB left turns, since currently the left-through turns have a shared lane.
- EB through: the addition of a second through lane improves PM peak hour LOS from F to D
- WB left turns: the addition of a third left turn lane improves the LOS from F to D (this intersection has a very high PM peak hour volumes of 540 vehicles)

Roundabouts on St. Francis Drive at Alamo Drive and at Sawmill Road:

HDR has conducted an aaSIDRA analysis for two intersections along the St. Francis Drive corridor: Alamo Drive and Sawmill Road. The roundabouts were designed with three circulating lanes, and three entering lanes from St. Francis Drive. Using these design parameters, the analysis showed that due to the very heavy volumes for northbound St. Francis Drive at Sawmill Road, the roundabout would operate at LOS D. The roundabout on St. Francis Drive at Alamo Drive would operate at LOS A. The construction of roundabouts requires considerable right-of-way availability; these two intersections appear to have sufficient right-of-way but in order for them to be considered, the issue of adequate right-of-way must be resolved.

A roundabout analysis for both intersections was performed with two circulating lanes instead of three. At the Alamo Drive intersection a two-lane roundabout still would operate at LOS A; however, a two-lane roundabout at the Sawmill/St. Francis intersection would operate at LOS F due to the very heavy PM peak volumes on St. Francis Drive. The aaSIDRA output files are located in Appendix F – aaSIDRA Roundabout Analysis.

Grade separation of St. Francis Drive at Cerrillos Road:

This option involves reconstructing St. Francis Drive as an underpass below Cerrillos Road. This is the most logical method to grade separate this intersection, due to the fact that the Rail Runner tracks cross more parallel to Cerrillos Road. A grade separation at this intersection would allow for greatly improved LOS at this intersection, since conflicting movements would be removed and both streets would have uninterrupted traffic flow - there would be no left-turns and only the right turns would be controlled. The grade separation essentially results in the intersection becoming an interchange.

Intersection improvements at locations where LOS is unacceptable, such as signal timing modifications, additional turn lanes, or lengthening turn lane storage:

The two intersections in the St. Francis Drive corridor that have the most deficient LOS are Sawmill Road and West Zia Road. In addition, the intersection of St. Francis Drive at Cerrillos Road has an LOS of D in both peak hours, but has almost high enough intersection delay to reach LOS E. There have been several different ideas discussed to alleviate the deficient LOS at these intersections:

- a roundabout analysis for the St. Francis Drive/Sawmill intersection shows that the LOS could improve from LOS to LOS D in the PM peak hour

- the St. Francis Drive/West Zia Road intersection has been considered for an interchange; removing the traffic signal and conflicting movements would allow for much improved LOS at that location during both peak hours
- as discussed previously, the St. Francis Drive/Cerrillos Road intersection has been considered for grade separation, resulting in much improved LOS

The remaining signalized intersections within the corridor have overall LOS of D or better for both the AM and PM peak hours, as shown previously in Table III.F.2, although there are individual movements which have substandard LOS of E (other than the three intersections listed above, there are no individual movements that have LOS F. In some cases, the substandard movements are on the side streets, and likely the result of the coordinated traffic signal plan that the City of Santa Fe has in place; however, some of the deficient movements are on the mainline.

III.F.1 REMOVAL OF THRU LANE FOR EACH DIRECTION OF ST. FRANCIS DRIVE (2-LANE SCENARIO)

Under a two-lane scenario, queuing of traffic on St. Francis Drive and the side streets becomes an additional concern. A Synchro analysis (included in Appendix G – 2-Lane Queuing analysis) was performed to determine the level of queuing for through movements for all approaches that occurs under 2030 conditions, during the PM peak. The 95th queue length was determined: the results are shown below on Table III.F.3:

QUEUE LENGTHS BY APPROACH				
Intersections with St. Francis Drive	2030 Projected Volumes – PM Peak Hour Queue Lengths (by Approach)			
	NB	SB	EB	WB
Sawmill Road	408	1132 #	745 #	53
West Zia Road	839 #	1202 #	123	147
Siringo Road	843 #	1072 #	121	158
West San Mateo Street	62	908 #	118	149
Alta Vista Street	1171 #	1035 #	127	215
Cordova Road	607 #	994 #	141	128
Cerrillos Road	814 #	444 #	196	191
Hickox Street	854 #	252	22	321 #
Agua Fria Street	714 #	801 #	150	242
West Alameda Street	1123 #	1155 #	108	224
224Paseo de Peralta (North)	162	476	218 #	107
Alamo Drive	625	456 #	189	563 #

TABLE III.F.3

- 95th percentile volume exceeds capacity, queue may be longer

III.F.2 ANALYSIS OF GROWTH RATE REDUCTIONS

Two scenarios have been analyzed for the PM Peak Period (since PM peak times are usually worse than AM peak times) to determine the growth rate reductions that would allow for acceptable LOS (D or better) all intersections and individual intersection movements for the signalized intersections along St. Francis corridor, under 2030 conditions:

- maintain 3 lanes (existing)
- reduce number of thru lanes on St. Francis from 3 to 2

III.F.2.1 GROWTH RATE REDUCTION - MAINTAIN EXISTING CONDITIONS (3 LANES) ON ST. FRANCIS DRIVE CORRIDOR

This scenario evaluates what level of growth rate reduction would need to occur for St. Francis Drive to operate at acceptable LOS if the roadway remains at its current configuration of three lanes for each direction of travel.

As identified in Table III.E.2, two intersections along the St. Francis Drive corridor will operate at unacceptable LOS in the PM peak hour:

- Sawmill Road at St. Francis Drive will operate at LOS F
- West Zia Road at St. Francis will operate at LOS E

In order to achieve acceptable LOS (D or better) at these two locations, a growth rate reduction of 33% was required.

III.F.2.2 GROWTH RATE REDUCTION – REDUCED FROM 3 TO 2 LANES ON ST. FRANCIS CORRIDOR

This scenario uses the same analysis as the existing (three-lane) scenario, except that it assumes that St. Francis will be reduced down to two lanes for each direction of travel. The loss of the third through lane results in a much more significant growth rate reduction (50%) needed to attain acceptable LOS at the two previously identified intersections with unacceptable LOS. Table III.F.4 is a comparison of reduced growth factors between the existing and two-lane scenarios for St. Francis Drive. This table also includes project 2030 PM peak volumes for St. Francis Drive at Sawmill Road and at West Zia Road, as well as what the volumes would be with the growth rate reduction.

The Synchro runs for both of the growth rate reduction scenarios are located in Appendix H – Growth Rate Reduction Analysis.

GROWTH RATE COMPARISON – 2030 HORIZON YEAR				
St. Francis Drive	Existing (3 Lanes)		2 Lanes	
	Sawmill Rd.	W. Zia Rd.	Sawmill Rd.	W. Zia Rd.
Growth Rate Reduction Needed to Attain LOS D or Better	33%	33%	50%	50%
Projected 2030 PM Peak Volumes	5170	5380	5170	5380
Volumes with Growth Rate Reduction	3447	3587	2585	2690

TABLE III.F.4

III.F.3 ADDITIONAL LANE SCENARIO – 4 THROUGH LANES ON ST. FRANCIS CORRIDOR

Another alternative that has been considered is providing an additional lane for each direction of St. Francis Drive through the corridor (providing four through lanes on St. Francis Drive). A Synchro analysis has been completed for the signalized intersections under this scenario; the results are shown on Table III.F.5. The Synchro runs for this analysis are located in Appendix I – Four-Lane St. Francis Drive Analysis.

The additional through lane on St. Francis Drive results in decreased intersection delays at all of the signalized intersections. This decrease, in some cases, results in over intersection LOS being improved. At two locations, Sawmill Road and West Zia Road, the addition of a fourth through lane on St. Francis Drive did not improve the LOS to an acceptable level, even though the overall intersection delay decreased.

Also, the addition of a fourth through lane along the corridor would result in the need for additional right-of-way. This is not as much of an issue within the southern area of the corridor south of West San Mateo Road, but north of Alta Vista Street through much of the remainder of the corridor study area, right-of-way availability is a problem. In particular, the area of St. Francis Drive between Cerrillos Road and Alameda Drive has little to no room for additional lanes.

A comparison between 2030 LOS for the existing alignment of St. Francis Drive compared to the LOS with 4 lanes is shown in Table III.F.6:

**SIGNALIZED INTERSECTION OPERATIONS ANALYSIS SUMMARY - 2030 Horizon Year Volumes
WITH ADDITIONAL LANE ON ST. FRANCIS DRIVE (FOUR THROUGH LANES)**

INTERSECTION	PEAK PERIOD	MAXIMUM V/C RATIO	LEVEL OF SERVICE & DELAY BY APPROACH MOVEMENT												INTERSECTION	
			EB			WB			NB			SB			DELAY (sec/veh)	LOS
			L	T	R	L	T	R	L	T	R	L	T	R		
St. Francis Dr. at Sawmill Road	AM	1.00	D	B	B	D	D	B	E	C	A	B	A	A	24.4	C
	PM	1.43	D	F	F	D	D	B	F	B	A	A	F	A	80+	F
St. Francis Dr. at West Zia Road	AM	1.43	D	F	F	C	D	C	D	F	B	D	B	A	80+	F
	PM	0.99	D	D	D	D	D	A	D	C	A	E	C	C	31.6	C
St. Francis Dr. at Siringo Road	AM	1.04	C	D	B	C	D	B	D	C	A	B	A	A	19.5	B
	PM	0.86	C	D	D	C	D	B	D	C	A	D	B	A	22.5	C
St. Francis Dr. at West San Mateo Road	AM	0.84	D	D	B	D	D	B	E	A	A	D	A	A	12.0	B
	PM	0.74	D	D	B	D	E	B	D	A	A	B	A	A	12.3	B
St. Francis Dr. at Alta Vista St.	AM	0.63	C	D	B	C	C	C	C	A	A	D	A	A	10.8	B
	PM	0.69	C	D	B	D	C	C	B	B	B	D	A	A	15.1	B
St. Francis Dr. at West Cordova Road	AM	0.83	C	D	B	D	D	A	E	C	C	C	C	C	26.5	C
	PM	0.90	C	D	C	E	D	A	D	C	C	D	C	C	29.5	C
St. Francis Dr. at Cerrillos Road	AM	1.05	D	D	D	D	D	D	-	B	E	-	C	C	33.5	C
	PM	1.29	F	D	D	D	D	D	-	C	B	-	B	C	46.7	D
St. Francis Dr. at Hickox St./PdP (South)	AM	0.75	C	D	D	C	C	C	B	B	B	D	B	B	18.8	B
	PM	0.82	D	D	D	C	D	D	C	B	B	D	B	B	22.6	C
St. Francis Dr. at Agua Fria St.	AM	0.72	C	C	C	C	D	D	D	B	B	A	B	B	17.5	B
	PM	0.81	C	D	D	C	D	D	D	C	C	B	B	B	22.0	C
St. Francis Dr. at West Alameda St.	AM	0.83	D	D	A	C	D	B	D	B	B	A	C	C	19.7	B
	PM	0.90	C	D	A	C	D	B	D	B	B	B	C	C	26.8	C
St. Francis Dr. at Paseo de Peralta (North)	AM	0.76	D	D	C	D	B	A	D	B	A	A	B	B	20.1	C
	PM	0.77	E	E	C	D	C	A	D	B	A	C	B	B	20.7	C
St. Francis Dr. at Alamo Drive	AM	1.22	D	F	F	D	C	C	C	B	A	B	B	B	39.5	D
	PM	1.01	E	C	C	D	F	F	B	B	A	C	C	C	25.4	C

TABLE III.F.5

LOS COMPARISON – 3-LANES VS. 4 LANES ON ST. FRANCIS DRIVE				
St. Francis Drive Corridor Segment 2030 Horizon Year 4-Lane Alternative	Existing (3 Lanes)		4 Lane Alternative	
	AM	PM	AM	PM
Sawmill Road	C	F	C	F
West Zia Road	F	E	F	C
Siringo Road	C	D	B	C
West San Mateo Road	C	B	B	B
Alta Vista Street	B	C	B	B
West Cordova Road	C	C	C	C
Cerrillos Road	D	D	C	D
Hickox Street	C	C	B	C
Agua Fria Street	C	C	B	C
West Alameda Street	C	D	B	C
Paseo de Peralta (N)	C	C	C	C
Alamo Drive	D	C	D	C

TABLE III.F.6

Recommendations for improvements along the St. Francis Drive corridor will be discussed in further detail in the overall report.

