City of Albuquerque

Neighborhood Traffic Management Program

Prepared for
Albuquerque City Council per Resolution R-09-17

By
Neighborhood Traffic Management Policy Study Group

CITY of ALBUQUERQUE
NINETEENTH COUNCIL

COUNCIL BILL NO. R-09-17 ENACTMENT NO. R-2010-022

SPONSORED BY: Trudy Jones, Isaac Benton

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RESOLUTION

CREATING A NEIGHBORHOOD TRAFFIC MANAGEMENT POLICY STUDY GROUP TO EXAMINE IMPLEMENTATION STANDARDS FOR TRAFFIC CALMING MEASURES WITHIN RESIDENTIAL NEIGHBORHOODS.

WHEREAS, pursuant to City Resolution R-03-314, the City Council adopted the Neighborhood Traffic Management Policy NTMP; and

WHEREAS, the original purpose of adopting the NTMP was to formalize a procedure for requesting implementation of traffic calming devices within residential areas; and

WHEREAS, since the development of the NTMP Manual, additional information has become available regarding the effectiveness of certain traffic calming devices and new traffic calming devices have been devised; and

WHEREAS, it is desirable to revisit City policy regarding residential traffic calming devices and develop and adopt new policies that incorporate current best practices to improve neighborhood traffic safety.

BE IT RESOLVED BY THE COUNCIL, THE GOVERNING BODY OF THE CITY OF ALBUQUERQUE:

Section 1. There is hereby created a "Neighborhood Traffic Management Policy Study Group" (Study Group) and shall be made up of the following members:

1. A representative from the Institute of Transportation Engineers (ITE), who shall serve as Chair of the Study Group.
2. A representative from the City Traffic Engineering Division.
3. A representative from the City Street Maintenance Division.
4. A representative from the Albuquerque Fire Department.
5. A representative from the Albuquerque Police Department.
6. A representative from the Planning Department.

7. The City Councilors from District 3 and District 8 or their designees.
8. The Study Group shall also have an advisor from the City Legal Department and may request input from other appropriate entities.

Section 2. The Study Group shall:

1. Review existing neighborhood traffic management policies and locations where traffic calming devices have been implemented.
2. Identify and map the primary emergency response routes to or within residential subdivisions or commercial properties.
3. Review existing data regarding the effectiveness of traffic calming devices, including their effect on emergency response routes.
4. Review and discuss new methods of traffic calming within residential neighborhoods.
5. Examine available funding sources and limitations.
6. Examine present neighborhood involvement procedures.
7. Develop outreach opportunities for educating the public on traffic safety and traffic calming devices.
8. Discuss any other matter deemed appropriate by the Study Group.

Section 3. Within three months of formation, the Study Group shall provide draft recommendations to be circulated to all affected departments for review and comment. Additionally, the City shall hold four public meetings, one in each quadrant of the city, in order to present the draft recommendations to and receive comments from the general public. Comments shall be reviewed by the Study Group, and a final recommendation shall be submitted to the Mayor for transmission to the Council within six months of the date of this Resolution being passed.

Section 4. The Neighborhood Traffic Management Policy Study Group will be staffed by the Mayor or his designee with support from Council Services as needed.

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PASSED AND ADOPTED THIS 4th DAY OF January, 2010
BY A VOTE OF: 9 FOR 0 AGAINST.

Ken Sanchez, President
City Council

APPROVED THIS 14th DAY OF January, 2010

Bill No. R-09-17

Richard J. Berry, Mayor
City of Albuquerque

ATTEST:

City Clerk

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I. Introduction

The City of Albuquerque is committed to developing an effective approach to managing neighborhood traffic. Neighborhood involvement is an important component of this approach. To maximize neighborhood involvement in improving local traffic conditions, the City of Albuquerque City Council passed a resolution forming the Neighborhood Traffic Management Program (NTMP) Study Group. This group was tasked with providing recommendations for an NTMP guide for City of Albuquerque to follow in managing neighborhood traffic.

Resolution R-09-17 created a study group to revisit City policy regarding residential traffic calming devices. The study group included the following members:

Name	**Organization**
Ross Lujan, P.E. (Chairman)	Institute of Transportation Engineers, President
Kara Shair-Rosenfield	Council District 3
Diane Dolan (Alternate)	Council District 3
Councilor Trudy Jones	Council District 8
Elizabeth Shields (Alternate)	Council District 8
Ted Korbin, P.E.	City Traffic Engineering Division
Wilfred Gallegos, P.E.	City Street Maintenance Division
Chief James Breen	Albuquerque Fire Department
Richard Sears	Albuquerque Fire Department
Lt. Jason Garcia (Alternate)	Albuquerque Fire Department
Ray Torres	Albuquerque Police Department
Shane Rodgers	Albuquerque Police Department
Deborah Stover	Planning Department
Russell Brito (Alternate)	Planning Department
Shannon Beaucaire	City Legal

Resolution R-09-17 outlined the following 8 objectives for this study group:

1. Review existing neighborhood traffic management policies and locations where traffic calming devices have been implemented.
2. Identify and map the primary emergency response routes to or within residential subdivisions or commercial properties.
3. Review existing data regarding the effectiveness of traffic calming devices, including their effect on emergency response routes.
4. Review and discuss new methods of traffic calming within residential neighborhoods.
5. Examine available funding sources and limitations.
6. Examine present neighborhood involvement procedures.
7. Develop outreach opportunities for educating the public on traffic safety and traffic calming devices.

8. Discuss any other matter deemed appropriate by the Study Group.

The study groupõs first meeting was held on April 22, 2010. There have been 8 subsequent meetings. Below are the study groupõs findings for each of the objectives.

II. R-09-17 Objectives

A. Objective 1

Review existing neighborhood traffic management policies and locations where traffic calming devices have been implemented.

The limitation of the existing Neighborhood Traffic Management Program (NTMP) provided as Appendix ñAò is that it was originally conceived as speed hump program only and did not address additional neighborhood traffic management methods. However, it became apparent that speed humps would not address every neighborhood traffic problem and subsequently over the last 5 years the City has installed some additional neighborhood traffic calming methods other than speed humps such as traffic circles, road closures, and electronic speed boards.

The study group conducted site visits to the following locations to review these implemented methods to determine the purpose and usefulness of each application.

Method: Chicanes
Location: 12th Street
Purpose: As a means of slowing down traffic
Observation: It is a collector but has residential characteristics; method added due to complaint from citizen that their house shook while buses drove past

Method: S-Curve
Location: 6th Street
Purpose: To adjust speed
Observation: Lines often fade; re-striping performed every 6-12 months; could use vertical diverters to force people to slow down

Method: Radar Speed Signs
Location: Indian School/Constitution
Purpose: Show presence in neighborhood
Observation: Drivers started to slow down when they saw a City vehicle; effective, but for how long

Method: Traffic Circle
Location: Lester/Northeastern
Purpose: To slow traffic without an unwarranted stop
Observation: AFD ladder truck went through from different directions to show the radius; some drivers stopped as if it were a 4-way stop while others drove through without stopping; there are concerns regarding visually impaired persons crossing the traffic circles

Method: Traffic Circle
Location: Columbia/Santa Clara
Purpose: To slow traffic without an unwarranted stop
Observation: This would have been better if the right-of-way had a larger radius; on approach all signs are yields

Method: Traffic Circle
Location: Trumbull/Mesilla
Purpose: To slow traffic without an unwarranted stop
Observation: Fire truck going through traffic circle has little room to maneuver within circle and trouble clearing traffic signs near circle; there are rails all around the circle that were scraped up from motorists driving to close

Method: Gate
Location: Trumbull and Pennsylvania
Purpose: To reduce egress in and out of the neighborhood
Observation: Assists APD with controlling unwanted traffic

Method: Barricades
Location: Espanola
Purpose: To eliminate cut through traffic
Observation: Very controversial for neighborhoods when balancing homeowner access and cut through traffic

It has been determined by the study group that while the City of Albuquerque has grown significantly since the original NTMP and continues to place a high value on neighborhood livability, the existing NTMP does not allow us to satisfactorily respond to viable concerns of our citizens.

There are two primary forms of ñunwanted trafficò that have been recognized on residential streets over the existing NTMP:

- Traffic using the local streets as a shortcut, detour or overflow.
- Excessive traffic speeds.

At the same time, traditional traffic engineering means of controlling traffic ï speed limits, stop signs, traffic signals, etc ï have less and less effect in management of driver behavior. Albuquerque Police Department (APD) enforcement is and will always remain an effective tool to reinforce motorist behavior. However, it is recognized that providing an enforcement level that is effective in modifying driver behavior will require a significant commitment of APD resources. Implementation of a Traffic Calming Program that encompasses the appropriate parties, defined problems, and remedies can go a long way to assist the efforts of APD.

B. Objective 2

Identify and map the primary emergency response routes to or within residential subdivisions or commercial properties.

Based on discussions by the study group it was determined that APD does not have specific emergency routes because they respond from many different locations. AFD however respond primarily from 24 response facilities and were tasked with developing emergency routes that should not be considered for traffic calming measures that impede emergency response (i.e. speed humps, barricades, etc.).

The emergency routes identified do not include arterial roadways as those roadways are not eligible for NTMP measures.

These primary emergency routes are provided as Appendix ñBò

C. Objective 3

Review existing data regarding the effectiveness of traffic calming devices, including their effect on emergency response routes.

As previously stated the existing NTMP was actually a speed hump program. The City has collected a significant amount of data on speed humps over the years. From this data it has been determined that the criteria for studying, developing, and implementing a traffic calming plan needs to be clearly defined in the new NTMP.

When traffic calming devices are improperly implemented speeds and the effects of traffic can actually become worse for residents. One example is that the data shows where speed humps were installed on roadways with an 85 percentile speed of 29 mph or less that the speeds actually went up.

Pre-85percentile	Post-85percentile	MPH Increase
24.5	26.8	2.3
25.3	26.6	1.3
26.4	27.0	0.6
27.4	27.6	0.2
28.5	28.4	0.1

As to the effects of traffic calming measures on emergency response routes, the study group recommends that speed humps should not be employed on primary emergency response routes because speed humps delay emergency response vehicles. Using data developed by the Portland, Oregon Fire Department, provided in Appendix ñCò fire trucks would be delayed an average of 4.7 seconds per speed hump while the smaller rescue squad vehicles would be delayed an average of 2.6 seconds per speed hump. The average emergency vehicle would be delayed 4.0 seconds per speed hump

For other traffic mitigation treatments such as road closures, narrowing of roads, traffic circles, and barriers, the AFD Plans Checking Division would need to review and approve such plans.

Delays induced by speed humps have the potential to increase the damage from stroke, drowning, hypothermia, heat stroke, heat exhaustion, seizures, septic shock, burns, drug overdose, and reactive airway disease.

D. Objective 4

Review and discuss new methods of traffic calming within residential neighborhoods.

The study group reviewed numerous potential traffic calming measures over the course of our meetings. Table 1 below summarizes these potential measures and the type of traffic concern to which the measure may apply.

