

Pedestrian & Bicycle Road Safety Assessment

Central Ave & San Mateo Blvd Albuquerque, NM

Prepared By:

Federal Highway Administration Resource Center
and the Mid-Region Council of Governments

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Executive Summary

New Mexico and the City of Albuquerque have been identified by the Federal Highway Administration (FHWA) as being in need of pedestrian safety improvements due to pedestrian-auto fatal crash rates. Drilling down from the state and the city level, the Central Ave corridor has the highest number of pedestrian crashes in the greater Albuquerque region. The Central Ave and San Mateo Blvd is the intersection on this corridor with the highest number of pedestrian crashes on the Central Ave corridor. It is also the intersection with the highest number of pedestrian crashes in the central New Mexico region. Addressing safety at this intersection is an important step when addressing safety overall in New Mexico. For these reasons a Road Safety Assessment was performed at this location. This process began in March 2015.

Central Ave and San Mateo Blvd stand out in many other ways as well. This intersection is a transfer point for four very high ridership transit lines; there are many pedestrians and pedestrians with disabilities crossing this intersection, and it is located in an "Activity Center." Activity Centers are areas identified in City of Albuquerque/Bernalillo County Comprehensive Plan for urban land uses and transportation improvements to support pedestrian travel. The residential densities, commercial services, jobs and transit service all support pedestrian travel; however, the high number of crashes indicate safety issues at this location.

The City of Albuquerque is implementing their first bus rapid transit service along Central Ave called Albuquerque Rapid Transit (ART). This project presents a unique opportunity to improve pedestrian safety. This road safety assessment (RSA) provides several recommendations to improve safety at this intersection. Many of these

improvements are planned to be implemented as part of the ART project, and the feasibility of including other recommendations with the ART project are being investigated. Although not all recommendations may be completed with the implementation of ART, this RSA provides an important first step when seeking further opportunities to address all recommendations.

Central Ave & San Mateo Blvd RSA Recommended Safety Improvements:

1. Address the lack of pedestrian space and maintenance issues at the southwest corner
2. Follow draft Public Right-of-Way Accessibility Guidelines (PROWAG), increase the size of key spaces, and align ramps and marked crosswalks to go beyond minimum accessibility accommodation.
3. Investigate reducing lanes on San Mateo Blvd.
4. Provide pedestrian median refuge islands on San Mateo crossings and plan for one-stage crossings
5. Reduce turning radii
6. Provide a 'No Turn on Red' phase to the signal plan and include a dynamic sign
7. Provide a 'Leading Pedestrian Interval'
8. Automate the pedestrian phase
9. Check signal timing for sufficient pedestrian crossing time.
10. Add backplates with retroreflective borders to all signal heads.
11. Re-mark and widen crosswalk markings
12. Safety education and interventions
13. Improve maintenance at bus stops
14. Provide wayfinding and improve connections for bicyclists
15. Coordination with ART and perform ongoing monitoring for safety improvements

Table of Contents

Introduction.....	1
Pedestrian-Bicycle Focus City/States	1
Definition of a Road Safety Assessment (RSA)	2
Why Central Ave and San Mateo Blvd?.....	2
Purpose.....	4
Study Area	4
Study Team and Planning Context	5
Study Team	5
Planning Framework.....	5
Albuquerque Rapid Transit.....	5
Priority Transit Investment Network.....	7
Pedestrian Composite Index	7
Complete Streets	7
Albuquerque/Bernalillo County Comprehensive Plan	8
New Mexico Strategic Highway Safety Plan	8
Land Use Context.....	8
Existing Conditions	9
Site Characteristics	9
Roadway	9
Pedestrian Infrastructure	9
Bikeways.....	10
Counts: Traffic, Transit, Pedestrian and Bikes.....	11
Crash Data	12
Site Visit Observations.....	13
Safety Improvements in the Study Area	16
Recommendations.....	16
Implementation: Funding Sources for Safety and Operational Improvements	23
Active Projects	23
Potential Funding Sources.....	23
Appendix A Crash Data	A-1
Appendix B Intersection Traffic Counts.....	B-1
Appendix C Signal Timing Plan	C-1

INTRODUCTION

PEDESTRIAN-BICYCLE FOCUS

CITY/STATES

The Federal Highway Administration, Office of Safety (FHWA) launched the Focused Approach to Safety in 2005 to better direct resources where there is greatest opportunity to save lives and prevent serious injuries. In 2011 and again in 2015, the City of Albuquerque became eligible to be one of nearly 30 Pedestrian/Bicycle Safety Focus Cities by the FHWA, due to the higher than average annual pedestrian fatality rate per population. Albuquerque shares this eligibility with other cities such as Miami, FL, New York City, NY and Los Angeles, CA, as shown in Figure 1.

In an effort to reverse this trend, FHWA has offered the City of Albuquerque the opportunity to access free training, technical assistance and technical experts in the pedestrian safety area. It includes identifying and implementing proven safety countermeasures to help solve safety issues and explore ways to improve the safety culture, policies, and procedures related to pedestrian safety. In 2013, as a part of the technical assistance effort, the City of Albuquerque identified a number of potential locations for a pedestrian and bicycle Road Safety Assessment. The location with the highest numbers of both pedestrian and bicycle crashes has historically been Central Ave and San Mateo Blvd.

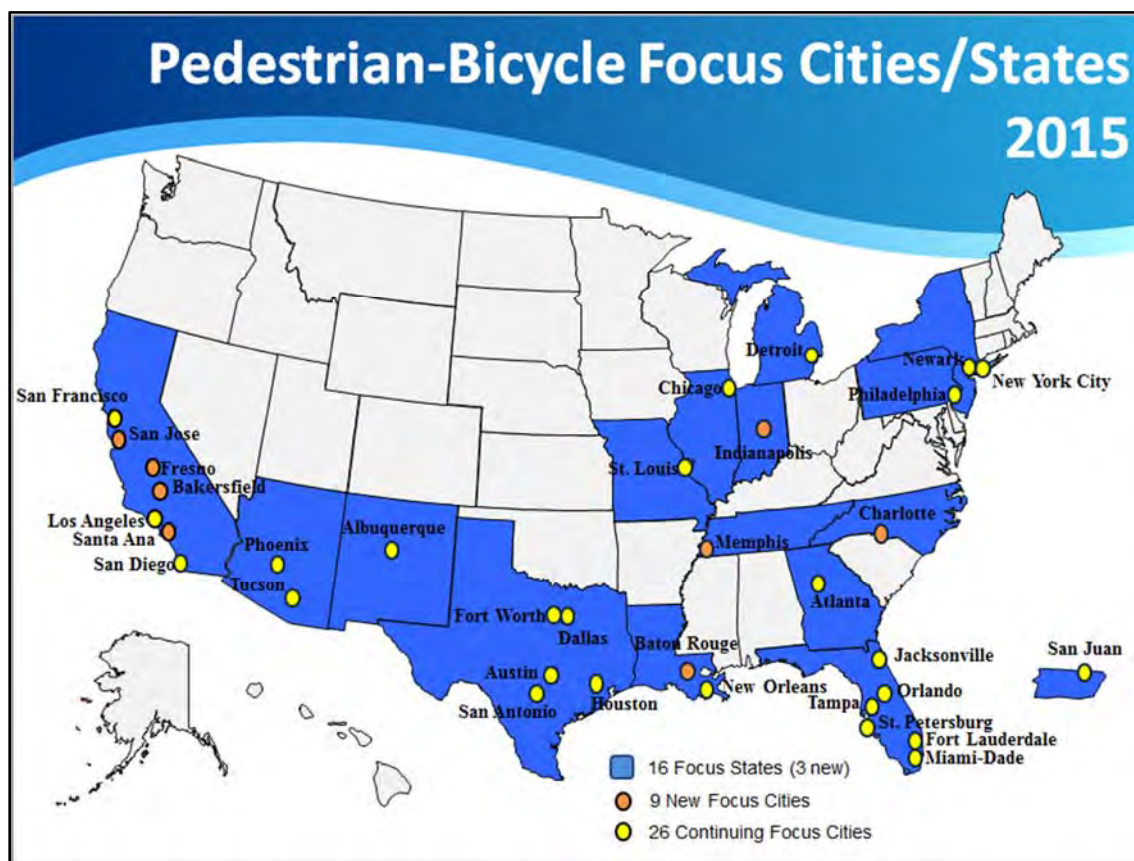


Figure 1: Federal Highway Administration Pedestrian and Bicycle Focus Cities and States (Source: FHWA)

DEFINITION OF A ROAD SAFETY ASSESSMENT (RSA)

According to the Federal Highway Administration's *Road Safety Audit Guidelines*, a Road Safety Audit or Assessment (RSA) is a formal safety examination of a future roadway plan or project or an in-service facility and is conducted by an independent, experienced, and multidisciplinary study team. The primary focus of an RSA is safety while working within the context of mobility, access, surrounding land use, and/or aesthetics. RSAs enhance safety by identifying potential safety issues affecting all road users under all conditions and suggesting measures for consideration by the design team or responsible agency.

An RSA is not simply a standards check. Standards checks are part of the design process to ensure adherence to design standards and guidelines. Although the RSA team may identify safety issues by comparing items of concern to standards, the general intention of the RSA is to identify areas where applied standards may interact with road user behaviors to generate a potential safety issue. In addition to using an RSA as a tool to assess and improve safety performance of facilities, public agencies may wish to conduct RSAs oriented to address safety issues related to specific user groups, such as pedestrians and bicyclists. RSA's can be performed as both a proactive and reactive approach to assessing and improving safety on a facility.

In 2013-2014 a RSA was conducted for West Central Ave. Many members of the study team participated in this effort as well.



Figure 2: RSA Team at the intersection of Central Ave & San Mateo Blvd (Source: Isebrands)

WHY CENTRAL AVE AND SAN MATEO BLVD?

Central Ave and San Mateo Blvd was selected for a pedestrian and bicycle Road Safety Assessment (RSA) primarily due to the high numbers of pedestrian and bicyclist crashes and due to the upcoming Albuquerque Rapid Transit (ART) project along the corridor that provides a unique and large opportunity for safety improvements to be implemented.

At the time of the RSA site visit, the ART project was in conceptual design and seeking funding to provide a rapid transit route along Central Ave including a station at San Mateo Blvd. Currently, ART has received a recommendation for funding in the President's fiscal year 2017 budget through a Small Starts Capital Grant from the Federal Transit Administration and is in the final design stages of the project.

This intersection is very busy with four major bus routes, nine transit stops within 400 ft. of the intersection, approximately 50,000 motor vehicles approaching the intersection per day, and an average number of 2,700 transit users getting on and off the bus (boarding and alighting) within the 400 ft. radius¹ (see Figure 3).

Although the intersection of Central Ave and San Mateo Blvd historically has the highest number of pedestrian crashes in the region, other intersections along Central Ave also have high concentrations of pedestrian and bicyclists crashes. Figure 4 shows the areas with high concentrations of pedestrian crashes in red. Central Ave has clusters of high concentrations of pedestrian crashes in Downtown, university area and the International District that extends from San Mateo Blvd to Wyoming Blvd.

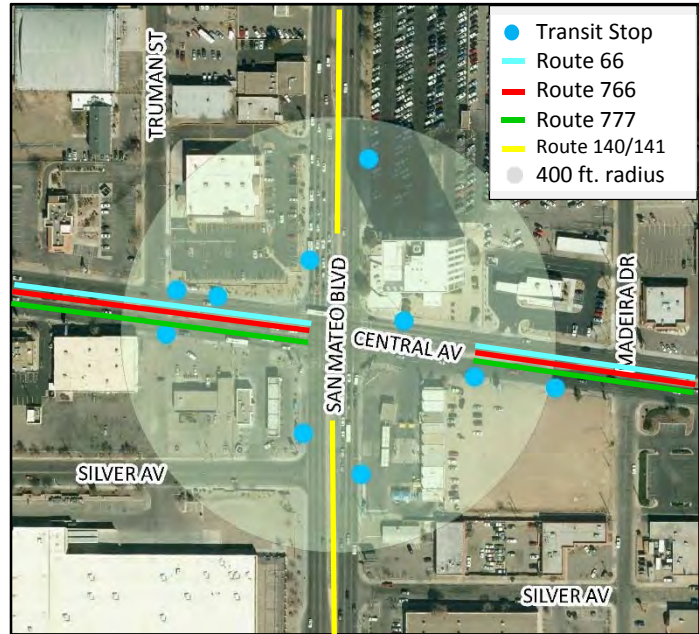


Figure 3: Transit lines and Transit Stops in Study Area
(Source: MRCOG)