IV: CRASH ANALYSIS

IV.A: CRASH ANALYSIS REQUIREMENTS AND DESCRIPTION

The purpose of collecting and analyzing historic traffic crash data for a project during consecutive periods is to identify possible crash patterns and to determine the probable causes of those crashes. The crash analysis includes patterns related to roadway conditions; time of day; weather conditions; type of crash; locations, i.e.: roadway, intersection, etc.; crash severity and driver characteristics.

Utilizing crash data also assists with determining expected values of a specific type of crash and ultimately identifying benefit costs and estimated Rate of Return (ROR) for improving roadway segments or intersection locations with the study boundary. These "estimated" ROR values should not be construed as "True" values, but more as approximated for planning purposes.

IV.B CRASH DATA

Crash data for 2003, 2004 and 2005 was requested from the NMDOT Traffic Safety Bureau. The crash reports can be found in Appendix J – Crash Analysis.

IV.C CRASH ANALYSIS AND RATE OF RETURN (ROR)

In order to create a comparison between crashes from one location to the other, crash rates are used. These rates are based on data such as traffic volume, length of road sections considered and period of time in years. Typical crash rate equations for intersections are rates per million of entering vehicles (RMEV) and for roadway segments are rates per 100 million vehicle miles (RMVM).

$$RMEV = \frac{C \times 1,000,000}{n \times 365 \times v}$$

$$RMVM = \frac{C \times 100,000,000}{n \times 365 \times l \times v}$$

where:

- R = Roadway Crash Rate per million entering vehicles (mev)
- C = Total Crashes in an n-year period
- n = year period of study (minimum 3 years)
- v = total entering volume in vehicles per day

Where:

- R = Roadway Crash Rate per 100,000,000 veh-mi
- C = Total Crashes in an n-year period
- n = year period of study (minimum 3 years)
- l = length of roadway in miles
- v = Average Daily Traffic (ADT) in vehicles per day

The New Mexico Department of Transportation (NMDOT) crash information presented yearly is based on a modified formula of the crash rate/100-million vehicle miles. Their reports show a crash rate (CR) = total crashes/100 MVM. It could be assumed that the state crash rate calculation is a derivation of a methodology typically used by the medical profession, where infection and mortality rates for various diseases are expressed in relation to population. This assumption can be made due to the inclusion of licensed drivers and population data in the crash summary report. Since the state crash rate is significantly higher than typical crash rate calculations, it can be concluded that comparing the state, county or city crash rates to the crash rates developed within this analysis will result in inconsistent comparisons due to the discriminating factors. Also noted, is that state crash rates are only calculated for roadway crashes (RMVM) not intersection crashes. An intersection crash may be included in a roadway crash, but are not provided in a separate calculation (RMEV). This analysis also includes a Critical Rate calculation for segment locations (C_{RI}). The critical rate analysis helps to identify locations or spots with observed crash rates higher than would be expected due to normal variation. The critical rate is calculated as follows:

$$C_{RI} = R_{AR} + k \times \text{sqrt}(R_{AR}/m) + 1/(2 \times m)$$

where:

R_{AR} = Average Roadway Crash Rate

k = statistical confidence level (typically 1.645 for $\alpha = 0.05$)

m = travel on a particular section in million vehicle miles

If R_{AR} is greater than C_{RI} , then the location should be investigated further for problems associated with geometric or environmental factors.

By far, the most common type of collision along the St. Francis Drive corridor was the rear-end accident. For the three year-accident analysis period, there were a total of 538 rear-end collisions for the years analyzed. Generally, this type of collision is the result of inattention of the part of the driver who rear-ends a vehicle in front of them, and they often occur within a relatively close distance to a controlled intersection. Some are caused by excessive speeding or other roadway conditions. This type of collision is typically hard to find solutions for.

It should be noted that some of the reported accidents did not list a specific location along St. Francis Drive. In those cases, because of the incomplete description of the accident location, such accidents could not be included in the analysis. Also, the reported accidents obtained for this analysis were along the St. Francis Drive corridor, and do not include intersection-related accidents that occurred on the side streets.

Table IV.C.1 shows the five-year accident history (2003 to 2007) at the twelve signalized intersections along the St. Francis Drive corridor:

ST. FRANCIS DRIVE INTERSECTION	2003 -2007 CRASHES		
	PDO	INJ	TOT
Sawmill Road	40	29	69
West Zia Road	60	32	92
Siringo Road	48	48	96
W. San Mateo Road	59	51	110
Alta Vista Street	53	28	81
West Cordova Road	53	39	92
Cerrillos Road	73	40	113
Hickox Street	31	20	51
Agua Fria Street	29	21	50
West Alameda Street	29	29	58
Paseo de Peralta (N)	22	12	34
Alamo Drive	22	15	37
TOTALS	519	364	883

TABLE IV.C.1

Table IV.C.2 illustrates the ranking of collisions at signalized intersections for the combined totals for the five-year period from 2003 to 2007:

RANKING	COLLISION FREQUENCY RANKINGS BY INTERSECTION	
	INTERSECTION	5-YEAR TOTAL ACC.
1	Cerrillos Road	113
2	West San Mateo Road	110
3	Siringo Road	96
4	West Zia Road	92
5	West Cordova Road	92
6	Alta Vista Street	81
7	Sawmill Road	69
8	West Alameda Street	58
9	Hickox Street	51
10	Agua Fria Street	50
11	Alamo Drive	37
12	Paseo de Peralta (N)	34
	TOTAL	883

TABLE IV.C.2

Of all the reported collisions on the St. Francis Drive corridor for the five-year period from 2003 to 2007, 883 occurred at the twelve signalized intersections. Table IV.C.3 shows the accident rates for each of the twelve signalized intersections along the corridor:

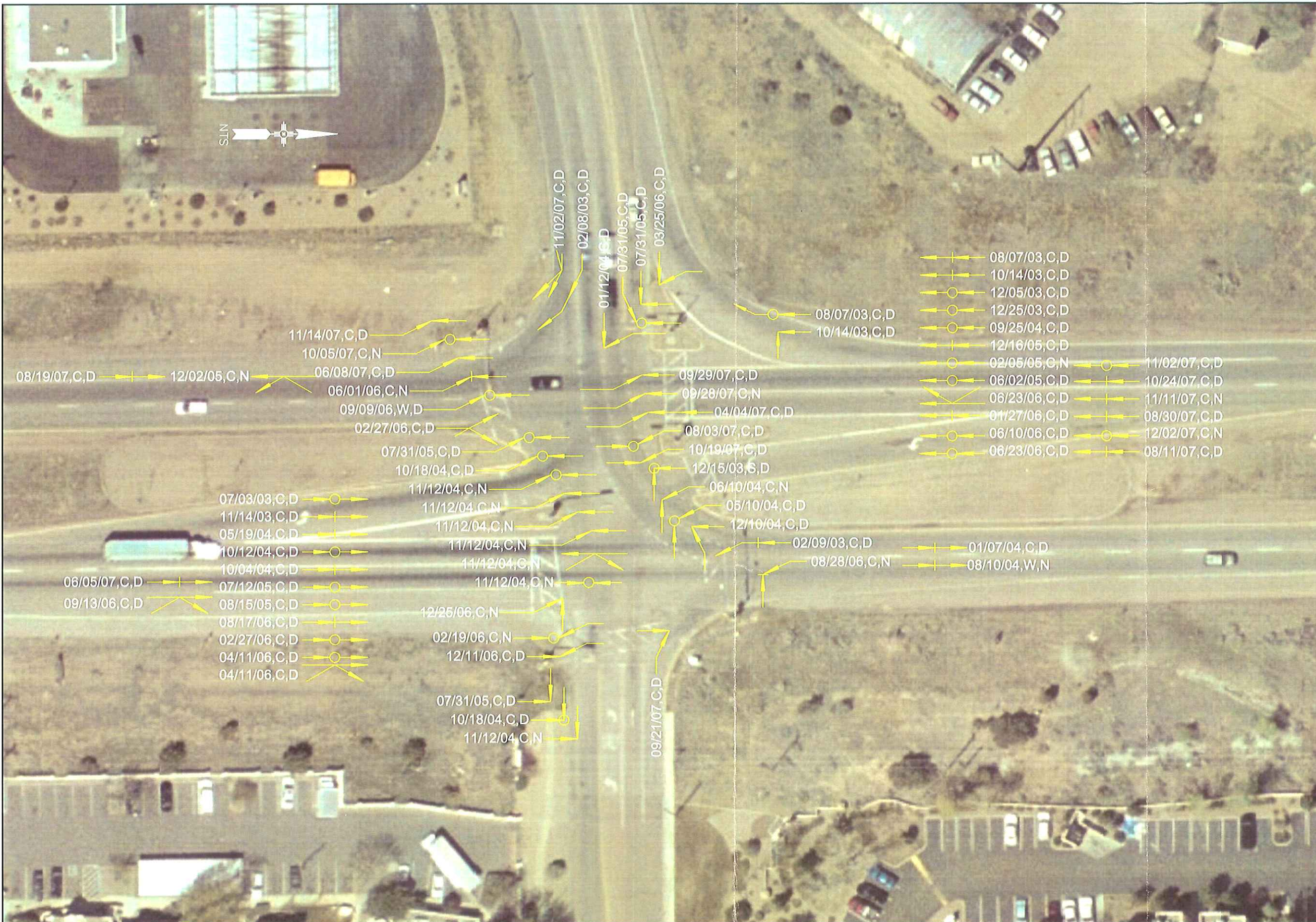
CRASH RATES FOR SIGNALIZED INTERSECTIONS

ST. FRANCIS DRIVE CORRIDOR		5-YEAR TOTAL ACC.	ACCIDENT RATE PER MILLION MILES
INTERSECTION WITH ST. FRANCIS DRIVE	ENTERING ADT FOR INTERSECTION		
Sawmill Road	39215	69	.964
West Zia Road	56138	92	.898
Siringo Road	53235	96	.988
West San Mateo Road	45372	110	1.328
Alta Vista Street	51134	81	.868
West Cordova Road	59008	92	.854
Cerrillos Road	72235	113	.857
Hickox St./Paseo de Peralta (S)	50679	51	.551
Agua Fria Street	53497	50	.512
West Alameda Street	54174	58	.587
Paseo de Peralta (North)	41915	34	.444
Alamo Drive	30074	37	.674

TABLE IV.C.3

Figure IV.C.1.1 to Figure IV.C.1.12 are collision diagrams for each of the twelve signalized intersections along the St. Francis Drive corridor. The intersection of Cerrillos Road at St. Francis Drive had 75 reported accidents over the five-year period.

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COLLISION DIAGRAM LEGEND

COLLISION TYPE

- ➔➔ REAR END
- ➔➔ HEAD ON
- ↙ ANGLE
- ↔ SIDESWIPE, OPPOSITE DIRECTION
- ↔ SIDESWIPE, SAME DIRECTION
- ⚡ OUT OF CONTROL
- } COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- ➔ AUTOMOBILE
- - - PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- ➔➔ PDO
- ➔➔ INJURY
- ➔➔ FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

