




Alameda
DRAIN & TRAIL
Master Plan



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1. Executive Summary



1.1 Introduction

The Alameda Drain & Trail Master Plan (master plan) provides a framework for improvements along the nine mile corridor that runs from Interstate 40 to the northern end of 2nd Street. The Alameda Drain was constructed to lower and moderate shallow groundwater tables and return unused irrigation water back to the Rio Grande for reuse. The Drain is part of the larger network of water conveyances that shape development patterns in the Middle Rio Grande Valley.

This master plan is the result of a collaborative, four party agreement between Bernalillo County, the Middle Rio Grande Conservancy District (MRGCD), the City of Albuquerque and the Albuquerque Metropolitan Flood Control Authority (AMAFCA). The overall intent of this project is to enhance this historic drainage way, creating a multi-use trail that works in conjunction with the Drain and results in a more cohesive, aesthetic corridor.

GUIDING PRINCIPLES 1. Master Plan Elements

- CREATE A MULTI-USE, PAVED RECREATIONAL TRAIL THAT PARALLELS THE DRAIN;
- CREATE LANDSCAPE IMPROVEMENTS THAT REDUCE INVASIVE/NOXIOUS WEEDS AND MRGCD MAINTENANCE AND ENHANCE AESTHETICS, WILDLIFE HABITAT AND WATER QUALITY;
- CREATE AMENITIES IN ASSOCIATION WITH THE TRAIL, INCLUDING TRAILHEADS, REST AREAS, LINEAR PARKS AND ART;
- BUILD STREET CROSSINGS THAT ACCOMMODATE TRAIL USERS AND MOTORISTS;
- IMPROVE WATER QUALITY;
- INSTITUTE A COHESIVE SIGNAGE SYSTEM;
- CREATE COMMUNITY GATHERING PLACES;
- PROMOTE HEALTHY LIFESTYLES; AND
- INCREASE PHYSICAL ACTIVITY

FIGURE 1. *Alameda Drain & Trail Illustration*



A Steering Committee, with representation from all four participating agencies, helped to guide the process of creating the Alameda Drain & Trail plan. The Steering Committee led the public outreach process, organizing a series of workshops, field tours and general forums. A total of four meetings, were held. These meetings shaped the project's recommendations, the trail alignment and amenities. The project team also contacted landowners adjacent to the Drain and met individually to discuss their ideas about the project and its impact on their property.

A key component of the project is the proposed alignment of the multi-use trail. The width of the Drain right of way varies but averages about 100 feet. The drainage way itself ranges from less than 30 feet to more than 50 feet wide. Maintenance of the drainage way requires a compacted roadway surface suitable for large equipment. This, along with access considerations for adjacent properties, shaped the decision of where to locate a paved multi-

use trail. In general, the public and stakeholders favored having the trail away from 2nd Street, on the west side of the drainage way. The proposed multi-use trail would be twelve feet wide with a two foot shoulder on each side. In addition to the paved trail, a secondary, unpaved trail is proposed in specific areas on the opposite side of the Drain from the paved trail.

The master plan proposes accompanying amenities to enhance the Drain and trail, including trailheads with parking, rest areas, water features and landscaping. The landscaping component has multiple objectives such as: reducing ongoing maintenance associated with removal of invasive weeds, filtering stormwater and creating shade for trail users. The master plan also proposes water quality measures to improve the function of outfalls into the Drain and intercept trash and other floating debris. These measures are also designed to reduce sedimentation in the Drain and direct more precipitation flows to landscaped areas.

The master plan contains a high-level estimate of probable costs for design and construction the project. The preliminary budget for the entire project is an estimated \$15,395,000.

Proposed phasing of the project starts with the segment from Montaña Road to Paseo del Norte. The second priority is the Mildred Avenue to Montaña Road segment. Like most long range projects, phasing will be driven by funding availability, jurisdictional priorities, connectivity to existing trail facilities, and to some extent private developments along the corridor.

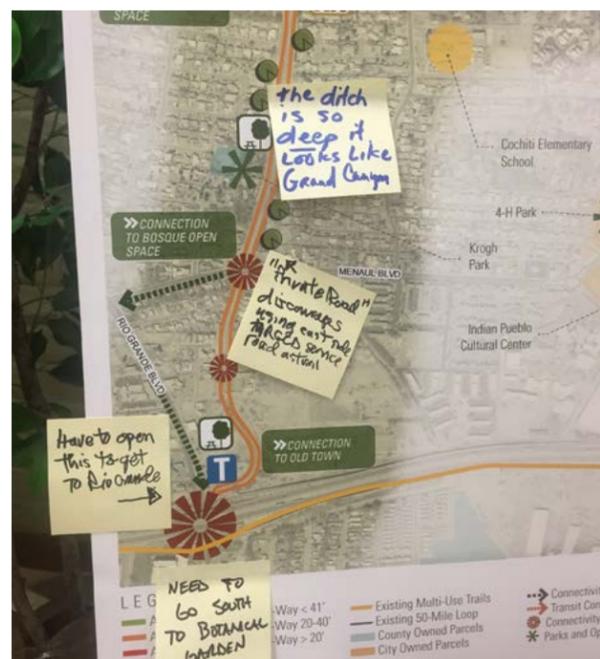
1.2 Public Outreach Process

At the outset of the project, a Public Involvement Plan outlined the overall strategy and scope for soliciting public input. The Steering Committee led the public outreach process, organizing a series of workshops, field tours and public meetings. The discussions that occurred through these forums shaped the recommendations, the trail alignment and amenities outlined in this plan. The project team also contacted landowners of adjacent Drain properties and met with many of them individually to discuss their ideas and potential impacts on their property. Among the meetings held were the following events:

- **A Discovery Workshop in Fall of 2015.** This meeting, held early in the process, provided participants with an overview of the project and had a series of exhibits with open-ended questions designed to solicit input on trail alignment, amenities and connections to surrounding facilities.
- **Project staff made numerous presentations** and updates to neighborhood groups and organizations like the Greater Albuquerque Bicycle Advisory Committee (GABAC).
- **Public Meetings** in early 2016 presented draft recommendations for trail alignment and corridor improvements.
- **A Saturday morning biking** tour of the corridor in February of 2016 allowed participants to view the corridor firsthand and discuss potential improvements.
- **Presentations to the MRGCD** board on project progress, solicited feedback from board members.

The general outcome of public engagement efforts has been overwhelmingly positive, with good input on specific issues and a consensus that this project is a good addition to the community.

FIGURE 2. *Public Meeting Images*



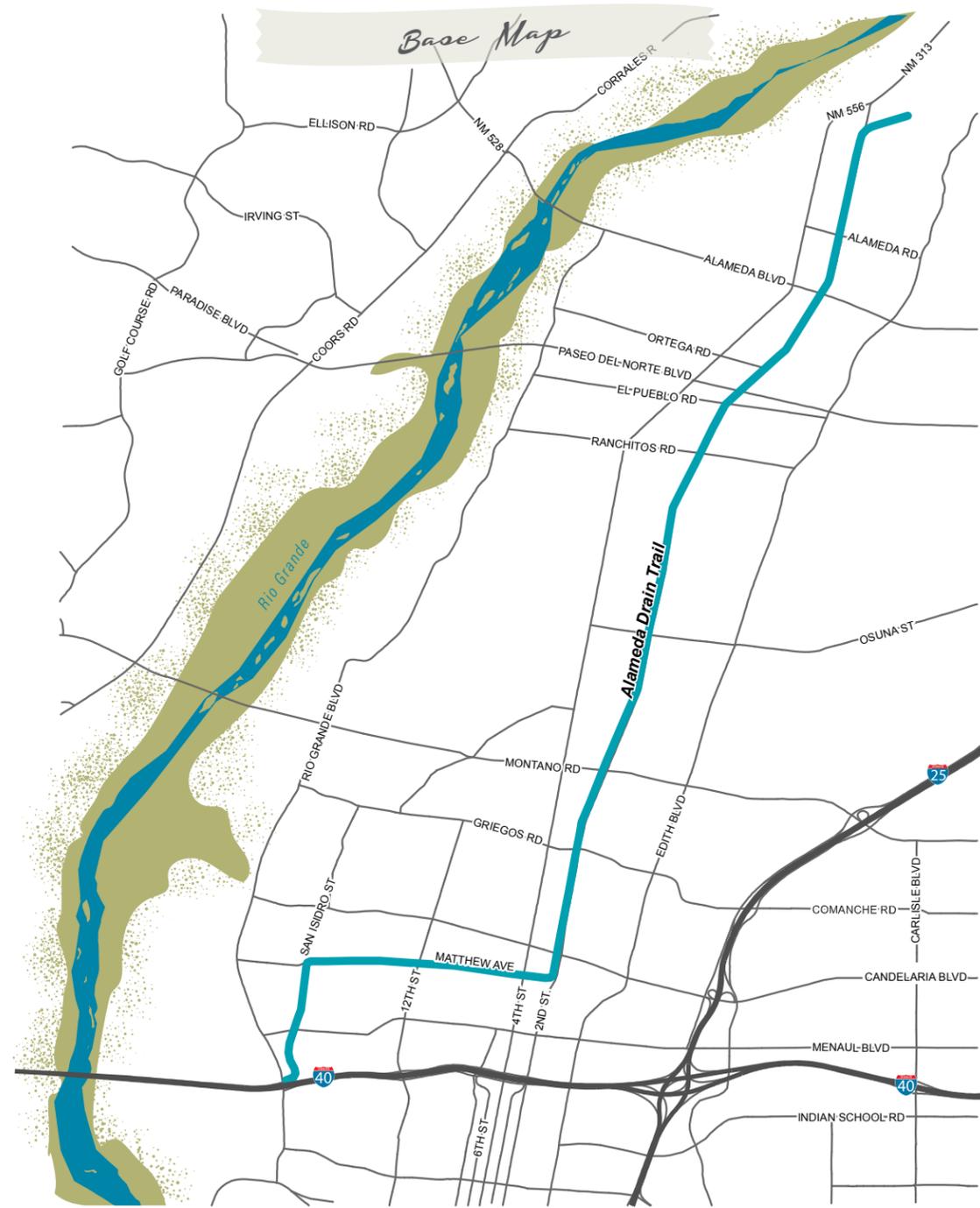
Public Meetings & Workshops - During the planning process the project team convened a number of public events including public meetings and field workshops. During these events the project team explored with members of the public possible alignment options and amenities for the Alameda Drain & Trail project.

1.3 History

The Alameda Drain was constructed in the 1930s to mitigate the inconsistent flows of the Rio Grande that caused frequent flooding in the Middle Rio Grande Valley. Deforestation upstream had increased the silt load in the river, leading to more sedimentation. As silt settled in the valley it raised the riverbed and water table and turned fertile farm land into swamps. In reaction to the flooding and deterioration of farmland, the MRGCD was formed and tasked to manage irrigation, drainage and flood control throughout the Middle Rio Grande Valley. MRGCD constructed storage and diversion dams along the river and dug new drainage and irrigation channels in the valley. The drainage channels funneled water away from the fields, reclaiming farmland for agriculture and helped control flows in the river.

While the Conservancy's initial efforts were a great success, by the 1940's insufficient funding made it difficult for the MRGCD to afford the necessary maintenance on much of its infrastructure. The Congressional Flood Control Acts of 1948 and 1950 provided the federal funding that the district needed to continue its efforts. The Rio Grande Flood Control Program was established to rehabilitate and modernize the existing MRGCD facilities.

Today, the MRGCD is still tasked with the management and maintenance of drainage and irrigation systems throughout the Middle Rio Grande Valley. Their continued work has helped to preserve agricultural production with an estimated value of \$35 to \$70 million annually. Apart from the economic benefit, recreational uses have increased and benefited local communities. Today, the majority of MRGCD ditches and drains in Bernalillo County are accessible and open to the public. The proposed trail along the Alameda Drain would continue the trend to enhance the greenways along the channel as a recreational corridor.



Historic Images



View showing construction of the highway from bridge East of Highway 66.



View showing construction of concrete culvert on Highway 66 at the point of the Alameda Interior Drain crossing.



View showing new highway bridge over Alameda Interior Drain where the course of the Drain makes it necessary to divert the highway

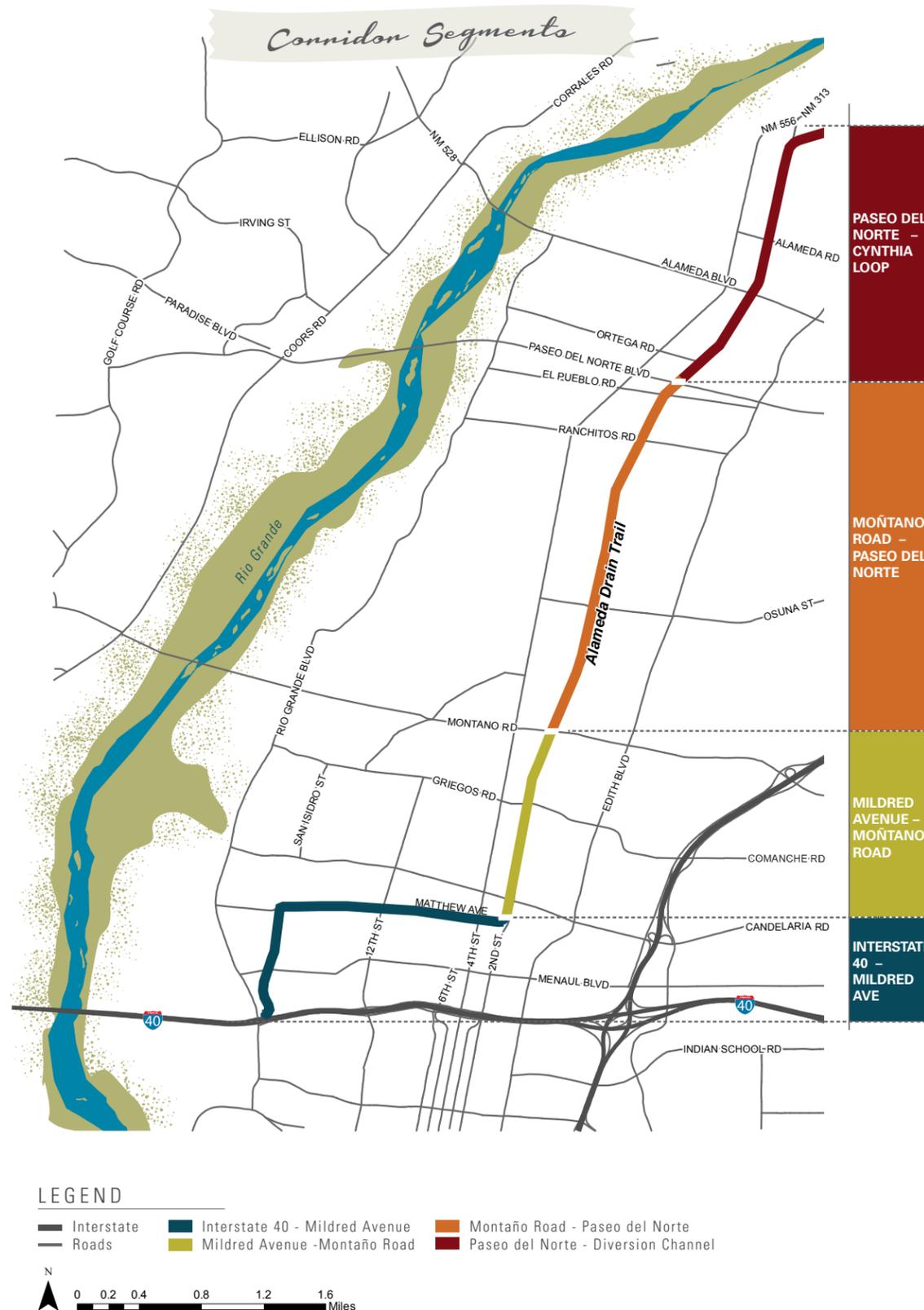
CORRIDOR OVERVIEW

The Alameda Drain & Trail Master Plan project area encompasses an approximately nine mile corridor, which extends from Interstate 40 (I-40) and Rio Grande Boulevard to the Sandia Pueblo boundary north of Cynthia Loop in the area west of Interstate 25 (I-25) in Albuquerque, Bernalillo County, New Mexico. The length of the proposed trail corridor is adjacent to existing roadways and developed areas. The Alameda Drain & Trail bisects a large variety of land uses. The southern section between I-40 and Matthew Avenue is mostly residential, the length of 2nd Street is predominantly commercial and industrial with nearby residential sections, and the northern portion from 2nd Street to the Sandia Pueblo boundary is rural and residential.

Alameda Drain & Trail Area Segments

For planning purposes the Drain has been divided into four segments: I-40 to Mildred Avenue, Mildred Avenue to Montañero Road, Montañero Road to Paseo del Norte and Paseo del Norte to the Sandia Pueblo boundary.

- I-40 - Mildred Avenue.** This segment constitutes the southern portion of the planning area located within City of Albuquerque's jurisdiction. Beginning north of I-40 and east of Rio Grande Boulevard, the Drain traverses predominantly residential neighborhoods with an urban character. The first south-north section of the Alameda Drain & Trail corridor is fronted by a number of vacant parcels with potential commercial uses. The east-to-west stretch along Matthew Avenue lies within a more densely developed residential area. An existing multi-use trail is located on the south side of the Drain along Matthew Avenue.
- Mildred Avenue - Montañero Road.** The second segment, located along 2nd Street, runs north-south and lies within the City of Albuquerque's jurisdiction. The character of the surrounding neighborhoods is semi-urban to urban with mostly residential, commercial and a number of light industrial uses. This segment contains some major street crossings, including, Candelaria Road and Griegos Road.



- Montañero Road - Paseo del Norte.** This segment crosses from the City of Albuquerque into Bernalillo County jurisdiction. It is partially governed by County, City and Village of Los Ranchos policies and regulations. The character of the surrounding neighborhoods is primarily semi-rural with residential, commercial and some light industrial uses located along the corridor. Major roads crossing the 2nd Street corridor are Montañero Road and Osuna Road.
- Paseo del Norte - Cynthia Loop.** This segment constitutes the northern section of the proposed Alameda Drain & Trail, stretching from Paseo del Norte to Cynthia Loop. Here, the Drain converges with 2nd Street. The character of surrounding neighborhoods is primarily rural featuring residential, with some commercial and light industrial uses. This segment is located within unincorporated Bernalillo County. In this segment, 2nd Street consists of a four-lane divided road with a center two-way left-turn lane from Paseo del Norte to Alameda Boulevard, and a two-lane road north of Alameda. Major roads intersecting 2nd Street in this segment are Paseo del Norte and Alameda Boulevard.

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2. Existing Conditions



This section examines the existing regulatory framework, existing physical and environmental conditions, as well as opportunities and constraints that present themselves along the project corridor. This initial analysis informs subsequent design concepts and trail alignment options.

2.1 Existing Conditions

The existing conditions set the stage and base requirements for the master plan design concepts. To develop a Drain & Trail framework appropriate for the local setting, the project team studied the context and prevailing existing conditions. Subsequent findings guided the proposed trail location and helped determine where trail amenities and landscaping should be placed. The project team reviewed existing plans and policy documents. This effort was supplemented by a survey of existing environmental conditions through field visits and research. The results informed a basic framework of opportunities and constraints that guide the proposed Trail & Drain design. A full summary of the existing condition review is located in Appendix A through Appendix G.

EXISTING PLANNING DOCUMENTS

The Alameda Drain is located within Bernalillo County unincorporated areas, Village of Los Ranchos de Albuquerque and City of Albuquerque jurisdictions. Several existing plans address the area covering the project corridor, and are summarized in [Table 1](#). Some plans have specific language about trails and some address broader goals such as increasing recreational opportunities. Policies drafted in these documents, include but are not limited to, land use, recreation, environment, circulation, open space and health have informed the direction of this master plan. The following plans and policies support the general intent and direction for the Alameda Drain and Trail Master Plan. A complete list of influential plans and their individual summaries is detailed in [“7. Appendix A” on page 123](#).

Local land use regulations operate under a three-tiered ranking system, with the Albuquerque/Bernalillo County Comprehensive Plan ranked the highest, at Rank I, and facility and sector plans ranking lower to remain under the general policy direction of the Comprehensive Plan. Area and Facility Plans, Rank II, address specific systems, such as Open Space or Bikeways and Trails, while Rank III Plans are sector or corridor specific, addressing smaller geographic areas that share common characteristics. A number of the plans within this system identify the desire of communities to invest in trails, encourage recreational uses and provide opportunities for bicycle commuting.

Pathways that connect open space areas and activity centers within the City and County are supported by virtually all adopted plans. Plans identify drainage channels to provide opportunities for recreational uses and to extend the trail network. Communities desire context-appropriate trail designs that enhance the visual qualities of their neighborhoods.

The Bernalillo County and City of Albuquerque Complete Streets Ordinances, as well as the City of Albuquerque Bikeways & Trails Facilities Plan, both refer to the Mid-Region Council of Governments’ (MRCOG) Long Range Transportation System (LRTS) Guide for future trail facilities and alignments. The LRTS identifies the 2nd Street corridor for a future paved trail location, and recommends assessing

drainage and utility easements as potential trail pathways. The proposed trail is in line with these recommendations and will complement the proposed on-street bike lanes on 2nd Street. It will allow trail access to a wider range of users away from fast moving traffic. The LRTS also recommends that the transit system connect to trail networks, allowing users to access trails more easily.

The Bernalillo County Parks, Recreation, & Open Space Master Plan recommends that trail designs be sustain-

able, using water harvesting elements and appropriate landscaping where possible. The Parks, Recreation, & Open Space Master Plan also recommends Public-Private Partnerships to fund and deliver trail services. A Memorial & Donation Program, for members of the community to purchase trees, rocks, or benches to honor loved ones, is suggested as another option to fund a trail. This plan also recommends cooperation with non-profit organizations to develop art, culture, and historic programming along the trail.

TABLE 1. Summary of Existing Plan Goals that Pertain to the Alameda Drain Corridor

PLAN	JURISDICTION COVERED	GOAL & INTENT	YEAR
Bikeways & Trails Facilities Plan, Metropolitan Transportation Plan	City of Albuquerque/ Bernalillo County	The Alameda Drain is designated as part of the regional network of trails.	2014, 2015
Bikeways & Trails Facilities Plan, Albuquerque/Bernalillo County Comprehensive Plan	City of Albuquerque	Trail should connect nodes and activity centers and transit routes and improve walkability.	2015, 1989
North Valley Area Plan, Albuquerque	City of Albuquerque	Trails should provide a connection to the Rio Grande Valley State Park.	1993
Long Range Transportation System Guide Bikeways & Trails Facility Plan, Major Public Open Space Facility Plan	City of Albuquerque/ Bernalillo County	Trails should be designed to be accessible and accommodate a wide range of users.	2015, 1999
Los Griegos Development Plan	City of Albuquerque	Intersections along the trail should be improved to allow safe passage of all users.	1987
Long Range Transportation System Guide Major Public Open Space Facility Plan	City of Albuquerque/ Bernalillo County	Trails should be buffered from the road to increase pedestrian comfort by increasing the lateral separation between pedestrians and fast moving cars.	2015, 1999
Los Duranes Sector Plan	City of Albuquerque	Trails should reflect the character of adjacent neighborhoods. This could be achieved through entry and interpretive signage and lighting that complement the local character.	2012
Albuquerque/Bernalillo County Comprehensive Plan	City of Albuquerque	Trails should feature landscaping and street furniture. All trail amenities should be designed to discourage vandalism.	1989
Parks, Recreation & Open Space Master Plan	Bernalillo County	Trails should feature local art exhibits along the corridor.	2015
Pedestrian/Cyclist Safety Action Plan	Bernalillo County	Trail design should be sustainable, employing water harvesting techniques and energy reduction features.	2012
MRGCD Ditches-with-Trails Survey	MRGCD	The survey was conducted to understand how and why people currently use trails along MRGCD ditches, and to understand what improvements would be most, if at all, welcome.	2007

Improvements in the Alameda Drain corridor are also guided by a number of sector plans that are specifically drafted towards the needs of adjacent communities. These plans call to retain the rural character, and to enhance and improve community identities. They also desire walkable neighborhoods, improved trails and access to the larger trail network.

A survey, to understand how and why people use MRGCD facilities, was conducted in 2007 for the MRGCD. This survey found that close to 80 percent of residents living along ditches and drains use the facilities for recreational purposes, walking being the most common activity. While most bicyclists prefer a paved surface, equestrians prefer unimproved surfaces. Safety was the most pressing concern for people surveyed, as well as access and the ability to take a baby stroller.

Federal regulations require that trails accommodate users with disabilities. Furthermore, trails are envisioned to attract a wide range of users to become multi-generational destinations and promote healthier lifestyles. The County supports the designation of trails as “prescription trails,” which are safe and accessible routes recommended for use to promote healthy lifestyles.

Altogether, the existing land use plans and studies related to the Alameda Drain corridor provide strong support for the creation of a multi-use trail along the Alameda Drain.

PHYSICAL CONDITIONS

The existing Alameda Drain is an unlined drainage channel operated and maintained by the MRGCD. Throughout much of the corridor, both sides of the Drain are gravel or dirt surfaced and accessible to pedestrians, cyclists and equestrians. The east-west section of the Alameda Drain corridor along Matthew Avenue currently features a multi-use trail. The project corridor segment north of 2nd Street, features a dirt trail not intended for vehicle access except for access to private properties and maintenance of the Drain. Urban infrastructure, including roadways, sewer, utilities, light fixtures, storm drains, utility poles, electrical transformers, and other improvements, are found throughout the Alameda Drain corridor and surrounding area. Numerous major and minor roadways intersect with the Alameda Drain corridor. Although sidewalks are not present throughout much of the corridor, many of the roadway intersections along 2nd Street have been modified to include curb ramps and some intersecting streets have sidewalks.

ENVIRONMENTAL CONDITIONS

A high-level environmental review was conducted of the project area to identify any environmental conditions with the potential to significantly impact the development of a trail along the Drain. The full memo is included in [“8. Appendix B” on page 129](#) and the memorandum is summarized in the section below.

Overview

The Alameda Drain is located within the Rio Grande Floodplain and Albuquerque Basin Eco-regions of the Arizona/New Mexico Plateau. These regions are characterized by river channels, floodplains, plains and piedmont plains with alluvial fans and some scattered hills. Natural vegetation throughout these areas includes cottonwood and willow, New Mexico olive, sand scrub, and desert grasses. Soil types are broadly characterized as deep, well- to excessively-drained soils, which are formed in alluvial deposits. A detailed summary of soils is located in Appendix B.

Wetland Inventory

A review of National Wetland Inventory maps indicates federally mapped wetlands are located in the project corridor. These include a freshwater emergent wetland and a riverine wetland. Both are associated with the North Diversion Channel and located close to the northern extent of the project area corridor. No other federally mapped wetlands were identified. The Rio Grande is approximately one mile to the west of the project area.

Biological Resources

According to federal and New Mexico listings of threatened, candidate, and endangered species, 16 bird species, two mammals species, and one fish species are listed and have the potential to occur within the project area. A detailed list of recorded species is located in Appendix B.

Cultural & Historic Resources

The Alameda Drain is a historic linear resource, according to the New Mexico Cultural Resource Information System (NMCRIS), that is eligible for listing on the State and National Registers. In addition, the proposed Alameda Drain & Trail is partially within the Los Alamos Addition Historic District. This residential historic district extends from 2nd Street westward to 4th Street between the areas north of Alamosa to the area south of Sandia.

Nearby Listed Sites of Environmental Concern

The Federal and New Mexico databases identify a variety of sites that are documented or suspected of environmental contamination. Listed sites include but are not limited to known or suspected releases of contamination, locations of leaking underground storage tanks, land uses considered to pose a high risk of environmental contamination, or sites subjected to environmental cleanup or restoration. A review of these databases revealed two active, leaking petroleum cleanup sites located close to the project corridor. Both sites, Graves Oil Transfer Yard and A&C Auto, are located approximately 350 feet east of the Alameda Drain corridor on the east side of 2nd Street.

Regulatory Considerations

The Alameda Drain & Trail planning effort will likely be subject to National Environmental Policy Act (NEPA) documentation as either a Categorical Exclusion (CE) or an Environmental Assessment (EA). The lead agency for this project will be Bernalillo County. The process requires that the purpose and need for the Alameda Drain & Trail be articulated and alternatives to the proposed improvements be considered.

Depending on actual Alameda Drain & Trail impacts, other state and federal regulations such as the Endangered Species Act, National Historic Preservation Act, Clean Air Act, Clean Water Act, and Migratory Bird Treaty Act may trigger additional regulatory requirements. Further evaluation of regulatory requirements will be necessary as the Alameda Drain & Trail details are defined.

2.2 Existing Ownership & Operations

MRGCD needs to access the Drain on a regular basis with heavy machinery to maintain the channels functionalities. This use has to be considered when developing design scenarios for a future recreational multi-use trail. Apart from the MRGCD, other users also access the Drain regularly. Some properties and businesses maintain primary and secondary access points through the Drain's maintenance roads. Infrastructure and encroachments, public roads and existing trails, storm drainage facilities, agricultural irrigation facilities and private and public utilities are all features interacting with the Drain. These features remain and need to be included in programming and design consideration. In the following section, a summary of maintenance and operation activities as well as ownership, uses and access are discussed.

MRGCD OPERATION

The primary operational functions of the Drain are irrigation and flood control facilitated by MRGCD. A secondary function is to carry stormwater to the Rio Grande from municipal and County systems licensed to discharge into the Alameda Drain. Storm water discharged from these systems are permitted by the Environmental Protection Agency (EPA) under the Municipal Separate Storm Sewer System (MS4) program as described in greater detail in ["Water Quality" on page 14](#). The MRGCD can develop maintenance agreements with all MS4 permittees that discharge to their facility.

This master plan recommends best management practices (BMPs) for storm water quality control to be included in improvements of the Drain. BMPs, however, should not obstruct or interfere with the flow of water and should not hinder ongoing MRGCD maintenance activities summarized in [Table 2](#).

Ditchriders require regular driving access to irrigation ditches within the project corridor to maintain and repair ditches. The proposed trail could be located within close proximity to these facilities only if a suitable, drivable access is located on the other side of the ditch.

Access to the Drain for operations and maintenance is provided by unimproved maintenance roads that run parallel to the Drain. Maintenance roads vary in width and generally run along both sides of the Drain for the length of the corridor. At major intersections the area available for maintenance access on the east side of the Drain is restricted as the result of roadway widening of 2nd Street to provide auxiliary lanes at the intersections. Driveways provide access to the maintenance roads at intersecting public roads throughout the corridor.

Maintenance of public and private road crossings and private driveway crossings are the responsibility of the public or private licensees. These responsibilities include cleaning debris, silt, weeds and other obstructions inside and around the inlet and outlet ends of road culvert crossings.

EASEMENTS, OWNERSHIP & PUBLIC AND PRIVATE USES

The Alameda Drain traverses a number of jurisdictions including the City of Albuquerque, Bernalillo County and the Village of Los Ranchos de Albuquerque as illustrated in the [Jurisdiction map on page 5](#).

Geographic information system (GIS) data and license agreements were provided by MRGCD. Review of this information suggests that the MRGCD owns or has easement interest along the entire project corridor from

I-40 to Alameda Boulevard. Easements are nonpossessory property interests that allow the easement holder to use land that he does not own. From Alameda Boulevard north to the Sandia Pueblo Boundary the majority of the corridor is held in fee simple, or complete ownership, by the MRGCD. Ownership and agreements are illustrated and summarized in [Appendices C and D](#).

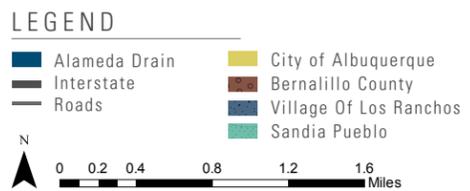
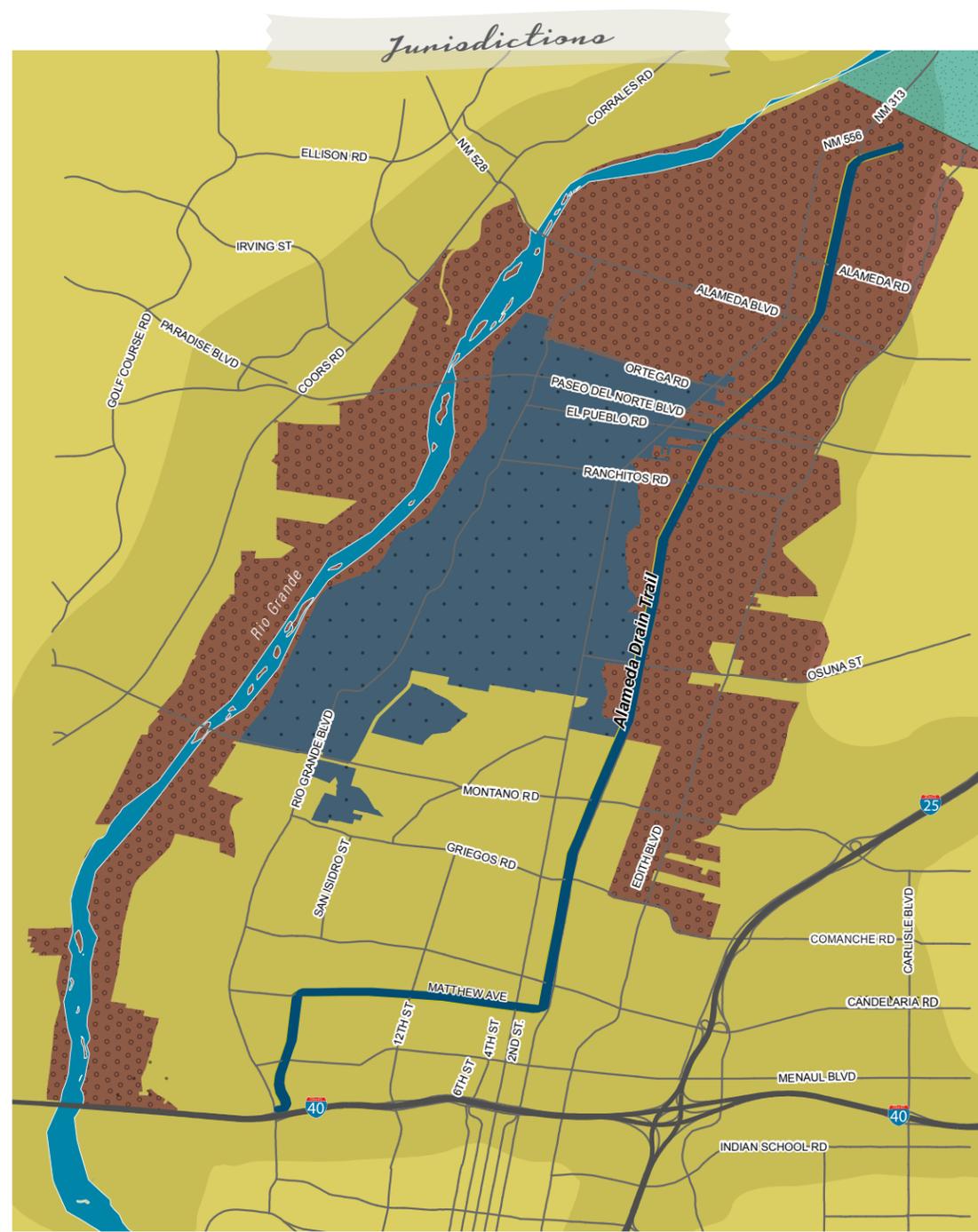
The Alameda Drain corridor is used by other individuals and entities for infrastructure to serve either public or pri-

vate needs. These typically include property access, storm drainage, and public and private utilities. Use of the Drain for these purposes is permitted by the MRGCD through license agreements stipulating the conditions by which the licensee can use the Drain right-of-way.

It is anticipated that the multi-use trail would be issued a license agreement between MRGCD, Bernalillo County and other contributing agencies.

TABLE 2. The MRGCD Maintenance Activities

ACTIVITY	FREQUENCY	LOCATION	NOTES
Dredging within the Drain	Performed every ten years, but may be done more frequently depending on storm flows	Both sides of the Drain or ditch where access is possible	
Mowing within the Drain and the level areas adjacent to both sides of the Drain as needed	Frequency depending upon seasonal rainfall		
Weed control operations including spraying post-emergent herbicides	Once or twice per year		The most problematic vegetation encountered within the Drain includes cattail, Johnson grass, tumbleweeds and willows
Repair of washouts	As needed, with the frequency depending upon seasonal rainfall		
Tree trimming within the Drain easements	As needed		Adjacent property owners require the MRGCD to trim branches overhanging property lines as well.
Maintenance of laterals	Performed at the same times as the main Drain		
Inspections	Performed when adjacent property owners alert the MRGCD to problems as they develop		
Ditchrider maintenance of irrigation ditches requires access to operate checks and turnouts, to check water levels and clean out or repair ditches	Regularly, every 1-3 weeks during irrigation season	Both sides of the irrigation ditch where access is possible	Ditchriders require regular access to the Drain, in cases where the trail is located adjacent to the Drain it may also have to be utilized for maintenance purposes. In these instances the trail will have to be closed to the public during maintenance activities.



ACCESS & USE INVENTORY

The inventory of uses and access types along the corridor include access to adjacent property, licensed infrastructure and encroachments, public roads and trails along and crossing the corridor, storm drainage facilities, other agricultural irrigation facilities, maintenance roads, private and public utilities, and the use of the Drain by public service entities. Access locations along the Drain are illustrated in [Appendix E](#).

Roads & Trails

Public roads that cross the Drain corridor are summarized in [Table 2](#) and detailed in [Appendix E](#). Formal recreational trails are parallel and cross the corridor at four locations. These include the Matthew Avenue trail along the south side of the corridor from the Griegos Interior Drain trail, which runs from Campbell Road to Matthew Avenue, a trail segment that runs parallel to the west side of 2nd Street between El Pueblo Road and Paseo del Norte, the Paseo del Norte trail that intersects 2nd Street just south of Paseo del Norte, and the Alameda Boulevard trail that runs along the south side of Alameda Boulevard. These trails are illustrated in [Appendix E](#).

TABLE 3. Public Road Crossing

CROSSING ROAD	CLASSIFICATION	TRAFFIC SIGNAL
Rio Grande Blvd.	Minor Arterial	
Lilac Drive	Local	
Indian School Rd.	Local	
San Isidro St.	Local	
12th St.	Minor Arterial	X
4th St.	Minor Arterial	
Mildred Ave.	Local	
Shropshire Pl.	Local	
Candelaria Rd.	Minor Arterial	X
Veranda Rd.	Local	
Aztec Rd.	Local	
Headingly Ave.	Local	
Mescalero Rd.	Local	
San Lorenzo Ave.	Local	

CROSSING ROAD	CLASSIFICATION	TRAFFIC SIGNAL
Griegos Rd. - W	Collector	X
Griegos Rd. - E	Minor Arterial	X
Shannon Pl.	Local	
Delmar Ave.	Local	
Montaño Rd.	Principal Arterial	X
El Caminito Rd.	Local	
Vineyard Rd.	Local	
Willow Rd.	Local	
Osuna Rd. - W	Collector	X
Osuna Rd. - E	Principal Arterial	X
Green Valley Rd.	Local	
Pueblo Solano Rd.	Local	
Cottonwood Rd.	Local	
Roehl Rd.	Local	
Los Ranchos Rd.	Local	X
Ranchitos Rd.	Collector	X
Horton Ln.	Local	
Wayne Rd.	Local	
El Pueblo Rd.	Collector	X
Paseo del Norte ramps	Principal Arterial	X
Tierra del Sol Rd.	Local	
Ortega Rd.	Collector	
Cielito Lindo Pl.	Local	
Homeland Rd.	Local	
St. Francis Rd.	Local	
Alameda Blvd.	Principal Arterial	X
Orlando Way	Local	
Alameda Rd. - E	Collector	
North Ct.	Local	
2nd St.	Principal Arterial	
Cynthia Loop	Local	

Drainage Inlets

A secondary operational function of the Alameda Drain is the accommodation of storm water runoff. Storm drainage inlets from the municipal storm drain systems are one of the uses licensed by the MRGCD. The City and MRGCD have an existing agreement allowing the discharge of storm water into the Drain. Storm drainage inlet locations are illustrated in [“11. Appendix E” on page 171](#). Maintaining access to the inlets and improving storm water quality are key issues for all entities, including City of Albuquerque, Bernalillo County and the Village of Los Ranchos de Albuquerque, involved in drainage operations and management. Also illustrated in [“11. Appendix E” on page 171](#) are the other MRGCD irrigation facilities located within the corridor or connecting to the Drain. These are also shown on the [Drainage and Irrigation map on page 10](#). [Table 4](#) details storm inlets to the Drain. The ID numbers are referenced on maps located in [Appendix C](#).

TABLE 4. Storm Inlets to Drain

ID#	CULVERT TYPE	SIZE (IN)
102	Storm Pipe	20
105	Storm Pipe	30
106	Storm Pipe	30
108	Storm Pipe	24
109	Storm Pipe	24
114	Storm Pipe	24
117	Storm Pipe	24
122	Storm Pipe	48
126	Storm Pipe	36
127	Storm Pipe	24
132	Storm Pipe	48
133	Storm Pipe	48
134	Storm Pipe	48
150	Storm Pipe	24
151	Storm Pipe	54
152	Storm Pipe	36
155	Storm Pipe	18
156	Storm Pipe	24

ID#	CULVERT TYPE	SIZE (IN)
157	Storm Pipe	12
162	Storm Pipe	24
164	Storm Pipe	18
165	Storm Pipe	24
166	Storm Pipe	24
206	Storm Pipe	30
208	Storm Pipe	24
217	Storm Pipe	24
218	Storm Pipe	36
223	Storm Pipe	24
230	Storm Pipe	12
238	Storm Pipe	18
242	Storm Pipe	24
243	Storm Pipe	24
245	Storm Pipe	12
247	Storm Pipe	26
255	Storm Pipe	24
258	Storm Pipe	24
261	Storm Pipe	24
264	Storm Pipe	18
265	Storm Pipe	18
268	Storm Pipe	24
269	Storm Pipe	24
270	Storm Pipe	24
273	Storm Pipe	24
274	Storm Pipe	18
277	Storm Pipe	60
278	Storm Pipe	30
279	Storm Pipe	18
285	Storm Pipe	24
297	Storm Pipe	24
302	Storm Pipe	36
304	Storm Pipe	18
305	Storm Pipe	18
306	Storm Pipe	18
307	Storm Pipe	24

Utilities

Public and private utilities have been installed throughout the corridor along the Drain. These installations are licensed with the MRGCD. Appendix F illustrates the results of a subsurface utility engineering (SUE) Level D utility records research for the corridor. Utilities include underground and overhead communications, underground and overhead electric, natural gas, potable water, and sanitary sewer.

MRGCD Maintenance Road

The MRGCD maintenance roads run parallel to both sides of the Drain for most of the corridor length. Besides providing for the MRGCD’s Operations and Maintenance and access for some adjacent property owners, the roads are used by public service entities. The U.S. Post Office uses the maintenance roads for mail delivery. The City of Albuquerque Solid Waste Management Department and Waste Management, Inc., which provides trash pickup service for residents and businesses in Bernalillo County, use the maintenance roads for trash pickup. Emergency services such as police, ambulance and fire use the roads for access as needed. Albuquerque Public School bus service does not use the maintenance/access roads for student pick-up or drop-off.

Parents who’s children attend Mountain Mahogany Community School, located approximately 950 feet north of Griegos Boulevard, use the west side of the Drain for parking and student drop-off and pick-up. The main access to the school on 4th Street.

Drain Right-of-Way

In some locations, the Drain right-of-way is used for parking by adjacent businesses. Review of the license agreements suggests that this use is not licensed with the MRGCD. This use may involve businesses west of the Drain corridor and on the east side of 2nd Street, as well as residential properties. Photos 1 and 2 illustrate two such cases evident on a random weekday.

FIGURE 3. Unauthorized parking on the Drain



Photo 1 (looking south) – Tractor trailers parked along 2nd Street south of Osuna Rd.



Photo 2 (looking west) – Car for sale at Mescalero Rd. intersection.

There is one area where parking within the drain easement is included in a license agreement. This is for a multi-family residential development in the northwest corner of the 2nd Street/El Pueblo Road intersection, identified as License Agreement ID #134 in [Appendix C](#).

2.3 Opportunities & Constraints

Opportunities are any type of sites or connections along the Drain that can be improved. These include but are not limited to visual qualities, programing, access and amenities. Constraints indicate existing conditions that challenge desired trail functions and design options. Constraints could impact the trail alignment, increase project costs, or compromise overall function of the Drain.

The [Opportunities and Constraints map on page 8](#) illustrates some of the opportunities and constraints facing the Alameda Drain & Trail project.

The project team created an inventory of existing opportunities & constraints and developed a map to present the results graphically. This map was discussed at workshops and amended with comments from the public. In the following section, opportunities & constraints related to connectivity, Americans with Disabilities Act (ADA) compliance, trail amenities, traffic, landscape, right-of-way, water quality, trail alignment and signage are discussed.

From this discussion, the project team generated potential design opportunities. These opportunities were also informed by the public involvement process and the information gathered at public meetings and workshops. A detailed segment-by-segment opportunities & constraints discussion is located in [Appendix G](#).

CONNECTIVITY

Good connectivity is the key to linking transportation networks, including roads, sidewalks and trails. Improved connectivity is an important goal of this plan. Enhancing links between trail networks and activity centers enhances accessibility and allows more options for travel between destinations.

This plan aims to improve connections between schools, parks, sports facilities, neighborhoods, transit stations and other activity centers. The project corridor contains a number of nodes with great potential to improve connectivity; however, there are constraints that have to be overcome.

CONSTRAINTS

- **Interstate 40 and Rio Grande Blvd.** A connectivity barrier exists at the southern end of the project corridor. Interstate 40 to the south and Rio Grande Blvd to the west are barriers that inhibit connectivity between the proposed trail and existing trail networks and activity centers. The Paseo Del Bosque Trail, Interstate 40 Trail and the Mountain Road Bike Boulevard are close; however, the interstate obstructs seamless linkage to these networks. Old Town, Downtown, the Bosque Open Space, the Indian Pueblo Cultural Center and other destinations could be incorporated into the trail network if these barriers are overcome.
- **2nd Street.** 2nd Street is a major barrier that restricts east-west movement. Infrequent pedestrian crossings encourage mid-block crossings at unsignalized locations, which increases conflicts between pedestrians and vehicular traffic.

DESIGN OPPORTUNITIES

- **Linkages.** Barriers to connectivity should be unbarred in order to enhance the overall trail network. The project has the opportunity to work in conjunction with other efforts currently underway south of Interstate 40 and provide linkages to Old Town and other trail amenities south of the project boundaries. Concepts for crossing 2nd Street will be identified to improve east-west movements.
- **Signage & Wayfinding.** Signage and wayfinding programs could enhance the user experience and direct users to other trails and places of interests

including but not limited to the Bosque Trail, Old Town, the Bio Park and the Zoo.

- **Access points.** The large number of access points along the Drain creates access opportunities for adjacent neighborhoods. Multiple access points enable residents to easily enter and exit the trail and encourage trail usage.
- **Existing, intersecting trails.** A number of existing trails intersect the Drain corridor. The proposed trail corridor has the opportunity to close gaps in the trail network, allowing users to travel further distance and connect to desired destinations. Trails that intersect the Drain or are located in close proximity to it, include:

- Paseo Del Bosque Trail
- Interstate 40 Trail
- Griegos Interior Drain Trail
- Matthew Trail
- Alameda Blvd. Trail
- Paseo del Norte Trail
- Osuna Trail
- 50 Mile Loop (proposed)

- **Linking to activity centers.** A number of activity centers, parks and public facilities that are located close to the Drain are listed below:

- Matthew Meadows Park
- Garfield Middle School
- Cochiti Elementary School
- Krogh Park
- 4-H Park
- Indian Pueblo Cultural Center
- Albuquerque Police Academy
- Goodrich Park
- La Luz Elementary School
- Edward G. Sandoval/North Valley Little League Park
- Los Puentes Charter School
- St. Therese School
- Edward G. Sandoval North Valley Little League Park Albuquerque
- Village of Los Ranchos de Albuquerque
- Balloon Fiesta Park
- Businesses along 2nd and 4th Street
- Chant Development, brewpubs
- Taylor Middle School

- Los Ranchos Elementary School
 - Taft Middle School
 - La Ladera Park
 - North Valley Library
 - Sandia Preparatory School
 - Los Ranchos and Montañito Rail Runner Stations
 - Los Ranchos Elementary School
 - Journal Center
 - Raymond G. Sanchez Community Center
 - BMX Park
 - Alameda Park
 - Alameda Elementary School
 - Mountain Mahogany Community School
- **Transit.** The access to Railrunner and ABQRide transit stations presents opportunities for further connectivity. Commuters can potentially access the stations from the trail and substantially increase the range they can travel.

INTERSECTIONS & CROSSINGS

Intersections where motorists and trail users converge are potential conflict points. Good intersection design reduces pedestrian exposure to potentially dangerous situations by increase visibility. Intersections can both pose a barrier and create activity nodes and connections. Improving the layout of intersections can improve traffic flow and enhance the pedestrian experience. This plan aims to improve major intersections along the corridor to create predictable pathway crossings for trail users. Minor streets and driveway crossings also need to be designed for all modes of travel.

CONSTRAINTS

- **Major road crossings.** Major road crossings include Candelaria Road, Griegos Road, Montañito Road, Osuna Road, Paseo del Norte and Alameda Boulevard. These intersections impede upon predictable south-north movements for trail users. At many intersections with 2nd Street, the available right-of-way along the Drain decreases, clearing space for turning lanes, and restricting available right of way for the proposed trail. Many of the crossings are not configured to accommodate cyclists and pedestrians and need modifications.

Opportunities & Constraints

LEGEND

- Alameda Drain
- Interstate
- Multi-Use Trail - Paved Trail
- Designated Bike Lane
- Local Roads
- 50 Mile Loop
- Proposed 50 mile Loop extension
- Connectivity Opportunities
- Linkage Opportunities
- Connectivity Barriers
- Parks and Open Space
- Schools
- Places of Interest
- Existing Tree Cover & Landscaping
- Views
- Transit Connection
- Railrunner Station
- Potential Parking/Trailhead
- Prescription Rx Trails
- ABQ Ride



- **Minor streets and driveway crossings.** At several locations, minor streets and driveway crossings need modifications to allow for a comfortable trail experience.
- **Unauthorized parking & ATVs.** At present, the Drain's right-of-way is used for parking, and all-terrain vehicles (ATVs) use the existing MRGCD maintenance roads for recreational purposes. These activities should be restricted to allow for usage of the corridor by trail users.

DESIGN OPPORTUNITIES

While intersections, large and small, require closer studies and creative design solutions, they also present an opportunity. Improved intersections will enhance the overall flow of traffic and create an environment that encourages more pedestrians and cyclists to use the trail.

A review of existing intersection and crossing conditions yielded a number of design opportunities. Opportunities in conjunction with best practices for intersection and crossing designs recommended by the National Association of City Transportation Officials (NACTO) are listed below. These practices will be used to inform the final trail concepts and treatments that are installed along the proposed trail.

- **Raised crossings/mini-speed tables.** Raised crossings and mini-speed tables are used to reduce speeds of cars. These can be installed along the corridor's minor streets and driveway crossings to slow motorists and alert them of the trail crossing.
- **Striped crosswalks.** Crosswalks guide pedestrians across road intersections and also provide visual cues to motorists.
- **Accessible curb ramps.** To comply with ADA requirements, all major intersection and minor street crossings need to be equipped with ADA accessible ramps and detectable warning surfaces. Driveways need to have accessible ramps and should be evaluated individually to determine if detectable warning surfaces are needed
- **Midblock Crosswalks.** Midblock crosswalks facilitate crossings to places where people want to go, but that are not served by an access path. The lack of marked and/or protected midblock crosswalks encourage people to cross informally. This creates potentially

dangerous situations, and can be observed along the 2nd Street corridor. Additional crosswalks may mitigate and reduce illegal road crossings and improve pedestrian connectivity to desired destinations.

- **Leading pedestrian intervals (LPI).** LPIs at signalized intersections give pedestrians a head start entering crosswalks
- **Pedestrian safety islands.** Pedestrian safety islands reduce the exposure time of trail users to traffic. Channelized right-turn lanes increase automobile speeding and reduce the attention paid to pedestrians and bicyclists. Reducing channelized right-turn lanes will slow turning speeds and create self-enforced yielding to pedestrians. Curb extensions, tight corner radii and pedestrian islands also force drivers to navigate intersections more cautiously.

ADA COMPLIANCE

A portion of the population have impairments that reduce and/or limit their mobility. Sidewalks, street crossings, and other public right-of-way elements present challenges for accessibility.

FIGURE 4. *Mini-speed table*



The Public Right of Way Accessibility Guidelines (PROWAG) were published in November 2005 to establish accessibility standards for the design, construction, and operation of new and existing facilities within public rights-of-way. The Complete Streets Ordinance enacted by the City and the County in 2015 requires streets, sidewalks, bikeways and other facilities to be designed and built according to standards set forth by PROWAG.

Accordingly, PROWAG standards should be integrated into the design concepts proposed by the Master Plan. The following standards should guide the trail framework.

- **Fixed objects.** Fixed objects, including but not limited to utility poles, light fixtures, and other street furniture should be located so not to obstruct movement on the trail. This will ensure that the trail can serve all users, including users with disabilities.
- **Intersections.** Intersections can pose major obstacles to people with disabilities. Raised intersections, flush with the sidewalk, require drivers to traverse the crossing slowly and make pedestrian crossings more comfortable. ADA compliant ramps and detectable warning surfaces are required on all intersection crossings along the trail.
- **Width.** A pedestrian access road free of obstructions should be maintained throughout the trail system, and should have a minimum width of four feet.

