



NEW VISION FOR LEAD & COAL AVENUES

A QUALITY OF
LIFE DOCUMENT



23 March 2007

LEAD & COAL
AVENUES
TASK FORCE

WILSON
& COMPANY
ENGINEERS & ARCHITECTS

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March 23, 2007

City of Albuquerque
Department of Municipal Development
Albuquerque, NM

Lead & Coal Avenues Task Force
Albuquerque, NM

RE: Lead & Coal Avenue Study, 2007
Recommendation to City of Albuquerque, Wilson & Company

Dear Sirs:

Since January 2006, Wilson & Company, Inc. (WCI) has been working with the City of Albuquerque and the Lead & Coal Avenues Task Force to study and provide engineering expertise regarding the function and characteristics of the Lead and Coal Corridor. This effort has developed several proposed alternatives which WCI has conceptually evaluated for the Task Force. The results of the efforts are documented in the report following this letter.

The Task Force has completed their work and their final proposal to the City of Albuquerque includes two alternatives for the improvement of the corridor. We have been requested by the City of Albuquerque to review these two alternatives and provide a recommendation as to the most feasible alternative based on engineering criteria.

The two alternatives presented by the Task Force include a conversion of the current one-way pairs into two residential type roadways, with two-way traffic using a single lane in each direction; and the second being a reduction in the number of driving lanes from three to two for each one-way roadway. Only the one-way alternative would include on-street bicycle lanes.

Based on the MRCOG yearly traffic flow maps, the traffic volumes along the two roadways have been fairly consistent over the last 10 years. Any change to the cross sectional characteristics of the roadway would at the very least need to address the current traffic volumes, potentially provide for further growth, and the impact on the area roadway network. While there are other east-west routes to the downtown area, UNM campus, Nob Hill, etc. such as Central Avenue or Gibson Blvd. These two main arterials are at capacity in the peak period (Central Avenue), or do not provide the most efficient route (Gibson Blvd.). The Gibson Blvd. route is 1.2 miles south of Lead & Coal Avenues.



The multi-use of the corridor adds another facet to the criteria in that the cross sectional characteristics will need to address the traffic volumes and at the same time the pedestrian, commuter bicyclist, and recreational bicyclist/user. Therefore, we have created a list of engineering criteria to address the multi-use of the corridor and will use this as basis for the recommendation to the City of Albuquerque. The main engineering criteria that an alternative would need to meet to gain acceptance by the public include:

1. Acceptable facility LOS
2. Pedestrian amenities per current COA requirements
3. ADA accessible facilities
4. Bicycle amenities per current COA requirements

Other criteria that are dependent on this list include left turn capabilities, right turn capabilities, landscaping/amenities, corridor lighting and signing & striping.

The no-build alternative was kept out of the matrix as the City of Albuquerque has expressed their desire to improve the corridor. The following decision matrix has been prepared to compare the two alternatives.

	1	2	3	4
	Facility LOS	Pedestrian Amenities	ADA Accessibility	Bicycle Amenities
Two-Way Alternative	Facility LOS is unacceptable.	Amenities are achieved.	Accessibility is achieved.	Amenities are not achieved.
One-Way Alternative	Facility LOS is acceptable.	Amenities are achieved.	Accessibility is achieved.	Amenities are achieved.

Based on this matrix and the engineering criteria it describes, Wilson & Company recommends that the City of Albuquerque implement the One-Way Alternative for each roadway that will include two driving lanes, on-street bicycle lane, pedestrian amenities, and ADA accessible facilities. This alternative will satisfy both the engineering criteria while addressing the Task Force's primary issues and design characteristics (as listed on page 4 of the report).

Should you have any questions or require any additional information please feel free to contact us at 505/348-4000.

WILSON & COMPANY


Scott F. Perkins, PE



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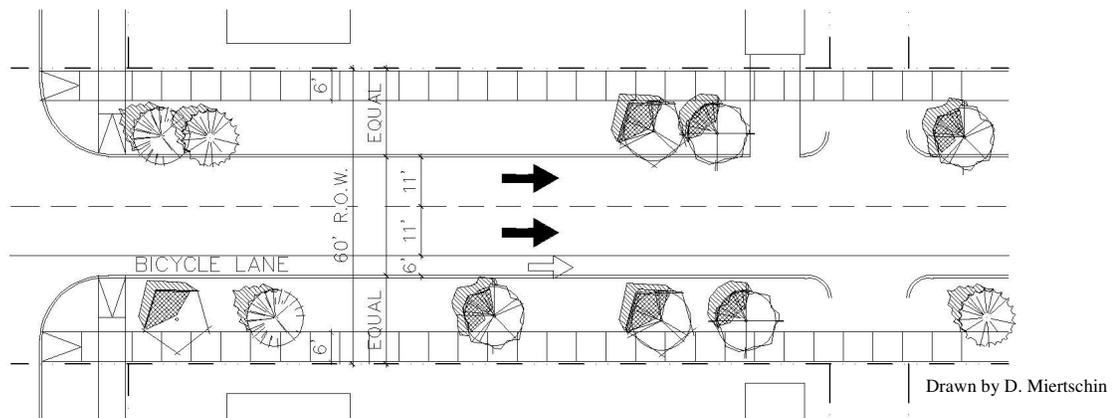
Vision

The vision of the Task Force is Lead and Coal Avenues as beautifully landscaped, environmentally sensitive, neighborhood, bicycle, and pedestrian friendly streets.

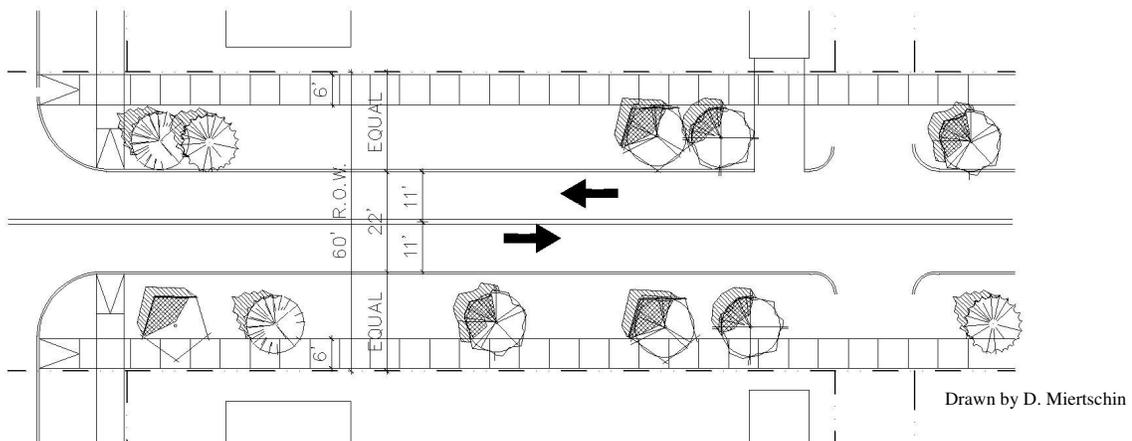
Executive Summary

Lead and Coal Avenues, from Downtown Albuquerque to Washington Street, function as a pair of one-way principal arterials which together carry up to 27,000 vehicles per day. Over the years numerous concerns have been voiced about their impact on the livability of the neighborhoods they traverse. A number of studies of the corridor have been completed, the last in 1996. Because of continuing citizen concern about Lead and Coal, the Mayor's office in late 2005 asked Wilson & Company to assess the corridor. A Public Involvement Meeting was held and a resident Task Force was formed.

The Task Force, along with Wilson & Company, first summarized the problems along the corridor, second identified goals for the re-design of Lead and Coal, and then examined various design options. After a planning level analysis and discussion, the Task Force recommends that the City Administration select one of the following alternatives:



One-Way Roadways, Each with Two Driving Lanes



Two-Way Roadways, Each with One Driving Lane in Each Direction

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Either alternative will bring the neighborhoods along Lead & Coal toward our re-design goals which are to:

- ◆ Reduce speed
- ◆ Make roadway pedestrian & bicyclist friendly
- ◆ Reduce accidents adjacent to homes
- ◆ Provide consistent roadway typical section
- ◆ Improve sight distance issues
- ◆ Give corridor neighborhood feel
- ◆ Address air & noise pollution
- ◆ Reduce traffic volumes
- ◆ Widen sidewalks
- ◆ Meet ADA requirements

Also, we recommend that either alternative incorporate the following features. These will further support our re-design goals and our overall objectives to calm traffic, enhance the residential and historic character of the neighborhoods, and make the neighborhoods more walkable.

- ◆ Lighting for pedestrians
- ◆ Pedestrian pushbuttons at crossings
- ◆ Signal cycle times at 50/50 split during off peak
- ◆ Improvement to and update of landscaping
- ◆ Lanes no wider than 11-ft
- ◆ Entry signs into each neighborhood
- ◆ Same treatment to both Avenues
- ◆ Installation of radar speed signs
- ◆ Installation of red light cameras at signals
- ◆ Installation of bollards or other barriers at signalized intersections
- ◆ Use of Quiet Asphalt

The Task Force intends to continue its involvement in the decisions made regarding Lead and Coal Avenues as the project proceeds through the detailed design phase and on to construction.



A. Introduction

Lead and Coal Avenues, from Downtown Albuquerque to Washington Street, function as a pair of one-way principal arterials which together carry up to 27,000 vehicles per day. Over the years numerous concerns have been voiced about their impact on the livability of the neighborhoods they traverse. The pedestrian amenities provided as well as the characteristics of the vehicles transiting through the corridor are issues.

There have been a number of studies completed on the corridor throughout the years. The most recent was completed in the 1996. It developed a number of alternatives, 13 including the no-build option, to address the understood issues. They evaluated each for feasibility, cost and impacts to traffic operations and neighborhoods. As an outcome of that study a demonstration was completed of the alternative that reduced the travel way by a lane in each direction. This option appeared to provide positive evaluation factors but due to negative public reaction the alternative project was not implemented.

In late 2005 Wilson & Company was asked to assess the corridor. This began with a Public Involvement Meeting held in January 2006. A number of issues were heard and following this meeting a focused Stakeholder's Task Force was formed. It consists of representatives from the area neighborhoods. This group was tasked with developing primary concerns and issues for the corridor, and to then formulate potential solutions. Once the solutions were on the table each would be evaluated on how each addressed the issues. Wilson & Company's task is to assist the Task Force in this effort.

Wilson & Company has developed a screening level type of analysis for each of the preferred alternatives. No detailed analysis was completed.

The process will now be to choose a final alternative for implementation. Several key issues will have to be finalized in a detailed design effort.

B. Existing Conditions

The first activity was an assessment of the existing conditions occurring along Lead and Coal Avenues. The study area extends from San Mateo Blvd. to Broadway Blvd. Data collection included the roadway section, right of way width, utilities, traffic volumes, services along the corridor, ADA facilities, signalization, and other conditions. This understanding of the surrounding context is a key component of the Context Sensitive Design process.

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The detailed information on the existing conditions has been placed in Appendix A in order to focus on the issues and concerns of the Task Force and to focus this document on the alternatives for improving the quality of life of the area.

C. Issues and Concerns

A key component of this study was the collection of the issues and comments provided by the public. This project has an extensive history mainly focused on the early 1990's study completed by JHK & Associates. That study looked at a number of alternative configurations for the Lead and Coal Corridor. That effort ended with the fielding of a demonstration project that reduced each roadway by one lane in each direction so that the Avenues each had two driving lanes.

Wilson & Company was asked to assist the Stakeholder's group by looking at a wide range of options and then determine an alternative that will be most acceptable. The first step in this process was to gather public input in the form of a Public Involvement meeting.

Public Involvement Meeting

The Public Involvement Meeting for the Lead & Coal Avenues was held at the Highland High School Lecture Hall, January 25th at 6:00 p.m. There was a large turnout of residents along the corridor and users of the roadways. A total of forty-two people signed in. The agenda for the evening included an open house from 6:00 pm to 6:30 pm, a short presentation by Wilson & Company, and a question and answer/comment session. The meeting adjourned at 8:20 p.m.

Written comments were gathered at the meeting and the verbal comments, questions, and suggestions were documented by Wilson & Company. Following the meeting, the comment period for the public to submit additional comments was until February 10th, 2006.

A review and summary of the comments received to date is as follows:

1. A majority of the public believes that speeding is a very big issue in the corridor. The comments on speeding tended to lead into other issues including difficulties in pedestrian use of the corridor, accidents within the corridor, speeding on other adjacent streets, and bicyclist safety.
2. The walkability of the corridor was mentioned several times. This includes the perceived inability to cross Lead and Coal, walk along the street, and access locations such as the parks, schools, and businesses. There were also comments from residents that have no problem crossing Lead & Coal. Overall, the public would like to see wider sidewalks, landscaping, and other amenities for the pedestrians.
3. The views on the number of lanes and one-way versus two-way traffic vary. A common view is that the number of lanes should be consistent within the corridor as it changes from two to three and sometimes four in some areas. Some would like to see the roadway turned into a residential street, but realize that this would not be better for everyone. It could cause more pollution and back-ups in other streets and in their own. Several comments were received from both commuters and residents that believed it should be left in its current configuration.

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4. The inclusion of an on-street bicycle lane was discussed. Opinions were mixed. Commuter type bicyclists preferred the on-street bicycle lanes.

A “next step” was discussed at the end of the comment portion of the meeting. Wilson & Company spoke with several of the attendees and they felt that a follow-up meeting needed to be held. We presented a potential tentative schedule. It is as follows:

- Continue gathering comments from the public.
- Prepare a summary of the comments and review with the City of Albuquerque.
- Compose a small working group to continue working on concepts.
- Prepare these concepts for presentation.
- Present the concepts at a second Public Involvement Meeting.

Task Force

As an outcome of this meeting, the City of Albuquerque decided to continue with the formation of a task force. The Stakeholder’s Task Force was formed to work through the issues of the corridor and develop a recommendation to the City for improvements to the corridor with Wilson & Company assisting in this endeavor. Members of the task force include:

Julia Heaphy-Nufer, Nob Hill N.A.	Berry Ives, Nob Hill N.A.
Tom Ocken, Silver Hill N.A.	Joseph Aguirre, University Heights N.A.
Alan Pope, Nob Hill N.A.	John Watts, Silver Hill N.A.
Peter Schillke, Sycamore N.A.	Bill Cobb, Silver Hill N.A.
Roberto Aguero, Nob Hill N.A.	Mike McKenzie, Huning/Highland N.A.
Kevin Nufer, Nob Hill N.A.	Amberley Pyles, Huning/Highland N.A.
David Miertschin, University Heights N.A.	Mardon Gardella, Federation of University Neighborhoods

Beginning in March 2006 several meetings were held with the Task Force. The meetings included a definition of the issues and problems of the corridor, brainstorming sessions for solutions, a corridor field visit to review the issues, discussion of the alternatives and tools to analyze the alternatives, and lastly the preparation of a report on the findings.

Definition of the Issues & Problems:

The Task Force categorized all the issues and concerns of the corridor as follows:

- **TRAFFIC CARRYING:** volume, safety, speed, local/regional traffic, other users.
- **SAFETY FOR ALL USERS:** pedestrian, bicycles, traffic, lighting, property owners, crime, accidents, ADA, misuse, walkability, speed, trash/litter, crossing areas.
- **ENVIRONMENTAL AESTHETIC:** walkability, noise, crime, pollution, landscaping.
- **VISION/SOCIAL:** zoning issues, quality of life, trash/litter, “respect”, noise.
- **BICYCLISTS:** safety, users.
- **LOCAL ACCESS:** pedestrians, vehicular, bicyclist.

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After reviewing and detailing the issues, the Team developed the following list of primary issues to be addressed by any alternative.

- ◆ Reduce speed
- ◆ Make roadway pedestrian & bicyclist friendly
- ◆ Reduce accidents adjacent to homes
- ◆ Provide consistent roadway typical section
- ◆ Improve sight distance issues
- ◆ Give corridor neighborhood feel
- ◆ Address air & noise pollution
- ◆ Reduce traffic volumes
- ◆ Widen sidewalks
- ◆ Meet ADA requirements

In addition, a list of characteristics to be included in the design of the alternatives was also completed and this would include:

- ◆ Lighting for pedestrians
- ◆ Pedestrian pushbuttons at crossings
- ◆ Signal cycle times at 50/50 split during off peak
- ◆ Improvement to and update of landscaping
- ◆ Lanes no wider than 11-ft
- ◆ Entry signs into each neighborhood
- ◆ Same treatment to both Avenues
- ◆ Installation of radar speed signs
- ◆ Installation of red light cameras at signals
- ◆ Installation of bollards or other barriers at signalized intersections
- ◆ Use of Quiet Asphalt

D. Brainstorming Session for Solutions

During the brainstorming sessions with the Task Force, eight solutions were developed which addressed many of the issues the Task Force had listed. Each solution was sketched in an AutoCad drawing and submitted back to the Task Force for further refinement. These drawings are located in Appendix E.

After the drawings were reviewed by the Task Force a refinement period began with discussion over each solution would fit into the current surroundings and what type of modifications and changes would be required to bring it about. From these discussions the Preferred Alternatives have come forward.

E. Preferred Alternatives

Based on the task force's goals, the following describe the Preferred Alternatives for Lead and Coal Avenues. Each will calm traffic, enhance the residential and, in some cases, historical character of the neighborhoods, and provide pedestrians with a safe environment. These goals coincide with the administration's stated desire to make Albuquerque a livable, walkable city filled with "Great Streets".

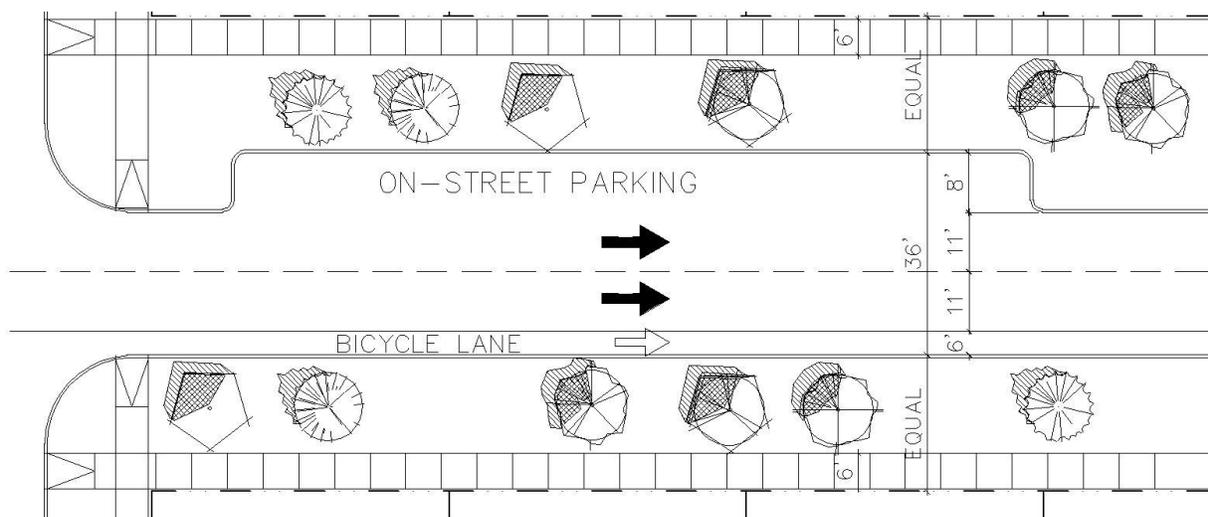
Please note that for each section one-way and two-way configurations are detailed. The Task Force recommends that the entire corridor from Broadway to Valverde be either one-way or two-way. Section A (Broadway to I-25), because of the width of its roadway section, might be an exception to this.