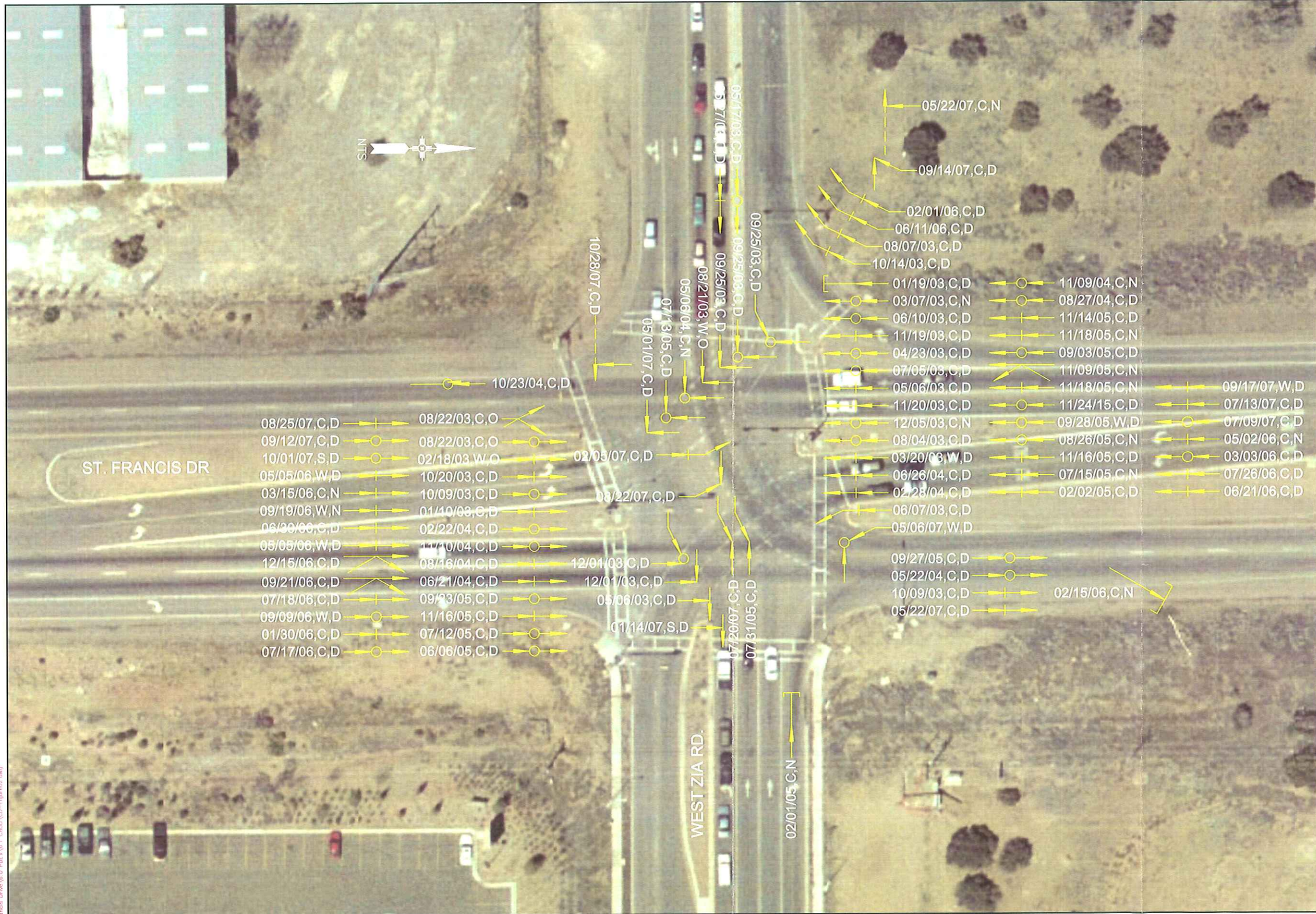
LIGHTING

- D DAY
- N NIGHT



St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 SAWMILL RD./ST. FRANCIS DR. COLLISION DIAGRAM

Date 5/2009
 Figure IV.C.1



COLLISION DIAGRAM LEGEND

COLLISION TYPE

- +→ REAR END
- HEAD ON
- ↙↘ ANGLE
- ↔ SIDESWIPE, OPPOSITE DIRECTION
- ↔ SIDESWIPE, SAME DIRECTION
- ⚡ OUT OF CONTROL
- } COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- AUTOMOBILE
- - - PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- +→ PDO
- INJURY
- FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

LIGHTING

- D DAY
- N NIGHT

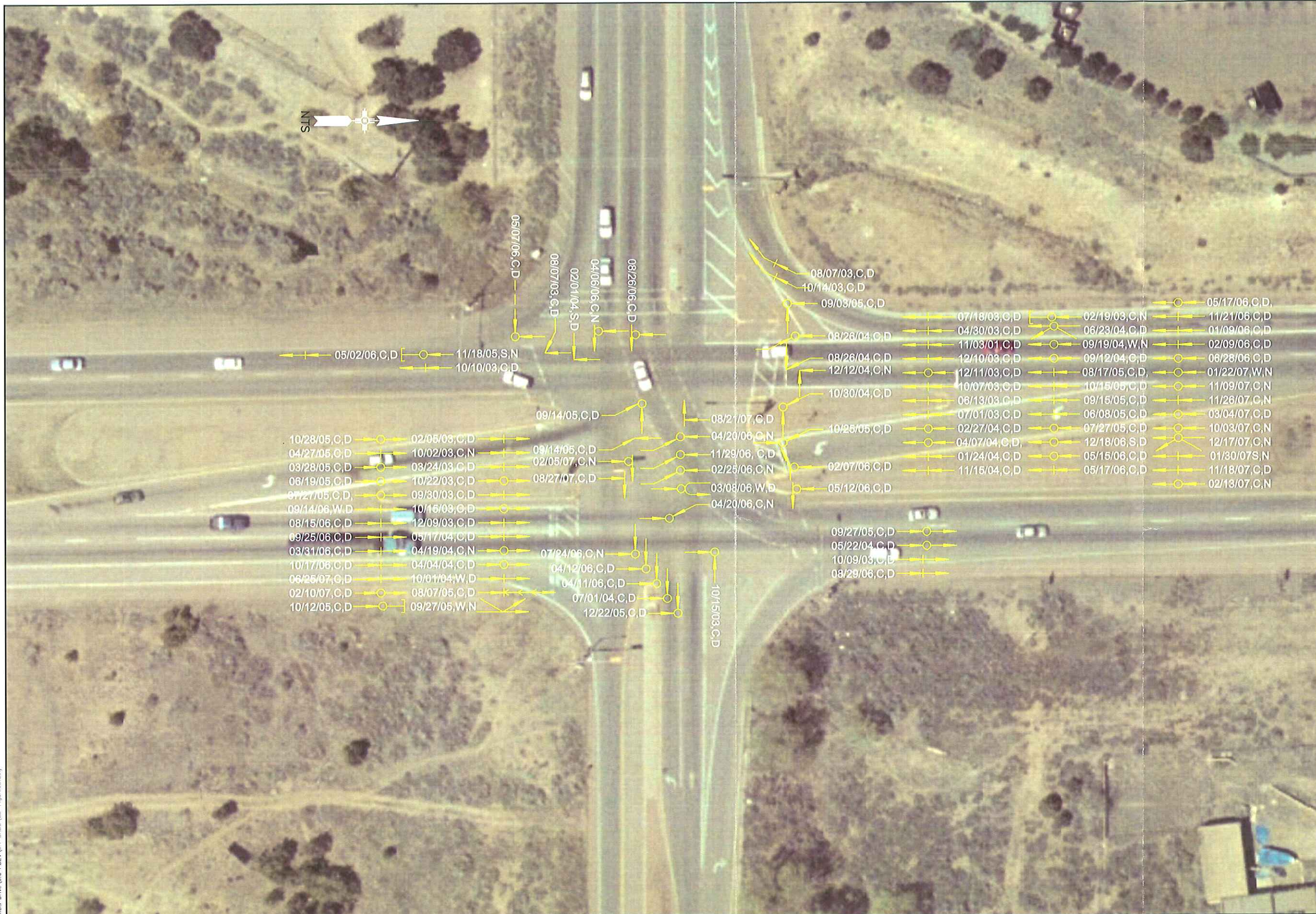
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St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 WEST ZIA RD./ST. FRANCIS DR. COLLISION DIAGRAM

Date 5/2009
 Figure IV.C.2

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COLLISION DIAGRAM LEGEND

COLLISION TYPE

- +→ REAR END
- ←→ HEAD ON
- ↙↘ ANGLE
- ↔ SIDESWIPE, OPPOSITE DIRECTION
- ↔ SIDESWIPE, SAME DIRECTION
- ~ OUT OF CONTROL
-] COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- AUTOMOBILE
- - - PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- +→ PDO
- INJURY
- FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

LIGHTING

- D DAY
- N NIGHT



St. Francis Drive Corridor Study
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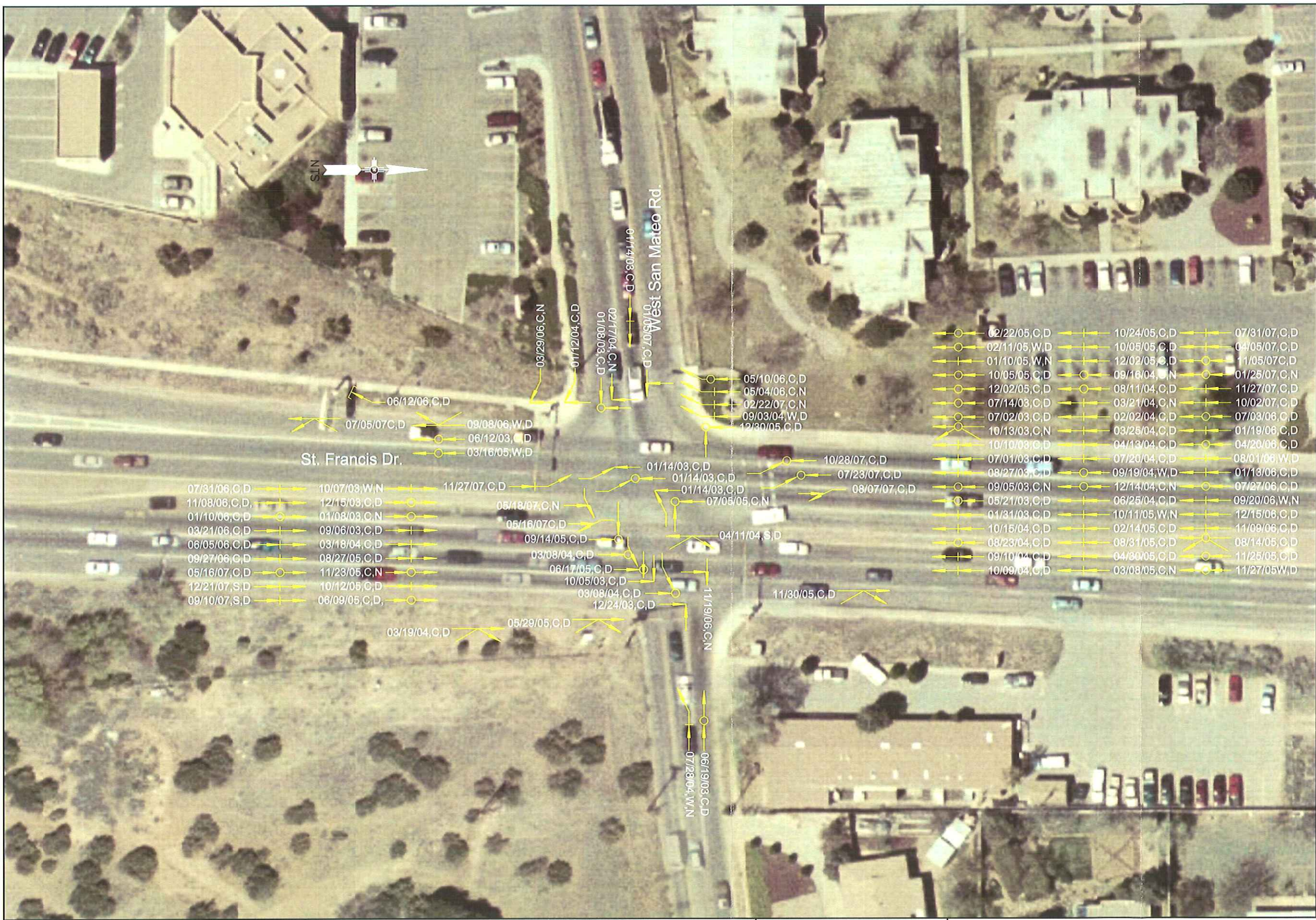
TRAFFIC ANALYSIS REPORT