FIGURE 5. *Precedent Images - Intersection Treatment*



▲ MINI-SPEED TABLE AT THE CONVENTION CENTER

Mini Speed Tables - Speed tables are traffic calming devices that slow traffic by raising the whole wheelbase of a vehicle. At the same time speed tables create a leveled crosswalk for pedestrians and cyclists. An example can be found at the Civic Plaza in Albuquerque.



▲ NACTO MINI-SPEED TABLE



▲ COLORFUL INTERSECTION CROSSING MARKING

Intersection crossings - mark the intended path of Trail users. They guide the user on a direct path through intersections, including driveways and ramps. They provide a clear boundary between the paths of bicyclists and motor vehicles. The Crossings should be colored or textured.

- **Surface.** The trail surface should be firm, stable and slip resistant.
- **Grade.** The grade of the trail should not exceed five percent.
- **Trail amenities.** All trail amenities including trailheads, parking and resting areas as well as other trail facilities need to comply with ADA requirements and standards.

TRAIL AMENITIES

Trail amenities can greatly enhance the trail experience and are desired for the proposed trail. Proposed amenities include but are not limited to; site furnishings, parking, exercise stations, art installations, community gathering places and gardens, activity nodes, resting areas and trailheads. The number, intensity and frequency of these amenities will depend on funding, management and maintenance activities and local needs and desires. Yet, adequate amounts of amenities should be included in order to enhance the trail experience and create a destination with memorable experiences. The type of trail programming selected will guide the user's experience and create attractions for the community. Amenities and programming should not require undue and burdensome maintenance, and should aid in crime prevention.

CONSTRAINTS

- **Corridor length.** The overall length of the project corridor is challenging, as funding only allows to install a limited number of amenities. Thus amenities should be placed strategically and serve community needs as efficiently as possible.
- **Crime & vandalism.** Residents, especially in the area near Matthew and 2nd Street, have voiced concerns that the installation of trail amenities may attract vandalism and increase crime. Thus, Trail & Drain design concepts should discourage crime and vandalism.

DESIGN OPPORTUNITIES

At present there are not many amenities along the corridor; however, ample space along the Drain offers opportunity areas to install a variety of amenities. There are a number of City-and County-owned parcels and parks that could provide additional opportunities to place trail amenities and programming along the trail.

During the Alameda Drain & Trail Master Plan planning process, possible trail amenities and programming opportunities were discussed at meetings and workshops. Listed below are trail amenities and programming features that the public and project team identified to be suitable for the trail.

- **Parking.** Possible locations for parking areas and trailheads are identified at the west end of Matthew, where the Drain bends east, at the confluence of the existing Alameda Drain Trail and 2nd Street, as well as at the northern end of the proposed trail corridor near Cynthia Loop. Parking areas need to comply with ADA requirements while keeping with the character of the surrounding neighborhoods.
- **Food truck court.** In recent years, food trucks have become popular in the City and County. Food trucks are located close to activity centers and attract residents to gather and consume a self-served meal. A designated food truck location could become a destination for future trail users, creating an activity node along the trail. The food court could either be located at one of the parks within the project corridor or within the Drain's right-of-way. As suggested at a public meeting, food trucks could also be placed closer to the Rail Runner stations to serve commuters.
- **Resting Areas.** Rest areas are desired for the future Trail. These could include nodes of vegetation, including trees to provide shade, possible cantilevered



Illustration of a possible location for a parking area and trailhead near the confluence of the existing Alameda Drain Trail and 2nd Street.

FIGURE 6. Precedent Images of Cultural Events Along the Drain



▲ TOY BOAT RACES



▲ POSSIBLE INSTALLATION FOR PASEO DEL NORTE UNDERPASS

- fishing areas and benches on which to rest.
- **Public Art.** Public art is another desired feature to be included in the Trail design. Art could be placed along the trail, promoting local culture and heritage. Public Art installations and exhibits add another facet to the trail experience.
- **Education.** The trail provides educational opportunities for including displays about the functions of the Drain, local history and other local assets.
- **Events.** Special events, such as duck races, scavenger hunts and guided tours can be organized along the trail. Events such as these could further increase the attractiveness of the trail and attract more users.



▲ FOOD TRUCKS



▲ RUBBER DUCK RACE



▲ BIKE OBSTACLE COURSE

TRAIL SURFACING

Trail surfaces vary depending on the context and the intended trail uses. In the City and County, multi-use trails are predominantly asphalt-paved. This is due to the fact that trails should accommodate all users, including users with disabilities. During public meetings the trail surfacing was discussed and both the unpaved and paved trail surface options were supported.

The surface of the trail will designate its uses. Unpaved trails are best suited for pedestrian and equestrian users; paved trails, however, are more inclusive and cater to almost every type of user. Paved trails will accommodate, amongst others, families with strollers, people with disabilities and bicyclists. This plan aims to design an inclusive trail that accommodates all users.

SURFACE POSSIBILITIES

- **Gravel.** A gravel or compacted crusher fines trail is considered by some to be less intrusive to the environment and more natural looking. It is considered to be softer on joints for runners and cheaper to install. However, the subsequent maintenance cost will be higher and it is difficult to maintain a consistent surface. Gravel is also prone to erosion and can migrate, yet is pervious and allows water to infiltrate. Gravel surfacing is also less convenient to some bicyclists and it is difficult to meet ADA surface standards.
- **Asphalt.** Asphalt offers a more stable ADA-compliant surface and is less expensive than concrete to install. However, the edges of asphalt surfaces tend to crack and vegetation can establish itself there. Cracks have to be filled, which can require substantial maintenance. It also requires greater initial excavation in order to provide the required base course depth. Asphalt is not pervious, which will increase storm water runoff.
- **Concrete.** Concrete has the best longevity and is suited to meet ADA standards. However, it is the most expensive trail surfacing option. While traditional concrete is not pervious, there are pervious concrete paving options that can be explored. Pervious concrete is concrete with reduced sand allowing water to drain through. Pervious concrete over an aggregate storage bed will reduce stormwater runoff volumes and pollutants.

TRAFFIC

Loud and fast traffic close to the trail can impact the trail experience. Most of the project area is located along 2nd Street, a heavily traveled commuter corridor. From a trail user's perspective the proximity to fast moving traffic impacts the trail experience.

DESIGN OPPORTUNITIES

- **Trail location.** To improve the trail experience, the trail can be located on the west side of the Drain. However, locations with limited right-of-way may require the trail to be placed on the east side of the Drain.
- **Landscape buffer.** To mitigate traffic noise and provide a buffer from traffic, landscaping can be strategically installed. This not only buffers traffic noise, but also enhances the visual qualities of the trail and provides habitat for native species.

FIGURE 7. Precedent Images of Trail Surfacing Options



▲ PAVED TRAIL (DALLAS)



▲ UNPAVED TRAIL (BOSQUE TRAIL)



▲ PAVED TRAIL WITH UNPAVED EQUESTRIAN TRAIL (BOSQUE TRAIL)



▲ PAVED TRAIL (SANTA FE)



▲ PAVED TRAIL (BOSQUE TRAIL)



▲ CRUSHER FINES (ELK MEADOW PARK, COLORADO)

LANDSCAPE

Historically, ditches and drains were lined with cottonwoods and willows interspersed by grassy meadows that served as habitat to a wide range of wildlife species. Many factors have modified the landscape found along these facilities including maintenance techniques, population growth, the introduction of invasive species and changes in the water-table. Today, invasive plant species have established themselves, largely out-competing desired, native plant species.

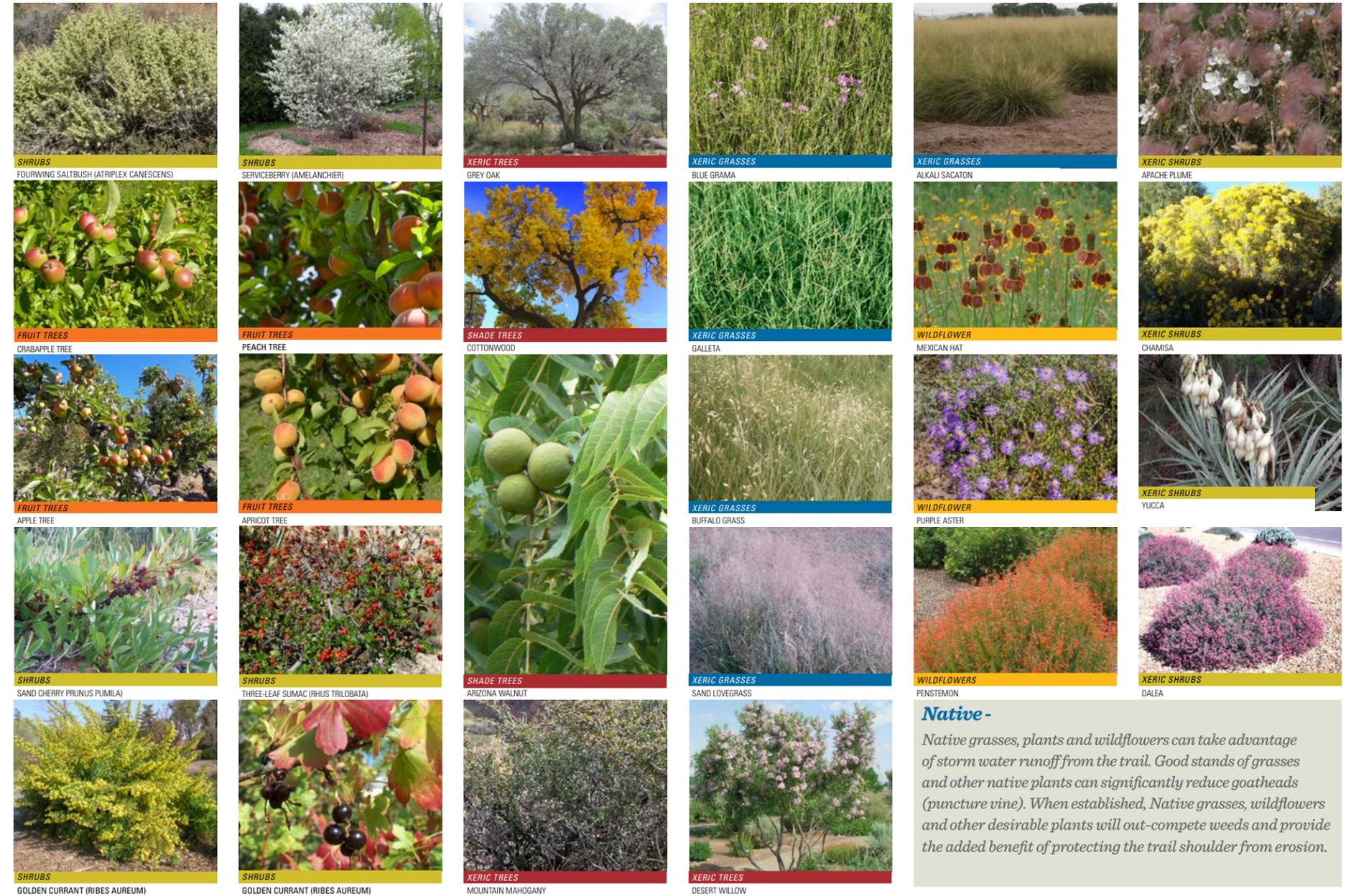
Additionally, vehicular traffic and maintenance activities have caused soil disturbances along the drain which contribute to decreases in desirable plant species and increased erosion. Soil compaction and dumping along ditch edges have also contributed to diminished stands of native grasses and forbs.

Vegetation management

Different methods can be employed to restore the native landscape. Vegetation management utilize a series of strategies that establish a long-term succession of native plants along the ditch. Typically, these species should include native climax plants, desired plants that are most prevalent along ditches and drains. These climax species include Arizona Sycamore, hackberry, reeds and sedges, grasses, and even some invasive species. Successional planting strategies, on the other hand, aim to reestablish a seed bank in the soil that leads to a protective soil cover, and establishes native plant species eventually reseeding themselves. Initial capital investments in native seeding operations must be followed by maintenance practices to support native plant communities.

Soil preparation and proper seeding operations can establish a strong soil seed bank. When not maintained properly, a disturbed soil medium offers ideal breeding grounds for invasive species. With proper maintenance during the first few years, invasive species will be culled and grasses, forbs and shrubs will begin to dominate the landscape. By the third year, native species will begin to propagate and a native ecosystem that is able to outcompete invasive plants will have establish itself.

FIGURE 8. *Examples of Desired Native Plant Species*



This plan aims to vegetate nodes of denser landscape along the trail corridor. Desired species could consist of grasses, shrubs and trees as well as edible species. A collection of desired plant species is illustrated above.

CONSTRAINTS

While landscape is desired along the corridor, the MRGCD maintenance requirements and associated needs have priority. Vegetation cannot impede these MRGCD efforts.

Short native grasses, forbs and some wetland plants are species that can be planted on the sloped earthen banks and maintenance access on the Drain. Established grasses and wildflowers have reduced weed populations along City and County trail networks and decreased the need for herbicides. Plant material must be chosen carefully to conform to crime prevention strategies and provide a clear view corridor for trail users.

Native -

Native grasses, plants and wildflowers can take advantage of storm water runoff from the trail. Good stands of grasses and other native plants can significantly reduce goatheads (puncture vine). When established, Native grasses, wildflowers and other desirable plants will out-compete weeds and provide the added benefit of protecting the trail shoulder from erosion.

DESIGN OPPORTUNITIES

- **Native grasses and wildflowers.** Establish native grasses and wildflower to stabilize ditch banks, reduce weed population and the need for herbicides. The plan recognizes that the vegetation on the Drain shoulder may be disturbed by MRGCD maintenance operations.
- **Shade.** Establish nodes of trees to provide shade and utilize stormwater runoff.

- **Water quality.** Establish raingardens/bioswales to capture runoff, increase infiltration rates and enhance water quality. Install low impact development features to capture first flush from 2nd Street and other paved surfaces. To support these passive water harvesting techniques, the trail should be graded to slope towards the raingarden/bioswales.
- **Stabilizing soil.** Washouts occur more frequently adjacent to paved surfaces. Landscaping methods reduce the potential for washouts adjacent to paved trails. Short native grasses, forbs and some wetland plants can be planted within the sloped earthen banks and maintenance access road along the Drain.
- **Edible Plants.** A large number of native plants are edible and can be utilized along the Drain. This type of landscape supports the agricultural character of the area.

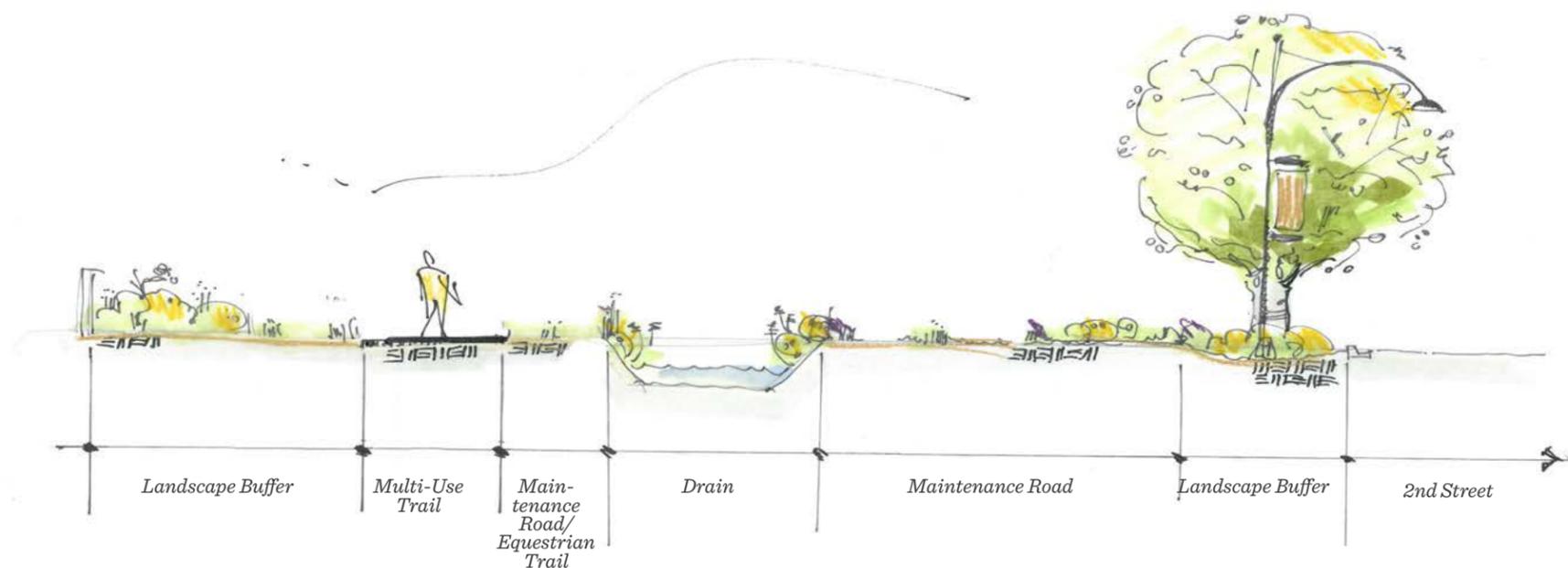
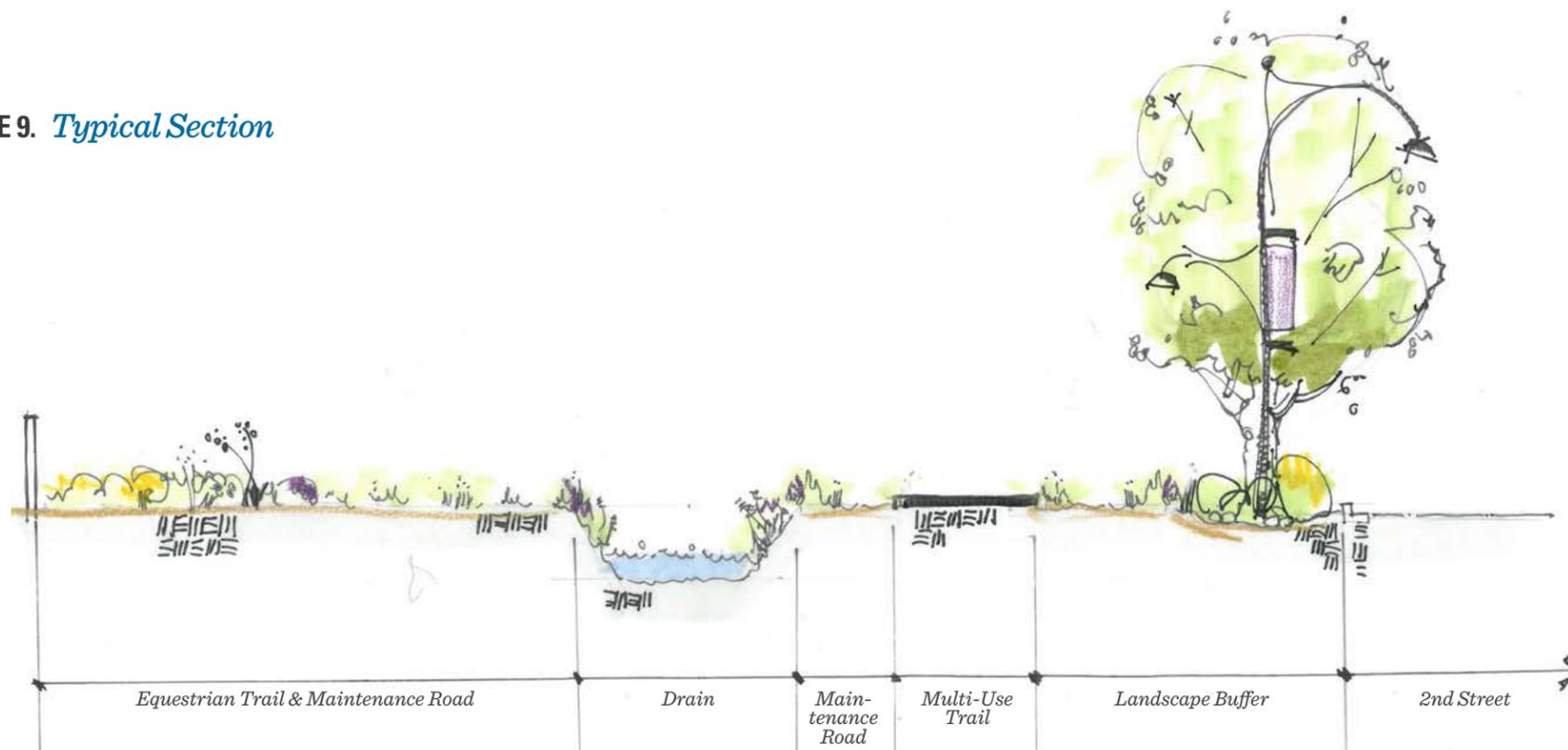
TRAIL ALIGNMENT

Both sides of the Alameda Drain appear suitable to accommodate the proposed trail, with the exception of several areas where a secondary drain or acequia exists on the west side of the Drain. The exhibit to the right details trail sections and possible trail alignment options.

CONSTRAINTS

- **Maintenance road.** The maintenance roads on both sides of the Drain facilitate MRGCD dredging and other maintenance operations. According to the MRGCD, the minimum width of maintenance roads should be 15 feet. However, in areas where right-of-way constraints exist, the trail can be located within 8 feet of the Drain and the trail will be shared by recreational users and maintenance personnel with their equipment. Areas of the trail that are expected to be used by heavy maintenance machinery should be thickened to prevent damage and undue wear and tear. During maintenance activities, the trail should be closed to facilitate maintenance activities and prevent conflicts.
- **Dredged material.** Dredged material is produced by maintenance activities. Dredged material is typically used to reshape the Drain embankments or spread out on the existing access roads. At times, excess material is moved off site and must be dried before being loaded into dump trucks. This activity needs to

FIGURE 9. Typical Section



be considered when developing trail concepts to allow room for the dredged material.

OPPORTUNITIES

- **Connectivity.** The placement of the trail will increase the overall connectivity of the existing trail

network. The Alameda Drain & Trail creates a unique opportunity to provide linkages between the North Valley and Downtown, to the north and south of Interstate 40, and to the east and west of 2nd Street.

- **Slope.** It is recommended that the trail slopes towards a landscaped area or the Drain. The landscape

can take advantage of stormwater runoff and overall runoff can be reduced by capturing it on site.

- **Views and vistas.** The Drain traverses portions of the North Valley with beautiful views of the Sandia Mountains to the north and the skyline of Downtown Albuquerque to the south. By locating the trail

strategically, views and vistas of the mountains and Downtown can be incorporated into the trail programming and enhance the user experience.

- **Right-of-way.** The Drain provides varying widths of available right-of-way. The installation of a multitude of amenities, landscape and furnishings could be provided in areas where adequate right-of-way exists.

WATER QUALITY

The Environmental Protection Agency (EPA) regulates storm water quality discharges from urbanized areas under the Clean Water Act Municipal Separate Storm Sewer System (MS4) program. Under this program, the Middle Rio Grande Watershed Based permit was issued in December 2014, directing the improvement of programs and activities that enhance storm water quality through cooperative efforts between the City of Albuquerque, Bernalillo County, the Village of Los Ranchos de Albuquerque, and 13 other co-permittees. Permit terms require permittees to develop and implement programs for the management and control of storm water pollutants that are known to occur in developed areas including particulates, solid waste (floatables), and biological pollutants. A major provision of the permit requires that permittees address storm water quality impacts related to redevelopment activities.

It should be noted that the MRGCD has an agricultural exemption from compliance with the Clean Water Act and, therefore, is not a permittee under the MS4 program. Every other agency within the Conservancy District's boundary, however, is a permittee and must comply with the MS4 permit requirements for discharges to the District's facilities, such as the Alameda Drain. To that end, the storm drain discharges into the Alameda Drain are considered regulated outfalls under the permit and, as such, the Master Plan includes conceptual measures for structural Best Management Practices (BMPs) to help mitigate impacts on water quality within the Drain from existing storm water discharges. These BMPs embrace Green Infrastructure/ Low Impact Development (GI/LID) approaches to help promote biological and physical treatment processes capable of reducing pollutant contributions.

FIGURE 10. *Examples of Water Features*



▲ DRIPPING BRIDGE TO EXEMPLIFY THE MOTION AND SOUND OF FALLING WATER



▲ WATER FEATURES INSTALLED AT DRAIN OUTFALLS.

FIGURE 11. *Precedent Images of Water Features*



▲ GABIONS STABILIZING RIVER BANKS



▲ GABIONS WITH PLANTS GROWING FROM THE ROCKS.



▲ GABIONS WITH WATER FEATURE

CONSTRAINTS

- **Elevation of pipe inverts.** The effectiveness of BMPs may be limited due to the elevation of pipe inverts at discharge points into the Drain. Some storm Drain outfall inverts are only 18 to 24 inches above the water surface within the Drain, providing limited area for the installation of mouth-of-pipe treatments.
- **Erosion at drain inlet.** Many of the storm drain inlets to the Drain do not have slope protection as a means to control erosion and, as such, the erosion that has occurred is extensive. The erosion that is occurring is caused by storm flows in the Drain following storm events.

DESIGN OPPORTUNITIES

Water quality design opportunities for storm water outfalls present themselves at multiple locations along the Alameda Drain. Many outfalls discharge flows from drop inlets located along the 2nd Street corridor. In some cases, intersection drainage systems are collected within the roadway and discharge at a single outfall directly into the Alameda Drain.

Existing water quality structures along 2nd Street are limited. Two intersections in particular, Vineyard Road and 2nd Street, and Willow Road and 2nd Street, have drop inlets that include a structural water quality Best Management Practices (BMP). The structure consists of a Double D drop inlet with the grates oriented perpendicular to the flow line. Within the inlet, a downward facing pipe elbow has been installed in front of the discharge pipe. This feature limits the amount of floating debris that discharges through the outlet which then concentrates in the inlet box.

There are, however, several municipal storm drain networks that discharge into the Alameda Drain including those north of Menaul Boulevard, in Candelaria Road, along Griegos Road, Montañó Road and Osuna Boulevard. Water quality features included in these and other contributing networks include StormCeptor manholes, sump inlets. A state-of-the-practice sand filter for low flows, that includes trash and debris removal systems for higher flows, is in-line to effect storm water treatment prior to release to the Drain from the City's Menaul Detention System.

Although not part of the trail improvement projects, similar network improvement opportunities should be explored and implemented in a coordinated effort to improve water quality in the Drain. Improvements that provide primary treatment to remove sediments and attached pollutants and secondary treatment to remove trash and other floating debris, should be implemented at upstream facilities outside the Drain corridor. Treatments within the Drain can then be focused primarily on tertiary methods to increase oxygen levels in the water to remove biological pollutants such as e-coli bacteria. This "treatment train" approach is recommended for the storm drain networks discharging to the Drain in addition to the localized BMPs that can be implemented with the trail improvement projects.

An example of a network "treatment train" improvement would be to construct a ported riser or other form of

floatable separation system in Edith Pond #2 which is part of the upstream network for the Griegos storm drain that discharges to the Alameda Drain in the southwest quadrant of the Griegos Road/2nd Street intersection. Edith Pond #2 is located on the north side of Griegos Road approximately 1,500 feet east of 2nd Street, immediately east of the BNSF/Rail Runner tracks. The pond currently provides primary storm water treatment of sediment removal. The ported riser would provide secondary treatment by removing floating debris prior to releasing the water downstream to the Alameda Drain. Tertiary treatments to address suspended solids and dissolved pollutants would be included in the BMPs within the Drain. This type of upstream improvement would improve water quality within the Drain but would be planned, designed and constructed separate from the Alameda Drain trail improvements.

Within the Alameda Drain corridor the following interventions can be installed at various locations and can serve to improve water quality and create habitat for native plants and wildlife species.

- **Passive water harvesting.** Grading the trail towards a landscaped swale can take advantage of runoff. This will reduce stormwater reaching the Drain, reduce potential pollutants washing into the Drain and reduce bank erosion.
- **Riprap & baffles.** The installation of riprap below the pipe outfall, or baffles within the storm drain pipe, can create turbulences and improve the aeration of storm water. Aeration will serve to increase dissolved oxygen levels which serves to help reduce bacterial populations.
- **Gabions.** Gabions are metal cages, cylinders, or boxes filled with rocks, concrete, or other materials. Gabions prevent erosion, and stabilize river/channel banks. Gabions can be installed along specific Drain sections to stabilize the Drain banks, while providing an opportunity to enhance the water quality and create habitat for native plants and wildlife.
- **In-line treatment.** The installation of in-line treatment systems between street inlets and the outfall to the Drain does lend itself as an opportunity to improve water quality. Installation of storm water quality manholes, engineered tree wells or similar structures could aid in improving water quality discharged from impervious surfaces. Opportunities for treatment of runoff from the improved trail surface are possible.

Directing flow from pavement and other improved trail surfaces into swales, rain gardens and similar Low Impact Design features will be explored.

- **Debris baskets.** Many of the discharges into the Alameda Drain are from discrete pipes tied into existing drop inlets located along the roadway section. A typical approach to addressing such conditions is to install debris baskets at each pipe outlet to prevent trash from entering the Drain. However, modification to the channel section through construction of benches, side channels or similar changes could allow for collection of multiple outlets within a primary treatment channel that would overflow and discharge into the main channel.
- **Large-scale structural BMPs.** BMPs that can address large diameter pipe outfalls from collected drainage systems are also possible. By installing overflow weirs, trash screen barriers and in-line sediment sumps, water quality impacts could be addressed. It may be possible to detain low flows within the existing channel section by installing screens, gabions and similar filtration devices perpendicular to the flow line. Final design would require thorough hydraulic analysis to ensure capacity of the Drain is maintained. Maintenance within the Drain usually consists of excavating and mowing using backhoes, excavators, and brush hogs with extended reach booms. Going forward, structural BMPs under review will consider access with similar equipment available to agencies responsible for maintenance.

SIGNAGE & WAYFINDING

Signage and wayfinding is identified as a key component of this planning effort. Signage and wayfinding plays an important role in the safety of trail users and to connect users with desired destinations. An effective wayfinding system is key to a successful trail framework in which users can orient themselves. It is a goal of this plan to develop a comprehensive signage and wayfinding system that ties existing trails, activity centers and the Alameda Drain & Trail together.

CONSTRAINTS

Existing trails within the corridor and adjacent trail systems lack consistent signage and wayfinding features. This creates a disconnect of trails, activity centers and other destinations.

FIGURE 12. Examples of Trail Signage



Signage Well designed and programmed signage packages will enhance the trail user experience and help the user navigate trail facilities.



DESIGN OPPORTUNITIES

The challenge is to create a system that is consistent at every point in the user's experience to guide their travel to desired destinations.

- **Interpretive signs.** Interpretive signs or exhibits display stories designed to stimulate trail visitors' interest while challenging their imaginations, and perhaps present new perspectives on familiar topics. Through the use of interpretive signage, the trail presents themes that enable visitors to understand more clearly the messages of history, the environment, or a nearly forgotten culture.
- **Information signing.** Information signage that describes the history and purpose of the Drain can be part of the proposed trail improvements.
- **Wayfinding.** Wayfinding signage is concerned with making spaces effectively navigable and allow the user to orient themselves successfully. Good wayfinding signage improves the trail user experience and creates better connectivity between trail networks, activity centers and places of interest.

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3. Master Plan Concepts



This section explores design concepts and trail alignment options to be considered for the final trail design and trail program.

Options detailed here, present an initial set of considerations which in the course of the master planning process are refined.

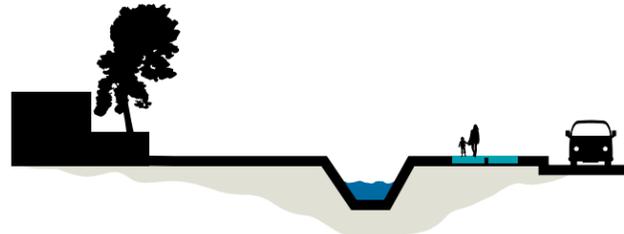
The final master plan concepts represent a smaller, more appropriate list of recommendations that are desired by the community and agencies involved in this project.

3.1 Trail Alignment

The trail alignment discussion details the development of alternatives for the location of the proposed trail. As detailed in the 'Opportunity & Constraints' discussion, private and public property access, availability of right-of-way and existing irrigation ditches create conflict areas that influence the alternative locations for the trail. In the following section, the location of the proposed trail is analyzed and discussed.

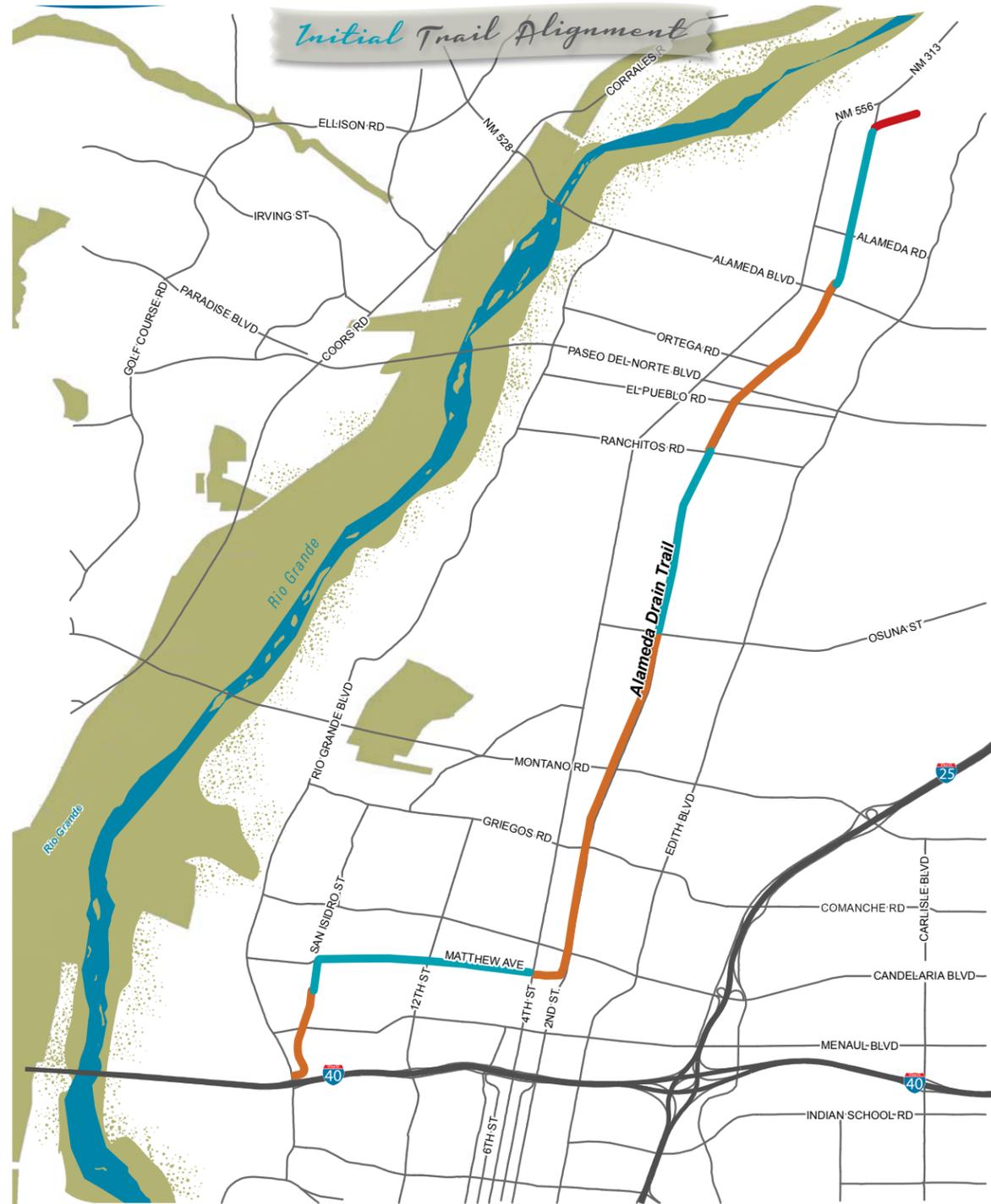
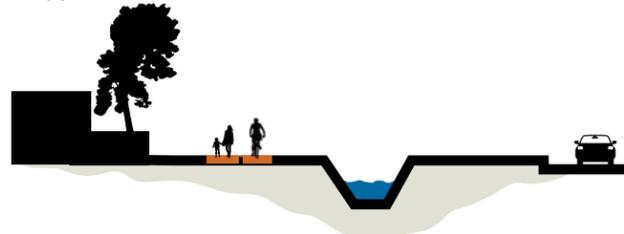
Initial Trail Location East/South side

Looking upstream



Initial Trail Location West/North Side

Looking upstream



LEGEND
 - Proposed trail location left side of the Drain
 - Proposed trail location right side of the Drain

DEKKER PERICH SABATINI

The guiding principles for establishing the trail alignment alternatives are summarized as follows:

GUIDING PRINCIPLES 2. Trail Alignment

- ACCOMMODATE MRGCD MAINTENANCE ACTIVITIES.
- PLACE TRAIL AWAY FROM HEAVY TRAFFIC ON 2ND STREET WHEN POSSIBLE.
- BUFFER TRAIL WITH LANDSCAPING WHEN PARALLEL TO ROAD.
- CREATE IMPROVED TRAIL-ROADWAY INTERSECTIONS
- AVOID CONFLICTS WITH ADJACENT PROPERTY ACCESS.
- AVOID FREQUENT SWITCHING OF TRAIL FROM ONE SIDE OF THE DRAIN TO THE OTHER.

The project team analyzed the Drain's right-of-way on both sides to initially identify where a trail could be accommodated. Private and public access to properties along the Drain was also evaluated and potential areas of conflict were identified. Lateral irrigation ditches and wasteways also influenced the possible location of the trail, as was the preference of trail users to be separated from the noise and potential conflicts associated with heavy vehicular traffic, especially along 2nd Street.

"Table 5. Alameda Drain Right-Of-Way Analysis & Initial Trail Alignment" on page 19, illustrates the widths available on each side of the Drain, and was used to guide the project team's initial trail alignment as illustrated in the figure to the left. In identifying where adequate width was available for the trail, the project team established a trail width of twelve feet with two foot wide compacted shoulders on each side, accompanied by a MRGCD maintenance road.

In areas where the right-of-way is constrained the trail may be narrowed to ten feet. In constraint circumstance the maintenance road may also be narrowed, however, MRGCD strongly recommends a maintenance access road of 15 feet where possible. When this cannot be achieved, the trail will be used to perform maintenance activities. Generally the trail should be located at least eight feet away from the Drain.

Following development of the Initial Alignment, a field review was conducted by the project team in an effort to identify existing conditions other than available right-of-way that would warrant consideration of alternative alignments. As will be discussed in the following segment alignment sections, this effort identified areas where alignment alternatives will be considered.

Alignment alternatives were not considered along some portions of the Drain in the following conditions and for the following reasons:

- Areas where existing licensed uses make one side of the Drain inaccessible.
- Areas where existing widths, especially between the Drain and either Matthew Avenue or 2nd Street, are insufficient to support the desired width for the trail.
- In areas where taking advantage of a wider side would result in the trail being “pinched” between 2nd Street and the Drain at a major intersection.
- In an effort to avoid frequent shifting of the alignment from one side to the other.

Further coordination with MRGCD and a bike tour of the corridor by the project team identified additional alignment alternatives. Alternatives took into consideration the following:

- Areas where narrower maintenance roads are considered acceptable because maintenance operations could be conducted from one side of the drain or from a trail adjacent to the Drain requiring a maintenance road on only one side of the Drain.
- Sight distance for trail users and motorists at trail intersections with minor streets and driveways.
- The trail user experience regarding noise levels, vehicular traffic and possible trail amenities.

The resulting trail alignment alternatives will be discussed in the following segment alignment sections.

TABLE 5. Alameda Drain Right-Of-Way Analysis & Initial Trail Alignment

	APPROXIMATE AVERAGE DRAIN CORRIDOR WIDTHS (FEET)									Factors Considered in Initial Alignment Selection
	From	to	Other Description	North Side			Drain	East/South Side	Total	
				Parallel Lateral						
SEGMENT - I-40 TO MILDRED	I-40	Rio Grande				45	41	31	117	No trail in this area; start trail east of Rio Grande
	Rio Grande	Lilac				47	29	21	97	More width available on north/west side; possible future development on east side south of Lilac; licensed drive north of Indian School on east side
	Lilac	Indian School	Zearing Lateral begins 120' S. of Indian School			25	36	20	81	
	Indian School	Abq. Acequia	Zearing Lateral ends at Abq. Acequia			30	41	20	91	Narrow section north of Abq. Acequia on west side; good area to cross to east side so can transition to Matthew trail on south side; existing trail on Matthew on south side; keep trail on south side to 4th
	Abq. Acequia	Matthew				38	46	32	116	
	Matthew	12th				17	46	30	93	
	12th	Griegos Acequia	Begin Griegos Acequia			14	46	48	108	
	Griegos Acequia	Garfield Elem.	End Griegos Acequia	25	16	12	39	38	89	
	Garfield Elem.	4th				18	42	35	95	
	4th	2nd				36	33	41	110	
2nd	Mildred				39	40	40	119		
SEGMENT - MILDRED TO MONTAÑO	Mildred	Shropshire				24	31	42	97	South of Candelaria North of Candelaria
	Shropshire	Veranda	Through Candelaria intersection			32	31	13	76	
	Veranda	S. of Griego				23	30	16	69	
	S. of Griego	Pleasant	Through Griego intersection			22	30	46	98	More consistent width available on west side; vary narrow on east side at major intersections
	Pleasant	Hilton	Start Gallegos Lateral			21	29	48	98	
	Hilton	S. of Montaña		15	17	27	32	14	73	
	S. of Montaña	Sandia	Through Montano intersection; Drain concrete lined on east side	13	20	28	36	11	75	
				17	16	66	42	40	148	
					37	37	40	146		
					38	35	20	126		
					36	40	12	121		

Legend
■ Initial Trail Location - Left (West or North)
■ Initial Trail Location - Right (East or South)

TABLE 6. Alameda Drain Right-Of-Way Analysis & Initial Trail Alignment (Cont.)

			APPROXIMATE AVERAGE DRAIN CORRIDOR WIDTHS (FEET)						Factors Considered in Initial Alignment Selection	
From	to	Other Description	North Side			Drain	East/South Side	Total		
				Parallel Lateral						
SEGMENT - MONTAÑO TO PASEO DEL NORTE			16	20	34	35	11	116		
			17	22	37	27	14	117		
	Sandia	N. of El Caminito	End Gallegos Lateral	16	21	36	37	43	153	
	N. of El Caminito	Willow				29	32	40	101	
						29	34	40	103	
	Willow	Nara Visa	Through Osuna intersection			31	32	13	76	South of Osuna
						36	32	16	84	North of Osuna
	Nara Visa	Los Ranchos	South of Green Valley			32	34	44	110	
						21	43	40	104	More width available on east side; avoids multiple primary access drives on west side
						26	36	43	105	
						25	38	40	103	
	Los Ranchos	Ranchitos			40	33	46	119		
	Ranchitos	El Pueblo	Drain concrete lined on east side			41	32	24	97	More width available on west side
					36	38	21	95		
					38	42	17	97		
El Pueblo	Sena	Drain underground through PdN interchange			--	--	24	24	Width between parking lot and 2nd St curb	
SEGMENT - PASEO DEL NORTE TO N DIVERSION CHANNEL	Sena	Cielito Lindo	Start Derramadera Wasteway	11	12	15	39	28	105	Nicer trail setting on west side between Derramadera Wasteway and Drain
				13	11	16	40	40	120	
	Cielito Lindo	S. of Alameda	End Derramadera Wasteway approximately 350' north of Cielito Lindo	12	14	47	35	27	135	More consistent width available on left
						36	33	30	99	
						51	42	27	120	
	S. of Alameda	Sandia	Through Alameda intersection			52	46	18	116	South of Alameda
						41	37	21	99	North of Alameda
	Sandia	2nd	Start Alameda Wasteway approximately 220' south of Alameda Road; Alameda Wasteway crosses Drain and 2nd Street approximately 800' north of North Court			58	38	49	145	Avoids primary access drives on left
						36	32	60	128	
						45	27	62	134	
					55	31	58	144		
2nd	Cynthia				22	26	39	87	Avoids secondary access drives on right	
					43	28	45	116		
Cynthia	NDC				43	37	37	117	No trail in this area; end trail at Cynthia Loop	

Legend

- Initial Trail Location - Left (West or North)
- Initial Trail Location - Right (East or South)



1. TRAIL ALTERNATIVES - INTERSTATE 40 TO MILDRED

Segment I-40 (Rio Grande Boulevard) to Mildred Avenue

The length of the segment from Rio Grande Boulevard to Mildred Avenue is approximately 2.4 miles. The initial trail alignment included the section of the Drain west of Rio Grande Boulevard. After a field review it was determined that a trail in this area will not, currently or in the future, provide a connection to other existing or planned trails, so it was decided to eliminate this section and start the master planned trail on the east side of Rio Grande Boulevard. Starting at Rio Grande Boulevard provides a connection to the existing bicycle lanes on Rio Grande, the I-40 trail on the south side of I-40 east of Rio Grande, and the I-40 trail west of Rio Grande using the bike route along Aspen Avenue. From the Rio Grande bike lanes access to the Bosque Trail is possible using Floral Road and Duranes Road.

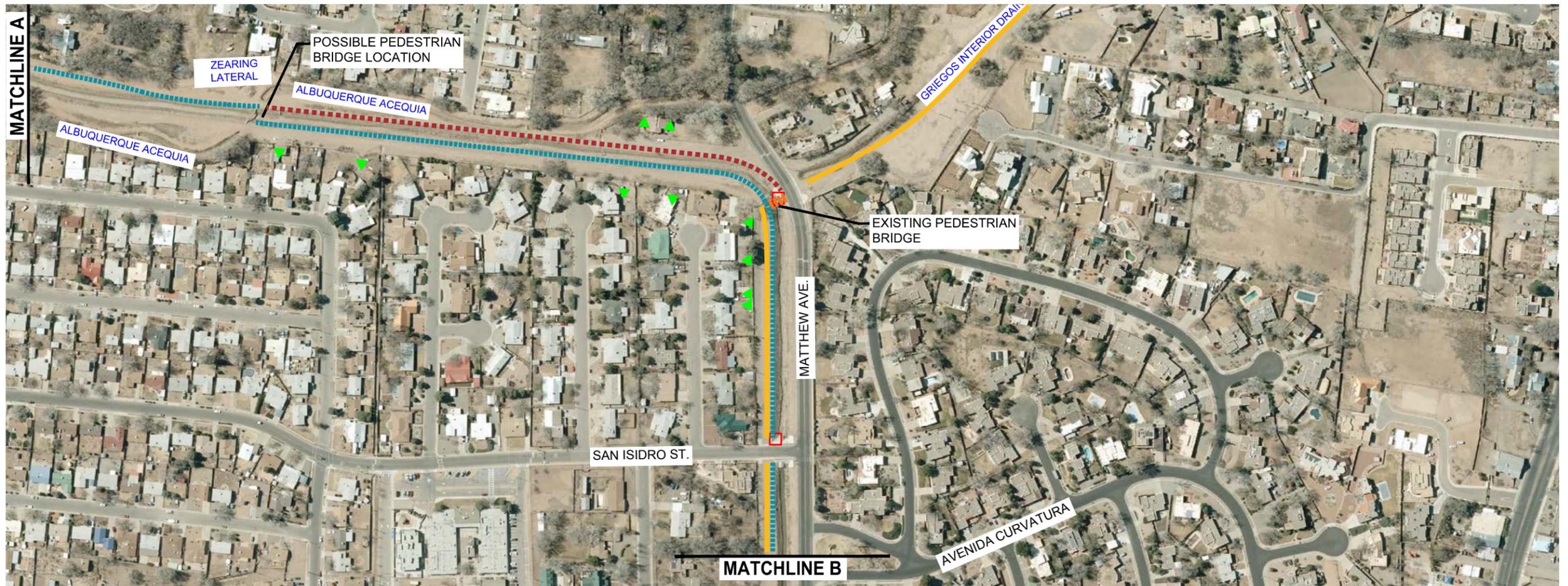
For the trail section from Rio Grande Boulevard to north of Indian School Road, the Initial Alignment located the trail on the west side of the Drain. The west side alignment was initially selected because of the available width and because the trail would need to be on the west side north of the Indian School Road crossing to avoid a gated/licensed residential drive on the east side of the Drain.

Following coordination with a property owner proposing to redevelop the property adjacent to the east and west sides of the Drain between Rio Grande Boulevard and Lilac Drive, **Alignment Alternative 1 (AA-1)** was identified. AA-1 includes moving the trail to the east side of the Drain within the proposed development (Rio Grande Boulevard to Lilac Drive), or could include trails and amenities along both sides of the Drain. The trail would then shift back to the west side between Lilac Drive and Indian School Road.

Legend

- - - Initial trail alignment
- - - Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





2. TRAIL ALTERNATIVES - INTERSTATE 40 TO MILDRED

Approximately midway between Indian School and Matthew Avenue the Albuquerque Acequia crosses the Drain. The Initial Alignment identified this as a possible location to cross the trail over the Drain to the east side. By doing so, the trail would then align with the existing trail on the south side of the Drain along Matthew Avenue. Trail users could then use the existing pedestrian bridge over the Drain at Matthew Avenue as they currently do to access the Griegos Lateral trail to the north or the existing bike lanes along Matthew Avenue.

Following a field review, **Alignment Alternative 2 (AA-2)** was identified and would continue the trail on the west side of the Drain north of the Albuquerque Acequia to Matthew Avenue. Trail users along AA-2 would then use the existing bridge at Matthew Avenue to cross the Drain to access the Matthew Avenue trail on the south side of the Drain.

The west side of the Drain right-of-way near Matthew Avenue is currently used by the MRGCD for vehicle access and parking for maintenance operations. This existing use would need to be accommodated with AA-2. AA-2 would also need to connect to the north side of the existing pedestrian bridge over the Drain at Matthew Avenue. The separation between the Matthew curb and gutter and the Drain is constrained at approximately four feet wide at the bridge which would make development of a pedestrian access route to the existing pedestrian bridge difficult. Crossing the Drain at the acequia as with the Initial Alignment would provide an opportunity for aesthetic features and potentially an improved experience for trail users. This alternative would however have a relatively higher construction cost than AA-2 due to the cost of the Drain crossing structure at the acequia.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





3. TRAIL ALTERNATIVES - INTERSTATE 40 TO MILDRED

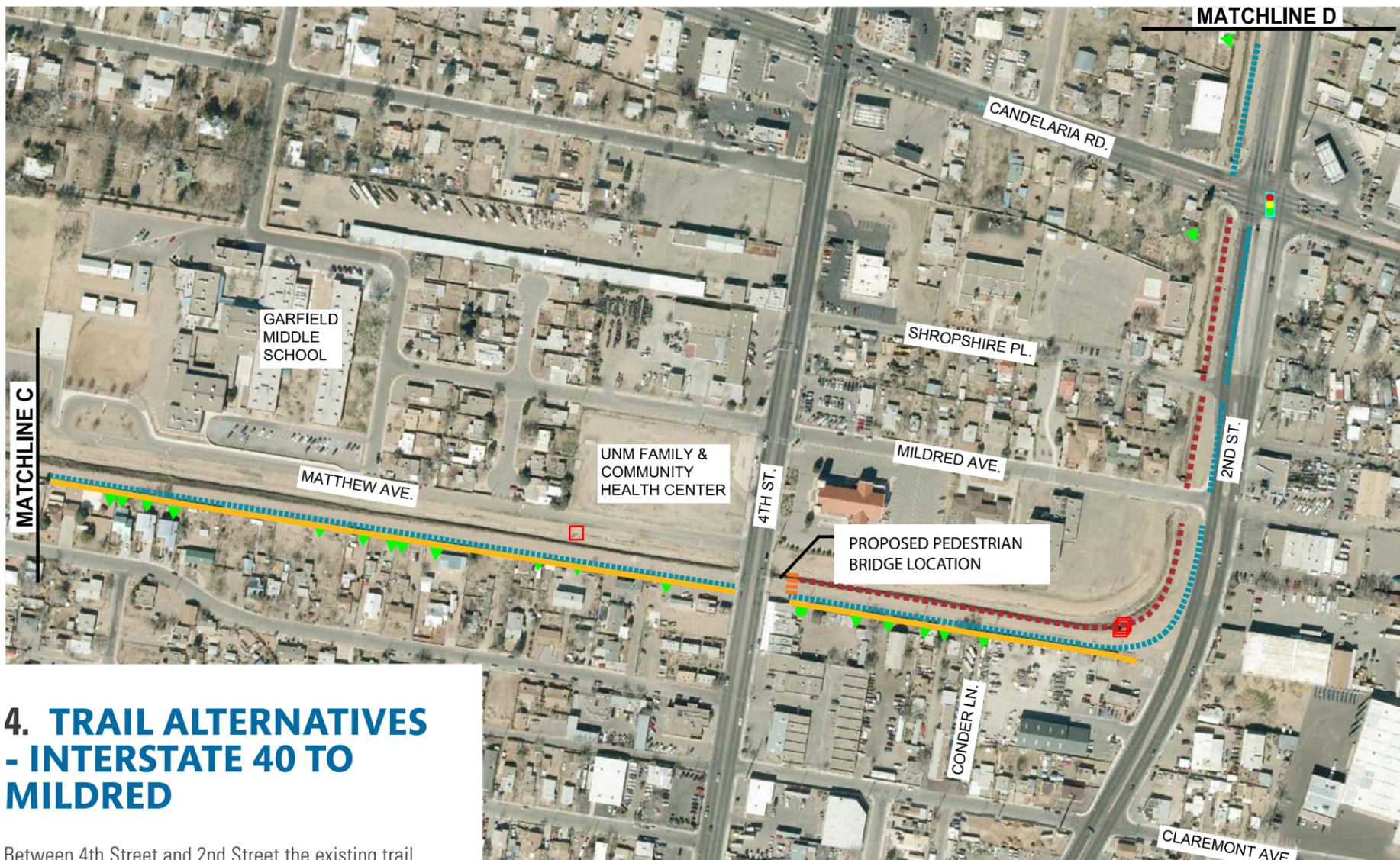
The section that follows Matthew Avenue, a distance of approximately 1.5 miles, currently has a paved trail along the south side of the Drain. Between the west end of the Matthew alignment and 4th Street there is insufficient width along most of the north side to adequately accommodate a trail, so the Initial Alignment is to keep the trail on the south side of the Drain. The trail would intersect with San Isidro Street approximately 650 feet east of the existing pedestrian bridge, and with 12th Street approximately 2,800 feet further east. There are 19 gated, secondary access drives to properties south of the Drain right-of-way between the west end of the Matthew alignment and 12th Street.