Section A (Broadway to I-25) with One-Way and Two-Way Option:

The Huning Highlands section of the Avenues has recently been renovated. Sidewalks, landscaping, ADA ramps and bicycle lanes were constructed. It has been noted by the residents along this segment that they perceive an increase in traffic speeds along the road. Traffic calming measures could be used to benefit the neighborhood. Such calming measures would enhance the historical and residential character of the neighborhood. There are no signalized intersections or striped pedestrian crosswalks within this stretch of the neighborhood, with the exception of the I-25 Frontage Road and Broadway intersections. There is currently a school crossing at Edith on both Lead and Coal. This could easily be converted to a permanent pedestrian crosswalk marked by signs telling drivers that they must yield to pedestrians.

Reduced lane width and driving surface (from 3 to 2 driving lanes, and from 12-ft to 11-ft wide lanes) creates a shorter distance for pedestrians to navigate. Reduction in lane width and driving surface reduces speed and makes space for pedestrian and neighborhood amenities.

For the one way option, we propose bulb outs at the corners with on street parking on the north side of the street. This on-street parking could help alleviate some of the congestion on side streets and help to calm traffic by making "rougher edges" to the Avenues.

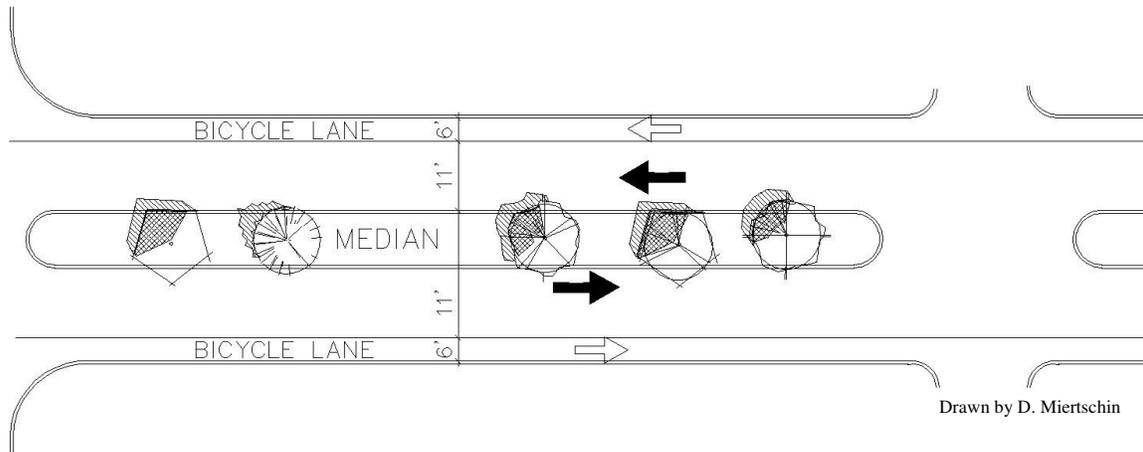


**Section A – One-Way Option
Broadway to I-25**

Drawn by D. Miertschin

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As a two-way option, we propose a planted median, which would provide a safe refuge for crossing pedestrians. Traffic speeds would be greatly reduced if traffic were going both ways. This could help alleviate the pass through traffic on the 400 block of the side streets. The residents have observed the use of the 400 block as a detour to avoid the one-way streets. The residents feel that two-way streets contribute to the residential character of the neighborhoods and that one-way streets create a “pass through” atmosphere. In the two-way option, 6-ft bicycle lanes are proposed on both sides of the street to accommodate both eastbound and westbound traffic.



**Section A – Two-Way Option
Broadway to I-25**

Section B (I-25 to Yale) with One-Way and Two-Way Option:

Silver Hill Neighborhood is designated as a historic neighborhood and Sycamore Neighborhood is designated as a metropolitan development area. Their residential character is greatly compromised by the high speeds along Lead and Coal Avenues. Throughout this section, the main goals are to slow traffic, create pedestrian amenities, and beautify the area around Lead and Coal Avenues.

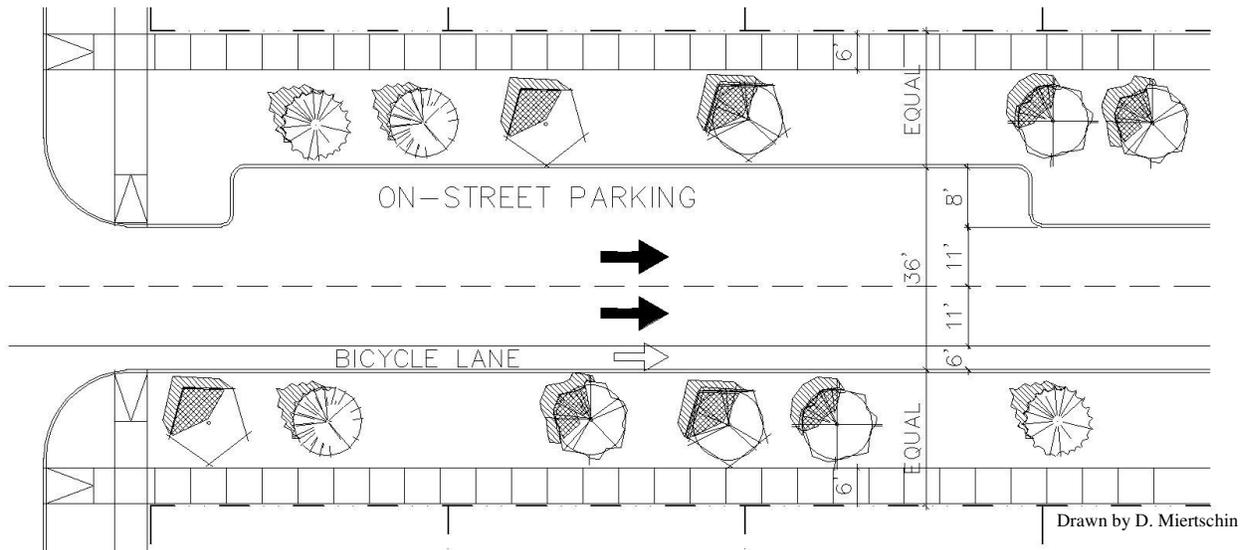
Narrowing the driving surface to two 11-ft wide driving lanes reduces the crossing distance for pedestrians while calming traffic. It also allows for a wide planting strip with trees on both sides of the street.

With this narrowing of the driving surface width, there is the opportunity for 6-ft wide sidewalks on both sides of both Avenues. The construction will allow for the construction of ADA ramps that meet the current ADA guidelines with directional facilities. However, directional ramps would place pedestrians in a more protected spot at crosswalks, allowing them to choose from a bi-directional path and creating the ability to see down the sidewalk. The sidewalks would also be buffered by the landscaped zones and parked cars. This makes the sidewalks much safer for pedestrians because they are protected from vehicular traffic.

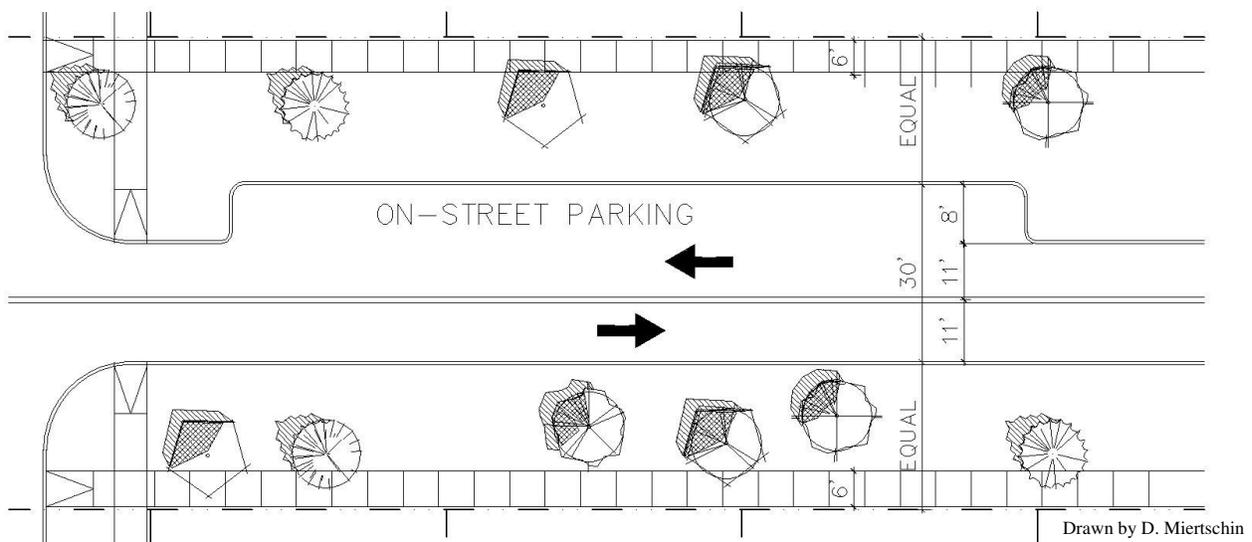
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With the parking positioned on the north side of the street, trees will be able to be planted closer to the road on the south side of the street. This type of landscape is believed to slow traffic. The bulb outs would help create shorter crossing distances for pedestrians.

The one way option both allows for a bike lane and for greater traffic flow. However, the two way option encourages greater residential characteristics and calmer traffic. Bikes would share the road with cars in this option.



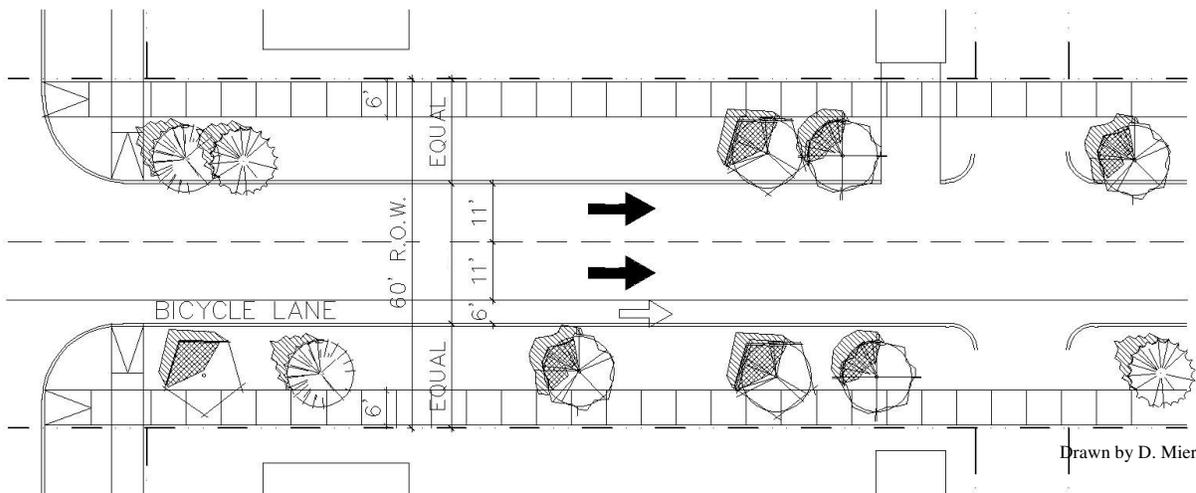
Section B – One-Way Option
I-25 to Yale



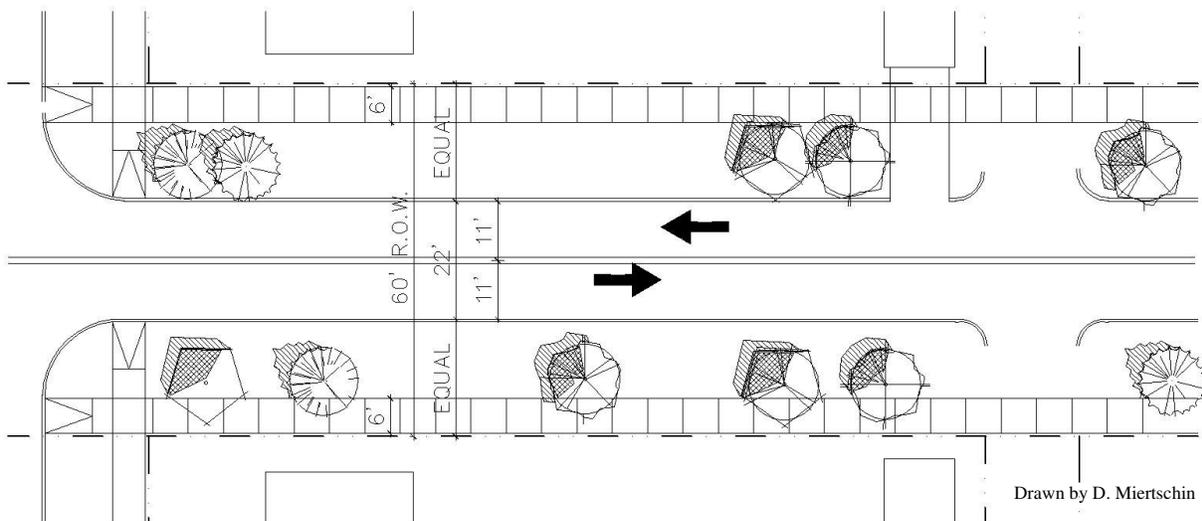
Section B – Two-Way Option
I-25 to Yale

Sections C (Yale to Girard) & D (Girard to Valverde) with One-Way and Two-Way Option:

The narrowest sections of the Avenues run through the University Heights, Southeast Heights, and Nob Hill neighborhoods. However, reductions in lane number and lane width will provide the space for greater pedestrian amenities. Currently, the sidewalks often are narrow (3-ft wide) in this section, and are located directly adjacent to the roadway. It is imperative that these sidewalks be widened and be buffered by plantings. However, because of space concerns, there is no on-street parking included in these diagrams. The task force has decided that increased plantings and wider sidewalks hold more value than parking.



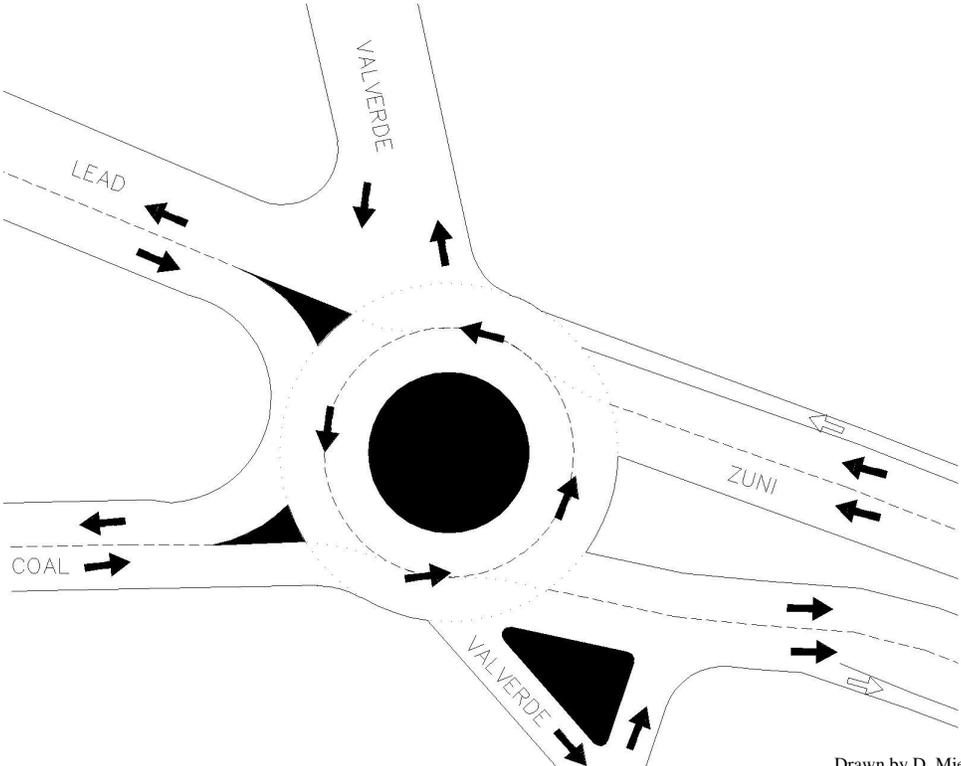
**Section C and Section D – One-Way Option
Yale to Girard, Girard to Valverde**



**Section C and Section D – Two-Way Option
Yale to Girard, Girard to Valverde**

Section D – Intersection of Valverde with Avenues for Two-Way Option:

This roundabout alternative would be utilized in the vicinity of the study area where the Avenues converge from one-way pairs to a roadway separated by a raised median, namely Zuni Road. The roundabout would connect the two-way streets of Lead Avenue, Coal Avenue, Valverde Drive, and Zuni Road.



Drawn by D. Miertschin

Construction Costs

The alternatives will require a modification of the existing roadway section due to the narrowing of the driving surface required by each. Up to 95% of the existing sidewalks and ADA ramps will need to be reconstructed. While there is the potential to salvage some of the sidewalks along the corridor this may not be acceptable due to the age of the concrete and possible damage during construction in the narrow sections. The segment between Broadway and I-25 was just recently completed so this area will remain and will not have to be reconstructed.

This construction cost estimate has been prepared based on current construction cost data, namely City of Albuquerque Unit Bid Prices and recently bid City of Albuquerque projects. In each alternative, one-way or two-way, the preferred method of implementing the improvements would be to center the typical roadway section within the existing right of way. This would require that new curb & gutter be constructed along both sides of each roadway. A second method of construction would be to only modify one side of the existing roadway section. The following table shows the construction cost for the first method of reconstructing both sides of the roadway. By reconstructing only one side, the construction cost would be approximately \$1.0 million to \$2.0 million less.

SUMMARY OF CONSTRUCTION COSTS		
	ITEM DESCRIPTION	AMOUNT
1.	CONSTRUCTION ENGINEERING	\$3,323,060.00
2.	ROADWAY	\$3,421,300.00
3.	STORM DRAIN SYSTEM	\$1,350,000.00
4.	WATER LINES	\$1,290,000.00
5.	SANITARY SEWER LINES	\$1,500,000.00
6.	PERMANENT SIGNING & STRIPING	\$300,000.00
7.	SIGNALIZATION	\$3,834,000.00
8.	REMOVALS	\$1,530,000.00
9.	LANDSCAPING	\$3,390,000.00
	SUBTOTAL	\$19,938,360.00
	NMGRT AT 6.875%	\$1,370,762.25
	TOTAL	\$21,309,122.25
	CONTINGENCY OF 20%	\$4,261,824.45
	GRAND TOTAL	\$25,570,946.70

The existing utilities within the corridor are very old and have the potential to be damaged during construction. In recent widening and roadway improvement projects with the City of Albuquerque, the Water Authority has opted to replace old water and sanitary sewer lines. Therefore, it would be expected that they would want to upgrade the utility lines in this section of the City, assuming funding for this work is available. The construction cost estimate assumes these lines will be replaced.