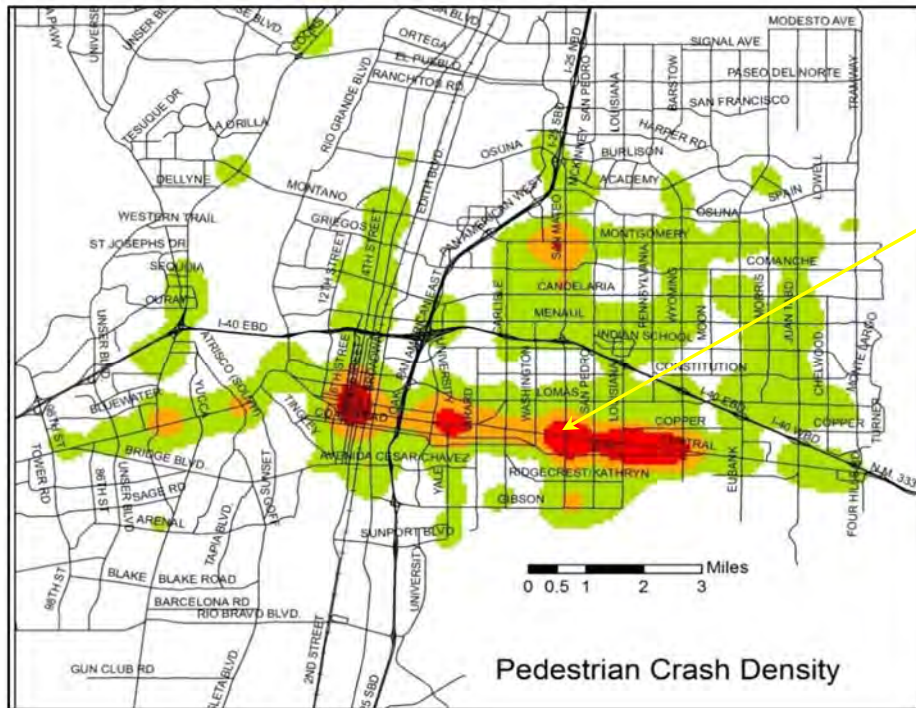


Figure 4: Pedestrian Crash Density Heat Map, Pedestrian Crashes 2000-2009 (Source: MRCOG)

¹ Average Weekday April 2011 Transit Ridership Data, ABQ RIDE

PURPOSE

The purpose of this pedestrian and bicycle Road Safety Assessment (RSA) was to:

- Identify and assess risks to all users in the intersection
- Assess the multi-modal aspects of the intersection and nearby area
- Quantify all the pedestrian movements in the intersection and nearby mid-block crossings
- Observe and document the diversity and abilities of typical pedestrians
- Observe the ABQ RIDE operations and user behavior
- Observe and document bicyclists and their behavior
- Identify best practices for intersection design and pedestrian and bicyclist safety
- Coordinate improvement opportunities with the ABQ RIDE ART project

STUDY AREA

The study area for this RSA extended a small distance beyond the physical intersection of San Mateo Blvd and Central Ave to include Truman St NE, Silver Ave SE, and Madeira Dr. NE as shown in Figure 6. This was included as part of the influence area of the intersection particularly with the user movements to and from transit stops.



Figure 5: Central Ave & San Mateo Blvd intersection
(Source: Isebrands)



Figure 6: General Study Area (Source: MRCOG)

STUDY TEAM AND PLANNING CONTEXT

STUDY TEAM

The RSA Study Team was comprised of individuals with a variety of backgrounds including: law enforcement, engineering, planning, public health, and transit. Representatives came from the City of Albuquerque (planning, municipal development, transit, police department), Mid Region Council of Governments, NM Department of Transportation, University of New Mexico Center for Injury Prevention, and the Federal Highway Administration (FHWA). For a detailed list, see participating agencies on page i.

The study team began the RSA by collecting data and talking to local groups and community members prior to two-day site visit.

One key element that came from the visits with local groups was learning about the high density of social services in the area. Some of these services target people with disabilities. For example, the New Mexico Division of Vocational Rehabilitation is located at this intersection. This agency assists in finding employment for people with disabilities.

Table 1: Visits prior to RSA Site Visit

Community Group	Date
International District Healthy Communities Coalition	3/26/2015
Transit Advisory Board	5/14/2015
International District Healthy Communities Coalition	6/25/2015
Fair West Neighborhood Association Annual Meeting	6/11/2015
International District Healthy Communities Coalition	8/27/2015
Wider Stakeholder Meeting	8/31/2015

PLANNING FRAMEWORK

ALBUQUERQUE RAPID TRANSIT

As part of a region-wide effort to improve transit and attract development to transit corridors, City of Albuquerque is implementing their first bus rapid transit project, Albuquerque Rapid Transit (ART). A key element to ART is capitalizing on the economic and social benefits that come with greater pedestrian/transit travel along the corridor. ART will run buses along the median in dedicated lanes from Coors Blvd to Louisiana Blvd along Central Ave. Stations will also be located in the median and spaced approximately a half-mile apart. The current Rapid Ride routes along Central Ave will be replaced by ART, but the local Route 66 will remain in place running in the far right lane with stops along the sidewalk. In February 2016 the project was recommended for a Small Starts grant from the Federal Transit Administration, with funding pending the approval of the Federal FY17 transportation budget. The total budget for this project is about \$119 million, and it is anticipated to be completed by fall 2017.



The priority of this RSA is improving pedestrian and bicycle safety, and ART includes a variety of pedestrian safety improvements. Some of the key recommendations from this report have been incorporated in the plans for ART; others are being investigated, and some recommendations might not be feasible with ART implementation. **This RSA report and process are intended to put forward a comprehensive list of safety improvements in order to take advantage of opportunities as they arise and provide a solid basis for pursuing funding. The final goal is to fully implement all safety recommendations.**

PRIORITY TRANSIT INVESTMENT NETWORK

Improving the ability for people to travel by transit is key factor in addressing future transportation challenges. Central Ave and San Mateo Blvd play a major role as part of this solution. These two roadways are part of the Priority Transit Network identified in the 2040 Metropolitan Transportation Plan and adopted by the Metropolitan Transportation Board (MTB) for funding priority to reach transit mode share goals.

The MTB has set the goal of achieving 20 percent of the aggregate trips along the corridors of the Priority Transit Network by transit by the year 2040. In order to meet this goal, 25 percent of sub-allocated federal funds (STP-U, STP-E, CMAQ-Mandatory) will be used to achieve this goal.

Central Ave is by far the most important corridor in

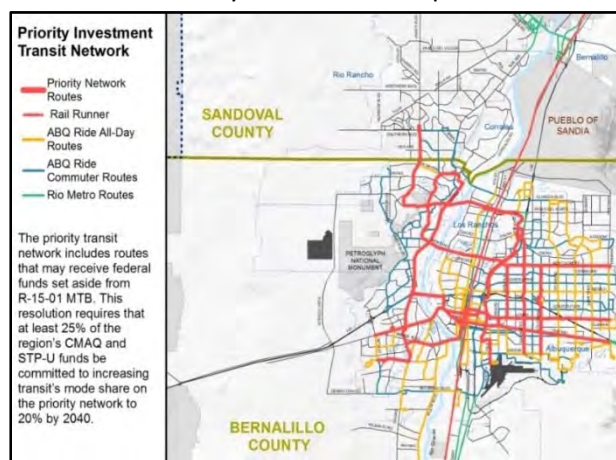


Figure 8: Priority Transit Investment Network
(Source: MRCOG)

the Priority Transit Network with 12.6 percent of people traveling along the entire Central Ave corridor by transit. In the vicinity of San Mateo Blvd, 17.9 percent of people travel along Central Ave by transit. Central Ave and San Mateo Blvd currently are key transit corridors, and as part of the Transit Priority Network, their pedestrian-transit role in the future are set to increase.

PEDESTRIAN COMPOSITE INDEX

The Mid-Region Council of Governments (MRCOG) updates and maintains the Pedestrian Composite Index which is a tool to help prioritize roadways for pedestrian improvements at the regional level. Pedestrian Composite Index uses regional data to compare aspects that would deter pedestrian travel (crashes, speed, number of lanes) to aspects that generate pedestrian activity (transit, schools, retail and residential densities). Roadways with both high deterrent and high generator scores indicate locations that have a high priority for pedestrian improvements. These are places that have adverse conditions for walking and a lot of pedestrian demand. Central Ave ranks very high in the region for pedestrian improvements.

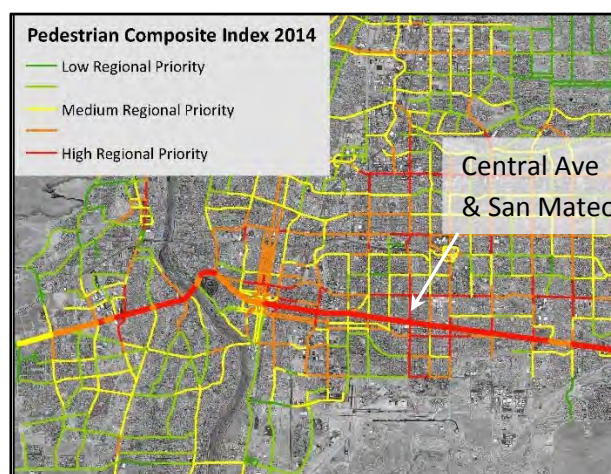


Figure 9: Pedestrian Composite Index (Source: MRCOG)

COMPLETE STREETS

In January 2015, the City of Albuquerque City Council unanimously passed the Complete Streets Ordinance (Council Bill O-14-27). One of the objectives of this ordinance is for major road projects to accommodate all modes of transportation. The Complete Streets Ordinance also formalizes the use of nationally developed and recommended guides to help design and evaluate

the accommodation of all modes. Multi-modal guides identified in the ordinance include: the Institute of Transportation Engineers Walkable Urban Thoroughfares Recommended Practice, the National Association of City Transportation Officials Urban Street Design Guide and the use of the National Academy of Sciences, National Highway Cooperative Research Board's methodology of evaluating Multi-Modal Level of Service.

In addition, City of Albuquerque's Mayor Berry has signed on the *Mayor's Challenge for Safer People, Safer Streets*². The US Secretary of Transportation has challenged all Mayors in the United State to advance safe streets for all users. The Mayor's Challenge calls for a Complete Streets approach. Complete Streets is a movement that stresses the need to accommodate all users of the roadway. This means identifying barriers and using designs that are appropriate to the context of the street and its uses. People of all ages and abilities are able to move safely on and across Complete Streets regardless of travel mode.

In conjunction with Albuquerque Rapid Transit, an inviting and comfortable pedestrian environment can encourage private investment by catalyzing redevelopment activity along newly retrofitted streets. Streets that have comfortable facilities can provide a more attractive and accessible area for all businesses.

ALBUQUERQUE/BERNALILLO COUNTY COMPREHENSIVE PLAN

The intersection of Central Ave and San Mateo Blvd are designated *Major Transit Corridors* within a

Community Activity Center in the Albuquerque Bernalillo County Comprehensive Plan. The plan describes Community Activity Centers as "well-functioning pedestrian areas" and sets land use and urban design policies to achieve this vision. Also, in support of the Comprehensive Plan, the City of Albuquerque Development Process Manual (DPM) requires wider sidewalks in Major and Community Activity Centers than in other areas of the city. The DPM minimum required sidewalk width in these centers is 10 feet wide (with a 6 foot set-back) along arterial streets.

NEW MEXICO STRATEGIC HIGHWAY SAFETY PLAN

The New Mexico Strategic Highway Safety Plan³ includes emphasis areas to improve intersection safety and special user safety that includes pedestrian and bicyclist safety. The pedestrian goal is to achieve a 50 percent reduction in pedestrian fatalities and injuries by 2030. The safety performance within the City of Albuquerque will be critical to achieving the goal for the state.

LAND USE CONTEXT

This intersection is surrounded by auto-oriented retail, an office tower, services and a nearby high school, with moderately dense housing in the vicinity. Perhaps the most significant nearby destinations are:

- Highland High School
- Wal-Mart
- State building with services and over 500 employees
- Circle K/Shell Gas Station and Walgreens (both have alcohol sales)
- Moderate density housing within a half mile of the intersection

² <https://www.transportation.gov/mayors-challenge>

³http://dot.state.nm.us/content/dam/nmdot/planning/NM_Comprehensive_Transportation_Safety_Plan.pdf

EXISTING CONDITIONS

SITE CHARACTERISTICS

The operations and safety of the users at the intersection of San Mateo Blvd and Central Ave are influenced by many factors, including pedestrian infrastructure, size of the intersection, transit stops and transfers, number of pedestrians and volume of motor vehicles.

ROADWAY

Both San Mateo Blvd and Central Ave are six-lane principal arterials. At this intersection, San Mateo Blvd has dual left turn lanes in both directions and Central Ave has one left turn lane in each direction. Central Ave has a posted speed of 35 mph and San Mateo Blvd has a posted speed of 40 mph. Roadway lighting infrastructure is present at the intersection which improves visibility.

PEDESTRIAN INFRASTRUCTURE

The sidewalk widths range from 5 ft. to 9 ft. wide. The traffic signals include pedestrian count down timers which provide pedestrians with additional information to assist them in determining if they have enough time to cross the roadway.