From 12th Street to 4th Street, a distance of approximately 3,300 feet, there are no minor streets that intersect with the Drain. There are 16 gated/secondary access drives and two primary access drives to properties south of the drain right-of-way.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- ▬ Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





4. TRAIL ALTERNATIVES - INTERSTATE 40 TO MILDRED

Between 4th Street and 2nd Street the existing trail continues on the south side of the Drain, ending at 2nd Street. The Initial Alignment has the trail on the south side of the Drain since there is adequate width available for a trail and maintenance road, and it provides reasonable access to the bike route along Claremont Avenue one block to the south on 2nd Street. From the intersection at 2nd Street the Initial Alignment follows the east side of the Drain north to Mildred Avenue.

Field investigation indicated that a considerable amount of vehicular traffic uses the area along the south side of the Drain between 4th Street and 2nd Street for access to properties south of the Drain right-of-way, and for access to and from Conder Lane, an alley-like street

between the Drain and Claremont Avenue. There is considerable rutting of the dirt area next to the existing trail and it is evident that vehicles are driving on the existing paved trail as well. Because of the vehicular activity in this area, **Alignment Alternative 3 (AA-3)** was identified which would move the trail to the north side of the Drain at 4th Street. The trail would follow the curve of the Drain and intersect with Mildred Avenue.

With the trail on the north side of the Drain east of 4th Street trail users would not be affected by vehicles accessing driveways and Conder Lane, which would improve the user experience and reduce the possibility for conflicts between trail users and motorists. Construction costs would be higher for AA-3 since the pedestrian crossing of the Drain at 4th Street would require a pedestrian bridge since there is not sufficient width in the existing 4th Street crossing of the Drain. The pedestrian crossing of 4th Street may warrant signalization so this location should be evaluated for a pedestrian hybrid beacon (HAWK) during design development for either the Initial Alignment or AA-3.

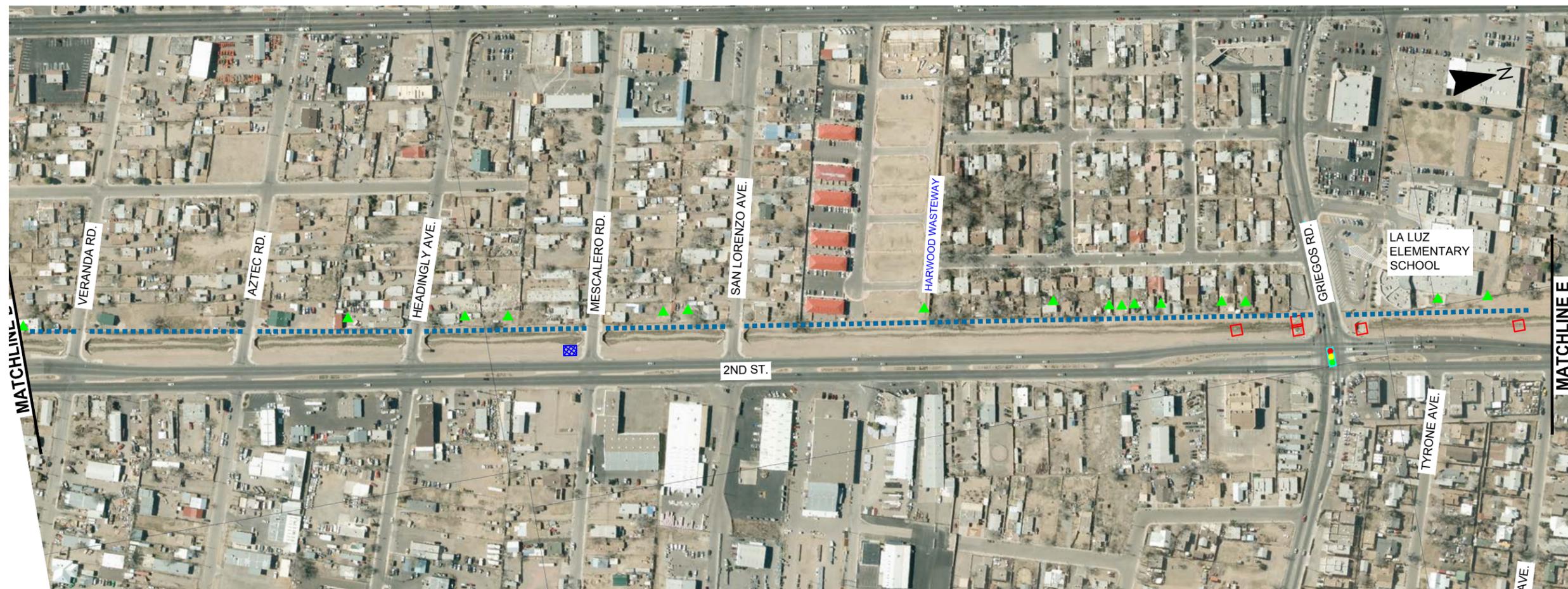
Segment Mildred Avenue to Montañó Road

The Mildred Avenue to Montañó Road segment is approximately 1.5 miles long. The Initial Alternative alignment for the section from Mildred to Candelaria has the trail on the east side of the Drain, extending north from the Initial Alignment south of Mildred Avenue. This alignment provides a direct connection to the Candelaria intersection crosswalk and provides an improved walking surface to the existing bus stop located between Shropshire Place and Candelaria. The existing width between Shropshire and Candelaria is only wide enough for a paved trail immediately adjacent to the curb and gutter on 2nd Street.

Alignment Alternative 4 (AA-4) which has the trail on the west side of the Drain from Mildred to Candelaria was identified as a continuation of AA-3. There is sufficient width to accommodate the trail and a maintenance road on the west side. There is one secondary access driveway to an adjacent private property that would need to be accommodated with AA-4. The existing culvert for the Drain on the south side of Candelaria would need to be extended to provide adequate width to cross the trail from the west side alignment to the intersection crosswalk. This would increase the construction cost of AA-4 relative to the Initial Alignment on the east side.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed



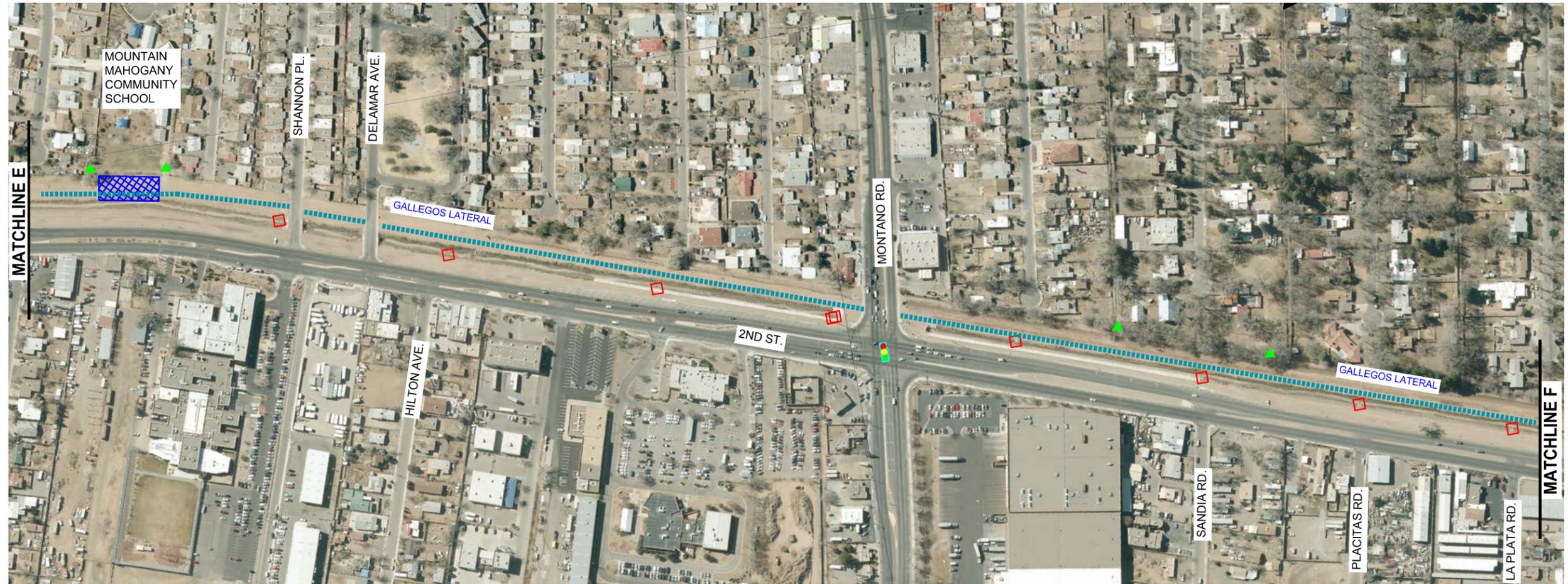
5. TRAIL ALTERNATIVES - MILDRED TO MOÑTANO

In the section from Candelaria Road to Griegos Road the Initial Alignment is to have the trail on the west side of the Drain. Although this side is narrower between Candelaria and Griegos Road there is adequate space for a trail and maintenance road. The maintenance road in this section would need to also serve as an access road to serve 14 secondary access drives to adjacent properties. These drives do not include a Drain crossing. There are five minor streets in this section that cross the Drain and intersect with 2nd Street.

Legend

- - - Initial trail alignment
- - - Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





6. TRAIL ALTERNATIVES - MILDRED TO MONTAÑO

North of Griegos to Montañó the west side widens considerably providing adequate width for the trail and maintenance road. There are two minor streets and four secondary access drives in this section. The west Drain right-of-way is used for student drop-off/pick-up at Mountain Mahogany Community School which is located west of the Drain right-of-way approximately 950 feet north of Griegos Road. Parents access the Drain right-of-way from either Shannon Place north of the school or Griegos to the south. The Drain right-of-way is approximately 60 feet wide in the area of the school so there may be sufficient room to continue to accommodate this use but measures would need to be considered to address potential conflicts between motorists and trail users.

The Gallegos Lateral extends from north of Delamar Avenue to the Montañó Road intersection on the west side of the Drain. There is sufficient space between the Lateral and the Drain to accommodate a trail and maintenance road. At the Montañó intersection there is sufficient space to cross the trail over the drain to access the intersection crosswalk.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





7. TRAIL ALTERNATIVES - MONTAÑO TO PASEO DEL NORTE

The segment from Montaño to Paseo del Norte is approximately 2.8 miles long. The Initial Alignment identified the west side of the Drain for the trail from Montaño to Osuna Road. This side has a more consistent width throughout the section that is adequate for the trail and maintenance road. The Gallegos Lateral runs along the west side of the Drain right-of-way from Montaño to just south of Vineyard Road, a distance of approximately 3,200 feet. There is sufficient space between the Lateral and Drain for the trail and a maintenance road. There are five primary access drives and four secondary access drives in this section.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- ▨ Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





8. TRAIL ALTERNATIVES - MONTAÑO TO PASEO DEL NORTE

From Osuna Road to Ranchitos Road, a distance of approximately 1.4 miles, the Initial Alignment was proposed to shift the trail to the east side of the Drain. The main reasons for shifting the trail was to avoid the primary access locations to properties west of the Drain right-of-way and there is adequate width available. There are 14 primary access drives to properties in this section where access requires driving along the Drain for ingress/egress. There are an additional 11 secondary drives and 10 drives with licensed Drain crossings in this section. Moving the trail to the east side of the Drain would reduce the potential for conflicts between trail users and property owners using the Drain right-of-way to access their properties.

Alignment Alternative 5 (AA-5) was identified following the second field review and would keep the trail on the west side of the Drain between Osuna and Ranchitos. The

field review involved touring both sides of the Drain on bicycle. It was apparent from the field review that the west side of the Drain is much quieter than the east side due to the increased separation from 2nd Street. This would provide a more pleasant experience for the trail user but would require design measures that would mitigate the potential for conflicts between trail users and motorists. Another advantage to the AA-5 alignment is the increased separation between the trail crossings of minor side streets and driveways, and the 2nd Street intersections. Increasing the separation of the trail crossing from the functional area of the 2nd Street intersection improves the visibility of trail users to motorists, by allowing motorists to focus on the trail intersection and the vehicular intersection separately.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed





9. TRAIL ALTERNATIVES - MONTAÑO TO PASEO DEL NORTE

The Initial Alignment from Ranchitos Road to El Pueblo Road placed the trail on the west side of the drain since the width available is greater than on the east side. An east side alignment for the trail would function as a two-way sidepath, a shared-use path adjacent to a roadway, along 2nd Street with only 17 feet to 24 feet available for the trail and amenities. The close proximity of an east side trail to 2nd Street and concerns for trail user visibility at the minor street crossings, as previously mentioned, make an east side alignment less desirable than a west side alignment. The Drain is concrete lined on the east side which eliminates the need to use large maintenance equipment on that side.

- Legend**
- Initial trail alignment
 - Alignment alternative 1
 - Existing multi-use trail
 - Unlicensed parking
 - Drainage inlet
 - Primary access-licensed
 - Primary access-unlicensed
 - ▲ Secondary access-licensed
 - ▲ Secondary access-unlicensed





10. TRAIL ALTERNATIVES - PASEO DEL NORTE TO SANDIA PUEBLO (CYNTHIA LOOP)

The section from Paseo del Norte to Alameda Boulevard is approximately 1.0 mile long and the section from Alameda Boulevard to the Sandia Pueblo Boundary at Cynthia Loop is approximately 1.3 miles, for a total segment length of 2.3 miles. The Initial Alignment for the section from Paseo del Norte to Alameda was to place the trail on the west side of the Drain. For the first 2,400 feet of this section the Derramadera Wasteway parallels the west side of the Drain right-of-way. Placing the trail between the Drain and Wasteway was initially selected to provide separation from 2nd Street and for the natural setting of the area.

Alignment Alternative 7 (AA-7) was identified following further coordination with MRGCD, and would place the trail on the east side of the Drain from Paseo del Norte to Cielito Lindo Place. The MRGCD expressed concerns that the width available west of the Drain is not sufficient to provide for the trail and an access road suitable for maintenance and operation of the Derramadera Wasteway by their Ditchriders. The width between the Drain and Wasteway varies from 12 to 15 feet with separation as narrow as eight feet at the three intersecting streets and drives in this section.

Except for immediately north of the southbound to west-bound on ramp from 2nd Street to Paseo del Norte, there is sufficient width along the east side of the Drain to accommodate a trail and maintenance road. Immediately north of the on ramp the width on the east side of the

Drain is only 11 feet, increasing to 19 feet wide approximately 100 feet north of the on ramp. There is a large drainage structure immediately north of the on ramp that consists of a storm drainage inlet into the Drain from the west, a drainage gate structure, and the channel lining for the culvert pipe that extends under the Paseo del Norte interchange.

The east side of the Drain widens to approximately 30 feet wide to the north and remains that wide for most of the stretch to Cielito Lindo Place. The existing culvert under Cielito Lindo Place would need to be extended or a pedestrian bridge installed at Cielito Lindo to cross the trail over the Drain to the west side. At the Cielito Lindo intersection the width available for the trail on the east side is about 20 to 25 feet.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed





11. TRAIL ALTERNATIVES - PASEO DEL NORTE TO SANDIA PUEBLO (CYNTHIA LOOP)



The Initial Alignment for the trail north of Alameda Boulevard to where the Drain crosses at 2nd Street, a distance of approximately 1.2 miles, was identified as being located on the east side of the Drain. Although both sides of the Drain currently provide adequate width to accommodate the trail and a maintenance road, the east side has several clusters of mature trees that would enhance the look of the trail and provide shady resting areas for trail users. Identifying the east side for the Initial Alignment also considered that there are lower traffic volumes along this two-lane stretch of 2nd Street north of Alameda Boulevard which makes traffic noise less of an issue.

From the 2040 Metropolitan Transportation Plan, there are plans to widen 2nd Street to add a two-way left-turn lane and bicycle lanes. These improvements could

narrow the available space for a trail on the east side of the Drain by as much as 26 feet depending on how the widening is accomplished. If the road was widened exclusively to the west, there would still be sufficient width between the Drain and road to accommodate a trail and maintenance road. The east side trail would, however, end up being closer to the widened 2nd Street.

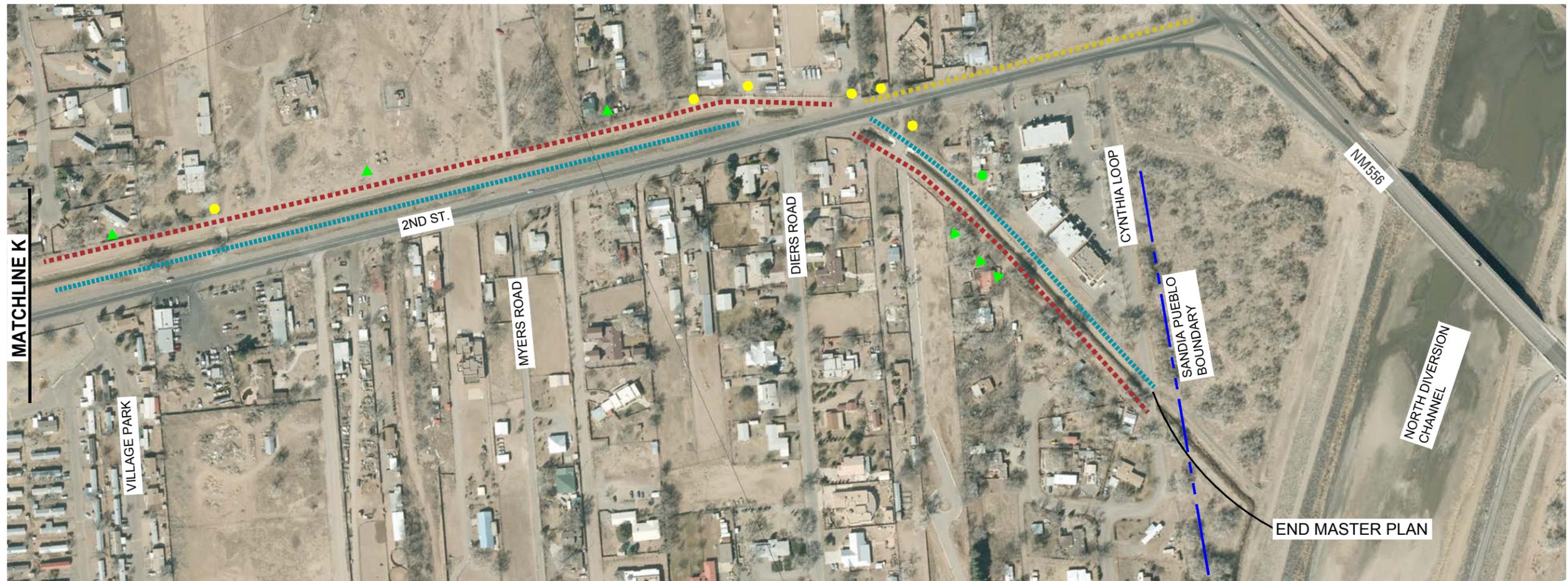
There are 16 primary access drives and ten secondary access drives to properties west of the Drain right-of-way in this section. There are three minor street crossings of the Drain and eleven driveways have Drain crossings.

Alignment Alternative 6 (AA-6) was identified following the field reviews and would place the trail

along the west side of the Drain from Alameda to the 2nd Street Drain crossing. As previously stated, there is adequate width on the west side of the Drain making this a feasible alternative. The west side trail alignment would not be significantly affected by the future 2nd Street widening.

Legend

- Initial trail alignment
- Alignment alternative 1
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed



12. TRAIL ALTERNATIVES - PASEO DEL NORTE TO SANDIA PUEBLO

North of the 2nd Street Drain crossing to the end of the project at Cynthia Loop, a distance of approximately 0.2 miles, the trail could be on either side of the Drain. The Drain in this area turns away from 2nd Street and is bound by residential and light commercial properties. The Initial Alignment placed the trail on the west side of the Drain.

There is one primary access drive on the west side of the Drain and the width ranges from approximately 20 to 40 feet. At the Cynthia Loop intersection there is an area that could serve as a trail head on the west side.

Another consideration north of the 2nd Street crossing is to extend a trail to the 4th Street/NM 556 intersection, approximately 1,000 feet north. This would provide a connection to the north that could serve the Sandia Pueblo area, Bernalillo and northeast Albuquerque.

Alignment Alternative 8 (AA-8) was identified on the east side in this section since both sides of the Drain have sufficient width and similar conditions that would accommodate the trail and maintenance activities. The width available on the east side ranges from approximately 30 to 45 feet. The current maintenance and access road on the east side is 12 to 15 feet wide but there is considerably more space east of the maintenance road and to the adjacent property fences and walls, that likely is part of the District's property. There are three secondary access drives on the east side.

Legend

- Initial trail alignment
- Alignment alternative 1
- Possible Trail Extension
- Existing multi-use trail
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed



North

3.2 Trail Cross Section & Surface Alternatives

The trail cross-sections illustrate the possible location of the multi-use trail, landscape areas and the maintenance access road, within the available right-of-way.

The context map indicates the area to which each cross section applies.

Cross-sections are for illustrative purposes and may not capture all existing conditions along the Drain.

FIGURE 13. Segment 1 - Typical Trail Section A

General characteristics:

- No existing official trail
- No formalized parallel road

Within the first stretch of Segment 1, between Rio Grande and Indian School, the Initial Trail Alignment was placed on the west side of the Drain.

This section illustrates the trail on the west side along with right-of-way reserved for an unimproved maintenance/access road on both sides. An Alignment Alternative (AA-1) was identified for this stretch, placing the trail on the east side.

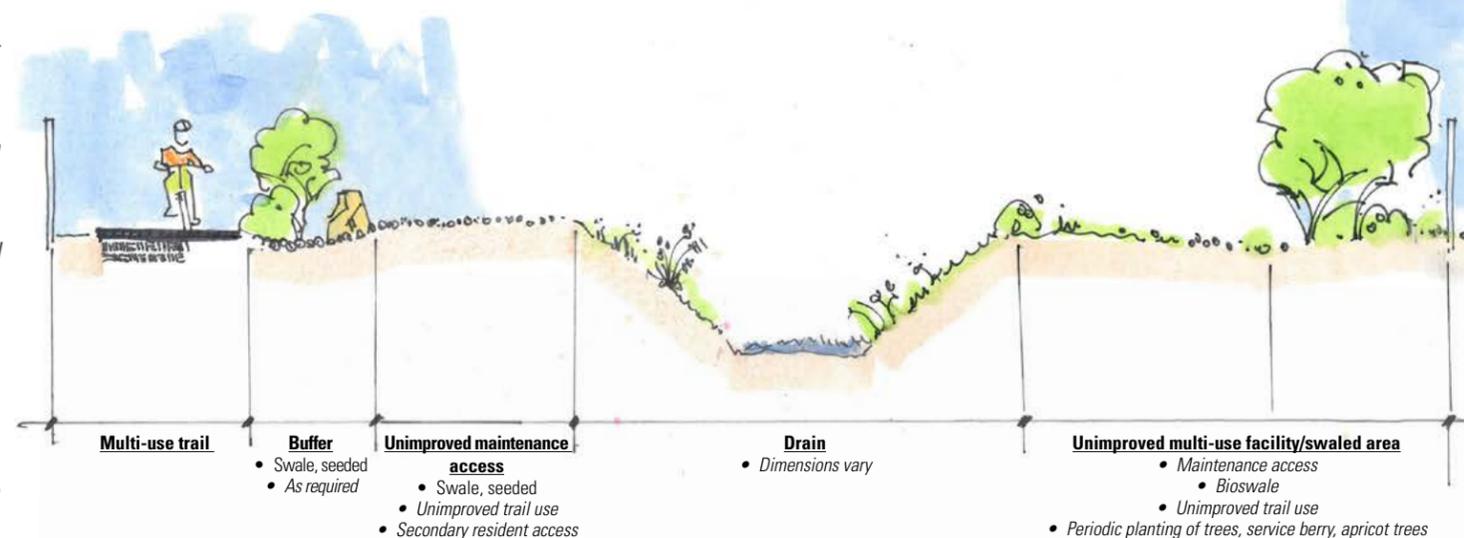


FIGURE 14. Segment 1 - Typical Trail Section B

General characteristics:

- No existing official trail
- No formalized parallel road

Further to the north, between Indian School and Matthew, the Initial Trail Alignment was placed on the west side. Where the Albuquerque Acequia crosses the Drain, the trail was to crossover to the east side to align with the existing trail along Matthew.

An Alignment Alternative (AA-2) which would maintain the trail on the west side to Matthew, and crossing the Drain at the Griegos Interior Drain, was identified.

This section illustrates the trail on the east side of the Drain after crossing from the west side.

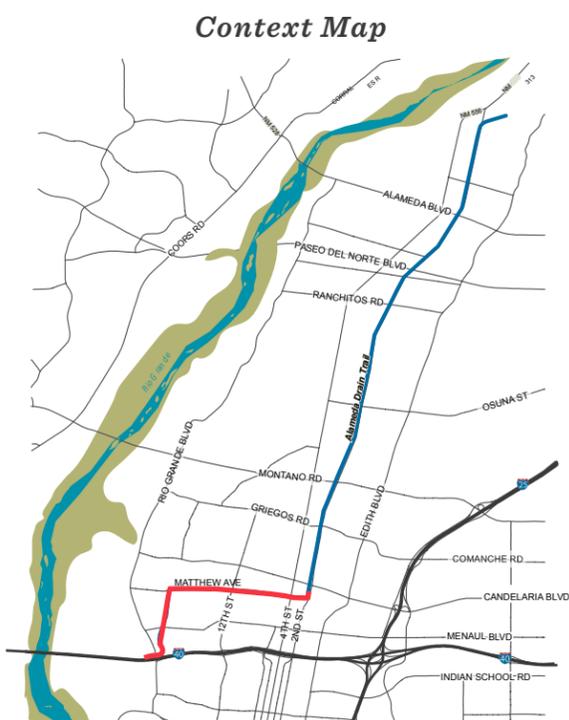
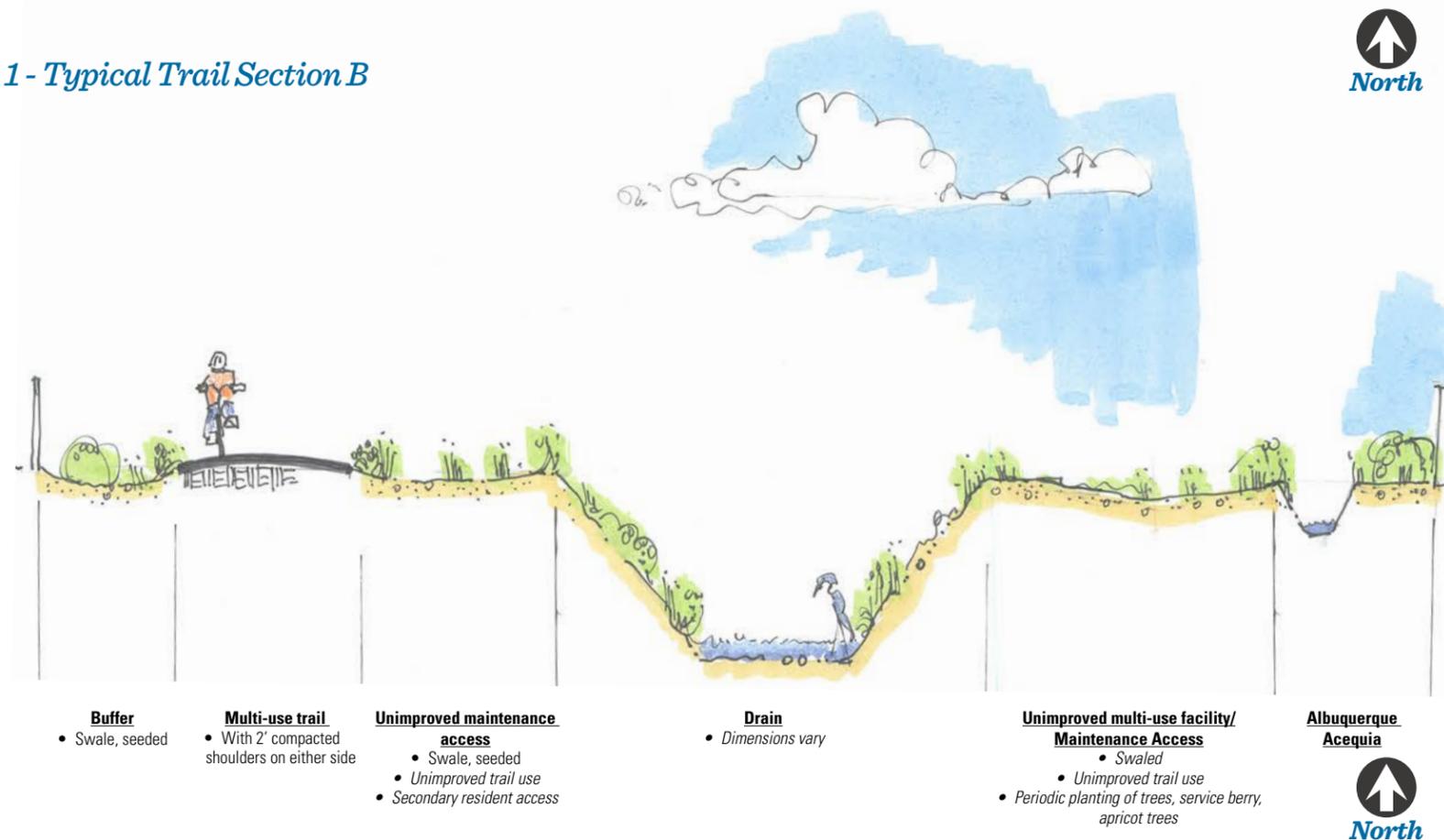


FIGURE 15. Segment 1 - Typical Trail Section C

General characteristics:

- Existing trail on south side of Drain
- Matthew running parallel to the Drain

Note: this illustration places the trail on the south side of the Drain. However, it is also possible to create a path on the north side, between 4th and 2nd Street.

The Initial Trail Alignment between the Griegos Interior Lateral and 4th Street located the trail on the south side of the Drain, where the existing trail is placed.

This section illustrates the trail on the south side along with right-of-way reserved for an unimproved maintenance access road.

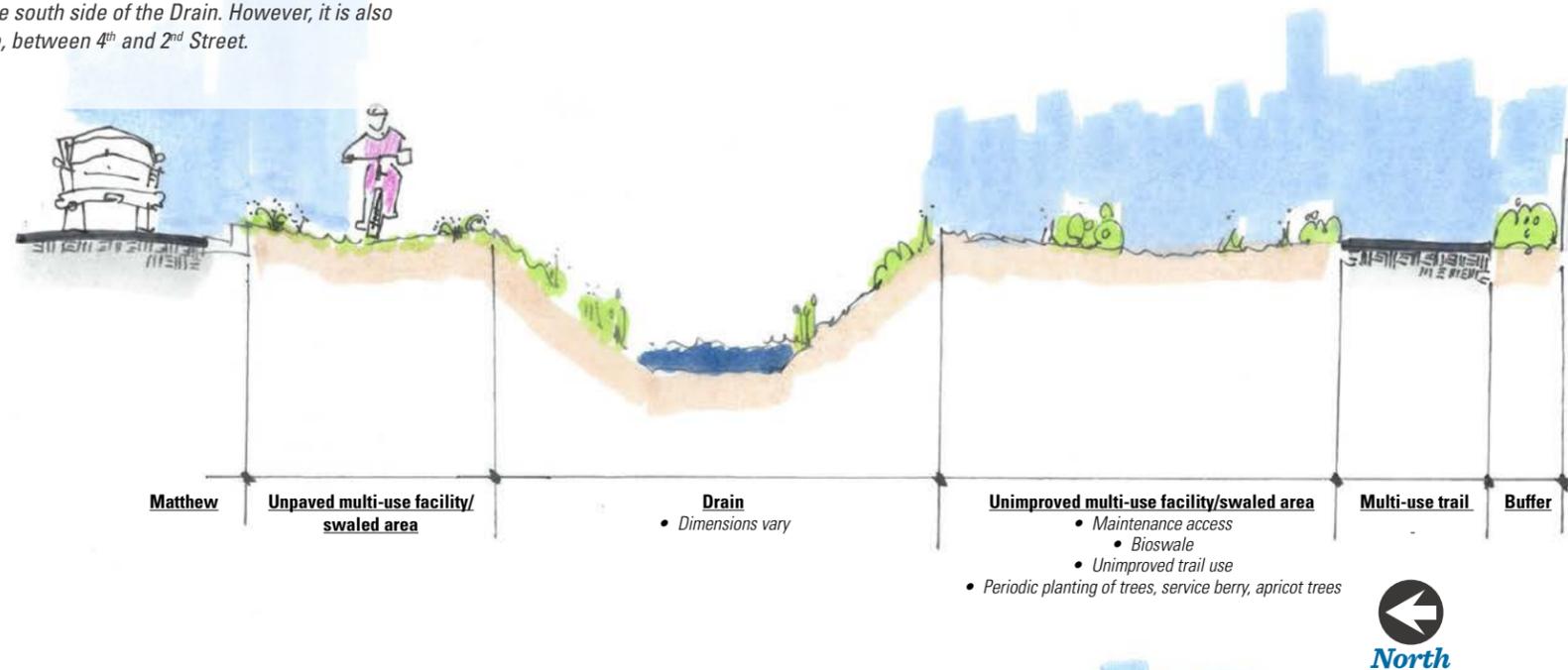


FIGURE 16. Segment 1 - Typical Trail Section D

General characteristics:

- No existing official trail
- No formalized parallel road

Within the last stretch of Segment 1, between 4th Street and 2nd Street, the Initial Trail Alignment placed the trail on the south side of the Drain with the existing trail. However, further analyses resulted in an Alignment Alternative (AA-3) placing the trail on the north side.

This section illustrates the AA-3 with the trail on the north side of the Drain.

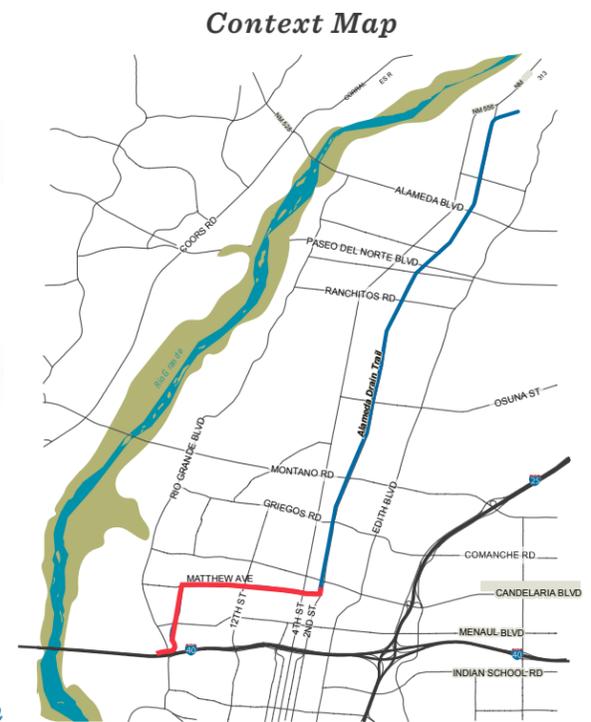
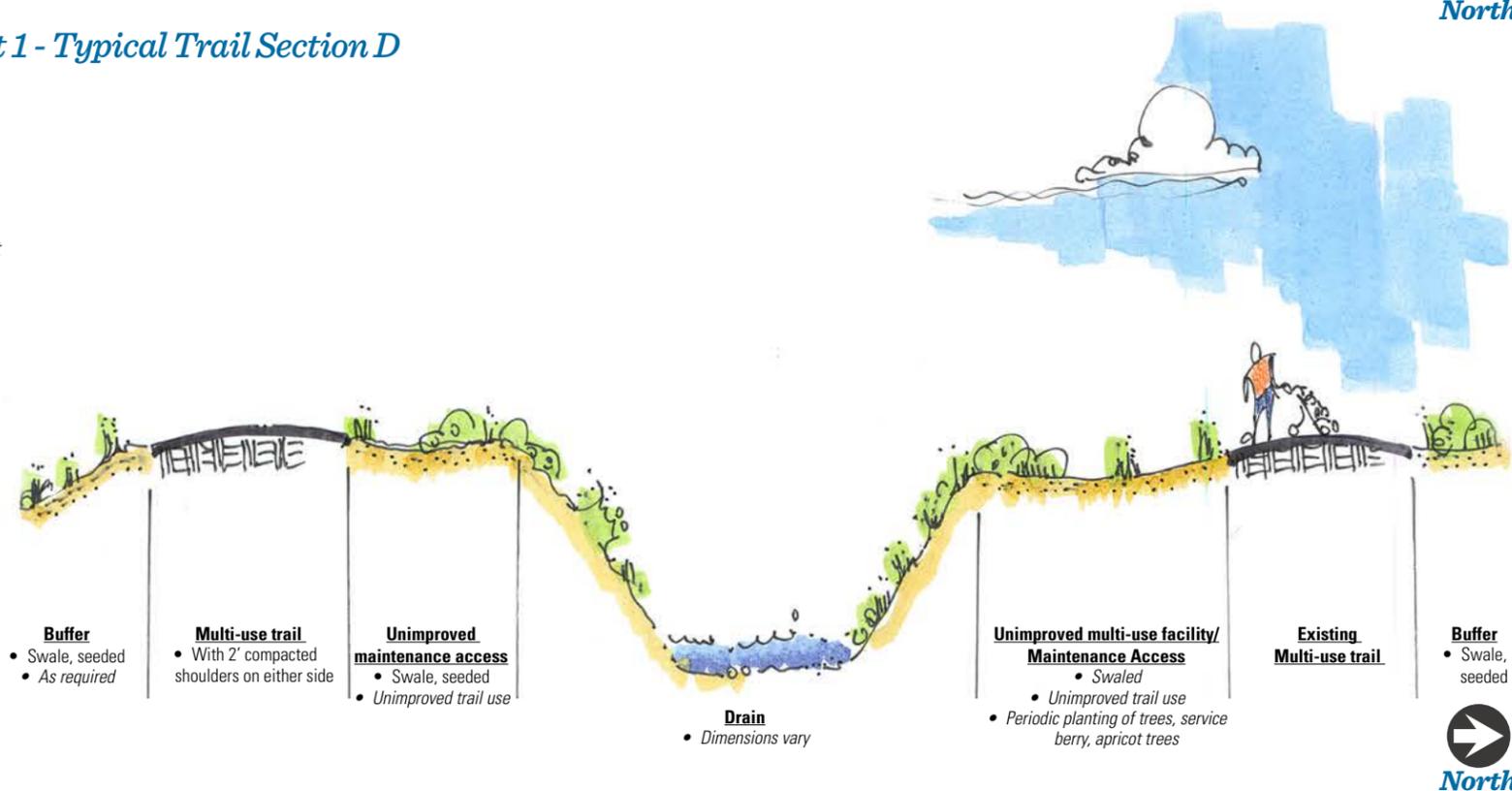


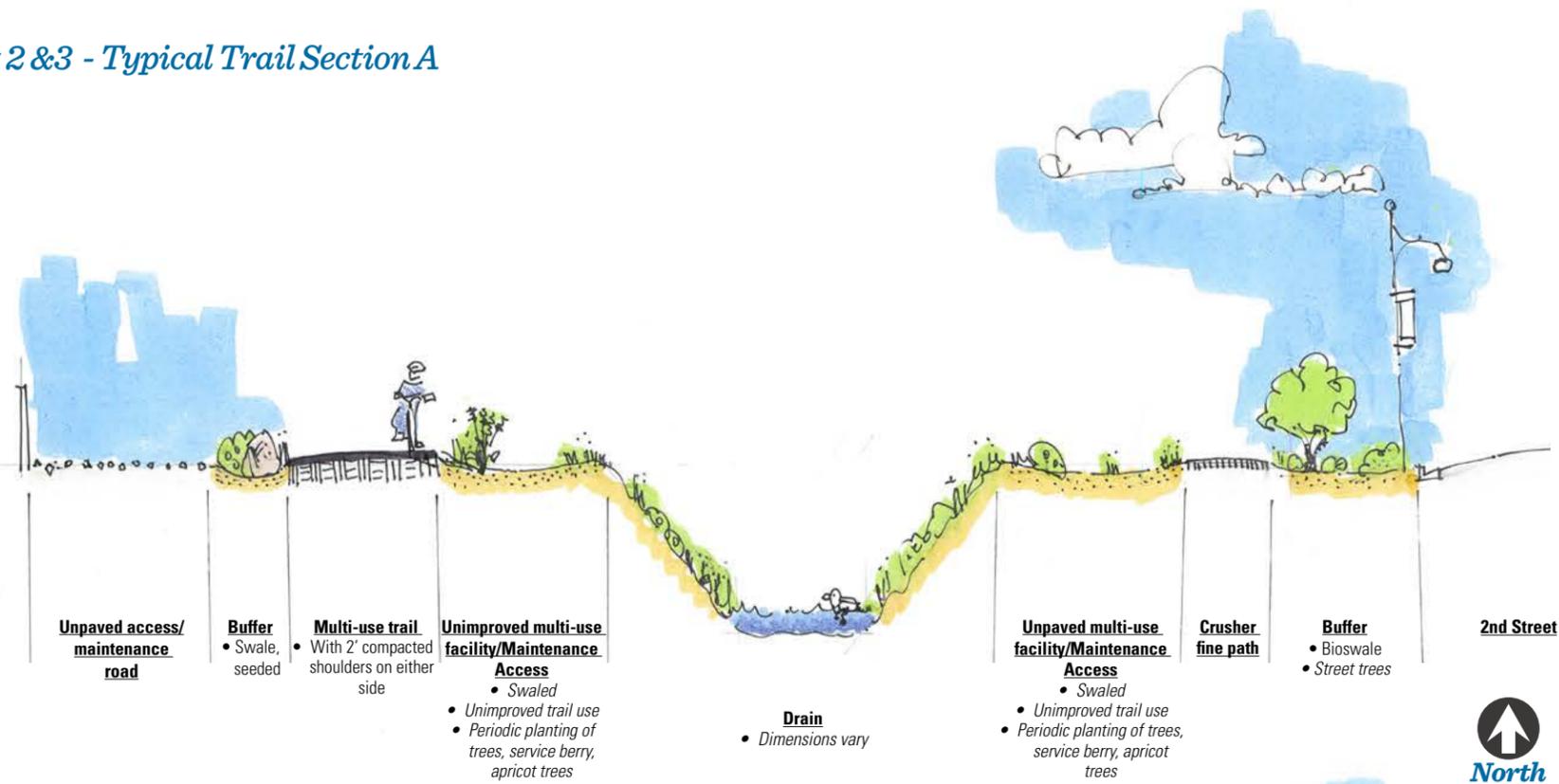
FIGURE 17. Segment 2 &3 - Typical Trail Section A

General characteristics:

- No existing official trail
- 2nd Street parallel to Drain

Between Candelaria and Osuna the Initial Trail Alignment placed the trail on the west side of the Drain with right-of-way reserved for an unpaved maintenance road on the east side. A maintenance road would also be located on the west side, also serving as access road.

This section illustrates the trail on the west side of the Drain along with the maintenance/access road.



Context Map

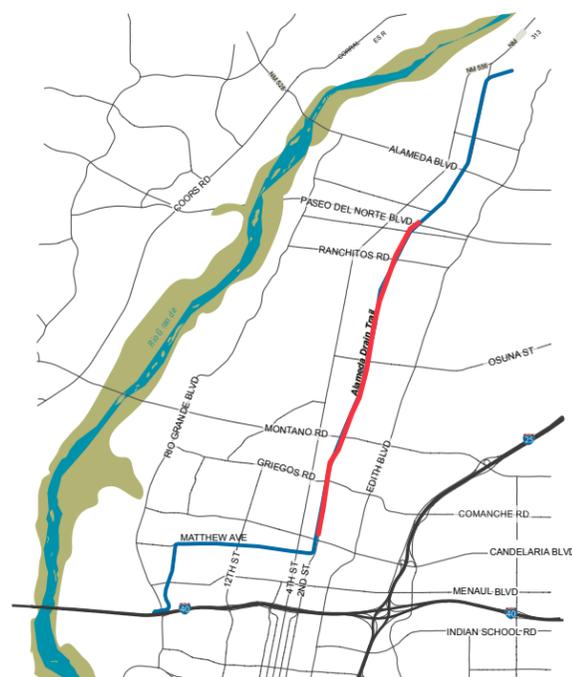


FIGURE 18. Segment 2 &3 - Typical Trail Section B

General characteristics:

- No existing official trail
- 2nd Street parallel to Drain

Between Osuna and Ranchoitos, the Initial Trail Alignment placed the trail on the east side of the Drain. An Alignment Alternative (AA-5) was identified placing the trail on the west side.

This section illustrates the Initial Trail Alignment, placing the trail on the east side.

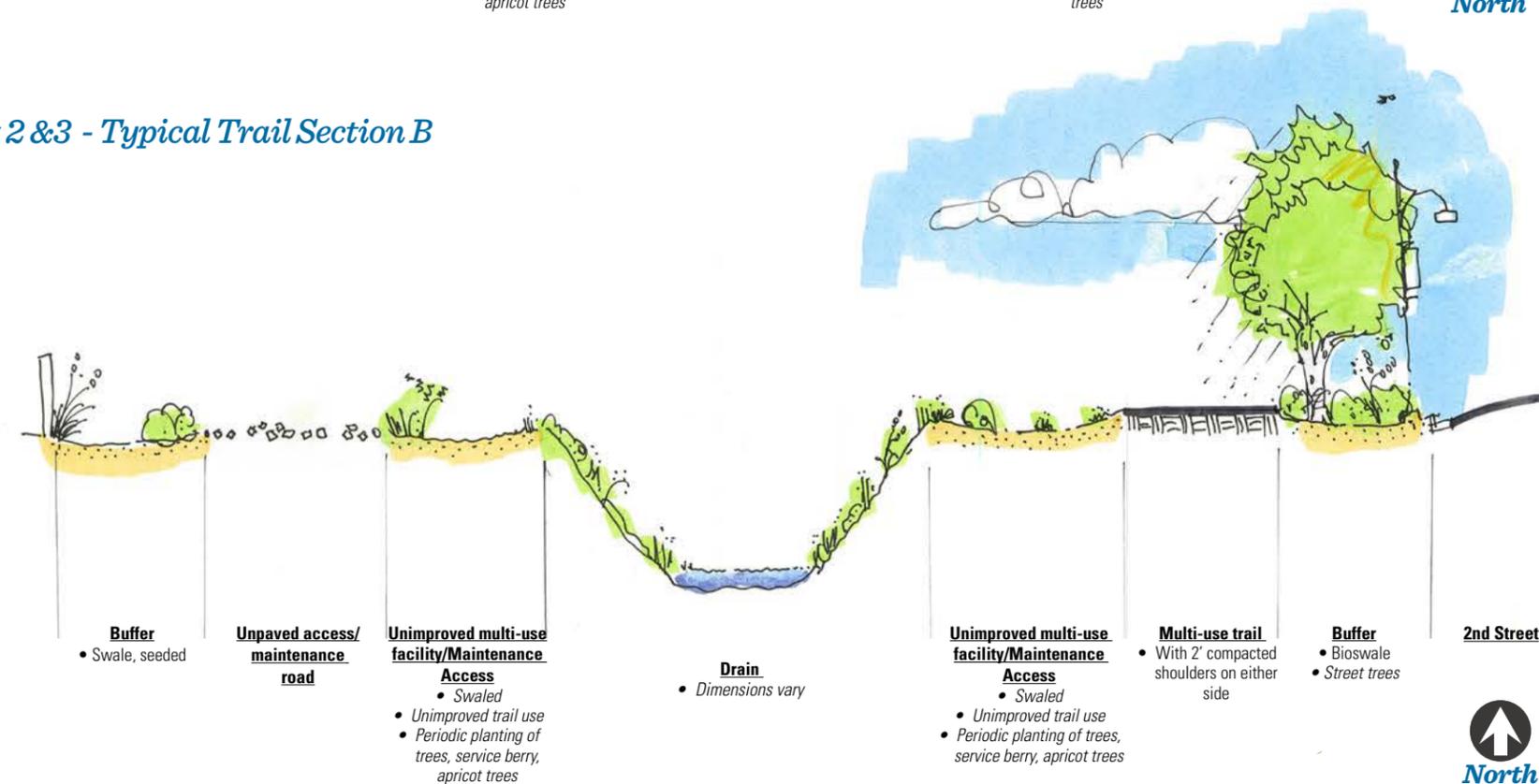


FIGURE 19. Segment 4 - Typical Trail Section A

- General characteristics:
- No existing official trail
 - 2nd Street parallel to Drain

In Segment 4, between Paseo del Norte and Cielito Lindo, the Initial Trail Alignment placed the trail on the west side of the Drain. However, further analysis resulted in an Trail Alignment Alternative (AA_7), placing the trail on the east side.

This section illustrates AA-7 with the trail on the east side.