The cost for the reconstruction of the signalization assumes that the location of signalized intersections would remain. For the two way alternate, the signalization would need to be modified by adding the signalization for the fourth leg. Currently the signals in the one-way

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condition are for the one-way Lead or Coal and the minor street. For the one way alternate, the signalization could likely remain but due to the age of the equipment it would be replaced. With this, the signalization construction cost is based on an average cost of replacement for each of the 27 signalized intersections within the project.

The estimated cost for landscaping is based on the installation of low water use type landscaping along the nearly 5.7 miles of roadways.

In addition, this construction estimate assumes that the existing pavement will remain. Should a rehabilitation of the existing pavement be required, this has the potential to increase the cost of the project by \$2,000,000.00 per each side for a total of \$4,000,000.00. Several other factors have the potential to increase the construction cost of this project, including right of way acquisition costs, removal of existing encroaching appurtenances, and other related items.

Impacts/Issues with Implementation

Change in Roadway Classification

The implementation of either alternative will change the roadway's characteristics and therefore may require the reevaluation of their functional classification in the MRCOG Street Network plan.

Right of Way Issues

The layout of the proposed roundabout at the east end of the corridor will have to be further developed. The concept, if implemented with the two way alternative, will have to be designed to provide adequate turning lane widths. Depending on the final design of the roundabout, this has the potential to require right of way takes.

Construction Issues and Affect on Residents & Traveling Public

One major item whose cost is difficult to estimate is the impact to the traveling public during the construction of any alternative. The construction has the potential to limit the roadway to a single driving lane for the duration of the project.

Based on the historic nature of the neighborhoods and the proximity of homes to the roadway, special measures to protect them from vibrational impact should be implemented.

F. Traffic Engineering – Analysis of Alternatives

Planning level capacity analysis

For this study we have utilized a screening level capacity analysis to review each of the Preferred (Build) Alternatives. Data from the MRCOG Traffic Flow maps for the greater Albuquerque area were used for this analysis. The tables below list the traffic volumes for the corridor from 1997 through 2005. As shown on these tables the volumes have not fluctuated greatly and appear to be fairly stationary. The average of the 2005 through 1997 traffic volumes are used as the basis for this analysis.

Traffic Volumes (1997 – 2005) – Lead Avenue

Lead Avenue		<i>Broadway to Interstate-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>	<i>Washington to San Mateo</i>
Traffic Volumes (Average Weekday Flows)	2005	12,100	12,300	13,600	12,600	11,700	22,500
	2004	12,500	13,500	15,700	13,700	12,200	21,500
	2003	12,800	15,400	15,900	13,800	12,300	21,700
	2002	12,900	15,400	15,900	13,900	12,300	21,800
	2001	13,900	14,300	14,500	16,500	14,300	19,400
	2000	13,400	12,200	14,400	13,300	11,700	19,300
	1999	13,200	12,500	14,500	13,400	12,000	21,100
	1998	12,900	13,000	14,600	13,500	12,100	21,200
	1997	12,600	14,500	14,300	14,200	12,800	21,300

Traffic Volumes (1997 – 2005) – Coal Avenue

Coal Avenue		<i>Broadway to Interstate-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>	<i>Washington to San Mateo</i>
Traffic Volumes (Average Weekday Flows)	2005	11,100	11,900	12,800	12,300	10,700	22,500
	2004	10,600	13,500	15,200	14,300	12,800	21,500
	2003	11,700	15,800	15,400	14,400	12,900	21,700
	2002	11,800	15,900	15,400	14,500	13,000	21,800
	2001	13,400	13,500	13,500	16,800	11,000	19,400
	2000	10,400	10,800	13,400	13,200	10,900	19,300
	1999	10,300	12,000	13,700	13,300	15,200	21,100
	1998	10,000	13,300	13,800	13,300	15,300	21,200
	1997	10,600	13,300	13,800	13,000	15,400	21,300

The volumes vary from 11,100 ADT to 14,822 ADT. Zuni, which runs between San Mateo and Washington, has an average volume of 21,089. Since Zuni is not part of the one-way pairs it will not be part of our analysis. For purpose of this Planning Level Analysis, we have divided Lead and Coal Avenues into five (5) corridor segments as follows:

- A) Broadway to I-25
- B) Interstate 25 to Yale Blvd.
- C) Yale Blvd. to Girard Blvd.
- D) Girard Blvd. to Carlisle Blvd.
- E) Carlisle Blvd. to Washington Blvd.

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This is suitable due to the relative consistency of the volumes within these corridor segments and the order of magnitude of this analysis to assess the impacts of the Preferred (Build) Alternatives.

Level of Service Analysis

To determine the Level of Service (LOS) of the facility, we have utilized the Florida Department of Transportation (FDOT) *Quality/Level of Service (LOS) Handbook and Generalized LOS Tables*.

This analysis is based upon an arterial's number of through lanes in a single direction. Since the ultimate result of the LOS analysis is a facility estimation of LOS, and it is widely recognized that signalized intersections are the arterial's primary capacity constraint, it is appropriate to place more emphasis on the intersections' characteristics than mid-block characteristics (FDOT Quality/LOS Handbook, 2002). Therefore, the number of through lanes is that of which is at the signalized intersection. The number of through lanes is determined by the through and shared through/right lanes at major intersections. Left turn lanes are not considered as part of the through lanes.

Level of Service Definitions:

The operational performance of an intersection or a highway facility is based on Level of Service criteria. Level of Service (LOS) is a term used to qualitatively describe roadway and intersection traffic operations with a rating of the quality of service of a facility. Level of Service is expressed as letters A to F, with LOS A representing the best operating conditions and LOS F the worst. General descriptions of level of service are provided below.

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

For facilities in an urban area the size of Albuquerque, **LOS D** or better traffic operations represents a reasonable performance goal for arterial segments and for intersections that are controlled by traffic signals. The FDOT Tables are a reasonable approach to reviewing and assessing LOS. The tables are mainly to be used for conceptual/planning level decisions. For

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a detailed analysis, it recommends that a Corridor Simulation Software be utilized. In this analysis, we have used *Table 4-1 for Generalized Annual Average Daily Volumes for Urbanized Areas*. See Appendix F for a full copy of the table.

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas (clips from Table 4-1)

Class III (more than 4.5 signalized intersections per mile and not within primary city central business district of an urbanized area over 750,000)						
		Level of Service				
Lanes	Divided	A	B	C	D	E
2	Undivided	**	**	5,300	12,600	15,500
4	Divided	**	**	12,400	28,900	32,800
6	Divided	**	**	19,500	44,700	49,300
8	Divided	**	**	25,800	58,700	63,800

ARTERIAL/NON-STATE ROADWAY ADJUSTMENTS			
DIVIDED/UNDIVIDED			
(alter corresponding volume by the indicated percent)			
Lanes	Median	Left Turns Lanes	Adjustment Factors
2	Divided	Yes	+5%
2	Undivided	No	-20%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

Analysis Assumptions and Evaluation Data:

There are several assumptions made for the Lead/Coal Corridor that are not directly addressed by the table. Lead and Coal each operate as a one-way roadway with city block(s) separating them. We have made the assumption that the corridor is a single arterial separated by a large median where as by reference can be compared as a four or six lane divided facility in the FDOT State Two-Way Alternates table. Another factor that has to be addressed is the number of signals along the reach. In the approximately 15,000-ft corridor (one way portion) there is an average of 13 signals (12 on Lead Ave., 13 on Coal Ave.) which equates to 4.6 signals per mile. The area is not located in a *Control Business District (CBD)* and will be classified as Class III.

We have utilized the following breakdown for the Lead and Coal Avenues based on the average of the 2005 through 1997 MRCOG Traffic Volumes (Average Weekday Flows). Please note that for the Two Way, One Lane in Each Direction Alternatives, we based the volumes on an average of the total 2005 volumes on each roadway (Example: Segment A (Broadway to Interstate 25), 12,922 (Lead) + 11,100 (Coal) = 24,022 ÷ 2 = 12,011). This assumes an even split of the total volume between the two roadways for this alternative.

Lead & Coal Corridor Section Volumes

		A	B	C	D	E
		<i>Broadway to Interstate 25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>
No-Build, Existing Roadway	<i>Lead Avenue</i>	12,922	13,678	14,822	13,878	12,378
	<i>Coal Avenue</i>	11,100	13,333	14,111	13,900	13,022
One Way, Two Lane Roadway	<i>Lead Avenue</i>	12,922	13,678	14,822	13,878	12,378
	<i>Coal Avenue</i>	11,100	13,333	14,111	13,900	13,022
Two Way, One Lane Each Direction Roadway	<i>Lead Avenue</i>	12,011	13,506	14,467	13,889	12,700
	<i>Coal Avenue</i>	12,011	13,506	14,467	13,889	12,700

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The through lanes for each Preferred (Build) Alternative were determined based on the methodology described in the FDOT Quality/Level of Service Handbook. The intent of the Task Force is to keep the crossing distance as short as possible for the walkability of the area so separate right turn bays are not part of the typical section of the Preferred (Build) Alternative. With this, each Preferred (Build) Alternative will have two (2) through lanes.

The original intent of the Task Force was to keep the typical section of each Preferred (Build) Alternative consistent through the signalized intersections. The first LOS analysis is based on this characteristic. In the Build: One Way Each Corridor, 4-Lane Divided the left through lane will become a shared lane (through/left turn lane). The Build: Two Way Each Corridor, 2-Lane Undivided will not have the ability to use a lane as a shared lane. So to account for this lack of a left turn lane, the service volumes have been reduced by 20% in this LOS determination per FDOT requirements for a roadway without designated left turn lanes.

LOS by Section:

The LOS for each Section was determined to be as follows:

Lead & Coal Corridor LOS by Section (w/o Left Turn Lanes)

	Max ADT to Achieve LOS D	Segment A	Segment B	Segment C	Segment D	Segment E
		<i>Broadway to I-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>
No-Build: <u>6-Lane Divided</u>	44,700 ADT for LOS D	LOS C/D with 24,022 ADT	LOS C/D with 27,011 ADT	LOS C/D with 28,933 ADT	LOS C/D with 27,778 ADT	LOS C/D with 25,400 ADT
Build: One Way, Two Lanes <u>4-Lane Divided</u>	28,900 ADT for LOS D	LOS C/D with 24,022 ADT	LOS C/D with 27,011 ADT	LOS D with 28,933 ADT	LOS C/D with 27,778 ADT	LOS C/D with 25,400 ADT
Build: Two Way Each Corridor <u>2-Lane Undivided</u>	10,080 ADT for LOS D	LOS D/E with 12,011 ADT for each road	LOS F with 13,506 ADT for each road	LOS F with 14,467 ADT for each road	LOS F with 13,889 ADT for each road	LOS E/F with 12,700 ADT for each road

After reviewing this LOS analysis of the Preferred (Build) Alternatives, the Task Force determined that including a left turn lane at the major intersections along the corridor would be beneficial. With this, the service volume does not have the 20% reduction. The LOS for each the Build: Two Way Each Corridor, 2-Lane Undivided, with left turn lanes is as follows:

Lead & Coal Corridor LOS for Two Way Alternative with Left Turn Lanes

	Max ADT to Achieve LOS D	Segment A	Segment B	Segment C	Segment D	Segment E
		<i>Broadway to I-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>
Build: Two Way Each Corridor <u>2-Lane Undivided</u>	12,600 ADT for LOS D	LOS D with 12,011 ADT for each road	LOS D/E with 13,506 ADT for each road	LOS D/E with 14,467 ADT for each road	LOS D/E with 13,889 ADT for each road	LOS D/E with 12,700 ADT for each road

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The analysis for the Two Way Alternative assumes that there is an even split of the total traffic between the two roadways. Based on the historic data, the traffic volumes are not split with Lead being favored in some segments of the corridor and Coal being favored in other segments. The potential to overload one of the streets will need to be considered.

The effect of the side friction caused by the turning maneuvers at the numerous side streets and driveways along the corridor would have the potential to erode the LOS for the Two Way Alternative further. In addition, the LOS D/E does not allow for much growth as any additional volume would sent it into a failing LOS.

Two Way Alternate

This Planning Level Analysis indicates a poor LOS at D/E for the Two Way Alternate. There are a few issues that may indicate an even worse operation.

- A) Our LOS assumes an even split between the two roadways. This is not necessarily the way it will occur. The intersection at Valverde and the Avenues will have to be reconfigured and this could force heavier movement to one roadway or the other.
- B) The movement of flow through traffic would indicate heavier west flow in the AM and corresponding east flow in the PM. This will also favor one direction or the other.
- C) The lack of left turn lanes at minor intersections will increase the number of certain types of accidents such as rear-end collisions.
- D) Stand-still traffic with this LOS could affect access and movement of emergency vehicles, and garbage and mail service.
- E) Stand-still traffic could cause an increase in cut through traffic during peak hours.

One Way Alternate

The One Way Alternate (two lanes, each direction) has an acceptable LOS very similar to the existing section as it performs at a LOS C/D. A couple of factors to be kept in mind with the One-Way 2-lane are:

- A) The volumes are very close to capacity numbers for the section. This was a similar conclusion reached by the 1996 *Lane Reductions Demonstrations Project* completed by JHK & Associates. That document stated that a one-lane reduction in capacity would eliminate any reserve east-west capacity to handle growth and emergency or construction detours. Our basic analysis concurs with this conclusion.
- B) There will be some diversion of traffic to surrounding roadways but we don't believe it will be significant in the short term. It will cause an at capacity utilization of the roadway during the peak.
- C) Some reductions in speed will occur similar to that seen in the 1996 demonstrations.
- D) The current rate of growth appears to be stable, but any future growth would likely cause an increase in congestion.
- E) There will be great benefit to safety of bicyclists with the addition of the bike lane.
- F) Details of the design would need to address the accessibility for garbage and mail services.

Matrix with Screening Factors

This matrix lists each alternative including the no-build alternative in which the roadways would remain in their current condition. Each was compared to the goals of the Task Force and given a rating from GOOD to FAILS TO MEET OBJECTIVE.

LEAD COAL ANALYSIS MATRIX TO COMMUNITY AND DESIGN GOALS

ALTERNATIVES	FUTURE VEHICLE CAPACITY	RIGHT OF WAY REQUIRED ***	BIKE LANE	REDUCE SPEED	PEDESTRIAN FACILITIES *	SCALED LIGHTING	SIDEWALK IMPROVEMENTS	SIGNAL TIMING/BALANCE **	11-FT LANE WIDTH	LANDSCAPING	NEIGHBORHOOD ENTRY SIGNS	RADAR SPEED DETECTION	CONSTRUCTION COST	TRAFFIC CONTROL	UTILITY IMPACTS
EXISTING/NO-BUILD	++	++	--	-	-	-	-	-	+	-	-	++	++	++	++
ONE WAY (TWO-LANE ROADWAY)	+	++	++	++	++	++	++	++	++	++	++	++	-	-	-
TWO WAY (ONE LANE EACH DIRECTION)	--	+	+	++	++	++	++	+	++	++	++	++	-	-	-

LEGEND

- ++ **GOOD**
- + **FAIR**
- **POOR**
- **FAILS TO MEET OBJECTIVE**

* INCLUDING CROSSING AREA ENHANCEMENT, SIDEWALKS, ADA FACILITIES AT INTERSECTIONS AND THROUGHOUT THE CORRIDOR, PUSH BUTTONS CONTROLS, ETC.

** A 50-50 GREEN SPLIT OF THE SIGNAL TIMING TO BALANCE THE SIDE STREET ACCESS WITH THE THROUGH MOVEMENT ON LEAD & COAL DURING THE OFF-PEAK PERIOD. THE ONE WAY ROADWAYS COULD LIKELY HAVE A SHORTER CYCLE LENGTH AS THERE WOULD BE FEWER PHASES THAN IN THE TWO WAY ALTERNATIVE.

*** DUE TO THE ADDITIONAL ROW REQUIRED FOR THE ROUNDABOUT AT VALVERDE/LEAD/COAL/ZUNI.

G. Recommendations

Over the last several months the Task Force has worked diligently to provide one preferred alternative that would best fit the desires of the neighborhoods. After much discussion and thoughtful investigation, the Task Force decided on presenting two alternatives as their recommendation – **the One Way Alternative and the Two Way Alternative.**

Each alternative will allow for the implementation of the main improvements and enhancements to the corridor. With the narrowing of the cross section width of each roadway, on-street bicycle lanes will be provided, wider sidewalks separated by landscape buffers can be constructed, the landscaping will provide a traffic calming effect, some on-street parking can be accommodated, and many of the other goals can be achieved. While they do meet the goals of the community, this is not without some negative impacts and issues with implementation. Even though the Level of Service analysis suggests that the Two Way Alternative may have negative impacts on road capacity, the Task Force nevertheless recommends it along with the One Way Alternative because it considers a two way roadway generally more appropriate for residential neighborhoods.

The Task Force leaves the final decision up to the City of Albuquerque after they have reviewed the feasibility of each alternative. The Task Force intends to continue its involvement in the decisions made regarding Lead and Coal Avenues as the project proceeds through the detailed design phase and on to construction.

Appendix B
Zone Atlas & Aerial Map

Appendix A

Existing Conditions

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Existing Conditions

The study area extends from San Mateo Boulevard to Broadway Boulevard along Lead Avenue and Coal Avenue (Zone Atlas pages K-14 through K-17). A larger view of the zone atlas pages and aerial photo is included in Appendix B.



Existing Roadway Features

Typical Roadway Section

The roadway section for both Lead Avenue and Coal Avenue along the corridor is generally a three driving lane section with the section transitioning into a two driving lane section in certain areas. This generally occurs at the west end of the project limits between Yale Boulevard and Interstate 25. The following table breaks down the corridor into six segments to generally describe the characteristics of the roadway section along the corridor. The pavement width information was taken from maps provided by the City of Albuquerque (See Appendix C.). Sidewalk widths and characteristics are highly variable and discussed in later sections.