The crossing distances measured from the pedestrian call button to the nearest edge of curb within the crosswalk are between 103 ft. and 127 ft. in length. The intersection is controlled by a traffic signal with a cycle length of 110-120 seconds depending on the time of day and day of week. The signal timing plan⁴ for the intersection provides the time allotted for

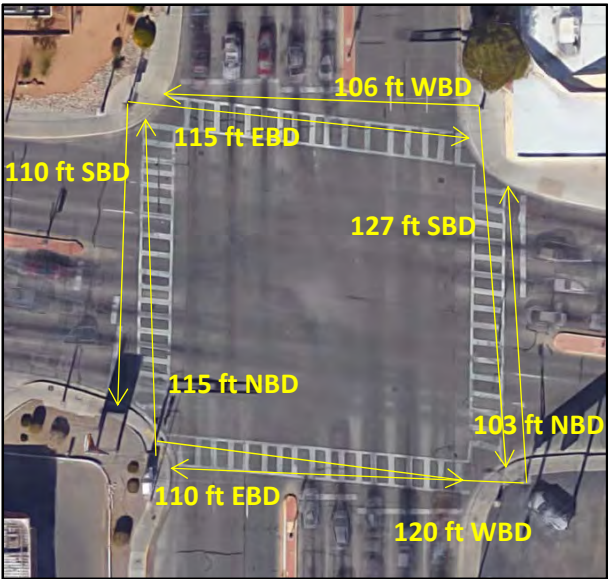


Figure 10: Intersection Crossing Distances
(Source: MRCOG)

the pedestrian walk phase and the pedestrian clearance time. For most legs the total time for pedestrians to cross the intersection is 33 seconds. When traveling at 3.5 feet per second, nearly all of these crossing times appear to be insufficient. Only the eastbound crossing time is below the total pedestrian time in the signal timing plan. The southbound direction has the most serious disparity with a deficiency of 3.3 seconds.

Table 2: Crossing Distance, Time and Signal Timing Plan

	Crossing Distance (ft.)	Crossing Time (sec) at 3.5 ft./sec	Signal Timing Plan Information		
			Ped Walk Time (sec)	Ped Clear Time (sec)	Total Ped Time (sec)
Westbound	120	34.3	7	26	33
Southbound	127	36.3	7	26	33
Eastbound	115	32.9	7	26	33
Northbound	115	32.9	7	24	31

⁴ See Appendix C for signal timing plan

BIKEWAYS

There are no marked or designated bike lanes on either Central Ave or San Mateo Blvd and no signage directing cyclists. Future plans do not call for bicycle lanes or other types of bicycle accommodation on Central Ave or San Mateo Blvd. However there are nearby bicycle routes and a bicycle boulevard that are fairly well connected to the intersection with local roads.



Figure 11: Bicyclist on the sidewalk looking to see if he should merge into traffic.
(Source: MRCOG)



Figure 12: Long Range Bikeway System Existing and Proposed Facilities
(Source: MRCOG)

COUNTS: TRAFFIC, TRANSIT, PEDESTRIAN AND BIKES

At Central Ave and San Mateo Blvd, on average 50,000 motor vehicles approach the intersection per day, and an average number of 2,700 instances of transit users getting on and off the bus (boarding and alighting), within the 400 ft. radius⁵ of the intersection. Table 3 provides a comparison of Average Weekday Traffic and Average Weekday Transit Users.

In November 2012, peak hour turning movement counts were performed at the intersection. In addition, mid-day pedestrian counts were performed in April 2015 prior to the RSA site visit. Table 4 provides a comparison of the number of people crossing the intersection by foot, bicycle and motor vehicle.

Table 3: Average Weekday Traffic and Transit Users

ROUTE	LOCATION	Average Weekday Traffic (AWDT)	Average Weekday Transit Users
CENTRAL	EAST OF SAN MATEO BLVD.	25,324	6,257
CENTRAL	WEST OF SAN MATEO BLVD.	26,292	7,282
SAN MATEO	NORTH OF CENTRAL	30,357	1,893
SAN MATEO	SOUTH OF CENTRAL	25,295	1,514

Source: MRCOG and ABQ RIDE

Table 4: Pedestrian, Bicyclists and Vehicle Counts: Time of Day

	Central Ave Eastbound	Central Ave Westbound	San Mateo Blvd. Blvd Northbound	San Mateo Blvd. Blvd Southbound
Pedestrians				
7:00 AM - 9:00 AM	64	62	37	100
11:30 AM - 1:30 PM	110	107	97	90
4:00 PM - 6:00 PM	180	101	90	186
Bicyclists				
7:00 AM - 9:00 AM	7	16	8	14
11:30 AM - 1:30 PM	5	10	5	2
4:00 PM - 6:00 PM	6	7	3	10
Motor Vehicles				
7:00 AM - 9:00 AM	971	2,116	1,354	1,922
4:00 PM - 6:00 PM	2,064	1,936	2,490	2,389

Source: CABQ Traffic Count Report and MRCOG Count Report , Appendix B

⁵ Average Weekday April 2011 Transit Ridership Data, ABQ RIDE

CRASH DATA

In the five year period from 2009-2013 there were two fatal pedestrian crashes and 19 pedestrian injury crashes near this intersection as well as 11 bicycle injury crashes. Additionally, there was one fatal vehicle crash and 91 injury crashes near this intersection. All of the crash data is summarized in Table 5. Figure 12 illustrates the crash data for 2014. The crash history makes the San Mateo Blvd and Central Ave intersection one of the highest crash locations for pedestrians and bicyclists, and in the top 10 for motor vehicles crashes in Albuquerque.

Table 5: Central Ave and San Mateo Blvd Intersection and Nearby Crashes (Including crashes north of the intersection, Madeira Dr, Silver Ave, and Truman St)

Crash Severity	Pedestrian Crashes	Bicyclist Crashes	All Other Crashes
Fatal Crash	2	0	1
Incapacitating Injury Crash	4	4	6
Injury Crash	15	7	85
Property Damage Only Crash	4	4	251
Total	25	15	343

Source: MRCOG and NMDOT Traffic Safety Bureau

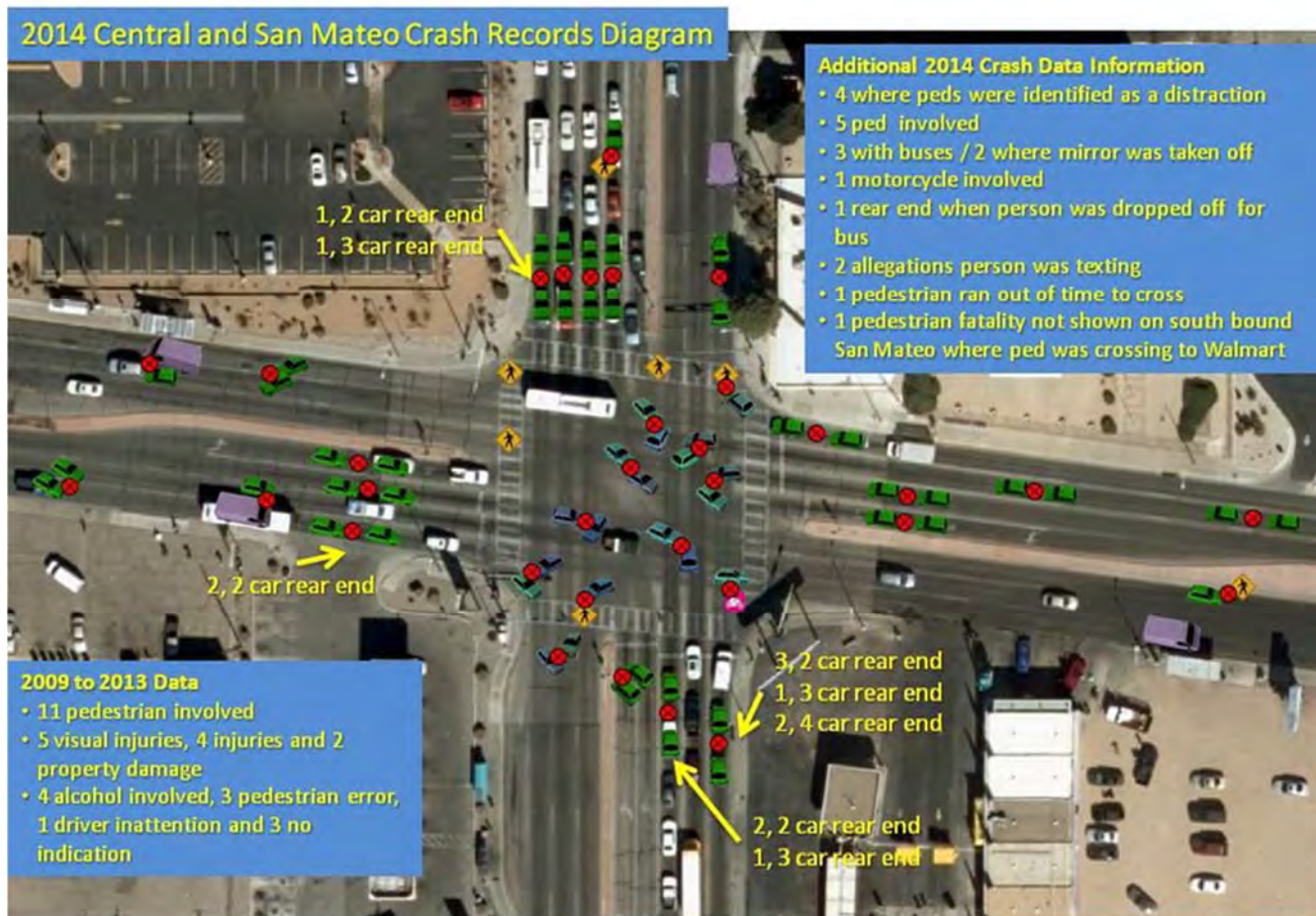


Figure 13: 2014 Central Ave and San Mateo Blvd Crash record Diagram (Source: MRCOG and City of Albuquerque)

SITE VISIT OBSERVATIONS

The majority of the RSA team visited the site together on Friday May 8, 2015 prior to the two-day full site visit. In addition video was taken and reviewed for the site. The following observations were made.

1. **High volumes of pedestrians and limited space to accommodate them** - Often there was not enough space on the sidewalk or at corners to fully accommodate pedestrians and sometimes bicyclists. The corner with the most crowded conditions was the SW corner with the Circle K/Shell gas station. This corner had maintenance issues with gravel landscaping as well.



Figure 14 & 15:

Above: View of the SW Corner

Right: High school students waiting in roadway for walk signal.

(Source: Isebrands)



2. **High volumes of pedestrian with disabilities and pedestrians using some form of wheeled device** - There were many people using walking aids and wheelchairs. Many pedestrians were observed pulling/pushing devices to carry items, and they had children in strollers.

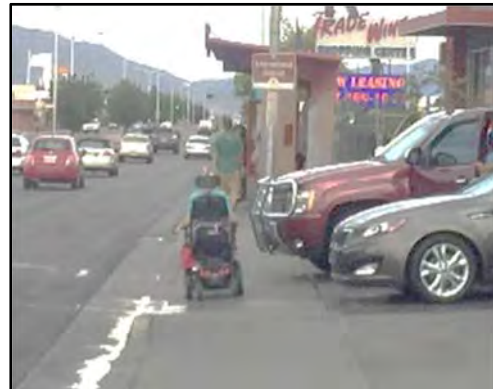


Figure 16 (Source: Isebrands)



Figure 17 (Source: MRCOG)

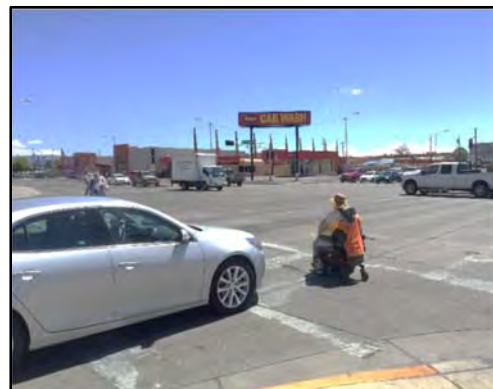


Figure 18 (Source: MRCOG)

Figure 16, 17 & 18: Pedestrians with disabilities.

3. **Traffic would fail to yield to pedestrians when turning right on red and turning left** - Often when stopping at red lights, motorists did not stop behind the stop bar.



Figure 19: Motorist making a right turn in front of a crossing pedestrian. (Source MRCOG)

4. **Vehicular turning movements were taken at fast speeds.** The posted speed limit for San Mateo Blvd is 40 miles per hour and for Central Ave it is 35 miles per hour. The turning radii are very large particularly at the NW and SE corners. High speeds decrease the likelihood of being able to avoid a crash and increase the likelihood for more serious injuries. See figure 20 for survivability rates based on speed and figure 21 for an image of the large turning radii.

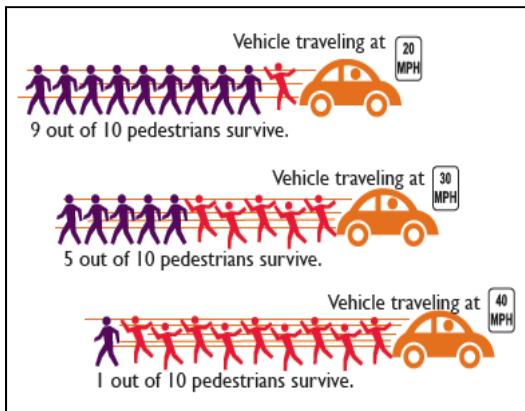


Figure 20: Survivability of Pedestrians (Source: Seattle Department of Transportation)



Figure 21: Image of the intersection showing corner turning radii. (Source: Google Maps)

5. **High volume of turning vehicles** - Left turns from Central Ave onto San Mateo Blvd occur during the green phase (permissive). Left turns from San Mateo Blvd onto Central can only occur on green arrows (protected). There were many right turning vehicles during both the red and green phases. Turning movements comprised a fair percentage of all the vehicular movements at the intersection⁶.