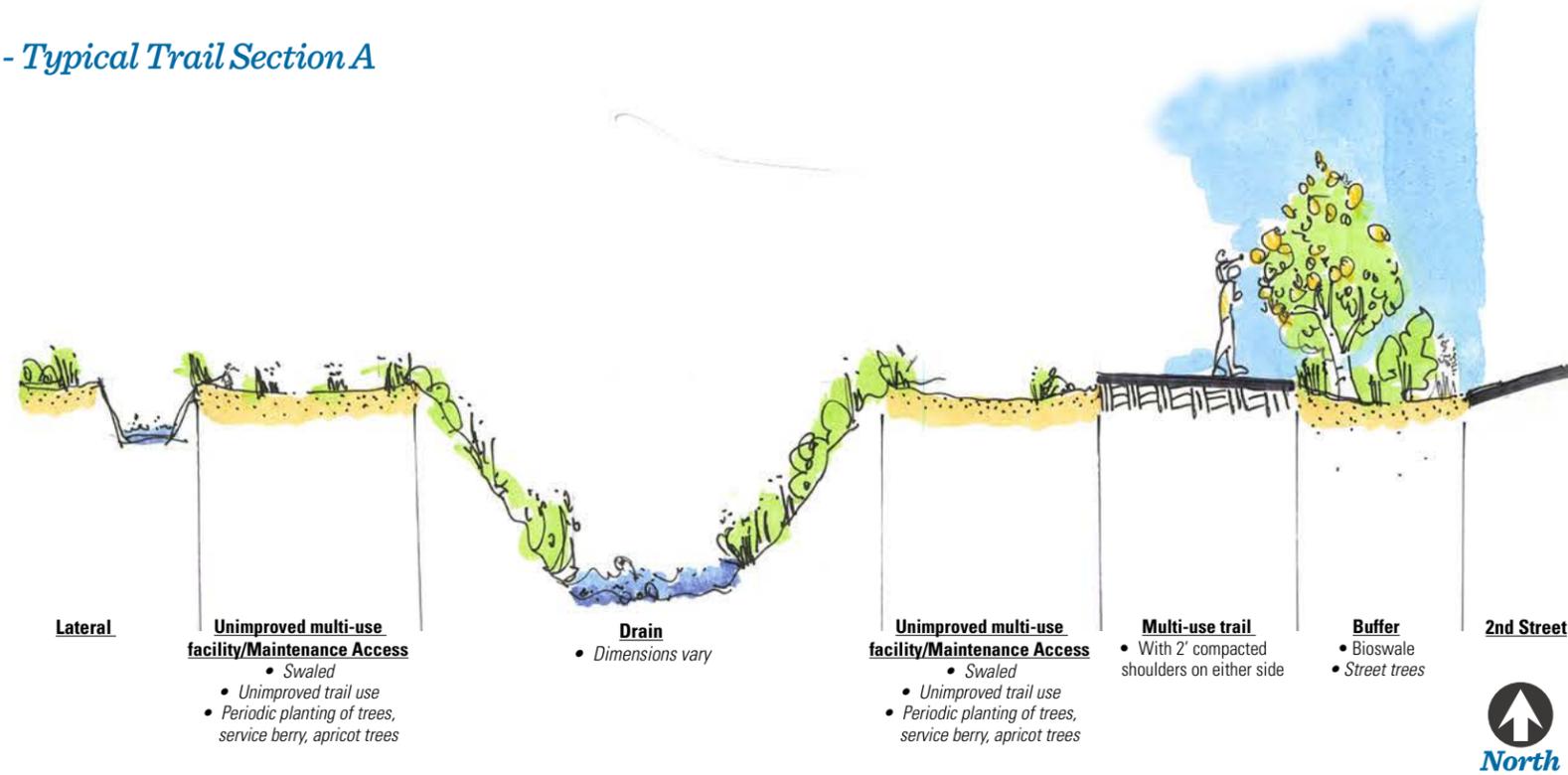
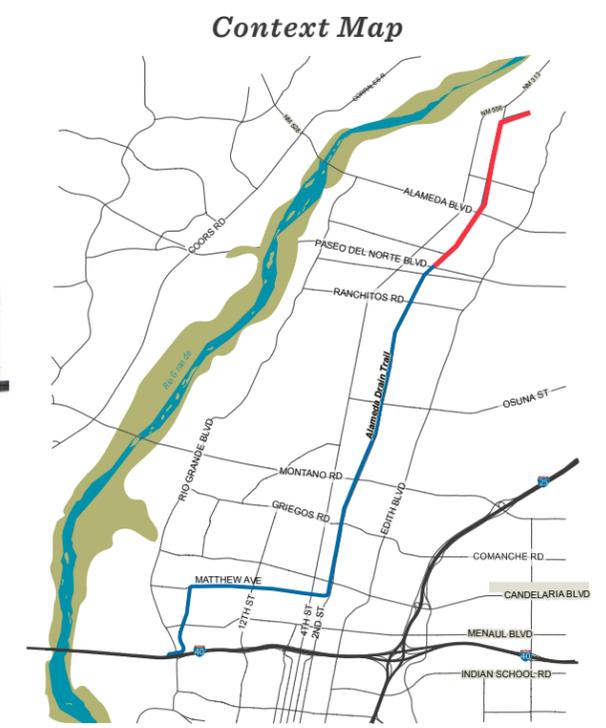
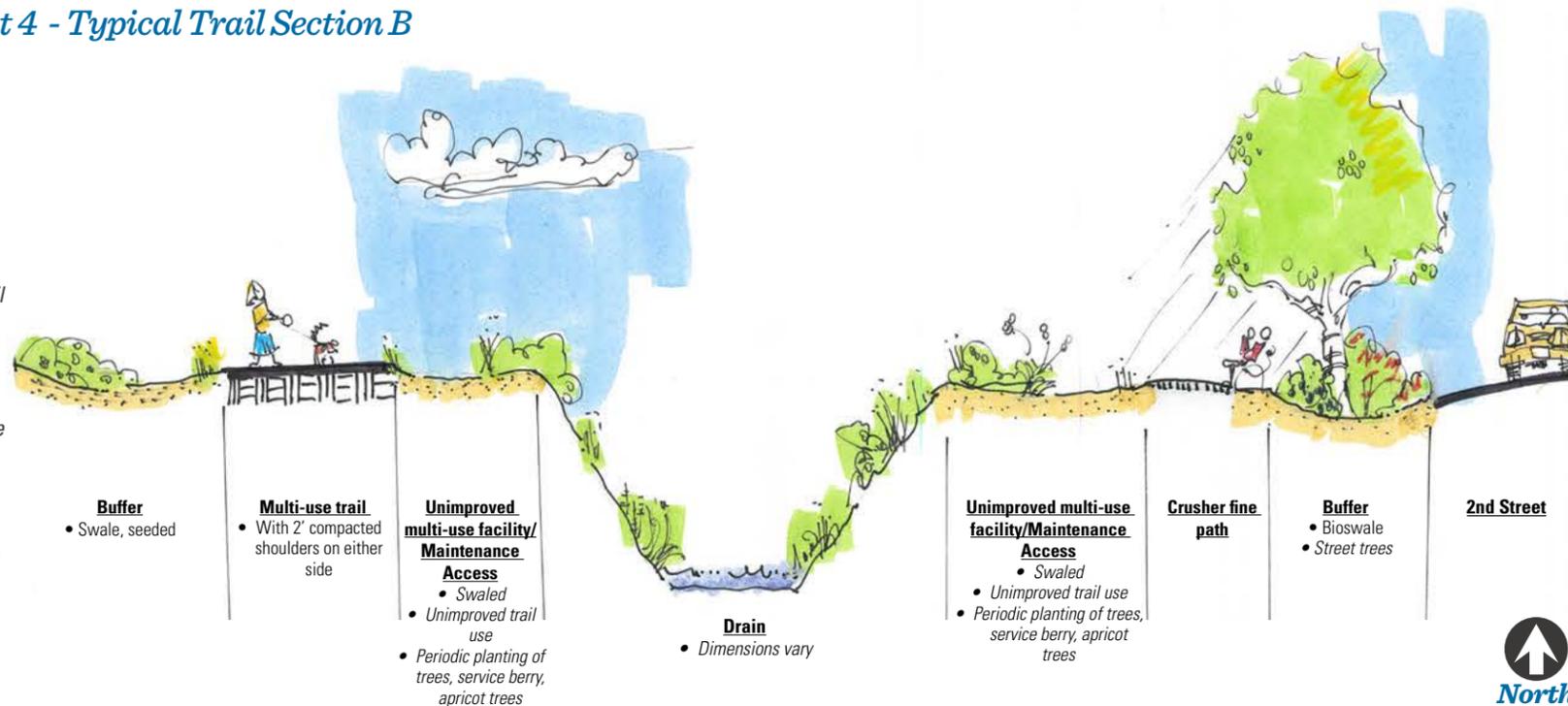


FIGURE 20. Segment 4 - Typical Trail Section B

- General characteristics:
- No existing official trail
 - 2nd Street parallel to Drain

Within the last stretch of Segment 4, between 2nd Street and Cythia Loop the Initial Trail Alignment placed the trail on the north side of the Drain. However, further analysis resulted in an Trail Alignment Alternative (AA_8), placing the trail on the south side.

This section illustrates the Initial Alignment, with the trail on the north side.



SURFACE ALTERNATIVES

While there is a wide range of surface types for recreational trails, there are only a few that accommodate all users. Firm and stable surfaces are required to meet ADA standards and to allow people with disabilities to use the trail. Since this plan aims to develop inclusive design concepts the proposed trail surface should comply with accessible design standard requirements.

Table 7. compares a number of surface options to highlight their weaknesses and strengths.

Many trails in the region are paved with asphalt, a less expensive alternative than concrete.

While the trail requires a stable surface the maintenance road and supplemental unpaved trail can be surfaced with alternative materials. Gravel could be an option for both, the maintenance road and secondary trail.

The final decision on trail materials will be made during the actual design phase of the project.

GUIDING PRINCIPLES 3. *Trail surface*

- USE SURFACE OPTION THAT ACCOMMODATE A WIDE RANGE OF USERS
- TRAIL SURFACE SHOULD BE DURABLE
- TRAIL SURFACE SHOULD BE COMPATIBLE WITH OVERALL CONTEXT

TABLE 7. *Trail surface options*

					
	Gravel	Asphalt	Concrete	Pervious Concrete	Pervious Asphalt
Accessibility	No	Yes	Yes	Yes	Yes
Longevity	No	Yes	Yes, Best longevity. Should last 20+ years	Yes	Yes
Durability	Least	Edges crack with vegetation	Best	Best	Best
Cost	Cheaper initial installation cost	Cheaper than concrete	More expensive	More expensive initial installment, cost savings over time	Less expensive than pervious concrete, however more expensive than asphalt
Maintenance	High ongoing maintenance costs. Difficult to maintain consistent surface quality	Constant maintenance of crack filling and sealing. Must be completely overlaid approximately every 8-10 years	Low maintenance	Low maintenance	Low maintenance
Pervious surface	Yes	No	No	Yes. Permits fluids to pass through it, reducing or controlling the amount of run-off from the surrounding area	Yes. Permits fluids to pass through it, reducing or controlling the amount of run-off from the surrounding area
Natural look	Yes	No	No	No	No
Benefits	Natural look	Cost savings	Longevity	Stormwater management	Stormwater management

3.3 Trail Intersections



A trail along the Alameda Drain will result in several intersections with varying types of roadway facilities. These range from major, multi-lane arterials, to collectors and local roads, to commercial and residential driveways. Traffic control at trail intersections will need to consider trail users, vehicular traffic on the intersecting roadway, and vehicular traffic parallel to the trail. This section addresses options for intersection geometry, signing and signals to accommodate trail users and vehicular traffic on intersecting facilities.

GUIDING PRINCIPLES 4. Trail Intersection

- MAJOR STREET INTERSECTIONS THAT ARE SIGNALIZED FOR VEHICULAR TRAFFIC WILL HAVE PEDESTRIAN PUSH BUTTONS, PEDESTRIAN SIGNALS AND MARKED CROSSWALKS
- INTERSECTIONS WITH MINOR STREETS AND DRIVEWAYS WILL BE DESIGNED TO ACCOMMODATE TRAIL USERS AS WELL AS VEHICULAR TRAFFIC
- MID-BLOCK CROSSING WILL BE PROVIDED TO IMPROVE CONNECTIVITY TO THE TRAIL AND SURROUNDING COMMUNITIES

TRAIL INTERSECTIONS WITH ROADS AND DRIVEWAYS

With the exception of the south portion of the Interstate 40-Mildred Avenue Segment and the far north portion of the Paseo del Norte-North Diversion Channel Segment, the Alameda Drain runs parallel to either Matthew Avenue or 2nd Street. As previously discussed, the proposed trail alignment, will be either between the drain and the parallel roadway or between the drain and adjacent properties. As such, trail intersections will occur at roadways and driveways either next to a road intersection or separated from a road intersection. The various types of trail intersections that may occur are summarized here and illustrated in the accompanying figures.

Trail roadway crossings are broadly considered either mid-block or sidepath crossings, depending on the relationship to the functional area of the adjacent roadway intersection. A midblock crossing occurs outside of the functional area and a sidepath crossing occurs within the functional area. The functional area of an intersection is defined as the area upstream and downstream of the physical intersection where motorists are reacting to the intersection, positioning for their intended maneuver, and queuing. The trail intersections along the Alameda Drain will occur within approximately 100 feet of the adjacent roadways, either Matthew Avenue or 2nd Street. Depending on the operations of the intersecting roadway, this may be within the intersection functional area. Determining whether the trail-roadway intersections are within the intersection functional areas is reserved for the design phase.

In general, with the trail located between the parallel road and the Drain, the trail roadway intersections will be a sidepath crossings. With the trail located between the Drain and adjacent properties, the trail-road intersections may be more similar to midblock crossing even if it is determined that they are located within the roadway intersection functional areas.

One of the main disadvantages to sidepath crossings is that bicyclists can go unseen by motorists, as they can be outside the driver's normal field of vision while scanning the intersection to make their desired maneuver. These

virtual blind spots for motorists exist because bicyclists come from directions that motorists are not accustomed to scanning prior to making their maneuvers. The presence of adequate sight distance and visibility does not mitigate this condition since it is more related to ingrained driver behaviors. Moving the trail crossing away from the roadway intersection does improve this situation along higher speed facilities (50 mph or greater) as it allows motorists to exit the parallel roadway first and then turn their attention to the trail crossing, or address the trail intersection separate from the roadway intersection on their approach from the side street. Studies of this configuration on lower speed facilities have suggested that greater separation does not reduce crashes, so sidepath crossings should be located in close proximity to the parallel roadway so motorists turning off the roadway can better detect sidepath riders.

For trail-roadway crossings that are separated from the roadway intersections, like a mid-block crossing, an important element in signing and marking the trail-roadway intersection is assignment of priority to either the trail or roadway. Trail and side street volumes need to be considered in determining whether trail users will stop or yield to roadway traffic, or vice versa. Changes in user volumes over time should also be considered as trail use may be low initially while trail segments are being developed in phases and increase once the full trail system is completed. So assigning priority to roadway traffic may be initially appropriate but may need to be reevaluated as future segments are completed.

According to the Manual on Uniform Traffic Control Devices (MUTCD), "when placement of "Stop" or "Yield" signs is considered, priority at a shared-use path/roadway intersection should be assigned with consideration of relative speeds of shared-use path and roadway users, relative volumes of shared-use path and roadway traffic, and the relative importance of the shared-use path and roadway."

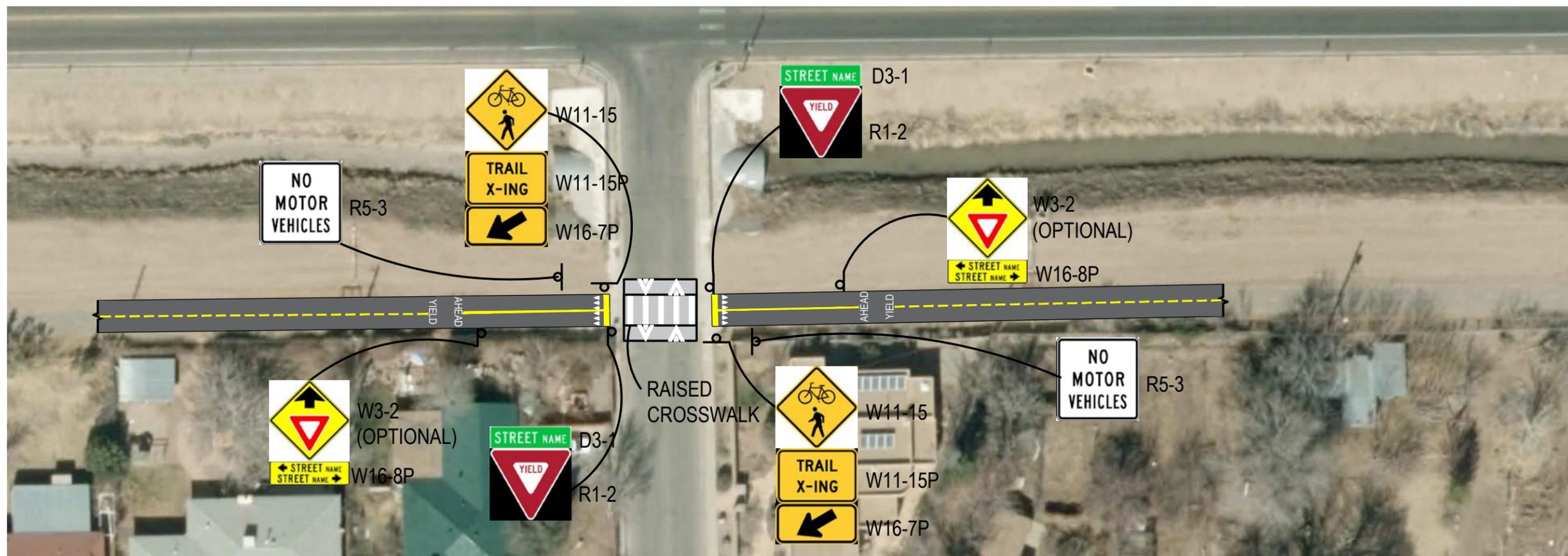
The guidance continues by stating that the least restrictive control that is appropriate should be placed on the lower priority approaches, and that "Stop" signs should not be used where "Yield" signs would be acceptable.

Another point worth noting is the Uniform Vehicle Code assigns right-of-way to the pedestrian in marked crosswalks. As marked crosswalks alone do not insure the safety of pedestrians and bicyclists at a trail-roadway intersection, supplemental signing and markings need to be considered as well. The New Mexico Motor Vehicle Code also assigns right-of-way to the pedestrian in a marked crosswalk, and the City of Albuquerque Traffic Code does not address assignment of right-of-way at crosswalks. The Albuquerque Traffic Code does however require motorists to yield to bicycles when turning across a bicycle lane or path.

Intersection sight distance at the trail-roadway intersection is another element that needs consideration when determining appropriate traffic control measures. Where adequate sight distance to oncoming roadway traffic exists, trail users are more likely to treat the intersection as a yield condition, so signing it as a stop condition for the trail user would likely be ignored. Existing walls, fences and vegetation may limit sight distance at the trail-roadway intersections, so design of appropriate intersection signing and markings will need to consider intersection sight distance at each location.

Where the trail is situated close to the Drain near intersections potential for erosion will need to be addressed in the design phase.

FIGURE 21. Trail Intersection - Minor Street with Trail Adjacent to Property Line



Trail Intersection with Minor Street.

Traffic control for trail intersections with minor streets, either set back from the road intersection or at the road intersection, are illustrated on [“Figure 21. Trail Intersection - Minor Street with Trail Adjacent to Property Line” on page 39](#) and [Figure 22](#).

Signage and markings along the minor street with the trail set back from the road intersection, which are associated with the trail located between the Drain and adjacent properties, may include a continental-style crosswalk and a bicycle/pedestrian crossing warning sign with supplemental “Trail Xing” and downward-pointing arrow plaques. Advanced bike/pedestrian crossing ahead warning signs may also be considered on a case-by-case basis. Traffic calming treatments on the minor street approach may also be appropriate if a need to control vehicle speeds

is identified. Raised crosswalks would be an appropriate treatment to increase driver awareness of the crossing. Advance speed hump markings may be used on the approaches to the raised crosswalk either alone or in conjunction with pavement wording such as “Hump”. Advance speed hump signing may also be appropriate. The appropriate level of signing and markings will depend on the operational characteristics of the minor street. As discussed previously, design factors will need to be considered when assigning priority to either the roadway or trail users. In consideration that yield control on the trail approaches to the intersections may be an appropriate treatment at most of the minor side streets, this has been

illustrated in the accompanying figures.

Signage and markings on the trail approaches with priority assigned to the roadway may include “Yield Ahead” markings and signs, and a “Yield” sign and yield line at the intersection. Detectable warning surfaces are required on the trail approaches to street intersections. The detectable warning surface may be other high visibility colors but yellow is used in the figures for clarity. A street name sign can also be included at the intersection to better inform trail users of their location.

Where equestrian traffic is anticipated, separate push-buttons may be considered to accommodate the height of the horse and rider.



FIGURE 22. *Trail Intersection - Minor Street with Trail Adjacent to Roadway*

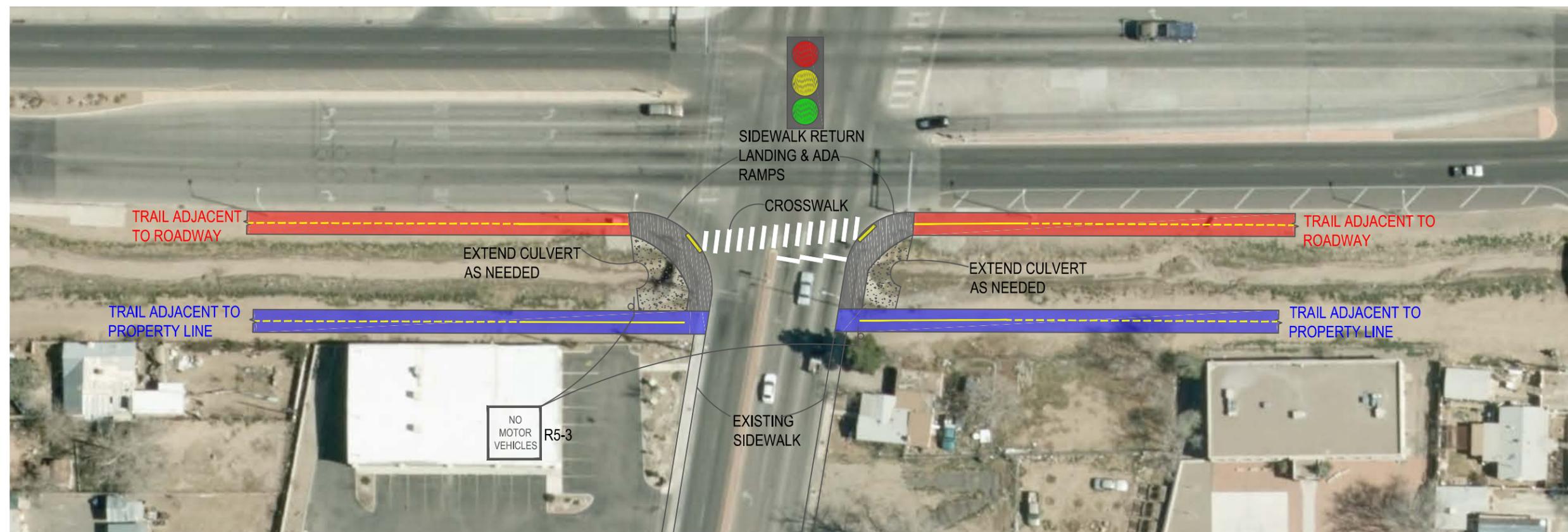


With the proposed trail situated between the Drain and parallel-street, a sidepath crossing would result. As previously discussed, sidepath crossings introduce potential conflicts between motorists and trail users that need to be considered. Developing a highly visible sidepath crossing improves the crossing and situating it closer to the parallel roadway, where speeds are lower than 50 mph, helps motorists turning from the parallel road better detect trail users.

Priority would typically be assigned to the trail user in a marked sidepath crossing. At a minimum on the roadway approach, a marked continental-style crosswalk, stop bar, and "Stop" sign should be installed at the crossing. Trail markings on the approaches to the crossing would include a solid yellow centerline along with detectable warning surfaces.



FIGURE 23. Trail Intersection - Major Street with Trail Adjacent to Property Line or Trail Adjacent to Roadway



Trail Intersection with Major Street.

The conditions associated with a major street intersection controlled by a traffic signal are illustrated on [“Figure 23. Trail Intersection - Major Street with Trail Adjacent to Property Line or Trail Adjacent to Roadway” on page 41.](#)

With the proposed trail on either side of the Drain, the major street crossing will be a sidepath type, situated at the typical pedestrian crosswalk location for the signalized intersection. In either case, the trail will transition to the standard pedestrian landing within the return of the intersection. The landings will be widened to accommodate trail users and will include access ramps, pedestrian push-buttons and signal heads, and detectable warning surfaces. Traffic signal mast arm and pedestal pole locations may need to be modified to properly locate pedes-

trian push-buttons relative to the access ramps. The “No Motor Vehicle” sign may be placed at the trail entrance if appropriate. There are some major intersections where drive pads are in place to facilitate motor vehicle access to primary and secondary private property access drives.

In areas where the trail is situated between the Drain and adjacent properties, it may be necessary to extend existing culverts in the Drain to accommodate a full-width trail where it crosses to access the intersection landing.

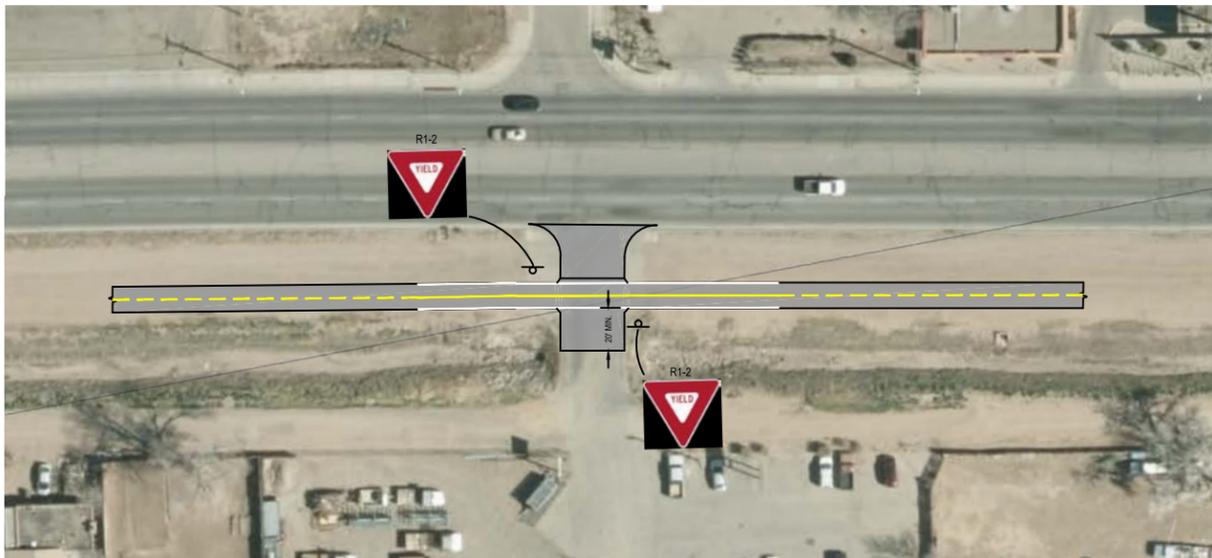
Where equestrian traffic is anticipated, separate push-buttons may be considered to accommodate the height of horse and rider.



FIGURE 24. Trail Intersection - Private Driveway with Trail Adjacent to Property Line



FIGURE 25. Trail Intersection - Private Driveway with Trail Adjacent to Roadway



Trail Intersections with Driveways

The AASHTO Guide for the Development of Bicycle Facilities and the FHWA Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) do not provide guidance for signing and markings associated with trail-driveway intersections. Commonly referenced transportation publications by the Institute of Traffic Engineers (ITE) and the National Association of City Transportation Officials (NACTO) also do not address signing and markings for these types of intersections. The various guidelines do emphasize the design challenges associated with trail-roadway intersections, especially when the trail is of a sidepath configuration as previously discussed. As each driveway along the Alameda Drain corridor will have unique characteristics that will affect design decisions, this plan will only identify the more general treatments to be considered.

Driveway intersections have similarities to minor street crossings that may warrant similar considerations for signing and markings. Determining the appropriate signing and markings for trail-driveway intersections will depend on:

- The motor vehicle traffic volumes expected for the driveway
- Whether the driveway serves commercial or residential property
- Available sight distance from the driveway to the trail and vice versa
- Proximity of the driveway to other driveways and streets
- Other sight-specific factors

The two conditions where trails cross driveways along the Alameda Drain corridor are illustrated on [Figure 24](#) and [“Figure 25. Trail Intersection - Private Driveway with Trail Adjacent to Roadway”](#) on page 42.

The driveways along Matthew Avenue and 2nd Street are either residential or small commercial and would be considered to have low vehicle volumes. As such, providing priority to the trail user may be appropriate provided that adequate sight distance is available in advance of the driveway crossing and other factors are favorable for this. “Yield” signs on the driveway approach may be considered, especially at commercial driveways frequented by motorists unfamiliar with the trail. Signing along the trail

may include intersection warning signs where visibility of the intersection is limited on the trail approach. Care should be exercised in placement of intersection warning signs to avoid overuse which could result in disrespect for the signs at more critical locations.

Pavement markings on the trail may include solid white edge lines to provide a visual delineation of the trail. A solid yellow center stripe carried through the intersection may be used to indicate that staying on the correct side of the pathway is advised. Overuse of the solid yellow center stripe should be avoided. Detectable warning surfaces on the trail approaches are not required for driveway crossings.

Driveways along the corridor are paved and unpaved. The trail should be paved through unpaved driveways to provide a consistent surface for trail users. Consideration should be given to extending the paving beyond the trail width to provide greater durability to accommodate the vehicular traffic crossing the trail, and to reduce the amount of gravel and dirt that is tracked onto the trail. AASHTO suggests that driveways be paved a minimum of 20 feet on each side of the crossing. Along the Alameda Drain trail the additional driveway paving should extend only to the right-of-way line or the intersecting road, as illustrated in the figures. The pavement section should be thickened at the driveways as well for greater durability.

In locations where several driveways are closely spaced, consideration should be given to consolidating the driveways to minimize conflict points with trail users. The applicability of this treatment will need to be evaluated individually during design.

TRAIL INTERSECTIONS AT UNCONTROLLED AND MID-BLOCK CROSSINGS

The mainline of the Alameda Drain Trail will cross some streets, including Lilac Drive, Indian School Road, 12th Street, 4th Street, and 2nd Street (at the northern end of the project) at a mid-block location. In other places, it may be desirable to connect the trail to other origins/destinations across a street at a mid-block location, for example, across Matthew Avenue or 2nd Street. [Figure 28](#) shows potential locations for these.

The crossing treatment to be used at mid-block locations should be consistent with FHWA guidance (Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations [September 2005]), and based on the volume of traffic, cross section and speed limit on the road being crossed.

Where the trail crosses Lilac Drive and similar locations, a two-lane undivided local road, the treatment may include a marked continental-style crosswalk the same width as the trail, with standard advance bike/pedestrian warning signs ahead of the crossing and the same sign with a downward diagonal arrow at the crossing. As an option at this and all mainline trail crossing locations, a sign announcing the Alameda Drain Trail could be placed between the modified W11-2 (bicycle and pedestrian warning) and arrow sign as shown on [“Figure 26. Sign Indicating Trail” on page 43](#). Discussion about trail signage is located in section [“3.5 Signage” on page 55](#).

Where the trail crosses Indian School Road, the speed limit is 35 mph and the 2014 average daily traffic volume (ADT) was about 8,300 vehicles per day (vpd). At this location a raised median refuge at the point of the trail crossing should be provided and the trail should be signed in advance and at the crossing point. Because of its low ADT and speed limit, along with the median refuge and signing, a continental-style crosswalk the same width as the trail is appropriate at the Indian School Road trail crossing. [Figure 28](#) illustrates this crossing location.

Where the trail crosses 4th Street, the speed limit is 35 mph and the 2014 ADT was about 21,000 vpd. At this

location, again it is appropriate to create a raised median refuge at the point of the trail crossing and to sign the trail in advance and at the crossing point. However, because of its high ADT, a marked crosswalk is not recommended here with only the median refuge and the signing. If use of this crossing meets MUTCD warrants (at least 20 pedestrian or bicyclists crossing in an hour), a pedestrian hybrid beacon (PHB, also known as a “HAWK crossing”) could be considered for the crossing in conjunction with a marked crosswalk.

At locations where a HAWK crossing is warranted signing and markings would consist of a continental-style crosswalk, with stop bars placed 20 feet to 50 feet in advance of the crosswalk. “Stop Here on Red” signs would be placed adjacent to the stop bars. The hybrid beacon assembly would be mounted overhead at the crosswalk location with a “Crosswalk, Stop on Red” sign. Parking restrictions and other sight obstructions should be prohibited 100 feet in advance of the crossing and at least 20 feet beyond the marked crosswalk. For illustrative purposes, this treatment is shown in [Figure 28](#) for the 4th Street crossing. It should be noted that if this location were identified for a HAWK signal during design, the Matthew Avenue intersection on the west side of 4th Street north of the Drain and other driveways within 100 feet of the crossing would need to be evaluated to determine how they would affect the operation of the crossing.

FIGURE 26. Sign Indicating Trail



The last mid-block location where the mainline crosses a street mid-block would be the crossing of 2nd Street at the northern end of the corridor. This location has a low ADT (4,100 vpd) but a relatively high speed limit (45 mph).

FIGURE 27. Possible mid-block crossing locations

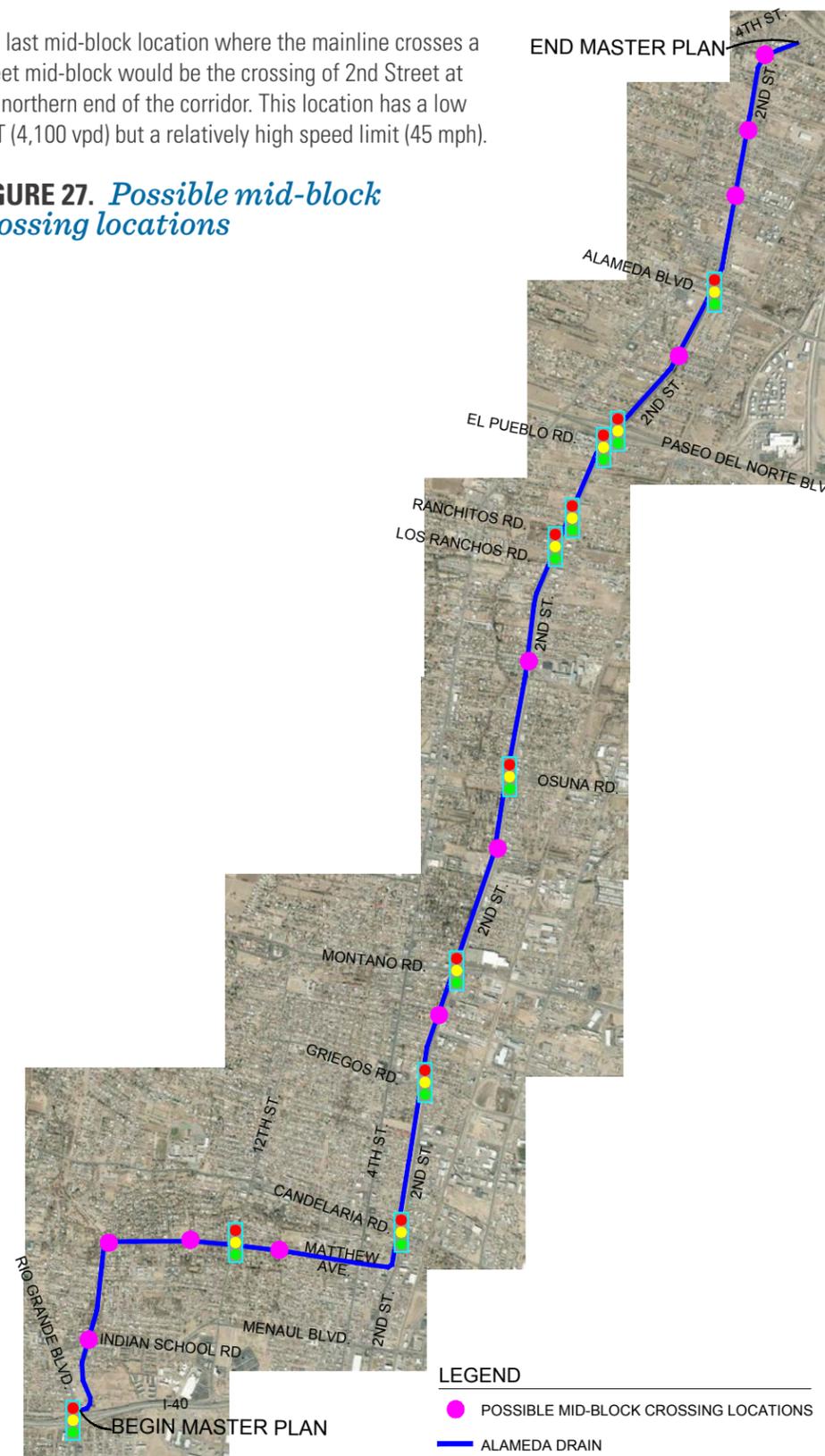
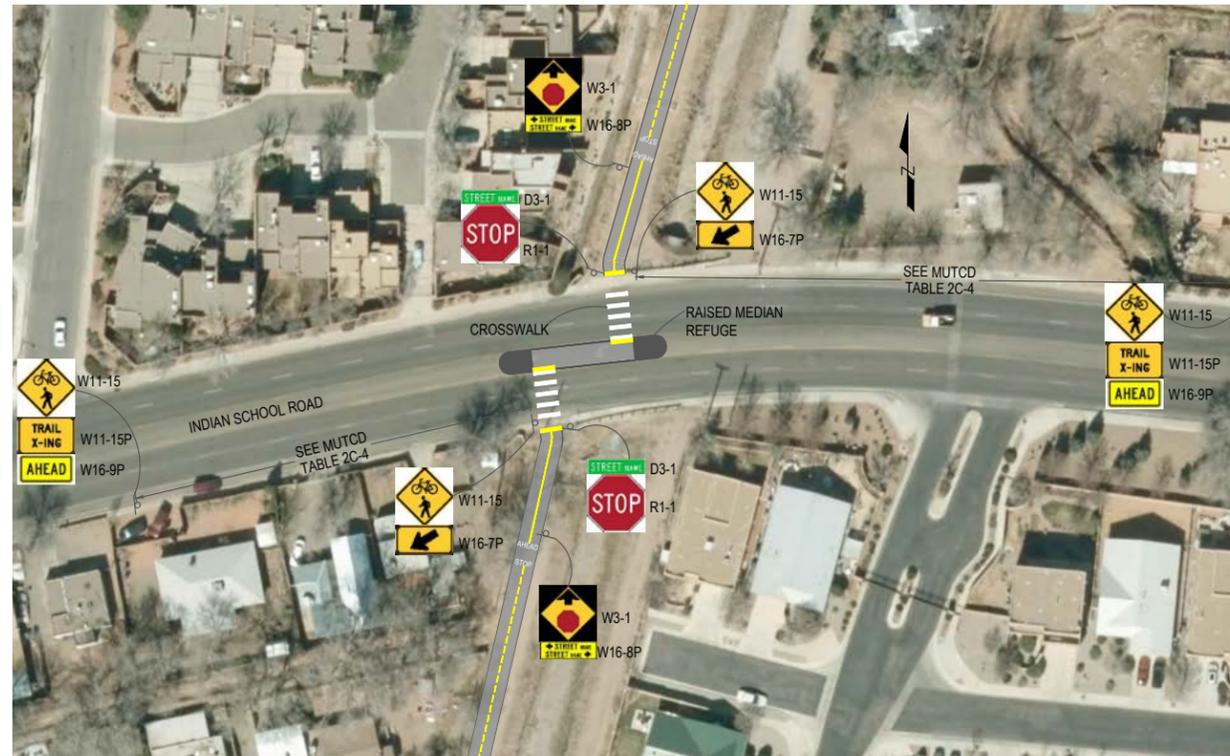


FIGURE 28. Mid-Block Crossing - Indian School



The 2040 Metropolitan Transportation Plan (MTP) shows that the installation of a two-way left-turn lane (TWLTL) is planned for 2nd Street north of Alameda Boulevard before the year 2040. Whether that is in place or not, a raised median refuge is appropriate at this location along with installation of advance and crossing warning signs at the point of the trail crossing (in the TWLTL, if it is already there). However, because of its high speed limit, a marked crosswalk is not appropriate at this location.

As previously mentioned, there may be other locations where a mid-block crossing is desired not for the mainline of the trail but for a connection of the trail to another origin or destination. Most likely, these would be across Matthew Avenue west of 12th Street, or along 2nd Street between Matthew Avenue and the northern terminus of the project.

Where the trail would connect across Matthew Avenue, the road has an ADT of about 3,000 vpd and speed limit of 30 mph. A midblock trail crossing should be marked with a continental-style crosswalk the same width as the trail, with standard advance bike/pedestrian warning signs ahead of the crossing and the same sign with a downward diagonal arrow at the crossing. No median refuge is necessary. *Figure 30*, illustrates this location.

Mid-block trail connection crossings of 2nd Street would involve crossing four or more driving lanes with a speed limit of 45 mph and an ADT of between 20,000 and 30,000 vpd. With these characteristics, a marked crosswalk should not be installed unless the crossing meets the

FIGURE 29. Mid-Block Crossing - 4th Street

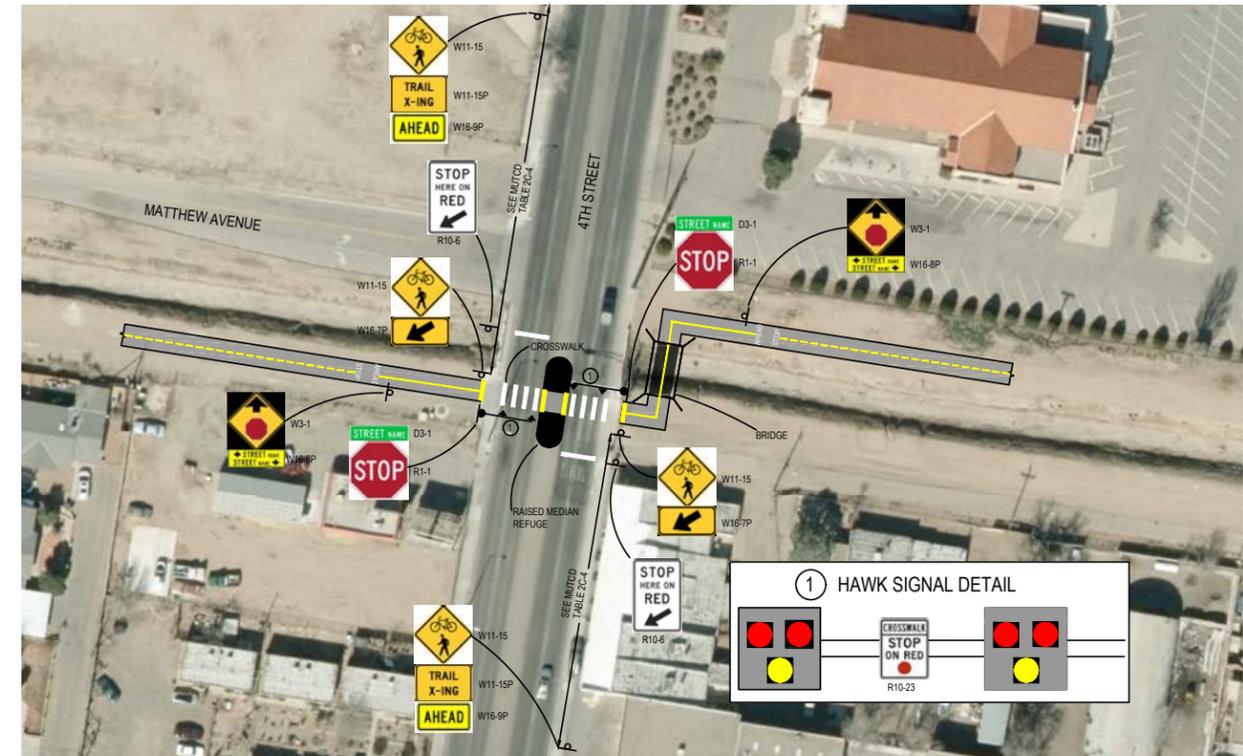


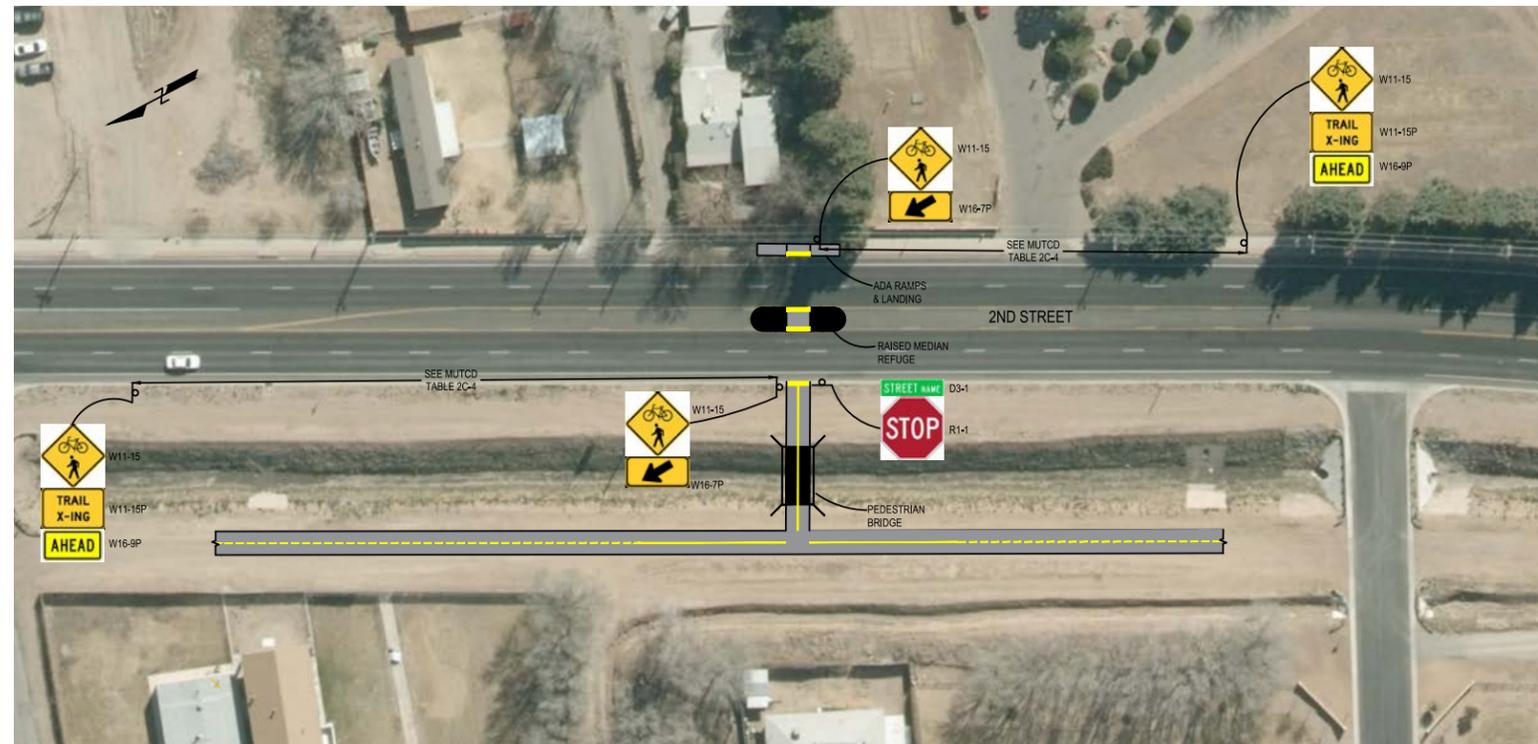
FIGURE 30. Mid-Block Crossing - Matthew



FIGURE 31. Mid-Block Crossing



FIGURE 32. Mid-Block Crossing 2nd Street with Trail Adjacent to Property Line



MUTCD warranting criteria and is controlled with a PHB. Short of a PHB, a median refuge area, pavement markings if required, and warning signs should be installed. The midblock crossing of the Silver Avenue bike boulevard at University Boulevard, in southeast Albuquerque, is an example of this type of crossing as shown on the [Figure 31](#), [Figure 32](#) and [Figure 33](#). illustrate the 2nd Street crossings, for two trail conditions, one with the trail on the west side of the Drain and one with the trail on the east side. For illustrative purposes, one crossing is shown with signing only and the other is shown with a HAWK signal.

FIGURE 33. Mid-Block Crossing - 2nd Street with Trail Adjacent to Roadway

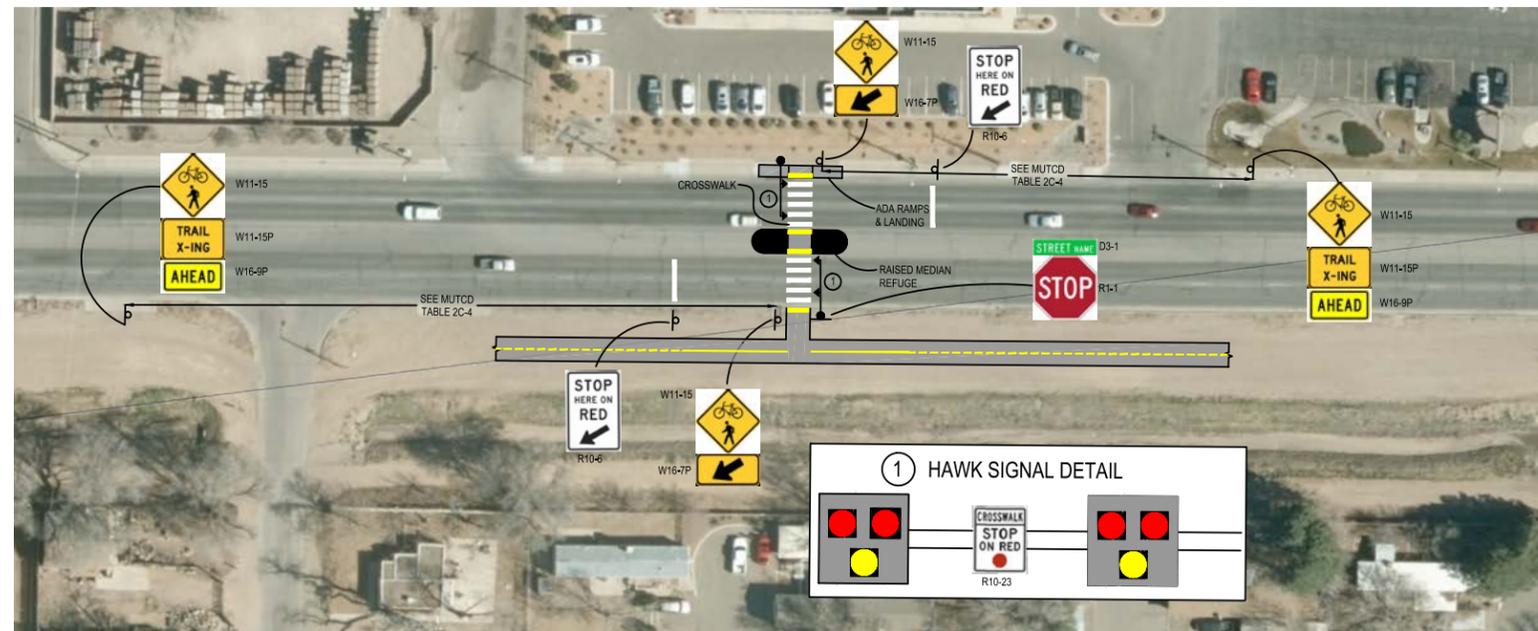


FIGURE 34. Split-Trail Configuration

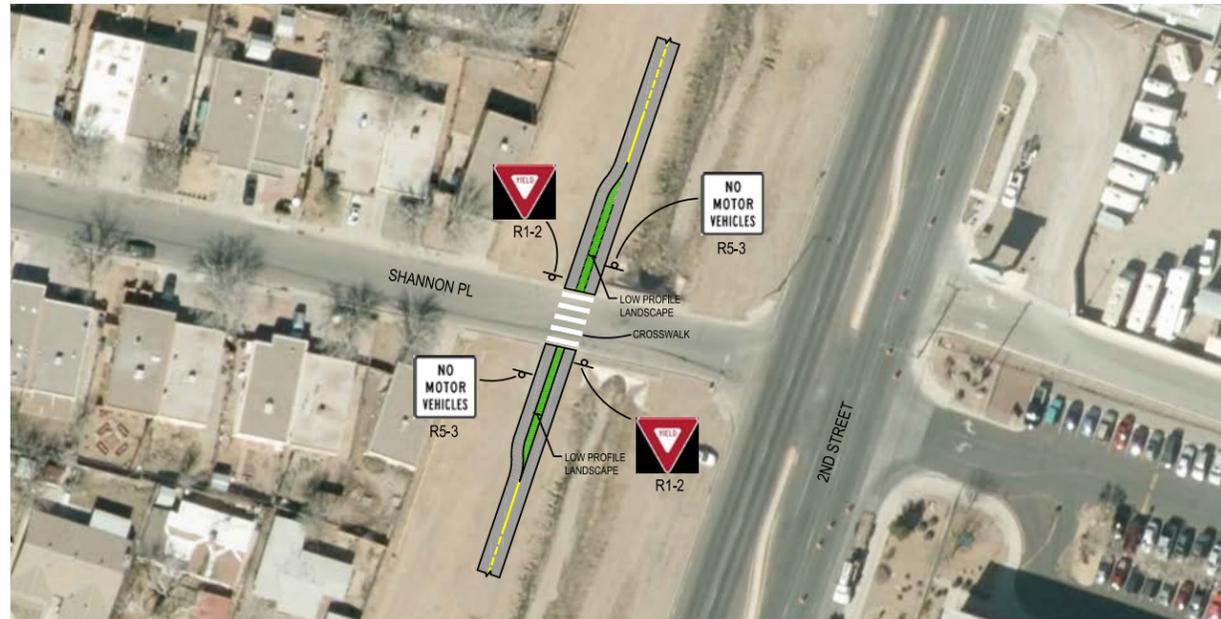


FIGURE 35. Chicanes



Other Trail Intersection Considerations

Other treatments to consider at roadway and driveway intersections include methods to control vehicular access to the trail and methods to reduce trail user speeds on intersection approaches.

Restricting motor vehicle access to trails is desirable but may be difficult because providing vehicular access to the Drain for maintenance activities and for access to adjacent private property is necessary. Design treatments will need to consider the level of vehicular access required and the available width adjacent to the Drain. Use of bollards, gates or similar permanent devices is not recommended since they create permanent obstacles for trail users. If unauthorized vehicular use is identified as a potential problem, the AASHTO Guide for the Development of Bicycle Facilities recommends the following three-step approach:

1. Post signs identifying the entry as a shared-use trail and regulatory signs such as the "No Motor Vehicles" sign near the trail-roadway intersection.
2. Design the path entry location to make intentional unauthorized access difficult, and so it does not look like a vehicle access. A preferred method is to split the trail into two narrower sections separated by low landscaping.
3. If unauthorized use persists at intolerable levels, assess whether the problem posed by unauthorized vehicle entry exceeds the risks and access issues associated with physical barriers such as bollards or gates.

At a minimum the trail entrances from the road should include "No Motor Vehicles" signs. ["Figure 34. Split-Trail Configuration" on page 46](#), illustrates an example of a split-trail configuration that can be used where width permits.

Controlling trail user approach speeds to intersections may be appropriate where sight distance is limited or where trail users must stop or yield. As illustrated in ["Figure 35. Chicanes" on page 46](#), chicanes may be considered in these situations. Care should be taken in design of the chicanes to end the chicanes a sufficient distance prior to the intersection to allow trail users to focus on the trail curvature separate from the trail intersection. Chicanes may also be appropriate to provide separation between the property line and trail to improve intersection sight distance, or in areas between the Drain and parallel road where it may be desirable to move the trail into a sidepath configuration at an intersection.

3.4 Trail Amenities



The following section discusses amenity elements. All amenities are intended to improve the overall trail user experience and enhance the project corridor.

Subsequent evaluation, however, will narrow the amenity selection introduced here, and a preferred set of amenities will be proposed.