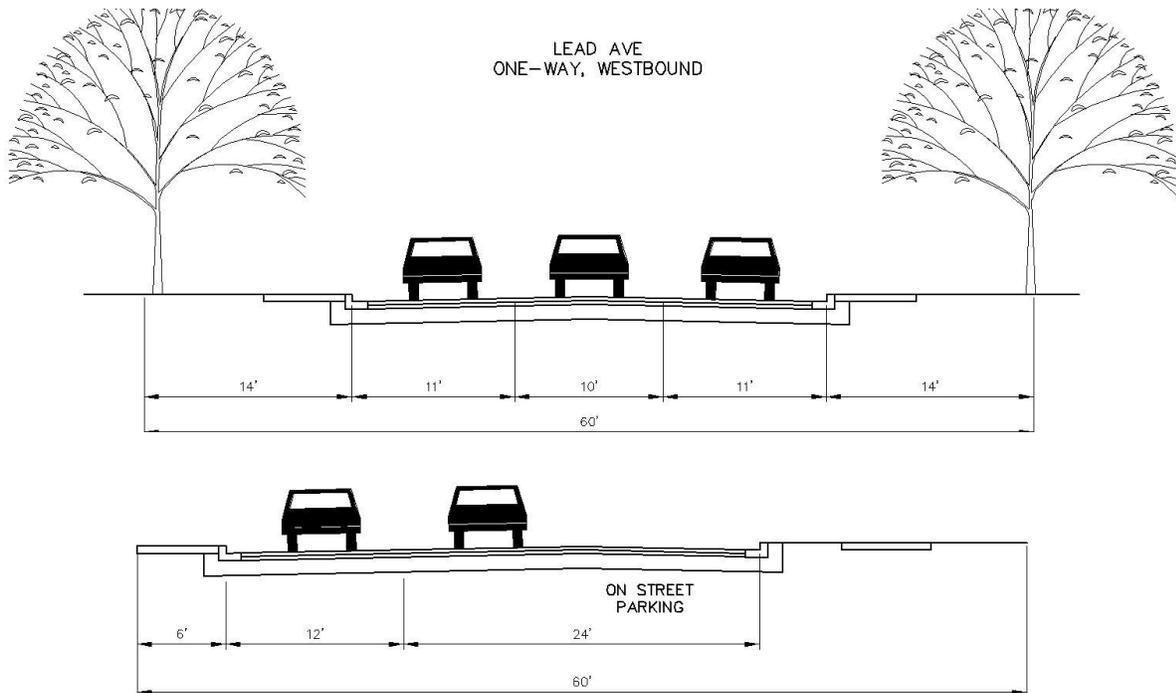
**Table A-1
Typical Roadway Section Characteristics – Lead Avenue**

Lead Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to Interstate 25</i>	<i>I-25 to Broadway</i>
Width of Pavement (face to face of curb)	86-ft	36-ft to 48-ft	32-ft	32-ft	32-ft	40-ft
# of Driving Lanes & Widths	3 lanes [12-ft, 12-ft, 12-ft]	2 lanes [12-ft, 12-ft]	3 lanes [11-ft, 10-ft, 11-ft]	2 lanes [11-ft, 11-ft]	2 lanes [11-ft, 11-ft]	3 lanes [12-ft, 12-ft, 12-ft]
Other Lanes	several center left turn lanes	left driving lane 20+ feet wide	none	shoulder on right side	shoulder/parking on right side	bike lane
Right of Way Width	100-ft	70-ft	60-ft	60-ft	80-ft	60-ft

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The following photos detail some specific areas along Lead Avenue within these segments.



Existing Typical Roadway Section – Lead Avenue

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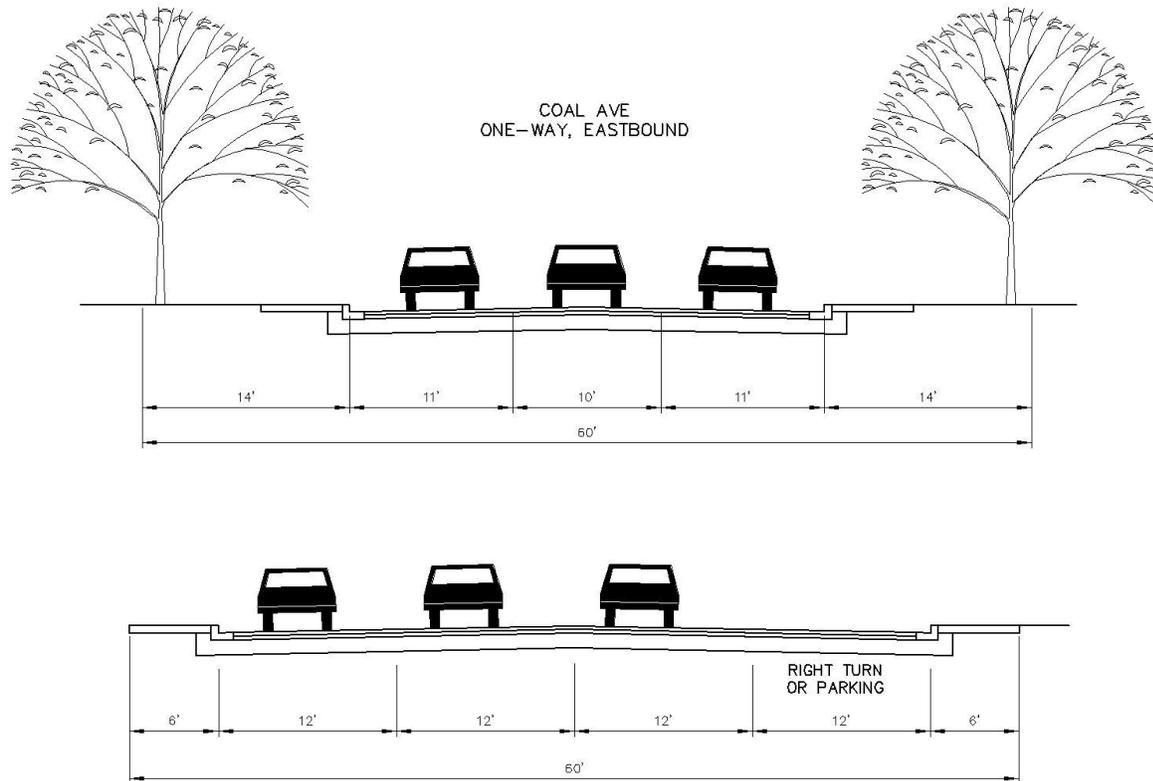
**Table A-2
Typical Roadway Section Characteristics – Coal Avenue**

Coal Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to Interstate 25</i>	<i>I-25 to Broadway</i>
Width of Pavement (face to face of curb)	86-ft	48-ft to 32-ft	32-ft	32-ft	36-ft	40-ft
# of Driving Lanes	3 lanes [12-ft, 12-ft, 12-ft]	3 lanes [11-ft, 10-ft, 11-ft]	3 lanes [11-ft, 10-ft, 11-ft]	3 lanes [11-ft, 10-ft, 11-ft]	2 lanes [11-ft, 11-ft]	3 lanes [12-ft, 12-ft, 12-ft]
Other Lanes	center left turn lane	none	none	shoulder/parking on right side	shoulder/parking on right side	bike lane
Right of Way Width	100-ft	60-ft	60-ft	60-ft	80-ft	60-ft

The following photos detail some specific areas along Coal Avenue within these segments.





Existing Typical Roadway Section – Coal Avenue

Existing Roadway Right of Way

The existing right of way width along the corridor varies but can be described similarly to the roadway typical section within the same six segments. A large majority of the corridor between Washington Boulevard to University Boulevard has a right of way width of 60 feet. Near the west end of the corridor between University and Interstate 25 the width widens to 80 feet and then decreases back down to 60 feet between Interstate 25 to Broadway. Tables A-1 and A-2 on page A-2 and A-3 of this appendix lists the existing right of way widths along the corridor. This information was taken from maps provided by the City of Albuquerque (See Appendix C).

Existing Pedestrian Features

Sidewalk exists along the entire corridor from San Mateo to Broadway on both sides of each street, but are highly variable. Along Lead & Coal Avenues, the sidewalk on both sides varies from 3-ft to 6-ft and is mostly adjacent to the curb and gutter. The segments of Lead Avenue between Vassar and I-25 and Coal Avenue between University and I-25 have a buffer between the sidewalk and curb and gutter on some sections of the north side. The segment of the corridor between I-25 and Broadway was very recently reconstructed with at least 6-ft sidewalk on both the north and south sides with buffers and landscape planting strips.

**Table A-3a
Typical Sidewalk Characteristics – Lead Avenue**

Lead Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to I-25</i>	<i>I-25 to Broadway</i>
Sidewalk	approx. 6-ft both sides, adjacent to curb	3-ft to 5-ft both sides, adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	6-ft on both sides with buffer

**Table A-3b
Typical Sidewalk Characteristics – Coal Avenue**

Coal Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to I-25</i>	<i>I-25 to Broadway</i>
Sidewalk	approx. 6-ft both sides, adjacent to curb	3-ft to 5-ft both sides, adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	3-ft to 5-ft both sides, often adjacent to curb	6-ft on both sides with buffer

As with most roadways in older established neighborhoods, the ADA provisions are retrofitted into the existing right of way limits and designed to best fit the other appurtenances around the ADA facility. The existing ADA facilities along the corridor include sidewalk, ramps at the intersections, and driveways. There are many instances where the signal mastarm and pedestal pole foundations, fire hydrants, and utility equipment are within the sidewalk or ADA ramp. The sidewalk does meet the minimum width for ADA compliance of 36" or 3-ft. However, the existing ramps and driveways vary in type and it is very likely that they do not meet the current requirements for ADA facilities, namely the 15:1 slope requirement, inclusion of truncated domes, and obstruction within the facility limiting the width to less than 36".



**Coal Avenue
Non-compliant (15:1) Driveway**



**Coal Avenue
Out-Dated ADA Ramp**

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Signalization

There are a total of 27 signalized intersections along the Lead & Coal Corridor with a total of 12 signals on Lead Avenue and 13 on Coal Avenue. These intersections do not necessarily correlate between the two streets as shown on the tables below. The signals are timed for 30 mph. The final two signalized intersections are at Washington and San Mateo where Lead/Coal transitions into Zuni Road. The following tables list the signalized intersections.

**Table A-4a
Signalized Intersections – Lead Avenue**

Lead Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to Interstate 25</i>	<i>I-25 to Broadway</i>
Signalized Intersection	San Mateo*	Morningside	Carlisle	Buena Vista	Cedar	Locust
	Washington*		Bryn Mawr Girard Columbia Yale	University	Oak	Broadway

* Intersection with Zuni.

**Table A-4b
Signalized Intersections – Coal Avenue**

Coal Avenue

	<i>San Mateo to Washington</i>	<i>Washington to Aliso</i>	<i>Aliso to Yale</i>	<i>Yale to University</i>	<i>University to Interstate 25</i>	<i>I-25 to Broadway</i>
Signalized Intersection	San Mateo*	Montclair	Carlisle	Buena Vista	Spruce	Locust
	Washington*		Wellesley Girard Stanford Yale	CNM Ped Xing University	Oak	Broadway

* Intersection with Zuni.

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Traffic Volumes

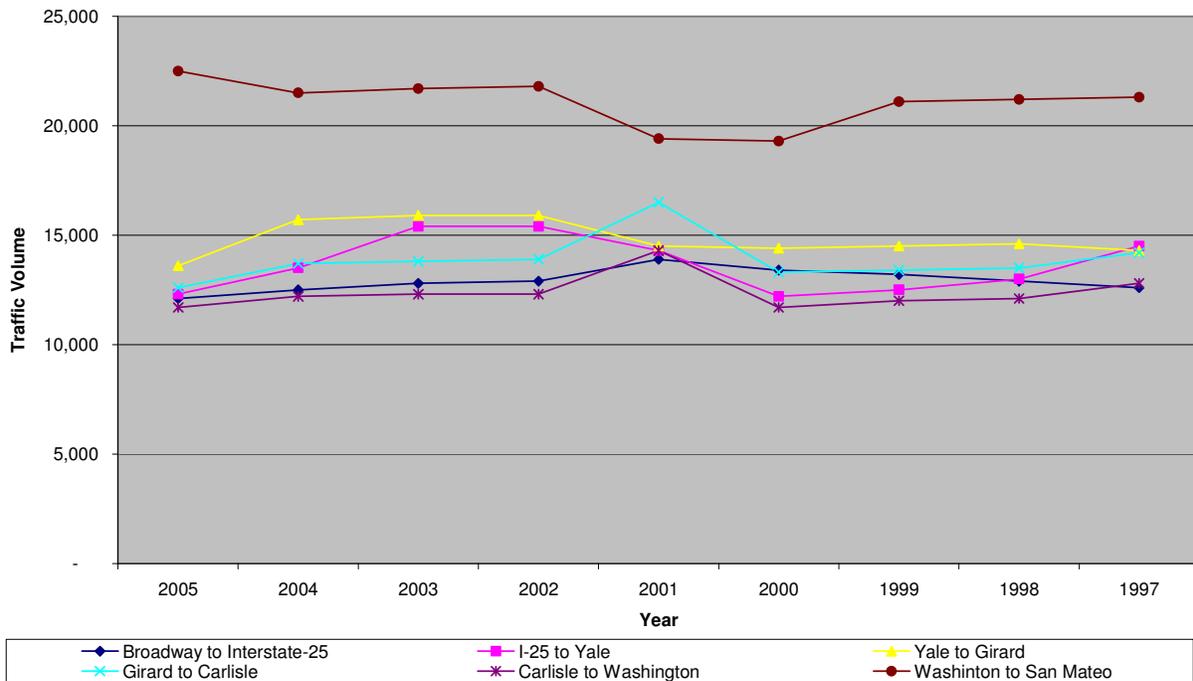
The traffic volumes for the corridor were taken from the Mid-Region Council of Governments Traffic Flow maps for the Greater Albuquerque Area, 1997 through 2005. The volumes have been fairly stable over the 9 year period for the Average Weekday volumes. Comparing the volumes from 1997 and 2005, the volumes have actually dropped by several percentage points. The following tables list these volumes with the graphs to show the growth and decline of volumes over the 9 year period.

**Table & Graph A-5a
Traffic Volumes (1997 – 2005) – Lead Avenue**

Lead Avenue

	<i>Broadway to Interstate-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washinton</i>	<i>Washinton to San Mateo</i>
2005	12,100	12,300	13,600	12,600	11,700	22,500
2004	12,500	13,500	15,700	13,700	12,200	21,500
2003	12,800	15,400	15,900	13,800	12,300	21,700
2002	12,900	15,400	15,900	13,900	12,300	21,800
2001	13,900	14,300	14,500	16,500	14,300	19,400
2000	13,400	12,200	14,400	13,300	11,700	19,300
1999	13,200	12,500	14,500	13,400	12,000	21,100
1998	12,900	13,000	14,600	13,500	12,100	21,200
1997	12,600	14,500	14,300	14,200	12,800	21,300

**Lead Avenue
Average Weekday Traffic Volumes
MRCOG MAPS 1997 - 2005**

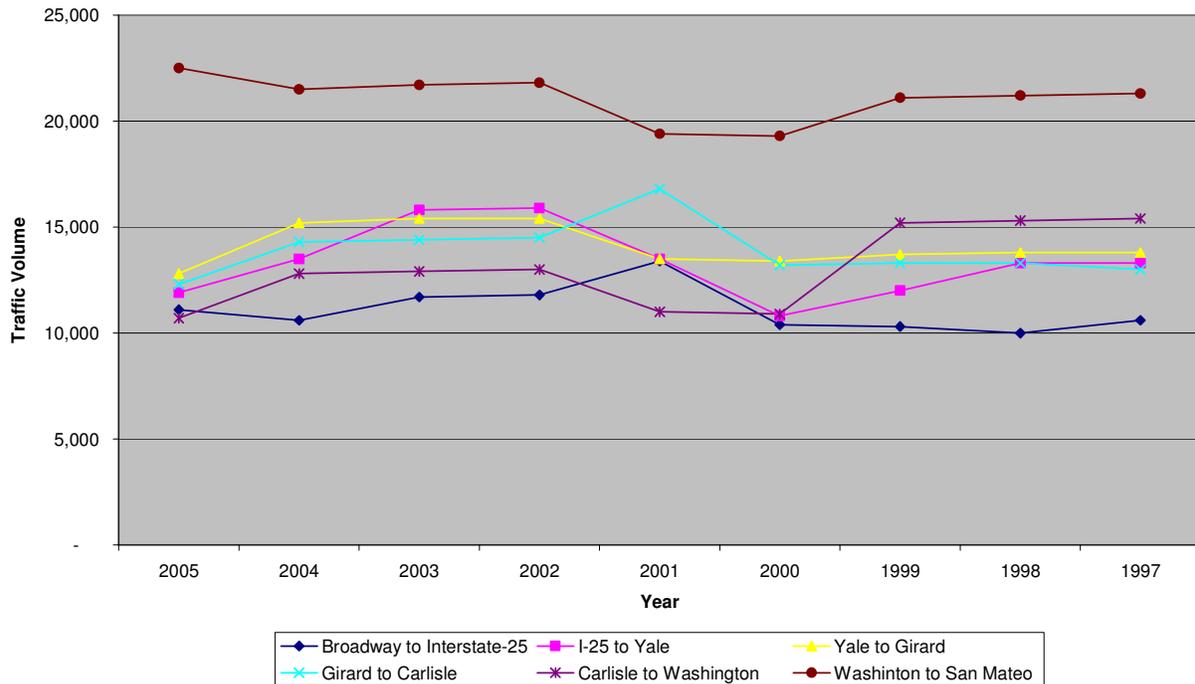


**Table & Graph A-5b
Traffic Volumes (1997 – 2005) – Coal Avenue**

Coal Avenue

	<i>Broadway to Interstate-25</i>	<i>I-25 to Yale</i>	<i>Yale to Girard</i>	<i>Girard to Carlisle</i>	<i>Carlisle to Washington</i>	<i>Washington to San Mateo</i>
2005	11,100	11,900	12,800	12,300	10,700	22,500
2004	10,600	13,500	15,200	14,300	12,800	21,500
2003	11,700	15,800	15,400	14,400	12,900	21,700
2002	11,800	15,900	15,400	14,500	13,000	21,800
2001	13,400	13,500	13,500	16,800	11,000	19,400
2000	10,400	10,800	13,400	13,200	10,900	19,300
1999	10,300	12,000	13,700	13,300	15,200	21,100
1998	10,000	13,300	13,800	13,300	15,300	21,200
1997	10,600	13,300	13,800	13,000	15,400	21,300

**Coal Avenue
Average Weekday Traffic Volumes
MRCOG MAPS 1997 - 2005**



The traffic volumes indicate a stable area experiencing very little traffic growth. It is reflective of an area at or very near build-out conditions. The fluctuations are due to time of year the counts were made or the activity in the area.

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Transit Service

Transit service along the corridor includes ABQ Ride's Route 97 Zuni which traverses the entire study limit. The full limit of Route 97 Zuni is from 2nd Street to Wyoming Boulevard.

Waste Management and Mail Services

Solid waste management services collect trash from residents that face Lead and Coal Avenues. Residents place trash cans directly on the street. This has been observed to cause some issues with conflict between the traveling public when trash cans get knocked over other otherwise fall into the vehicle path.