TABLE 1 APPLICABILITY OF TREATMENTS BY TRAFFIC RELATED CONCERN						
Types of Measures	**Type of Traffic Related Concern**					
	Speeding	**Traffic Volume**	**Vehicle Collisions**	**Pedestrian Safety**	**Noise**	**Cost**
Non-Physical Control Measures						
Targeted Speed Enforcement	●	○	◡	◡	◡	**$$$**
Speed Radar Trailer	●	○	○	○	◡	**$$**
Speed Feedback Sign	●	○	○	○	◡	**$$**
Centerline / Edgeline Lane Striping	●	○	○	○	○	**$$**
Optical Speed Bars	◡	○	○	○	○	**$$**
Signage	●	◡	◡	○	○	**$**
Speed Legend	●	○	○	○	○	**$**
Centerline Botts Dots	○	○	◡	◡	○	**$$**
High Visibility Crosswalks	◡	○	○	◡	○	**$$$**
Angled Parking	●	◡	○	○	○	**$**
Speed Control – Narrowing Measures						
Neckdown / Bulbout	●	◡	○	●	○	**$$$**
Center Island Narrowing / Pedestrian Refuge	●	◡	◡	●	○	**$$**
Two-Lane Choker	●	◡	○	○	○	**$$$**
One-Lane Choker	●	◡	○	○	○	**$$**
Speed Control – Horizontal Measures						
Traffic Circle	●	◡	●	◡	○	**$$$$**
Roundabout (Single Lane)	◡	◡	●	○	●	**$$$$**
Chicane	●	◡	○	○	○	**$$$**
Lateral Shift	◡	◡	○	○	○	**$$$**
Realigned Intersection	◡	◡	●	○	○	**$$$$**
Speed Control – Vertical Measures						
Speed Hump	●	●	◡	◡	**X**	**$$**
Speed Lump	●	●	◡	◡	**X**	**$$**
Speed Cushion	●	●	◡	◡	**X**	**$$**
Speed Table	●	◡	◡	◡	**X**	**$$$**
Raised Crosswalk	●	◡	◡	●	**X**	**$$**
Raised Intersection	●	◡	◡	●	**X**	**$$$**
Textured Pavement	◡	○	○	◡	**X**	**$$$$**
Rumble Strips	◡	○	○	○	**X**	**$**
Volume Control Measures						
Full Closure	●	●	○	○	○	**$$$$**
Partial Closure	●	●	○	○	○	**$$**
Diagonal Diverter	●	●	○	○	○	**$$$**
Median Barrier	○	●	◡	○	○	**$$$$**
Forced Turn Island	○	●	◡	○	○	**$$**
● = **May be used or considered**		○ = **Indifferent**				
◡ = **Rarely used or considered**		X = **Should not be used or considered**				
$ = $0 - $10,000		**$$$ = $25,000 - $100,000**				
$$ = $10,000 - $25,000		**$$$$ = $100,000 +**				

The Program for Roadway Infrastructure Safety Measures (PRISM) are provided in Appendix ñDò

E. Objective 5

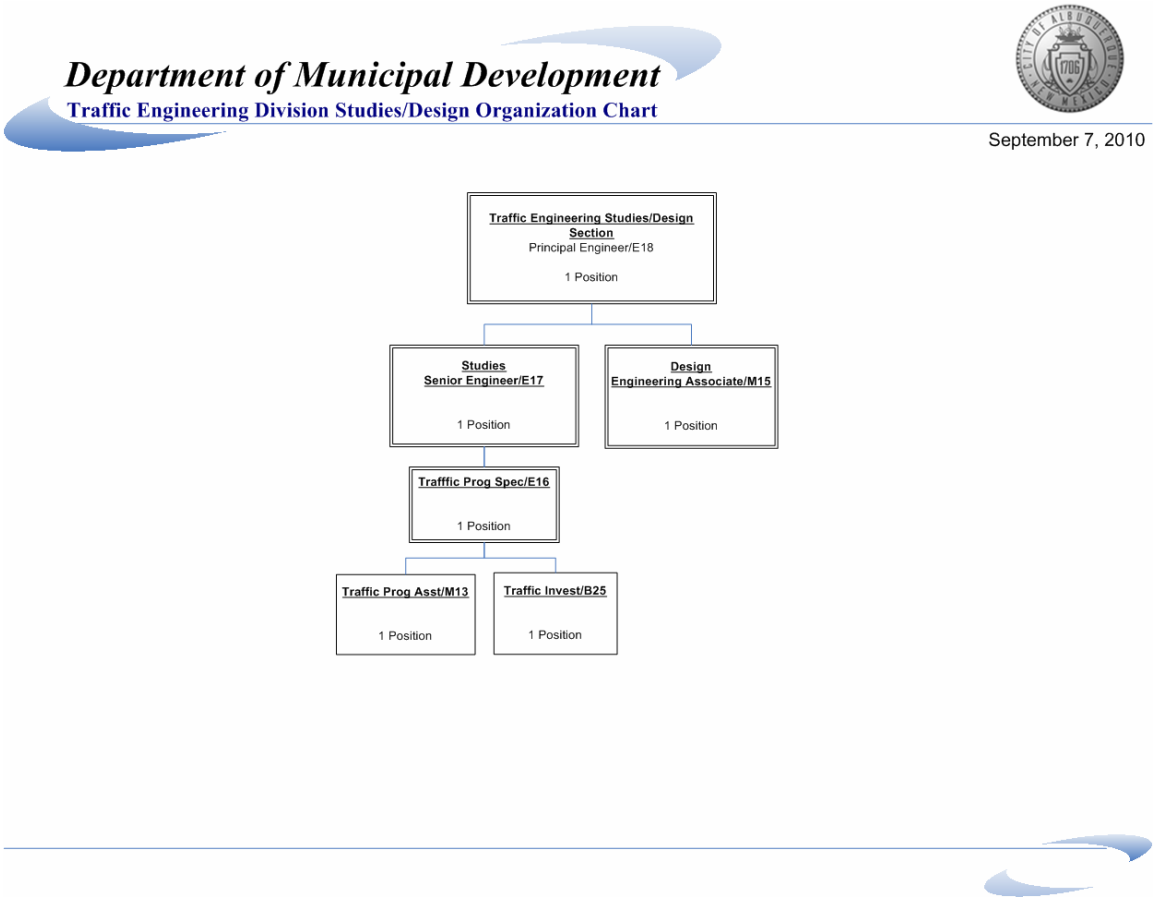
Examine available funding sources and limitations.

Within the existing Decade Plan the City has dedicated $250,000 specifically for Neighborhood Traffic Improvements. The 2009 Decade Plan is provided as Appendix ñEò. In addition to incorporating pedestrian, multi-modal, and traffic calming measures into new construction projects the City spends approximately $150,000 per year on NTMP measures.

As previously noted, the current NTMP has been narrowly defined to include only speed humps. Therefore the NTMP requests received over the past 5 years have focused solely on speed humps. The average number of speed hump requests over this 5 year period has been approximately 450 requests per year. Each of these NTMP requests requires internal Traffic Engineering staff assessment to research the location, identification of previous studies, and field visits to assess conditions. The time for this staff review range from 4 hours or as long as 60 hours depending on conditions. After this assessment the process moves to field data collection and the associated cost is approximately $1,000 per location on average. When a speed hump meets criteria, is approved by the neighborhood and is funded, the cost per location to install is approximately $4,000. The maintenance cost is approximately $1,000 when the street is resurfaced to remove/replace a speed hump.

More recently there has been a shift in interest in placing speed boards/radar display signs (also known as ñyour speed is signsò) on the right of way. In this past year ten locations were deployed at an approximate total cost of $12,000 per location.

The organization chart below identifies the current City staff in DMD/Traffic Engineering that is dedicated, if only partially, to NTMP.



F. Objective 6

Examine present neighborhood involvement procedures.

The existing NTMP neighborhood involvement procedures are antiquated, ambiguous, and staff intensive.

Due to the lack of a specific neighborhood involvement process, the existing staff assigned to the NTMP Program became quickly overwhelmed from 311 requests. In time citizens became frustrated due to their sense of a lack of response from the City.

A majority of the requests received by Traffic Engineering are from a single citizen and not a neighborhood group. There is not a clear process for a neighborhood to provide a coordinated NTMP request to the City of Albuquerque and in turn there is not a clear process for Traffic Engineering to respond to a neighborhood request.

G. Objective 7

Develop outreach opportunities for educating the public on traffic safety and traffic calming devices.

Through this study group there are 4 planned public meetings. At these meetings (1 in each quadrant of the City) the study group will provide examples of existing and potential NTMP measures. The group will illustrate the application of the measure, pros/cons of each measure, and the applicable cost of each.

If a new NTMP is developed this information on each type of accepted NTMP method should be illustrated with a brochure, or a website, and accessible to all citizens.

Because neighborhood traffic mitigation can be controversial from one resident to the next it is suggested that the new NTMP include a special process for neighborhood associations to be required as the requestor and organizer of the study. This information should be easily accessible through brochures, websites, Gov TV, and any other peripheral public outreach opportunities.

H. Objective 8

Discuss any other matter deemed appropriate by the Study Group.

The study group spent a significant amount of effort on the purpose for a new NTMP. Based on this effort it has been determined that the new NTMP should:

- Have an integrated traffic calming process.
- Provide the ability of residents to feel safe and secure in their neighborhood through active participation.
- Provide the opportunity to interact socially with neighbors.
- Provide the ability for neighborhoods to experience a sense of home and privacy.
- Provide a sense of community and neighborhood identity.
- Balance the relationship between an effective transportation network and the needs of a neighborhood.
- Balance our economic, social and environmental health and to maintain a sustainable city.

The study group has also developed some guidelines that should be considered for a new NTMP and have branded this process as Program for Roadway Infrastructure Safety Measures (PRISM). This process is provided in Appendix ñDò

The new NTMP process should have clearly defined criteria based on the applicability of the appropriate traffic calming measure as shown previously in Table 1. The first step of the process should be to clearly identify if the request meets a traffic calming measure.

Possible Ideas for Triage for NTMP/PRISM

Streets should be assessed for:

1. A minimum length without intersections
2. A minimum number of vehicles per day one direction average weekday traffic volume
3. Peak hour volume greater than 400 vehicles per day one direction
4. A percentile of speed exceeding the posted speed limit by a certain percentage
5. Roadway segment not studied within a certain number of years

The following streets shall be ineligible for neighborhood traffic calming:

1. Emergency routes
2. Non City jurisdiction (State, County, etc)
3. Streets classified as minor or major arterials
4. Streets that have curves or grades that make application of traffic calming devices have a negative impact on the neighborhood
5. Others as deemed necessary

The NTMP should not address requests for stop signs and traffic signals which are not traffic calming measures and have their own warranty criteria based on Federal Highway Administrations Manual of Uniform Traffic Control Devices (MUTCD). Section 2B.06 STOP Sign Applications in Chapter 2 of the 2009 Edition of the MUTCD provides guidance for use of the STOP sign and Section 4C.01 Studies and Factors for Justifying Traffic Control Signals in Chapter 4 discusses the studies and warrants for traffic signal use. The 2009 Edition of the MUTCD can be accessed by following the link below:

http://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.htm

The study group recommends the following general steps for implementing an NTMP measure be used to develop the final NTMP Process.