GUIDING PRINCIPLES 5. Community Amenities

- CREATE SPACES THAT ARE WELCOMING, ACCESSIBLE AND ACCOMMODATING FOR ALL USERS.
- DESIGN FACILITIES THAT ARE HIGH QUALITY AND VISUALLY PLEASING.
- ENCOURAGE PHYSICAL EXERCISE FOR ALL AGE GROUPS.
- INCORPORATE THE PRINCIPLES OF UNIVERSAL DESIGN.
- IDENTIFY OPPORTUNITIES WHERE PRIVATE SECTOR INVESTMENT CAN CREATE AMENITIES.
- ENHANCE THE ALAMEDA DRAIN CORRIDOR THROUGH PUBLIC ART DISPLAYS.
- DEVELOP A MATERIALS PALETTE FOR TRAIL SITE FURNISHINGS TO ESTABLISH A SPECIFIC CHARACTER ON THE ALAMEDA DRAIN & TRAIL.
- INCORPORATE CEPTED CONSIDERATIONS IN THE DESIGN OF AMENITIES.

Community amenities are features, facilities and public spaces that serve the community. These amenities contribute to the attractiveness of a neighborhood and typically, include aesthetic features, public spaces and facilities to meet a range of social, cultural and recreational needs of the community. In neighborhoods these amenities play an important role in providing a sense of place and livability for residents of all ages.

Through the planning process and stakeholder interviews, a number of potential amenities were identified by the community. These are proposed at specific locations as identified on the maps along the project corridor.

LINEAR PARK

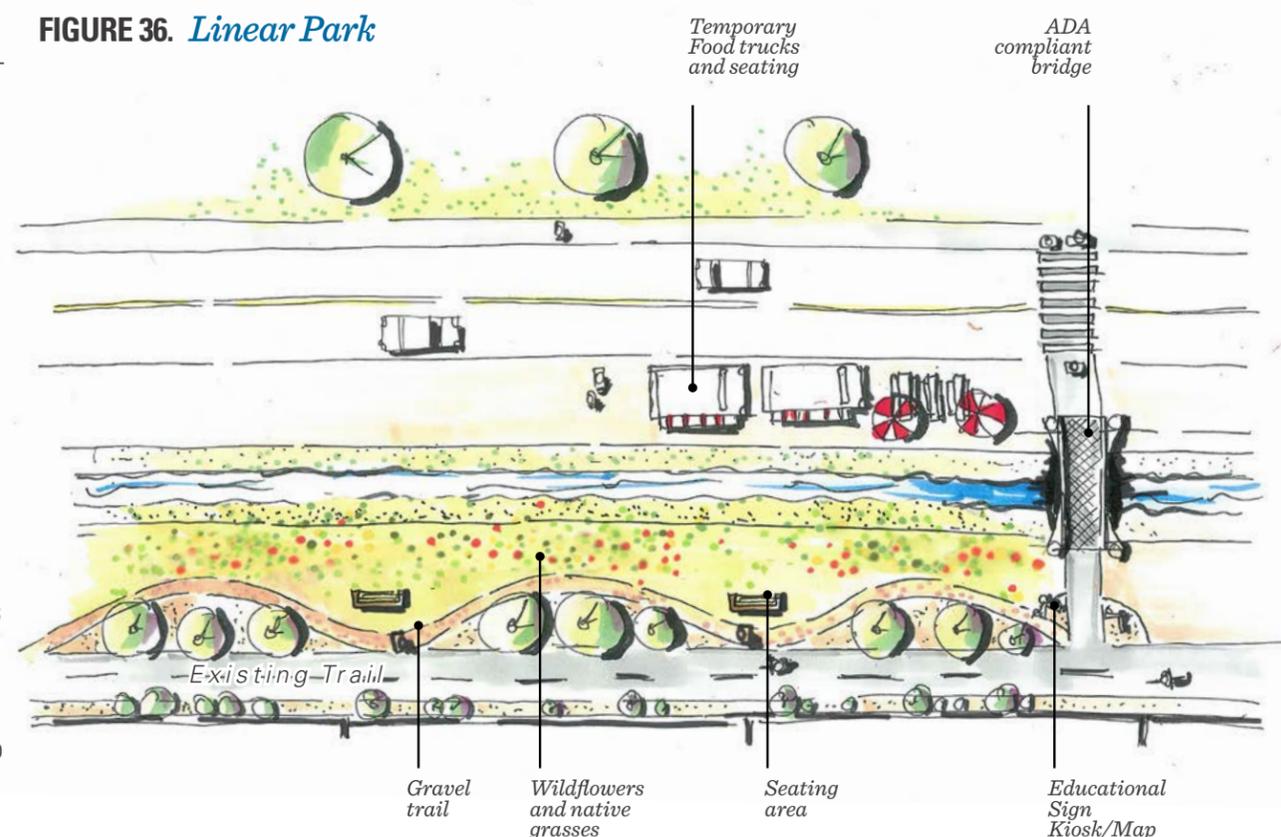
A linear park is a park that is substantially longer than it is wide. The linear park facilitates active recreation, including walking, running and biking. In many cities, linear parks are greenways that traverse the urban environment and have created recreational corridors that allow users to reach their destinations by alternative means of transportation.

The Alameda Drain presents a great opportunity to create such a green corridor. Particularly in its more urbanized stretches, a linear park could become a destination, providing a vegetated node that can incorporate a variety of activities.

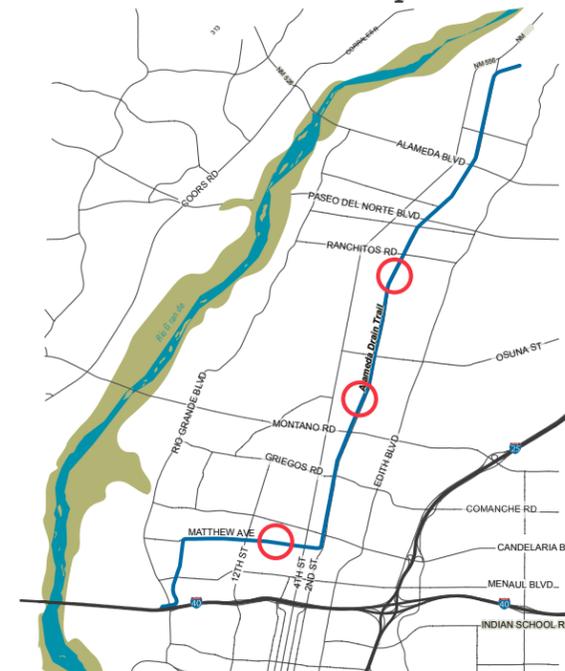
The Bernalillo County Parks, Recreation & Opens Space Master Plan (2015-2023), calls for a linear park within the Greater Gardner Neighborhood along 2nd Street between Montañó and Osuna. Generally, the North Valley area located within the County lacks parks, locating a facility here could serve the community and satisfy the need for a recreational facility.

Figure 36, illustrates a concept for a linear park across from Matthew Meadows Park. The existing trail would be maintained to allow users that want to move quickly to do so. A second, gravel trail, would be added to allow people to stroll, run and linger. Nodes of trees and shrubs could line the existing trail to the north, as not to interfere with MRGCD maintenance needs.

FIGURE 36. Linear Park



Context Map



Gabions and water features can be strategically placed to celebrate the presence of water. In addition, educational signs could inform about the Drain, its history and functions.

The context map to the left illustrates a number of proposed linear park locations, these may be reconsidered during the design and development phase.

POTENTIAL LINEAR PARK AMENITIES:

- Open green-spaces, seeded with native grasses and wildflowers
- Benches, picnic tables, trash receptacles and dog stations
- Aesthetic improvement including public art
- Landscape plantings and stormwater infiltration systems such as bioswales
- Trees nodes and edible plantings

Legend

- Linear Park

PARKING/TRAILHEAD

There are many opportunities along the trail to install new parking facilities. However, parking can also be facilitated through shared parking agreements with adjacent schools, churches and other businesses.

There are several opportunities to install trailheads along the project corridor. As the length of the trail is extensive, trailheads should feature signage that includes maps, information about the trail path, any intersecting trails and close-by activity centers.

All parking facilities need to meet ADA requirements and should be designed to reflect the character of surrounding neighborhoods. Directional signs and information kiosks should also be included in the parking areas.

In general, this plan recommends small parking facilities for ten or less cars, at a few strategic locations along the corridor.

The context map below illustrates a number of proposed parking lot locations, these may be reconsidered during the design and development phase.

Context Map

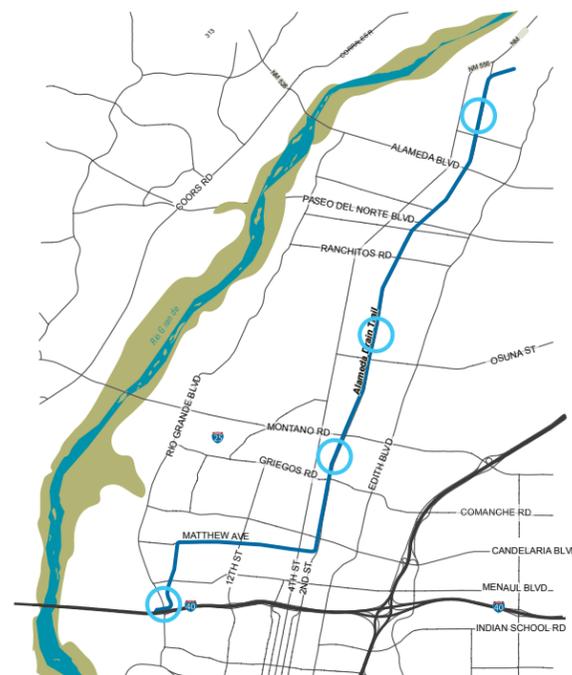


FIGURE 37. *Parking/Trailhead Concept*



POTENTIAL PARKING/TRAILHEAD FACILITY AMENITIES:

- Rocks or railroad ties to mark the parking area or other wooden and/or rock products to distinguish the parking facility elements
- Informational kiosks that include a map of the trail, additional assets along the trail, information about the project and education information about the Drain's function
- Landscape areas that capture runoff from the road and the parking lot
- Water features

Legend

- Trailhead/Parking

SHARED PARKING

There are opportunities to share existing parking facilities with various institutions located along the Drain. The list below reflects some of the entities that could be approached to discuss shared parking arrangements.

- The Range Cafe
- Cochiti Elementary School
- Garfield Middle School
- St. Therese Little Flower Church
- La Luz Elementary School
- Bernalillo County Children's Court Division
- Goodrich Park

- North Valley Library
- Victory Christian School
- Nativity of the Blessed Virgin Mary Catholic Church
- Raymond G. Sanchez Community Center

BRIDGES

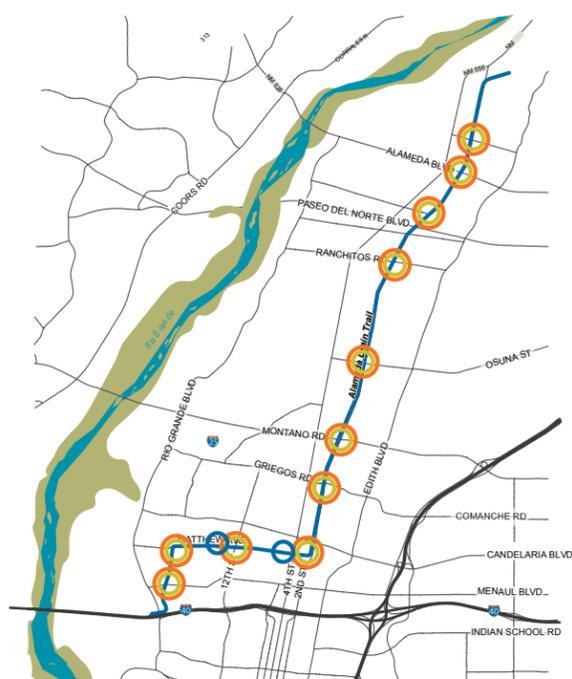
Bridges are a central feature on the Alameda Drain, maintaining the connectivity and flow of traffic crossing the Drain. There are a wide range of bridge types in the City and County. Many of the existing bridges are constructed with unique materials and methods, providing great architectural variety.

To assure consistency and safety this plan recommends bridge types that are already associated with existing trails in the region.

Typical bridges over AMAFCA channels are commonly made of steel and surfaced with wood planks. The wood planks, however, often warp and crack to create an uneven, unsafe surface for bicyclists and pedestrians. Thus, non-wooden bridges made of concrete, are recommended.

The context map below illustrates a number of proposed locations for access control methods. However, locations have to be analyzed on a case by case bases and finalized during the design and development phase.

Context Map



GATES AND BARRIERS

Illegal parking and unauthorized vehicle access to the Drain banks is a concern along the entire project corridor. These activities increase conflicts between future trail users and vehicular traffic and should be minimized and managed with appropriate access control methods.

Access control methods include, but are not limited to railings, fences, gates, bollards or guard posts, landscaping or natural features such as boulders. [Figure 38](#), illustrates some examples of access control methods.

Bollards

Bollards are commonly used as access control measures but, can pose an obstruction to trail users. For this reason, the 2012 AASHTO Guide for the Development of Bicycle Facilities does not recommend the routine use of bollards.

The City of Albuquerque Bikeways and Trails Facility Plan recommends to use of bollards only when the trail could be mistaken as a vehicular road or for areas where violations have been reported. When bollards become necessary, the plan recommends locating them in the center of the trail or at its edges. If ATV access needs to be restricted, the spacing between the bollards can be reduced. The plan also recommends to brightly color bollards and allow access of emergency vehicles by using bollards that are easily removed.

The City of Albuquerque Bikeways and Trails Facility Plan provides a detailed discussion on best practices to be consider when installing bollards.

Boulders

Boulders are also widely used to restrict vehicular access to trail facilities. Boulders offer several advantaged over bollards including being less expensive than bollards and having the ability to blend into the natural environment. However, boulders like bollards, may pose a obstruction and hazard to trail users.

Legend

- Bridges
- Gates
- Barriers

FIGURE 38. Precedent Images Gates & Barriers

Bollards



Retractable bollards



Boulders



Static median bollard

Retractable gate



Gates

Gates are used to control vehicular access to trail corridors. Gate must be designed so it cannot be removal or damage as a gap in the gateway will allow bicyclist or pedestrians to pass through and access the trail. When utilizing gates, signage should be placed to alert trail users of upcoming gates.



Medians

Another less hazardous method to restrict trail access is through the installation of medians that divide the trail at an access point into two one-way paths. This method, however, could also obstruct necessary MRGCD maintenance activities and access to properties along the Drain.

SITE FURNISHINGS

Trash receptacles, benches, and picnic tables are desired at trailheads, rest stops, community gathering places and activity nodes. Site furnishings should be durable, weather resistant and vandal resistant.

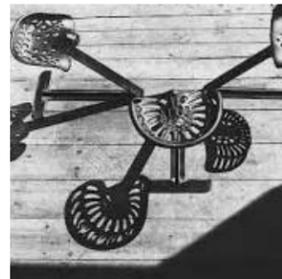
Site furnishings should reflect the character of nearby neighborhoods. For instance, close to Rio Grande Boulevard the site furnishings may reflect the iconic columns at the corners of the intersection, or perhaps Old Town tradition, whereas further north the furnishings reflect the nearby industry of welding shops and be constructed of rebar, or even further north be constructed of tractor seats. Less conventional seating may be provided with boulder seating areas and sawed logs benches.

FIGURE 39. Precedent Images, Site Furnishings

Furnishing - traditional design



Repurposed design



Rustic design



'Welding' design



FOOD TRUCK COURT

A food truck court, a place where food vendors temporarily locate and sell their specialties, can become a community gathering place. The site can either be located at an established activity center or can become an anchor for activity in itself by being placed at a location with good connectivity.

There are currently no established activity centers along the project corridor, however there are great opportunities to create new activity nodes close to areas where public facilities, parks or employment centers are located. Locations close to transit stops, such as the Railrunner station, also provide good opportunities to have food trucks park temporarily.

The context map below illustrates a number of proposed locations for food trucks. Locations have to be analyzed on a case by case bases and finalized during the design and development phase.

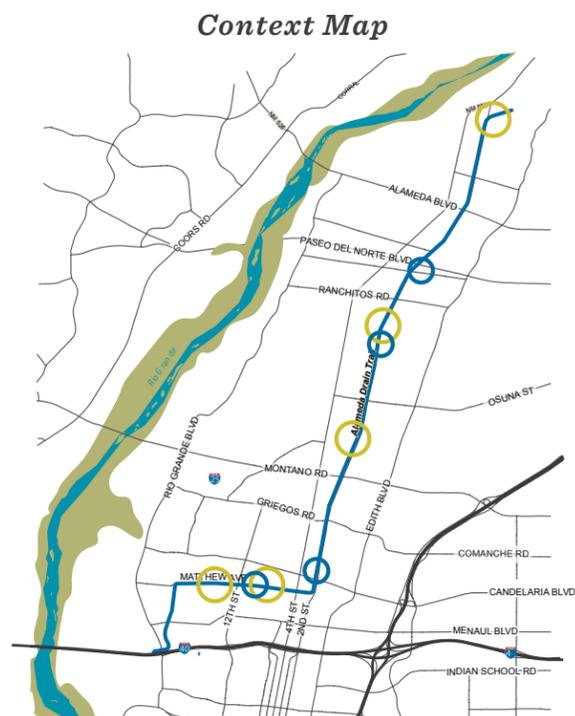


FIGURE 40. Food Truck Court

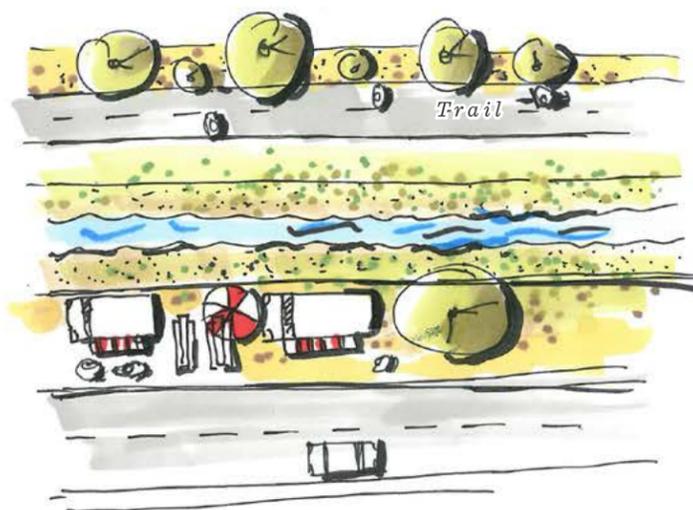
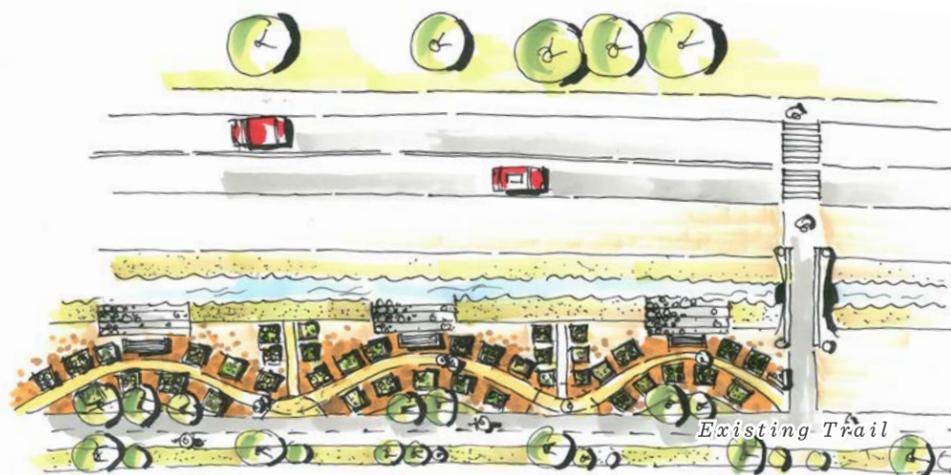


FIGURE 41. Community Garden



“Figure 40. Food Truck Court” on page 51, illustrate a possible temporary set-up for food trucks. Food trucks could be located along 2nd Street where sufficient right-of-way is available. The east side of the Drain appears to be more practical for access and visibility reasons. Existing public facilities such as the library and the police academy can be anchored to profit from established

Legend

- Food Trucks
- Community Garden

activities at these locations. Another site to consider for a temporary food court could be locations close to the Paseo Del Norte or Montañó Railrunner Station, locations identified as desirable for such uses during public meetings.

POTENTIAL FOOD TRUCK COURT LOCATIONS:

- On Matthew and 12th Street
- On 2nd Street across from community centers, Albuquerque Police Academy or the North Valley Library
- On 2nd Street across from industrial/business areas
- Proximity to transit centers

COMMUNITY GARDEN

Gardening and farming have a long standing history within the project corridor. Engaging community members with agriculturally linked activities, would help to support and preserve this tradition. Community gardens also beautify neighborhoods and create spaces in which people can gather and socialize. Community gardens celebrate diversity in individual plots while creating opportunities for people to work together and learn from each other. These activities facilitate community gatherings and strengthen social cohesion.

Community gardens have also proven to be useful in reducing neighborhood crime and providing productive, recreational green space in areas where agricultural activities have declined.

TYPES OF COMMUNITY GARDENS:

- Plot Gardens (divide into individual plots)
- Cooperative Gardens (work as a team on one large garden)
- Youth Gardens
- Entrepreneurial Market Gardens (sell produce)
- Therapeutic Gardens

As the name implies, community gardens are generally run by the community. Gardens can also be operated by schools and other institutions, however, most often they are run and managed by a community based organization.

Within the project corridor opportunities to create community gardens exist. These could either be organized by a school, a neighborhood or a combination of the both.

Figure 41. Illustrates possible locations and layouts for community gardens.

POTENTIAL COMMUNITY GARDEN LOCATIONS:

- On Matthew south side of the drain
- On 2nd Street across from community centers or the North Valley Library.
- La Luz Elementary School

Other locations have to be explored during the design and development phase.

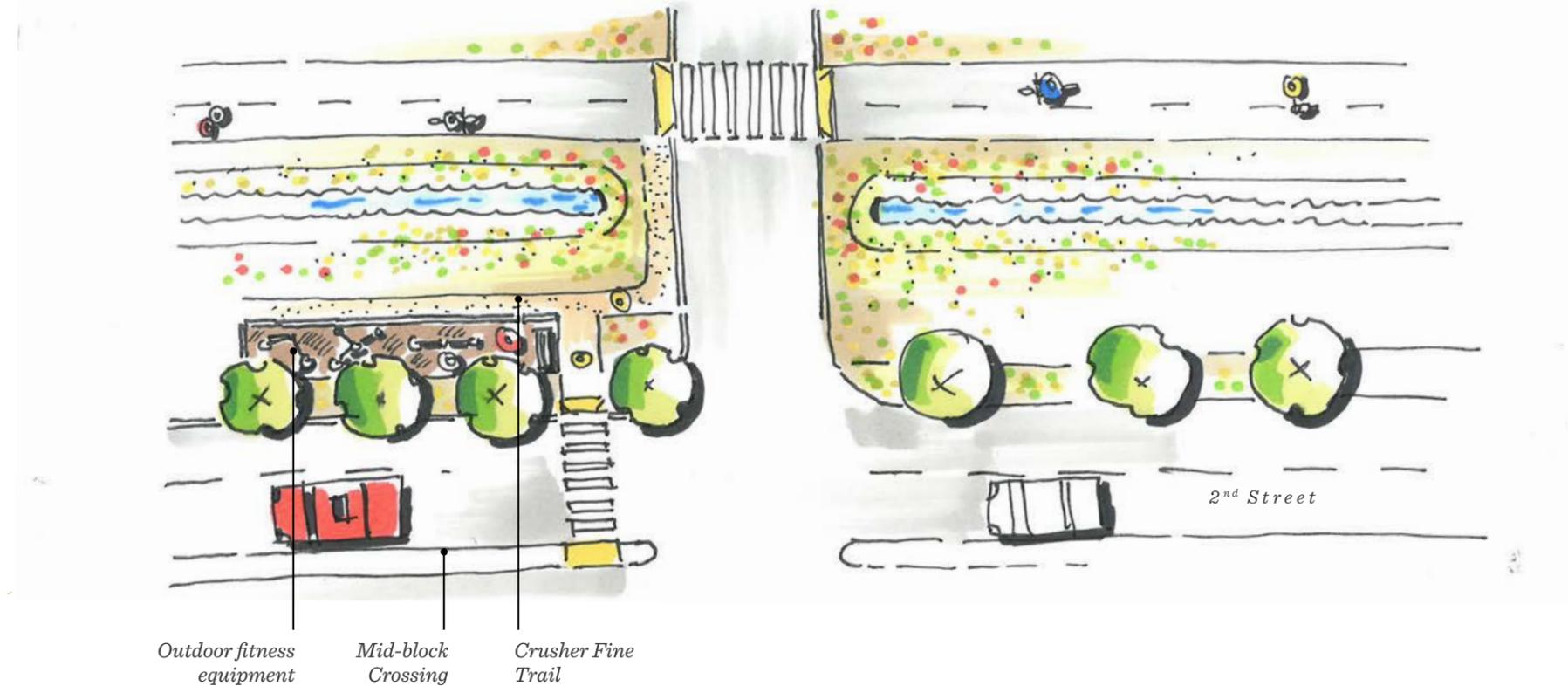
OUTDOOR EXERCISE EQUIPMENT

Outdoor exercise equipment encourages physical activity in public spaces. This equipment has been successfully utilized in other parts of the country and is becoming popular as valuable park and trail amenities.

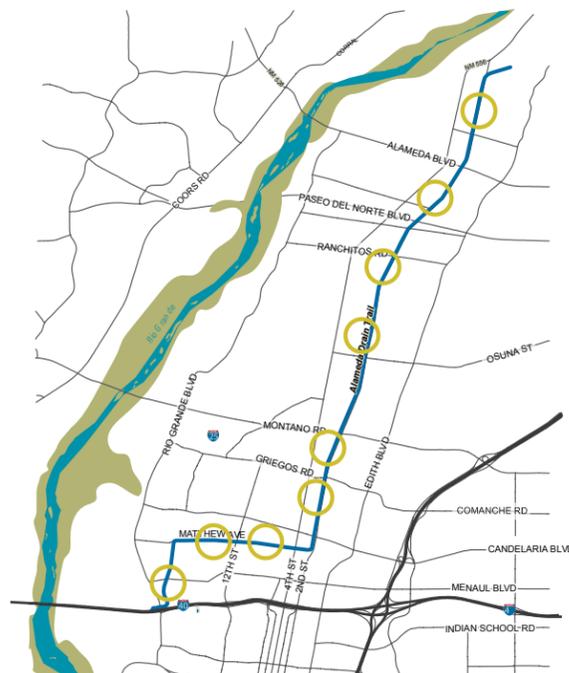
A wide range of equipment exists; strength, cardiovascular, flexibility, and combinations of the above. Combined with the trail, fitness equipment can contribute to a well rounded workout. When clustering the equipment, workouts can also be practiced in groups. This allows individuals to exercise with others or learn from a personal training group. Organized fitness classes around outdoor fitness equipment have gained popularity over the years.

Outdoor exercise equipment is targeted primarily towards adults, not children. Children may be attracted to the equipment so precautions need to be taken so not to attract children playing too close to the Drain in order to prevent dangerous situations.

FIGURE 42. Outdoor Exercise Equipment



Context Map



The context map illustrates possible locations for outdoor exercise equipment stations. There are several locations that fitness equipment could be installed but they become more useful if placed within strategic intervals, enabling users to include the equipment in their exercise routine.

Outdoor exercise stations could also become part of the Bernalillo County [Prescription RX Trail program](#), developed to promote healthy lifestyle.

POTENTIAL OUTDOOR EQUIPMENT LOCATIONS:

- On Matthew and 12th Street
- On 2nd Street across from community centers, Albuquerque Police Academy or North Valley Library

Legend

- Outdoor equipment

FIGURE 43. Precedent Images, Outdoor Exercise Equipment



BIKE OBSTACLE COURSE

The planning corridor already entails some bike specific activities and facilities, including the BMX bike park at the Raymond Sanchez Community Center, and bicycle practice activities on the Drain by the police academy.

A linear bike obstacle course could complement these activities and be installed anywhere along the Drain corridor to entice and attract users. [Figure 44](#) illustrates a potential location for a bike obstacle park along 2nd Street.

The context map below illustrates a number of proposed locations for a obstacle course. However, locations have to be analyzed on a case by case bases and finalized during the design and development phase.

POTENTIAL BIKE OBSTACLE COURSE LOCATIONS:

- On Matthew south side of the Drain
- On 2nd Street across from community centers, Albuquerque Police Academy or North Valley Library

FIGURE 44. *Bike Obstacle Course*

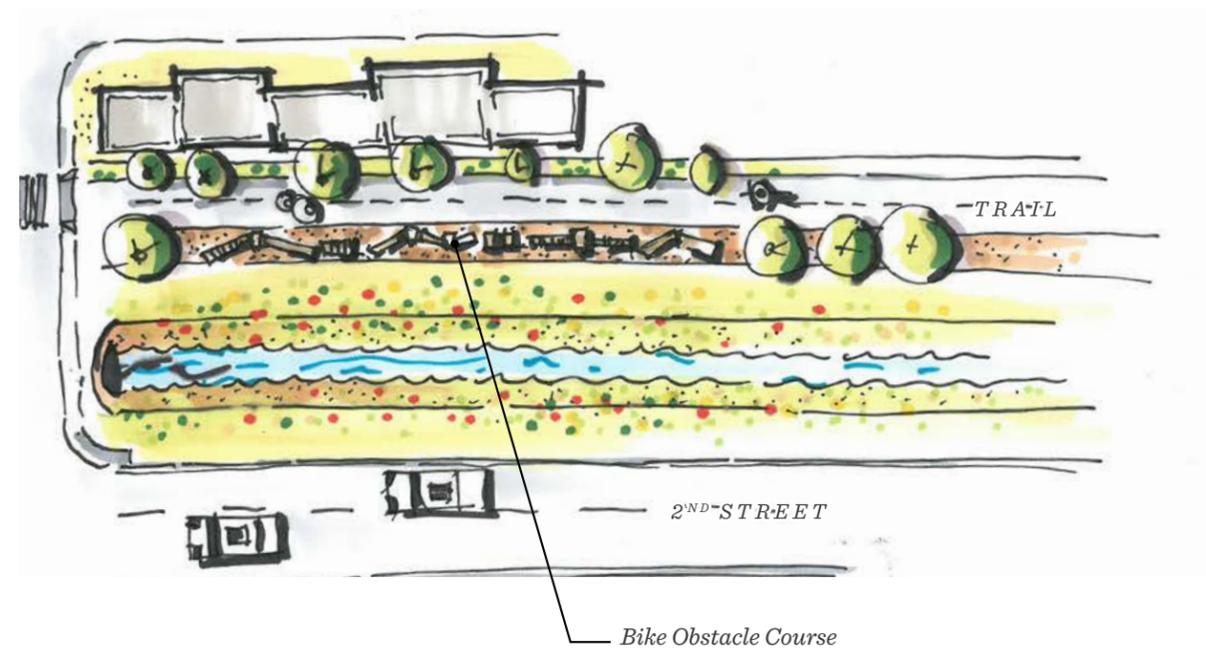
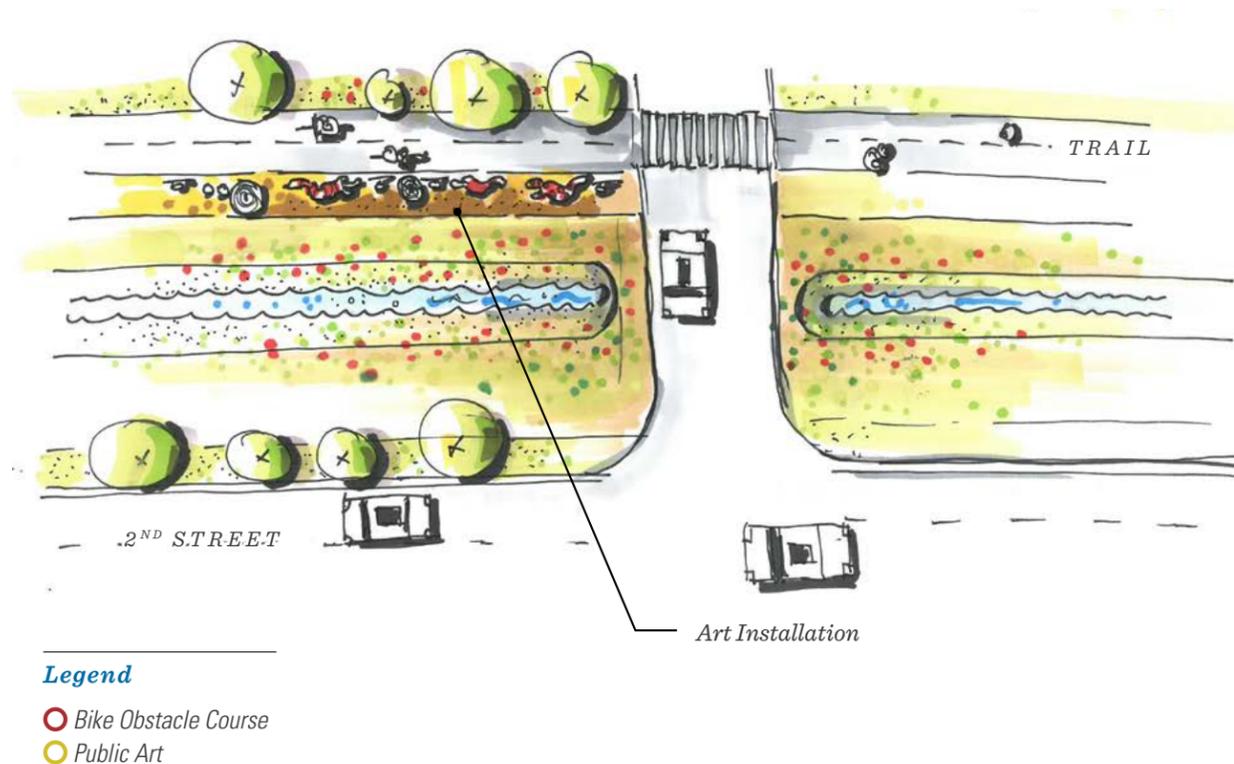


FIGURE 45. *Art Installation*



PUBLIC ART

Art beautifies the public realm and gives it more meaning. Public art can turn a space or corridor into a destination and attract more visitors.

The Alameda Drain & Trail corridor has the potential to incorporate public art displays anywhere along the trail. A possible set-up is illustrated in [Figure 45](#).

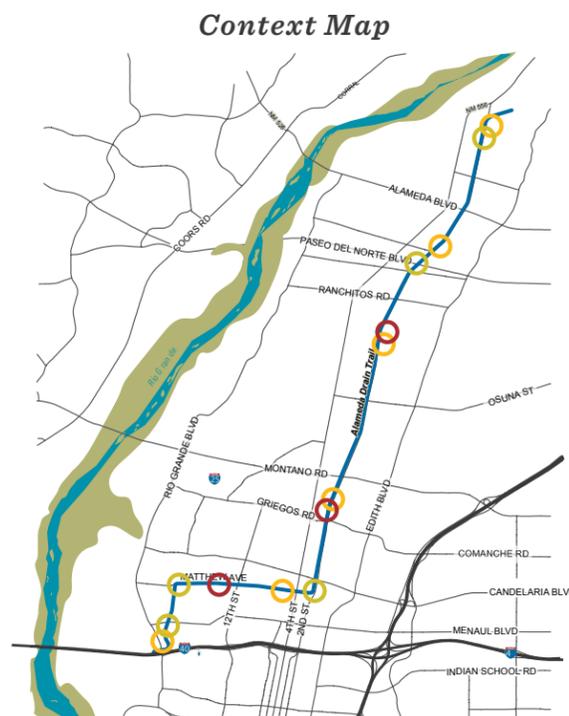
Examples of public art may include art made of recycled materials or even materials that are found in the Drain. Public art may vary according to the context it is placed in. Art can reflect the history and character of its neighboring communities and thereby create a strong sense of place and belonging.

This plan also encourages the creation of partnerships with schools and other public institutions to develop public art programs and place art along the Drain.

The context map to the left illustrates a number of proposed locations for public art. However, locations have to be analyzed on a case by case bases and finalized during the design and development phase.

POTENTIAL PUBLIC ART LOCATIONS:

- At trail heads
- At intersections
- At the Paseo del Norte overpass
- In nodes clustered close to schools and public institutions.
- Murals on existing crossings



WATER FEATURES

Water in New Mexico is a scarce and precious resource. Over the years, the Drain and its functions have contributed to the development and character of the middle Rio Grande Valley. Still today, it fulfills important functions in the Valley and offers a unique opportunity for trail users to interact, observe, and experience the movement of water.

Drain outfalls create opportunities to prevent erosion and enhance water quality. The Alameda Drain & Trail master plan proposes to highlight the Drain water through the use of water features that display it visually and audibly.

Cantilevered overlooks. Cantilevered overlooks are open steel grate cantilevers overhanging the Drain by 6-8 feet. Located by larger pools of water which could become gathering spot for ducks, fish, crawdads and minnows, overlooks are intended to create an accessible experience of water and wildlife as illustrated in [Figure 49](#). The overlook could also accommodate fishing and the feeding of wildlife without directly accessing the water from the steep edges.

Solar powered fountain. The solar powered fountains are envisioned to pump Drain water into a fountain feature that then drip water back into the Drain from a cantilevered overlook or bridge as illustrated in [Figure 47](#). This feature permits the trail user to appreciate water through sound and movement and encourages respect for the Drain as a legacy of MRGCD water management. Solar can also power a variety of other fountains that showcase and display water as illustrated in [Figure 46](#).

Gabions. Gabions are metal mesh cage structures filled with rocks as illustrated in [Figure 48](#). These structures are commonly employed to protect river banks from soil erosion and being washed out. Along the drain, gabions could serve as stepped seating or visual accents that serve to protect drain banks and visually enhance the trail corridor.

FIGURE 46. *Water fountain*



FIGURE 47. *Solar Powered fountain*



FIGURE 48. *Gabions*

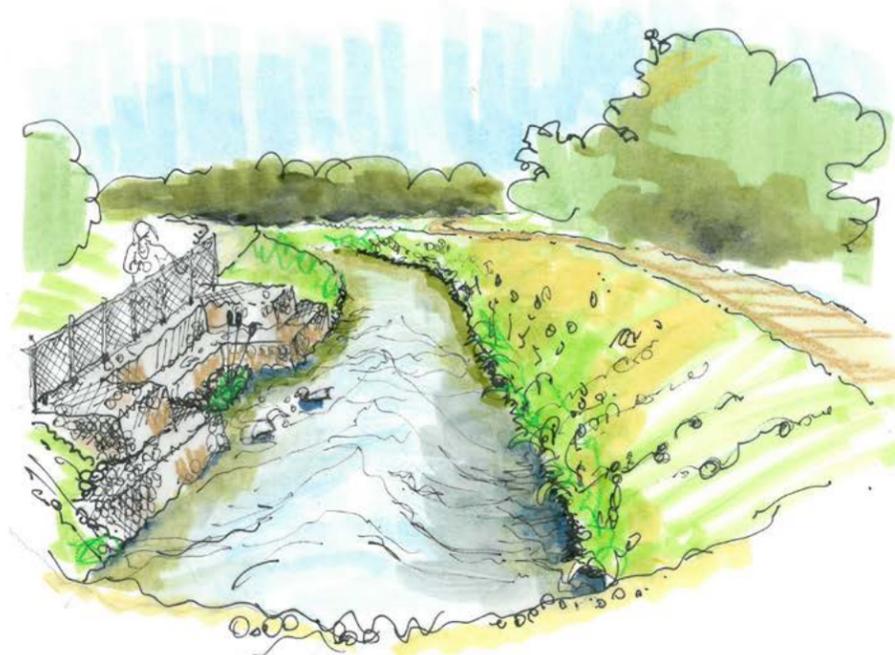


FIGURE 49. *Cantilevered overlook*



3.5 Signage

 Signage to guide and inform users about the trail, its purpose, adjacent amenities and trail connections or places of interest is an important component to creating a successful trail experience. In addition, trail signage can improve the continuity to the corridor and educate trail users about the Drain’s functions, maintenance needs, or local history and heritage.

Trail related information can be disseminated in a wide range of formats including directional, wayfinding, entry, kiosk and interpretive signage, trail markers and through the use of websites, fliers and guides.

The ‘Wayfinding’ section of the [City of Albuquerque Standard Specification](#) recommends the following elements to be included in a signage program for multi-use trails:

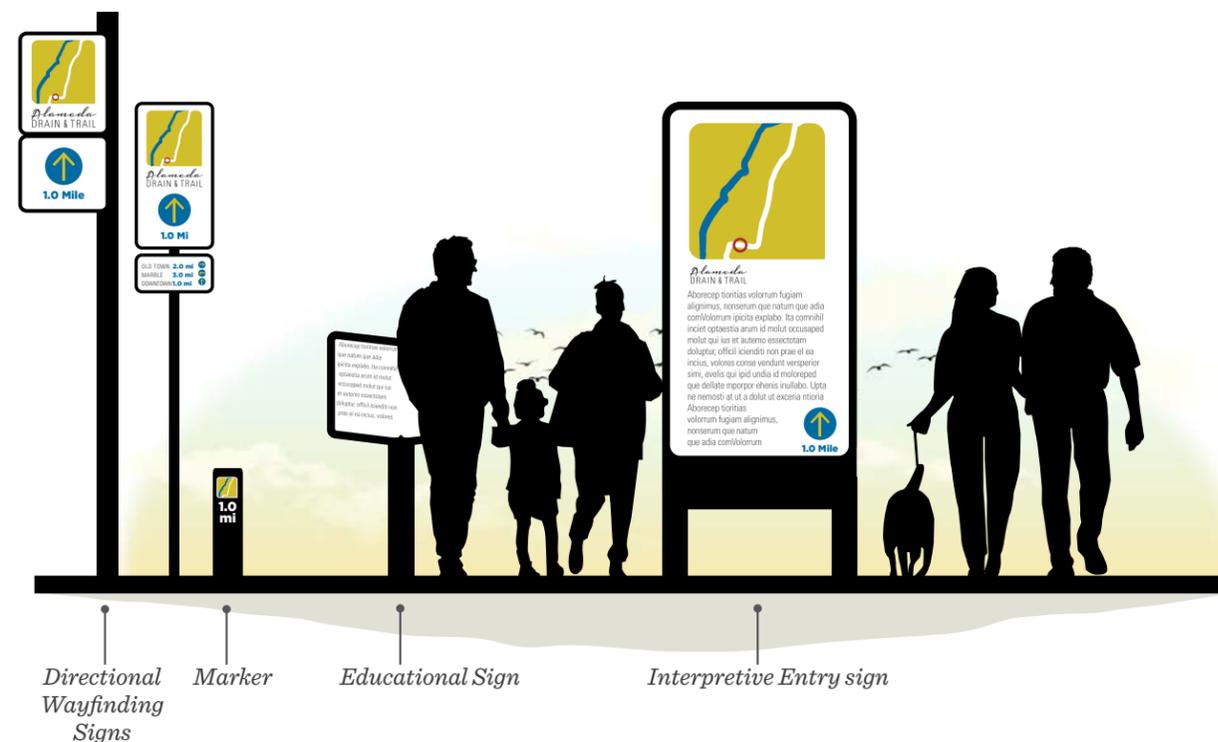
- Trail name;
- Trail direction and mile marker; street and trail intersections;
- Trail location identified by the distance from the beginning terminus of the trail expressed in miles and tenths of miles;
- Pavement markings; and
- Trail regulatory signs placed where most visible and effective.

The city has developed signs to give the paved multi-use trail network its own sense of community and style, as shown in [Figure 50](#).

FIGURE 50. City of Albuquerque Multi-Use Trail Sign



FIGURE 51. Signage



GUIDING PRINCIPLES 6. Signage

- ENHANCE NAVIGATION AND ORIENTATION FOR VISITORS AND RESIDENTS
- EDUCATE ABOUT THE ALAMEDA DRAIN, ITS FUNCTIONS AND MAINTENANCE NEEDS
- MAINTAIN TRAIL SIGNAGE IN GOOD ORDER
- SIGNS SHOULD REFLECT THE NATURE OF THE TRAIL
- LOCATE SIGNS SO THEY CAN EASILY BE SEEN BY TRAIL USERS
- LIMIT THE INFORMATION ON THE SIGNS TO THE NECESSARY
- CONSOLIDATE SIGNS AND MESSAGING WHERE POSSIBLE AND REMOVE UNNEEDED SIGNS
- SIGNS SHOULD PRESENT INFORMATION THAT IS EASILY UNDERSTOOD BY ALL USERS
- TEXT SHOULD BE LIMITED TO WHAT IS NECESSARY AND SHOULD BE SUPPLEMENTED BY GRAPHICS THAT ARE UNIVERSALLY UNDERSTOOD

The City of Albuquerque ‘[Bikeways and Trails Facility Plan](#)’ offers guidance for the multi-use trail signage that should be incorporated in the Alameda Drain & Trail signage and wayfinding program. The plan also states that signage should be customized to the specific the trail specific to create individual identities for each trail facility. This master plan gives an overview of the signage and wayfinding concept for the Drain, but ultimate signage and wayfinding designs and locations should consult the Bikeways and Trails Facility Plan and be finalized during the design and development phase.

SIGN MATERIAL

Signs can be constructed of different types of material including wood, plastic and fiberglass, aluminum, steel and stone. Materials are chosen depending on budget, aesthetics preferences, durability, maintenance costs, and replacement cost due to vandalism or theft.

Wood. Wood is traditionally used to construct many types of signs as it is readily available and visually pleasing.

Wood properties and factors to consider are:

- Adaptability and resistance to weather conditions needs to be considered, especially in the New Mexican climate
- Wood from cedar is more weather-resistant but not as vandal-resistant
- Need to be sealed to enhance the durability

Plastics and Fiberglass. Plastics and Fiberglass are a durable, commonly used material. Plastics and Fiberglass properties and factors to consider are:

- Plastics and fiberglass are weather-resistant
- Fairly inexpensive materials and easily adaptable to different shapes
- Good choice for smaller signs and signposts.
- Includes materials that are reflective

Aluminum. Aluminum is readily available and also commonly used. Aluminum properties and factors to consider are:

- Aluminum is lightweight and very durable
- Aluminum is most useful for traffic control signs
- Aluminum is more expensive and may not be appropriate for larger signs

Steel. Steel properties and factors to consider are:

- Affordable and durable but heavier than aluminum
- Requires special treatment to inhibit rust, however may be well suited for the New Mexican climate

Stone. Stone properties and factors to consider are:

- Stone is best as a decorative base for larger signs that require posts or as markers along the trail

All signs should be constructed of weather resistant and vandal resistant materials.

SIGN TYPE

Trail Markers.

Trail markers identify the trail path, provide its name, mileage and direction, and may indicate its length.

Markers, as illustrated in [Figure 52](#) and throughout the subsequent precedent images, are typically small signs

FIGURE 52. *Markers*



FIGURE 53. *Precedent Images - Trail marker*



that mark the trails path, reassuring the trail users that they are still on the trail. Markers can be constructed out of small posts, stenciled onto other objects, or painted directly on the trail surface, as indicated in [Figure 54](#).

Trail markers should be installed in a visible location and at the eye level of users. Generally, markers that include mileage indications are placed every quarter to one mile. All trail markers should be designed according to the characteristics of the trail and unobtrusive.

Directional/Wayfinding Signs.

Directional/wayfinding signs inform trail users about destinations that can be reached along the trail. These signs are placed at trailheads, trail junctions, road crossings and trail access points. Examples are shown in [Figure 54](#) and subsequent precedent images.

Directional/wayfinding signs should be located in a visible location, mounted to a pole or post readily visible to trail users.

Wayfinding signs also present an opportunity to point to non-traditional destinations, such as places where users can eat and drink or places outside the trail corridor.

Directional signs should include the following information:

- Trail name;
- Logo of trail;
- Significant destinations, including but not limited to: public facilities, places of interest, cultural institutions, popular food and beverage venues (breweries, restaurants - here could be an opportunity to raise revenue through sponsorship) ;
- Distance to each destination; and
- Direction to each destination (an arrow, unless the direction is obvious by the placement of the sign)

FIGURE 54. *Directional/Wayfinding Sign*



FIGURE 55. *Precedent Images - Directional/Wayfinding Sign*



Entry Signs

Entry signage announce to users that they have arrived and should help with trail identification and navigation. Entry signs should be placed at all major trail access points and trailheads.

INFORMATION POSTED ON ENTRY SIGNS MAY INCLUDE:

- Trail name;
- Involved agency logos;
- Allowable uses of the trail;
- Total trail length;
- Trailhead elevation along with maximum and minimum trail elevations;
- Surface type, firmness, and stability;
- A statement that posted information reflects the conditions of the trail when it was constructed or assessed and that events beyond the control of the agency staff can make trails temporarily inaccessible; and
- Map of trail.

Interpretive Signs

Interpretive signage, as illustrated in [Figure 56](#), provides trail-specific information about the trail path and related trail amenities. Interpretive signs that can be placed at trailheads and throughout the trail corridor in order to display educational information pertaining to the Drain's function, its purpose or the history and/or heritage of the area it is placed in. Interpretive signs can also include information about the Drain's maintenance needs in order to inform visitors about maintenance schedules and trail closures.

FIGURE 56. *Trailhead/Interpretive Signs*



FIGURE 57. *Precedent Images - Trailhead/Interpretive Sign*



Generally, interpretative signs should be posted conspicuously so that they are readily visible to trail users.

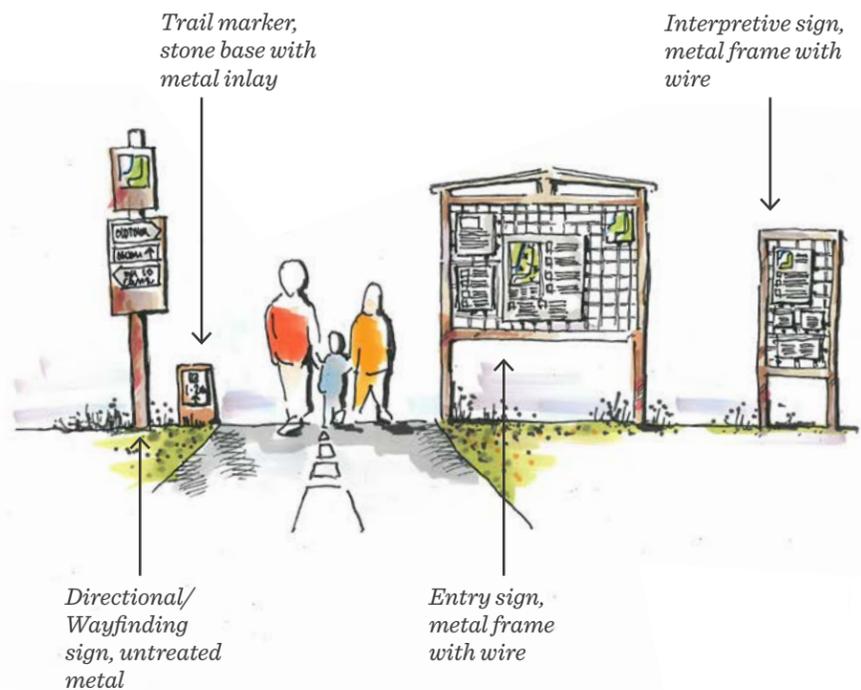
INFORMATION POSTED ON INTERPRETIVE SIGNS MAY INCLUDE:

- Information about the Drain's function, its purpose or the history and/or heritage of the area it is placed in.

Other Trail Signage

Adopt-a-trail Program could be introduced to raise funds and awareness, and engage the community to take ownership of the trail.

FIGURE 58. Signage Concept - Rustic/Metal

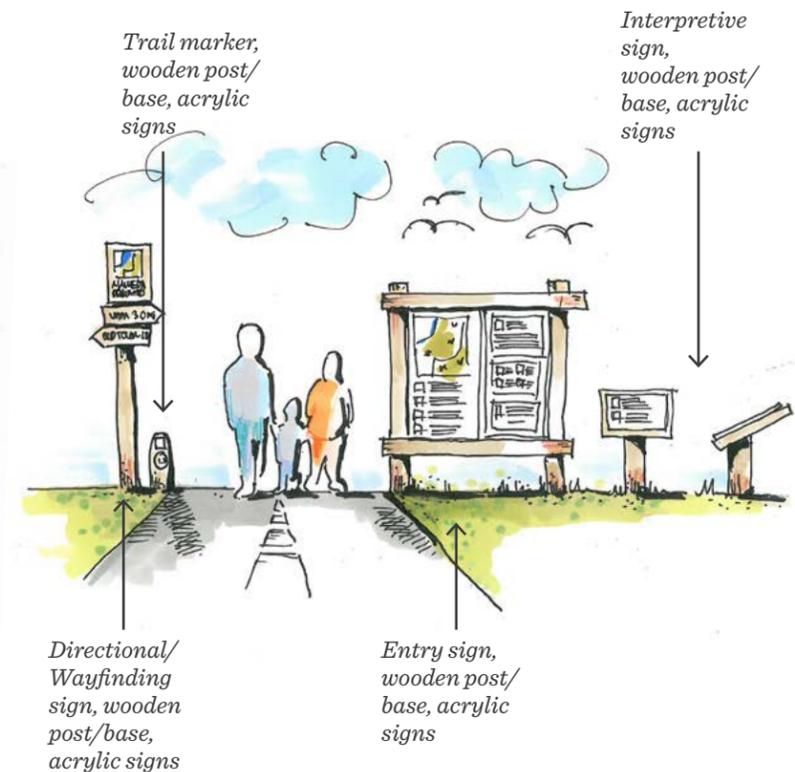


Rustic metal concept

Figure 58 incorporates untreated metal with acrylic elements to create a rustic, natural look. Similar metal features have also been used at the county's Bachechi open space, and would tie the trail sign elements in with other County facilities.