SIRINGO/ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009

Figure: IV.C.3

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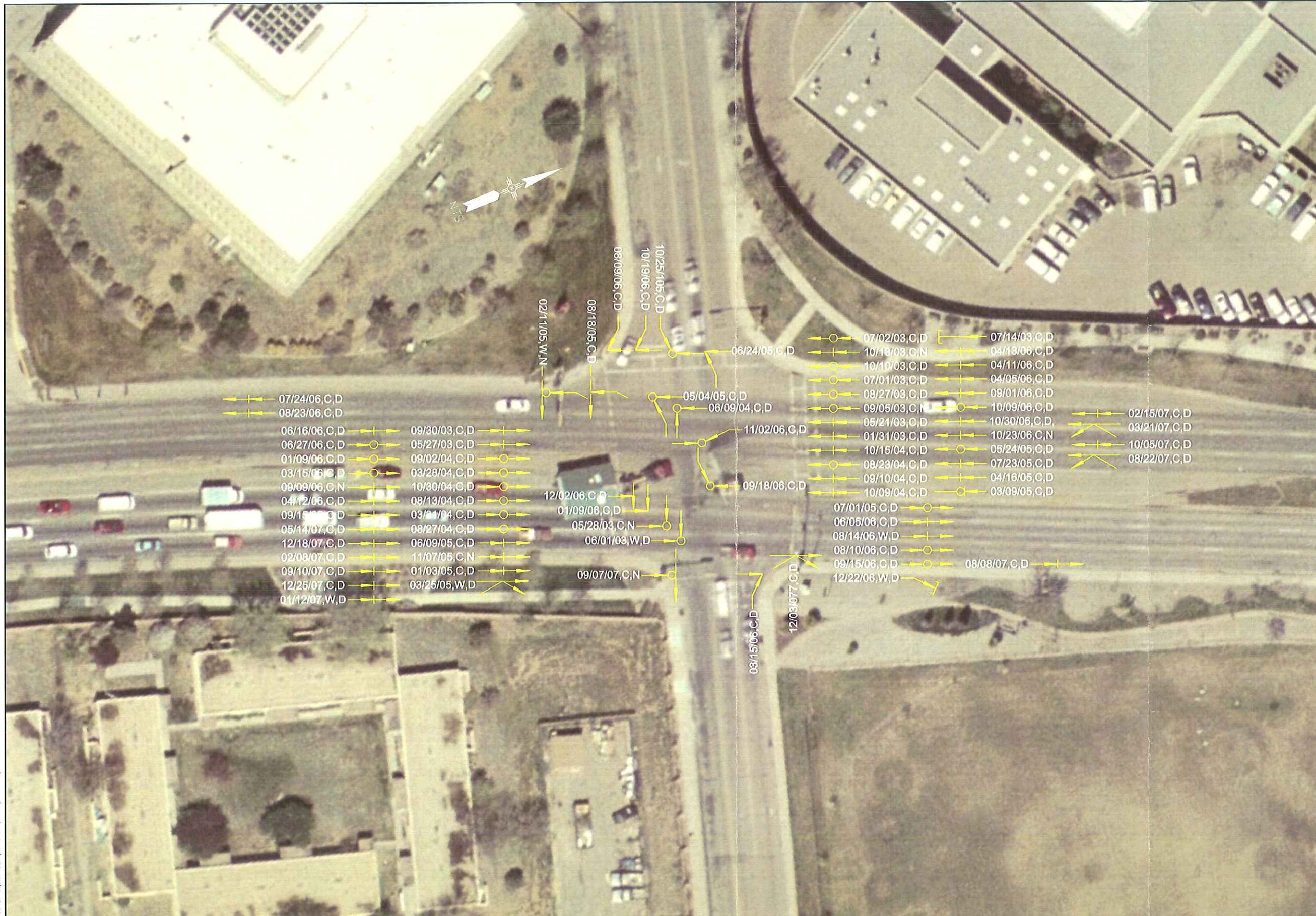
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COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT
VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED
VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING
SEVERITY	
	PDO
	INJURY
	FATAL
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY
LIGHTING	
D	DAY
N	NIGHT



St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 WEST SAN MATEO RD./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.4

Date: May 27, 2009 - 8:15am
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COLLISION DIAGRAM LEGEND

COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT

VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED

VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING

SEVERITY	
	PDO
	INJURY
	FATAL

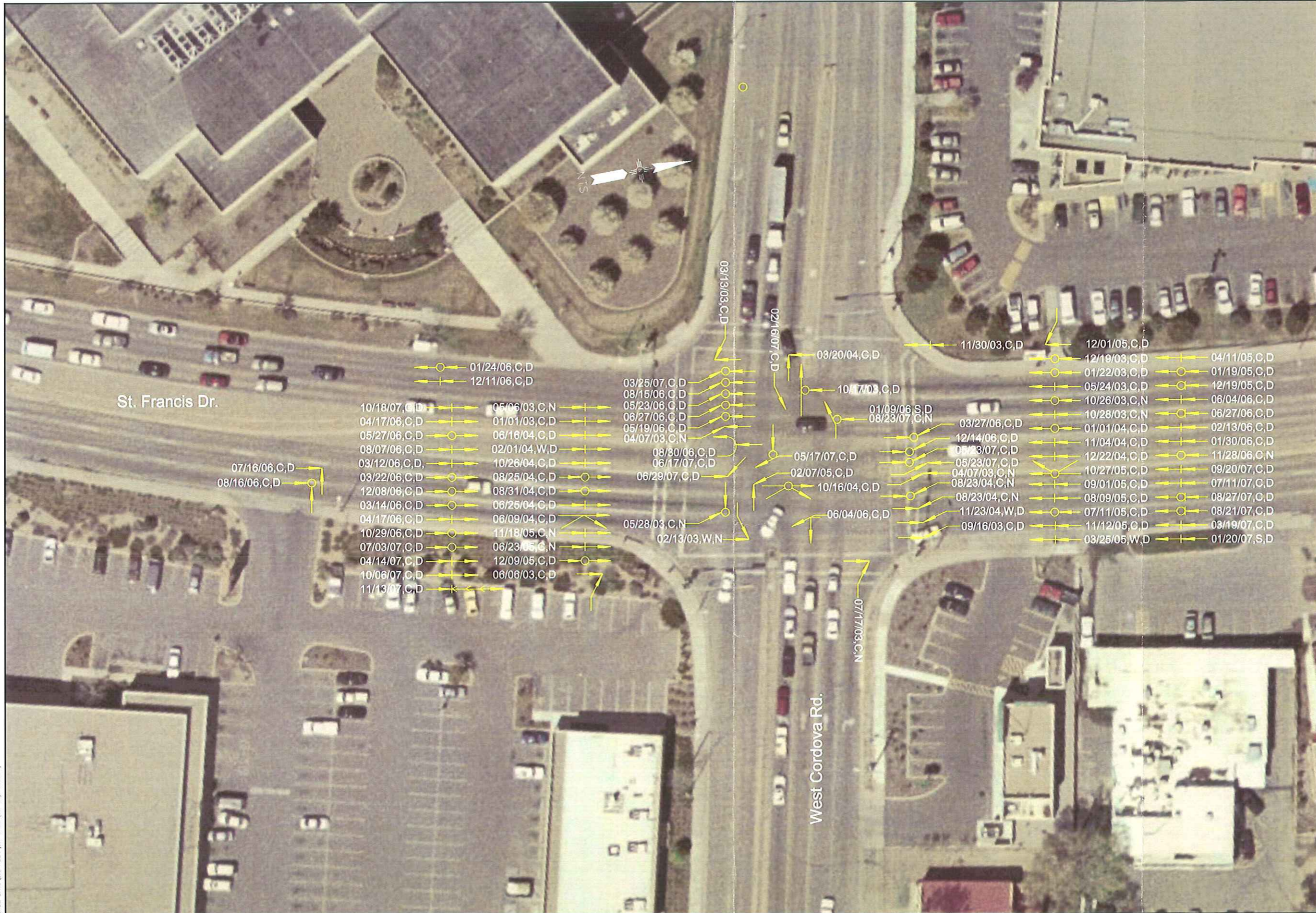
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY

LIGHTING	
D	DAY
N	NIGHT



St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 ALTA VISTA ST./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.5



COLLISION DIAGRAM LEGEND

COLLISION TYPE

- +→ REAR END
- ← HEAD ON
- ↙↘ ANGLE
- ↔ SIDESWIPE, OPPOSITE DIRECTION
- ↔ SIDESWIPE, SAME DIRECTION
- ⚡ OUT OF CONTROL
- } COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- AUTOMOBILE
- - - PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- +→ PDO
- INJURY
- FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

LIGHTING

- D DAY
- N NIGHT

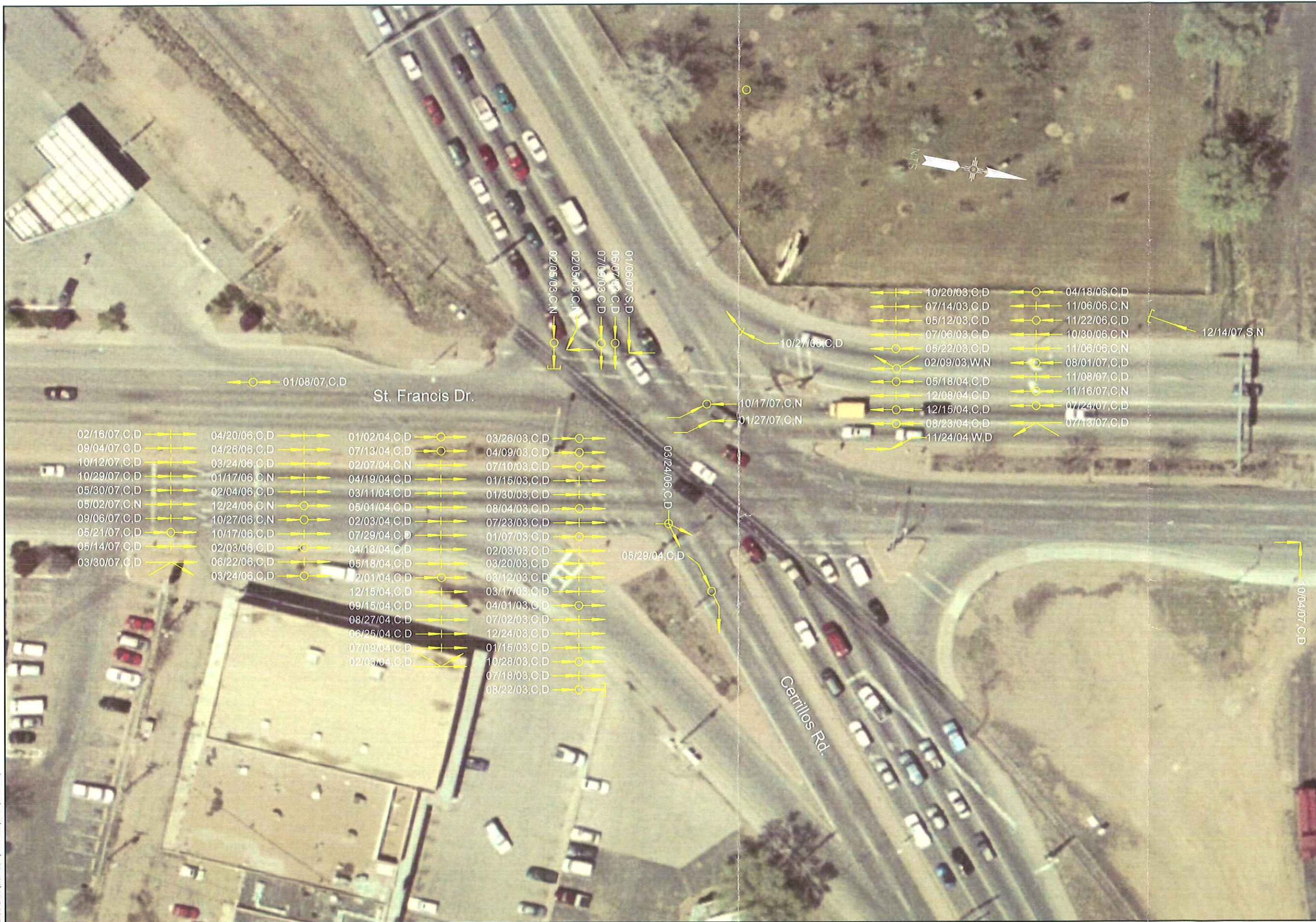
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 TRAFFIC ANALYSIS REPORT
 WEST CORDOVA RD/ST. FRANCIS DR. COLLISION DIAGRAM