Step 1 Apply for NTMP participation

All citizens are eligible to apply for NTMP participation. Individuals are encouraged to work with or form a working group of residents in the area of

concern. Applications for participation in the NTMP are provided by the Traffic Engineering Division (TED), on the website or at the TED office. Completed applications should be returned to the TED.

Upon receipt of a completed application, TED will perform a search for applicable data. Data is considered applicable if collected by the City DMD/TED or a City approved contractor collecting data on behalf of the City and the data was collected no more than 3 years prior to application for NTMP. On the application, it is important to note significant changes (suggestions of changes are provided on the application) that have affected traffic within a neighborhood, as these changes can be used to determine the applicability of data.

TED will respond in writing to the applicant. The response will inform the applicant if applicable data is found, meaning no significant change in traffic has been found and the data on file with TED was not collected more than 3 years prior to the application. The response will also indicate if the warranting thresholds as set forth in this NTMP have been met. If the application has applicable data but the warranting threshold is not met, the application will be denied and a date will be provided for the current data expiration. Applicants must re-apply for NTMP participation if they would like an area to be considered after data expiration.

If the application is accepted by TED the applicant will continue to the next step.

Step 2 Petition

Pending available funding and once TED has determined there is no applicable data, the applicant will be provided with a petition form. This petition form will be accompanied by a map of the affected area as determined by TED by following guidelines within a new NTMP.

A petition will be considered complete if 2/3rds of at least one member of the households, on the TED provided map, have signed the petition.
The petition process is used by TED only to determine if there is sufficient neighborhood support to expend staff resources on data collection. The TED may modify the petition area, including expansion, to address unique circumstances.
Upon completion of a successful petition, TED will include the area and traffic concern, as described on the initial application, to a prioritization list of data collection and analysis.

Step 3 Data Collection and Analysis

This step of the NTMP process includes the collection of technical traffic data necessary in determining the issue brought forward by the applicant and possible resolutions of that issue.

TED can utilize traffic volume counts, speed surveys, crash reports and other information as necessary to collect data they see appropriate to analyze the issue as presented by the applicant. TED will then perform an analysis of the data collected by use of a published set of criteria.

Potential Criteria for Ranking between Proposed Projects

Criteria	Maximum Points	Definition
Speed	20	2 points for each mph that the 85 percentile speed is above the posted speed limit
Volume	20	Total Volume per day traffic divided by 100
Cut-Through Traffic	10	1 point for 100 vehicles
Accidents*	25	5 points for the number of reportable accidents on the project street within the past 3 years
Community Support	4	1 Point for each 10 percentage points above 60 percent on qualifying petition
Bike and/or Transit Route	6	3 points each if officially designated
Unique Conditions	15	5 points if no sidewalk 5 points if within 500 ft of school, park or senior center or city facility 5 points for site distance issues -5 points if there are existing traffic control measures on the street
Total possible Points	100	

*The accidents included are for ranking purposes only. The selection of the final type of traffic calming would include an evaluation of only those accidents that might have been mitigated by the improvement.

All applications that have continued to the Data Collection and Analysis step will have a public meeting to discuss the finding of the data analysis.

Step 4 Public Meeting

TED will request that the applicant or applicants set up a public meeting including all households included in the map provided by TED during the petition step and any Neighborhood Associations registered with City Office of Neighborhood Coordination, which the area falls within. During this public meeting, TED will discuss the data collected, the analysis of the data, for a NTMP measure to be installed.

If criteria are met, then a survey of devices determined by Table 1 in this report will be given during the meeting, unless there is only on alternative for device.
If criteria for an NTMP measure are not met, then education and enforcement will be addressed during the public meeting.

The NTMP application is provided as Appendix ñFò

Appendix "A" – Current Process

City of Albuquerque Speed Hump Process and Criteria

Opening Statement:

One of the most common concerns reported to the City of Albuquerque (COA), Traffic Engineering, is speeding on residential streets. The speed limit on residential streets is 25 Miles per Hour (MPH). The speed limit is not required to be posted in order to be enforced. This is by COA Code of Ordinance, § 8-2-4-2. However, active enforcement of speed limits on all the residential streets within the city is not always possible. When the volume and traffic speeds on a residential street meet minimum criteria, the installation of speed humps can prove to be an effective tool in reducing speeds. Usually, speed humps at locations where the minimum criteria were not met will not decrease the overall traffic speeds. In some cases, traffic speeds will increase. Additionally, the installation of speed humps is limited to residential streets meeting minimum criteria.

Once Traffic Engineering receives a written request to have speed humps installed on a residential street, and the street criteria have been met, a traffic study will be completed to ensure the standards are met. Should speed humps be warranted on a street, it will be prioritized with all other speed hump projects in the COA. Before installation occurs, a survey of the residents on the street is also completed to ensure that there is agreement amongst the residents that speed humps are desired.

Streets must meet the following minimum criteria in order to be considered for the installation of speed humps:

The street must not be greater than a two-lane roadway.

1. The street must have at least 50% of the housing fronting the roadway. Parks and schools may be considered as frontage.

2. The street width must be less than 50 feet and the segment should be more than 700 feet long.

3. Average daily traffic volumes on the street shall not be greater than 3,000.

Other consideration criteria:

a. The 85th percentile speed of the vehicles shall be greater than five (5) MPH over the speed limit.

b. Centerline radius of the street is greater than 300 feet. Speed humps cannot be installed on curves or locations where the minimum sight distance is not met.

City of Albuquerque Speed Hump Process and Criteria (Continued)

c) Speed humps should only be installed on roadway segments where the road grade is less than 5%. Installation of speed humps on grades greater than 5% must be based on an engineering evaluation. This is to ensure that the installation will not create unacceptable risks to traffic safety or storm drainage. Speed humps shall not be installed on street sections with grades greater than 8%.

d) Speed humps should not be installed on streets with drainage or flooding problems unless their effect can be mitigated through design.

e) Speed humps should not be installed on streets with a curb less than 8-inches tall, nor should they be installed on a street without curb and gutter.

f) Speed humps should not be installed in front of driveways, over underground access covers, or adjacent to catch basins or drainage structures.

g) Speed humps may impact the operation of emergency response vehicles, trucks, and buses. Streets that serve as the primary emergency vehicle access or bus route should not have humps installed unless the effect of their operation is evaluated.

h) Speed humps should not be installed on a roadway within 300 feet of an intersection where the roadway approach to the intersection is controlled by a traffic signal or stop.

i) The spacing for speed humps is normally between 350 to 400 feet.

Speed Hump Process:

Should a resident who lives on the street or a neighborhood association believe that all of these qualifications have been met; a written request shall be submitted via e-mail or a letter to the COA Traffic Engineering Division.

Mailing Address: Attn: Traffic Engineering
Speed Hump Request
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Email Address: PCastillo@cabq.gov or BColeman@cabq.gov

Traffic Engineering will then complete a review of the criteria to ensure the minimum qualifications are met. If met, a traffic analysis for volume and speed will then be conducted. Should the resulting data indicate that the installation of speed humps would be beneficial; the street will be added to the speed hump priority listing. The priority listing is based on street ranking, which is calculated using the daily traffic volume and percentage of vehicles exceeding the established speed thresholds.

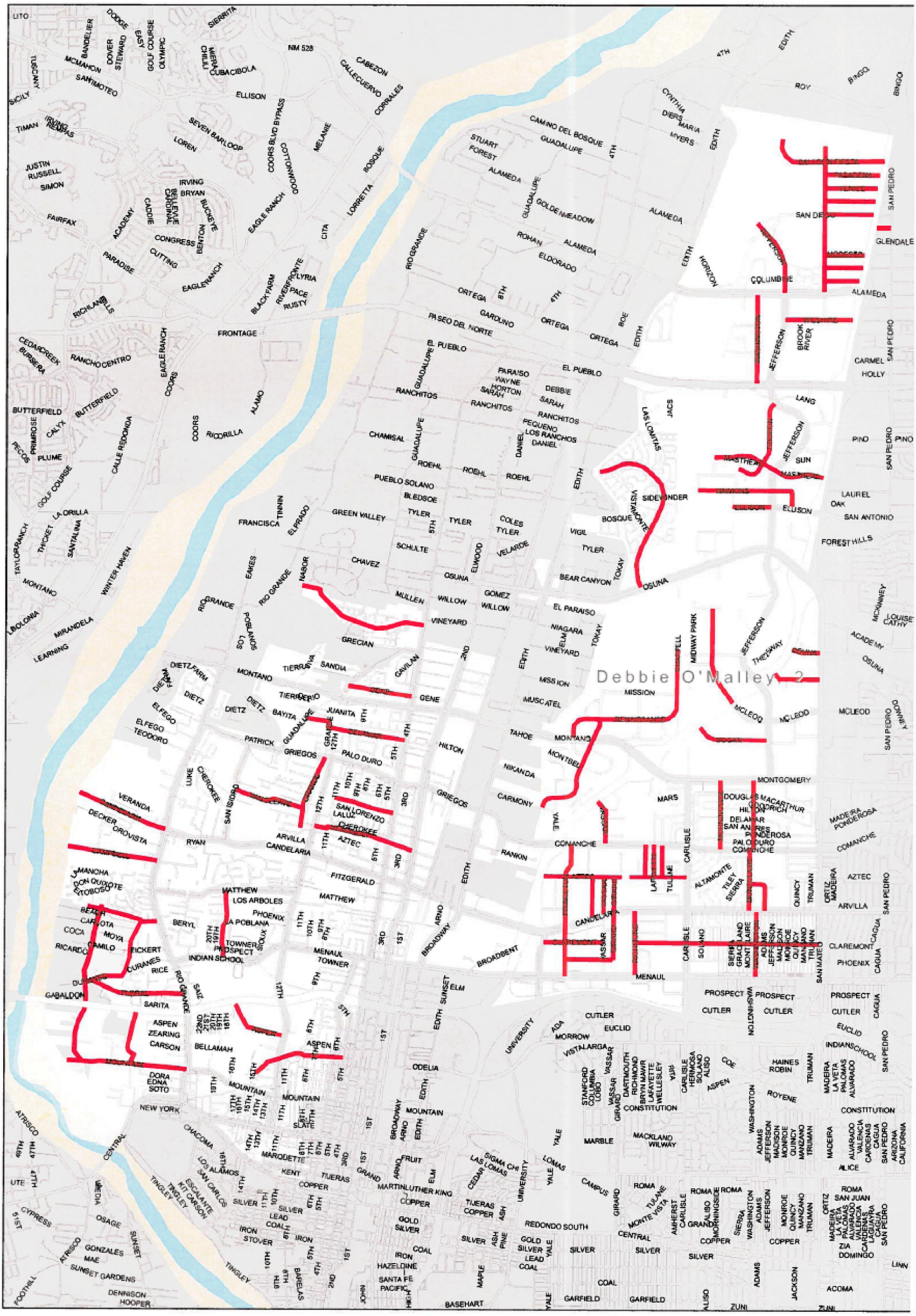
City of Albuquerque Speed Hump Process and Criteria (Continued)

When a street has not reached the top of the priority list in five years, Traffic Engineering will attempt to contact the original requestor to determine if the speeding problems still exist. If it is felt that the speed problems persist, an updated traffic study can be conducted. If Traffic Engineering is unable to contact the resident or neighborhood association representative, or they feel that the problem no longer exist, then the street is removed from the speed hump priority listing.