TABLE 6: The Percentage of All Movements that are Right and Left Turns

	Central Ave	
	Eastbound	Westbound
AM Left	18.9%	16.0%
PM Left	22.4%	16.5%
AM Right	13.4%	13.8%
PM Right	12.9%	19.2%

	San Mateo Blvd	
	Northbound	Southbound
AM Left	13.3%	15.7%
PM Left	12.1%	18.9%
AM Right	11.8%	9.7%
PM Right	11.3%	11.6%

⁶ See Appendix B for Turning Movement Study

6. **Fairly high number of bicyclists and erratic bicyclist behavior** - Many of the bicyclists were on the sidewalk, riding against traffic and taking advantage of a variety of gaps in traffic.



Figure 22: This bicyclist was observed in video taken for the RSA. The individual was riding against traffic alongside the median on San Mateo. The bicyclist continued into the intersection and made a left-hand turn.
(Source: MRCOG)

7. **Frequent mid-block crossings away from the intersection** – For the most part, most pedestrians crossed at the intersection with the signal. The percentage of pedestrians crossing with the signal varied for each leg. (see figure 23). This is unlike west Central Ave where during a 2013 RSA the vast majority of pedestrians were observed crossing mid-block several feet away from the intersection. However there were significant numbers of pedestrians crossing when there were gaps in traffic.

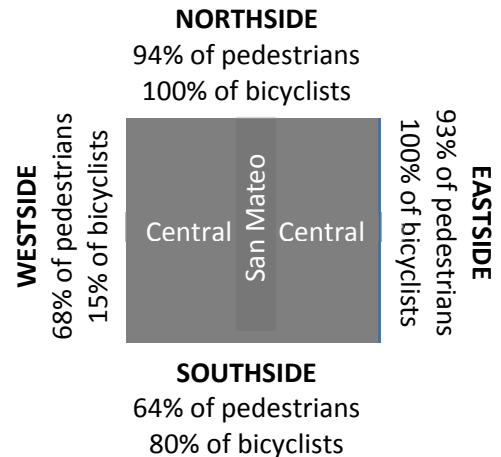


Figure 23: Percentage of Pedestrians and Bicyclist Crossing at the Intersection Mid-Day 11:30AM-1:30PM
(Source: MRCOG, Appendix B)

8. **Substance abuse issues were evident at this intersection.** The RSA team observed a small fraction of pedestrians who were loitering and/or were experiencing some form of alcohol or drug impairment. During the site visit there were apparent instances of substance abuse from 5pm-6pm. In a conversation with two transit riders in the area, they expressed general concern about people consuming alcohol at nearby bus stops.

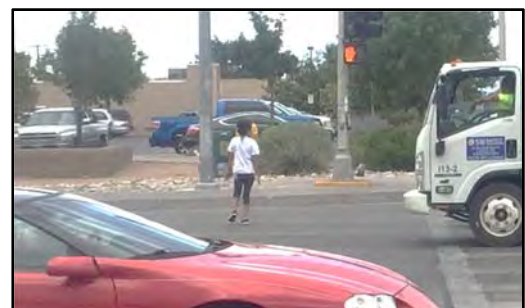


Figure 24: This pedestrian was observed stumbling into traffic crossing Central Ave
(Source: City of Albuquerque)

SAFETY IMPROVEMENTS IN THE STUDY AREA

Most RSA's include short term, medium term and long term recommendations. Due to the Albuquerque Rapid Transit, many long-term improvements are planned to be completed shortly. For this reason, safety recommendations are not grouped by time frame. It will be important to seek other opportunities to implement any recommendations that cannot occur with the ART project. This RSA effort represents a critical first step when seeking Highway Safety Improvement Funding. As new efforts emerge to improve pedestrian and bicyclist safety, this report provides a baseline of current issues with the best current interventions to improve upon in the future.

RECOMMENDATIONS

1. **Address Southwest Corner:** The southwest corner of this intersection (with Circle K) was the most problematic due to lack of space and maintenance issues. At this corner, pedestrians often wait in the roadway to cross the intersection. The posts holding up the Circle K sign, utility cabinets, and the large turning radius all contributed to minimal space for the high volumes of pedestrians. In addition, the gravel landscaping presented maintenance issues.
2. **Follow draft Public Right of Way Accessibility Guidelines (PROWAG) and provide additional space in key locations and further considerations for crossings:** Currently design plans meet minimum draft Public Right-of-Way Accessibility Guide (PROWAG). FHWA encourages the use of the draft PROWAG over the 1991 American Disabilities Act Accessibility Guide (ADAAG). Although ADAAG currently sets minimum standards for public rights-of-way, ADAAG was developed primarily for buildings and does not address all situations that involve public-right-of way. Many agencies and municipalities have chosen to adopt the draft

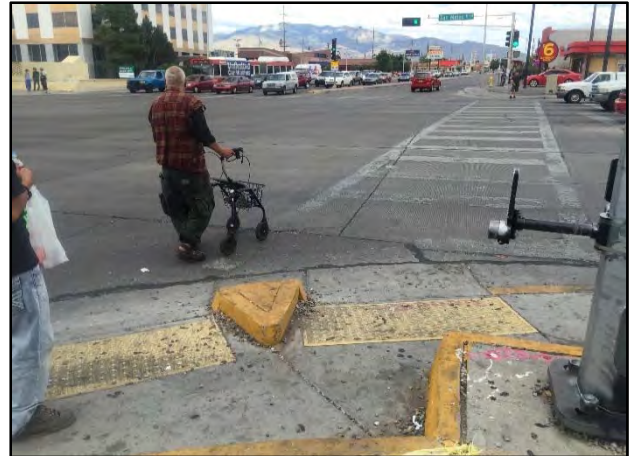


Figure 25: View looking east from the SW corner
(Source: City of Albuquerque)

PROWAG guidelines in place of ADAAG including New Mexico Department of Transportation (NMDOT). For the ART project, ABQ RIDE has chosen to follow the more progressive PROWAG guidelines.

Due to the high percentage of people with disabilities at this intersection PROWAG minimum guidelines should to be increased in key locations to appropriately and safely accommodate all users, particularly the high numbers of people with disabilities. The good news is that the February 2016 construction drawings show the effort made to go beyond minimum draft PROWAG dimensions:

- The dimensions needed for turning wheelchairs at ramps in most cases is wider than the recommended 4 ft.
- The corners have minimum grade changes that allow for meeting draft PROWAG standards, and also help to travel around corners.

However, there remain a few recommendations for changes.

- Provide 10 ft. wide sidewalks.
- Ensure that corner ramps align with striped crosswalks.
- Ensure clear space for boarding and alighting.

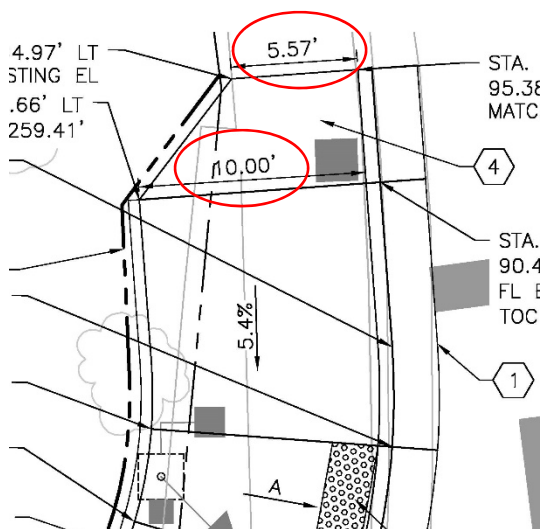


Figure 26: San Mateo NW Corner Intersection Plan
(Source: ABQ Ride Feb 2016 construction plans sheet 44 of 261)

Wider pedestrian access route (sidewalks) - Current draft PROWAG requirements call for a 4 ft. minimum with a 5 ft. by 5 ft. passing area every 200 ft. (R302.3 Continuous Width and R302.4 Passing Spaces) Please make the effort to provide at least a 6 ft. wide pedestrian access route in all areas including in front of bus shelters and on sidewalks leading to the intersection.

To the extent possible, increase the sidewalk width to 10 ft. wide following the City of Albuquerque Development Process Manual and the Long Range Transportation System Guide recommendations for arterials in activity centers. The corners often include 10 ft. wide sidewalks, but then this width narrows in other areas.

Further considerations for crossings:

Align Ramps with Cross Walk Striping – Instead of providing turning space at the bottom of ramps, align the ramps and/or crosswalks so that ramps open into the marked crosswalk area. The Feb 2016 construction plans show ramps for crossing Central Ave that appear much more off crossing alignment than the ramps leading to cross San Mateo Blvd.

Boarding and alighting space – Current draft PROWAG requirements call for boarding and alighting space of 5 ft. by 8 ft. Provide this boarding and alighting space for both the ART platform and the rightmost lane running routes (Route 66, Route 140/141). For ART stations, ensure that the canopy structure at the station does not protrude into this area.

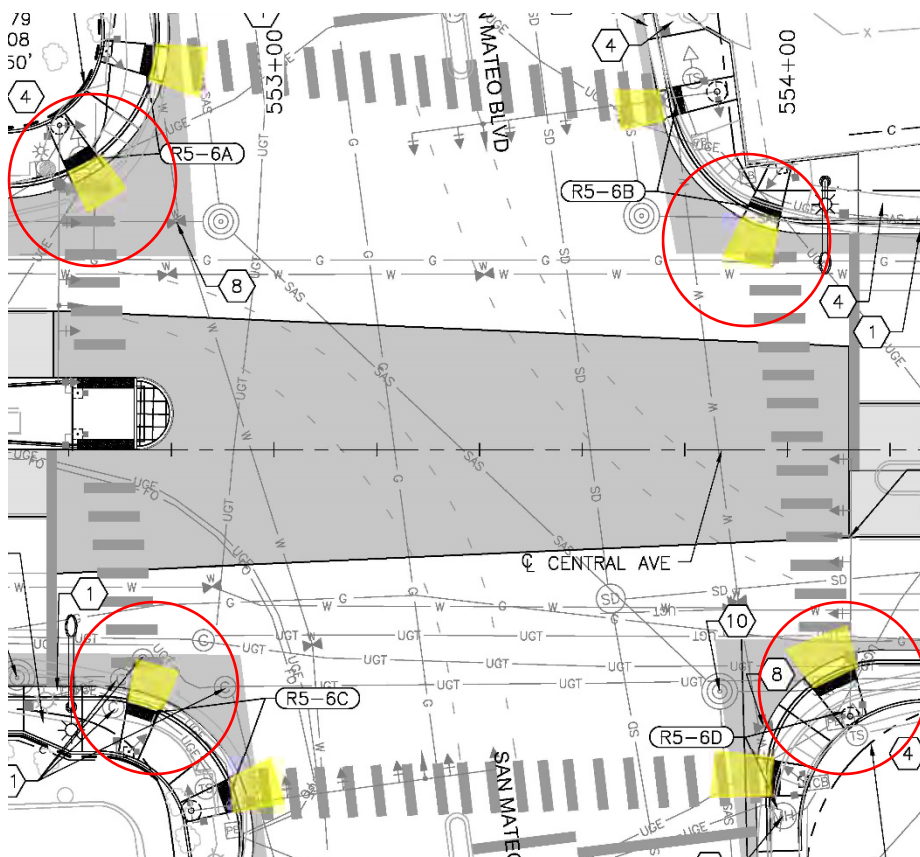


Figure 27: Central Ave and San Mateo Roadway Plan
(Source: ABQ Ride Feb 2016 construction plans sheet 81 or 261)

3. Investigate lane reductions on San Mateo Blvd and Reduce the posted speed limit to 35 mph:

Currently San Mateo Blvd has three directional lanes and two dual left turn lanes in each direction. The current and projected volume to capacity ratios for the AM and PM hour are all well below capacity. Travel demand projections for the AM and PM peak hour traffic show San Mateo Blvd using at most 65 percent of its capacity by the year 2040. It would be worthwhile to see if the excess motor vehicle capacity could be converted into a pedestrian refuge island or a wider sidewalk at this intersection.

Also investigate lowering the posted speed limit to 35 mph along San Mateo. San Mateo is designated as a Community Principal Arterial and part of the Priority Transit Network in the 2040 Metropolitan Transportation Plan's Long Range Transportation System Guide. Both of these designations identify San Mateo as a route that should not prioritize the through movement of automobiles at high speeds.