Existing Utilities

Storm Drainage Facilities

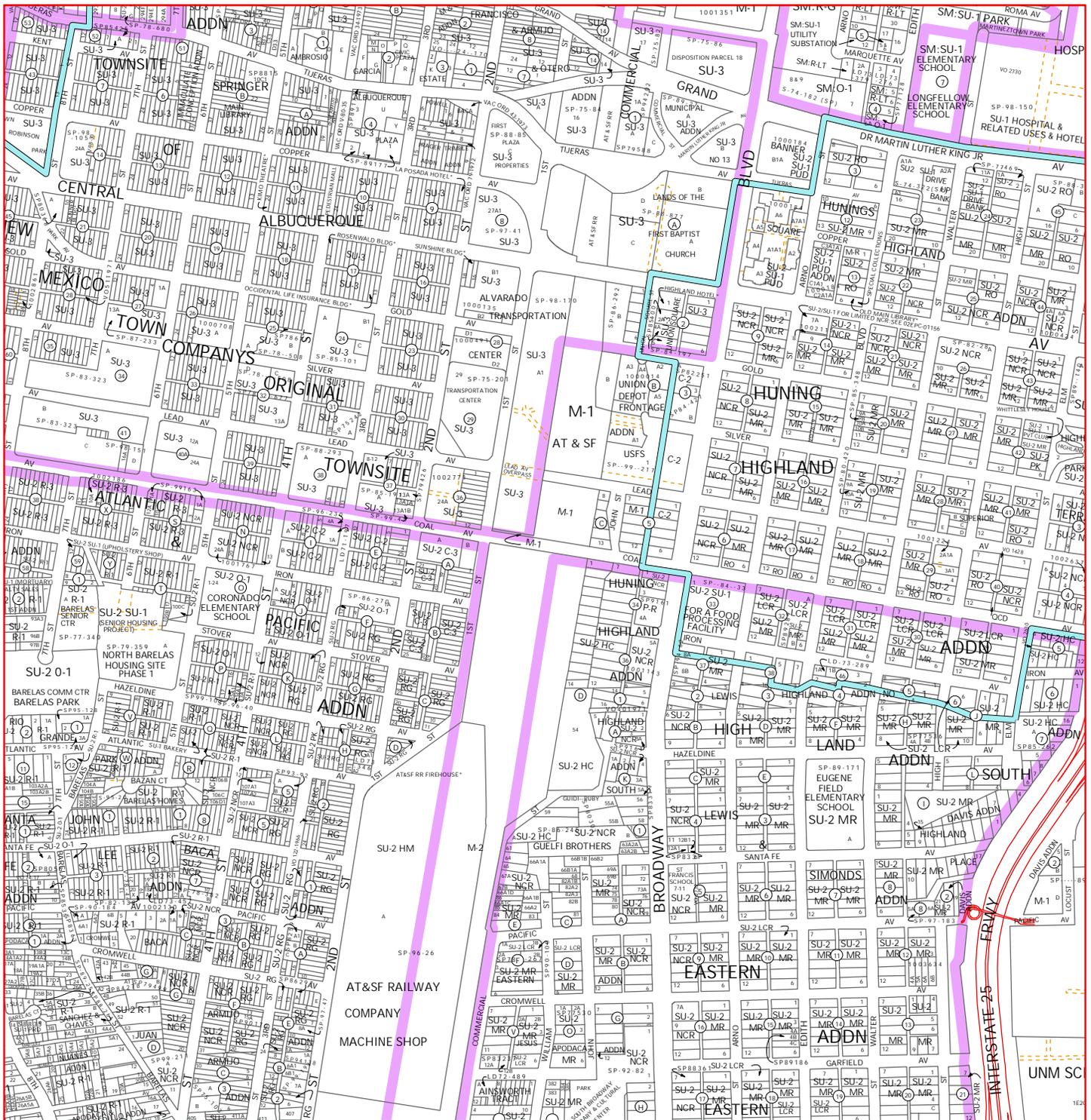
The storm drainage system along the corridor varies in size with five segments of mainline under Lead and Coal. The systems maps in Appendix D show the existing storm drainage system. The pipe ranges in size from 15" to 72" RCP with numerous (approximately 95) curb drop inlets along the way. Any change in the width of the roadway could require the addition of more inlet depending on the flows carried by the streets.

Water Lines

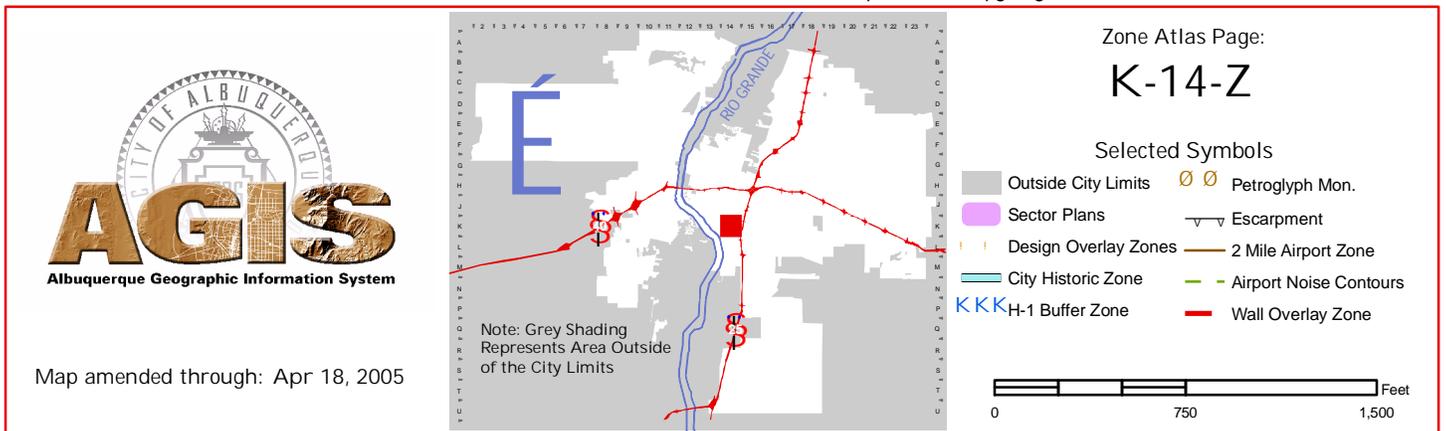
The existing water lines along the corridor vary in size from 6" to 10" diameter and vary in material including cast iron and PVC. A 22" steel line exists between Carlisle and Columbia, but appears to be abandoned. The lines traverse the entire corridor and any change in the placement or location of other utilities would need to take the water lines into account.

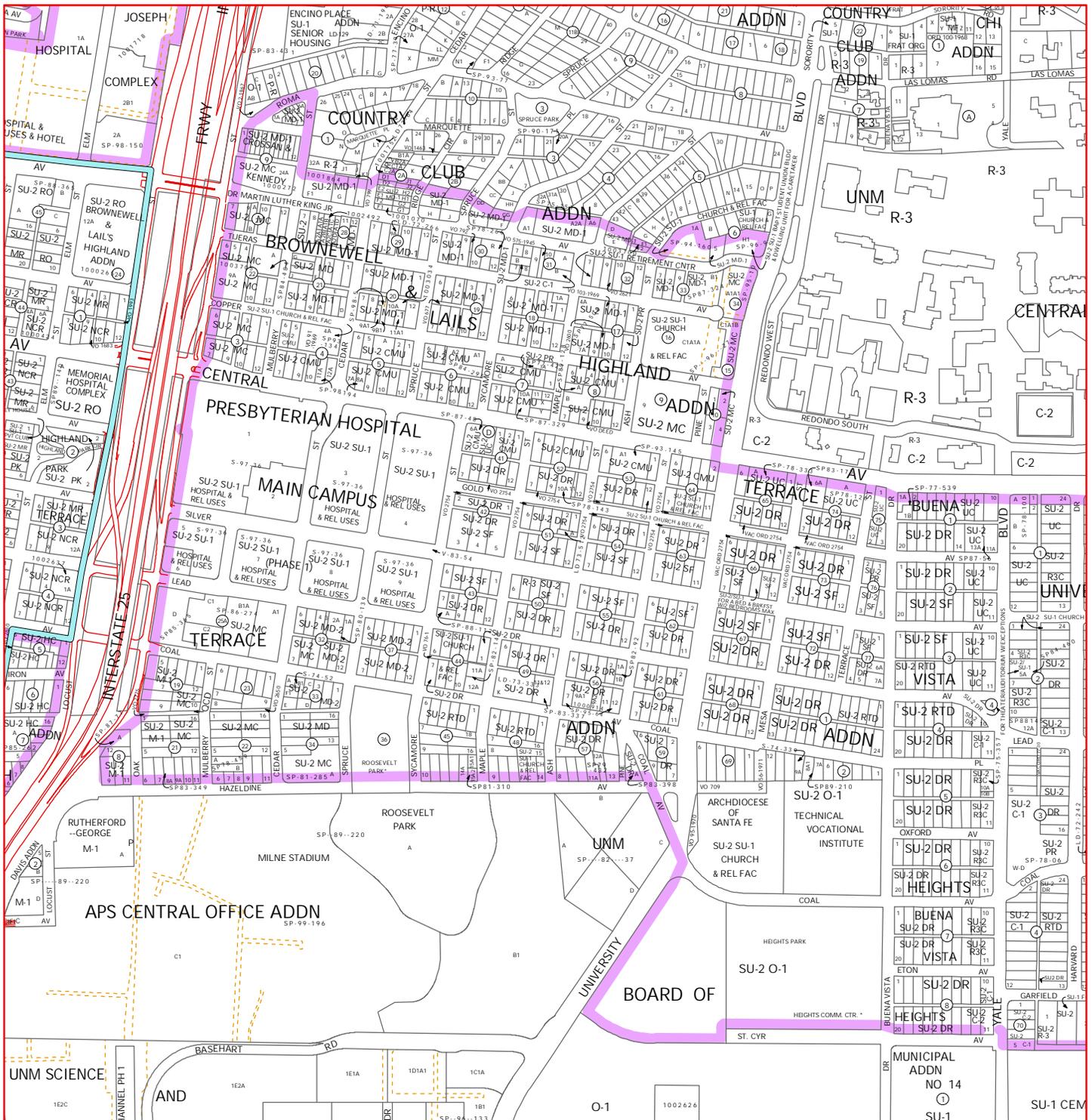
Sanitary Sewer Lines

The existing sanitary sewer lines along the corridor vary in size from 8" to 42" diameter lines. The 8" to 10" diameter sanitary sewer laterals between University and Broadway are vetrified clay pipe. This type of pipe has the potential to be damaged during construction activities. The 42" to 48" diameter sanitary sewer force main lines between University and Bryn Mawr, and the 18" to 24" diameter sanitary sewer force main lines between Hermosa and Washington consist of reinforced concrete pipe or concrete pipe.



For more current information and more details visit: <http://www.cabq.gov/gis>

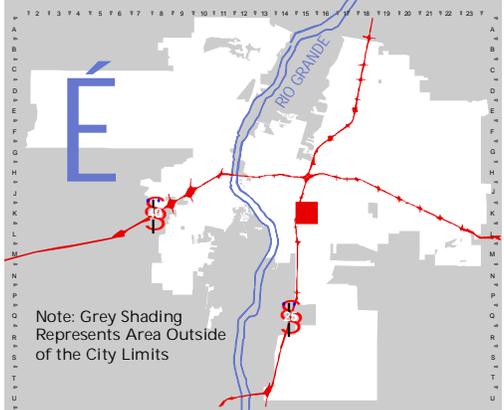




For more current information and more details visit: <http://www.cabq.gov/gis>



Map amended through: Apr 18, 2005



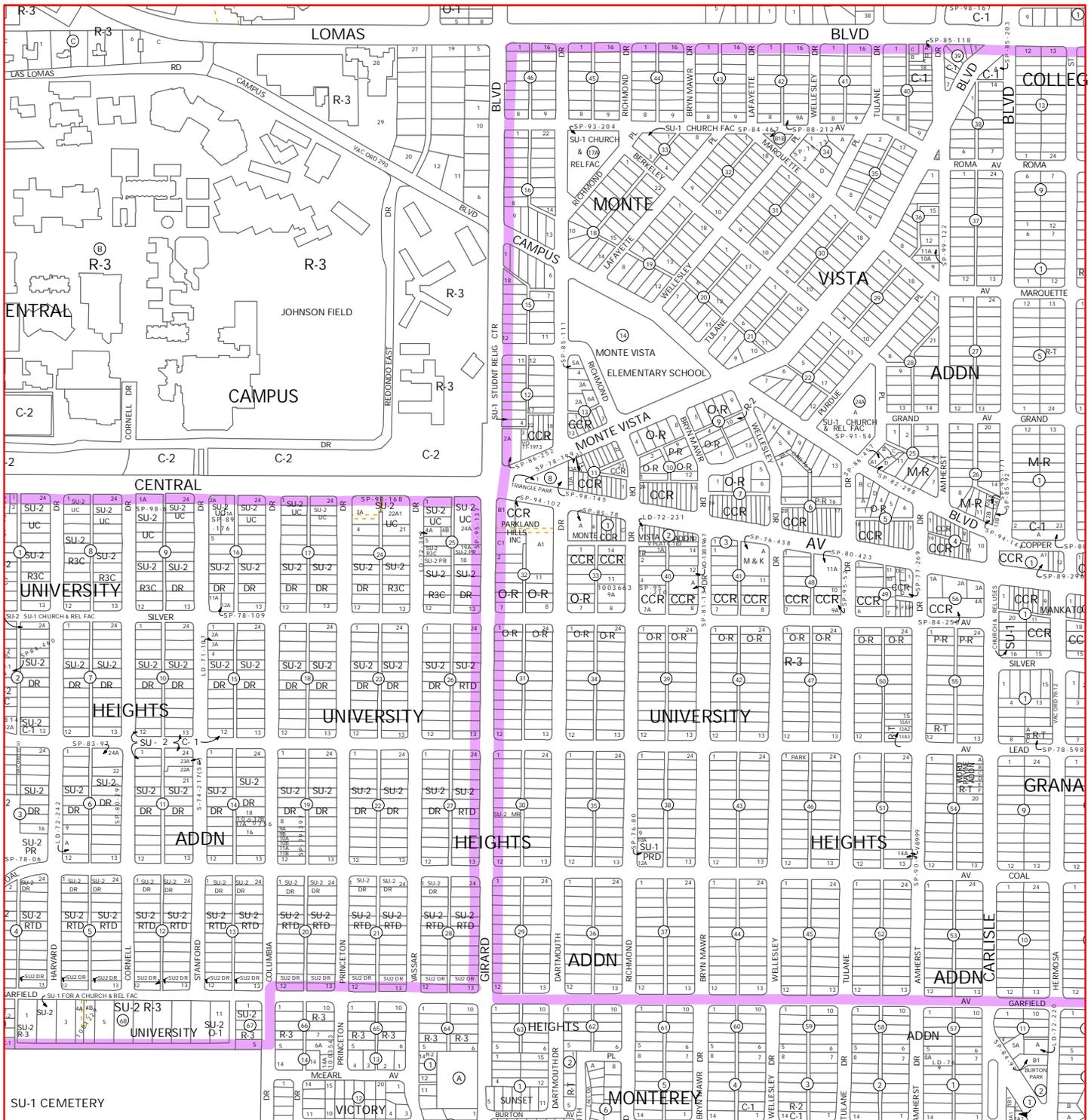
Note: Grey Shading Represents Area Outside of the City Limits

Zone Atlas Page:
K-15-Z

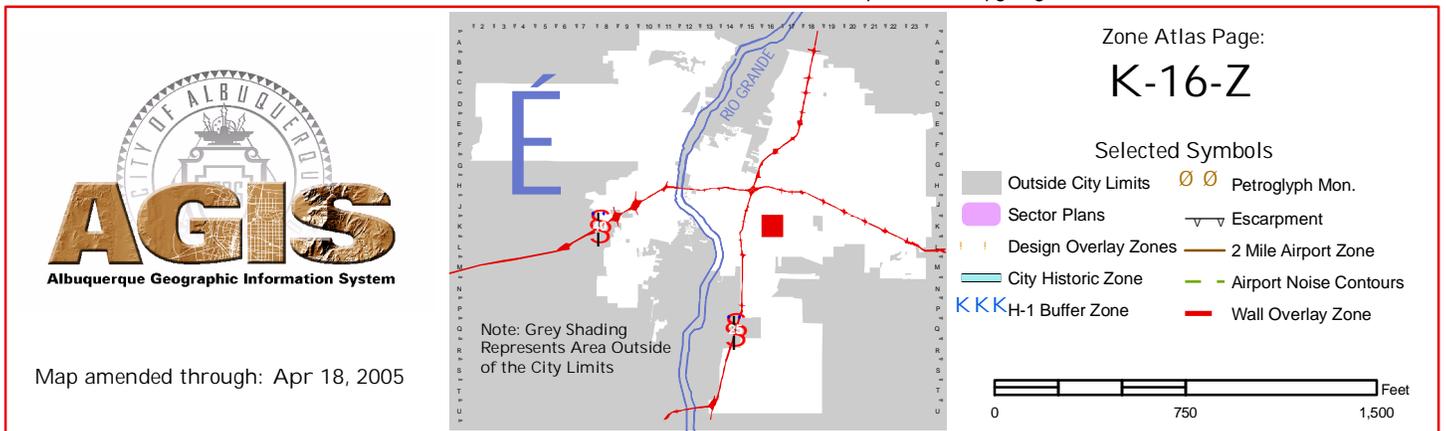
Selected Symbols

Outside City Limits	Petroglyph Mon.
Sector Plans	Escarpment
Design Overlay Zones	2 Mile Airport Zone
City Historic Zone	Airport Noise Contours
KKKH-1 Buffer Zone	Wall Overlay Zone

0 750 1,500 Feet

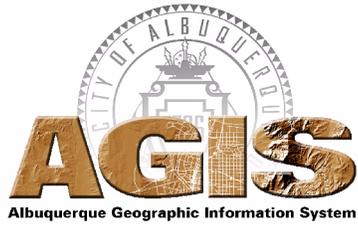
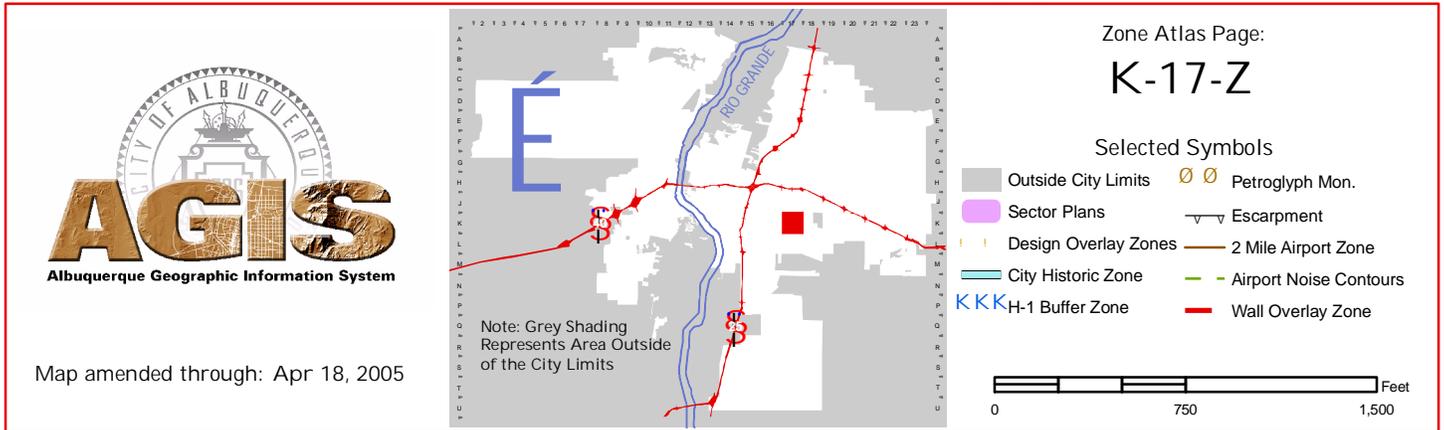