If funding has been identified for the speed hump project, and the criteria above have been met, a survey will be sent to the properties on the street segment where speed humps are being proposed. Properties within 500 feet of the proposed project and properties who cannot avoid traffic calming devices when traveling to and from their homes will receive a notice of the proposed project. Properties separated from the project street segment by a major street will not be included in the survey or notification process.

If a minimum of two-thirds of the returned surveys indicate that the installation of speed humps are desired, the humps will be scheduled for construction. Should less than two-thirds of the returned petitions indicate that humps are desired, the humps will not be installed and the road segment will be removed from the speed hump priority listing. Unless there is a substantial change in field conditions, a minimum of five years must pass before the street can be reconsidered.

Albuquerque Fire Department Primary Route Maps



Legend

Dist2

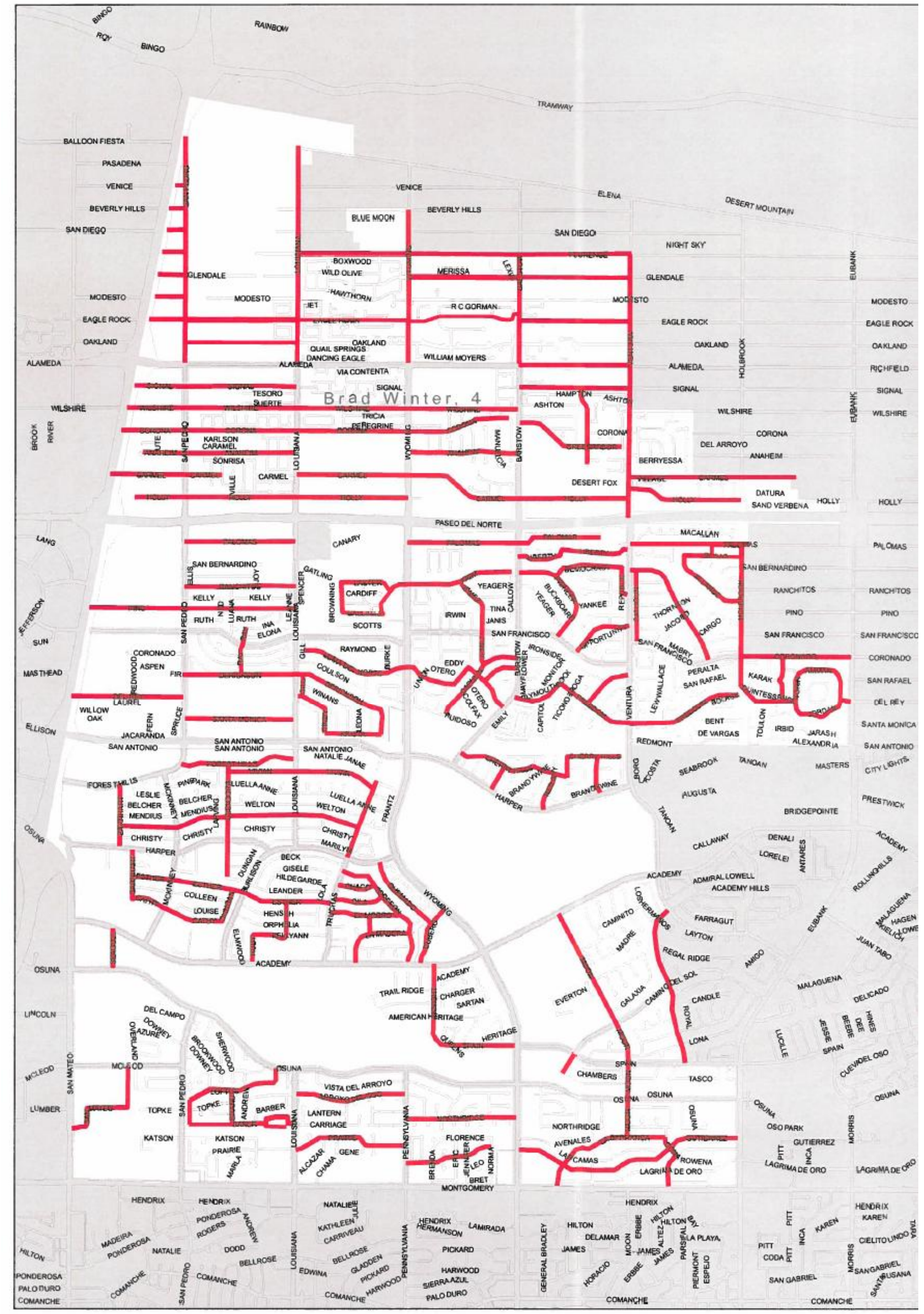
City Council District 2

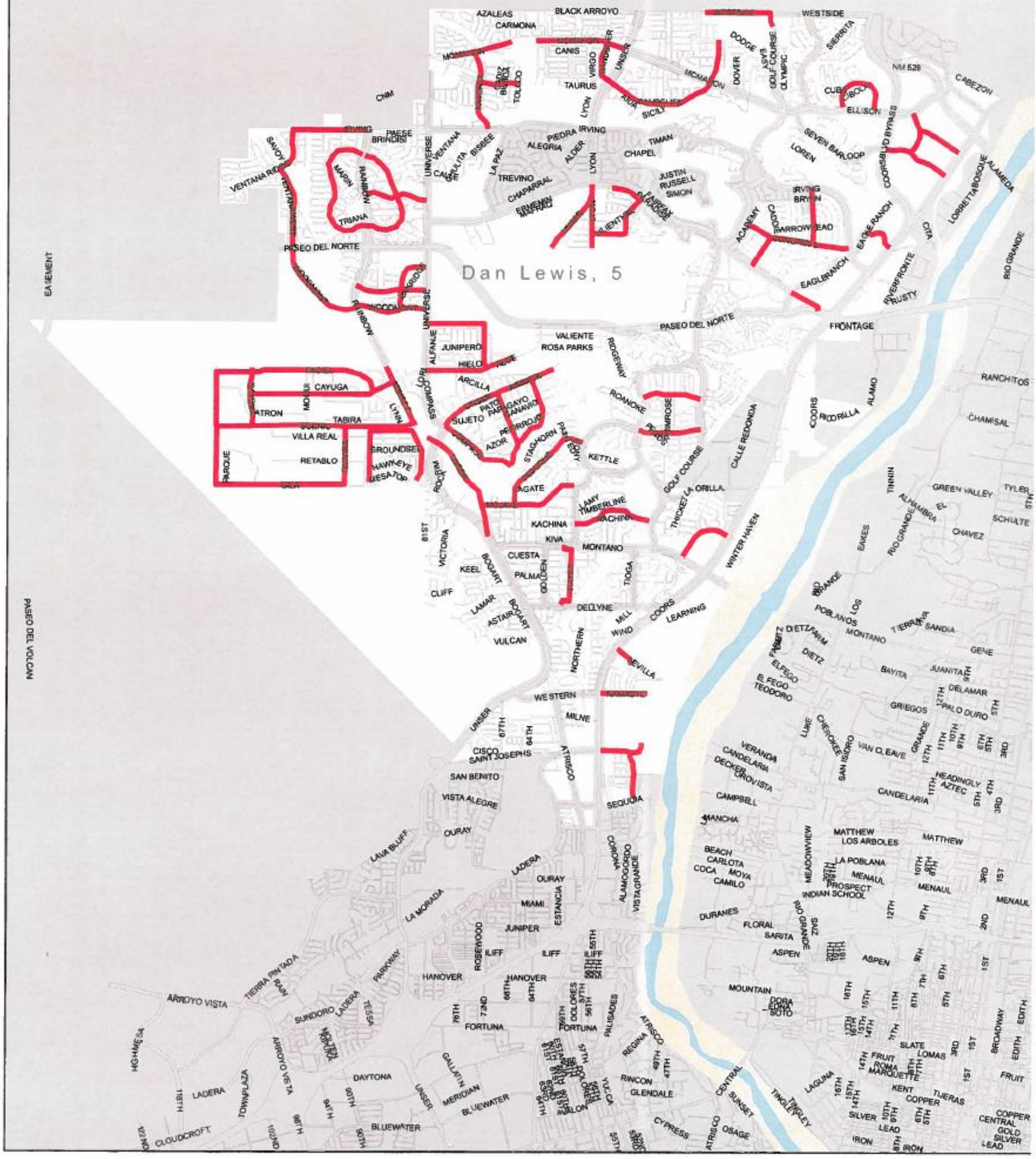
Legend

Dist3

City Council District 3

Isaac Benton, 3


Brad Winter, 4
Legend
Dist4
City Council District 4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SIMON
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ACADEMY
ARROWHEAD
EAGLE RANCH
EAGLEBRANCH
RIVERFRONTE
RUSTY
CITA
RIO GRANDE
FRONTAGE
VALIENTE
ROSA PARKS
RIDGEWAY
JUNIPERO
HIELO
ARCILLA
ALFANJE
CAYUGA
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BROUNDSEL
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PATRON
LYNN
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PAPAGAYO
PERIROJO
AZOR
STAGHORN
ROANOKE
PRIMROSE
KETTLE
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GOLF COURSE
THICKET
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WINTER HAVEN
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CHAMISAL
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ALAMO
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BOGART
PALMDEN
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VULCAN
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SEVILLA
WESTERN
MILNE
URBINO
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CISCO
SAINT JOSEPHS
SAN BENITO
VISTA ALEGRE
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MIAMI
ESTANCIA
JUNIPER
ALAMOGORDO
VISTA GRANDE
ROBEWOOD
ILIFF
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HANOVER
PARKWAY
TIERRA PINTADA
RAIN
ARROYO VISTA
SUNDORO
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ASPEN
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BROADWAY
DIETZ FARM
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ELFEGO
EL FEGO TEODORO
BAYITA
JUANITA
DELAMAR
PALO DURO
GRIEGOS
LUKE
CHEROKEE
SAN ISIDRO
VAN CLEAVE
GRANDE
VERANDA
CANDELARIA
DECKER
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CAMPBELL
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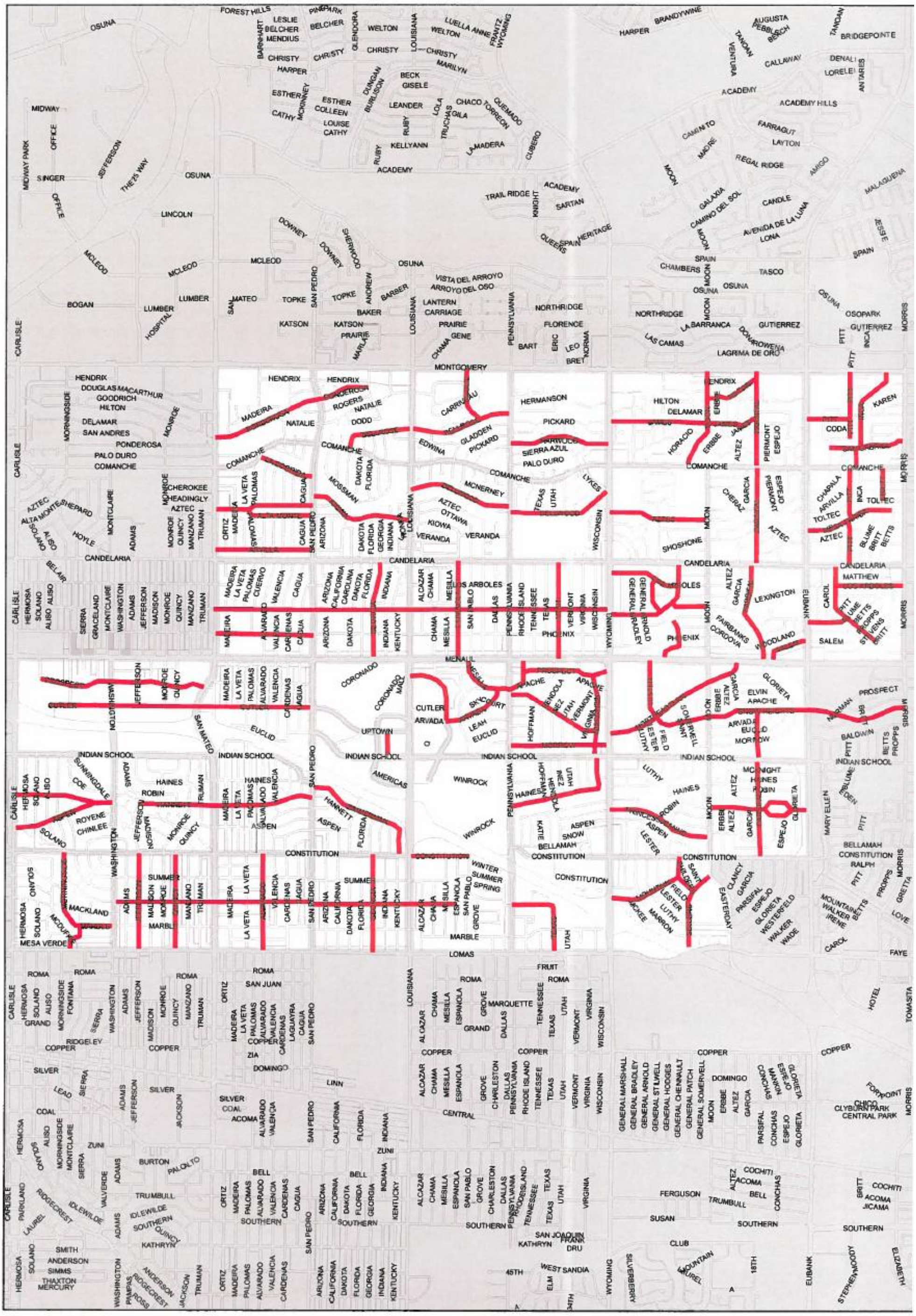
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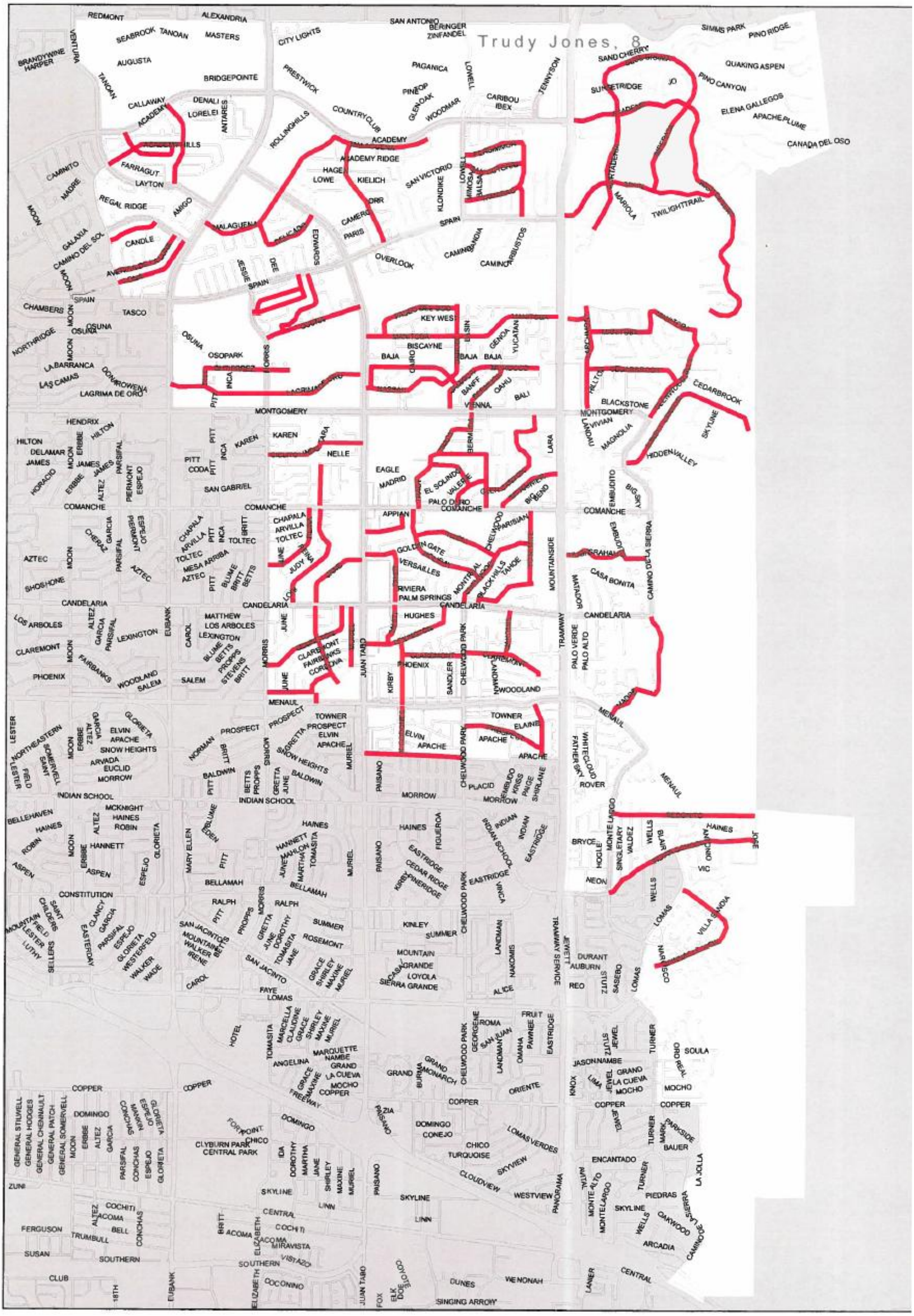

Don Harris 9

City Council District 9

Legend

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Appendix "C" – Portland Study on Emergency Response Routes

EXECUTIVE SUMMARY

In 2005 Portland Fire and Rescue Services (PF&R) was directed by City Council to conduct a study to evaluate its fire, rescue and emergency services resource allocation and service delivery methods. The study also was to provide options for resource allocation and service delivery methods to meet future demand, including cost efficiencies and alternative forms of service delivery. To perform this evaluation, the City selected TriData, a division of System Planning Corporation, by competitive bid.