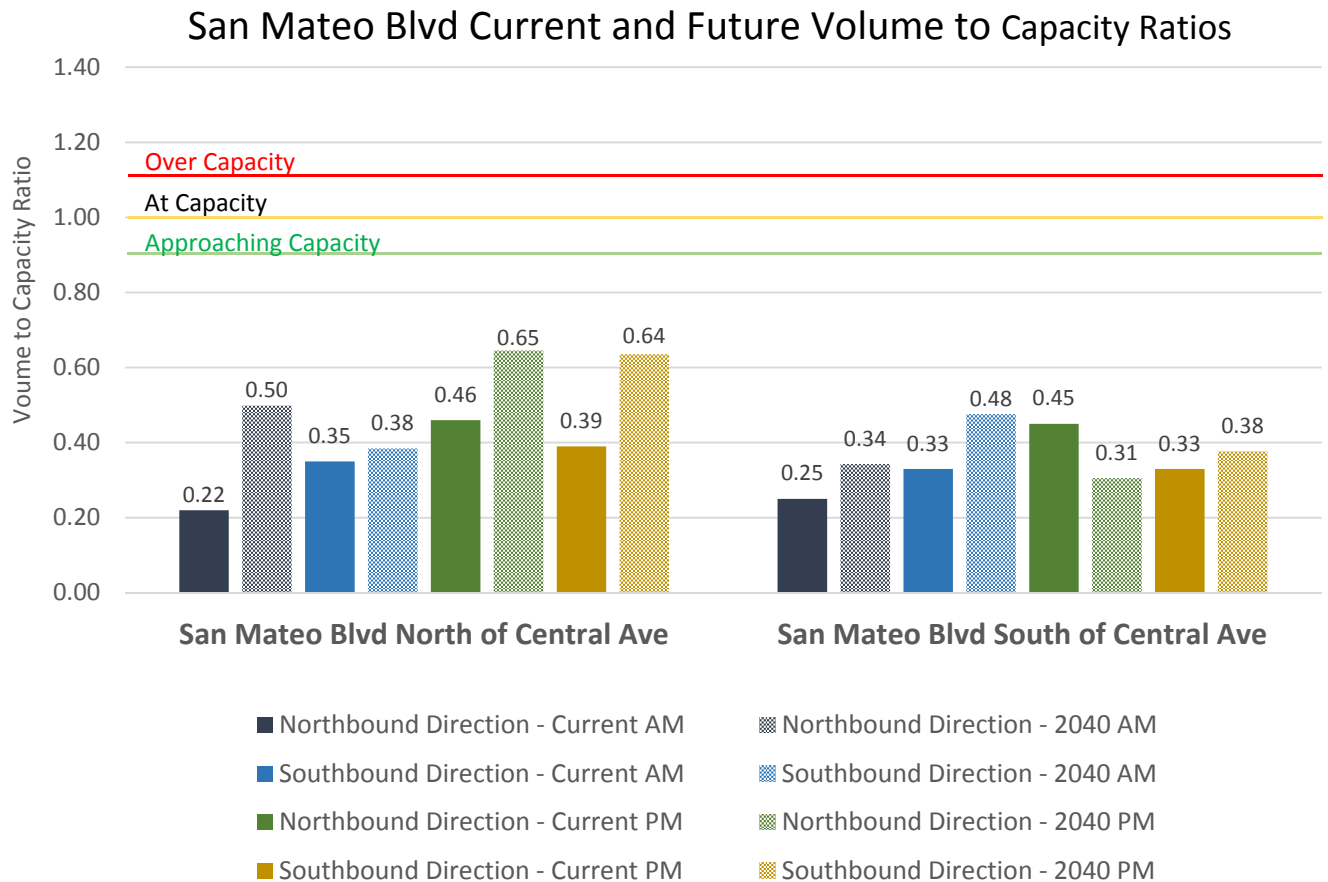


Chart 1: San Mateo Blvd current and future volume to capacity ratios (Source: MRCOG)

4. **Provide pedestrian median refuges and plan for one-stage crossings:** Provide the large pedestrian median refuge planned with the ART station. Also provide small median refuge islands at the San Mateo Blvd crossings where the left-turn median is present, but still provide one-stage crossings. Providing medians and pedestrian crossing islands at both signalized and unsignalized crossings is one of the FHWA's proven pedestrian safety countermeasures.



Figure 28: One-stage pedestrian median refuges in Austin TX. (Source: Google Maps)

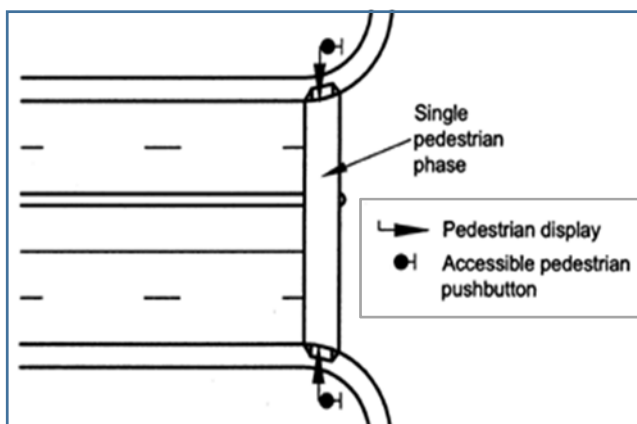


Figure 29: One-stage pedestrian crossing with median refuge island (Source: FHWA, Publication FHWA-HRT-04-091)

5. **Reduce Turning Radii:** The large turning radii on the corners of the intersection allow for high speed turns made by passenger vehicles.

Central Ave serves many purposes. It has the highest transit ridership in the region, some sections are designated Main Streets, it is one of the few river crossings and it is part of the Primary Freight Corridor network. As this corridor evolves it will be important to determine how these different uses will interact and if other corridors would be better candidates for freight.

For the purposes of this RSA, the large curb radii present safety issues due to allowing high speed turning movements. Higher speeds increase the likelihood for more severe injuries. Heavy vehicles can still be accommodated, but turns will require encroaching on other lanes of traffic.



Figure 30: Heavy vehicle turning from Central Ave to San Mateo Blvd (Source: Isebrands)

Table 7: Percentage of Passenger Vehicles and Heavy Vehicles

	Central Ave*	San Mateo Blvd**
Passenger Vehicles	85.2%	84.9%
Heavy Vehicles		
Buses	1.8%	1.1%
Single Unit Trucks	5.3%	4.2%
Single Trailer Trucks	4.4%	4.5%
Multi-Trailer Trucks	3.3%	5.3%
Total Heavy Vehicles	14.8%	15.1%

Source: MRCOG

*Central Ave between San Pedro and Louisiana (segment a block east of intersection)

**San Mateo Blvd between Central Ave and Lomas (segment north of intersection)

6. **Provide a 'No Turn on Red' phase to the signal plan with the dynamic sign:** There was a high number of pedestrian and vehicle conflicts due to motorists making right hand turns on both the red and green phase. A 'No Right on Red' phase would help to address this issue.



Figure 31: Leading pedestrian interval with no turn on red dynamic sign. (Source: Presentation: *2009 MUTCD New Provisions for Pedestrians and Bicyclists*, John LaPlante & Richard Moeur)

7. **Provide a Leading Pedestrian Interval (LPI):** The Manual of Uniform Traffic Devices (MUTCD) provides another option for reducing conflicts between pedestrians and motorists. This is a leading pedestrian interval. The 'No Turn on Red' addresses conflicts during the red phase and the LPI addresses conflicts during the green phase. The LPI allows pedestrians to begin crossing for at least three seconds and timed to allow pedestrians to cross at least one lane of traffic before turning traffic is given the green signal. This allows pedestrians to establish themselves in the crosswalk before right-turning traffic can begin moving.
8. **Automate the pedestrian phase:** Currently if pedestrians want to cross the road with the pedestrian phase they need to press the call button. 'Rest in Walk' automatically places a pedestrian call. Albuquerque's downtown areas do not have pedestrian call buttons because the pedestrian phase turns on automatically. At the intersection there were crossing pedestrians during nearly all the cycles. Sometimes pedestrians neglected to press the call button. This added confusion about when to cross.
9. **Check signal timing:** Currently the time allotted for pedestrians to cross the road appears to be short according to the signal timing plan which was updated was in December 2011. (See Appendix C for the signal timing plan).

According to Manual of Uniform Traffic Control Devices, in locations where pedestrians walk slower than 3.5 ft. per second or where pedestrians use wheelchairs to routinely cross, then a walking speed slower than 3.5 ft. per second should be considered in the clearance time. Given the concentrations of people with physical disabilities at this intersection, a slower walking speed should be used for the clearance interval time.

10. **Add backplates with retroreflective borders to all signal heads:** This is one of FHWA's proven safety countermeasures. Retroreflective borders improve the visibility of the illuminated face of the signal in both day and nighttime conditions which improve safety for all modes entering the intersection.



Figure 32: Backplate with a retroreflective border (Source: FHWA)

11. **Re-mark crosswalks and widen crosswalk markings:** Increase the visibility of crosswalks to prevent motorists from encroaching on crosswalks when stopping. Current crosswalk markings are very worn out, particularly near each corner. High-visibility crosswalks have been shown to increase motorist yielding and the channelization of pedestrians, leading the Federal Highway Administration (FHWA) to conclude that high-visibility pedestrian crosswalks have a positive effect on pedestrian and driver behavior.

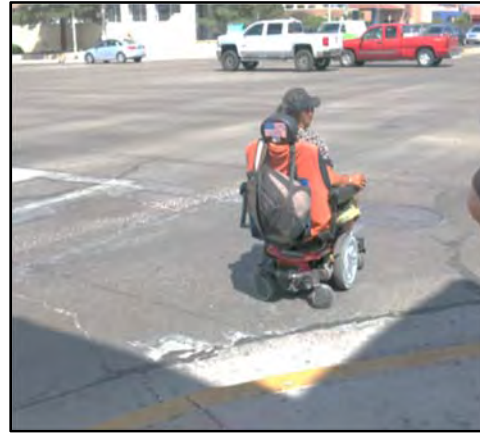


Figure 33: Example of the worn cross walk paint (Source: Isebrands)

12. **Safety education and interventions:** There are a variety of behavioral and social issues that require interventions.

The ongoing 'Look for Me' campaign funded through the New Mexico Department of Transportation helps to address motorists not yielding to pedestrians and risky pedestrian crossings. This program uses primarily outreach educational services and media. In the past, police enforcement was involved with officers issuing warnings and then citations for illegal maneuvers made by both motorists and pedestrians.

Substance abuse is a contributing factor to safety issues at this intersection. When a pedestrian who is intoxicated is involved in a crash many groups, particularly the media, are quick to attribute all the factors leading to nearly all crashes are due to the pedestrian being intoxicated. This focus on the surface problem of public intoxication detracts from the wide variety of safety issues and misses the underlying problems that can involve substance dependence, mental illness, homelessness and poverty. Often transportation agencies are reluctant and inexperienced at addressing larger social issues that underlie public intoxication.

Fortunately, public health advocates have developed methods to offer both short-term and long-term solutions for public intoxication through sober centers. These centers offer a less costly, more effective alternative to emergency room visits and jail. Bernalillo County Department of Substance Abuse Program (DSAP) offers this alternative with the Public Inebriate Intervention Program (PIIP). DSAP has partners with the Albuquerque Fire Department and the Albuquerque Police Department to identify inebriates and offer voluntary transportation to the Bernalillo County Metropolitan Assessment Treatment Services (MATS) facility. At MATS, intoxicated individuals receive appropriate treatment and have access to a variety of other programs that include detoxification services, medical observation, supportive aftercare, residential services, and a hospital that for adult/adolescent medical detoxification and rehabilitation⁷

Transit security routinely work with Albuquerque Police Department's Crises Outreach and Support Team (COAST) and the Critical Intervention Team (CIT) to help people get treatment. However, programs like PIIP and other programs at MATS are voluntary so individuals can deny treatment.

Coordination between programs that address substance abuse and transportation agencies is relatively new, however, collaboration between these two professions is needed in order to address all pedestrian safety issues.

13. **Improve maintenance at bus stops and along sidewalks:** Currently the bus stops often have trash and other maintenance issues. Conversations with users expressed concern over these issues.

Trash, other debris and graffiti may not present an immediate safety concern, however in criminology theory, the 'broken window theory' states that maintaining facilities and monitoring small issues helps create an atmosphere of order and lawfulness which in turn prevents more serious crimes from happening⁸.

14. **Provide Wayfinding and Improve Connections for Bicyclists:** Since there are no existing or planned bicycle facilities on Central Ave and San Mateo Blvd it is important to find alternatives for bicyclists to reach the bus stops and other destinations at this intersection safely.

15. **Coordination with ART and ongoing monitoring for safety improvements:** As ART progresses through final design there may be further opportunities to improve safety at this intersection. Although ART presents the largest single opportunity for safety improvements other smaller opportunities should not be overlooked. Finally, often the RSA is the starting point to provide the documentation needed to pursue safety funds and develop partnerships to provide a multi-disciplinary effort to address pedestrian safety issues.

⁷ Alexandria Tonigan, Paul Guerin, *Bernalillo County Department of Substance Abuse: Public Inebriation Program* (University of New Mexico, Institute for Social Research, 2015)

⁸ George Kelling, Catharin Coles, *Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities* (1992)

IMPLEMENTATION: FUNDING SOURCES FOR SAFETY AND OPERATIONAL IMPROVEMENTS

Some of the identified projects and funding sources for safety and operational studies and improvements include the following:

ACTIVE PROJECTS

ART (ABQ RIDE, City of Albuquerque) –

The planned ART project provides a unique opportunity to implement some of the RSA recommendations that would normally be longer-term items. Based on information from ABQ RIDE, these include:

- Widened sidewalks at the intersection corners: planned widths at the corners of the intersection range from 7' to 12' wide, with 10' on both the NW and SW corners.
- Reduced radii at the corners: planned radii range from 23' to 30'.
- Median refuge on Central: in conjunction with the ART station planned on Central on the west side of the intersection.
- Revamped signal timing: signal timing will be updated to accommodate pedestrian crossing times
- Bicycle wayfinding signs at the ART station: signage will show bicyclists where nearby bicycle routes and facilities are.

While the ART project will not implement all recommendations due to limits to its scope, some significant improvements are planned and when implemented will partially or fully implement key

recommendations of this RSA. For a summary of the RSA recommendations and related ART planned improvements see Table 8 on page 24. Future projects will still be required to refine and fully implement other recommendations.

Currently there are no additional projects for this intersection in the Transportation Improvement Program or 2040 Metropolitan Transportation Plan that are not tied to bus rapid transit, but projects could be added in the future.