FIGURE 59. Signage Concept - Traditional Wood

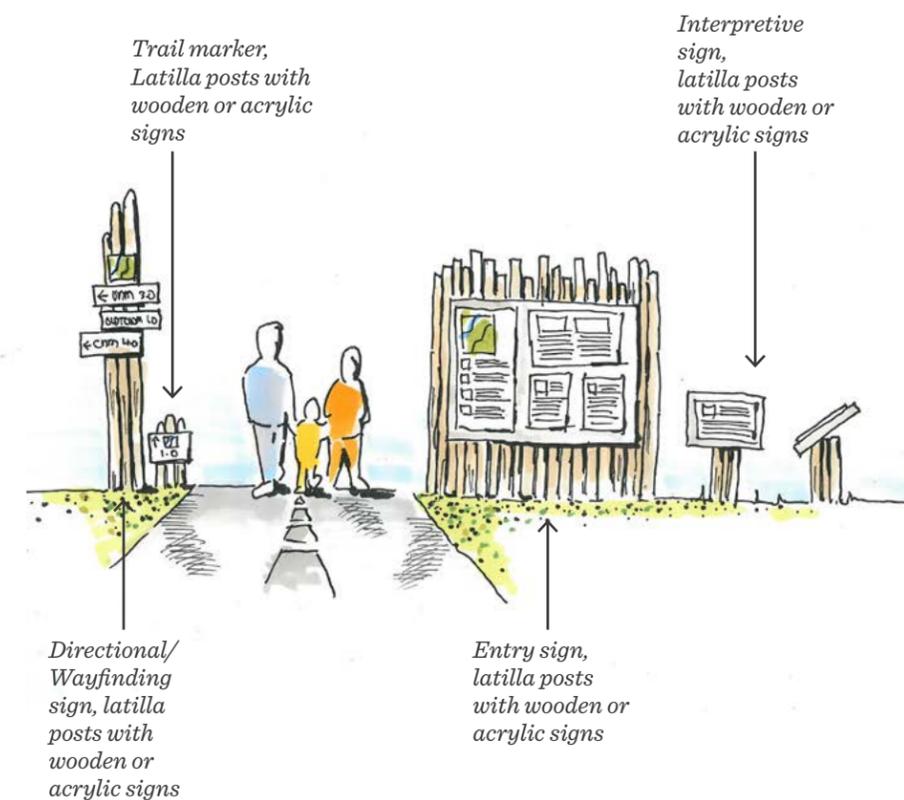


Traditional wood concept

Figure 59 also integrates existing open space signage elements. As seen in the precedent images to the left, a number of existing open space areas employ wood to as materials for signs and kiosks. This concept would employ as a main feature posts, with acrylic signs attached.



FIGURE 60. Signage Concept - Coyote Fence



Coyote fence concept

Figure 60 does not reflect sign elements already used by the County. However, it ties into materials used in adjacent neighborhoods. This concept would mount acrylic signs to coyote fence sections.



3.6 Landscape

Landscape improvements along the Drain enhance the visual qualities of the corridor and mitigate erosion while reducing water quality issues. Seeding the Drain banks with native grasses and wildflowers will stabilize the soil, improve water quality and reduce the need for maintenance activities. It is also anticipated that desired, native landscape will ultimately out compete unwanted weeds and further reduce the need for maintenance. Street trees along 2nd Street can also function as buffer and visually enhance the corridor.

GUIDING PRINCIPLES 7. Landscape

- CREATE AN ALAMEDA DRAIN & TRAIL IDENTITY
- ESTABLISH A PRIMARY PLANT PALETTE CONSISTING OF NATIVE AND WHERE POSSIBLE, RIPARIAN PLANTS
- PROVIDE A COMFORTABLE USER EXPERIENCE BY PLANTING NATIVE SHADE TREES AND STREET TREES IN STRATEGIC LOCATIONS
- REVEGETATE THE ALAMEDA DRAIN & TRAIL CORRIDOR
- PRESERVE EXISTING, DESIRED SPECIES
- HARVEST STORMWATER FROM IMPERVIOUS SURFACES TO FEED THE LANDSCAPE
- INCREASE STORMWATER INFILTRATION RATE
- IMPROVE WATER QUALITY
- REDUCE MAINTENANCE NEEDS AND THE NEED TO EMPLOY HARMFUL HERBICIDES TO CONTROL WEEDS
- GROW AN EDIBLE LANDSCAPE
- RESEED DISTURBED AREAS WITH GRASSES AND WILDFLOWERS AFTER ALL DREDGING ACTIVITIES

Planting Strategies & Noxious Weed Control

Improving the landscape along the Drain through establishing native species is a desired outcome of this plan. At present, desired plant communities are being

TABLE 8. Trail Landscape by Amenity

Landscape type	Features	Plant Material
Trailheads	Parking, signage, accessible walks, art, Water quality features, bridges, site furnishings, lighting, barriers, amenities	Shade and fruit trees, agricultural plantings, ornamental plantings- irrigated
Rest stops	Site furnishings, interpretive signage	Shade trees, shrubs- preferably unirrigated
Parks- Linear	Parking, signage, Water quality features, site furnishings, amenities	Shade and fruit trees, agriculture plantings, ornamental plantings, irrigated
Stromwater or wasteway drain entry	Interpretive signage, Water quality features, bridges	Phytoremediation plantings- not irrigated
Community Garden	Signage, site furnishings, planting beds, art, amenities	Fruit trees, shade trees, agricultural plantings, irrigated
Trail lengths	Trail, bollards, gates, street crossings, barriers	Seeded grasses and wildflowers

eliminated or damaged along with undesired species during maintenance activities. Through revegetation, the MRGCD can ultimately reduce the need for maintenance and the use of herbicides. Seeding strategies are therefore mandated to allow new vegetation to root and develop.

General guidelines for landscape treatments and revegetation are detailed in the Landscape section ([Landscaping 7.C.8.d, p.204](#)) of the Bikeways and Trails facility plan and in [Section 1012](#) of the City of Albuquerque Standard Specifications. According to these standards, landscaping should be kept back two feet from the edge of the trail (unless it is strictly grasses). Trees are encouraged along trails but should be planted at least six to ten feet back from the edge of trail. Shrubs should also not interfere with the trail as they mature and be located away from the trails edge.

The landscape concepts respond to the availability of funding, community input and concerns for weed control. Limited trail budgets prohibit continuous landscaping

along the trail. The landscape concept therefore envisions sequenced pockets of shade located at activity nodes and trail amenities along the corridor. These shady nodes will provide cool seating areas with food bearing plants. [Table 8](#) outlines recommended plant types by trail amenities.

Certain phreatophytes trees such as willow, may be established with dormant pole plantings in early spring. Pole plantings may be subject to more attrition than traditional plantings. Other xeric tree species can be established with irrigation systems.

Drain banks. Erosion can be controlled by establishing the appropriate vegetation along the Drain's banks. Drain banks are difficult to vegetate because of the steep slope (1:1 to 1.5:1) and because they flood partially and/or completely with possible scouring during significant rain events. Mowing and periodic disturbance due to dredging activity further reduces the ability of plants to get established. Generally, MRGCD keeps riparian species such as coyote willow, bulrushes and cattails from establishing themselves along the drain banks.

Current species that have established themselves on the Drain banks include horsetail, sedges, switchgrass and salt grasses which have resiliently responded to frequent mowing and periodic dredging disturbing their root mass.

Riparian seed mixes should be developed to respond to these conditions. It is recommended that a seeding protocol along the banks occur after all dredging activities to minimize erosion and stabilize the soil.

Upland areas. Upland areas are those areas above the Drain bank that compose the maintenance and access roads, trails, parking and planting areas. Seed mixes should be used to combat weed species such as goat heads and kochia. As detailed in the paper "[Competition as a weed control strategy](#)" by Susan Kelly ([Appendix H](#)), native grasses can outcompete the weed species if the seed bank within the soil is reinvigorated with grass, wildflower and forb seeds.

Current species that have established themselves along the upland areas include Apache plume, Blue grama, Chamisa and Side oats grama.

It is recommended that seeding of grasses and wildflowers occur along upland areas after all dredging activities to minimize windblown dust and reduce perception of the area as a dirt lot.

A planting and maintenance guide is detailed in the [Preferred Alternative Section](#).

Plant Palette

Choosing the right plants palette for the project corridor involves a wide range of considerations, including climate zones, micro-climates, soils, sun exposure, availability of moisture and exposure to wind. Establishing any kind of species are especially challenging in New Mexico with it's extreme temperatures and low levels of precipitation.

Landscape site design concepts also involve steps to evaluate and select plants that perform environmental, functional and aesthetic roles. With the species requirements and functions in mind, [Table 8](#) was developed to fit the specific needs of the corridor.

The proposed species are intended to emulate native New Mexican plant communities and should stabilize the Drain's banks and outcompete unwanted species. The landscape also aims to create a special "sense of place" and visual identity for the Alameda Drain & Trail corridor. While these

are all functions that will enhance the corridor for the user and MRGCD, establishing native plant communities will also provide habitat for indigenous species and migratory wildlife.

The plant palette provides opportunities for a variety of design applications and concepts depending on what plants are chosen and where they are placed. While this will heavily depend on existing conditions, soil conditions and access to water, a wide range of native plants are available to fit each niche environment.

Revegetation of the corridor is a desired goal of the Master Plan and sites can be achieved if landscape plans and seeding procedures are jointly followed.

The palette also introduces a variety of edible plants that can fill the same niches that other more common plants fill, and provide food for trail users as well as edible plant materials for wildlife species.

The following landscape palette introduces plants that suit the corridor and can be established to stabilize the soil, revegetation the corridor and create a pleasant user experience.

Plant Palette

TREES (chosen for water tolerance, salinity and clay tolerance, shade production, and possible pole planting techniques):

Cottonwood	<i>Populus Fremontii 'Wislenzii'</i>
Lanceleaf cottonwood	<i>Populus x acuminata</i>
Peachleaf willow	<i>Salix amygdaloides</i>
Chinese Pistache	<i>Pistache chinensis</i>
Mesquite	<i>Prosopis spp.</i>
Hackberry	<i>Celtis occidentalis</i>
Sensation Box elder	<i>Acer negundo 'Sensation'</i>
Tatarian Maple	<i>Acer tatarian 'GarAnn'</i>
Western River Birch	<i>Betula occidentalis</i>
New Mexico olive	<i>Foresteria neomexicana</i>
Desert Willow	<i>Chilopsis linearis</i>
Arizona walnut	<i>Juglans microcarpa</i>
Arizona Sycamore	<i>Plantanus wrightii</i>
Red Oak	<i>Quercus rubrum</i>

FIGURE 61. *Plant Options*



SHRUBS

Apache Plume	<i>Fallugia paradoxa</i>
Chamisa	<i>Chrysothamnus nauseosus</i>
Seepwillow	<i>Baccharis salicifolia</i>
Silverberry	<i>Eleganus pungens</i>
Sumac	<i>Rhus spp.</i>
Fernbush	<i>Chamaebatiaria millefolium</i>

PERENNIALS FOR WET AREAS

Yerba mansa	<i>Anemopsis californica</i>
TREES (FOOD PRODUCERS)	
Peach	<i>Prunus spp.</i>
Pomegranate	<i>Punica granatum</i>
Apricot	<i>Prunus spp.</i>
Apple	<i>Malus spp.</i>

Jujube
Persimmon
Pecan
Hazelnut

Ziziphus mauritiana
Diospyros virginiana
Carya illinoensis
Corylus spp.

SHRUBS (FOOD PRODUCERS)

Service Berry	Amelanchier alnifolia
Gooseberry, currant	Ribes cereum
Raspberries	Rubus spp.
Sand plum	Prunus besseyii
Nanking Cherry	Prunus tomentosa
Canyon grape	Vitus arizonica
Wolfberry	Lycium pallidum
Chokecherry	Prunus virginiana

AGRICULTURAL PERENNIAL PLANTINGS

Asparagus	Asparagus officinalis
Rhubarb	Rheum rhabarbarum
Okra	Abelmoschus esculentus

Plant Matrix

The plant matrix describes plants introduced in the plant palette in greater detail, outlining plant properties and water usage.

The majority of plants to be utilized along the corridor are native to New Mexico and therefore adapted to the local climate. Each species has unique properties that make them suitable for specific areas and their intended uses. The matrix should be utilized to choose suitable plant species for these areas during the design phase following the adaption of this plan.

TABLE 9. Landscape Matrix

Plant	Properties	Water use			Season										
		Shade	Understory	Ornamental	Fruit	Berries	Nuts	Pods	Bulb	Low	Moderate	High	Bloom (timing and color)	Fall color	
Traditional Plant Species															
Trees (chosen for water tolerance, salinity and clay tolerance, shade production, and possible pole planting techniques)															
Rio Grande Cottonwood	Populus Fremontii 'Wislenzii'	X										X	N/A		
Lanceleaf Cottonwood	Populus x acuminata	X										X	N/A	x	
Peachleaf Willow	Salix amygdaloides	X										X	N/A	x	
Chinese Pistache	Pistache chinensis	X									X		N/A	x	
Mesquite	Prosopis spp.		X							X			Summer, yellow		
Hackberry	Celtis occidentalis	X									X		N/A	x	
Sensation Box elder	Acer negundo 'Sensation'	X									X		N/A	x	
Tatarian Maple	Acer tatarian 'GarAnn'	X		X							X			x	
Western River Birch	Betula occidentalis			X								X	N/A	x	
New Mexico Olive	Foresteria neomexicana		X								X		N/A	x	
Desert Willow	Chilopsis linearis			X							X		Summer, pink and white		
Arizona Walnut	Juglans microcarpa	X									X		N/A		
Arizona Sycamore	Plantanus wrightii	X									X		N/A		
Red Oak	querlus grisea	X									X		N/A	x	
Afgan Pine	Pinus nigra	X									X				
Arizona Cypress	Cupressus arizonica	X								X					
Grey Oak	Casuarina glauca		X							X					
One Seed Juniper	Juniperus monosperma									X					
Shrubs															
Apache Plume	Fallugia paradoxa		X	X						X			Year-round, white		
Chamisa	Chrysothamnus nauseosus		X	X						X			Fall, Yellow	x	
Seepwillow	Baccharis salicifolia		X	X						X			Spring, White		
Silverberry	Eleganus pungens		X	X						X			Summer, Yellow		
Sumac	Rhus Spp.		X							X			N/A	x	
Fernbush	Chamaebatiaria millefolium		X							X			Summer, White		
Four Wing Saltbush	Atriplex canascens		X							X			N/A		
Alkali Sacaton	Alkali sacaton		X							X			N/A		
Sand Sage	Artemesia filifolia		X							X			N/A		
Bear Grass	Nolina microcarpa		X							X			N/A		
Algerita	Mahonia haematocarpa		X				X			X			N/A	X	
Algave	Agave SPP.			X						X			Tall Stalk		
Shrubs and perennials for wet areas															
Yerba Mansa	Anemopsis californica		X	X								X	Year-round, white		
False Indigo	Baptista australis		X	X								X	Spring, Blue		
Coyote Willow	Salix exigua		X	X								X	N/A		
Horsetail	Equisetum			X								X	N/A		
Red Dogwood	Cornus sericea			X								X	Spring white		
Kerria				X								X	Spring white		

Plant	Properties	Water use							Season					
		Shade	Understory	Ornamental	Fruit	Berries	Nuts	Pods	Bulb	Low	Moderate	High	Bloom (timing and color)	Fall color
Edible Plant Species														
Trees (food producers)														
Peach	Prunus spp.	X		X	X					X			Spring, Pink	
Pomegranate	Punica granatum		X	X	X					X			Summer, red	
Apricot	Prunus spp.	X			X					X			Spring, white	
Apple	Malus spp.	X			X					X			Spring, Pink	x
Jujube	Ziziphus mauritiana		X		X					X			N/A	
Pecan	Carya illinoensis	X					X				X		N/A	
Quince	Cydonia oblonga		X	X	X					X			Summer, pink	
Hazelnut	Corylus spp.	X					X				X		N/A	
Shrubs (food producers)														
Service Berry	Amelanchier alnifolia					X				X			Spring, white	x
Gooseberry, currant	Ribes cereum					X				X			N/A	x
Raspberries	Rubus spp.					X				X			Summer, White	
Sand plum	Prunus besseyii								X				Summer, White	x
Nanking Cherry	Prunus tomentosa									X			Summer, pink	x
Canyon grape	Vitus arizonica								X				N/A	
Wolfberry	Lycium pallidum					X			X				N/A	
Chokecherry	Prunus virginiana									X			Spring, white	x
Agricultural perennial plantings														
Asparagus	Asparagus officinalis									X			N/A	
Rhubarb	Rheum rhabarbarum									X			N/A	
Okra	Abelmoschus esculentus							X		X			N/A	
Onion	Allium spp.								X					

The table below indicates the functions that different plants can fulfill. The plants referenced in this table relate to the overall plant palette.

TABLE 10. Plant palette situational

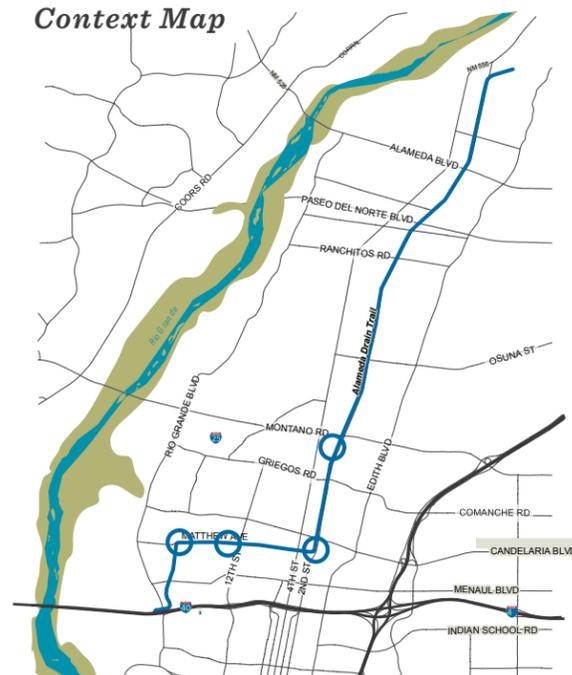
	Food bearing landscapes	Shade and seasonal interest	Water harvest-ing/water quality	Xeric plantings	Habitat Planting
Trees	Peach	Chinese Pistache	Rio Grande Cotton-wood	Desert Willow	Desert Willow
	Pomegranate	Arizona Sycamore	Lanceleaf cotton-wood	Mesquite	Mesquite
	Apricot	Red Oak	Peachleaf willow	Grey Oak	New Mexi-co olive
	Apple	Ash	Chinese Pistache	Gambel Oak	Arizona walnut
	Jujube	Arizona Cypress	Mesquite	Arizona Cypress	
	Pecan	Afghan Pine	Hackberry	One Seed Juniper	
	Quince		Sensation Box elder		
	Hazelnut		Tatarian Maple		
	Pinon		Western River Birch		
			New Mexico olive		
Shrubs & Perennials			Desert Willow		
			Arizona walnut		
			Arizona Sycamore		
			Red Oak		
	Service Berry	Blue Mist Spirea	Yerba mansa	Apache Plume	Yarrow
	Gooseberry, currant	Fernbush	False indigo	Chamisa	Butterfly Bush
	Raspberries	Red Yucca	Coyote Willow	Seepwillow	Chokecherry
	Sand plum	Sulfur Buckwheat	Horsetail	Silverberry	Milkweed
	Nanking Cherry	Broom	Red Dogwood	Sumac	Penstemon
	Canyon grape	Salvia	Kerria	Fernbush	Globe Mallow
Grasses	Wolfberry	Yarrow		Four Wing Saltbush	Copper Rose
	Chokecherry	Butterfly Bush		Alkali Sacaton	
				Sand Sage	
				Yucca	
				Beargrass	
				Agave	
				Algerita	
	Indian Ricegrass	Miscanthus	Switchgrass	Deergrass	Native grass, shrubs and tree seed blend
		Muhlygrass	Karl Foerester reed grass	Sand lo-vegrass	
			Sedges	Blue Grama	
			Buffalo grass		
			Salt Grass		

3.7 Stormwater Best Management Practices

There are over 109 discrete pipe discharges into the Alameda Drain along the length of the project corridor from Rio Grande Boulevard on the south to Cynthia Loop on the north end. The installation of storm water quality Best Management Practices (BMPs) at pipe discharges is anticipated as part of the development and eventual construction of the Alameda Drain & Trail.

BMPs are generally classified in two categories; **structural** and **non-structural**. Structural BMPs include engineered facilities that, through physical and biological processes, improve water quality. Non-structural BMPs include management and education programs that serve to enhance, improve or modify activities and behaviors to reduce pollutant contributions to storm water runoff.

Context Map



Opportunities to enhance the treatment in the existing upstream storm drain networks discharging into the Alameda Drain is important to implement as separate projects. These “treatment train” improvements will help reduce pollutants in the storm water discharging into the Drain, which will then allow primarily tertiary treatment within the Drain corridor. Development of improvement options to upstream network facilities is beyond the scope of this master plan.

The facilities proposed for the Alameda Drain focus on structural BMPs within the Drain corridor that can be designed, constructed and maintained with the goal of reducing pollutant loads within the Drain.

Water quality improvements in the Alameda Drain must be addressed from two different perspectives, rainfall events and perennial flows. Storm drain discharges result from individual rainfall events so therefore, produce a “pulse” of impacted water. Perennial flow within the Drain, or “baseflow” occurs due to shallow groundwater infiltration, nuisance flows and discharge from the North Diversion Channel “bathtub” located west of the Albuquerque

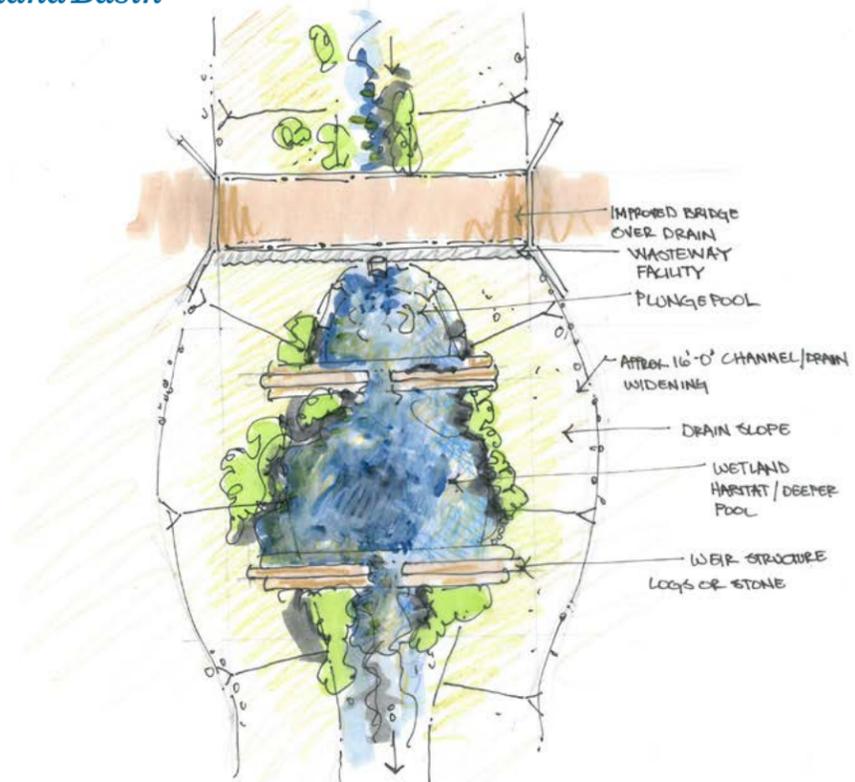
GUIDING PRINCIPLES 8. Stormwater

- ADDRESS STORM DRAIN DISCHARGES RESULTING FROM INDIVIDUAL RAINFALL EVENTS.
- ADDRESS PERENNIAL FLOW WITHIN THE DRAIN OCCURRING DUE TO SHALLOW GROUNDWATER INFILTRATION, NUISANCE FLOWS.
- INSTALL STORM WATER QUALITY BEST MANAGEMENT PRACTICES (BMPs) ALONG THE PROJECT CORRIDOR.
- CONSIDER THE INSTALLATION OF STRUCTURAL BMPs THAT ARE DESIGNED WITH THE GOAL OF REDUCING POLLUTANT LOADS WITHIN THE DRAIN
- OPPORTUNITIES TO ENHANCE THE TREATMENT EFFICIENCY OF THE EXISTING UPSTREAM STORM DRAIN NETWORK DISCHARGING INTO THE ALAMEDA DRAIN IS IMPORTANT BUT IS BEYOND THE SCOPE OF THIS PLAN

Legend

○ Water Feature

FIGURE 62. Wetland Basin



Balloon Fiesta Park. Bathtub discharge into the Alameda Drain result from trickle flows within the North Diversion Channel and typically do not exceed 35 cubic feet per second. From that perspective, structural BMPs can address both “pulse” flow and “baseflow” conditions.

In-Pipe/End-of-Pipe Treatment

Baseflow water quality treatment can address aqueous pollutants including e. coli bacteria, fine sediment which carry heavy metals, and nutrients such as nitrogen and phosphorus. Installation of small drop structures and settling areas populated with wetland plants, create a biotreatment system capable of addressing these contaminants. Pulse flow discharges typically carry “floatables” such as plastic water bottles, cigarette butts, along with leaves and twigs and other organic debris. Construction of mesh screens and similar filters can help capture these materials. However, regular maintenance will be needed to remove accumulated debris after successive storm events.

Mesh screens provide an efficient and cost effective method for capturing floating debris prior to entering the Drain. The disadvantages include the need for frequent maintenance to clean out accumulated debris, the unsightly build-up of debris when they are installed out in the open, the potential for accumulated material to be flushed into the Drain from a larger storm, and the potential for the dried debris to blow out of the collection area and back into the Drain. These characteristics will need to be considered in the selection of preferred BMPs.

Other in-line treatments that could also be retrofitted for end-of-pipe installation include water quality manholes like sump manholes, and bypass manholes with debris containment. These treatments would also require regular maintenance to remove accumulated debris. Installation of these BMP types along with the basins and bio-swales in the following paragraphs is a feasible “treatment train” type approach.

Bio-swales can be of the Landscape Bio-Retention/Bio-Swale type discussed in section 4.8, or an in-drain storm water treatment bio-swale. This type would be a secondary channel constructed parallel to and within the side slope of the Drain. It would be approximately 50 feet in length and span one or more inlet pipes (18-inch diameter maximum). The in-drain bio-swale would have rip-rap lining and include plantings suitable for the location.

Following is a discussion of BMPs that could be used in the Alameda Drain corridor.

Constructed Wetland Basin

Constructed wetland basins enhance water quality by catching solids and floatables as illustrated in [Figure 62](#). These features also allow water to aerate, increasing the oxygen levels in the water. Aeration enhances fish and aquatic species habitats, serves to support beneficial bacteria and improves the overall water quality.

Constructed wetland basins are installed at stormwater inlets and wasteways and constructed by widening the channel to create a basin in which the stormwater is caught and slowed. This allows for aeration and also the opportunity to remove solids. Establishing native species on the side of the basin creates wildlife habitat, stabilizes the banks and reduces erosion. These basins can also serve to enhance the visual qualities of the corridor.

Stepped basin with vegetation

Stepped, vegetated basins catch floatables and also help the water to aerate as illustrated in [Figure 63](#). These features can in addition serve as visual features, where water is being displayed and the user can experience its sound and movement.

Like the constructed wetland basin this feature creates stepped basins that allow the water to slow down and aerate. Floatables can be removed from the basins and the water aerated.

FIGURE 63. *Stepped Basin with Vegetation*

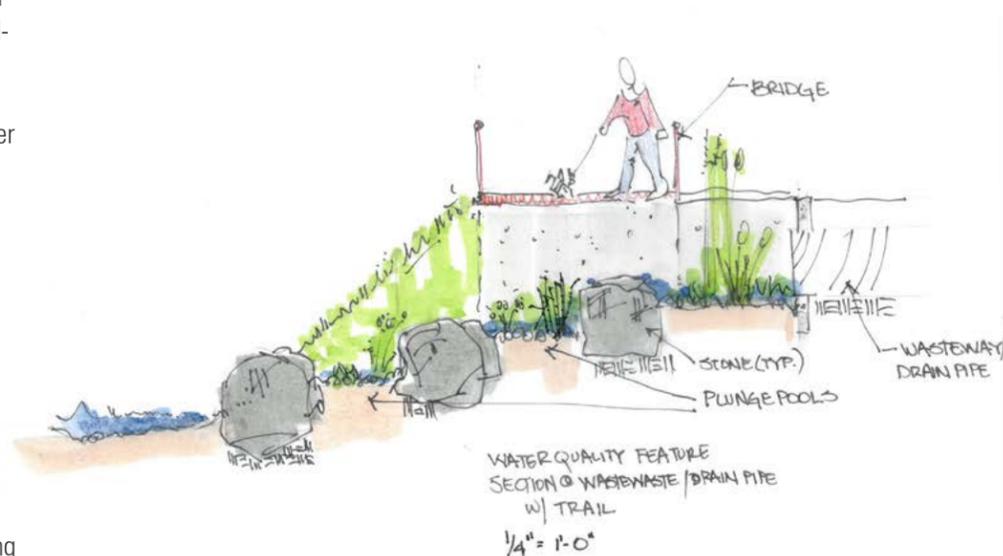
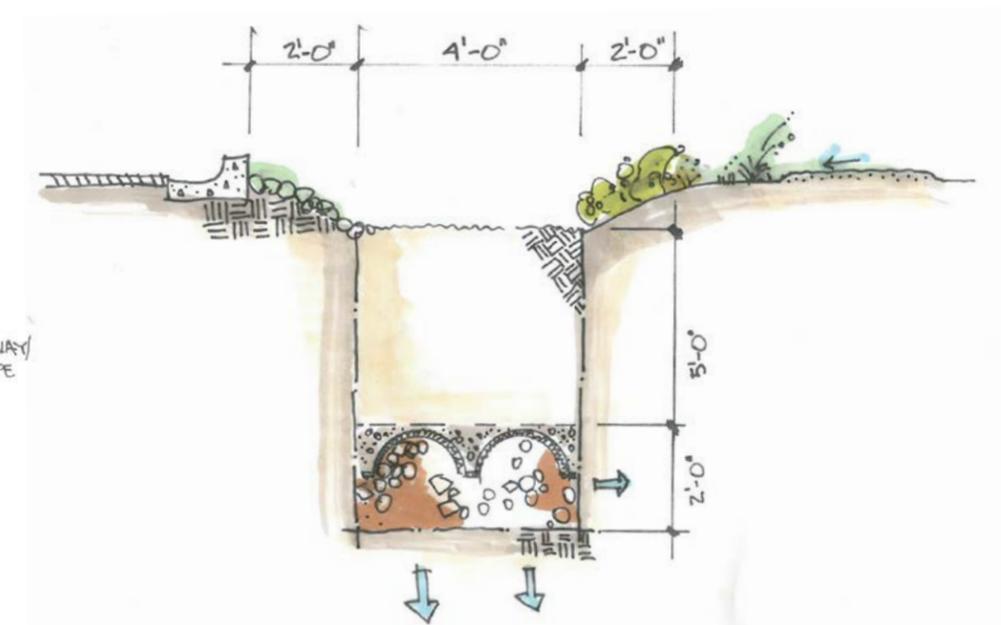


FIGURE 64. *Bioswale*



Bioswale

Bioswales are water quality features employed to capture and treat stormwater runoff, attenuate flooding and funnel stormwater away from critical infrastructure, as illustrated in [Figure 64](#). Bioswales are Low Impact Development (LID) techniques utilized nationwide to encourage water infiltration on-site and to reduce runoff contributing to flooding and pollution.

Bioswales are typically installed adjacent to roadways or impervious areas and capture stormwater runoff through curb cuts during storm events. The captured water benefits landscape located in a depressed area and helps clean runoff from pollutants. Excess water infiltrates into the ground or is discharged back into the roadway or adjacent pervious area. Bioswales have the added benefit of being aesthetically pleasant and creating habitat for native species and wildlife. Bioswales can be employed along the Alameda Drain to capture runoff and feed vegetation.

The following details illustrate potential treatment BMPs that were considered as part of the project evaluation.

FIGURE 65. *Example of Trash Interception Structure*



FIGURE 66. *Example of Trash Interception Structure*

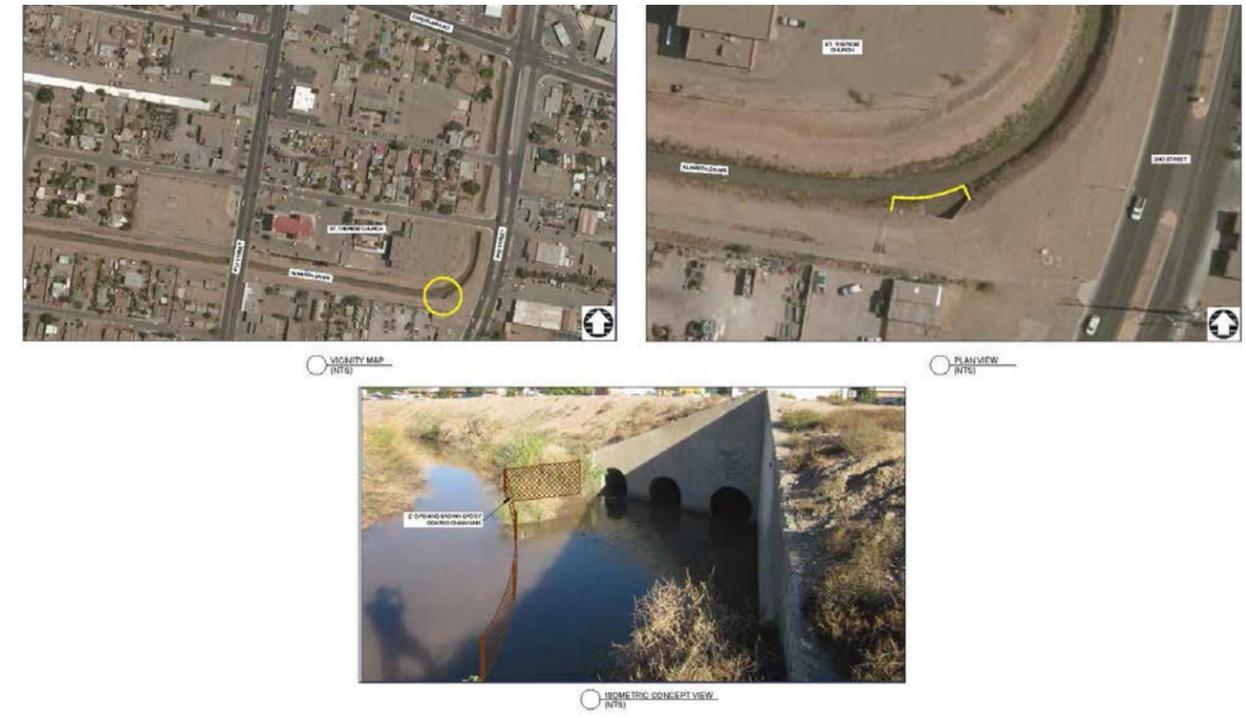


FIGURE 67. *Example of Trash Interception Structure*



FIGURE 68. *Example of In-Drain Stormwater Treatment Bioswale*

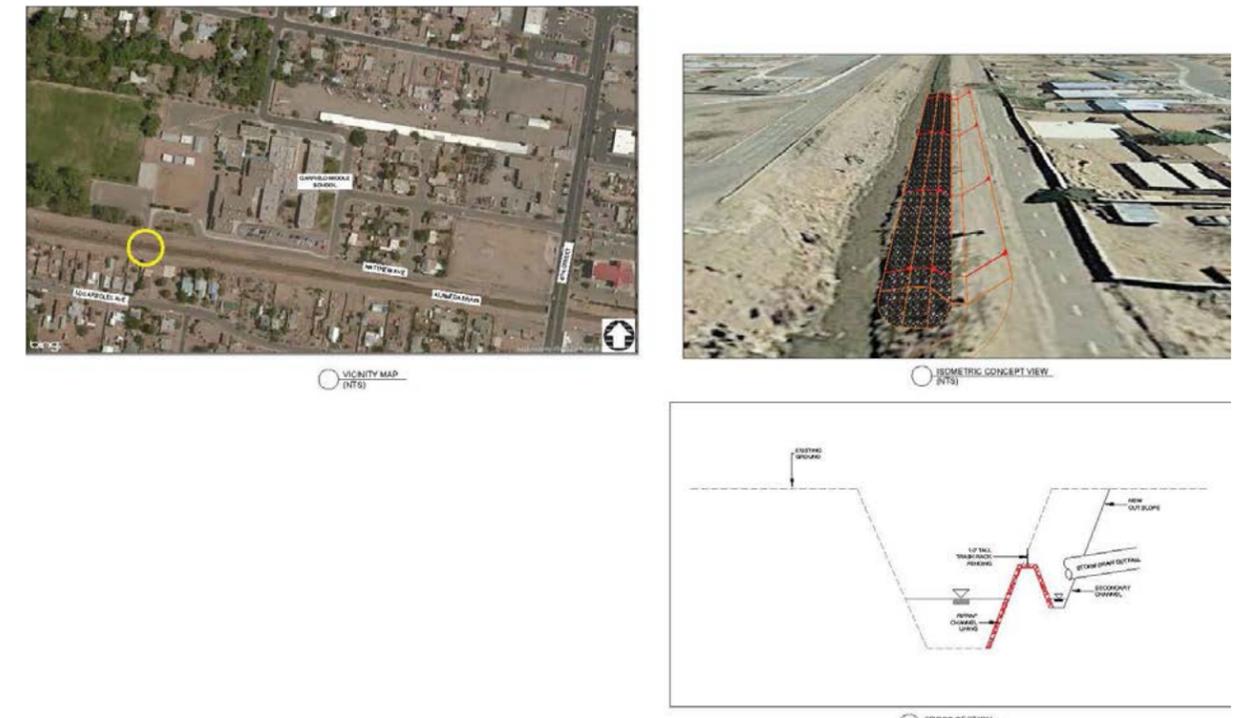


FIGURE 69. Example of Log Check Dam

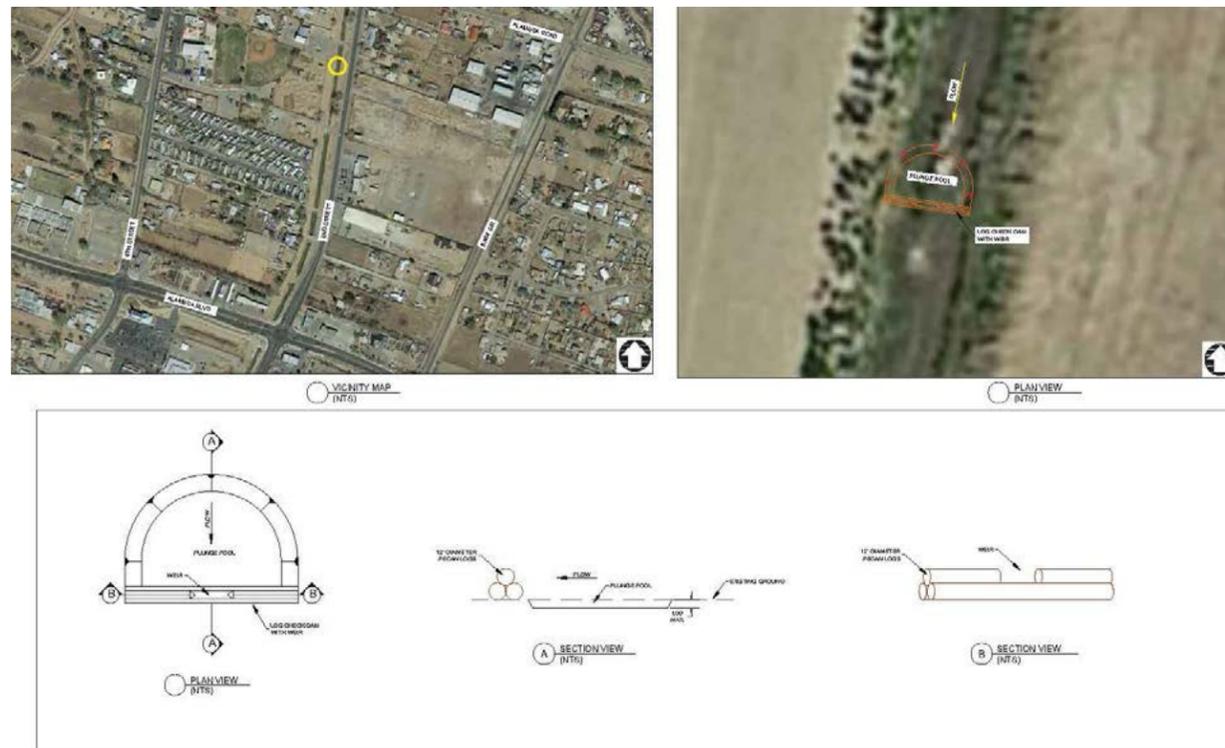


FIGURE 70. Example of Rock Check Dam

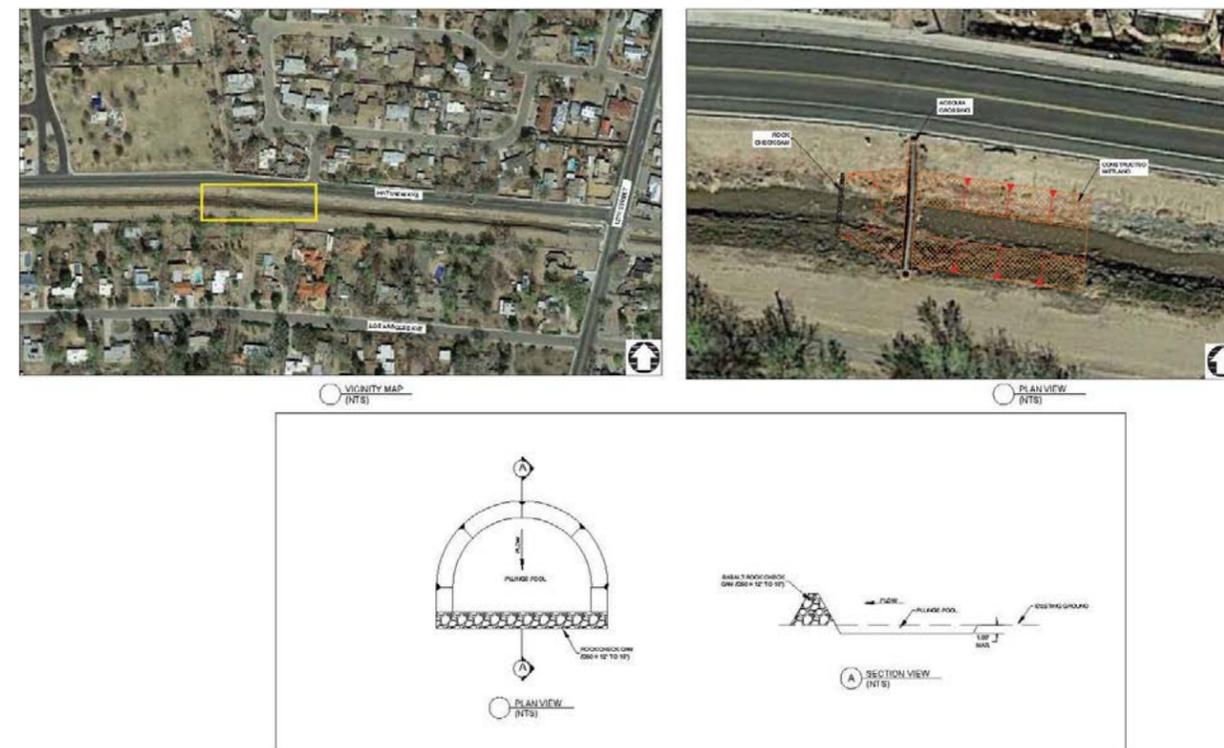


FIGURE 71. Example of Trash Interception Structure with Screen

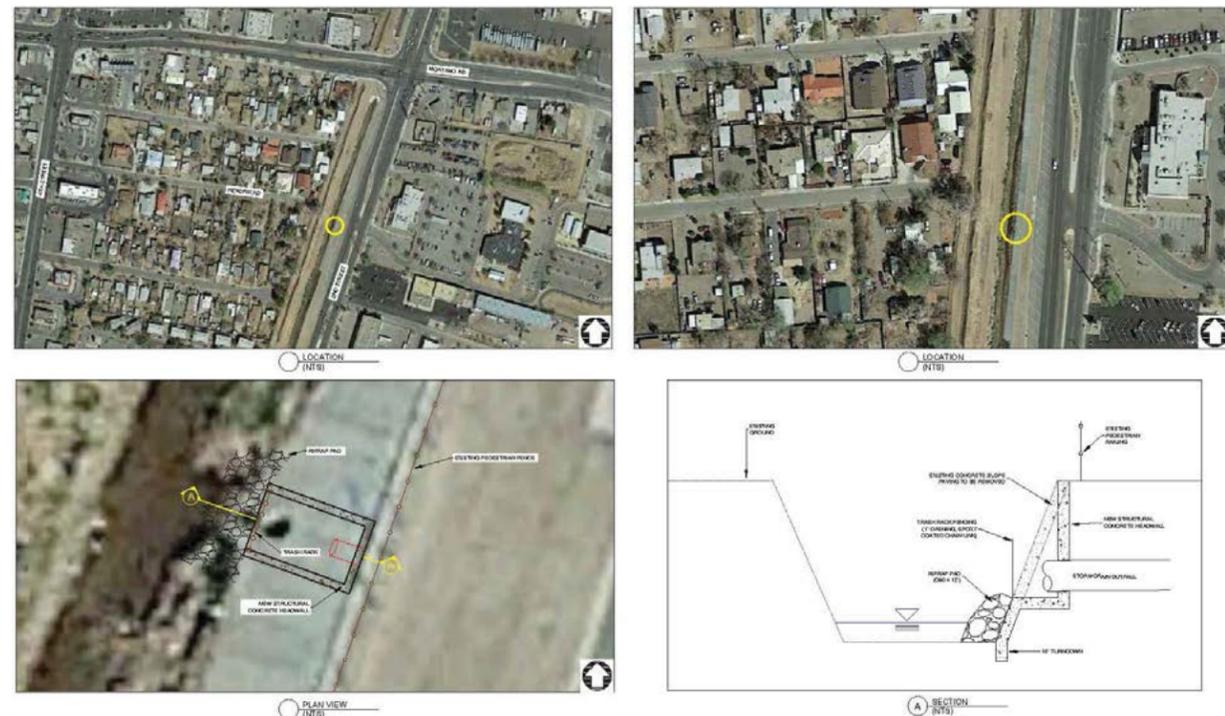
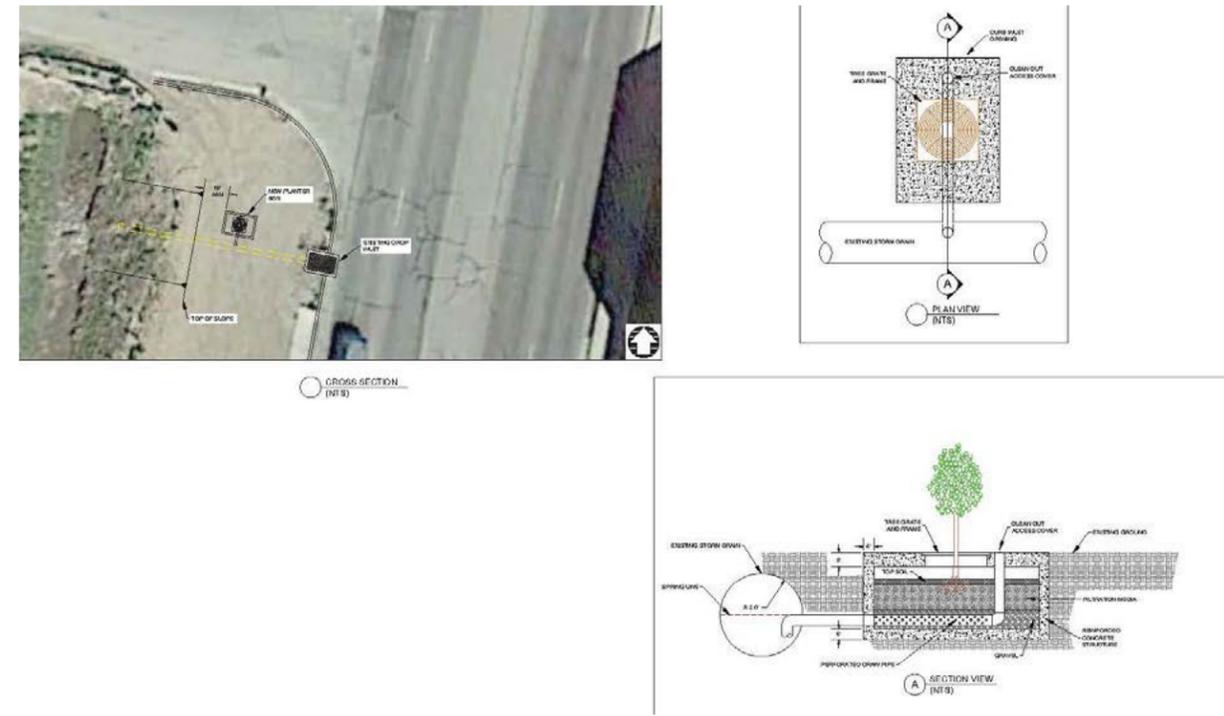


FIGURE 72. Example of Tree Well



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4. Preferred Alternative



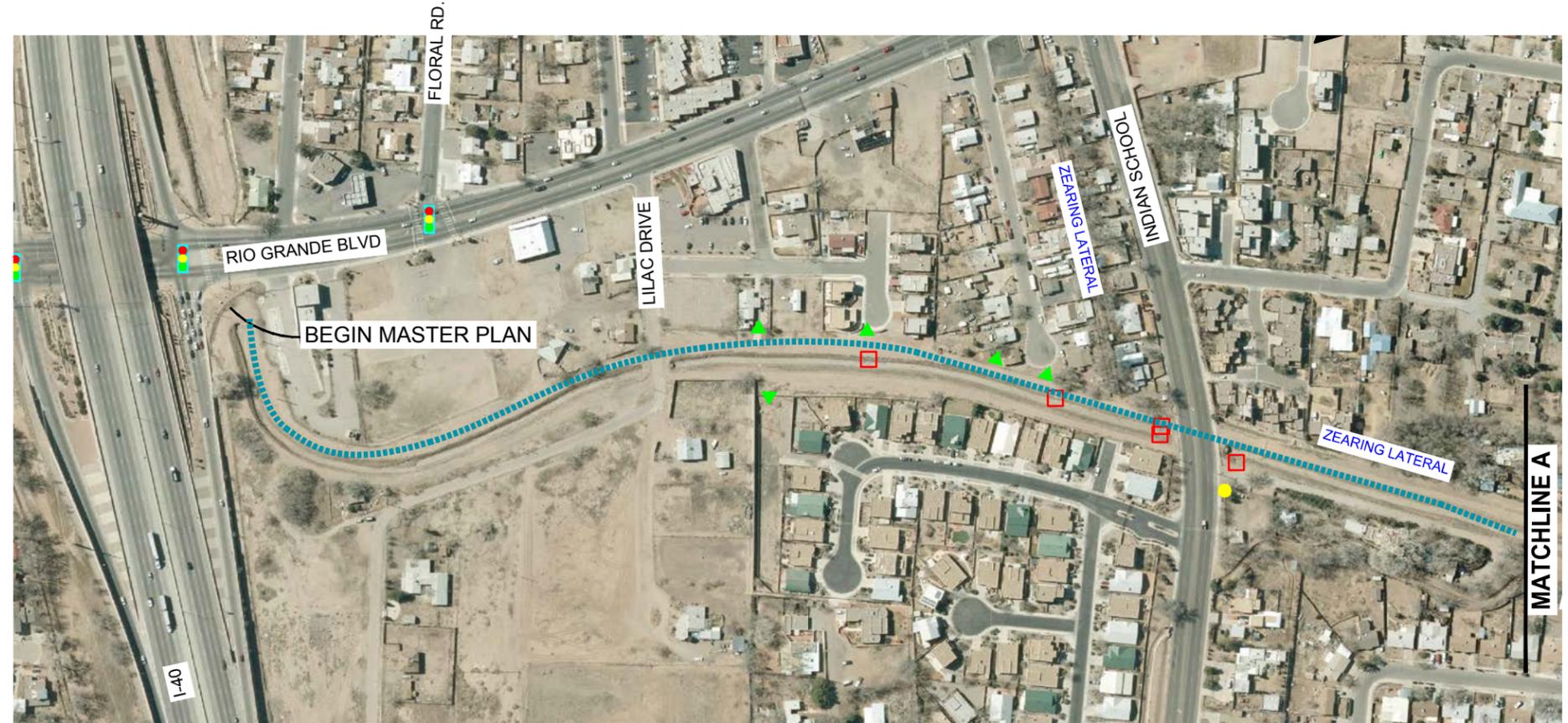
The preferred alternative section presents trail concepts that are recommended by this master plan. This section also details appropriate location, placement and design for each concept and recommends a trail alignment.