TriData had undertaken previous studies in 1993 and 1996. The present study was to perform the above task in a collaborative effort with PF&R and to compare it to national standards and best practices from other jurisdictions. The highlights of the findings and the 122 recommendations are presented below.

ORGANIZATION AND MANAGEMENT

Organizational Culture – The organizational culture of PF&R is one of the best and most positive that TriData has experienced. This is a smart organization that uses its human resources to their full potential, treats them with respect, and consequently has a very productive workforce.

It is an organizational culture that is quite adept at the empowerment of its employees both sworn and civilian. It encourages and fosters new ideas. The TriData team was told many times during interviews that if an individual is willing to do the research and present a new idea, he or she will be heard.

The hallmark of the organization's success lies in its use of a Core Leadership Team and the mechanisms within the entire organizational structure that foster communication, openness and transparency.

Organizational Structure – The organizational and command structure for PF&R is large and complex but quite effective. The functionality and cooperation between sworn and civilian appears to be virtually seamless. The layers of administrative control have no glaring problems that need any major changes. However, on the Fire Operations side of the Bureau, the battalion system shows signs of an overwrought span of control. There is need to reinstate the four battalion system previously used in the Bureau.

Office of the Fire Chief – The Office of the Fire Chief has been functioning in a very strong leadership position. The focus of the office organizationally has been on Human Resources (HR). We suggest a fundamental shift in the focus.

We propose Portland Office of Emergency Management (POEM) to be kept under the auspices of PF&R, because PF&R is the most experienced city Bureau in Emergency Management.

Human Resources and Recruiting – It is appropriate for the Human Resources Coordinator (HRC) to be involved in the Core Leadership Team in relation to personnel matters, but slightly unusual for HR to be attached directly to the Office of the Fire Chief. Moving the HRC to the Management Services Division (MSD) should be considered.

Management Services Division – There are excellent working relations between the Fire Bureau side and the MSD. PF&R has the best managed budget of the City agencies.

Budgeting and Finance – The Finance section of the MSD is responsible for all the Bureau's financial activities, including accounts receivable and payable, annual budget, capital improvement plan, and financial reports. Because of the effectiveness of the Finance section, the Bureau should maintain there the current systems employed for handling payroll, accounts receivable, and collections.

Planning and Administrative Services – Planning and Administrative Services (PAS) is responsible for the majority of planning initiatives that the Bureau undertakes, and uses a sophisticated data analysis mechanism to back up its findings. The comprehensiveness of their efforts shows in the number of internal studies, benchmarks, and statistical reports produced by the section.

Risk and Demand Analysis

Risks – The current risk for the Portland area is high in a number of respects. Call volumes in some areas are high. This trend is compounded by the significant growth both in residential development and commerce. The City's port facility and international airport create elevated service needs for both day-to-day response activity and their potential targeting for weapons of mass destruction including chemical, biological, radiological, nuclear, and explosives (CBRNE) incidents.