For more current information and more details visit: <http://www.cabq.gov/gis>





For more current information and more details visit: <http://www.cabq.gov/gis>

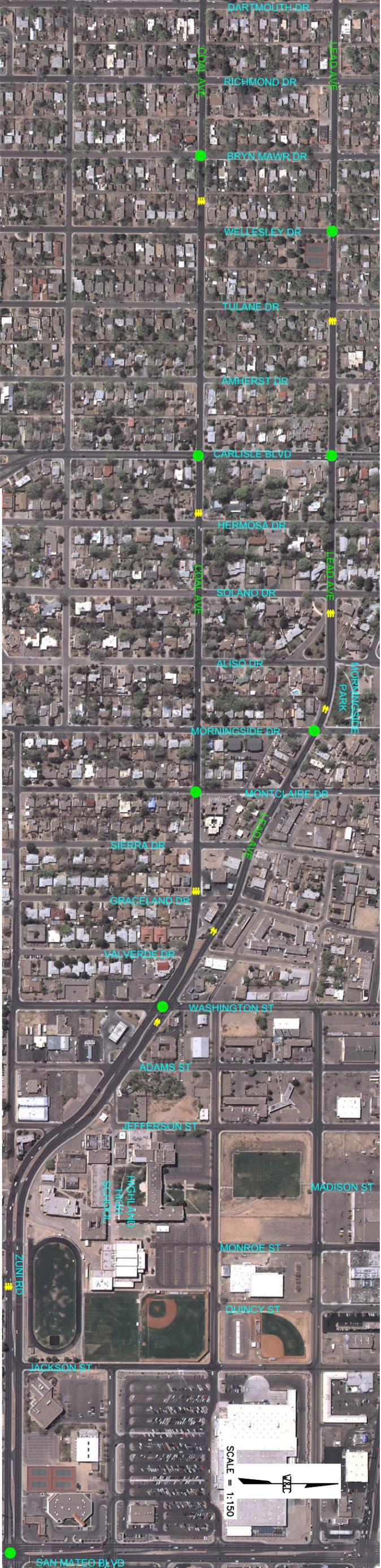


Map amended through: Apr 18, 2005

Appendix C
Pavement & Right of Way Width Maps



MATCHLINE A-A SEE BELOW



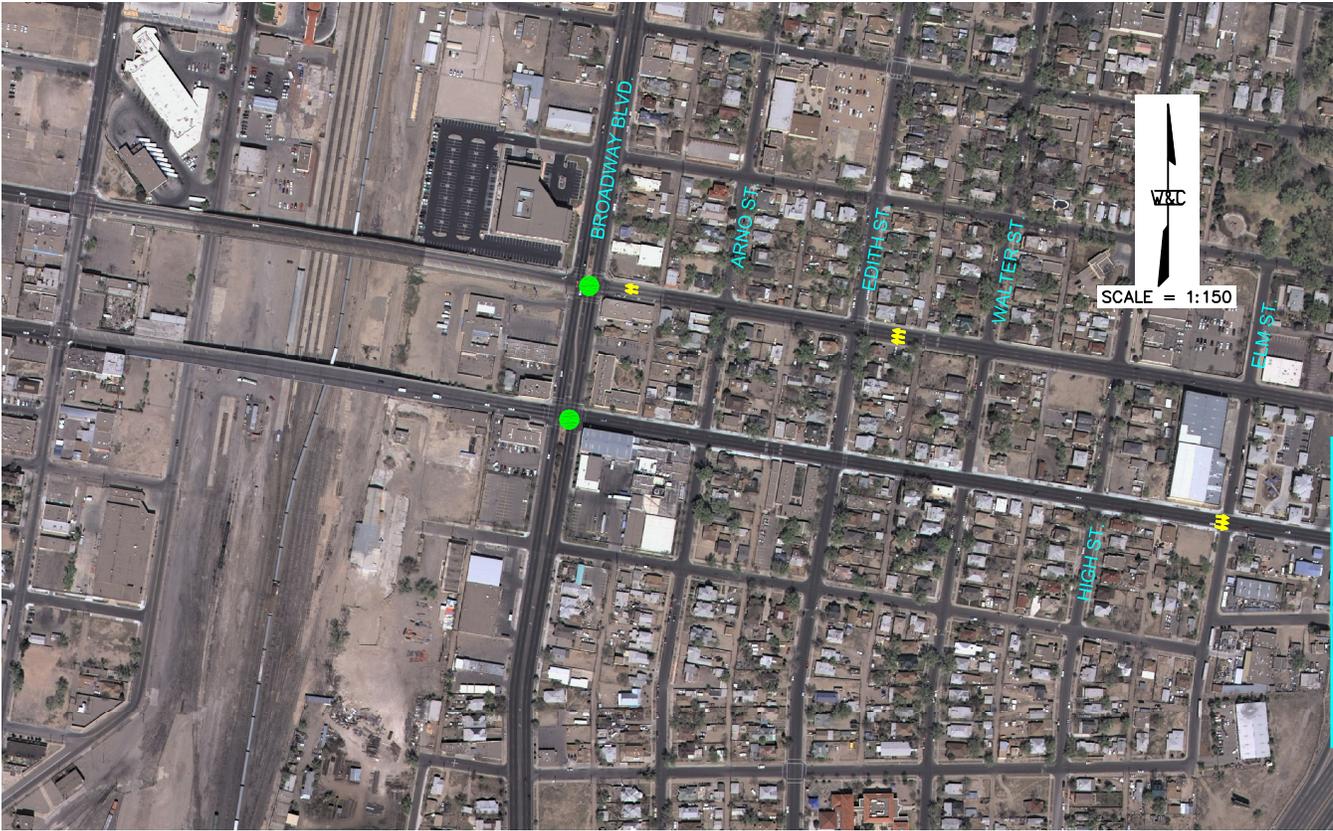
● SIGNALIZED INTERSECTION

MATCHLINE A-A SEE ABOVE

CITY OF ALBUQUERQUE
 DEPARTMENT OF MUNICIPAL DEVELOPMENT
 TRANSPORTATION DIVISION
 Lead & Coal Corridor
 I-25 to San Mateo

SCALE = 1:150

SCALE = 1:150



● SIGNALIZED INTERSECTION

WILSON & COMPANY



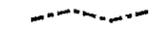
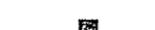
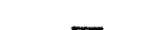
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
TRANSPORTATION DIVISION

Lead & Coal Corridor
I-25 to San Mateo

Appendix D

Utility System Maps

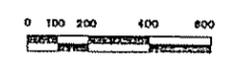
Legend

-  Lateral Stubout
-  Inlet Connector
-  Collector
-  Reservoir Drain
-  Siphon
-  Double Pipe
-  Force Main
-  Abandon Lines
-  Manhole
-  Inlet
-  Catch Basin
-  Junction Box
-  Vault
-  Standpipe/Riser
-  Surface Flow
-  Pipe Flow
-  Water Course
-  Holding Ponds
-  Dams
-  Well
-  Reservoir
-  Pump Station

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

NEXT SHEET NO. K-13

NEXT SHEET NO. K-15



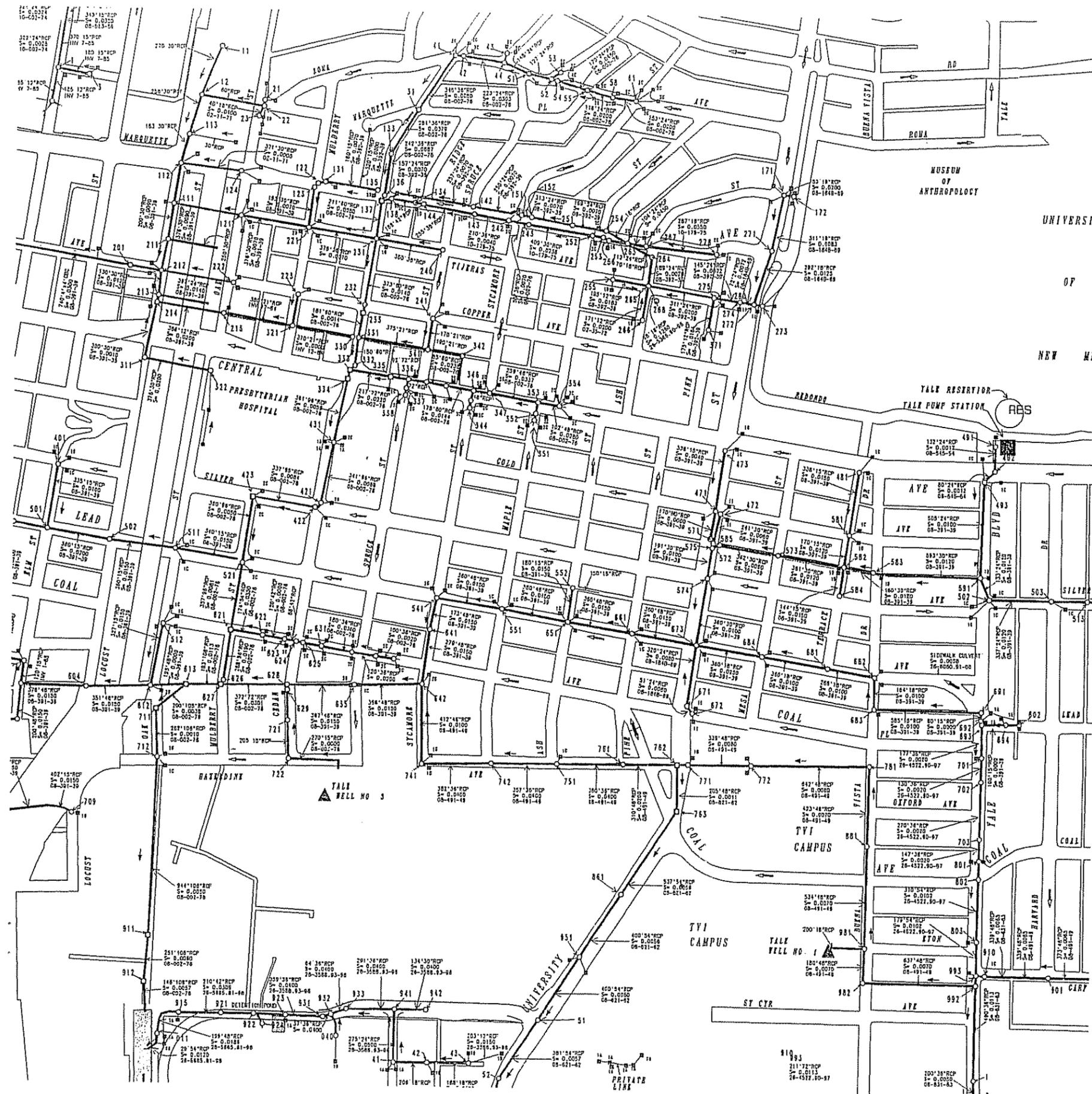
SCALE
MAP GRID

K-14

- Notes:
- 1 Map is for information only and is subject to corrections [Corrections call 766-3608]
 - 2 Features are drawn for general representation of facilities.
 - 3 Refer to as-built drawing for

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

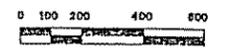
NEXT SHEET NO. K-14



NEXT SHEET NO. K-16

Legend

- Lateral Stubout Inlet Connector
- Collector
- Reservoir Drain Siphon
- Double Pipe
- Force Main
- Abandon Lines
- Manhole
- Inlet Catch Basin
- Junction Box
- Vault
- Standpipe/Riser
- Surface Flow
- Pipe Flow
- Water Course Holding Ponds Dams
- Well
- Reservoir
- Pump Station



SCALE
MAP GRID
K-15

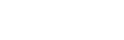
Notes:

1. Map is for information only and is subject to corrections (Corrections call 768-3608)
2. Features are drawn for general representation of facilities
3. Refer to as-built drawing for true representation.
4. Utility identification...

NEXT SHEET NO. L-15

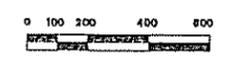


Legend

-  Lateral Stubout Inlet Connector
-  Collector
-  Reservoir Drain Siphon
-  Double Pipe
-  Force Main
-  Abandon Lines
-  Manhole
-  Inlet Catch Basin
-  Junction Box
-  Vault
-  Standpipe/Riser
-  Surface Flow
-  Pipe Flow
-  Water Course Holding Ponds Dams
-  Well
-  Reservoir
-  Pump Station

NEXT SHEET NO. K-15

NEXT SHEET NO. K-17



SCALE
MAP GRID

K-16

Notes:

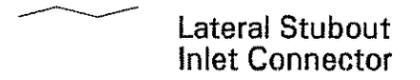
- 1 Map is for information only and is subject to corrections (Corrections call 768-3608)
- 2 Features are drawn for general representation of facilities
- 3 Refer to as-built drawing for true representation

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

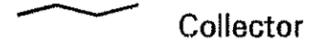
NEXT SHEET NO. L-18

Storm

Legend



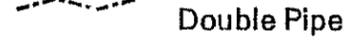
Lateral Stubout Inlet Connector



Collector



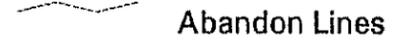
Reservoir Drain Siphon



Double Pipe



Force Main



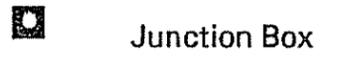
Abandon Lines



Manhole



Inlet Catch Basin



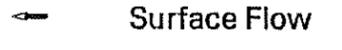
Junction Box



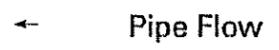
Vault



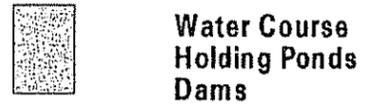
Standpipe/Riser



Surface Flow



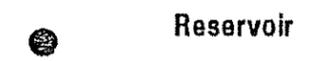
Pipe Flow



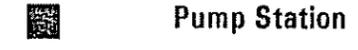
Water Course Holding Ponds Dams



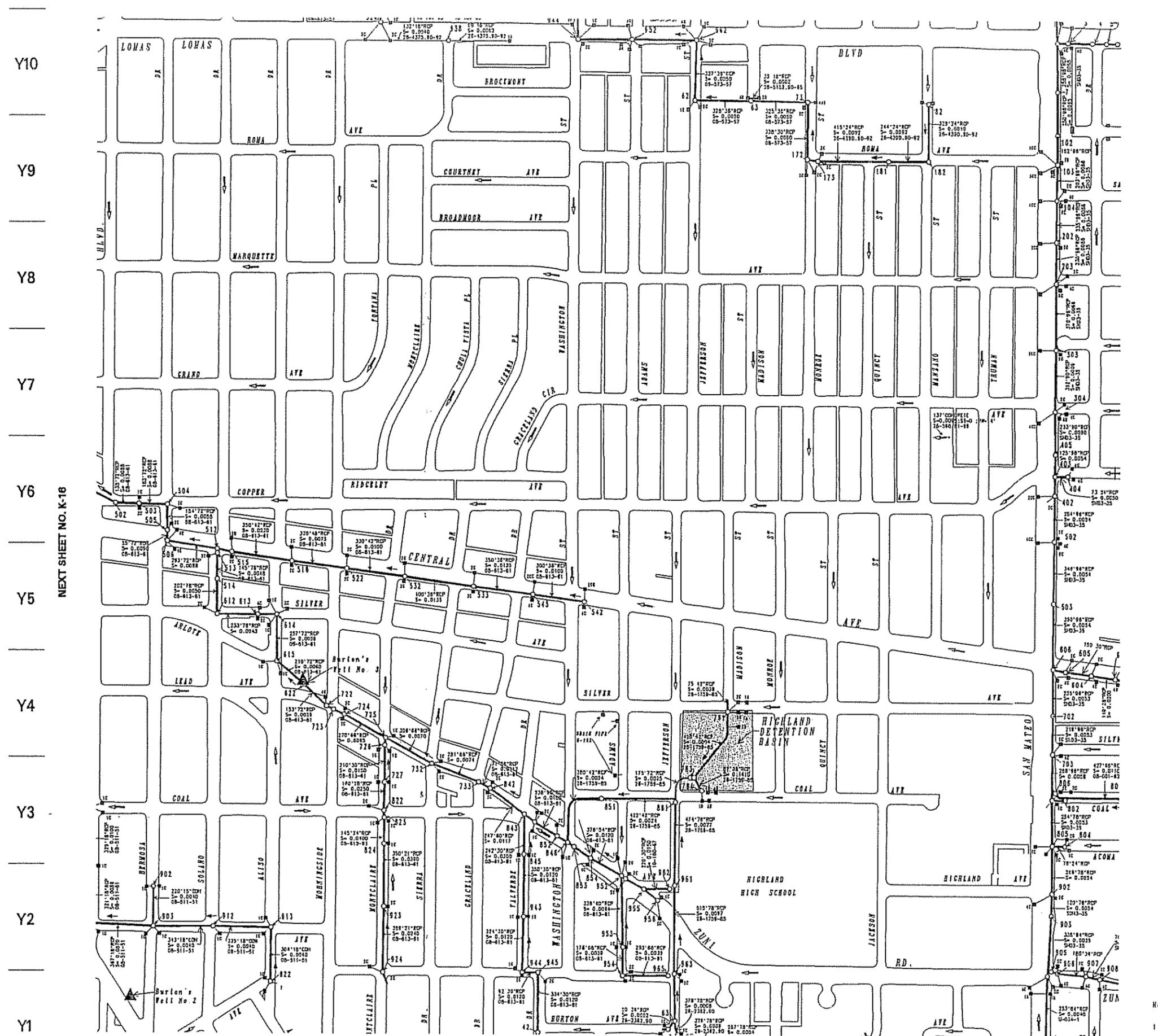
Well



Reservoir



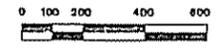
Pump Station



Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

NEXT SHEET NO. K-16

NEXT SHEET NO. K-18



SCALE
MAP GRID

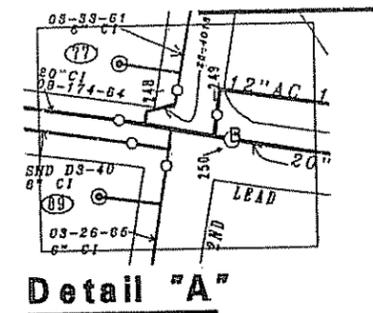
K-17

Notes:

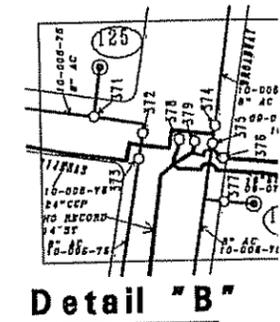
- 1 Map is for information only and is subject to corrections (Corrections call 768-3608)
- 2 Features are drawn for general representation of facilities
- 3 Refer to map sheet numbers for

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

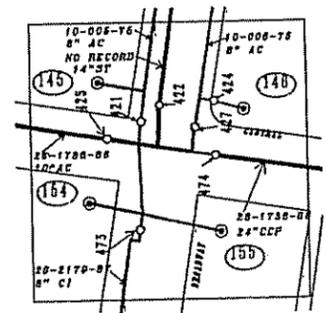
NEXT SHEET NO. K-13



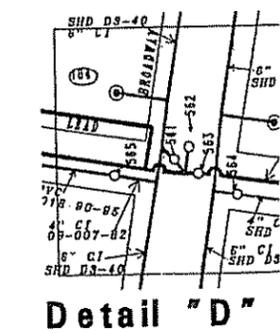
Detail "A"



Detail "B"

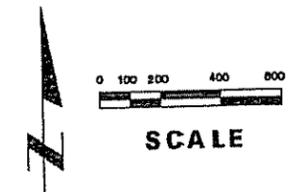


Detail "C"



Detail "D"

NEXT SHEET NO. K-15



SCALE

Compiled: June 20, 2000

Notes:

- 1. Map is for information only and is subject to corrections (Corrections call 768-3608.)
- 2. Valves or Fire Hydrants Identification requires Map Grid and valve or fire hydrant number.