Figure 34: Transit users (Source: City of Albuquerque)

POTENTIAL FUNDING SOURCES

As part of the Transit Priority Network, set-aside funds for increasing trips taken by transit could be available for people arriving to transit by walking.

FHWA Highway Safety Improvement Program (HSIP)

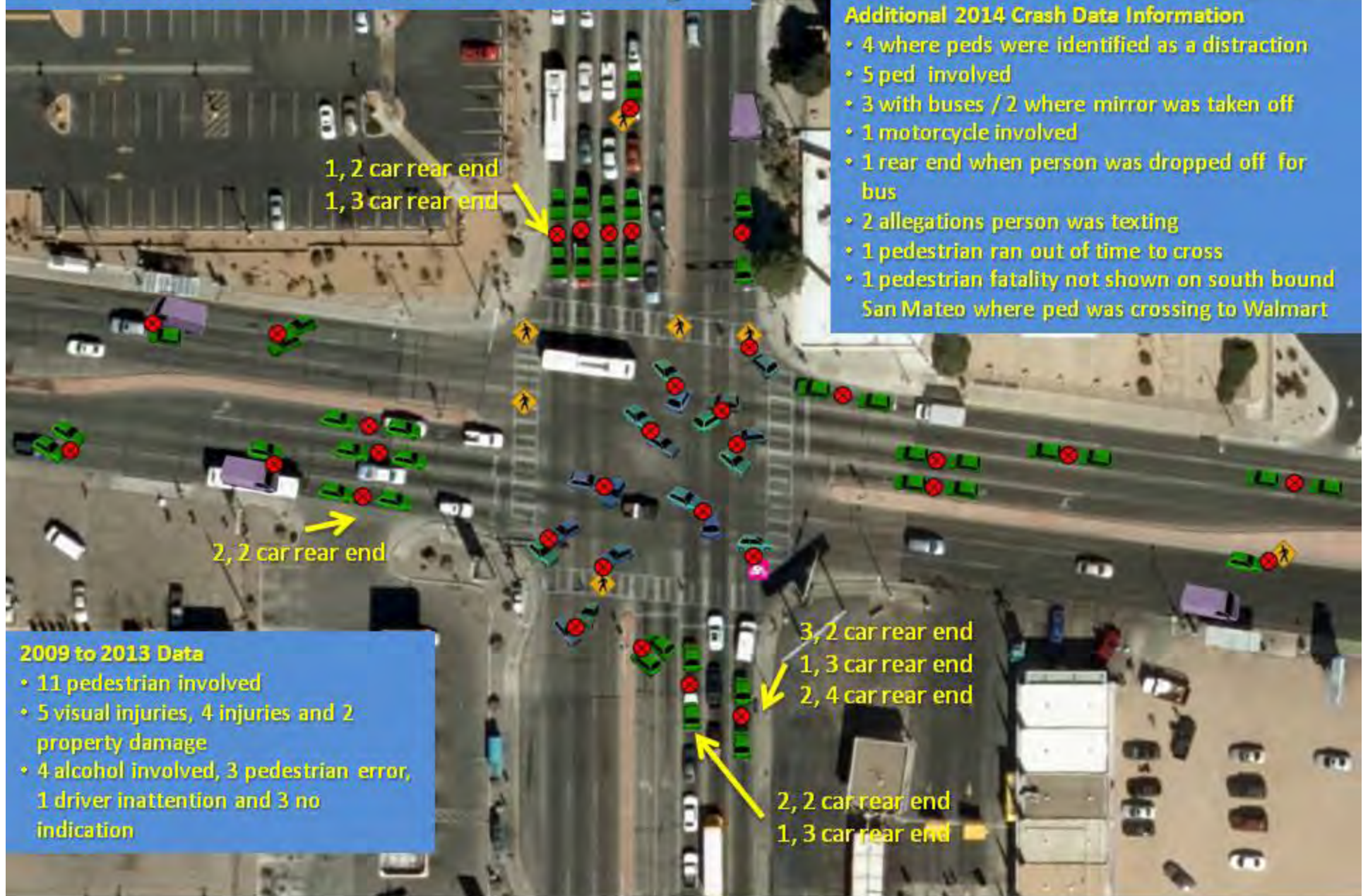
NHTSA, Statewide Pedestrian and Bicyclist Focus Education and Enforcement Effort⁹

⁹ <http://www.grants.gov/web/grants/view-opportunity.html?oppId=281258>

Table 8: RSA Recommendations and related ART Planned Improvements	
Central Ave & San Mateo Blvd RSA Recommended Safety Improvements	ART Improvements (preliminary design Jan 2016)
1. Address the lack of pedestrian space and maintenance issues at the southwest corner	Increased Public R.O.W., wider sidewalks and relocation of gravel and sign.
2. Follow draft Public Right-of-Way Accessibility Guidelines (PROWAG), increase the size of key spaces, and align ramps and marked crosswalks to go beyond minimum accessibility accommodation.	Incorporation of draft PROWAG Guidelines and increased public R.O.W. on the NW and SW corners, wider sidewalks, wider approaches and ramps on all four corners, and wider marked crosswalks.
3. Investigate reducing lanes on San Mateo Blvd.	
4. Provide pedestrian median refuge islands on San Mateo crossings and plan for one-stage crossings	Design anticipates one stage crossings for all four legs of the intersection and one pedestrian median refuge island associated with the ART station.
5. Reduce turning radii	Reduced turning radii on all four corners
6. Provide a 'No Turn on Red' phase to the signal plan and include a dynamic sign	Not included in preliminary design
7. Provide a 'Leading Pedestrian Interval'	Not included in preliminary design
8. Automate the pedestrian phase	Not included in preliminary design
9. Check signal timing for sufficient pedestrian crossing time.	Signal timing will be updated to accommodate pedestrian crossing times.
10. Add backplates with retroreflective borders to all signal heads.	Included with preliminary design
11. Re-mark and widen crosswalk markings	Wider crosswalks and installation of new 24 inch solid white reflectorized plastic pavement marking.
12. Safety education and interventions	
13. Improve maintenance at bus stops	Increased maintenance of ART stations is included in the ART budget.
14. Provide wayfinding and improve connections for bicyclists	Bicycle wayfinding signs to be included at the ART stations kiosks.
15. Coordination with ART and ongoing monitoring for safety improvements	

APPENDIX A CRASH DATA

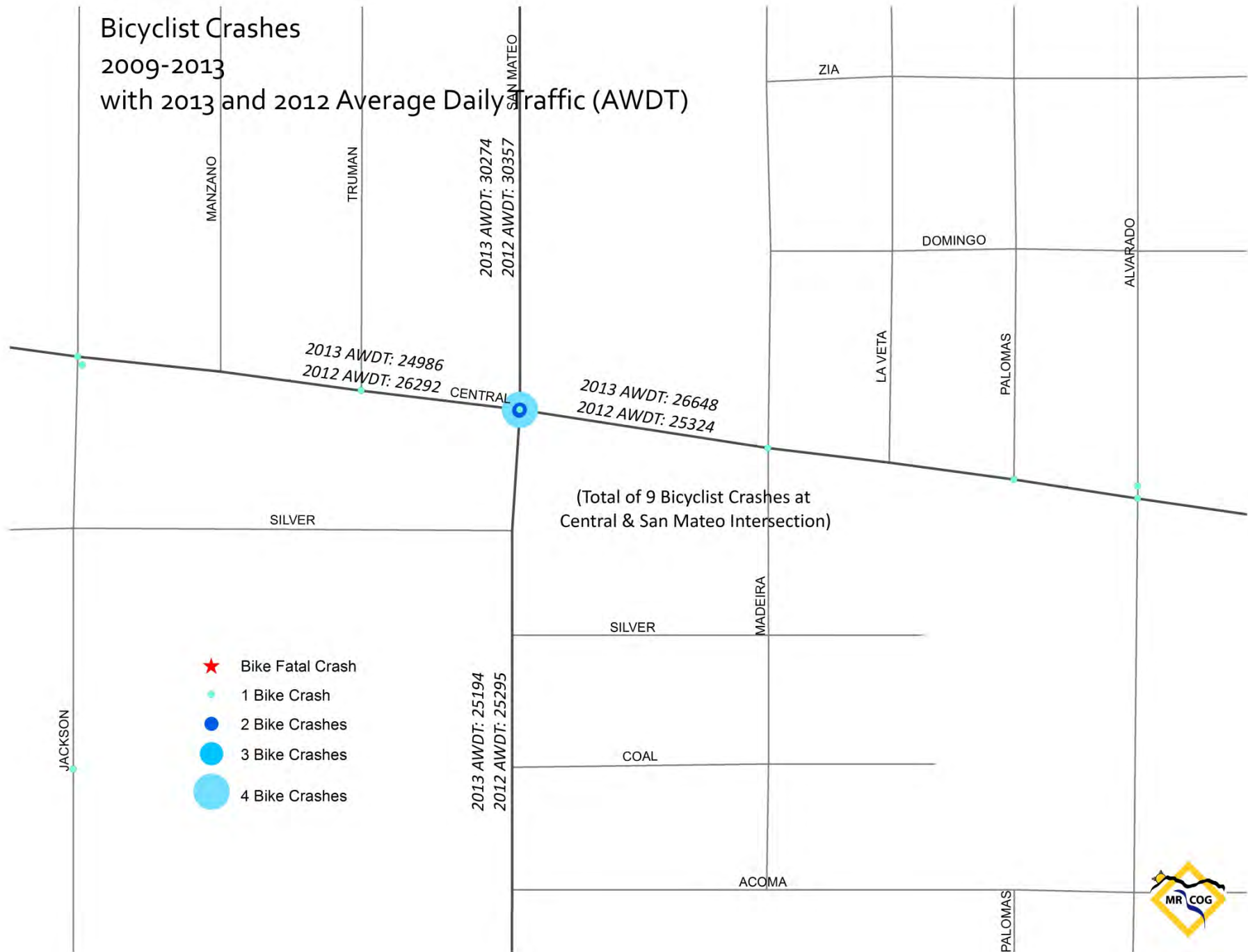
2014 Central and San Mateo Crash Records Diagram



with 2013 and 2012 Average Daily Traffic (AWDT)