4.1 Trail Alignment

The *Initial Alignment* and the *Alignment Alternatives* were evaluated based on several specific factors and through general discussions with agency representatives, the project team and stakeholders. Evaluation factors included MRGCD maintenance operations, how the trail would affect access to existing driveways, conditions at trail intersections with minor streets and driveways such as sight distance, geometry and signing, the trail user experience, relative construction costs and the available width for the trail. The preferred alignment along with evaluation matrices are illustrated in the following section.

Several criteria for evaluating the trail alignment alternative were utilized, but a greater emphasis was placed on several factors. Accommodating MRGCD maintenance and operations was an overarching goal of the master plan development so this factor was given a higher priority. Developing a trail facility that provides the user with a quality environment and experience was also given greater emphasis since this will increase trail use and support the investment of the participating agencies. The conditions at trail-roadway intersections was considered to be among the higher priority factors since this will directly affect the user experience as well as vehicular traffic operations. Finally, the width available for the trail was given more emphasis to take advantage of areas that are currently under used while accommodating existing uses of the Drain corridor.

As previously mentioned, alignment alternatives were not considered along some portions of the Drain to avoid existing licensed uses, where widths were too narrow, and to avoid frequent shifts from one side to the other.



1. PREFERRED ALIGNMENT - INTERSTATE 40 TO MILDRED

Description:

The trail alignment begins on the east side of Rio Grande Boulevard just north of the intersection for the westbound I-40 exit ramp. Since this location is within the access control limits for the Interstate, coordination with the NMDOT and possibly FHWA is needed for the access control break. The Initial Alignment placed the trail on the west side of the Drain from Rio Grande Boulevard to north of Indian School Road. *Alignment Alternative 1* placed the trail on the east side of the Drain between Rio Grande and Lilac Drive in consideration of the planned redevelopment of the property between the I-40 exit ramp and Lilac Drive.

Preferred Alignment:

The preferred alignment places the trail on the west side of the Drain from Rio Grande Boulevard to Lilac Drive (Initial Alignment). In this case since there are

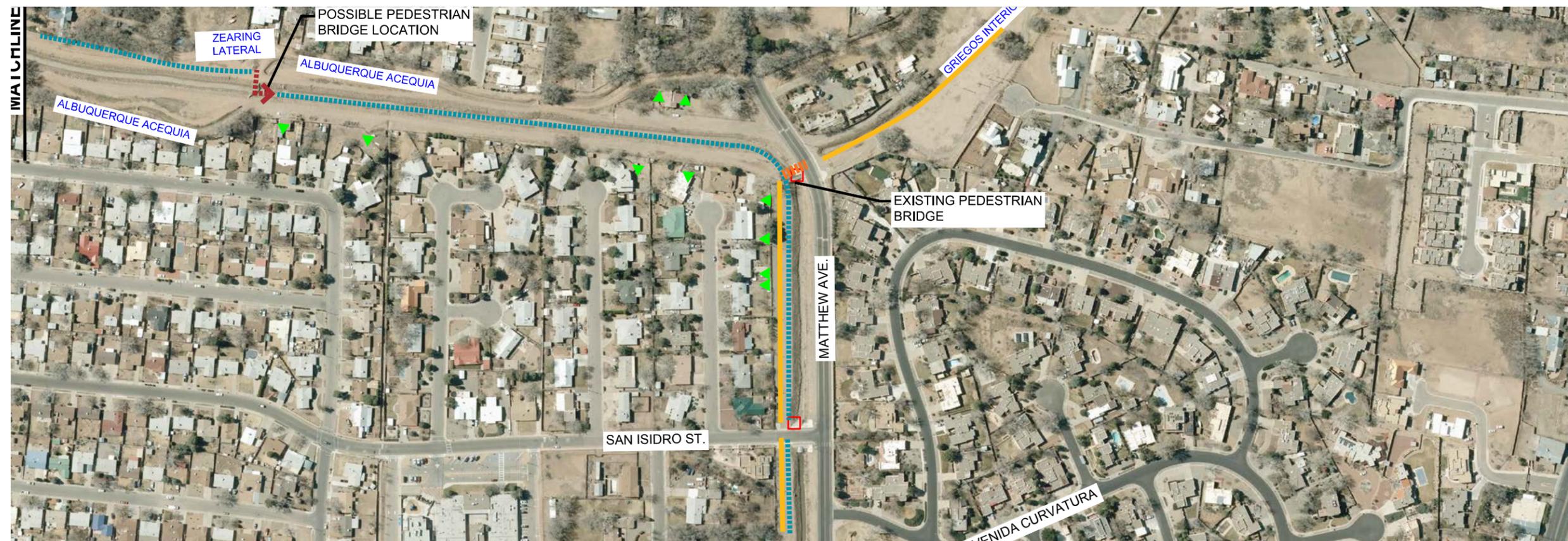
no clear advantages to the trail being on the west side, an east side alignment is a viable alternative if it better serves development plans for the area. North of Lilac Road the preferred alignment is on the west side (Initial Alignment) to Indian School Road, and would continue on the west side from Indian School north to the Albuquerque Acequia crossing. A raised median mid-block crossing is recommended for the trail crossing of Indian School Road.

Connections to existing trail facilities south of I-40 are possible using existing bicycle lanes on Rio Grande Boulevard. Connecting to the Bosque Trail using Floral Road west of Rio Grande Boulevard to Duranes Road is also possible. This route is indicated as a proposed bike route on the 2040 MTP Long Range Bikeway System Map.

<i>Rio Grande Blvd. to Lilac Drive</i>		
<i>Analysis Criteria</i>	<i>Initial Alignment</i>	<i>Alignment Alternative 1</i>
MRGCD Operations & Maintenance	Similar	Similar
Effects on Driveway Access	Similar	Similar
Conditions at Intersections	Similar	Similar
User Experience	Better	—
Trail Connectivity	Similar	Similar
Other Users (solid waste, USPS)	Similar	Similar
Relative Construction Cost	Similar	Similar
Available Width	Better	—
Overall Rating	Preferred	—

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed



2. PREFERRED ALIGNMENT - INTERSTATE 40 TO MILDRED

Description:

At the Albuquerque Acequia crossing of the Drain approximately midway between Indian School Road and Matthew Avenue the **Initial Alignment** shifted to the east side with a proposed Drain crossing structure (a pedestrian bridge in the vicinity of the existing acequia crossing). This configuration allows for a good transition to the existing trail alignment on the south side of the Drain along Matthew Avenue. **Alignment Alternative 2** was identified between the acequia crossing and Matthew Avenue and would place the trail on the west side of the Drain.

Preferred Alignment

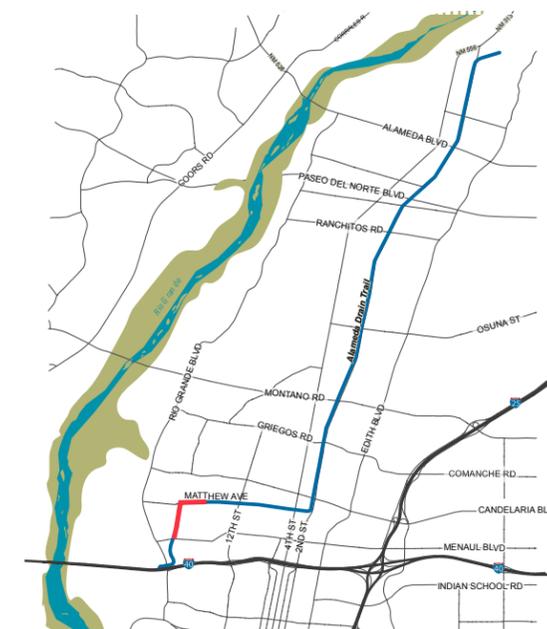
The preferred alignment crosses to the east side of the Drain at the Albuquerque Acequia (Initial Alignment) and continues it to Matthew Avenue. The alignment would then continue east along Matthew on the south side of the Drain. The alignment along Matthew would be further north in the Drain right-of-way than the existing trail which runs along the south side of the corridor. A midblock pedestrian crossing should be considered across Matthew Avenue at the curve to provide a connection to the Griegos Interior Drain trail on the north side of Matthew Avenue.

Indian School Rd. to Matthew Ave.		
Evaluation Criteria	Initial Alignment	Alignment Alternative 2
MRGCD Operations & Maintenance	Better	—
Driveway Access	—	Better
Conditions at Intersections	Similar	Similar
User Experience	Better	—
Trail Connectivity	Better	—
Other Users (solid waste, USPS)	Similar	Similar
Relative Construction Cost	Higher	—
Available Width	Better	—
Overall Rating	Preferred	—

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





3. PREFERRED ALIGNMENT - INTERSTATE 40 TO MILDRED

Description

The *Initial Alignment* location for the trail along the Matthew Avenue corridor was identified as the south side of the Drain since there is more space for the trail. At the west end of the Matthew Avenue alignment there is an existing pedestrian bridge crossing the Drain that provides a connection across Matthew to the trail along the Griegos Interior Drain.

Preferred Alignment

No alignment alternatives were considered for the Matthew Avenue corridor between the west-end of the Drain and 4th Street. The preferred location for the trail in this section is along the south side of the Drain. The alignment along Matthew would be further north in the Drain right-of-way than the existing trail which runs along the south side of the corridor. A minor intersection crossing

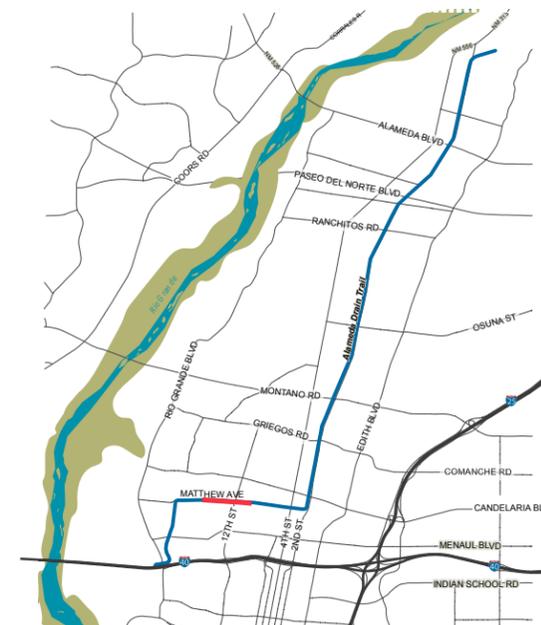
at San Isidro Street is recommended as is a mid-block crossing at 12th Street. Due to the close proximity of the signalized intersection of Matthew and 12th Street (approximately 100 feet north of the existing trail crossing) a signalized crossing for the trail coordinated with the existing traffic signal should be considered.

Pedestrian bridge crossings of the Drain along with mid-block roadway crossings of Matthew Avenue should be considered at the Menaul and Foraker Laterals to provide connectivity to Matthew Meadows Park and Garfield Middle School.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





4th St. to Mildred Ave.

Evaluation Criteria	Initial Alignment	Alignment Alternative 3
MRGCD Operations & Maintenance	Similar	Similar
Driveway Access	-	Better
Conditions at Intersections	-	Better
User Experience	-	Better
Trail Connectivity	Better	-
Other Users (solid waste, USPS)	-	Better
Relative Construction Cost	-	Higher
Available Width	Similar	Similar
Overall Rating		Preferred

Mildred Ave. to Candelaria Rd.

Evaluation Criteria	Initial Alignment	Alignment Alternative 4
MRGCD Operations & Maintenance	Similar	Similar
Driveway Access	Better	-
Conditions at Intersections	-	Better
User Experience	-	Better
Trail Connectivity	Similar	Similar
Other Users (solid waste, USPS)	Better	-
Relative Construction Cost	-	Higher
Available Width	-	Better
Overall Rating		Preferred

4. PREFERRED ALTERNATIVE - INTERSTATE 40 TO MILDRED

Description

The *Initial Alignment* location for the trail east of 4th Street was identified to be along the south side of the Drain. A mid-block crossing at 4th Street is recommended and will require a pedestrian bridge crossing the Drain on the east side of 4th street to provide a pedestrian access route across the Drain. Field observations suggest heavy use of the Drain right-of-way by vehicular traffic. *Alignment Alternative 3* shifts the trail alignment to the north side of the Drain east of 4th Street. Between Mildred Avenue and Candelaria Road the Initial Alignment was identified to be on the east side of the Drain to provide a direct connection to the crosswalk at the Candelaria intersection. *Alignment Alternative 4* was identified on the west side of the Drain as a continuation of

AA-3.

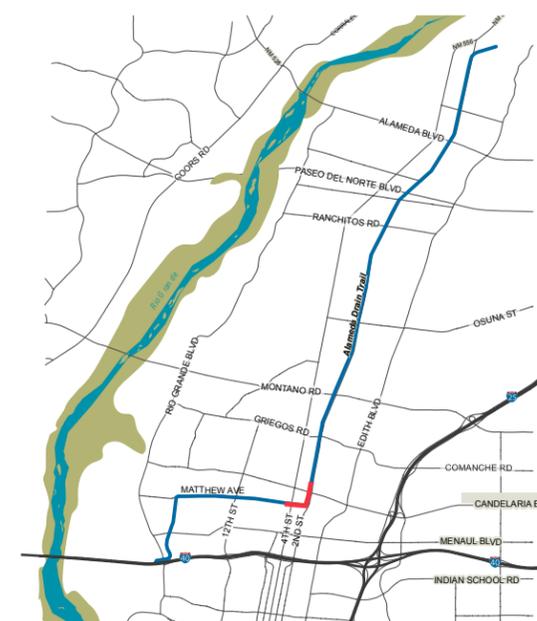
Preferred Alignment

Alignment Alternative 3, shifting the trail to the north side of the Drain, is the preferred alignment for the section from 4th Street to Mildred Avenue. A mid-block crossing at 4th Street is recommended and may will require a pedestrian crossing the Drain on the east side of 4th Street to provide a pedestrian access route across the Drain. Due to the close proximity of the Matthew and 4th Street intersection (approximately 90 feet north of the existing trail crossing) a signalized crossing for the trail is recommended. *Alignment Alternative 4*, west side alignment, is preferred for the section from Mildred Avenue to Candelaria Road.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed

Context Map





5. PREFERRED ALIGNMENT - MILDRED TO MONTAÑO

Description:

The *Initial Alignment* from Candelaria Road to Griegos Road placed the trail on the west side of the Drain.

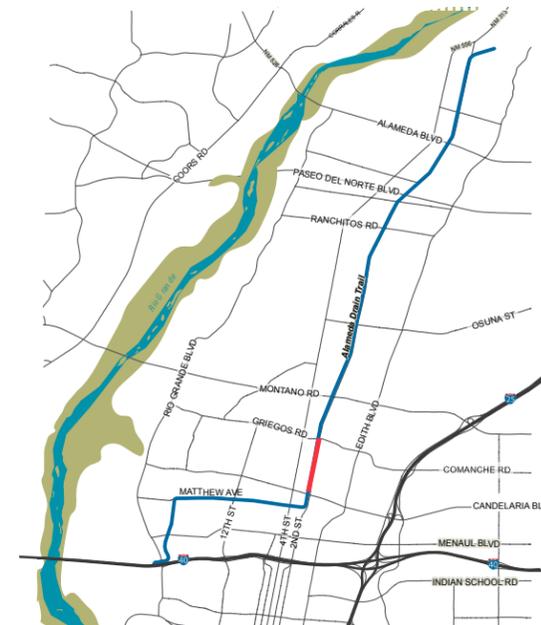
Preferred Alignment

No alignment alternatives were considered for the section from Candelaria to Griegos so the preferred alignment is on the west side of the Drain.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





6. PREFERRED ALIGNMENT - MILDRED TO MONTAÑO

Description

The *Initial Alignment* from Griegos Road to Montañó Road placed the trail on the west side of the Drain.

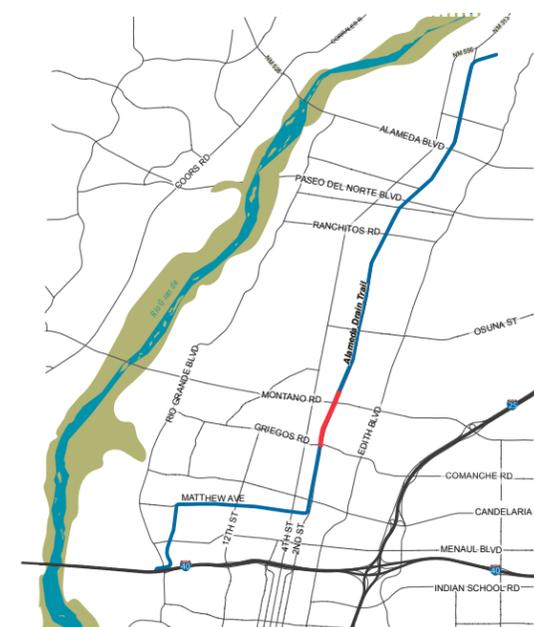
Preferred Alignment

No alignment alternatives were considered for the section from Griegos to Montañó or from Montañó to Osuna so the preferred alignment is on the west side of the Drain. In the section where the Gallegos Lateral runs along the west side of the Drain right-of-way (between Delamar Avenue and Montañó Road), the preferred location for the trail is between the Lateral and the Drain.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- Secondary access-licensed
- Secondary access-unlicensed

Context Map





7. PREFERRED ALIGNMENT - MONTAÑO TO PASEO DEL NORTE

Description:

The Initial Alignment from Montaño Road to Osuna Road placed the trail on the west side of the Drain.

Preferred Alignment

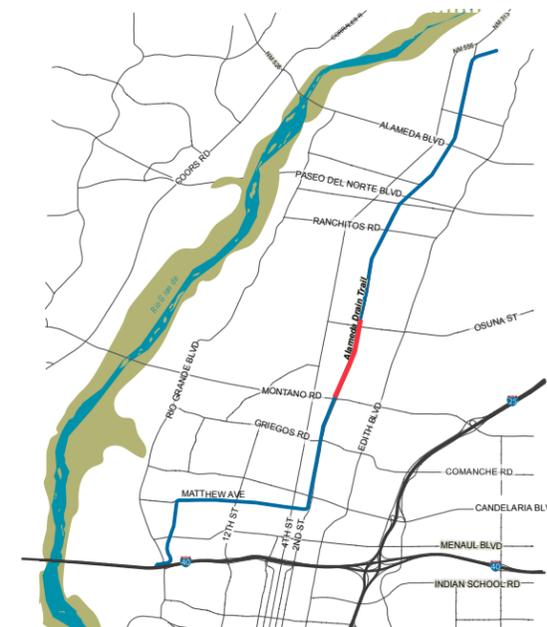
No alignment alternatives were considered for the section from Montaño to Osuna so the preferred alignment is on the west side of the Drain. In the section where the Gallegos Lateral runs along the west side of the Drain right-of-way (between Montaño Road and south of Vineyard Road), the preferred location for the trail is between the Lateral and the Drain.

Separation between the Drain and lateral is approximately 35 feet which is sufficient for a trail and an access road for maintenance of the lateral by MRGCD Ditchriders.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- ▨ Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





8. PREFERRED ALIGNMENT - MONTAÑO TO PASEO DEL NORTE

Description

The *Initial Alignment* from Osuna Road to Ranchitos Road proposed a trail alignment on the east side of the Drain to reduce the potential for conflicts between trail users and property owners accessing their driveways along the west side of the Drain right-of-way. *Alignment Alternative 5* proposed a west side alignment to improve the trail user experience by increasing the separation from 2nd Street. AA-5 would also potentially improve visibility of trail users to motorists coming from 2nd Street at trail intersections with the greater separation.

Preferred Alignment

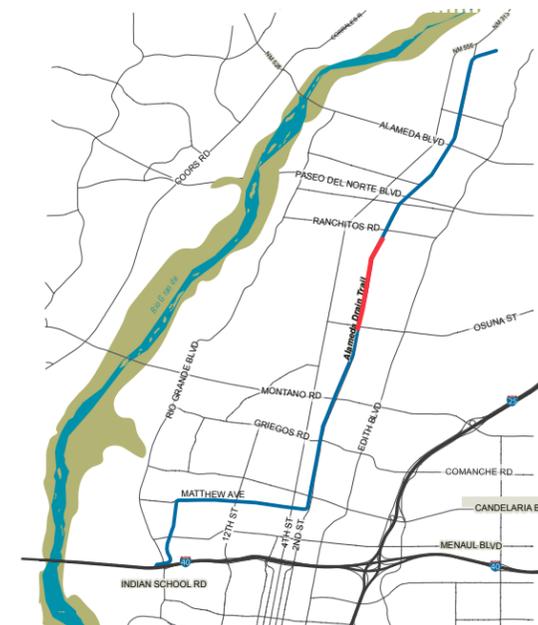
Alignment Alternative 5 is the preferred alignment from Osuna to Ranchitos. Design measures that mitigate the potential conflicts between trail users and property owners accessing their driveways will need to be implemented. Culverts for the Drain crossings at Los Ranchos Road and Ranchitos Road may need to be extended to provide a pedestrian access route from the west side alignment to the signalized intersection crosswalks. This alignment will better accommodate MRGCD maintenance activities from the east side of the Drain, as there is more space. It will also better accommodate maintenance of the storm drain inlets to the Drain, and related pipes crossing the east side of the Drain right-of-way, which primarily enter along the east side.

<i>Osuna Rd. to Ranchitos Rd.</i>		
<i>Evaluation Criteria</i>	<i>Initial Alignment</i>	<i>Alignment Alternative 5</i>
MRGCD Operations & Maintenance	–	<i>Better</i>
Driveway Access	<i>Better</i>	–
Conditions at Intersections	–	<i>Better</i>
User Experience	–	<i>Better</i>
Trail Connectivity	<i>Similar</i>	<i>Similar</i>
Other Users (solid waste, USPS)	<i>Better</i>	–
Relative Construction Cost	<i>Similar</i>	<i>Similar</i>
Available Width	<i>Better</i>	
Overall Rating		<i>Preferred</i>

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





9. PREFERRED ALIGNMENT - MONTAÑO TO PASEO DEL NORTE

Description:

The *Initial Alignment* from Ranchitos to El Pueblo placed the trail on the east side of the Drain due to the relatively narrow space available on the east side.

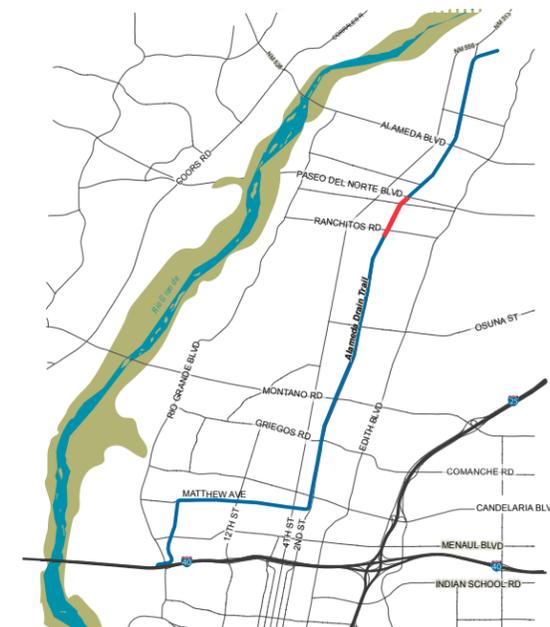
Preferred Alignment

No alignment alternative was identified for the section from Ranchitos to El Pueblo so the preferred trail alignment is on the west side of the Drain.

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





10. PREFERRED ALIGNMENT - PASEO DEL NORTE TO SANDIA PUEBLO (CYNTHIA LOOP)

Description

The *Initial Alignment* from Paseo del Norte to Alameda Boulevard proposed the trail alignment west of the Drain, and between the Drain and the Derramadera Wasteway for the south part of this section.

Alignment Alternative 7 would have the trail on the east side of the Drain from the north side of the Paseo del Norte interchange ramp to Cielito Lindo Place, a distance of approximately 2,100 feet. This alternative would better serve the MRGCD Ditchriders as they operate and maintain the Derramadera Wasteway.

Preferred Alignment

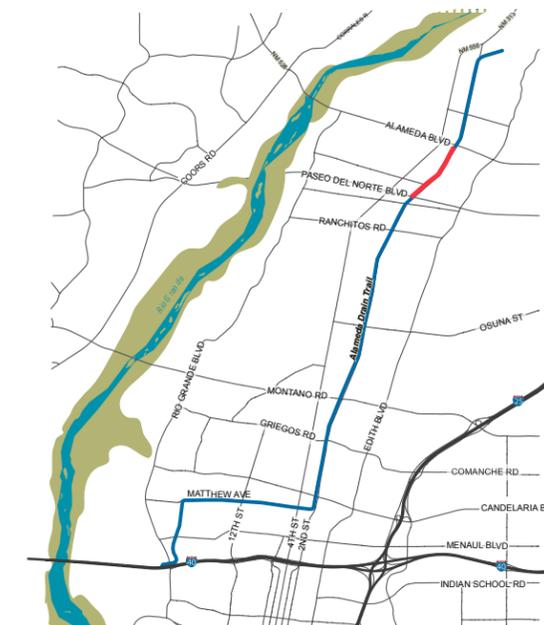
Alignment Alternative 7 is the preferred alignment in this section as it provides the best accommodation for MRGCD Ditchriders maintaining and operating the Derramadera Wasteway, and it takes advantage of the width available on the east side. Construction cost may be higher if a pedestrian bridge is needed to cross the Drain north of Cielito Lindo Place.

Paseo del Norte to Cielito Lindo Place		
Evaluation Criteria	Initial Alignment	Alignment Alternative 7
MRGCD Operations & Maintenance	--	Better
Driveway Access	Similar	Similar
Conditions at Intersections	Better	--
User Experience	Better	--
Trail Connectivity	Similar	Similar
Other Users (solid waste, USPS)	Similar	Similar
Relative Construction Cost	--	Higher
Available Width	--	Better
Overall Rating		Preferred

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- x Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





11. PREFERRED ALIGNMENT - PASEO DEL NORTE TO SANDIA PUEBLO (CYNTHIA LOOP)

Description:

The *Initial Alignment* from Alameda Boulevard to the 2nd Street Drain crossing proposed the trail alignment on the east side of the Drain to take advantage of the mature trees between the Drain and 2nd Street. *Alignment Alternative 6* was identified following field reviews and would place the trail on the west side of the Drain.

Preferred Alignment

Alignment Alternative 6, west side trail alignment, is preferred in the section from Alameda Boulevard to the 2nd Street Drain crossing, since it provides greater separation from 2nd Street which improves conditions at the trail intersections, and it would not be affected by future widening of 2nd Street. It also provides a better user experience with the increased separation from 2nd Street.

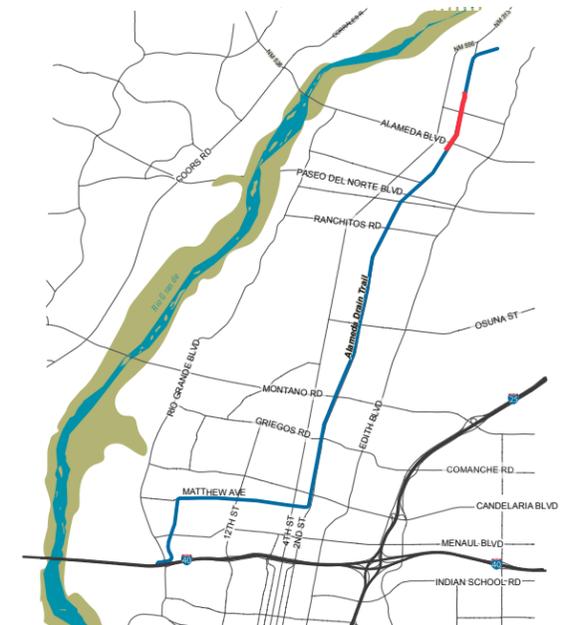
Alameda Blvd. to 2nd St. Crossing

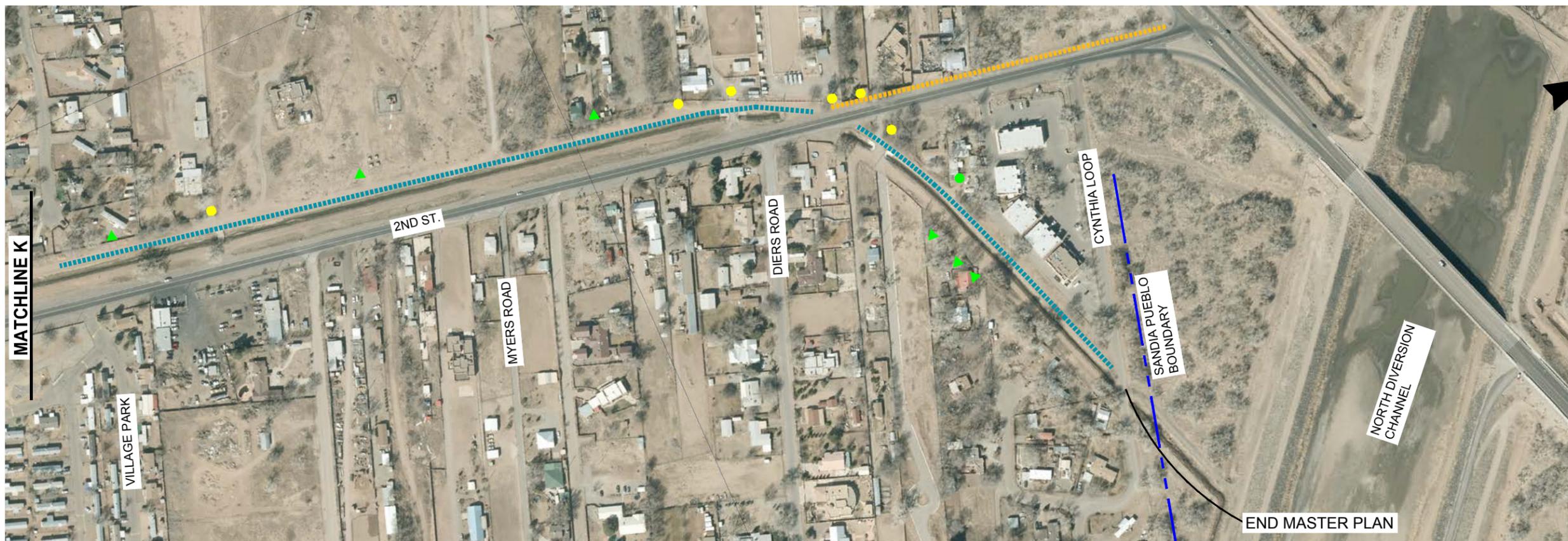
Evaluation Criteria	Initial Alignment	Alignment Alternative 6
MRGCD Operations & Maintenance	Similar	Similar
Driveway Access	Better	-
Conditions at Intersections	-	Better
User Experience	-	Better
Trail Connectivity	-	Better
Other Users (solid waste, USPS)	Better	-
Relative Construction Cost	Similar	Similar
Available Width	Better	-
Overall Rating	-	Preferred

Legend

- Initial trail alignment
- Alignment alternative
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map





12. PREFERRED ALIGNMENT - PASEO DEL NORTE TO SANDIA PUEBLO (CYNTHIA LOOP)

Description

The *Initial Alignment* of the trail from the 2nd Street Drain crossing to Cynthia Loop proposed the trail on the west side of the Drain.

Alignment Alternative 8 would have the trail on the east side of the Drain in this section.

Preferred Alignment

The Initial Alignment, trail on the west side of the Drain, is the preferred trail alignment from the 2nd Street crossing to Cynthia Loop. A mid-block crossing of 2nd Street is recommended at the beginning of this section.

Extending a separate trail north along 2nd Street to the 4th Street/NM 556 intersection should also be considered, to improve connections to the north.

A trail head should be considered at the north end immediately south of Cynthia Loop. There are existing mature trees in this area that would provide shade for a parking and rest area.

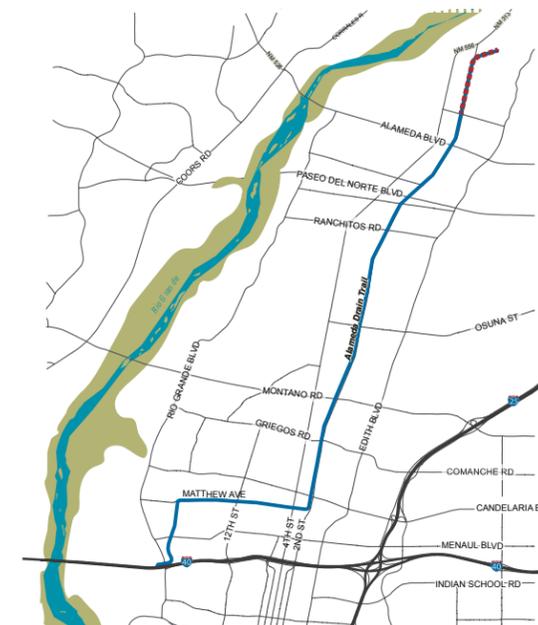
2nd St. Crossing to Cynthia Loop

Evaluation Criteria	Initial Alignment	Alignment Alternative 8
MRGCD Operations & Maintenance	Similar	Similar
Driveway Access	Better	—
Conditions at Intersections	Similar	Similar
User Experience	Similar	Similar
Trail Connectivity	Similar	Similar
Other Users (solid waste, USPS)	Similar	Similar
Relative Construction Cost	Similar	Similar
Available Width	Similar	Similar
Overall Rating	Preferred	

Legend

- Initial trail alignment
- Alignment alternative
- Alternate trail alignment
- Existing multi-use trail
- Possible Pedestrian Bridge
- Unlicensed parking
- Drainage inlet
- Primary access-licensed
- Primary access-unlicensed
- ▲ Secondary access-licensed
- ▲ Secondary access-unlicensed

Context Map

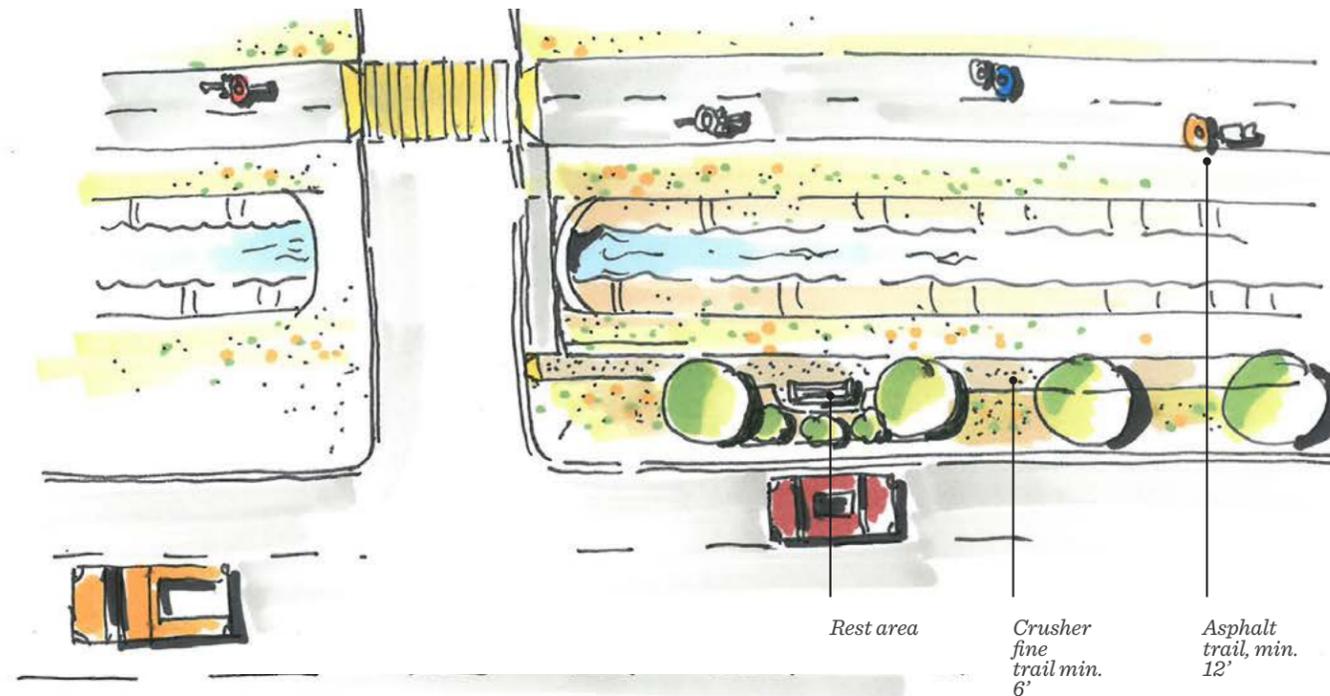


4.2 Trail Surfacing

Section "3.2 Trail Cross Section & Surface

Alternatives" on page 33 introduced a range of trail surfacing materials. Several options were considered and the project team found the installation of an asphalt trail to be suitable for this project. In addition, the team recommends supplementary crusher fine path to be installed periodically to connect the paved trail with amenities located on the other side of the Drain. Figure 73 illustrates a location where a crusher fine path provides access to a rest area.

FIGURE 73. Trail surfacing



1. TRAIL SURFACING - ASPHALT & CRUSHER FINES

Description

The Alameda Drain & Trail master plan recommends both an asphalt and stabilized crusher fine trail, to accommodate the varying preferences of all potential trail users. As indicated in ["ADA Compliance" on page 9](#), this is the most appropriate surface to serve all population groups.

The stabilized crusher fine path will be installed to facilitate access to trail amenities such as the linear park, rest areas and community gardens. The crusher fine trail is not proposed as a continuous trail but utilized to connect trail users to trail amenities located on the opposite side of the Drain from the asphalt trail.

Asphalt Trail

Asphalt provides a continuous, smooth, joint-free, trail surface generally favored by most trail users. Hard surface materials, particularly asphalt, have significantly shorter construction times, provide long term durability, minimize maintenance, and offer long term cost savings. Based on the anticipated type and intensity of use, maintenance requirements, and cost, asphalt has been found to be the most viable trail surface for the proposed multi-use trail.

Crusher Fine Path

Crusher fines trails are constructed of small particles of crushed rock; such trails accommodate users that prefer unpaved surfaces. This material is recommended only for the secondary trail at specific locations.

Placement Criteria Asphalt Trail:

- Sufficient ROW (min. 12' feet + 8 feet buffer from Drain + 2 feet compacted shoulders on either side)
- Use thickened section where driveways cross trail and where MRGCD maintenance vehicles need to be accommodated
- Meet requirements for accessibility in ADA.

Placement Criteria Crusher Fine Path:

- Proximate to landscaped node or other trail amenity
- Place outside primary maintenance access roads to avoid damage

Design Elements

- Min. 12' wide trail for asphalt trail
- Min. 6' wide trail for crusher fine trail
- Trail design shall comply with the City of Albuquerque Bikeways and Trails Facility Plan.
- 2 feet compacted shoulders on either side of the trail
- 3 feet minimum away from fences and walls
- If adjacent to roadway provide a 5 foot buffer
- Slope, not to exceed 2%. It is recommended cross slope is designed at 1.5%

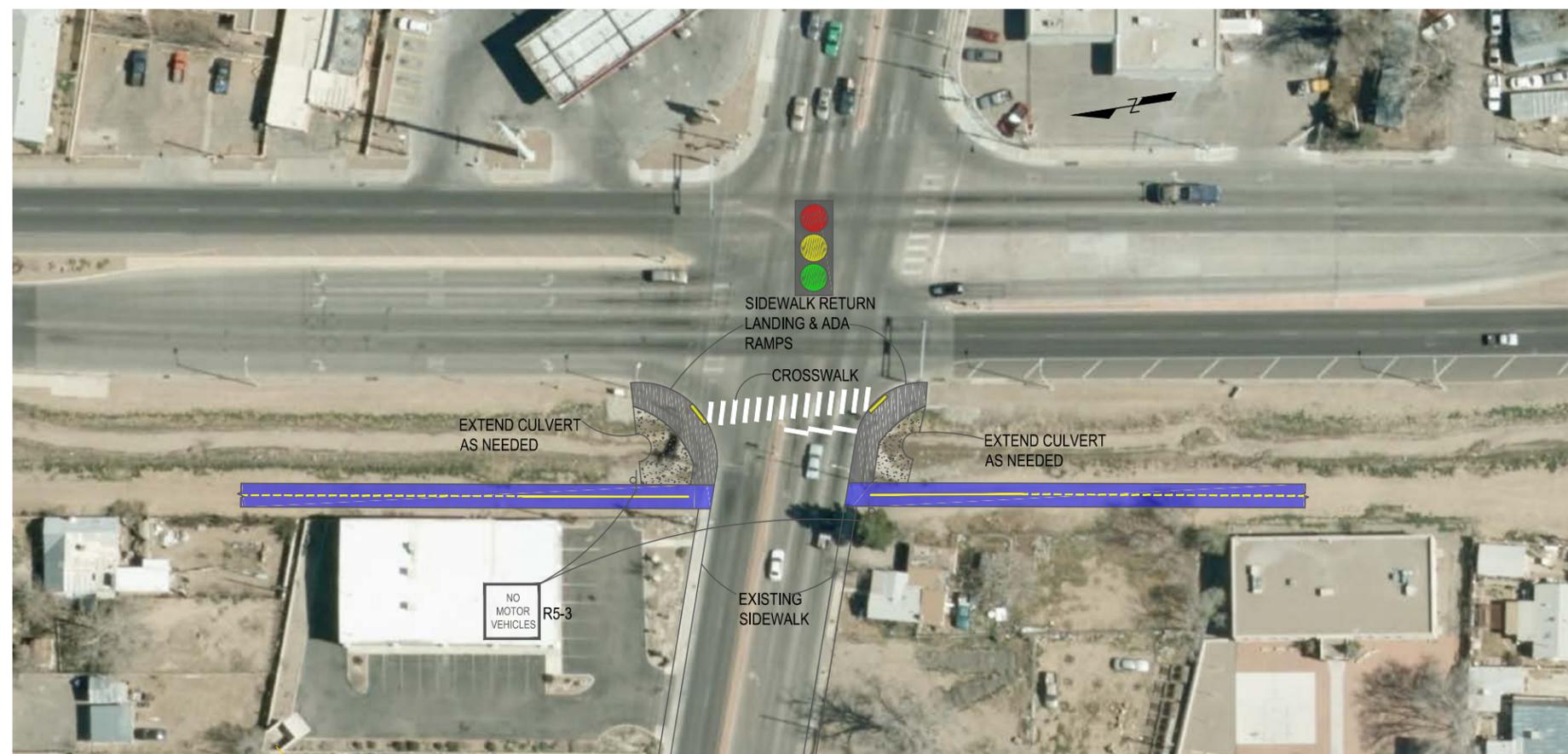
Other Requirements:

- Asphalt needs to be regularly maintained to address cracks and allow for a unobstructed user experience.

4.3 Trail Intersection Treatment

 Trail intersection treatments were presented in section “3.3 Trail Intersections” on page 38. These concepts included trail intersection treatments for major street intersections (signalized intersections), minor street intersections and driveway intersections. The concepts included intersection treatments for trail alignments on each side of the Drain as well as various mid-block crossing layouts applicable to lower-volume two-lane (minor) streets, and the multi-lane streets within the corridor.

In the case of the intersection treatments, the appropriate treatment for specific locations will depend largely on the trail location relative to the Drain. The following are recommendations for trail intersection treatments proposed for the project corridor.



1. INTERSECTIONS WITH MAJOR STREETS

Description

Major street intersections will be signalized for vehicular traffic with pedestrian signals and marked crosswalks. Trail users will be directed to the normal crosswalk location for the intersection. There are eight major intersection crossings in the corridor.

Function

Provide pedestrian access route and signalized crossing of major street intersections.

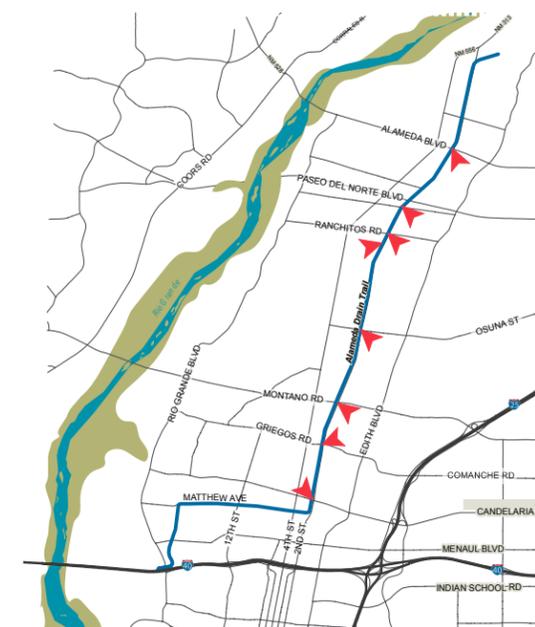
Placement Criteria

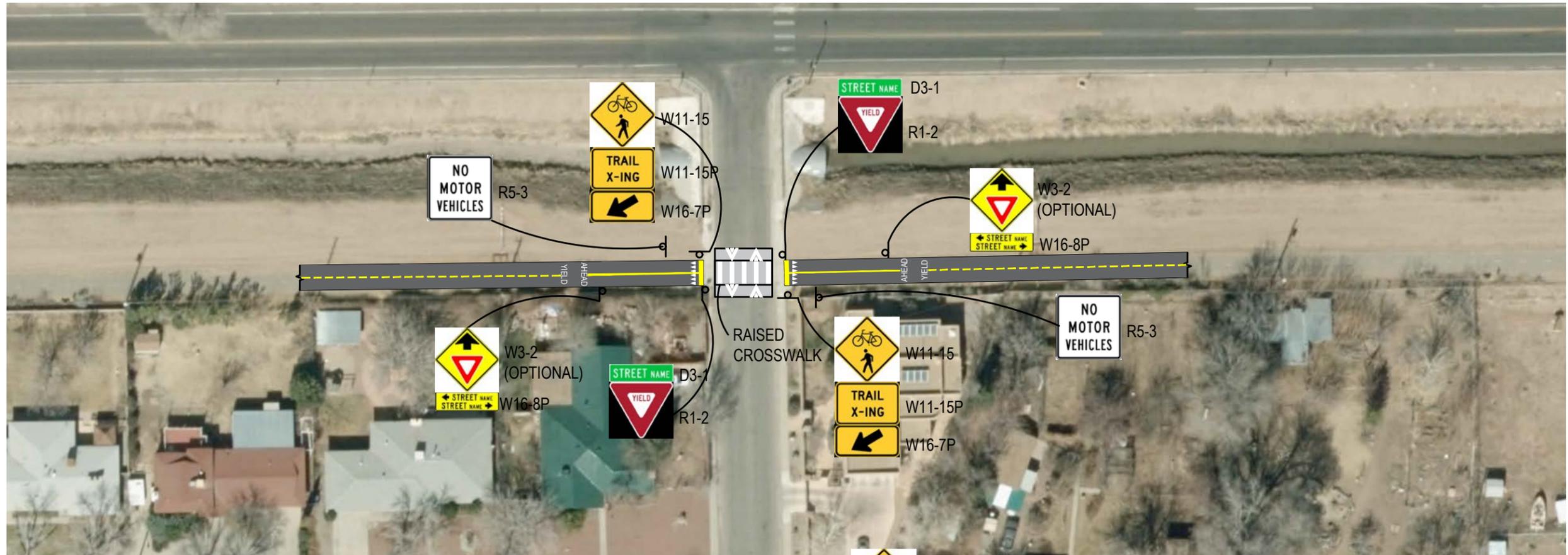
Place at locations where the trail crosses major intersection with traffic signals.

Design Elements

- Design of the crossings and landings will follow current guidelines from the MUTCD and PROWAG for width, slopes, pedestrian pushbutton locations, signing, pavement markings, and pedestrian signal head placement. At locations where the trail is located on the Drain side opposite the normal crosswalk location culvert extensions may be necessary to provide an adequate trail width across the Drain. The existing culvert condition and hydraulic capacity should be evaluated to determine if extension is appropriate, or if replacement and upsizing is warranted.

Context Map





2. INTERSECTIONS WITH MINOR STREETS

Description

Minor streets that cross the Alameda Drain intersect with either Matthew Avenue or 2nd Street within close proximity to the Drain. Trail crossings of minor streets at the Matthew Avenue or 2nd Street intersections, or set back from the intersection were considered. The preferred location for trail crossings is set back from the intersection. The setback distance would depend on the trail alignment approaching the minor street. The intent of the setback is to move the trail crossing away from the road intersection functional area to allow motorists to focus on the trail crossing separate from entering or exiting the road intersection. There are 31 minor street intersections in the corridor.

Function

To provide a pedestrian access route across minor streets that cross the Drain right-of-way. Crossing could be raised to provide level surface for trail users, creating a speed table and slowing motorists.

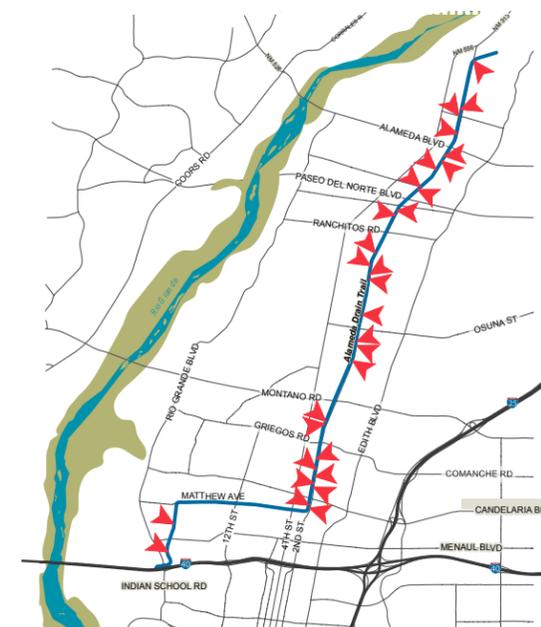
Placement Criteria

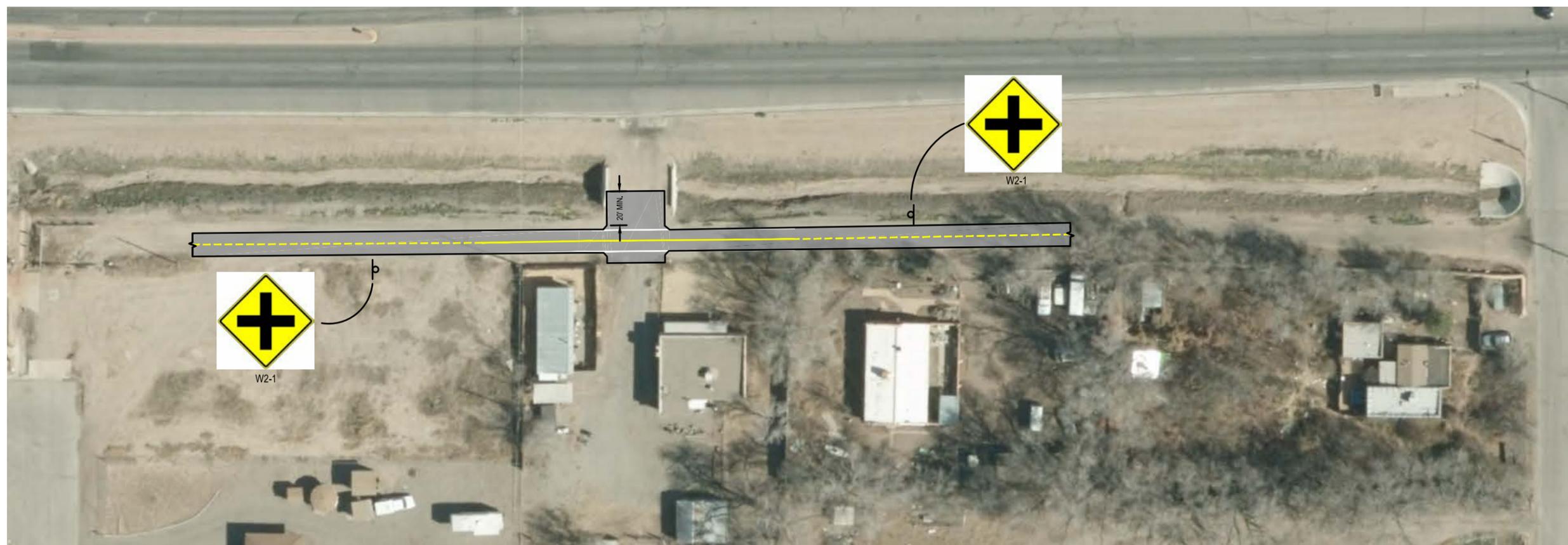
- Place at locations where the trail crosses minor streets.

Design Elements

- Design of the crossings and landings will follow current guidelines from the MUTCD and PROWAG for width, slopes, signing and pavement markings. Traffic calming treatments such as raised crosswalks may be considered where appropriate to improve visibility of the crossing.
- At locations where the trail-road intersection cannot be separated a significant distance from the roadway intersection, a sidepath crossing configuration will be required. At these locations a raised crosswalk will not be appropriate and signing would assign priority to the trail user.

Context Map





3. INTERSECTIONS WITH DRIVEWAYS

Description

Existing business and residential driveways either cross the Drain right-of-way or connect to the Drain right-of-way, in which case driveway users need to travel along the Drain for a distance to access the driveway. Of the 164 driveways along the Drain, 25 have direct access across the Drain. These drives are exclusively along 2nd Street. Users of the remaining 139 driveways must travel along the Drain right-of-way to access another driveway crossing, or a major or minor street crossing. It should be noted that of the 164 driveways, 58 appear to serve as the primary access to the property while 106 appear to serve as a secondary access. The preferred configuration for trail intersections with driveways that

cross the Drain is similar to the minor street intersections with the crossing set back from the driveway intersections with 2nd Street where possible. This will allow motorists to focus on trail traffic before or after they focus on vehicular traffic as they enter or exit the driveway.