MAP GRID

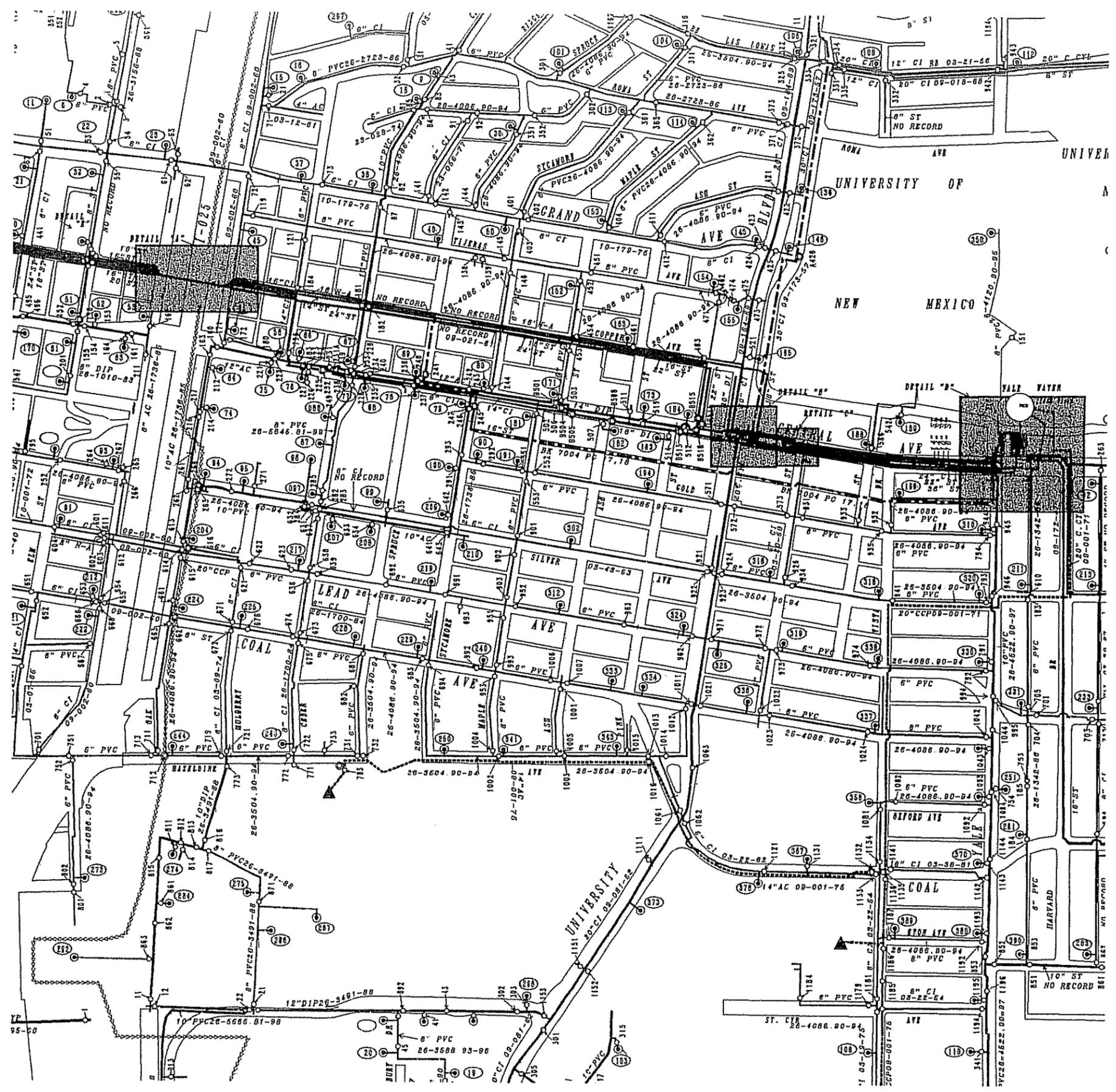
K-14

WATER

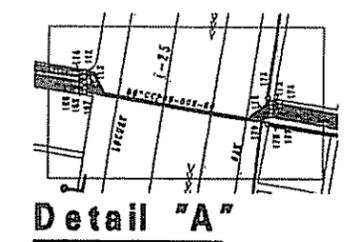
Details

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

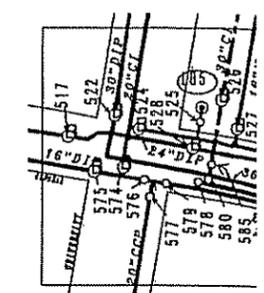
NEXT SHEET NO. K-14



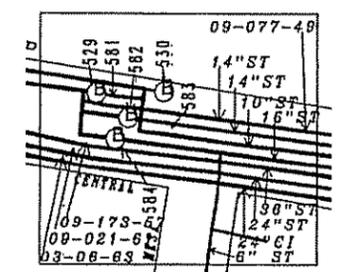
NEXT SHEET NO. L-15



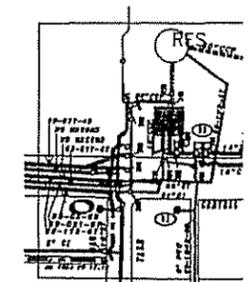
Detail "A"



Detail "B"

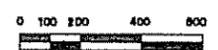


Detail "C"



Detail "D"

NEXT SHEET NO. K-16



SCALE

Compiled: June 20, 2000

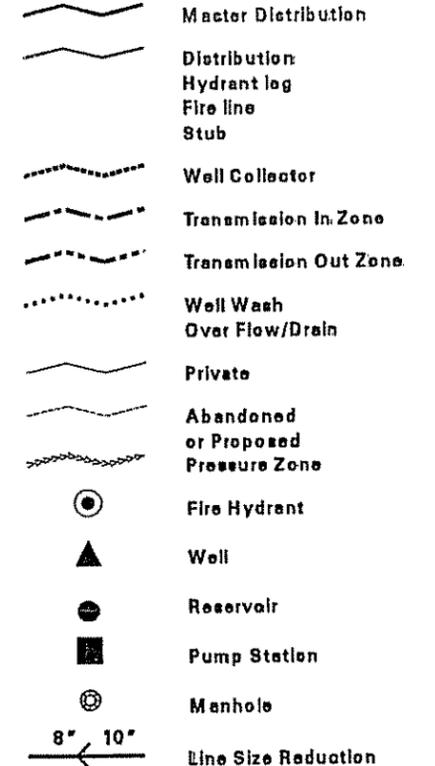
Notes:

- 1. Map is for information only and is subject to corrections (Corrections call 768-3608.)
- 2. Valves or Fire Hydrants Identification requires Map Grid and valve or fire hydrant number.
- 3. Valves or Fire Hydrants numbers

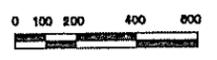
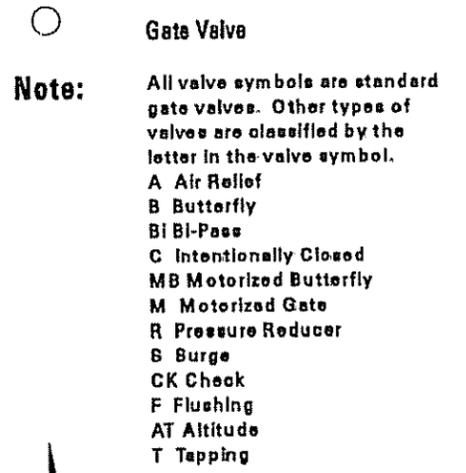
MAP GRID

K-15

Legend



Valve Types



SCALE

Compiled: June 20, 2000

MAP GRID

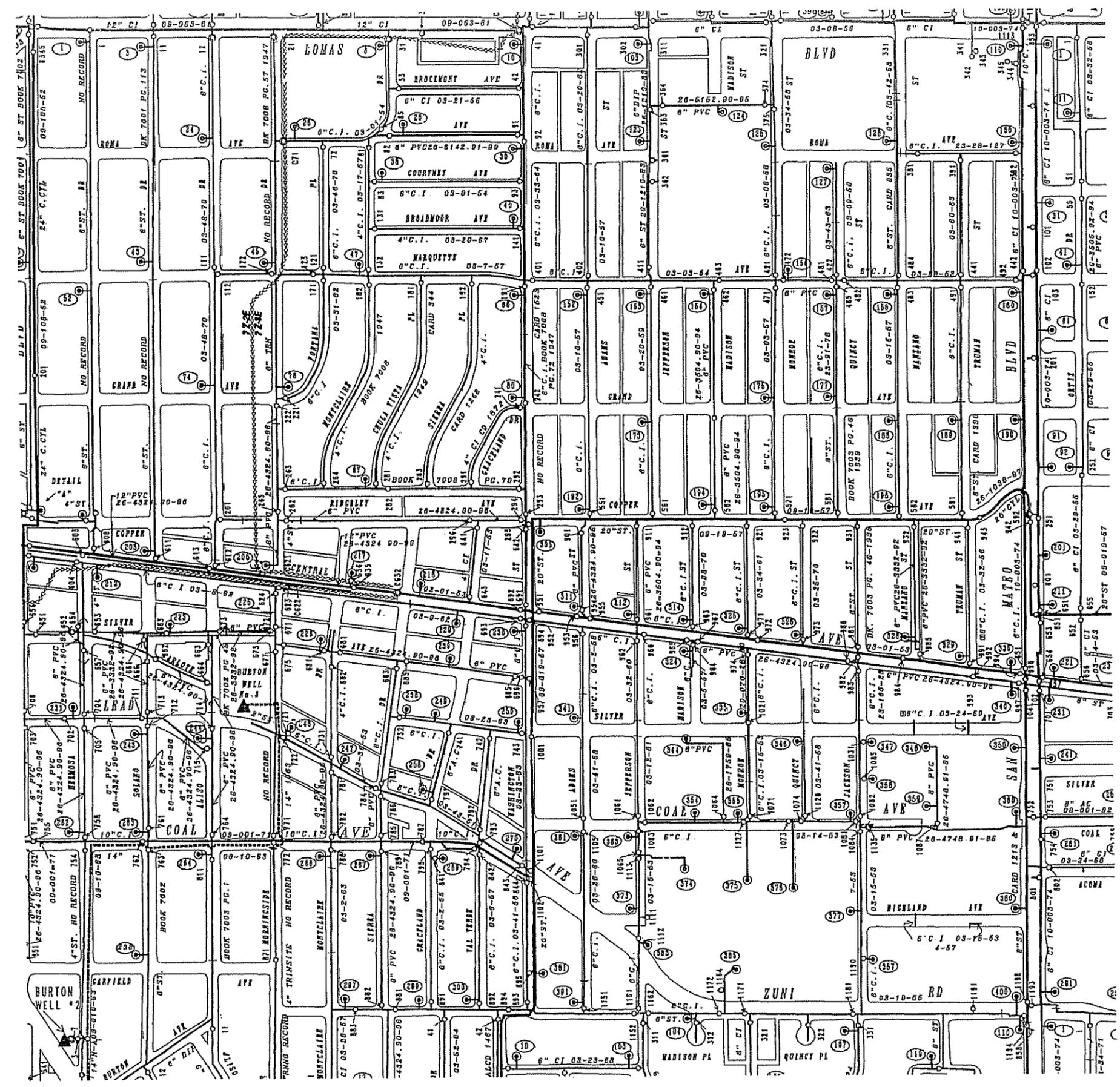
K-17

Notes:

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- Valves or Fire Hydrants Identification requires Map Grid and valve or fire hydrant number.
- Valves or Fire Hydrants numbers

Y10
Y9
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1

NEXT SHEET NO. K-16



NEXT SHEET NO. K-18

NEXT SHEET NO. L-17

SEWER

LEGEND

DATA

- As-built length
- Pipe diameter
- Pipe Material
- 178"8"CP/PE ← Slip liner
- S=0.0200 ← Pipe Slope
- 26-3735-89 ← Project Number
- TB-2036/65 ← T-BOOK Information

- SANITARY SEWER LATERALS
- FORCE MAIN LINE
- INTERCEPTOR LINE
- SLIP LINES
- SIPHONS
- INACTIVE OR ABANDON

242

- MANHOLE
- LAMPHOLE
- LIFT STATION
- CHLORINATION STATION
- PUMP STATION
- JUNCTION BOX
- OVERPASS
- END OF PROJECT

MATERIALS

- CIP = CAST IRON PIPE
- AC = ASBESTOS CONCRETE
- PVC = POLYVINYL CHLORIDE PIPE
- VCP = VETRIFIED CLAY PIPE
- DIP = DUCTILE IRON PIPE
- HDPE = HIGH DENSITY POLYETHYLENE PIPE
- RCP = REINFORCED CONCRETE PIPE
- CP = CONCRETE PIPE
- PEL = POLYETHYLENE LINED
- CMB = COMBINATION PIPE (SEE AS-BUILTS)
- ST = STEEL PIPE
- RPM = REINFORCED PLASTIC MORTAR
- CMP = CORRUGATED METAL PIPE
- FIB = FIBERGLASS LINER
- ULN = U-LINER
- INT = INSITU
- TLK = TLOCK
- N-A = UNKNOWN MATERIAL



SCALE

Compiled: October 19, 1993

MAP GRID

K-14

Notes:

- 1 Map is for information only and is subject to corrections (Corrections call 768-3608)
- 2 Manhole identification requires both the Map Grid & Manhole No
- 3 Manhole Numbers carried from adjacent maps have the map grid



NEXT SHEET NO. K-13

NEXT SHEET NO. K-15

Y10

Y9

Y8

Y7

Y6

Y5

Y4

Y3

Y2

Y1

SEWER LEGEND

DATA

- As-built length
- Pipe diameter
- Pipe Material
- 178'8"CP/PE ← Slip liner
- S=0.0200 ← Pipe Slope
- 26-3735-89 ← Project Number
- TB-2036/55 ← I-BOOK Information

- SANITARY SEWER LATERALS
- FORCE MAIN LINE
- INTERCEPTOR LINE
- SLIP LINES
- SIPHONS
- INACTIVE OR ABANDON

242

- MANHOLE
- LAMPHOLE
- LIFT STATION
- ORIENTATION STATION
- PUMP STATION
- JUNCTION BOX
- OVERPASS
- END OF PROJECT

MATERIALS

- CIP = CAST IRON PIPE
- AC = ASBESTOS CONCRETE
- PVC = POLYVINYL CHLORIDE PIPE
- VCP = VETRIFIED CLAY PIPE
- DIP = DUCTILE IRON PIPE
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- CP = CONCRETE PIPE
- PEL = POLYETHYLENE LINED
- CMB = COMBINATION PIPE (SEE AS-BUILTS)
- ST = STEEL PIPE
- RPM = REINFORCED PLASTIC MORTAR
- CMP = CORRUGATED METAL PIPE
- FIB = FIBERGLASS LINER
- ULN = U-LINER
- INT = INSITU
- TLK = TLOCK
- N-A = UNKNOWN MATERIAL

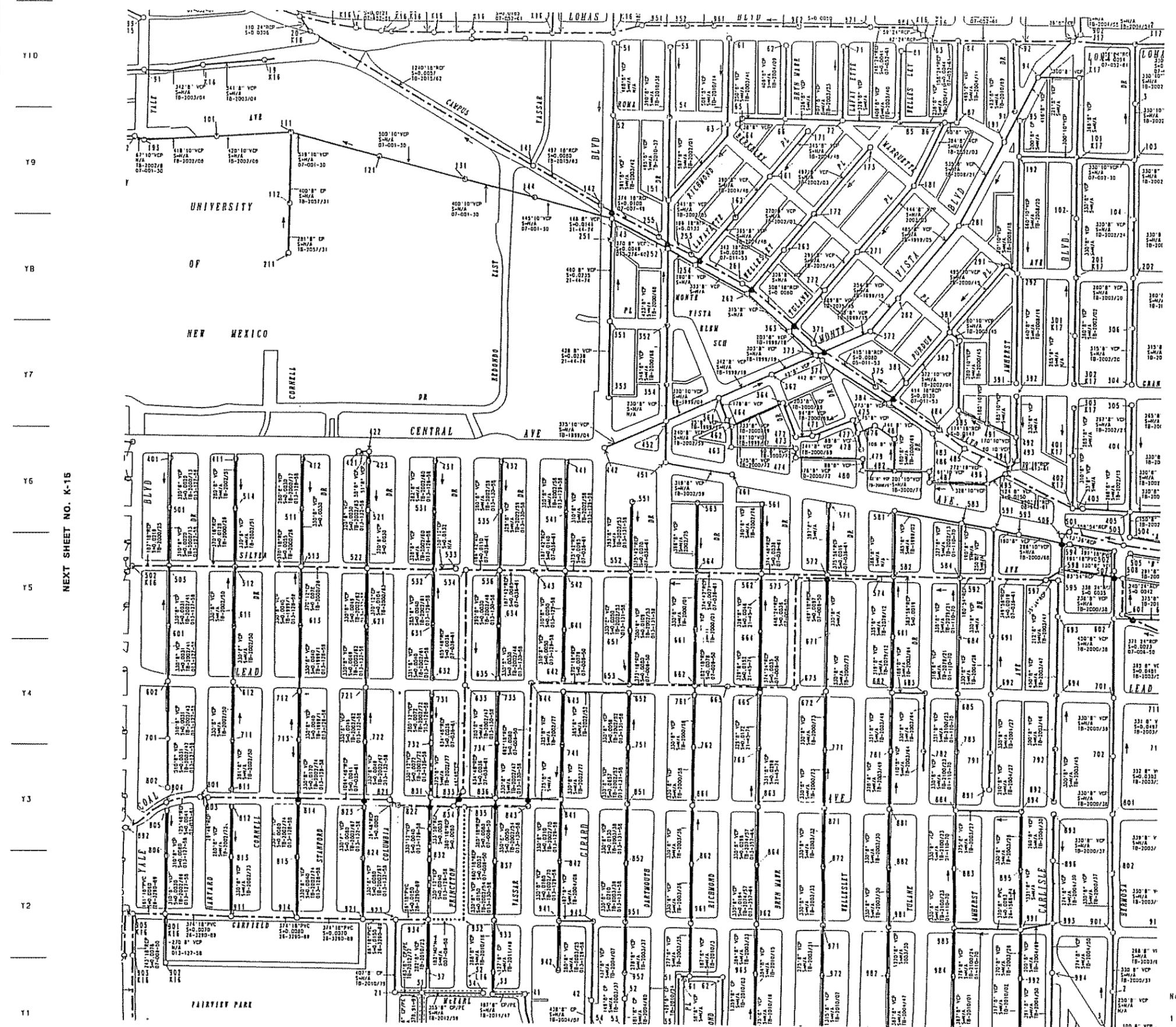


SCALE

Compiled: October 18, 1993

MAP GRID

K-16



NEXT SHEET NO. K-15

NEXT SHEET NO. K-17

NEXT SHEET NO. L-16

Notes:

- 1 Map is for information only and is subject to corrections (Corrections call 768-3608)
- 2 Manhole identification requires both the Map Grid & Manhole No
- 3 Manhole Numbers carried from adjacent maps have the map grid shown

SEWER

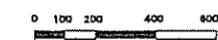
LEGEND

- DATA
- As-built length
 - Pipe diameter
 - Pipe Material
 - 178"8"CP/PE ← Slip liner
 - S=0.0200 ← Pipe Slope
 - 26-3735-89 ← Project Number
 - TB-2036/65 ← T-BOOK Information