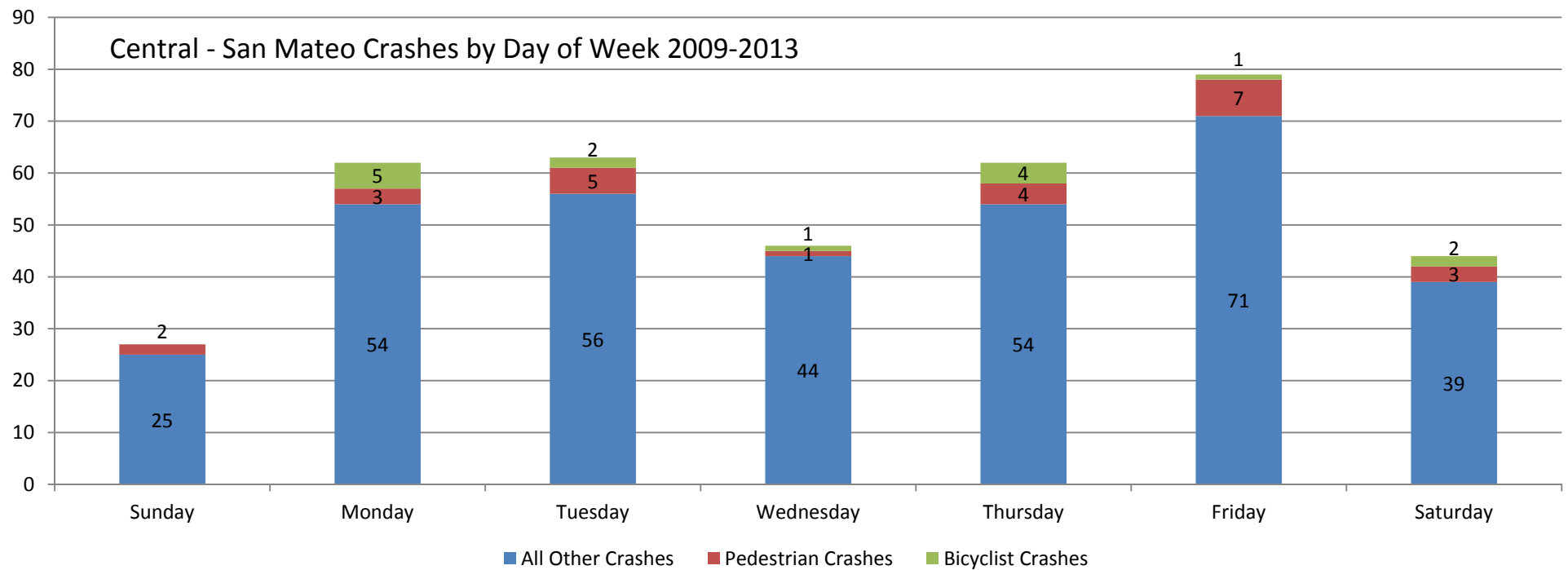


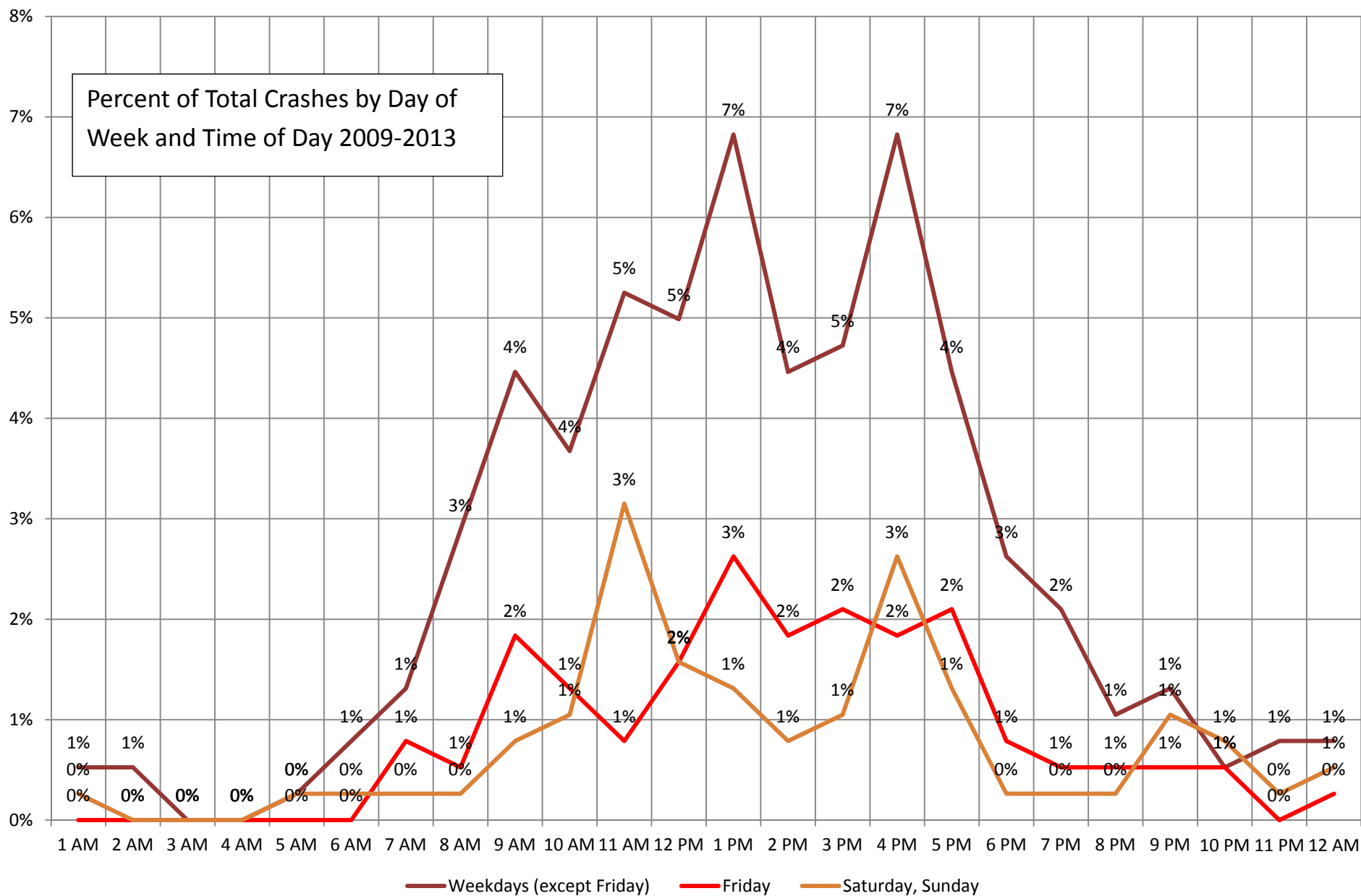
Bicyclist Crashes 2009-2013 with 2013 and 2012 Average Daily Traffic (AWDT)



Central and San Mateo Intersection Crashes & Surrounding Side Streets 2009-2013

Crash Severity	Pedestrian Crashes	Bicyclist Crashes	All Other Crashes	Total Crashes
Fatal Crash	2		1	3
Incapacitating Injury Crash	4	4	6	14
Injury Crash	15	7	85	107
Property Damage Only Crash	4	4	251	259
Total	25	15	343	383





APPENDIX B INTERSECTION TRAFFIC COUNTS

Harwick Transportation Group, Inc.

1440 Camino Cerrito SE
Albuquerque, NM 87123
505-228-9776

Counter: RC/TN

File Name : sanmateo-central
Site Code : 11142012
Start Date : 11/14/2012
Page No : 1

Groups Printed- Cars - Trucks - Buses

	Central Ave Eastbound					Central Ave Westbound					San Mateo Blvd Northbound					San Mateo Blvd Southbound					Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00 AM	19	78	11	(2)	108	34	91	10	(8)	135	12	74	10	(6)	96	34	162	17	(10)	213	26	552	578
07:15 AM	31	89	13	(6)	133	43	129	9	(7)	181	13	117	17	(6)	147	37	247	16	(11)	300	30	761	791
07:30 AM	32	78	16	(4)	126	37	140	29	(8)	206	18	147	17	(3)	182	26	216	14	(10)	256	25	770	795
07:45 AM	25	86	16	(6)	127	52	232	47	(11)	331	24	174	26	(7)	224	41	194	13	(10)	248	34	930	964
Total	107	331	56	(18)	494	166	592	95	(34)	853	67	512	70	(22)	649	138	819	60	(41)	1017	115	3013	3128
08:00 AM	23	75	15	(16)	113	42	246	40	(9)	328	30	136	17	(4)	183	27	168	23	(11)	218	40	842	882
08:15 AM	18	88	12	(10)	118	61	231	44	(3)	336	27	121	18	(1)	166	44	164	27	(17)	235	31	855	886
08:30 AM	20	58	18	(8)	96	53	203	48	(12)	304	18	129	27	(8)	174	34	168	27	(15)	229	43	803	846
08:45 AM	38	98	14	(12)	150	36	209	50	(4)	295	25	144	13	(2)	182	41	157	25	(16)	223	34	850	884
Total	99	319	59	(46)	477	192	889	182	(28)	1263	100	530	75	(15)	705	146	657	102	(59)	905	148	3350	3498
*** BREAK ***																							
04:00 PM	52	195	38	(29)	285	49	158	55	(9)	262	49	190	36	(8)	275	66	159	33	(32)	258	78	1080	1158
04:15 PM	58	164	33	(18)	255	34	139	42	(16)	215	45	255	46	(9)	346	73	240	44	(27)	357	70	1173	1243
04:30 PM	61	158	31	(28)	250	44	170	46	(16)	260	38	227	34	(8)	299	57	216	31	(20)	304	72	1113	1185
04:45 PM	52	147	29	(14)	228	33	162	51	(9)	246	39	300	45	(14)	384	69	238	45	(33)	352	70	1210	1280
Total	223	664	131	(89)	1018	160	629	194	(50)	983	171	972	161	(39)	1304	265	853	153	(112)	1271	290	4576	4866
05:00 PM	61	199	42	(38)	302	52	177	59	(16)	288	44	244	44	(18)	332	55	181	31	(22)	267	94	1189	1283
05:15 PM	60	171	33	(20)	264	43	162	44	(18)	249	43	269	30	(15)	342	58	242	40	(15)	340	68	1195	1263
05:30 PM	62	172	43	(21)	277	42	130	32	(13)	204	37	199	33	(11)	269	52	183	32	(13)	267	58	1017	1075
05:45 PM	43	133	27	(12)	203	48	132	32	(4)	212	39	176	28	(7)	243	45	153	46	(24)	244	47	902	949
Total	226	675	145	(91)	1046	185	601	167	(51)	953	163	888	135	(51)	1186	210	759	149	(74)	1118	267	4303	4570
Grand Total	655	1989	391	(244)	3035	703	2711	638	(163)	4052	501	2902	441	(127)	3844	759	3088	464	(286)	4311	820	15242	16062
Apprch %	21.6	65.5	12.9			17.3	66.9	15.7			13	75.5	11.5			17.6	71.6	10.8					
Total %	4.3	13	2.6		19.9	4.6	17.8	4.2		26.6	3.3	19	2.9		25.2	5	20.3	3		28.3	5.1	94.9	
Cars	650	1919	389		3192	691	2652	629		4119	499	2874	439		3929	752	3053	460		4542	0	0	15782
% Cars	99.2	96.5	99.5	95.9	97.3	98.3	97.8	98.6	90.2	97.7	99.6	99	99.5	92.1	98.9	99.1	98.9	99.1	96.9	98.8	0	0	98.3
Trucks	4	7	2		15	6	9	8		23	2	8	1		11	4	16	4		27	0	0	76
% Trucks	0.6	0.4	0.5	0.8	0.5	0.9	0.3	1.3	0	0.5	0.4	0.3	0.2	0	0.3	0.5	0.5	0.9	1	0.6	0	0	0.5
Buses	1	63	0		72	6	50	1		73	0	20	1		31	3	19	0		28	0	0	204
% Buses	0.2	3.2	0	3.3	2.2	0.9	1.8	0.2	9.8	1.7	0	0.7	0.2	7.9	0.8	0.4	0.6	0	2.1	0.6	0	0	1.3

Harwick Transportation Group, Inc.

1440 Camino Cerrito SE
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Counter: RC/TN

File Name : sanmateo-central
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	Central Ave Eastbound				Central Ave Westbound				San Mateo Blvd Northbound				San Mateo Blvd Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 7:00:00 AM to 12:30:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 7:45:00 AM																	
7:45:00 AM	25	86	16	127	52	232	47	331	24	174	26	224	41	194	13	248	930
8:00:00 AM	23	75	15	113	42	246	40	328	30	136	17	183	27	168	23	218	842
8:15:00 AM	18	88	12	118	61	231	44	336	27	121	18	166	44	164	27	235	855
8:30:00 AM	20	58	18	96	53	203	48	304	18	129	27	174	34	168	27	229	803
Total Volume	86	307	61	454	208	912	179	1299	99	560	88	747	146	694	90	930	3430
% App. Total	18.9	67.6	13.4		16	70.2	13.8		13.3	75	11.8		15.7	74.6	9.7		
PHF	.860	.872	.847	.894	.852	.927	.932	.967	.825	.805	.815	.834	.830	.894	.833	.938	.922
Cars	85	289	61	435	204	898	175	1277	98	549	86	733	142	688	88	918	3363
% Cars	98.8	94.1	100	95.8	98.1	98.5	97.8	98.3	99.0	98.0	97.7	98.1	97.3	99.1	97.8	98.7	98.0
Trucks	1	3	0	4	3	1	3	7	1	3	1	5	2	2	2	6	22
% Trucks	1.2	1.0	0	0.9	1.4	0.1	1.7	0.5	1.0	0.5	1.1	0.7	1.4	0.3	2.2	0.6	0.6
Buses	0	15	0	15	1	13	1	15	0	8	1	9	2	4	0	6	45
% Buses	0	4.9	0	3.3	0.5	1.4	0.6	1.2	0	1.4	1.1	1.2	1.4	0.6	0	0.6	1.3
Peak Hour Analysis From 12:35:00 PM to 5:50:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 4:35:00 PM																	
4:35:00 PM	61	158	31	250	44	170	46	260	38	227	34	299	57	216	31	304	1113
4:50:00 PM	52	147	29	228	33	162	51	246	39	300	45	384	69	238	45	352	1210
5:05:00 PM	61	199	42	302	52	177	59	288	44	244	44	332	55	181	31	267	1189
5:20:00 PM	60	171	33	264	43	162	44	249	43	269	30	342	58	242	40	340	1195
Total Volume	234	675	135	1044	172	671	200	1043	164	1040	153	1357	239	877	147	1263	4707
% App. Total	22.4	64.7	12.9		16.5	64.3	19.2		12.1	76.6	11.3		18.9	69.4	11.6		
PHF	.959	.848	.804	.864	.827	.948	.847	.905	.932	.867	.850	.883	.866	.906	.817	.897	.973
Cars	241	685	149	1075	170	645	191	1006	165	1023	157	1345	242	871	140	1253	4679
% Cars	103.0	101.5	110.4	103.0	98.8	96.1	95.5	96.5	100.6	98.4	102.6	99.1	101.3	99.3	95.2	99.2	99.4
Trucks	1	1	0	2	0	4	1	5	0	2	0	2	0	3	2	5	14
% Trucks	0.4	0.1	0	0.2	0	0.6	0.5	0.5	0	0.2	0	0.1	0	0.3	1.4	0.4	0.3
Buses	0	13	0	13	0	12	0	12	0	4	0	4	0	4	0	4	33
% Buses	0	1.9	0	1.2	0	1.8	0	1.2	0	0.4	0	0.3	0	0.5	0	0.3	0.7

Harwick Transportation Group, Inc.