The City's potential for natural disasters, including seismic events, winter storms and flooding all compounds the necessity for proper planning and sufficient resource capacity. The City encompasses an area of nearly 150 square miles (including contract areas) that has a mix of dense urban core settings along with suburban areas on its periphery. PF&R serves an estimated population of over 550,000 and this number increases significantly during normal business hours with the influx of workers and tourists into the downtown areas.

The department's long-term goals depend in large part on the risks in the area and future demand for services.

Population – Population size, growth, and density all impact the risk of fire, fire death, and, subsequently, the demand for fire and EMS services. The population of Portland has grown over the past decade at an annual rate of just under one percent. It is projected to exceed 600,000

by 2013, a net increase of 5,909 persons per year. These increases will undoubtedly increase the Bureau's demand.

Demand and Workload – Demand is the number and types of calls for service—services provided by the entire fire department. In FY05, PF&R responded to just over 59,700 incidents with 70,167 unit responses. They included 2,204 fire calls, 39,769 EMS calls, and 17,723 other calls (i.e., false alarms, good intent, automatic alarms). The upper bound projection is 70,000 by 2012, but the lower bound is for incidents to remain below 70,000 for quite some time (beyond 2025).

DETERMINING RESOURCE NEEDS

Various standards and regulatory mechanisms influence the decision-making process when considering the organization and development of fire/EMS departments. Standards are promulgated by the Insurance Services Office (ISO), the National Fire Protection Agency (NFPA), the Commission on Fire Accreditation International (CFAI), the Occupational Safety and Health Administration (OSHA). Also pertinent are comparable departments across the nation.

STATION LOCATION ANALYSIS AND FIRE AND RESCUE OPERATIONS

Response Times – After considering the national standards and the situation in Portland, TriData recommends the department adopt response time goals outlined in the table below.

Response times have three components:

- Call Processing time (controlled by Emergency Communication outside PF&R)
- Turnout time (from the fire station)
- Travel time (to the incident).

Additionally, Portland records vertical response times (time until first responder reaches a patients side). Overall, the response times are higher than the recommended goals. The chapter sets forth several recommendations, including working very closely with the Bureau of Emergency Communications (BOEC) to improve and reduce call processing and dispatch times.

Call Type	Time Segment	Current 90th Percentile	Current PF&R Goal	Recommended Goal
Fire	Call Processing: Urgent	0:01:48*	0:01:00	0:01:00
	Call Processing: High		0:01:30	
	Call Processing: Low		0:02:00	
EMS	Call Processing: High	0:01:52*	0:01:30	0:01:00
	Call Processing: Low		0:03:00	
ALL	Turnout	0:01:51	0:05:20	0:01:00
Fire	Travel	0:05:41		0:04:00
	Total	0:09:00		0:06:00
EMS	Travel	0:05:39		0:04:00
	Total	0:08:16		0:06:00

Geographic Information Systems (GIS) analysis was used to examine the location and deployment of stations and apparatus for the three districts in Portland.[1] The analysis showed gaps and overlaps in coverage. CAD data was also used to create incident density maps showing the areas with the highest concentrations of calls.

Based on this analysis, we found overall coverage in Districts 1, 2, and 3 to be very good at present. Call volumes in those Districts needs to be closely monitored to determine when to add resources to handle the growing demand.

In the southwestern portion of the city, in District 4, there is a need to adjust resources now to offer better coverage and response times in the area. There are currently plans to move Station 18 southwest of its current location to be near the intersection of SW Capitol Highway and Interstate 5. This move should proceed. There are also plans for a Station 21 to cover the rest of the area. Based on the analysis, TriData is recommending not proceeding with the plans for Station 21 in its planned location. The proximity to the city's border and the coverage overlap with Station 5 makes placing Station 21 in this area inefficient. Talks should continue with Tualatin Valley Fire & Rescue (TVF&R) on a possible location for a station that would serve both communities. A relocation of Station 5 southwest, near the intersection of SW 30th Avenue and SW Vermont Street, would bring much of the area to be covered by Station 21 within the four-minute reach of Station 5. This option should be considered as an alternative to building and staffing a new station in the area (with TVF&R).

The downtown area is currently over-served by the four trucks at Stations 1, 3, 4, and 13. There is also a large gap in truck coverage in the southwest portion of the city. Trucks needed in that area will have much higher response times. Because of this coverage need in the southwest

[1] For the analysis District 1 was combined with District 2 due to its small size.

and the excess coverage in the downtown area, TriData recommends relocating Truck 1 to Station 5.

PF&R has long been a trendsetter in this region regarding firefighting tactics, fire ground safety, and incident management. Only a few areas were identified for improvement.

- Reducing the number of responding units(engines) from four to three for certain types of alarms will increase efficiency without compromising safety;
- With the re-establishment of a fourth battalion district, re-evaluate the initial assignment of two Battalion Chiefs to certain types of alarms; and,
- Special Operations should be placed under POEM.

EMERGENCY MEDICAL SERVICES

Advanced Life Support first response is provided by PF&R while the ambulance transport is provided by American Medical Response (AMR), contracted through Multnomah County. In many cities, this type of relationship is often wrought with distrust, disagreement, territorial battles, and even questionable service to the citizens. In this situation, one quickly realizes that the stereotypical public/private feuds are not present – much to everyone's credit.

The relationship between PF&R and AMR is good, and there are open lines of communication between the organizations. PF&R should maintain the current relationship with AMR and reevaluate at the five year mark.

Trends in the number of applicants to PF&R who are certified paramedics and the number of firefighters who attend paramedic training appear to be good. If these trends continue unabated, PF&R should not have any foreseeable problems recruiting paramedics.

Finally, PF&R does an excellent job tracking quality EMS data such as intubations attempts and successes, cardiac arrest rates, and interosseous infusion. It should continue to do so and serve as a model EMS organization.

FIRE PREVENTION

The Fire Prevention Division has been an award-winning organization. In recent years, it has further improved its professionalism and has been using a more business-like approach. The change is due in part to new staff, closer management of code enforcement inspections, and willingness to try innovative approaches to fire code enforcement.

Paramount to the FPD's continued improvement is a shift to the establishment of prevention as a core value of PF&R. Management within prevention services should be certified at a higher level of functional expertise, and should have experience in that functional area.

Another method to ensure that fire prevention becomes a core fire bureau value is to have fire companies actively engaged in performing prevention duties, as they have been.

In the area of fire investigation, the recommendation to upgrade the supervisory position for fire investigations to a chief position that can function as a Deputy Chief Fire Marshal will improve caseload management capabilities of the unit while also improving efficiency.

SUPPORT SERVICES

Information Technology – Approximately four years ago, the City of Portland decided to consolidate information technology services for city bureaus into a centralized IT organization, the Bureau of Technology Services (BTS). After the BTS consolidation, there was a reduction of 45.5 percent (5 of 11 positions) in the number of IT positions assigned to PF&R. To make the IT consolidation work better from PF&R perspective, we recommend that PF&R adopt the same strategy used by the Police Bureau, which is to pay for a dedicated BTS IS Manager.

Another key area in need of improvement is the network connectivity to the fire stations. It is the most pressing and highest priority IT issue for PF&R. Although a longer term city wide solution may be desirable, the immediacy of the problem demands an immediate interim solution. Insufficient network speed and capacity severely impedes the ability of fire station personnel to develop information technology skills and to fully use its capabilities.

PF&R should also work with BTS to define the hardware technical response needed for the 24/7 emergency response operations of PF&R.

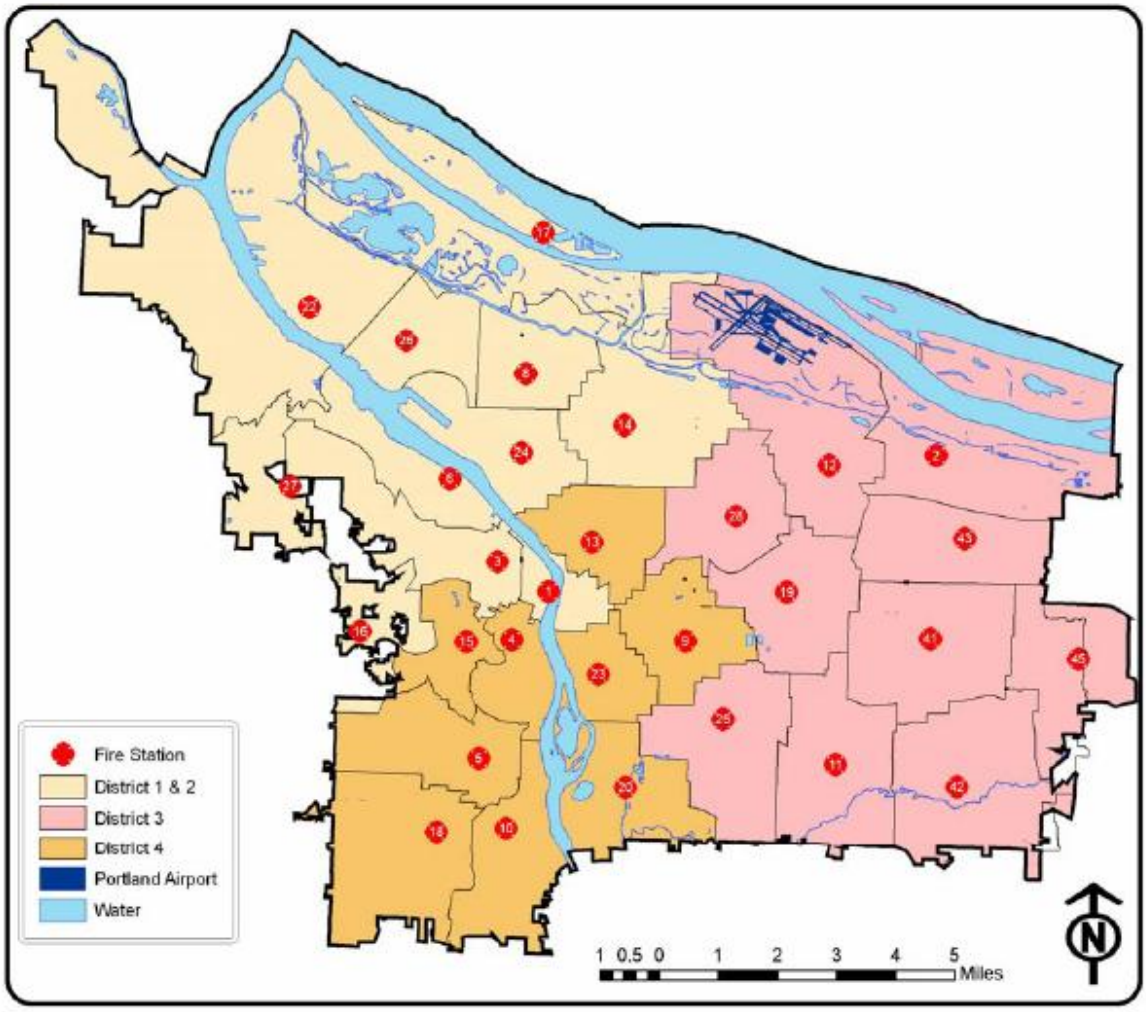
Apparatus, Equipment, and Facility Maintenance – PF&R has some of the best-equipped and maintained apparatus that we have encountered in the course of conducting our studies. It has its own apparatus maintenance facility, which is independent of the City's other fleet service facilities

While the Apparatus Maintenance performs at a high level, the loss of personnel has left the remaining Emergency Vehicle Technicians (EVT) unable to perform some of the necessary work because they overloaded, and must outsource work. As a result PF&R needs to fill vacant positions, upgrade certain part time positions to full time, restore a foreman's position, and hire an administrative support position to free up the Apparatus Maintenance Supervisor.