- SANITARY SEWER LATERALS
- FORCE MAIN LINE
- INTERCEPTOR LINE
- SLIP LINES
- SIPHONS
- INACTIVE OR ABANDON

- MANHOLE
- LAMP HOLE
- LIFT STATION
- CHLORINATION STATION
- PUMP STATION
- JUNCTION BOX
- OVERPASS
- END OF PROJECT

- MATERIALS
- CIP = CAST IRON PIPE
 - AC = ASBESTOS CONCRETE
 - PVC = POLYVINYL CHLORIDE PIPE
 - VCP = VETRIFIED CLAY PIPE
 - DIP = DUCTILE IRON PIPE
 - HDPE = HIGH DENSITY POLYETHYLENE PIPE
 - RCP = REINFORCED CONCRETE PIPE
 - CP = CONCRETE PIPE
 - PEL = POLYETHYLENE LINED
 - CMB = COMBINATION PIPE (SEE AS-BUILTS)
 - ST = STEEL PIPE
 - RPM = REINFORCED PLASTIC MORTAR
 - CMP = CORRUGATED METAL PIPE
 - FIB = FIBERGLASS LINER
 - ULN = U-LINER
 - INT = INSITU
 - TLK = TLOCK
 - N-A = UNKNOWN MATERIAL



SCALE

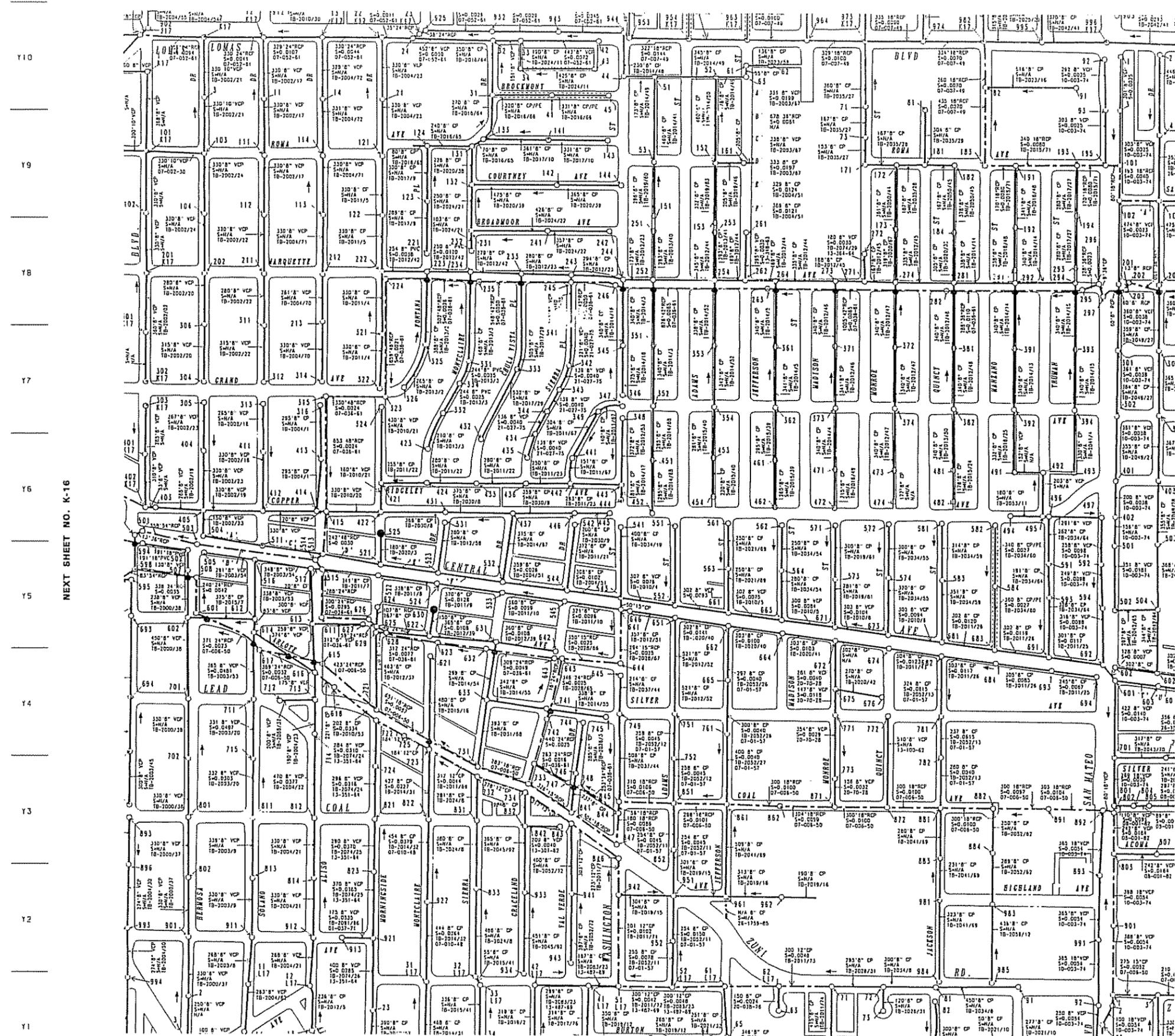
Compiled: October 18, 1993

MAP GRID

K-17

Notes:

- 1 Map is for information only and is subject to corrections (Corrections call 766-3608)
- 2 Manhole identification requires both the Map Grid & Manhole No
- 3 Manhole Numbers carried from adjacent maps have the map grid shown
- 4 This map was originally titled



Y10

Y9

Y8

Y7

Y6

Y5

Y4

Y3

Y2

Y1

NEXT SHEET NO. K-16

NEXT SHEET NO. K-18

NEXT SHEET NO. L-17

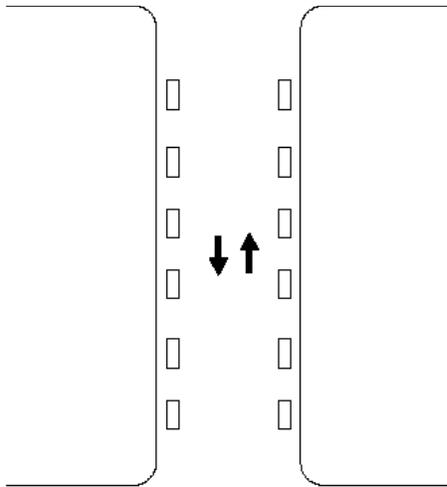
Appendix E

Brainstorming Session Solutions

Brainstorming Session Solutions

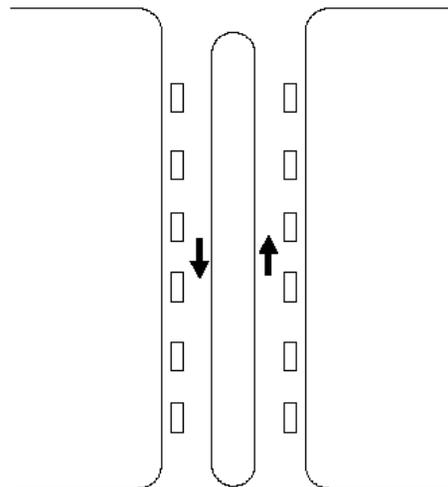
The following solutions were created during the brainstorming sessions with the Task Force. Eight solutions were developed which addressed many of the issues the Task Force had listed. Each solution was sketched in an AutoCad drawing and submitted back to the Task Force for further refinement.

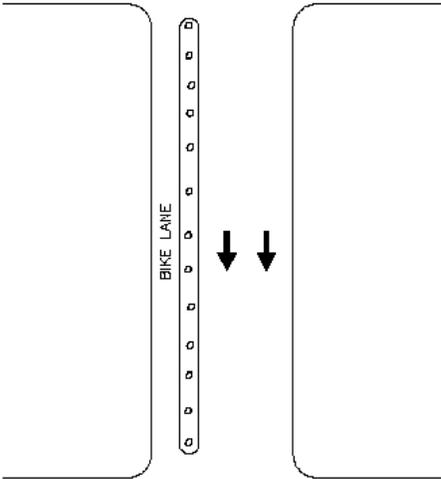
Each alternative is proposed for both Lead and Coal Avenue with the exception of Alternative 8 in which each street has a different treatment. The Task Force's entire list, in no particular order, of proposed alternatives as developed at the brainstorming sessions are as follows:



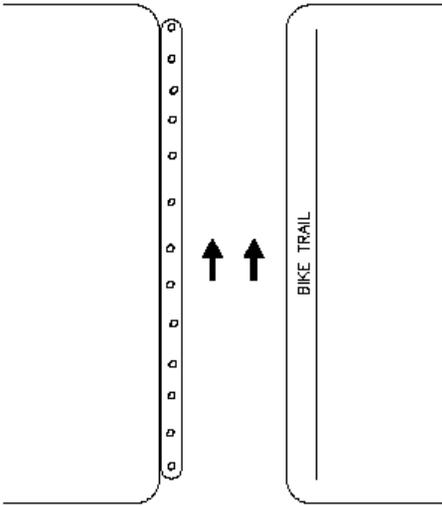
Solution 1 – Fully residential streets with parking on each side of roadway.

Solution 2 – One lane each direction with wide median and parking on each side.

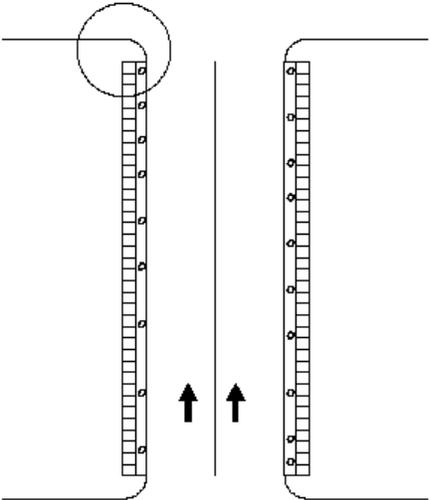




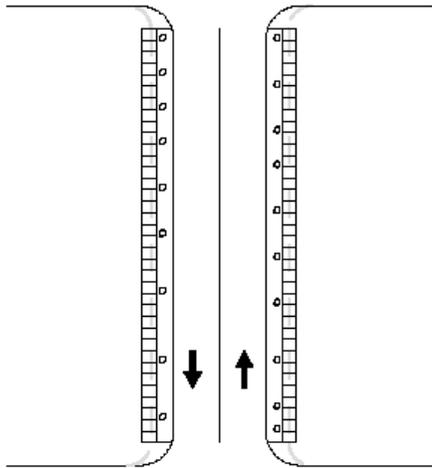
Solution 3 – One-way with 2 driving lanes, buffer between bicycle lane and driving lane.



Alternative 4 – “Twin Parks”, 2 lane, one-way streets with “fast” bike trail on one, and “slow” bike trail on the other.

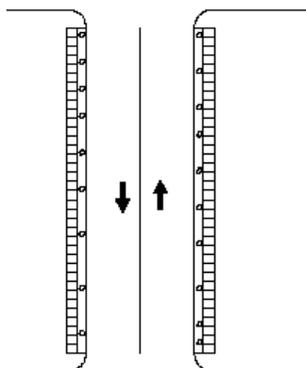
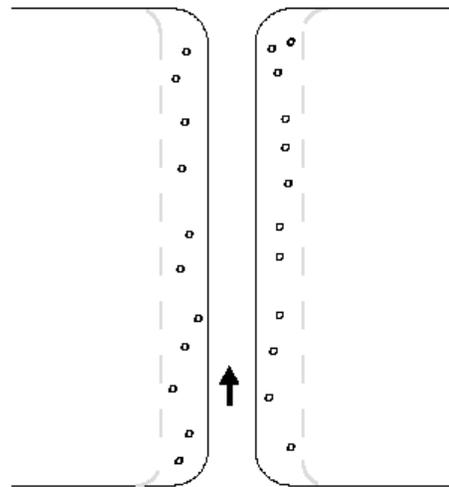


Solution 5 – One-way with 2 driving lanes, wider sidewalks, buffer between sidewalk and driving lane, ADA improvements.

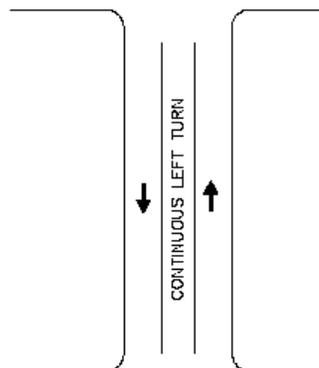


Solution 6 – Two-way roadways without left turn lanes, wide of pavement reduced, buffer between sidewalk and driving lane.

Solution 7 – One-way with 1 driving lane, wide planting areas on both sides.



COAL



LEAD

Solution 8 – One lane in each direction with continuous left turn lane (Lead), one lane in each direction without left turn lane and with bike and pedestrian improvements (Coal).

Appendix F

FDOT LOS Tables

**TABLE 4 - 1
GENERALIZED ANNUAL AVERAGE DAILY VOLUMES FOR FLORIDA'S
URBANIZED AREAS***

UNINTERRUPTED FLOW HIGHWAYS							FREEWAYS																																																																																																																																																																																																																																									
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0-84%	**	>5	≥4	≥3	≥2																																																																																																																																																																																																																																											
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<p>Source: Florida Department of Transportation Systems Planning Office 605 Suwannee Street, MS 19 Tallahassee, FL 32399-0450 http://www11.myflorida.com/planning/systems/sm/los/default.htm</p>							<p>02/22/02</p>																																																																																																																																																																																																																																									

*This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Values shown are two-way annual average daily volumes (based on K_{100} factors) for levels of service and are for the automobile/truck modes unless specifically stated. Level of service letter grade thresholds are probably not comparable across modes and, therefore, cross modal comparisons should be made with caution. Furthermore, combining levels of service of different modes into one overall roadway level of service is not recommended. The table's input value defaults and level of service criteria appear on the following page. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.
 **Cannot be achieved using table input value defaults.
 ***Not applicable for that level of service letter grade. For automobile/truck modes, volumes greater than level of service D become F because intersection capacities have been reached. For bicycle and pedestrian modes, the level of service letter grade (including F) is not achievable, because there is no maximum vehicle volume threshold using table input value defaults.

TABLE 4 - 1 (continued)
GENERALIZED ANNUAL AVERAGE DAILY VOLUMES FOR FLORIDA'S
Urbanized Areas
INPUT VALUE ASSUMPTIONS

ROADWAY CHARACTERISTICS	UNINTERRUPTED FLOW FACILITIES			
	Freeways		Highways	
	Class III	Class IV		
Number of through lanes	4 - 12	4 - 12	2	4 - 6
Posted speed (mph)	65	55	50	50
Free flow speed (mph)	70	60	55	55
Basic segment length (mi)	1.5	0		
Interchange spacing per mile	2.5	1		
Median (n,y)			n	y
Left turn lanes (n,y)			y	y
Terrain (r,l)	1	1	1	1
% no passing zone			80	
Passing lanes (n,y)			n	
TRAFFIC CHARACTERISTICS				
Planning analysis hour factor (K)	0.097	0.093	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.95	0.95	0.925	0.925
Base capacity (pcphpl)			1700	2100
Heavy vehicle percent	6.0	4.0	2.0	2.0
Local adjustment factor	0.98	1.00	1.0	1.0

ROADWAY CHARACTERISTICS	INTERRUPTED FLOW FACILITIES																	
	State Arterials										Non-State Roadways			Bicycle	Pedestrian	Bus		
	Class I		Class II			Class III		Class IV			Major City/County	Other Signalized	Class II	Class II				
Number of through lanes	2	4 - 6	8	2	4 - 6	8	2	4 - 6	8	2	4 - 6	8	2	4 - 6	2 - 4	4	4	
Posted speed (mph)	45	50	50	45	45	45	35	35	35	30	30	30	45	45		40	40	
Free flow speed (mph)	50	55	55	50	50	50	40	40	40	35	35	35	50	50		45	45	
Median type (n,nr,r)	N	r	r	n	r	r	n	r	r	n	r	r	n	r		r	r	
Left turn lanes (n,y)	Y	y	y	y	y	y	y	y	y	y	y	y	y	y		y	y	
Paved shoulder/bicycle lane (n,y)																n,50%,y	n	
Outside lane width (n,t,w)																t	t	
Pavement condition (u,t,d)																t		
Sidewalk (n,y)																	n,50%,y	n,y
Sidewalk/roadway separation (a,t,w)																	t	
Sidewalk/roadway protective barrier (n,y)																	n	
Obstacle to bus stop (n,y)																		n
TRAFFIC CHARACTERISTICS																		
Planning analysis hour factor (K)	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925
Base saturation flow rate (pcphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Heavy vehicle percent	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.0	2.0	2.0	
Local adjustment factor	1.0	1.0	0.95	0.98	0.98	0.95	0.95	0.95	0.92	0.92	0.92	0.90	0.98	0.98	0.95	0.98	0.98	
% turns from exclusive turn lanes	12	12	12	12	12	12	12	12	12	12	12	12	14	14	16	12	12	
Bus span of service																		15
CONTROL CHARACTERISTICS																		
Signalized intersections per mile	1.5	1.0	1.0	3.0	3.0	3.0	5.0	5.0	5.0	8.0	8.0	8.0	3.0	3.0		3.0	3.0	
Arrival type (1-6)	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	
Signal type (a,s,f)	a	a	a	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
Cycle length (C)	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	
Effective green ratio (g/C)	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.41	0.41	0.31	0.44	0.44	

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways				Highways			State Two-Way Arterials				Non-State Roadways		Bicycle	Pedestrian	Bus
	Class III		Class IV		Two-Lane % FFS	Multilane		Class I ATS	Class II ATS	Class III ATS	Class IV ATS	Major City/County ATS	Other Signalized Control Delay	Score	Score	Buses per hr.
A	≤ 0.32	≤ 11	≤ 0.29	≤ 11	> 0.917	≤ 0.29	≤ 11	> 42 mph	> 35 mph	> 30 mph	> 25 mph	> 35 mph	≤ 10 sec	≤ 1.5	≤ 1.5	> 6
B	≤ 0.53	≤ 18	≤ 0.47	≤ 18	> 0.833	≤ 0.47	≤ 18	> 34 mph	> 28 mph	> 24 mph	> 19 mph	> 28 mph	≤ 20 sec	≤ 2.5	≤ 2.5	> 4
C	≤ 0.74	≤ 26	≤ 0.68	≤ 26	> 0.750	≤ 0.68	≤ 26	> 21 mph	> 22 mph	> 18 mph	> 13 mph	> 22 mph	≤ 35 sec	≤ 3.5	≤ 3.5	≥ 3
D	≤ 0.90	≤ 35	≤ 0.88	≤ 35	> 0.667	≤ 0.88	≤ 35	> 21 mph	> 17 mph	> 14 mph	> 9 mph	> 17 mph	≤ 55 sec	≤ 4.5	≤ 4.5	≥ 2
E	≤ 1.00	≤ 45	≤ 1.00	≤ 45	> 0.583	≤ 1.00	≤ 41	> 16 mph	> 13 mph	> 10 mph	> 7 mph	> 13 mph	≤ 80 sec	≤ 5.5	≤ 5.5	≥ 1
F	> 1.00	> 45	> 1.00	> 45	≤ 0.583	> 1.00	> 41	≤ 16 mph	≤ 13 mph	≤ 10 mph	≤ 7 mph	≤ 13 mph	> 80 sec	> 5.5	> 5.5	< 1

v/c = Demand to Capacity Ratio

% FFS = Percent Free Flow Speed

ATS = Average Travel Speed

02/22/02