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 Figure: IV.C.6

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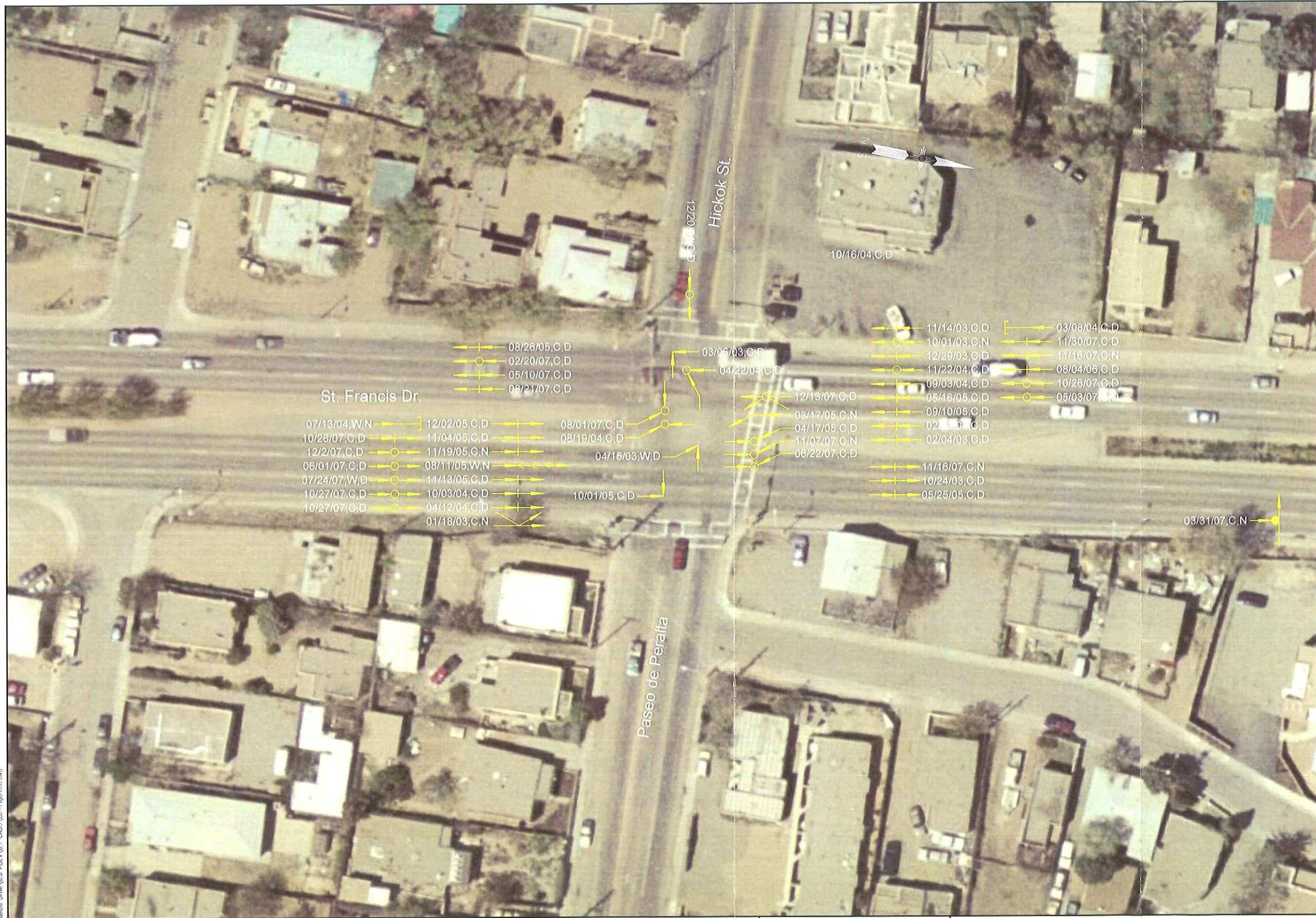
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COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT
VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED
VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING
SEVERITY	
	PDO
	INJURY
	FATAL
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY
LIGHTING	
D	DAY
N	NIGHT



St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161
 TRAFFIC ANALYSIS REPORT
 CERRILLOS RD./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.7