Additionally, a consistent EVT Certification standard Training should be established and maintained. It is not unreasonable to require apparatus mechanics to hold and maintain their certifications as well.

Finally there is a need for PF&R to upgrade the Apparatus Maintenance System software used to track inventory parts to improve efficiency.

Map 8: PF&R Districts



Travel speed was based on U.S. Census Tiger files contained in the road files provided by the city. Tiger files contain census feature class codes (CFCC codes) that define road types and can be used to assign estimated speed limits. Speed limits were then set at 10 miles per hour below the typical speed limit based on road type to account for obstacles that a unit may encounter while responding to an incident such as traffic congestion, stops, and turns. No speed limits were set below 25 mph.

Estimated travel time for each road segment was based on the speed limits and length of the segment. Road segments containing a traffic calming device had 4.7 seconds per device added to the estimated travel time. The additional time was based on the average delay caused by speed humps as recorded by PF&R in previous studies.

PRISM Program for Roadway Infrastructure Safety Measures

Speed Enforcement

Description

- APD provided enforcement presence in neighborhoods to increase awareness, monitor speeds, and issue citations.

Application

- In neighborhoods where speed control is desired

Qualifications

- ?% of the traffic is traveling at 30mph or higher

Advantages

- Inexpensive, temporary remediation effort for neighborhoods
- Quick implementation
- Mobility
- No impact to emergency response

Disadvantages

- Effectiveness may be temporary
- May cause diversion of traffic to adjacent neighborhoods

Cost

- Low to moderate based need

ALBUQUERQUE POLICE "In Step With Our Community"

PRISM Program for Roadway Infrastructure Safety Measures

Speed Trailer

Description

- APD provided mobile speed detection device that display the traveling speed of an oncoming vehicle as it passes the trailer.

Application

- In neighborhoods where speed control is desired, placed on a street for a limited amount of time then relocated to another street, allowing a single device to be effective in many locations.

Qualifications

- Traffic volume is >500 vehicles per day and < 2,000 vehicles per day
- ?% of the traffic is traveling at 30mph or higher

Advantages

- Portability
- Inexpensive, temporary remediation effort for neighborhoods
- Visual reminder of excessive speed
- Quick implementation
- Allows coverage in many locations
- No impact to emergency response

Disadvantages

- Effectiveness may be temporary
- Appropriate location to set up the trailer
- May cause diversion of traffic to adjacent neighborhoods
- Subject to vandalism

Cost

- Low to moderate based number required

PRISM Program for Roadway Infrastructure Safety Measures

Speed Boards

Description

- Permanent speed detection device that display the traveling speed of an oncoming vehicle as it passes the trailer.

Application

- In neighborhoods where speed control is desired

Qualifications

- Traffic volume is >500 vehicles per day and < 2,000 vehicles per day
- ?% of the traffic is determined to be non-local traffic based on a license plate study of the peak hour
- ?% of the traffic is traveling at 30mph or higher

Advantages

- Heightens driver awareness to the posted speed limit
- Real time feedback to motorist
- Visual reminder of excessive speed
- Permanent measure
- No impact to emergency response

Disadvantages

- Effectiveness may decrease over time
- Appropriate location (sight distance)
- Subject to vandalism
- Effective only in the direction seen

Cost

- Low to moderate based equipment specified

PRISM Program for Roadway Infrastructure Safety Measures

Centerline/Edgeline Lane Striping

Description

- Reducing road widths by introducing medians, or striping lanes, they are used to narrow the travel lanes for vehicles, thereby inducing drivers to lower their speeds.

Application

- To narrow travel lanes for vehicles

Qualifications

- 15 % of the traffic is traveling at 25 mph or higher

Advantages

- Inexpensive
- Can be used to delineate on-street parking
- No impact to emergency response

Disadvantages

- Has not been shown to significantly reduce travel speeds
- Requires regular maintenance

Cost

- Low

PRISM Program for Roadway Infrastructure Safety Measures

Optical Speed Bars

Description

- Optical speed bars are transverse stripes spaced at gradually decreasing distances with the intent of enhancing the driver's perception of speed, resulting in a speed reduction.

Application

- Situations where traffic traveling at higher speeds > 30 mph are required to slow to a stop or near stop, such as on a stop sign or traffic signal.

Qualifications

- 15 % of the traffic is traveling at 25 mph or higher

Advantages

- Inexpensive
- On average, were shown to reduce speeds by 30 percent
- No impact to emergency response

Disadvantages

- Long-term effects in residential area unknown
- Requires regular maintenance

Cost

- Low

Signage

Description

- Signing is used to help reduce speeds in residential areas. Signing enforces speed reduction with the use of speed limit signs and/or neighborhood signs

Application

- To alert drivers of changing conditions

Qualifications

- No Limitations with respect to ADT or Speed. ?.% of the traffic is traveling at 30mph or higher

Advantages

- Inexpensive
- Truck restrictions can reduce through truck traffic
- No impact to emergency response

Disadvantages

- Signs may not change driver behavior
- If speed limits are set too low, drivers are more likely to exceed the speed
- Requires regular maintenance

Cost

- Low

Speed Legend

Description

- Speed legends are numerals painted on the roadway indicating the current speed limit in miles per hour.

Application

- To reinforce speed limit, typically placed near a speed limit sign post.

Qualifications

- No Limitations with respect to ADT or Speed. ?.% of the traffic is traveling at 30mph or higher

Advantages

- Inexpensive
- Reinforces speed limit
- No impact to emergency response

Disadvantages

- Has not been shown to significantly reduce travel speeds
- Requires regular maintenance
- Limited Effectiveness as stand alone device

Cost

- Low

Centerline Raised Pavement Markers

Description

- Botts dots, or "raised pavement markers," are small bumps lining the centerline or edgeline of a roadway. They are often used to encourage vehicles to stay in their lane especially where vehicles have a tendency to deviate outside of the proper lane, risking collision.

Application

- Typically used on curves where vehicles may deviate outside the proper lane.

Advantages

- Inexpensive
- No impact to emergency response
- Improve the nighttime visibility of the roadway edges
- Helps drivers stay in their lane under low-visibility conditions

Disadvantages

- Noise
- Has not been shown to significantly reduce travel speeds
- Requires regular maintenance

Cost

- Low

High Visibility Crosswalks

Description

- High-visibility crosswalks use special marking patterns and raised reflectors to increase the visibility of a crosswalk.

Application

- To increase the visibility of crosswalks in specific areas.

Qualifications

- 20 pedestrians per hour during the peak hour or 60 pedestrians total for the highest consecutive four-hour period

Advantages

- Increased visibility of crosswalk
- May encourage pedestrians to cross at location
- Designate the shortest path
- Direct pedestrians to locations of best sight distance

Disadvantages

- May give pedestrians a false sense of security
- Requires more maintenance than regular crosswalks

Cost

- Moderate to High

Angled Parking

Description

- Angled parking reorients on-street parking spaces to a 45-degree angle, increasing the number of parking spaces and reducing the width of the roadway available for travel lanes. Works well in areas with high parking demand and turnover rates.

Application

- Provides parking while reducing speeds by narrowing the travel lane.

Qualifications

- ADT <5,000; Width ≥48 feet: Speed Limit ≤30 mph

Advantages

- Reduces speeds by narrowing travel lane
- Increases parking
- easier for vehicles to maneuver into and out of

Disadvantages

- May restrict the use of bike lanes
- Ineffective on streets with high number of driveways
- Potential conflict with vehicles backing out of parking
- Precludes the use of bike lanes

Cost

- Low

Neckdown / Bulbout

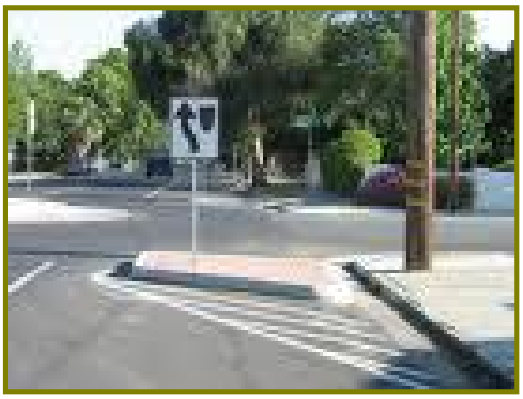
Description

- Neckdowns/bulbouts are raised curb extensions that narrow the travel lane at intersections or midblock locations. Increase pedestrian comfort and safety at the intersection. The magnitude of speed reduction is dependent on the spacing of neckdowns between points that require drivers to slow. Neckdowns have achieved a 7 percent reduction in speeds.

Application

- Provides a narrowing of the travel lane at intersections or midblock locations.

Qualifications



- ADT ≤ 10,000; Speed Limit ≤ 35

Advantages

- Reduces pedestrian crossing distance
- Creates protected parking area
- Reduces travel speeds

Disadvantages

- May slow right-turning emergence response vehicles
- May require bicyclists to merge with vehicular traffic for short distance

Cost

- Moderate to high

PRISM Program for Roadway Infrastructure Safety Measures

Center Island Narrowing

Description

- Center island narrowing are raised islands located along the centerline of a street that narrow the travel lanes at that location. Placed at the entrance to a neighborhood, and often combined with textured pavement, they are often called “gateways." Fitted with a gap to allow pedestrians to walk through at a crosswalk, they are often called “pedestrian safe haven refuges.” They can also be landscaped to increase visual aesthetic

Application

- Provides a narrowing of the travel lanes

Qualifications

- ADT ≤ 20,000; Speed Limit ≤ 35

Advantages

- Can increase pedestrian safety
- Aesthetic upgrades can have positive aesthetic value

Disadvantages

- Effect on vehicle speeds is limited (no horizontal or vertical deflection)
- May reduce on-street parking
- Could impact snow route removal

Cost

- Low to moderate

Two-lane Choker

Description

- Neckdowns/bulbouts are raised curb extensions that narrow the travel lane at intersections or midblock locations. Increase pedestrian comfort and safety at the intersection. The magnitude of speed reduction is dependent on the spacing of neckdowns between points that require drivers to slow. Neckdowns have achieved a 7 percent reduction in speeds.

Application

- Provides a narrowing of the travel lane at intersections or midblock locations.