1440 Camino Cerrito SE
Albuquerque, NM 87123
505-228-9776

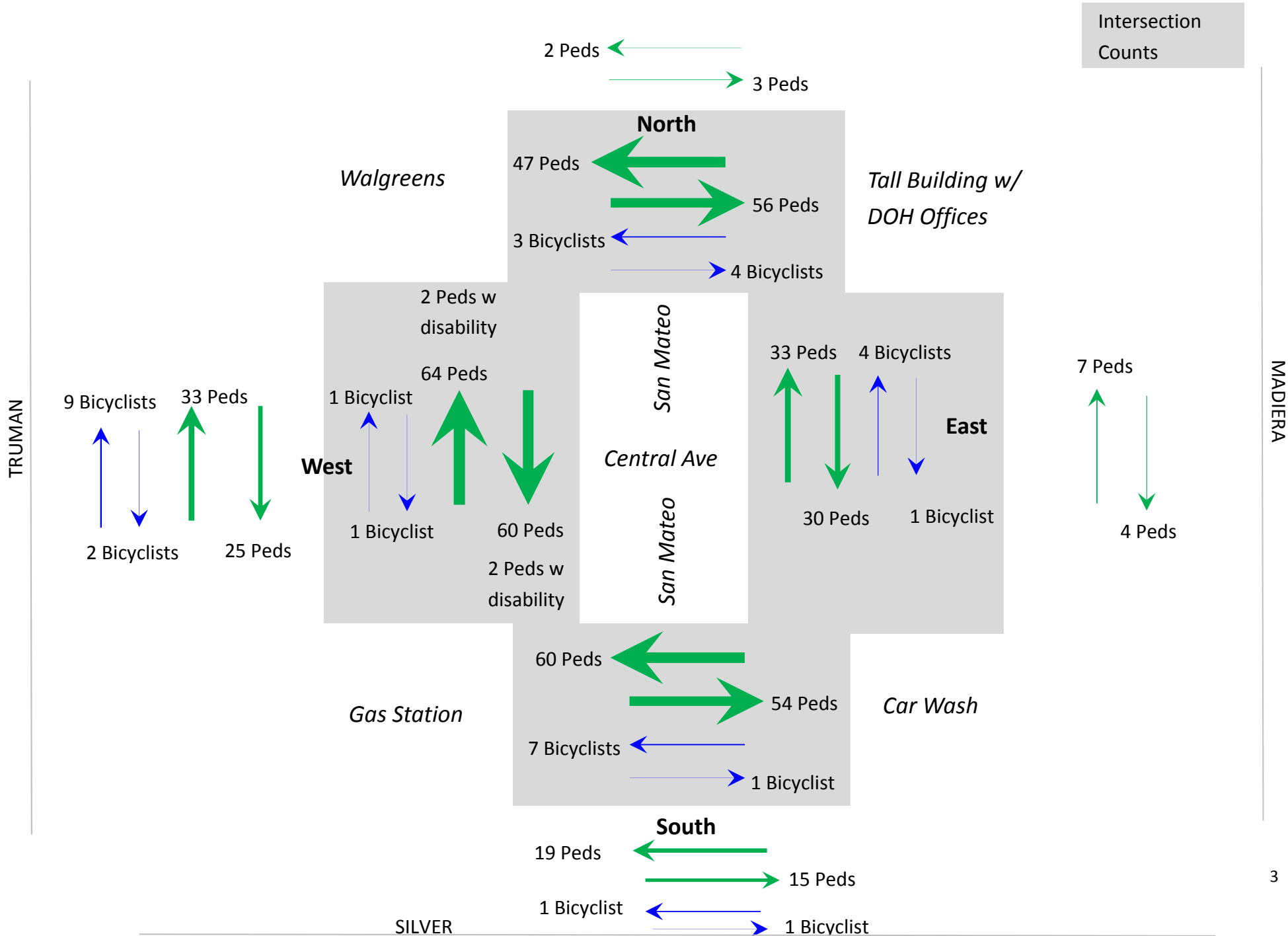
Counter: RC/TN

File Name : SanMateo-Central
Site Code : 11142012
Start Date : 11/14/2012
Page No : 1

Groups Printed- Trucks/(BIKES)

	Central Ave Eastbound					Central Ave Westbound					San Mateo Blvd Northbound					San Mateo Blvd Southbound					Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00 AM	0	0	0	(0)	0	0	0	1	(0)	1	0	0	0	(0)	0	0	2	0	(0)	2	0	3	3
07:15 AM	0	0	1	(2)	1	2	1	0	(0)	3	0	0	0	(0)	0	0	2	0	(1)	2	3	6	9
07:30 AM	0	0	0	(0)	0	1	0	0	(0)	1	0	2	0	(0)	2	0	4	0	(2)	4	2	7	9
07:45 AM	0	1	0	(0)	1	1	1	1	(0)	3	0	2	1	(0)	3	0	1	1	(0)	2	0	9	9
Total	0	1	1	(2)	2	4	2	2	(0)	8	0	4	1	(0)	5	0	9	1	(3)	10	5	25	30
08:00 AM	1	1	0	(0)	2	1	0	0	(0)	1	1	1	0	(0)	2	0	0	0	(0)	0	0	5	5
08:15 AM	0	1	0	(0)	1	1	0	1	(0)	2	0	0	0	(0)	0	1	0	0	(0)	1	0	4	4
08:30 AM	0	0	0	(0)	0	0	0	1	(0)	1	0	0	0	(0)	0	1	1	1	(0)	3	0	4	4
08:45 AM	1	0	1	(0)	2	0	3	1	(0)	4	1	0	0	(0)	1	0	0	0	(0)	0	0	7	7
Total	2	2	1	(0)	5	2	3	3	(0)	8	2	1	0	(0)	3	2	1	1	(0)	4	0	20	20
*** BREAK ***																							
04:00 PM	0	2	0	(0)	2	0	0	0	(0)	0	0	0	0	(0)	0	0	1	0	(0)	1	0	3	3
04:15 PM	0	1	0	(0)	1	0	0	1	(0)	1	0	0	0	(0)	0	2	0	0	(0)	2	0	4	4
04:30 PM	1	0	0	(0)	1	0	3	1	(0)	4	0	1	0	(0)	1	0	3	0	(0)	3	0	9	9
04:45 PM	0	0	0	(0)	0	0	0	0	(0)	0	0	1	0	(0)	1	0	0	0	(0)	0	0	1	1
Total	1	3	0	(0)	4	0	3	2	(0)	5	0	2	0	(0)	2	2	4	0	(0)	6	0	17	17
05:00 PM	0	1	0	(0)	1	0	0	0	(0)	0	0	0	0	(0)	0	0	0	2	(0)	2	0	3	3
05:15 PM	0	0	0	(0)	0	0	1	0	(0)	1	0	1	0	(0)	1	0	0	0	(0)	0	0	2	2
*** BREAK ***																							
05:45 PM	1	0	0	(0)	1	0	0	1	(0)	1	0	0	0	(0)	0	0	2	0	(0)	2	0	4	4
Total	1	1	0	(0)	2	0	1	1	(0)	2	0	1	0	(0)	1	0	2	2	(0)	4	0	9	9
Grand Total	4	7	2	(2)	13	6	9	8	(0)	23	2	8	1	(0)	11	4	16	4	(3)	24	5	71	76
Apprch %	30.8	53.8	15.4			26.1	39.1	34.8			18.2	72.7	9.1			16.7	66.7	16.7					
Total %	5.6	9.9	2.8		18.3	8.5	12.7	11.3		32.4	2.8	11.3	1.4		15.5	5.6	22.5	5.6		33.8	6.6	93.4	

Pedestrian & Bicyclist Crossing Counts Friday 11:30AM-1:30PM



APPENDIX C SIGNAL TIMING PLAN

Intersection No.: 26

System:	I2
Address:	1
RIU:	NONE

Intersection Name: CENTRAL - SAN MATEO

Phase I.D.:	1	2	3	4	5	6	7	8
Phase Dir.:	E-N	WB	N-W	SB	W-S	EB	S-E	NB
Recall:	OFF	MAX	OFF	MAX	OFF	MAX	OFF	MAX
Added Initial:	0	0	0	0	0	0	0	0
Initial - Min:	3	16	3	16	3	16	3	16
Initial - Max:	3	16	3	16	3	16	3	16
Ped-Walk:	0	7	0	7	0	7	0	7
Ped-Clear:	0	26	0	26	0	26	0	24
Ext-Preset:	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0
Ext-Minimum:	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0
Reduce-Before:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce-To Min:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum-#1:	18	32	18	32	18	32	18	32
Maximum-#2:	18	32	18	32	18	32	18	32
Maximum-#3:								
Clear-Yellow:	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Clear-Red:	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0
Det Memory:	NL	L	NL	L	NL	L	NL	L

Flash Mode: ALL RED

Start Up Mode:	ALL RED
Time:	8 SEC.
First Phases:	2 & 6
Start In:	GREEN

Approved: BB

Print Date: 10/22/2013

Overlap Phases: NONE

Overlap	Par Ph	Gm	Yel	Red
A				
B				
C				
D				
E/W	E/W	N/S	N/S	X/Y
xNA	xSA	xEA	xWA	xZA

Ped Heads:	YES	YES	YES	YES	NONE
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Ped Buttons:	YES	YES	YES	YES	NONE
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Bike Buttons:	NONE	NONE	NONE	NONE	NONE
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Vehicle Detection:

Local, presence:	YES
Local, pulse:	NONE
System:	NONE

Direction	Type	Dist Back	
NB	NONE		ft.
SB	NONE		ft.
EB	NONE		ft.
WB	NONE		ft.

Direction	Type	Dist Back	
N-W	PRES		ft.
S-E	PRES		ft.
E-N	PRES		ft.
W-S	PRES		ft.

Dual Entry:	NO
Guar Pass Time:	NO
Simul Gap Out:	NO
Max. Ext:	NO
Red Rest 1-4:	NO
Red Rest 5-8:	NO
Min. Red:	2
Cond. Serv:	NO

Turn On Date	12/20/1978
Controller Type	Econo ASC2S-2100
Electronics Level	MICRO
No. of Rings	2
No. of Phases	8
External Logic	N
Cabinet Type	P

Slave No.:	2
Multiplex No.:	7
Sec. Func. Cir:	NO
Prom Rev (c/t):	A/A

Timeclock-Cabinet	
Timeclock-Computer	
Flash T-O-D	

NOTES:

1. Adjusted recalls, ped walk time, 3/27/92.
2. Adjusted ped clearance times, 8/5/92.
3. Controller changeout from 911 to 820, 2/11/93.
4. Intersection geometrics revised - existing pulse loops gone, timings adjusted to reflect new geometrics.
5. Revised red clearance times, 5/25/95
6. Updated file, 8/8/00.
7. Timing sheet changed to reflect change of I2 address and controller, 1/7/09.
8. Through movement yellow clearances adjusted per Adminsitration, 1/31/13
9. Clearance intervals updated to NMDOT standard by BB, 10/22/13.

COORDINATION TIMING PLAN DATA

4/20/2016 4:43 PM

Intersection # and Name: **026 - Central & San Mateo**

COORDINATOR OPTIONS

SPLIT UNITS	%	ACT CRD PHASE	X
OFFSET UNITS	%	ACT WALK/REST	.
INTERCNT FMT	PLAN	INHIBIT MAX	X
INTERCNT SRC	NIC	MAX2 SELECT	.
RESYNC COUNT	0	MULTISYNC	.
TRANSITION	SMOOTH	FLOAT FORCE OFF	.
DEWLL PERIOD	0%		

FREE ALT SEQUENCE A B C D E F

--	--	--	--	--	--

COORDINATION PATTERN DATA PATTERN 1

CYCLE LENGTH	110	PLAN	1					
OFFSET	64							
PHASE	1	2	3	4				
DIRECTION	E-N	WB	N-W	SB				
SPLITS	13	41	13	33				
PHASE	5	6	7	8				
DIRECTION	W-S	EB	S-E	NB				
SPLITS	18	36	14	32				
PHASE	1	2	3	4	5	6	7	8
COORD PHASE		X				X		
VEH RECALL								
MAX RECALL		X				X		
ALT SEQUENCE	A	B	C	D	E	F		

COORDINATION PATTERN DATA PATTERN 3

CYCLE LENGTH	110	PLAN	3					
OFFSET	64							
PHASE	1	2	3	4				
DIRECTION	E-N	WB	N-W	SB				
SPLITS	18	35	15	32				
PHASE	5	6	7	8				
DIRECTION	W-S	EB	S-E	NB				
SPLITS	18	35	17	30				
PHASE	1	2	3	4	5	6	7	8
COORD PHASE		X				X		
VEH RECALL								
MAX RECALL		X				X		
ALT SEQUENCE	A	B	C	D	E	F		

COORDINATION TIMING PLAN DATA

4/20/2016 4:43 PM

<u>COORDINATION PATTERN DATA PATTERN 5</u>									
CYCLE LENGTH	120				PLAN				5
OFFSET	64								
PHASE	1		2		3		4		
DIRECTION	E-N		WB		N-W		SB		
SPLITS	18		37		16		29		
PHASE	5		6		7		8		
DIRECTION	W-S		EB		S-E		NB		
SPLITS	15		40		17		28		
PHASE	1	2	3	4	5	6	7	8	
COORD PHASE		X				X			
VEH RECALL									
MAX RECALL		X				X			
ALT SEQUENCE	A	B	C	D	E	F			

<u>CLOCK / CALENDAR</u>	
DATE SET:	CURRENT DATE
TIME SET:	CURRENT TIME
SYNC REFERENCE TIME:	3:30

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	1	2	2	2	2	2	3
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

STEP	PGM	TIME	PATTERN
1	1	7:00	3
2	1	22:00	0
3	2	6:30	1
4	2	9:00	3
5	2	15:00	5
6	2	18:30	3
7	2	22:00	0
8	3	7:00	3
9	3	22:00	0

COORDINATION TIMING PLAN DATA

4/20/2016 4:43 PM

NOTES:

6/18/08 - Adjusted the Offsets to allow better progression.
12/28/11 - Coord sheet updated.