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COLLISION DIAGRAM LEGEND

COLLISION TYPE

- |→ REAR END
- ←|← HEAD ON
- ↙↘ ANGLE
- ↔ SIDESWIPE, OPPOSITE DIRECTION
- ↔ SIDESWIPE, SAME DIRECTION
- ~~~~~ OUT OF CONTROL
- } COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- AUTOMOBILE
- - -→ PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- |→ PDO
- INJURY
- FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

LIGHTING

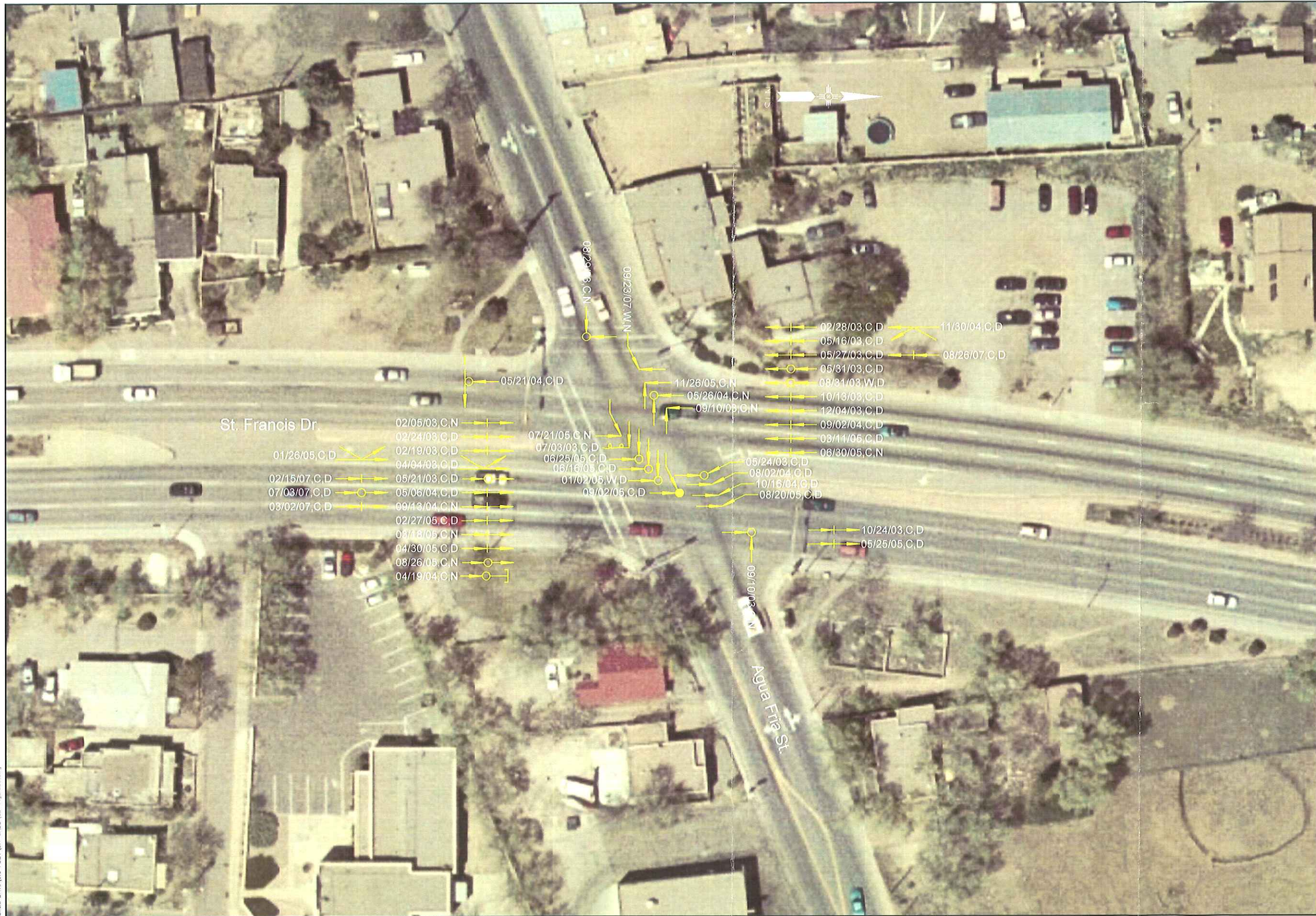
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- N NIGHT



St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 PASEO de PERALTA (S)/ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.8

Date: May 27, 2009 - 8:37am
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COLLISION DIAGRAM LEGEND

COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT

VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED

VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING

SEVERITY	
	PDO
	INJURY
	FATAL

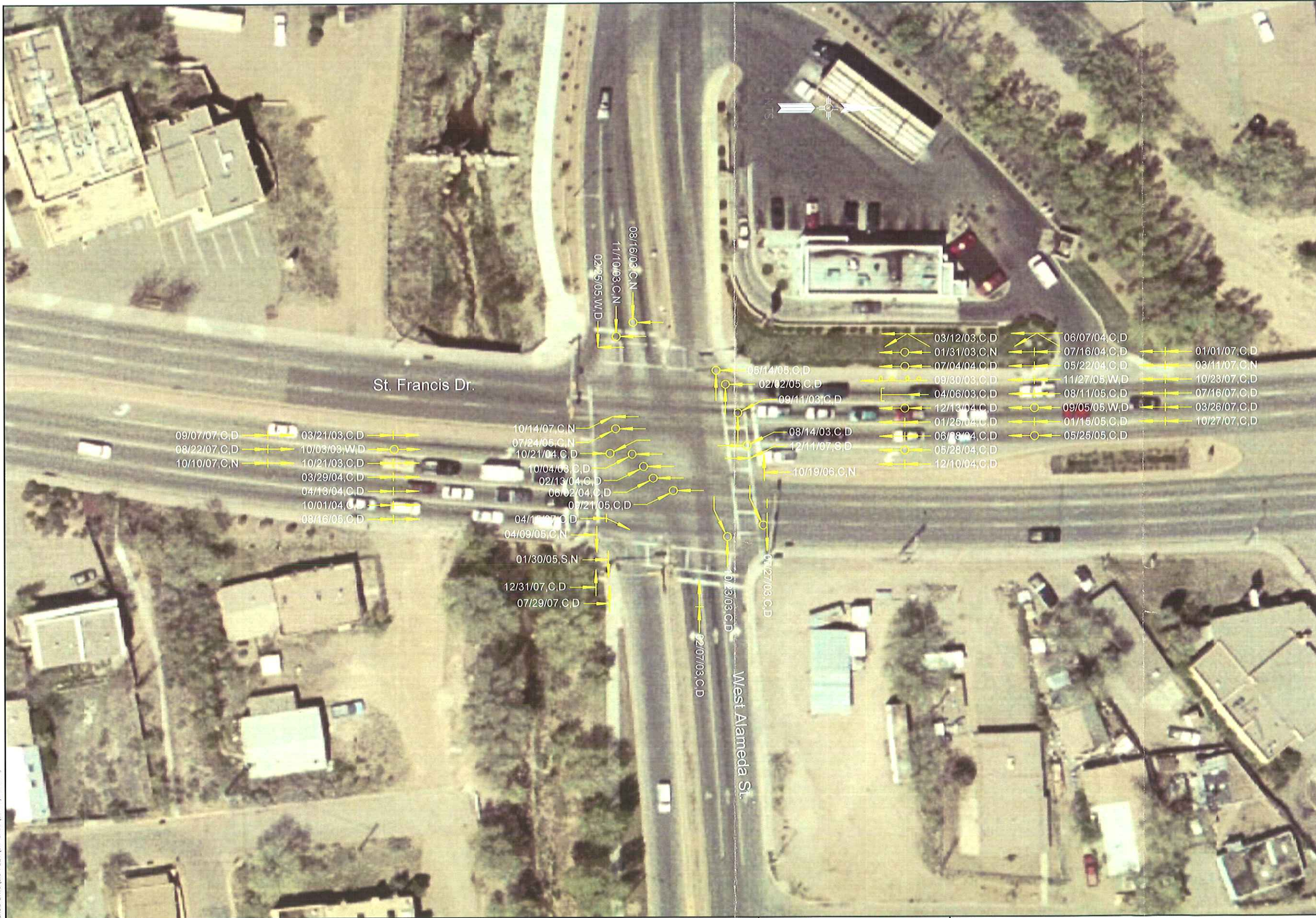
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY

LIGHTING	
D	DAY
N	NIGHT



St. Francis Drive Corridor Study
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 TRAFFIC ANALYSIS REPORT
 AGUA FRIA ST./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.9



COLLISION DIAGRAM LEGEND

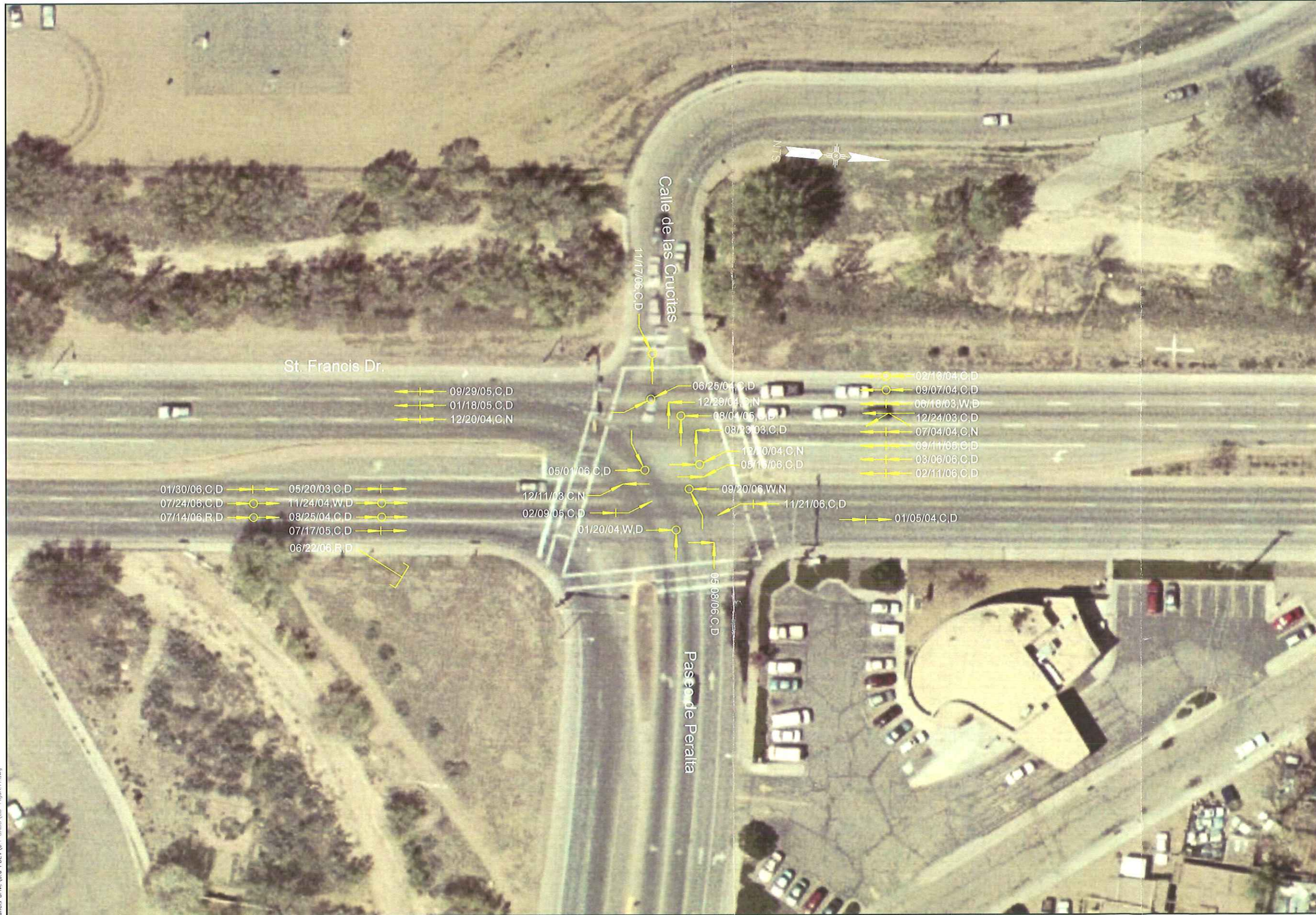
COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT
VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED
VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING
SEVERITY	
	PDO
	INJURY
	FATAL
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY
LIGHTING	
D	DAY
N	NIGHT

Date: May 27, 2009 - 8:32am
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St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN DS5F3
 TRAFFIC ANALYSIS REPORT
 WEST ALAMEDA ST./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.10



COLLISION DIAGRAM LEGEND

COLLISION TYPE

- +— REAR END
- >— HEAD ON
- └┘ ANGLE
- ↙↘ SIDESWIPE, OPPOSITE DIRECTION
- ↖↗ SIDESWIPE, SAME DIRECTION
- ⋯ OUT OF CONTROL
- } COLLISION WITH FIXED OBJECT

VEHICLE TYPE

- > AUTOMOBILE
- - -> PEDESTRIAN
- UNINVOLVED

VEHICLE MOVEMENT

- ↘ TURN (RT OR LT)
- ←←← BACKING

SEVERITY

- +— PDO
- INJURY
- FATAL

ROAD SURFACE

- C DRY, CLEAR
- W WET
- S SNOWY, ICY

LIGHTING

- D DAY
- N NIGHT

09/29/05,C,D 01/18/05,C,D 12/20/04,C,N

01/30/06,C,D 07/24/06,C,D 07/14/06,R,D

05/20/03,C,D 11/24/04,W,D 08/25/04,C,D 07/17/05,C,D 06/22/06,R,D

12/11/03,C,N 02/09/05,C,D 01/20/04,W,D

05/01/06,C,D 12/29/04,C,N 08/04/05,C,D 08/23/03,C,D 12/10/04,C,N 05/17/03,C,D

06/25/04,C,D 11/17/06,C,D

02/13/04,C,D 09/07/04,C,D 06/18/03,W,D 12/24/03,C,D 07/04/04,C,N 09/11/06,C,D 03/06/06,C,D 02/11/06,C,D

09/20/06,W,N 11/21/06,C,D 01/05/04,C,D

05/08/06,C,D

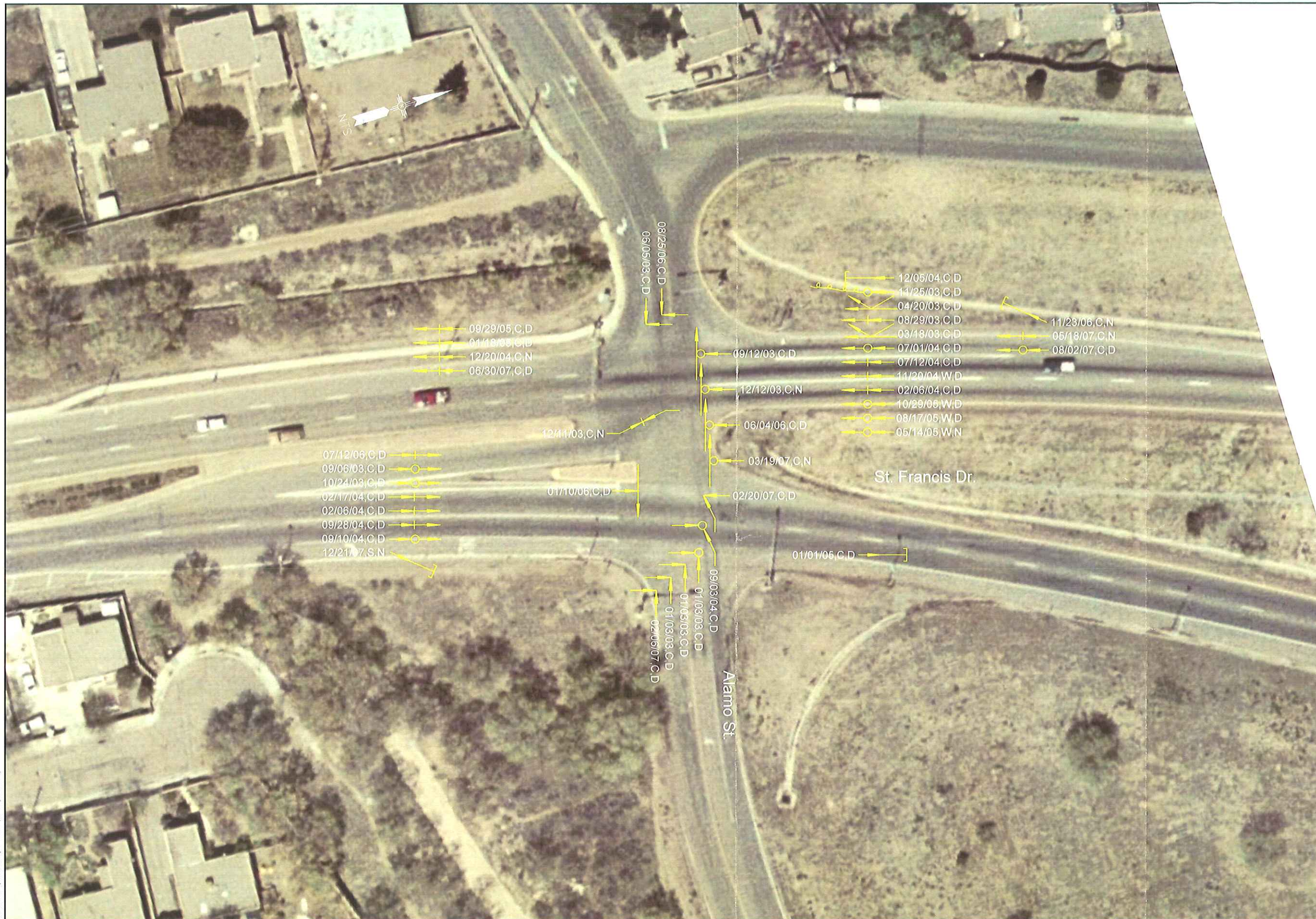
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St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN DS5F3
 TRAFFIC ANALYSIS REPORT
 PASEO de PERALTAS (N)/ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.11

Date: May 27, 2009 8:36am
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COLLISION DIAGRAM LEGEND

COLLISION TYPE	
	REAR END
	HEAD ON
	ANGLE
	SIDESWIPE, OPPOSITE DIRECTION
	SIDESWIPE, SAME DIRECTION
	OUT OF CONTROL
	COLLISION WITH FIXED OBJECT
VEHICLE TYPE	
	AUTOMOBILE
	PEDESTRIAN
	UNINVOLVED
VEHICLE MOVEMENT	
	TURN (RT OR LT)
	BACKING
SEVERITY	
	PDO
	INJURY
	FATAL
ROAD SURFACE	
C	DRY, CLEAR
W	WET
S	SNOWY, ICY
LIGHTING	
D	DAY
N	NIGHT



St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN DS5F3
 TRAFFIC ANALYSIS REPORT
 ALAMO ST./ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.12



The remaining 430 reported collisions along the St. Francis Drive corridor occurred at un-signalized intersections or mid-block segments between intersections. In order to more accurately pinpoint the mid-block areas, the collision totals are broken down into the five previously identified roadway segments along the St. Francis Drive corridor, as shown in Table IV.C.4:

FIVE-YEAR (2003 – 2007) ACCIDENT HISTORY AT UNSIGNALIZED INTERSECTIONS AND MID-BLOCK LOCATIONS						
ST. FRANCIS DR.	2003	2004	2005	2006	2007	5-YR TOTAL ACC.
ROADWAY SEGMENT	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	
Rabbit Rd. to W. San Mateo	23	42	26	25	30	146
W. San Mateo to Cerrillos	32	26	33	14	7	112
Cerrillos Rd. to PdP (North)	32	35	29	9	15	120
PdP (North) to Guadalupe	6	3	10	0	7	26
Guadalupe to NM 599	4	6	13	0	3	26
TOTALS	97	112	111	48	62	430

TABLE IV.C.4

Crash rates for mid-block areas are shown below in Table IV.C.5:

CRASH RATES FOR UNSIGNALIZED INTERSECTIONS AND MID-BLOCK LOCATIONS

Roadway Segment	Begin Intersection	End Intersection	Segment Length (Miles)	Number of Reported Crashes	Daily Entering Vehicles (VPD)	Crash Rate (Cr/100-MVM)
1	Rabbit Road	W. San Mateo Rd.	1.451	146	40165	137
2	W. San Mateo Rd.	Cerrillos Rd.	1.145	112	43534	123
3	Cerrillos Rd.	PdP (North)	.944	120	44341	157
4	PdP (North)	Guadalupe St.	.642	26	25502	87
5	Guadalupe St.	NM 599	1.036	26	36500	38

TABLE IV.C.5

The statewide crash rate for New Mexico is 148.0 accidents per 100 million vehicles miles. As shown in Table IV.C.5, the crash rates for the midblock segments of St. Francis Drive are mostly consistent with, or below.