Qualifications

- ADT ≤ 10,000; Speed Limit ≤ 35

Advantages

- Reduces pedestrian crossing distance
- Creates protected parking area
- Reduces travel speeds

Disadvantages

- May slow right-turning emergence response vehicles
- May require bicyclists to merge with vehicular traffic for short distance

Cost

- Moderate to high

One-lane Choker

Description

- One-lane chokers narrow the roadway width such that there is only enough width to allow travel in one direction at a time.

Application

- Provides a narrowing of a street, they are good for areas with substantial speed problems and when on-street parking shortage exists.

Qualifications

- ADT ≤ 3,000; Speed Limit ≤ 30

Advantages

- Maintains two-way vehicle access, except at choker
- Reduces speed and volumes
- Negotiable by emergency vehicles

Disadvantages

- Can be used on low-volume, low-speed streets
- May require bicyclists to merge with vehicular traffic for short distance
- May reduce on-street parking
- Increase debris in gutter
- May increase sight distance issues

Cost

- Moderate to high

Traffic Circle

Description

- Traffic circles are raised islands, placed in intersections, around which traffic circulates. Yield signs can be used as traffic controls at the approaches of the traffic circle. Circles prevent drivers from speeding through intersections by impeding the straight-through movement and forcing drivers to slow down to yield.

Application

- Placed at intersections

Qualifications

- ADT ≤ 3,000; Speed Limit ≤ 30

Advantages

- Reduces speed
- Improves safety
- Negotiable by emergency vehicles

Disadvantages

- Impacts emergency vehicles and crosswalks if not designed properly
- May reduce on-street parking

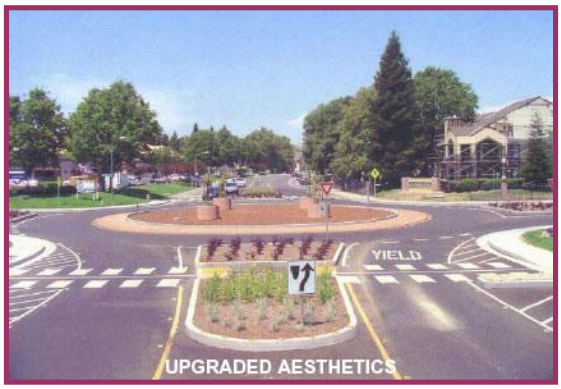
Cost

- High

Roundabout (single-lane)

Description

- Require traffic to circulate counterclockwise around a center island, roundabouts are used on higher volume streets to allocate right-of-way among competing movements.. They are larger than neighborhood traffic circles, have raised islands to channel approaching traffic to the right, and do not have stop signs.



Application

- Typically substituting for a traffic signal, may be most appropriate for new developments, due to large amount of required right-of-way and construction cost.

Qualifications

- Daily Entering Volume <16,000; Speed Limit ≤ 45 mph

Advantages

- Enhanced safety compared to traffic signal or stop sign
- Minimize queuing at intersection approaches
- Less expensive than traffic signals
- Negotiable by emergency vehicles

Disadvantages

- Impacts emergency vehicles and crosswalks if not designed properly
- May reduce on-street parking
- Continuous flow of traffic limits pedestrian crossing opportunities

Cost

- High

Chicane

Description

- An artificial feature creating extra turns in a roadway, used on city streets to slow cars.

Application

- Provides a narrowing of the travel lane at intersections or midblock locations.

Advantages

- Can reduce pedestrian crossing distance
- Can create protected parking area
- Reduces travel speeds
- Reduces traffic volumes
- Negotiable by emergency vehicles

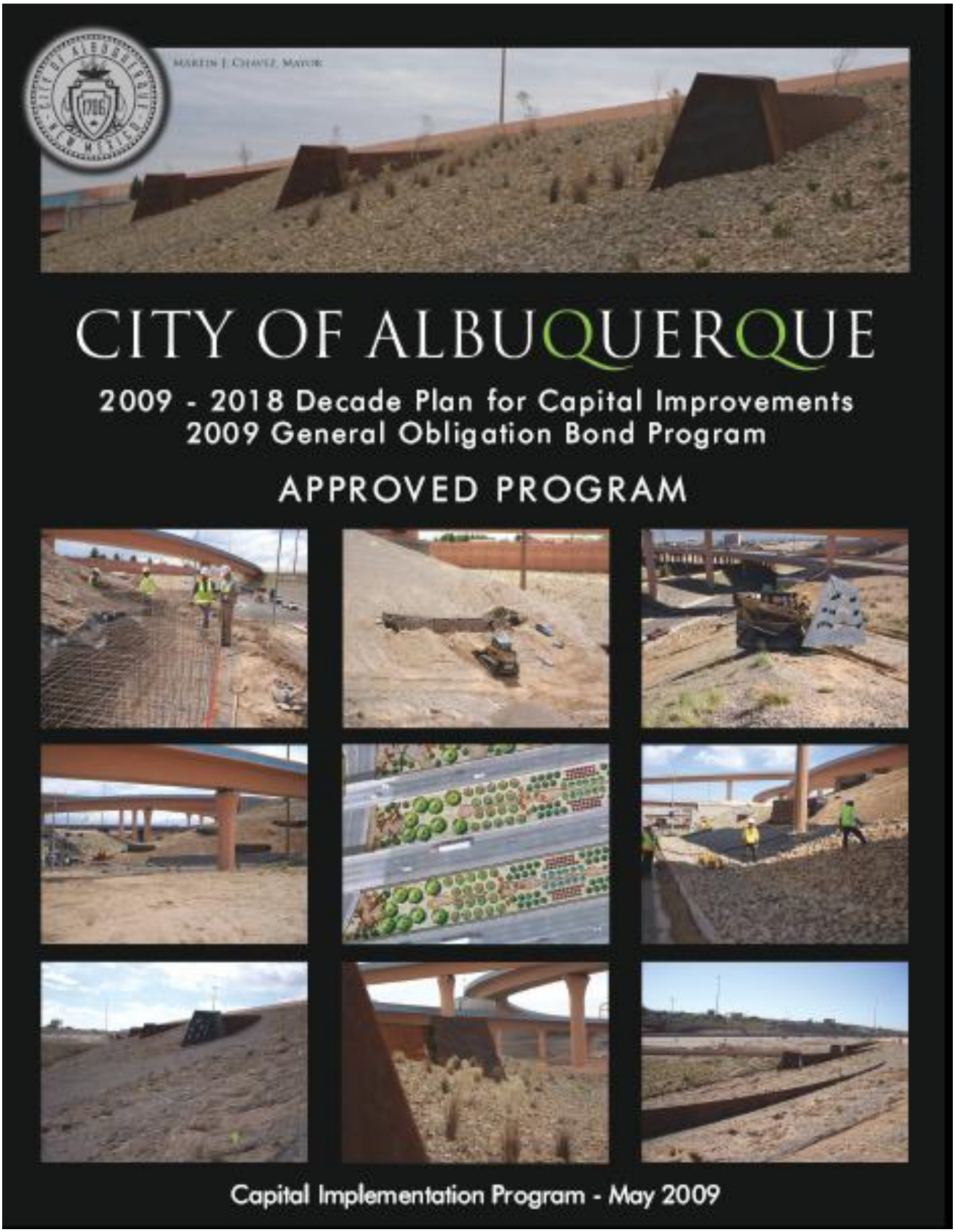
Disadvantages

- May slow right-turning emergence response vehicles
- May require bicyclists to merge with vehicular traffic for short distance
- Effect on vehicle speeds is limited (no horizontal or vertical deflection)
- May require bicyclists to merge with vehicular traffic for short distance
- May reduce on-street parking
- Increase debris in gutter

Cost

- Moderate to High

Appendix "E" – 2009 Decade Plan



G.O. Bond Summary

PRF Page	Department / *Division* / Project Title	2009	2011	2013	2015	2017	Totals
	DMD / Streets						
28	Reconstruction of Lead and Coal Avenues	$4,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$24,000,000
29	Advance Trans. Planning & Eng. (Streets)	$250,000	$750,000	$750,000	$750,000	$750,000	$3,250,000
30	Advance Right-of-Way Acquisition (Streets)	$750,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$4,750,000
32	Major Paving Rehabilitation	$325,000	$6,000,000	$7,000,000	$7,000,000	$7,000,000	$27,325,000
34	Intersection Signalization	$1,750,000	$1,750,000	$2,250,000	$2,250,000	$2,250,000	$10,250,000
36	Safety & Intersection Improvements	$1,500,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$9,500,000
38	Bridge Repair	$1,000,000	$1,000,000	$1,500,000	$1,500,000	$1,500,000	$6,500,000
39	NW Arterial Roadway Improvements	$1,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$9,000,000
41	SW Arterial Roadway Improvements	$1,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$9,000,000
43	Traffic Sign Replacement / Lighted Street Signs / Pavement Markings	$500,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$8,500,000
45	Sidewalk Improvements	$750,000	$750,000	$750,000	$750,000	$750,000	$3,750,000
47	Street Lighting	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
48	Public Works Funding (Streets)	$735,000	$1,100,000	$1,100,000	$1,100,000	$1,100,000	$5,135,000
49	Albuquerque Traffic Management System	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$5,000,000
50	Atrisco Drive, SW	$1,000,000	$1,200,000				$2,200,000
51	Neighborhood Traffic Improvements	$225,000	$250,000	$250,000	$250,000	$250,000	$1,225,000
52	Median Landscaping - Candelaria / San Mateo to Eubank	$1,000,000					$1,000,000
53	Median Landscaping - Eubank / Constitution to Montgomery	$1,250,000					$1,250,000
54	Intersection Level of Service (LOS) Project Implementation	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
56	Trails and Bikeways	$430,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$12,430,000
57	Singer Bridge Widening	$300,000	$3,000,000				$3,300,000
58	Unser Boulevard Reconstruction	$200,000	$2,500,000				$2,700,000
59	Alameda Boulevard Widening	$250,000	$2,500,000				$2,750,000
60	Alameda Boulevard Widening - San Pedro to Wyoming	$1,450,000					$1,450,000

Appendix "F" – NTMP Application

DRAFT APPLICATION

Neighborhood Traffic Management Program

Applicant Name(s)_____

Applicant Address_____

Contact Phone _____ E-Mail _____

Neighborhood Traffic Problem

(Please provide the closest location or locations of the problem, intersections and house numbers are helpful, and the timeframe for which the problem is most often occurring.)

Σ Cut-Through Traffic Location_____ Time_____

Σ Parking Problems Location_____ Time_____

Σ Speeding Location_____ Time_____

Σ Pedestrian Safety Location_____ Time_____

Σ Other Location_____ Time_____

Neighborhood Traffic Conditions

Please explain if any conditions have changed in the area recently that could be contributing to the problem. Has a new development been built in the neighborhood?

_____

_____

_____

_____

Applicant Signature_____ Date_____

Once this application is received by the Department of Municipal Development Traffic Engineering Division, the area will be researched for studies done in the past X years. If no current data exists, the division will provide you with a map of the homes in the area and a signature form, X% of the homes on the map must sign in order for a study to be prompted.

Contact information for DMD/TED

NTMP website