Figures IV.C.13 through IV.C.16 are collision diagrams illustrating the midblock accidents along the full length of the St. Francis Drive corridor. Figures IV.C.17 through IV.C.19 describe the results of the crash analysis by type of collision, time of day, pavement conditions and weather conditions:



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St. Francis Drive Corridor Study

NM - 084 - 2(12) 161

CN DS5F3

TRAFFIC ANALYSIS REPORT
 ST. FRANCIS DR. COLLISION DIAGRAM

Date
 5/2009

Figure
 IV.C.13



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St. Francis Drive Corridor Study

NM-084-2(12)161

CN DS5F3

TRAFFIC ANALYSIS REPORT
 ST. FRANCIS DR. COLLISION DIAGRAM

Date
5/2009

Figure
IV.C.14B



Date: May 28, 2009 - 8:10am
 User: ageritas
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St. Francis Drive Corridor Study
 NM-084-2(12)161 CN DS5F3
 TRAFFIC ANALYSIS REPORT
 ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.14B



St. Francis Drive Corridor Study

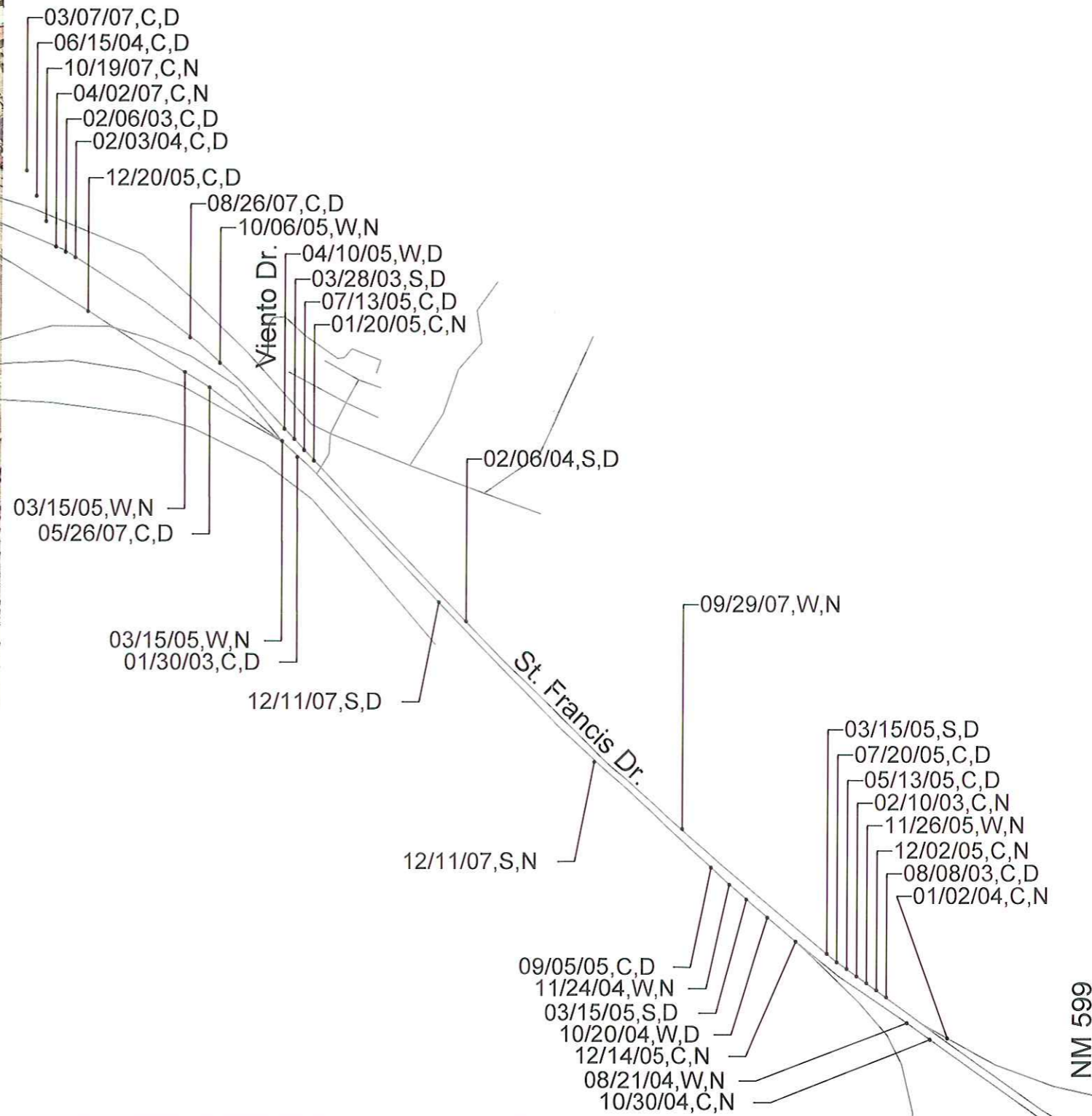
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CN DS5F3

TRAFFIC ANALYSIS REPORT
ST. FRANCIS DR. COLLISION DIAGRAM

Date
5/2009

Figure
IV.C.15



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St. Francis Drive Corridor Study
 NM - 084 - 2(12) 161 CN DS5F3
 TRAFFIC ANALYSIS REPORT
 ST. FRANCIS DR. COLLISION DIAGRAM

Date: 5/2009
 Figure: IV.C.16

NM 599

County: Santa Fe

Main Roadway: ST. FRANCIS DRIVE

Beginning MP: N/A

Ending MP: N/A

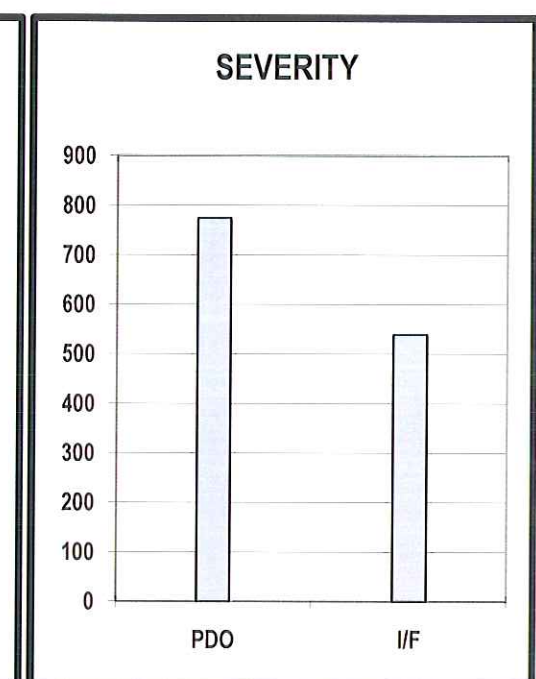
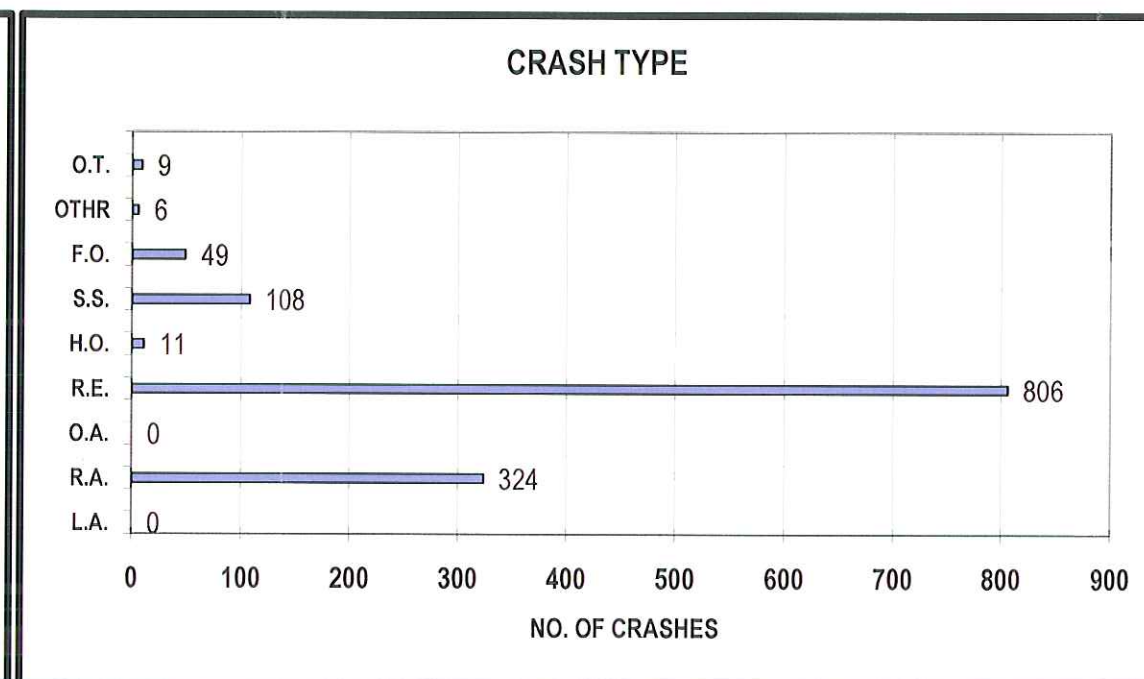
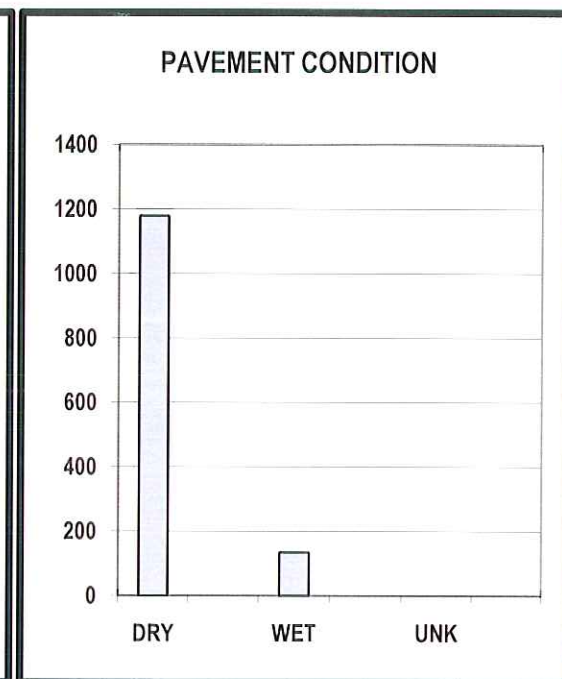
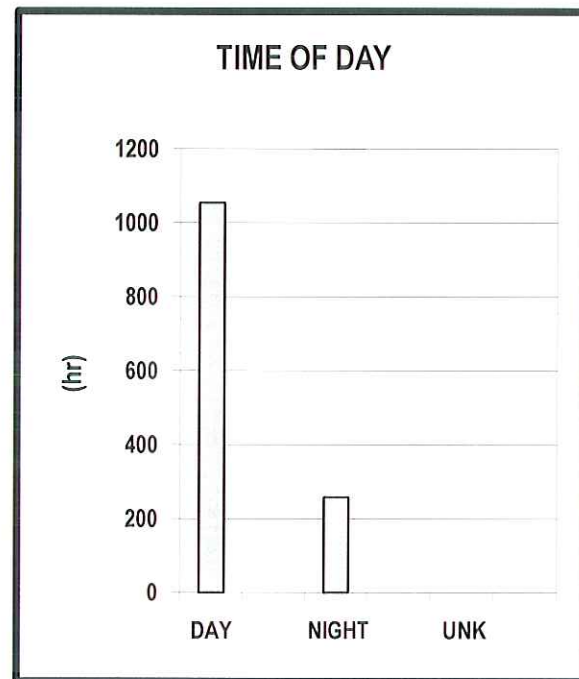
Date: 4/24/09

Prepared By: RC

Intersecting Roadway: FROM RABBIT RD. TO NM 599 INTERCHANGE

No. of Years: 5

Year	TIME OF DAY						PAVEMENT CONDITION						WEATHER CONDITION						CRASH TYPE																			
	DAY		NIGHT		UNK		DRY		WET		UNK		CLEAR		INCLEMENT		UNK		LT ANG		RT ANG		OTHER ANG		REAREND		HEAD ON		SIDE SWIPE		FIXED OBJ.		OTHER		OVER TURN		TOTAL	
	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F		
2003	130	96	28	31	0	0	148	114	10	13	0	0	148	118	10	9	0	0	0	0	46	35	0	0	92	76	0	2	13	3	5	6	1	2	1	3	158	127
2004	128	98	25	25	0	0	142	112	11	11	0	0	146	115	7	8	0	0	0	0	30	36	0	0	102	75	1	2	17	5	3	3	0	0	0	2	153	123
2005	128	99	39	26	0	0	139	113	28	12	0	0	148	120	19	5	0	0	0	0	24	32	0	0	115	78	0	3	14	5	13	4	0	3	1	0	167	125
2006	116	73	24	14	0	0	124	81	16	6	0	0	131	81	9	6	0	0	0	0	23	36	0	0	90	44	0	0	23	5	4	2	0	0	0	0	140	87
2007	128	58	28	19	0	0	135	71	21	6	0	0	144	74	12	3	0	0	0	0	37	25	0	0	89	45	1	2	20	3	8	1	0	0	1	1	156	77
Subtotal	630	424	144	115	0	0	688	491	86	48	0	0	717	508	57	31	0	0	0	0	160	164	0	0	488	318	2	9	87	21	33	16	1	5	3	6	774	539
TOTAL	1054	424	259	115	0	0	1179	491	134	48	0	0	1225	508	88	31	0	0	0	0	324	164	0	0	806	318	11	9	108	21	49	16	6	9	6	774	539	



REPORTED CRASH SUMMARY STATISTICS

PERCENT OF DAYTIME CRASHES:	<u>80%</u>
PERCENT OF NIGHTTIME CRASHES:	<u>20%</u>
PERCENT OF CLEAR WEATHER CRASHES:	<u>93%</u>
PERCENT OF INCLEMENT WEATHER CRASHES:	<u>7%</u>

CRASH TYPE STATISTICS

PERCENT LEFT TURN ANGLE CRASHES:	<u>0%</u>
PERCENT RIGHT TURN ANGLE CRASHES:	<u>25%</u>
PERCENT OTHER ANGLE CRASHES:	<u>0%</u>
PERCENT REAR END CRASHES:	<u>61%</u>
PERCENT HEAD ON CRASHES:	<u>1%</u>
PERCENT SIDE SWIPE CRASHES:	<u>8%</u>
PERCENT FIXED OBJECT CRASHES:	<u>4%</u>
PERCENT BACKING CRASHES:	<u>0%</u>
PERCENT OVER TURN CRASHES:	<u>1%</u>
TOTAL CRASH TYPES:	<u>100%</u>

CRASH SEVERITY STATISTICS

PERCENT PROPERTY DAMAGE ONLY CRASHES:	<u>59%</u>
PERCENT INJURY/FATAL CRASHES:	<u>41%</u>
TOTAL CRASH SEVERITY:	<u>100%</u>

SUMMARY OF CRASHES FOR ST. FRANCIS DRIVE CORRIDOR - RABBIT RD TO NM 599 INTERCHANGE (2003 to 2007)

YEAR	TYPE OF CRASH														TOTAL	TOTAL # OF FAT./INJ.
	HEAD ON		OVERTURN		FIXED OBJECT		SIDESWIPE		REAR END		RIGHT ANGLE		OTHER			
	PDO	FAT./INJ.	PDO	FAT./INJ.	PDO	FAT./INJ.	PDO	FAT./INJ.	PDO	FAT./INJ.	PDO	FAT./INJ.	PDO	FAT./INJ.		
2003	0	2	1	3	5	6	13	3	92	76	46	35	1	2	285	127
2004	1	2	0	2	3	3	17	5	102	75	30	36	0	0	276	123
2005	0	3	1	0	13	4	14	5	115	78	31	25	0	3	292	125
2006	0	0	0	0	4	2	23	5	90	44	23	36	0	0	227	87
2007	1	2	1	1	9	1	20	3	88	45	37	25	0	0	233	77
SUBTOTALS	2	9	3	6	34	16	87	21	487	318	167	157	1	5	1313	539
TOTALS	11		9		50		108		805		324		6		1313	539

Roadway Crash Rate:

$$RMVM = \frac{C \times 100,000,000}{n \times 365 \times l \times v}$$

where:

- R = Roadway Crash Rate per 100,000,000 veh-mi
- C = Total Crashes in an n-year period
- n = year period of study (minimum 3 years)
- l = length of roadway in miles
- v = Average Daily Traffic (ADT) in vehicles per day

$\frac{320}{3}$
 $\frac{6}{32910}$

RMVM = 148.00 crashes/100-million veh-mi

Intersection Crash Rate:

$$RMEV = \frac{C \times 1,000,000}{n \times 365 \times v}$$

where:

- R = Roadway Crash Rate per million entering vehicles (mev)
- C = Total Crashes in an n-year period
- n = year period of study (minimum 3 years)
- v = total entering volume in vehicles per day

$\frac{533}{3}$
 $\frac{606676}{606676}$

RMEV = 0.80 crashes/mev

Average Roadway Crash Rate:

$$R_{AR} = \frac{\text{sum}(C) \times 100,000,000}{n \times 365 \times \text{sum}(l \times v)} = \underline{148.00} \text{ crashes/100-million veh-mi}$$

sum (C) = 320 sum (l) = 6 sum (v) = 32910

Critical Roadway Crash Rate:

$$C_R = R_{AR} + k \times \text{sqrt}(R_{AR}/m) + 1/(2 \times m) = \underline{168.51} \text{ crashes/veh-mi per location}$$

k = 1.645 m = 1
 C_R must be greater than R_{AR}

Average Intersection Crash Rate:

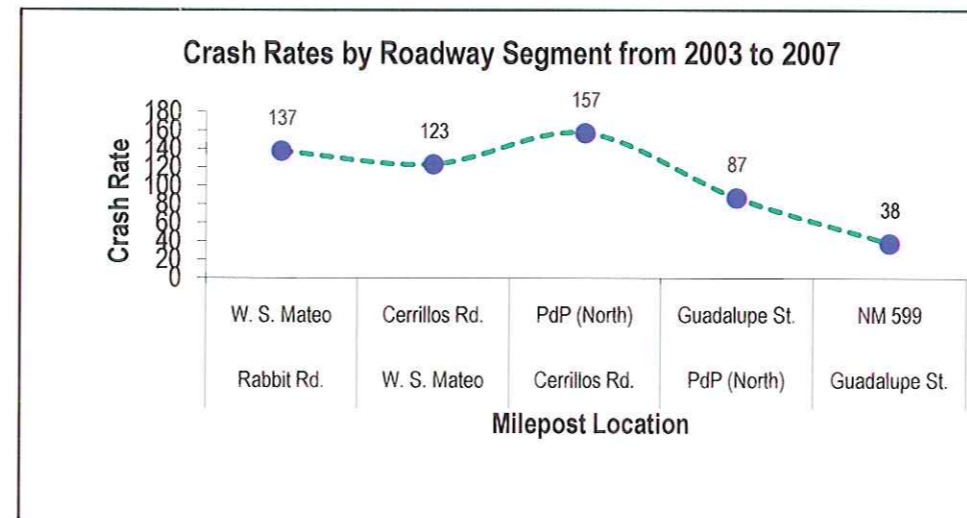
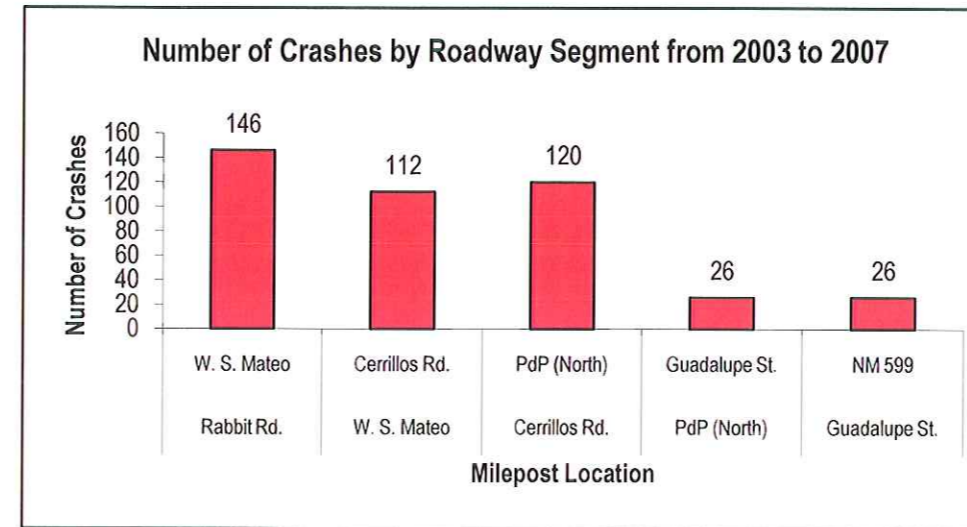
$$R_{AI} = \frac{\text{sum}(C) \times 1,000,000}{n \times 365 \times \text{sum}(\text{ent.vols})} = \underline{0.80} \text{ crashes/mev}$$

sum (C) = 533 sum (v) = 606676

Crash Rates for Study Segments - St. Francis Drive

Roadway Segment	Begin Intersection	End Intersection	Segment Length (Mile)	Number of Reported Crashes	Daily Entering Vehicles (VPD)	Crash Rate (Cr/100-MVM)
1	Rabbit Rd.	W. S. Mateo	1.451	146	40165	137
2	W. S. Mateo	Cerrillos Rd.	1.145	112	43534	123
3	Cerrillos Rd.	PdP (North)	0.944	120	44341	157
4	PdP (North)	Guadalupe St.	0.642	26	25502	87
5	Guadalupe St.	NM 599	1.036	26	36500	38

FIGURE IV.C.19



IV.D PEDESTRIAN AND BICYCLE ACCIDENT DATA

Pedestrian and bicycle accident data was analyzed for the St. Francis Drive corridor during the five-year period from 2003 to 2007. Table IV.D.1 shows the breakdown of pedestrian and bicycle accidents by segment location and type:

FIVE-YEAR (2003 TO 2007) ACCIDENT HISTORY FOR PEDESTRIANS AND BICYCLISTS ALONG THE ST. FRANCIS DRIVE CORRIDOR																
ST. FRANCIS DR.	2003			2004			2005			2006			2007			5-YR TOTAL ACC.
PEDESTRIAN OR BICYCLIST	PDO	INJ	TOT	PDO	INJ	TOT	PDO	INJ	TOT	PDO	INJ	TOT	PDO	INJ	TOT	
Pedestrian Accidents	0	5	5	1	1	2	1	1**	2	0	3	3	3	2#	5	17
Bicyclist Accidents	0	2	2	0	1	1	0	2	2	0	3	3	1	0	1	9
TOTALS	0	7	7	1	2	3	1	3	4	0	6	6	4	2	6	26

TABLE IV.D.1

** - this was a fatal collision that occurred at approximately 1:30 a.m. in which an eastbound pedestrian attempted to cross southbound travel lanes of St. Francis Drive near the NM 599 interchange.

- a collision involved where a pedestrian under the influence of alcohol attempted to cross St. Francis Drive near the Hickox Street intersection, and was struck by a northbound vehicle. The pedestrian violated the right-of-way and sustained fatal injuries.

The above two collisions represent the only fatal collisions along the St. Francis corridor for the five-year reporting period from 2003 to 2007.

Of the 27 reported collisions in which a pedestrian or bicyclist was involved, 18 collisions resulted from the pedestrian or the bicyclist violating right-of-way. Also, eight collisions involved the pedestrian or bicyclist being under the influence of alcohol at the time the collision occurred.

IV.E CRASH DATA ANALYSIS- ST. FRANCIS DRIVE AT ST. MICHAELS DRIVE ON/OFF RAMP

In 2005, St. Francis Drive had modifications constructed at the NB and SB on ramps from St. Michaels Drive. In the original configuration, St. Francis Drive had a lane that continued from each of the on-ramps to the nearest intersection (for NB St. Francis the on-ramp continued to West San Mateo Road and for SB St. Francis the on-ramp continued to Siringo Road). However, the modifications to St. Francis Drive removed those lanes and created merge points from the on-ramps.

There has been concern about increased accident rates at the merge points of the NB/SB on-ramps from St. Michaels Drive. Our analysis of the crash data for 2006 and 2007 (the two years available since the modifications on St. Francis Drive) does not indicate a noticeable increase of crash rates at the merge points, as shown on Figure IV.C.14B.

V. REFERENCES

- A. *A Policy of Geometric Design of Highways and Streets, 4th Edition.* Washington D.C.: American Associations of State Highway and Transportation Officials, 2001.
- B. *Highway Capacity Manual, HCM2000.* Washington D.C.: Transportation Research Board, National Research Council, 2000 and *Highway Capacity Software 2000, Version 4.1c,* McTrans, University of Florida, Federal Highway Administration, 2000.
- C. *NCHRP Report 457 – Engineering Study Guide for Evaluating Intersection Improvements,* Washington D.C.: Transportation Research Board – National Research Council, 2001.
- D. *Access Management Manual,* Santa Fe, NM.: New Mexico Department of Transportation, 2002.
- E. *Traffic Access and Impact Studies For Site Development,* 1991, Institute of Transportation Engineers (ITE)
- F. *Safety Study Guidelines,* Columbus, OH: Ohio Department of Transportation, 2002.
- G. *Fundamentals of Traffic Engineering,* 15th Edition, 2001, Institute of Transportation Studies – University of California, Berkeley.
- H. *Traffic and Highway Engineering,* 2nd Edition, 1999, Nicholas J. Garber & Lester A. Hoel. Revised Second Edition. Brooks/Cole Publishing, Pacific Grove, California.
- I. *Traffic Engineering Handbook,* 5th Edition. ISBN: 0-935403-32-9, Prentice Hall Inc., Washington D.C., 1999. Institute of Transportation Engineers (ITE).
- J. *New Mexico Traffic Crash Information,* 2004 Edition. Santa Fe, New Mexico, 2005. New Mexico Department of Transportation Traffic Safety Bureau.