Function

To provide a pedestrian access route across driveways that enter or cross the Drain right-of-way.

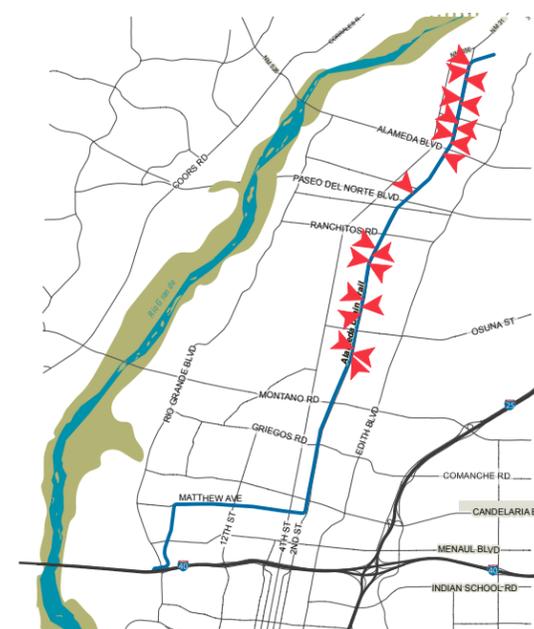
Placement Criteria

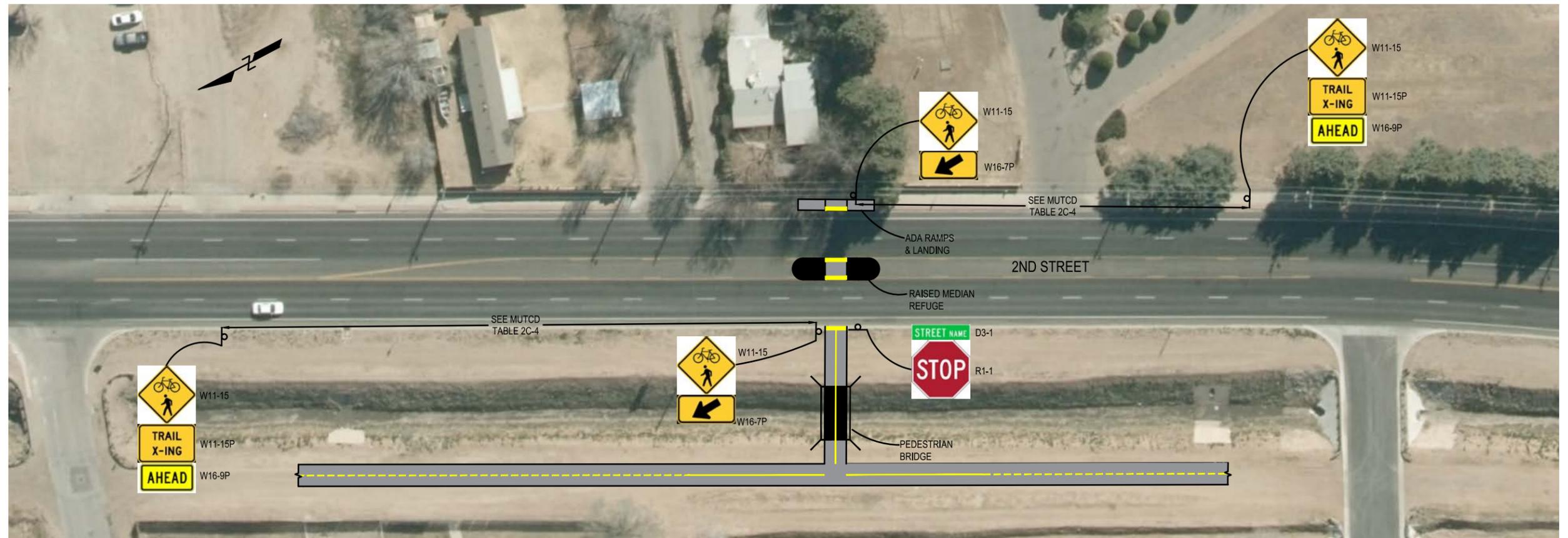
- Place at locations where the trail crosses driveways that connect directly to 2nd Street.

Design Elements

- Design of the crossings will follow current guidelines from the MUTCD for signing and pavement markings.
- The paved trail will be continuous across the driveway with the pavement section thickened to accommodate the vehicular traffic loads and widened to reduce damage to the trail edges and reduce tracking of dirt and rocks onto the trail.
- Signing will depend on vehicle volumes, driveway type, sight distance available, and other sight-specific factors.
- Priority should be assigned to the trail user, if appropriate.

Context Map





4. MID-BLOCK CROSSINGS

Description

Mid-block crossings will be required where the mainline trail crosses roadways at mid-block locations and to provide connections to the mainline trail from other origins and destinations. Crossing treatments may include traffic signs and pavement markings for the trail and the roadway, raised medians for refuge, and pedestrian hybrid beacon (PHB) signalization.

Function

To provide facilities to improve connectivity from the trail to other facilities and areas.

Placement Criteria

- Place at locations where the trail or trail segments cross streets at mid-block locations.

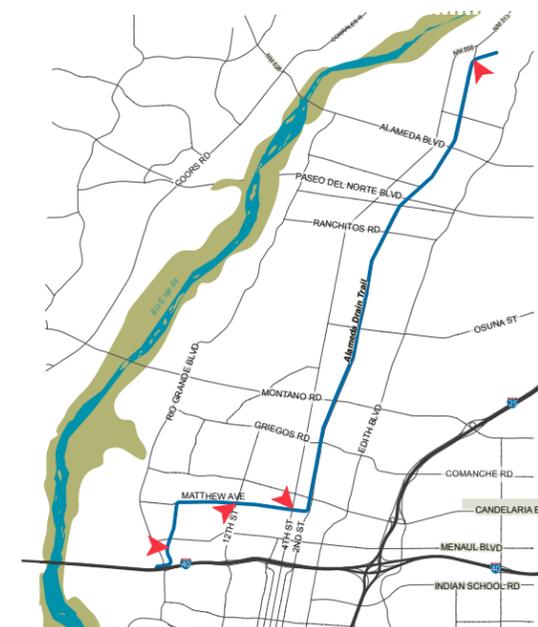
Design Elements

- Crossings should be designed to accommodate pedestrians since they experience greater exposure at intersections, and consider the characteristics of bicyclists and other users.
- Crossing design will follow current guide-

lines from the MUTCD, AASHTO and FHWA for signing, signals and pavement markings.

- Selection of the appropriate crossing treatment will be site specific and based on the vehicular traffic volumes, pedestrian volumes, crossing distances and vehicle speeds.
- Pedestrian hybrid beacons (HAWK signals) as illustrated in [Figure 33](#) should be considered where warranted.

Context Map



4.4 Design Concept Location

The following section provides potential locations of each amenity, water feature and landscape design concept. Icons that refer to each concept illustrates the location on the map and are supplemented with a list of locations.

Proposed locations are subject to change and should be reevaluated during the design and development phase.

In addition, a subsequent map illustrates potential trail connections that a developed Alameda Drain & Trail will facilitate.

SEGMENT 1

INTERSECTION DESIGN CONCEPTS

Intersections with Major Streets

- Indian School Rd. & Alameda Drain

Intersections with Minor Streets

- Lilac Dr. & Alameda Drain
- San Isidro St. & Alameda Drain

Intersections with Driveways

Mid-Block Crossings

- Indian School Rd & Alameda Drain
- Matthew Ave. & 12th Street
- Matthew Ave. & 4th Street

AMENITIES DESIGN CONCEPTS

Trailhead

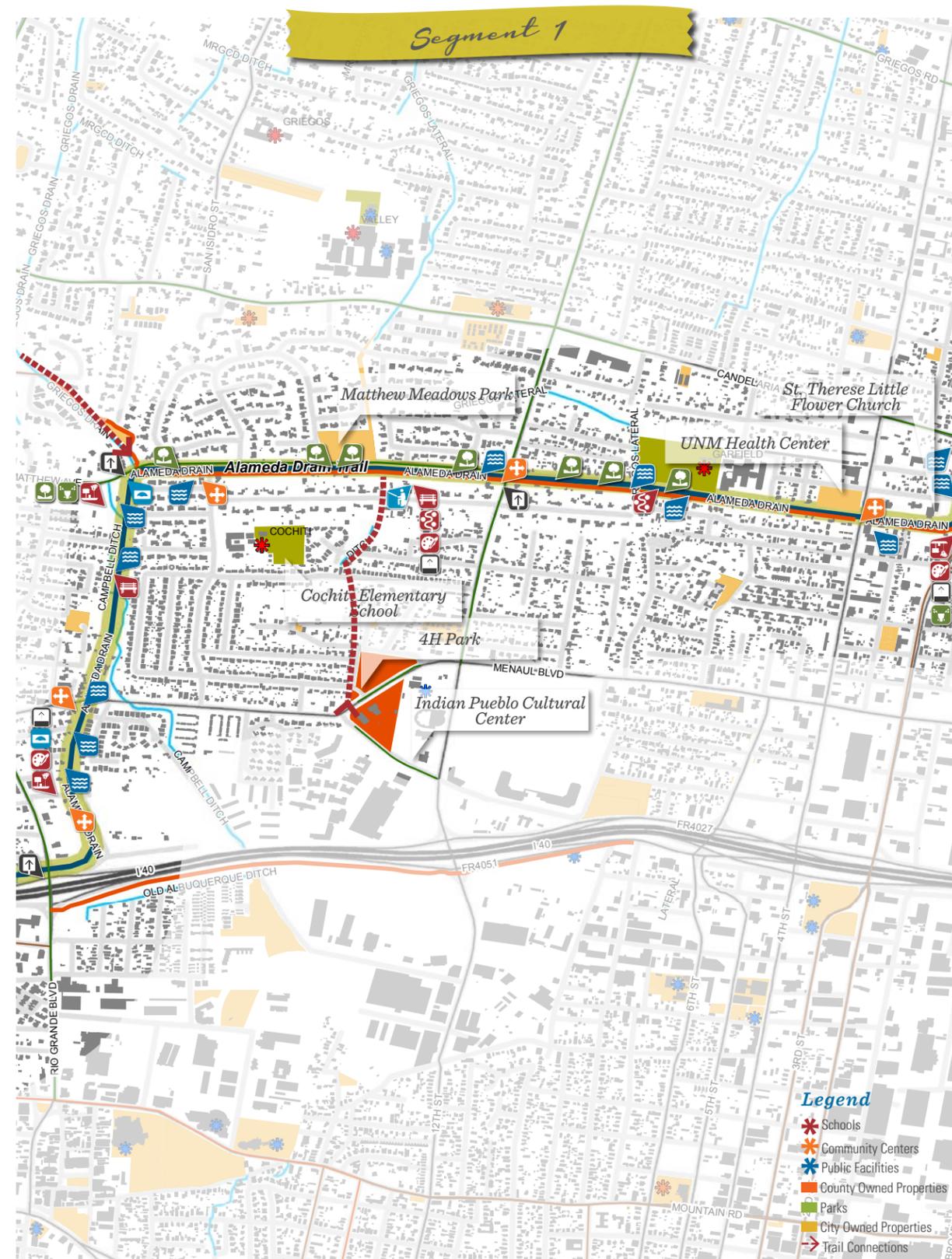
- Lilac Dr. & Alameda Drain
- South of Matthew Ave. & Griegos Drain

Parking

- Lilac Dr. & Alameda Drain
- South of Matthew Ave. & Griegos Drain

Shared Parking Opportunities

- Range Cafe
- New Development North of Interstate 40
- St. Therese Little Flower Church



Linear Park

- Between Griegos Drain and 12th Street, on the south side of the Drain
- Adjacent to Garfield Middle School

Amenities - Rest area

- Located every mile
- Associated with Linear Park, between Griegos Drain and 12th Street, on the south side of the Drain

Public Art

- Associated with the Trailhead at Lilac Rd. & Alameda Drain
- Associated with the Linear Park, between Griegos Drain and 12th Street, on the south side of the Drain
- Associated with the Trailhead at Matthew Ave NM & 2nd Street

WATER FEATURES

Water features - dripping bridge

- Associated with the trailhead at Lilac Dr. & Alameda Drain
- South of Matthew Ave NM & Griegos Drain

Water features - Drain overlook

- Associated with Linear Park, between Griegos Drain and 12th Street, on the south side of the Drain

SIGNAGE

Markers

- Every quarter mile

Directional Sign

- Rio Grande Blvd. & Alameda Drain
- At the bridge at Matthew Ave. & Griegos Drain
- Matthew Ave. & 12th Street
- Matthew Ave & 4th Street

Wayfinding to

- 4H Park
- Indian Pueblo Cultural Center
- Garfield Middle School
- Cochiti Elementary School
- UNM Health Center

Trailhead Sign/Educational Sign

- Saiz Rd. & Alameda Drain
- South of Matthew Ave. & Griegos Drain
- Matthew Ave. & 2nd Street

LANDSCAPE

Low-Impact-Development (LID) Bio retention/ bio swale

- Trailhead south of Matthew Ave. & Griegos Drain
- Matthew Ave. near San Isidro St.
- Matthew Ave. across from Mathew Meadows Park (2)

Irrigated landscape

- Associated with the Trailhead at Saiz Rd. & Alameda Drain
- Associated with the Trailhead south of Matthew Ave. & Griegos Drain
- Trailhead at Matthew Ave. & 2nd Street

WATER QUALITY FEATURES

Step Drop Structure

- Alameda Drain near Rive Ave.
- Alameda Drain near San Venito Pl.
- Matthew Ave. & San Isidro St.
- Alameda Drain & Griegos Interior Drain
- Alameda Drain by Garfield Middle School

Bioswale

- Alameda Drain & Indian School
- Matthew Ave. & 12nd Street
- Alameda Drain & 4th Street
- 2nd Street & Candelaria Rd.

Rock Check Dam

- Alameda Drain & Albuquerque Acequia
- Alameda Drain & Zearing Lateral
- Alameda Drain & Manual Lateral

Log Check Dam

- Alameda Drain & Griegos Interior Drain
- 2nd Street south of Shropshire Pl.

Structural Trash Screen

- Location to be determined during design development phase

Tree Bio-Well

- Location to be determined during design development phase

SEGMENT 2

INTERSECTION DESIGN CONCEPTS

Intersections with Major Streets

- Candelaria Rd. & 2nd Street
- Veranda Rd. & 2nd Street
- Griegos Rd. & 2nd Street
- Montañó Rd. & 2nd Street



Intersections with Minor Streets

- Mildred Ave. & 2nd Street
- Shropshire Pl. & 2nd Street
- Veranda Rd & 2nd Street
- Aztec Rd. & 2nd Street
- Headingly Ave. & 2nd Street
- Mescalero Rd. & 2nd Street
- Shannon Pl. & 2nd Street
- San Lorenzo Ave. & 2nd Street
- Delamar Ave. & 2nd Street

Mid-Block Crossings

- Matthew Ave NM & 4th Street

AMENITIES DESIGN CONCEPTS

Trailhead

- 2nd Street north of Griegos between Shannon & Delamar

Parking

- 2nd Street north of Griegos between Shannon & Delamar

Shared Parking Opportunities

- La Luz Elementary School

Linear Park

- Adjacent to La Luz Elementary School, proposed as a community garden

Amenities - Rest area

- Located every mile

Public Art

- Associated with Trailhead near 2nd Street south of Candelaria Blvd.

WATER FEATURES

Water features - dripping bridge

- Associated with the linear park on 2nd Street south of Candelaria Blvd.
- Associated with the linear park adjacent to La Luz

Water features - Drain overlook

- Associated with the linear park on 2nd Street south of Candelaria Blvd.
- Associated with the linear park adjacent to La Luz

SIGNAGE

Directional Sign

- Located at all major intersections

Wayfinding to

- North Valley Little League
- La Luz Elementary School

Trailhead Sign/Educational Sign

- Associated with the trailhead on 2nd Street south of

- Candelaria Blvd.
- Associated with the linear park adjacent to La Luz

Markers

- Located every mile

LANDSCAPE

Street Trees

- Along 2nd Street where irrigation is available

Low-Impact-Development (LID) Bio retention/bio swale

- Near Candelaria Blvd. & 2nd Street

Irrigated landscape

- Near Candelaria Blvd. & 2nd Street
- Medians (2) by Hilton Ave

WATER QUALITY FEATURES

Step Drop Structure

- Alameda Drain & Placitas Rd.
- 2nd Street south of Montaño Rd.
- 2nd Street & Hilton Ave.

Bioswale

- 2nd Street & La Plata Rd.
- 2nd Street & Sandia Rd.
- 2nd Street near Hendrix Rd.
- 2nd Street & Shannon Pl.

Rock Check Dam

- 2nd Street & Harwood Wasteway

Log Check Dam

- 2nd Street south of Harwood Wasteway

Structural Trash Screen

- 2nd Street near Gene Ave NW

Tree Bio-Well

- Location to be determined during design development phase

SEGMENT 3

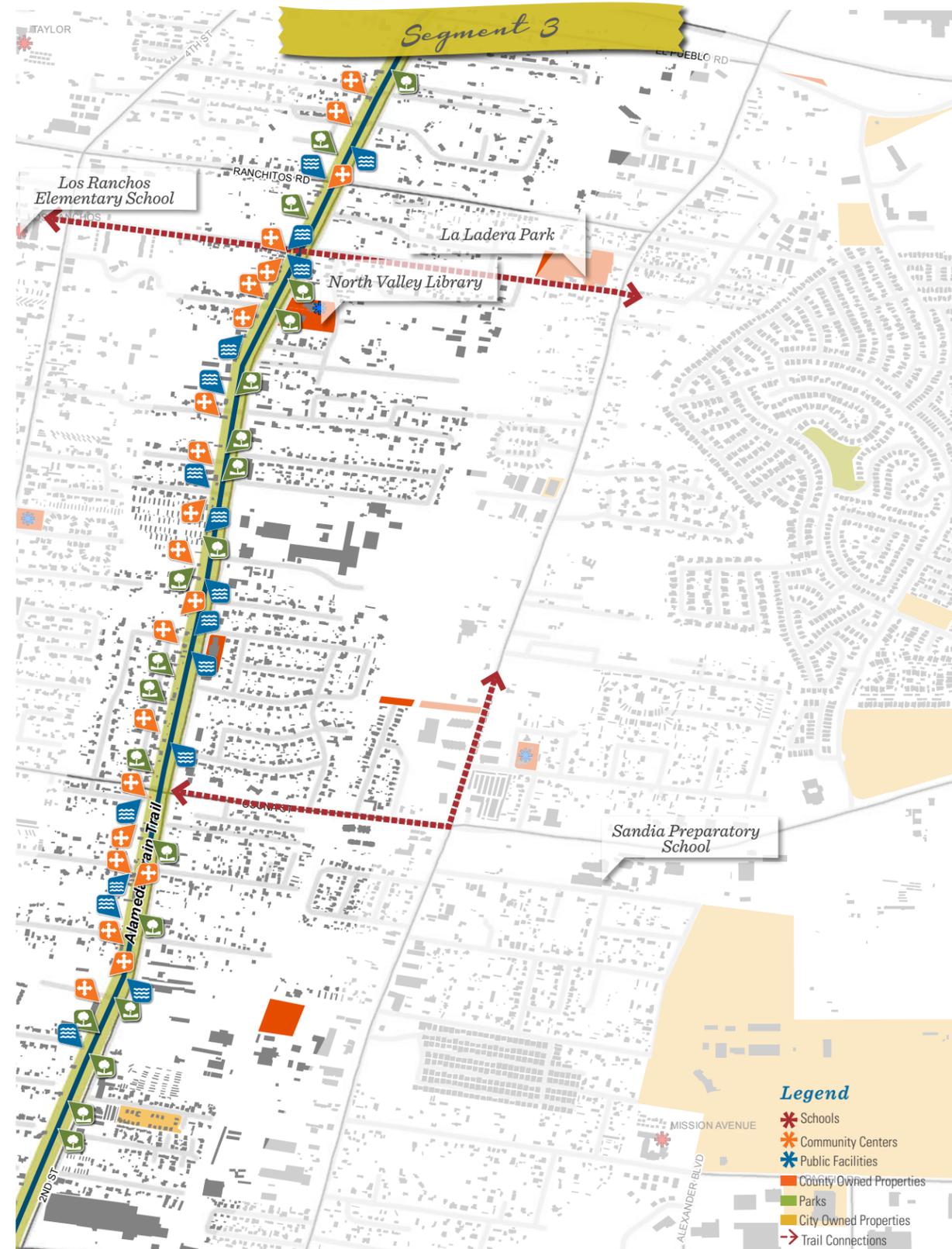
INTERSECTION DESIGN CONCEPTS

Intersections with Major Streets

- Osuna Rd. & 2nd Street
- Los Ranchos & 2nd Street
- Ranchitos & 2nd Street

Intersections with Minor Streets

- El Caminito & 2nd Street
- Vineyard Rd. & 2nd Street
- Willow Rd. & 2nd Street
- Green Valley Rd. & 2nd Street



- Pueblo Solano Rd. & 2nd Street
- Cottonwood & 2nd Street
- Roehl Rd. & 2nd Street
- Horton Ln. & 2nd Street
- Wayne Rd. & 2nd Street

Intersections with Driveways

- Between El Caminito & Vineyard Rd.
- Between Merritt Wasteway & Willow Rd.
- Between Willow Rd. & Osuna Rd.
- Between Osuna Rd. & Green Valley
- Two between Green Valley Rd. & Pueblo Solano Rd.
- Four Between Roehl Rd. & La Cienega Ln.
- Two between La Cienega Ln. and Los Ranchos

AMENITIES DESIGN CONCEPTS

Trailhead

- Saiz Rd NW & Alameda Drain
- South of Matthew Ave NM & Griegos Drain

Amenities - Rest area

- Located every mile

SIGNAGE

Markers

- Located every mile

Directional Sign

- Located at all major intersections

Wayfinding to

- La Ladera Park
- North Valley Library
- UNM Health Center
- Mid Valley Recreational Center
- Los Ranchos Elementary School

LANDSCAPE

Street Trees

- Along 2nd Street where irrigation is available

Low-Impact-Development (LID) Bio retention/bio swale

- Located approximately every quarter mile along the trail

WATER QUALITY FEATURES

Step Drop Structure

- 2nd Street & Los Ranchos Wasteway (2)
- 2nd Street south of La Cienega
- 2nd Street near El Caminito NW
- 2nd Street & the Merrit Wasteway
- 2nd Street & Pueblo Solano Rd NW

- 2nd Street south of Pueblo Solano Rd NW
- 2nd Street & Green Valley Rd NW
- 2nd Street south of Green Valleu Rd NW
- 2nd Street & Velarde Rd. NW
- 2nd Street south of Velarde Rd. NW
- 2nd Street south of Will Rd. NW (1)
- 2nd Street south of Will Rd. NW (2)
- 2nd Street south of Vineyard Rd.
- 2nd Street south at the Stottis Lateral

Bioswale

- 2nd Street south of Tyler Rd.

Rock Check Dam

- 2nd Street north of Roehl Rd NW
- 2nd Street near the end of the Griegos Lateral

Log Check Dam

- South of Horton Ln.
- 2nd Street & the Merritt Wasteway

Structural Trash Screen

- Location to be determined during design development phase

Tree Bio-Well

- 2nd Street south of Osuna Rd. NW

SEGMENT 4

INTERSECTION DESIGN CONCEPTS

Intersections with Major Streets

- Alameda Rd.
- Alameda Blvd.
- Paseo Del Norte
- Ortega Rd.

Intersections with Minor Streets

- Alameda Rd
- Tierra Del Sol
- Ortega Rd.
- Cielito Lindo
- Francis Rd.
- Orlando Way
- Alameda Rd.
- North Ct.

Intersections with Driveways

- Between Ortega Rd. and Cielito Lindo
- Homeland Rd. and St. Francis Rd.
- Between Alameda and Orlando Way
- Between Orlando Way and Alameda Rd.
- Between North Ct. and 2nd Street

Mid-Block Crossings



- Alameda Drain and 2nd Street

AMENITIES DESIGN CONCEPTS

Trailhead

- West of Diers Rd NW

Amenities - Rest area

- Located every mile

Public Art

- Associated with the trailhead west of Diers Rd NW

WATER FEATURES

Water features - dripping bridge

- Associated with the trailhead west of Diers Rd NW

Water features - Drain overlook

- Associated with the trailhead west of Diers Rd NW

SIGNAGE

Trailhead Sign/Educational Sign

- Associated with the trailhead west of Diers Rd NW

Markers

- Located every mile

Directional Sign

- Located at all major intersections

Wayfinding to

- Raymond G. Sanchez Community Center
- Alameda Soccer Park
- Alameda Elementary School
- Balloon Fiesta Park

LANDSCAPE

Low-Impact-Development (LID) Bio retention/bio swale

- Located approximately every quarter mile along the trail

Irrigated landscape

- Located at the trailhead west of Diers Rd NW

WATER QUALITY FEATURES

Step Drop Structure

- North of St. Francis Rd.
- South of Homeland Rd.
- South of Cielito Lindo Pl.

Bioswale

- North of Wayne Rd.
- North of Paso Del Norte

Rock Check Dam

- Paseo del Norte & the Derramader Wasteway
- Between Tierra Del Sol and Ortega Rd.

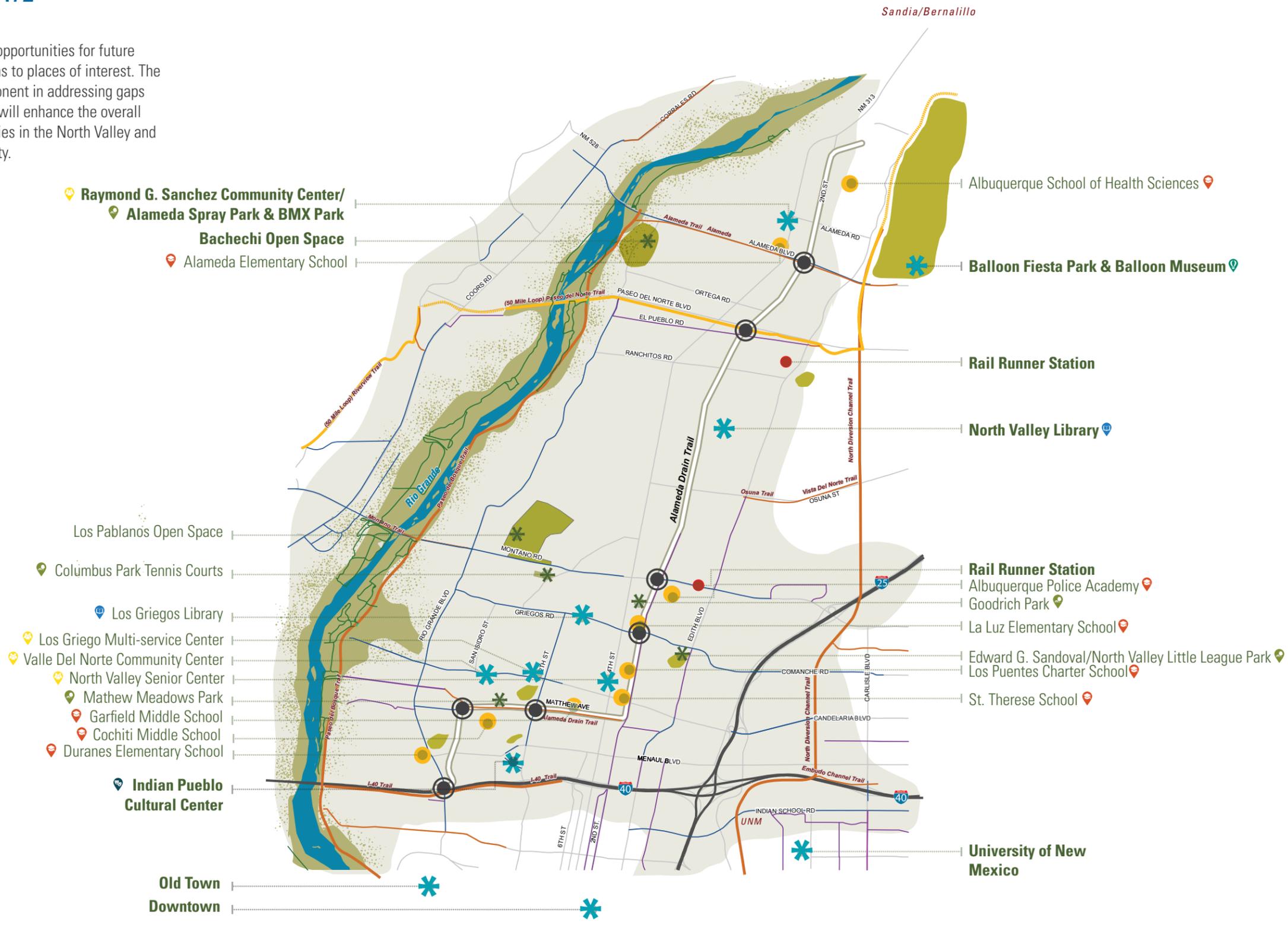
Log Check Dam

- South of Alameda Rd.

POTENTIAL TRAIL CONNECTIONS

The map to the right illustrates opportunities for future trail connections and connections to places of interest. The proposed trail is a critical component in addressing gaps in the greater trail network and will enhance the overall connectivity between communities in the North Valley and other parts of the City and County.

FIGURE 74. Possible Trail Connections



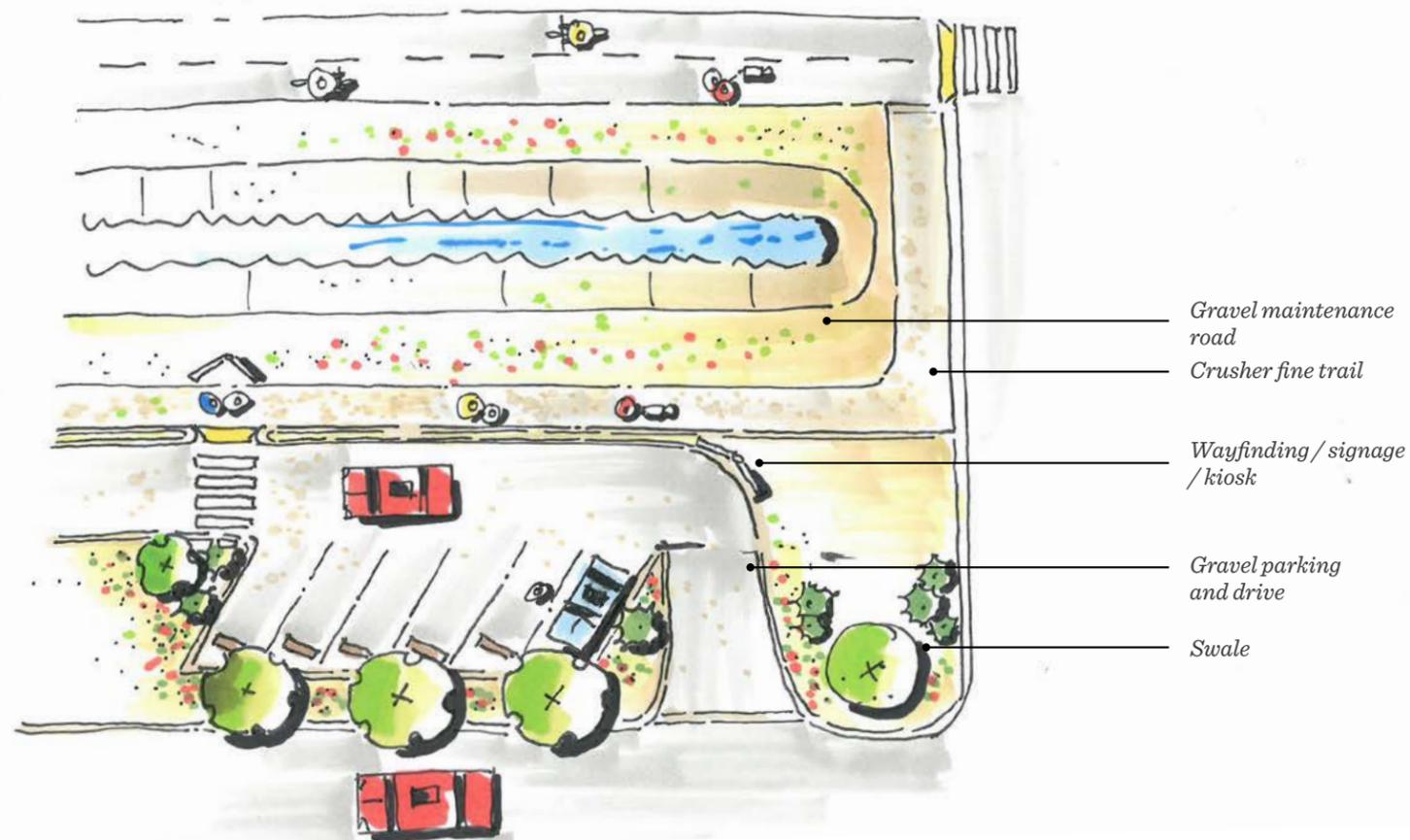
4.5 Amenities



Section “3. Master Plan Concepts” on page 17 introduced a wide range of amenities to be considered for the project corridor. These amenities were further analyzed through general discussions with agency representatives, the project team and stakeholders, resulting in substantial refinement of the trail amenities deemed appropriate for the Alameda Drain & Trail corridor.

The following sections details the desired amenities and their recommended location as proposed by the project team.

FIGURE 75. Trailhead/Parking Concept



5. TRAILHEAD/PARKING

Description

Trailheads along the Alameda Drain & Trail corridor should mark trail beginnings, ends, and at intersecting trails locations. A small number of parking spaces, including accessible parking spaces, should be located here. A kiosk should serve to display information including the purpose and extent of the trail, wayfinding information, information concerning the history and culture of the Drain and its surrounding communities, and MRGCD maintenance schedules/closures.

Where possible it is recommended to share existing parking facilities as discussed in section “3.4 Trail Amenities” on page 47.

Trailheads along the Drain will serve as important nodes and become meeting points, wayfinding tools, and most importantly allow people with disabilities easy accessibil-

ity to the trail. Additionally, the trailhead should display information to communicate with adjacent neighborhoods about trail closures and other maintenance activities.

Placement Criteria:

- Beginning or end of trail or at significant trail access points
- Sufficient right-of-way (min. 30')
- In close proximity to activity centers
- In close proximity to nodes of multi-modal travel
- In close proximity to irrigation laterals entering the Drain

Design Elements

- Right-of-way width from back of curb to Drain approximately 75'-0"
- Accessible parking with a paved connection to the trail

- Address security concerns by employing Crime Prevention tactics through the implementation of Environmental Design (CPTED) guidelines.
- Trash receptacles
- Seating
- Signage-wayfinding map
- Interpretive signage for MRGCD, AMAFCA
- Pet waste station
- Public art piece
- Bike racks
- Water feature
- Irrigated shade and fruit bearing plantings
- Low impact development
- Lighting
- Shade Structure
- Temporary food truck parking areas

Context Map

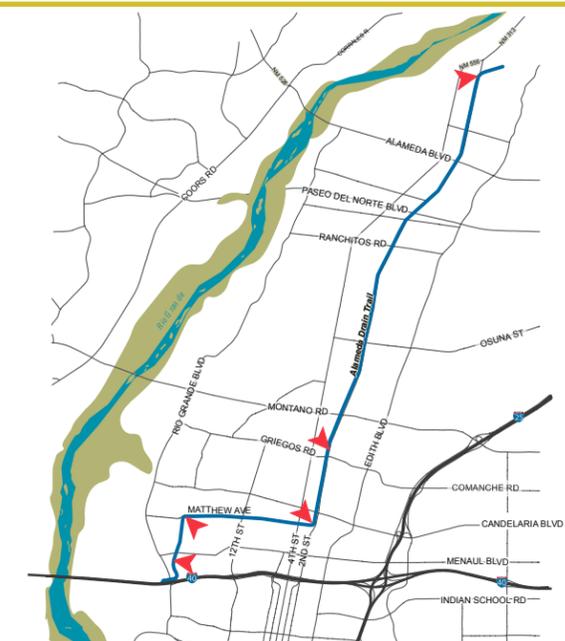
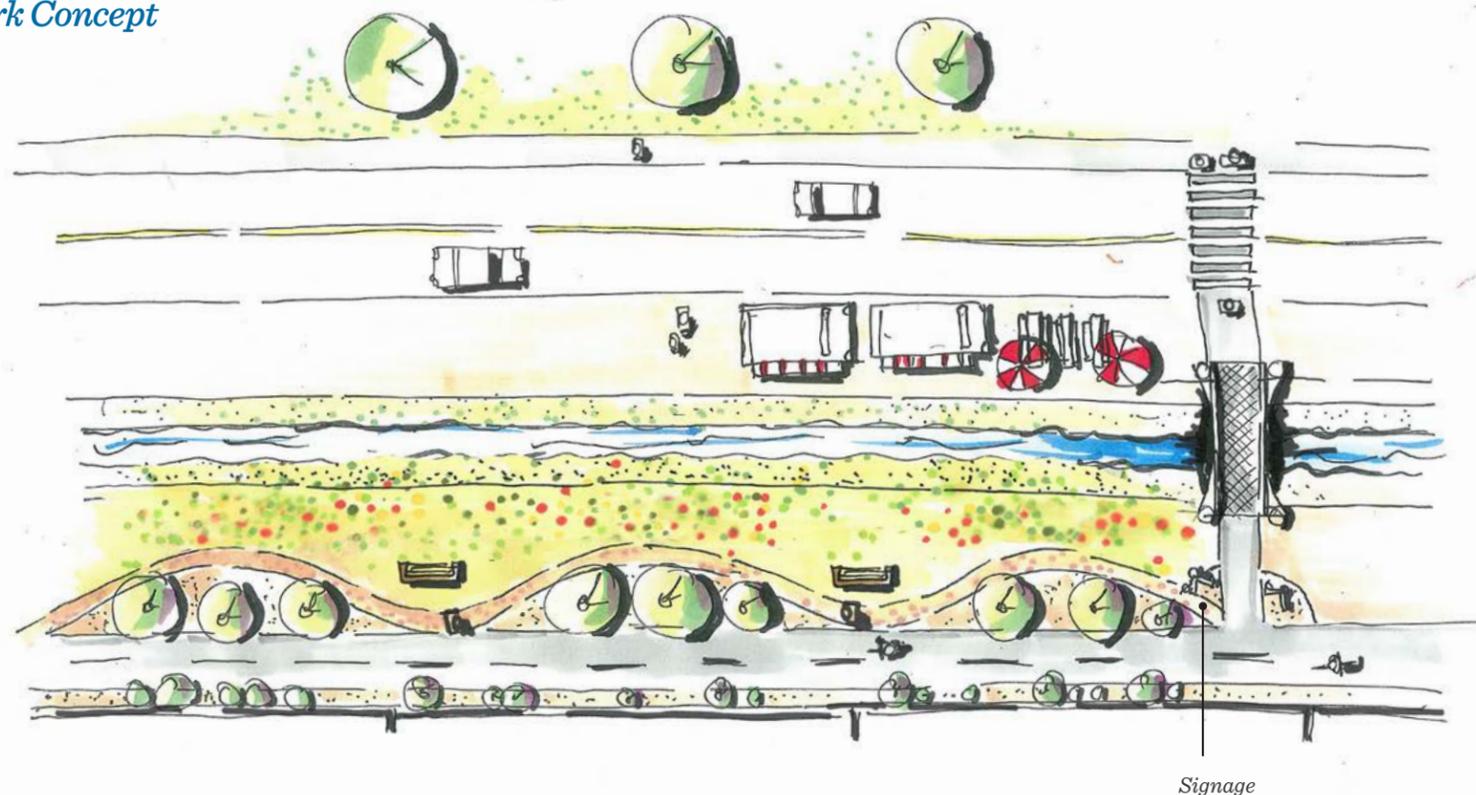


FIGURE 76. *Linear Park Concept*



Priority Location

As discussed earlier, the Bernalillo County Parks, Recreation & Open Space Facility Master Plan (2015-2023), identified the vicinity of the Greater Gardner Neighborhood Association as a possible location for a linear park. The master plan recommends to locate the park along 2nd Street, between Montaño and Osuna.

6. LINEAR PARK

Description

The concept of the linear park was detailed in [“3.4 Trail Amenities” on page 47](#).

Linear park’s should span an area of approximately 50 x 200 feet and run parallel to the Drain. Park’s should feature an enhanced level of landscaping including trees, shrubs and grasses. Their designs should include a crusher fine path, picnic areas, benches, trash receptacles, dog stations, informational signage and may include temporary spaces in which food trucks can be operated.

Linear park’s should be accessible and in close proximity to neighborhoods and activity centers.

Placement Criteria:

- Proximity to neighborhoods/activity centers
- Sufficient right-of-way (min. 50')
- Access to irrigation
- Parallel to wasteways

Design Elements

- Crusher fine path, min. 6'
- Site furnishings
- Native trees and edible plantings
- Bio-swales to infiltrate stormwater and supplement irrigation
- Signage-wayfinding map
- Interpretive signage for MRGCD, AMAFCA
- Open green-spaces, seeded with native grasses and wildflowers
- Temporary food truck parking areas
- Play areas for multiple age groups

- Outdoor exercise equipment
- Public art
- Incorporate the Principles of Universal Design
- Adult outdoor exercise equipment
- Address security concerns by employing Crime Prevention tactics through the implementation of Environmental Design (CPTED) guidelines.

Context Map

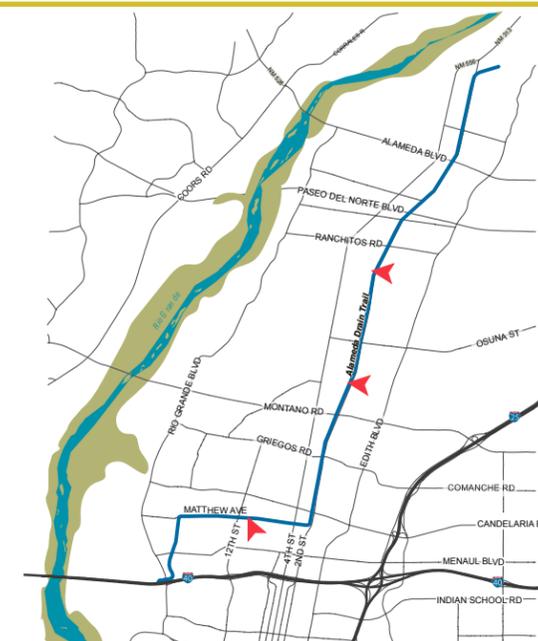
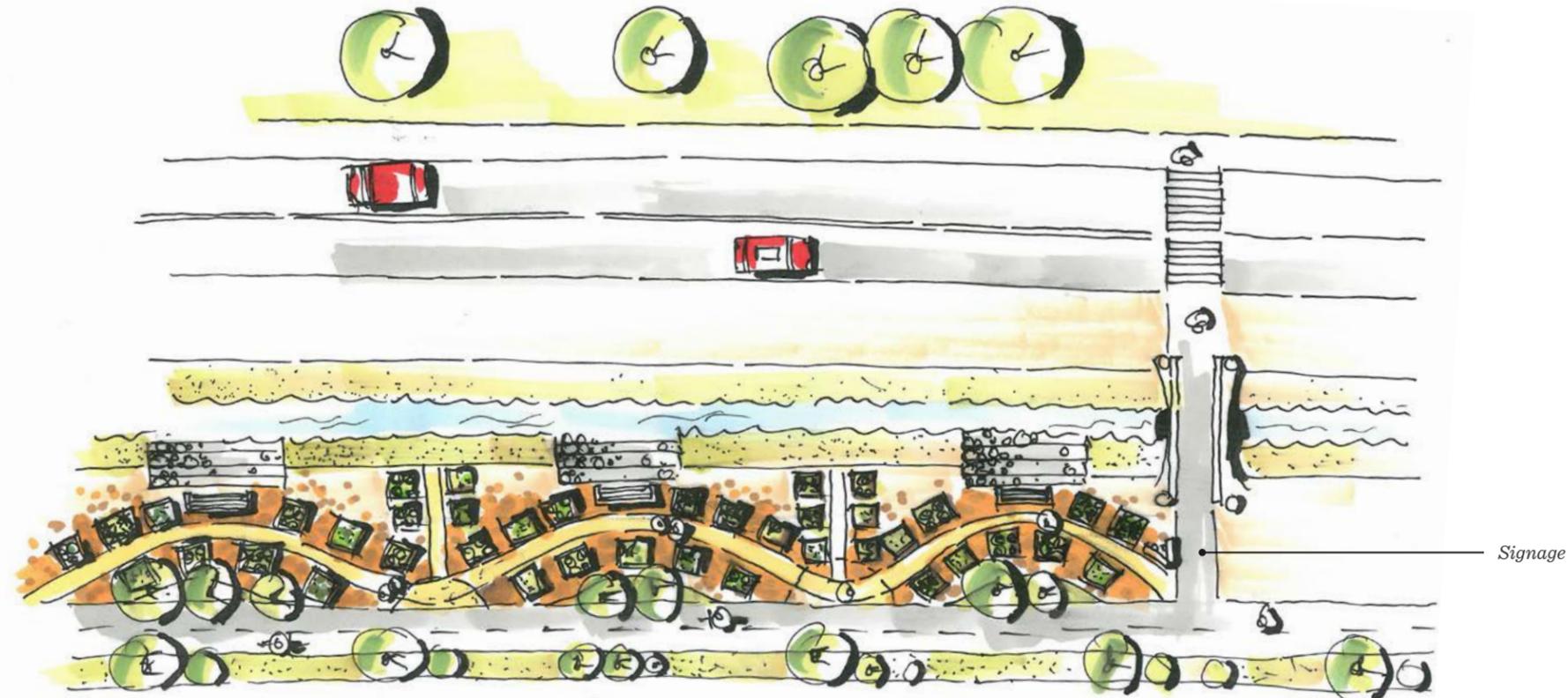


FIGURE 77. *Community Garden Concept*



7. COMMUNITY GARDEN

Description

The concept of a community garden was introduced in [“Community Garden” on page 51](#).

The North Valley area has a long standing farming tradition and the community garden will create a space that allows the community to continue and celebrate this tradition.

The community garden will only function if the community takes ownership to organize and manage it themselves. Thus, prior to implementation, communities and community members should be identified that will take the lead on this project.

The community garden should be an inclusive place that attracts people from all age groups. The garden should include an adequate number of plots to be assigned to community members and have access to an irrigation

system. Fencing helps to delineate the space and control vandalism and nuisance wildlife impacts to the garden. Picnic tables and benches should be installed to provide areas where gardeners can sit and rest. Signage, identifying the garden, possible sponsors and gardeners as well as contact numbers and general information should also be placed at the garden site.

The ultimate design and elements of the garden should be finalized with the communities that will take ownership of the space.

Placement Criteria:

- Proximate to gathering/community spaces such as schools and other public facilities.
- Sufficient right-of-way
- Access to irrigation

Design Elements

- Raised planters
- Irrigation
- Site Furnishings
- Native trees and edible plantings
- Signage-wayfinding map
- Interpretive signage for MRGCD, AMAFCA
- Public Art
- Outdoor exercise equipment
- Address security concerns by employing CPTED guidelines.
- Incorporate Universal Design Principles

Context Map

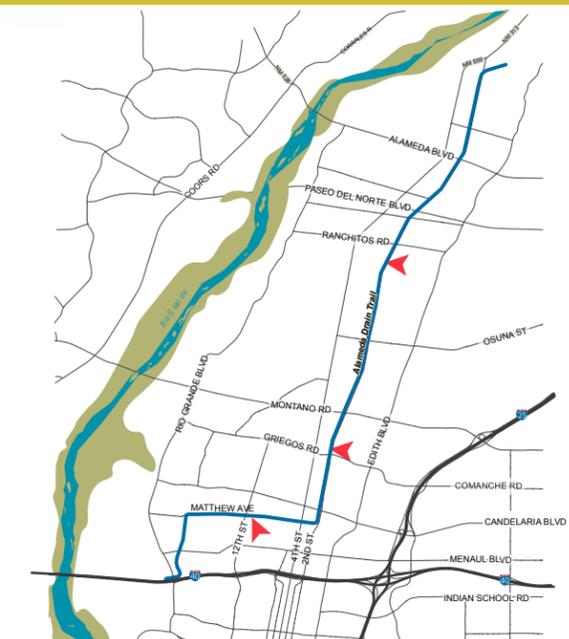


FIGURE 78. *Rest Area Concept*



- Priority Location**
- North of Montañío as part of the linear park
 - North of Osuna
 - South of Paseo Del Norte, in the vicinity if Ranchitos
 - At the east side of the Alameda Soccer Complex
 - At the east side of the Raymond G. Sanchez group facility

8. REST AREA

Description

Rest areas should occur every mile and be nodes of intensity of use and landscape development.

Rest areas should provide seating and allow trail users to refuel. They may be oriented towards the Drain to allow for the observation of water flow and wildlife. To allow rest areas to be convenient accessible and pleasant, rest areas should occur in conjunction with landscape features to provide shade and visual relief. When rest areas are located on the opposite side of the trail a path should connect the multi-use trail and rest area.

Placement Criteria

- Located every mile
- Occur in conjunction with bioswales, the linear park, trailheads and parking
- Sufficient right-of-way
- Allow for 20 feet minimum maintenance clear zone between the rest area and the Drain

Design Elements

- Irrigated landscape and street trees
- Accessible site furnishings
- Trash receptacles
- Bench, picnic benches
- Outdoor fitness equipment
- Pet waste station
- Public art
- Outdoor exercise equipment

- Address security concerns by employing CPTED guidelines.
- Incorporate the Principles of Universal Design

Additional Design Requirements

- In the County portion of the project corridor, more maintenance intensive and irrigated landscaping shall only be co-located with rest areas for ease of maintenance. Areas between should have minimal landscaping, and include only the paved trail and reclamation seeding for native grasses.

Context Map

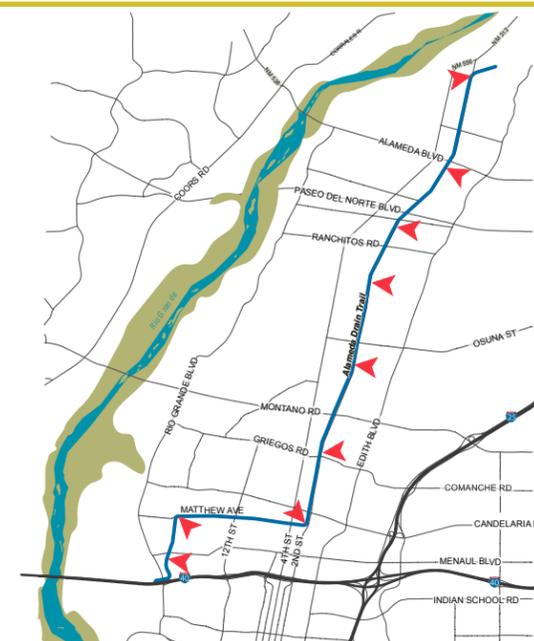


FIGURE 79. *Public Art Concept*



9. PUBLIC ART

Description

Public art, as described in section [“Public Art” on page 53](#), should be installed periodically along the project corridor.

Public art pieces should create interest and enjoyment along the Drain. Artwork should highlight important social, environmental, and cultural issues, creating a sense of ownership by showcasing talented local artists.

This Master Plan recommends that an artist-in-residence works hand-in-hand with the implementing agencies and surrounding neighborhoods to create either temporary or permanent artwork for the trail. Local art initiatives can also be employed to produce public art that is place specific and provide an educational and outreach tool which engender a sense of community ownership for the trail.

The ultimate theme and location of the art should be finalized in conjunction with the artist and adjacent communities.

Placement Criteria

- Located in areas of high visibility
- In close proximity to schools or public facilities
- Accessible from the trail
- Sufficient right-of-way
- Incorporate CEPTED considerations in the community garden design

Design Elements

- Water, environmental and historic or culturally important motifs including but not limited to neighborhood identifiers, agriculture, ditch safety, water quality, dumping, or wildlife.
- MRGCD, County and City Logo Motifs
- Celebration of local artistic talent.
- Barriers/gate design alternatives

FIGURE 80. *Access Control Concept*



10. ACCESS CONTROL MEASURES

Description

Access control measures where discussed in the [“Gates and Barriers” on page 49](#).

Unauthorized uses, access and parking has made access control measure necessary to prevent conflicts with trail users. Retractable bollards are a preferred access control method as they would not prevent maintenance equipment to access the Drain. Another access control method that has been discussed are landscaped medians that divide the trail into two one-way paths, but this methods may restrict access to the Drain for maintenance purposes. Trail access points along the Drain will vary greatly and special consideration should be given to each site to determine what measure is best suitable.

Clear consensus on the best access control method has not been reached. The methods that best controls access will need to be analyzed during the design and development phase.

Placement Criteria

- Only apply access control methods if the need is demonstrated
- Strategically placed to not create hazardous situations
- Bollards and boulders should be placed at the centerline of the trail and set back from intersection roads

Design Elements

- Constructed from materials that are vandalism resistant

FIGURE 81. Preferred Site Furnishing



11. SITE FURNISHINGS

Description

In section [“Site Furnishings” on page 50](#), different furnishing options were discussed. Traditional metal furnishings, illustrated in the precedent images above, were selected as the preferred option. In order to keep the idea of water present during the winter month, furnishings should utilize a color palette that resembles the hues of water. While traditional metal furnishings are preferred, alternative site furnishings may be selected if they evoke the character of the surrounding communities to create a stronger identity and sense of place.

Final site furnishing selections should be made during the design and development phase.

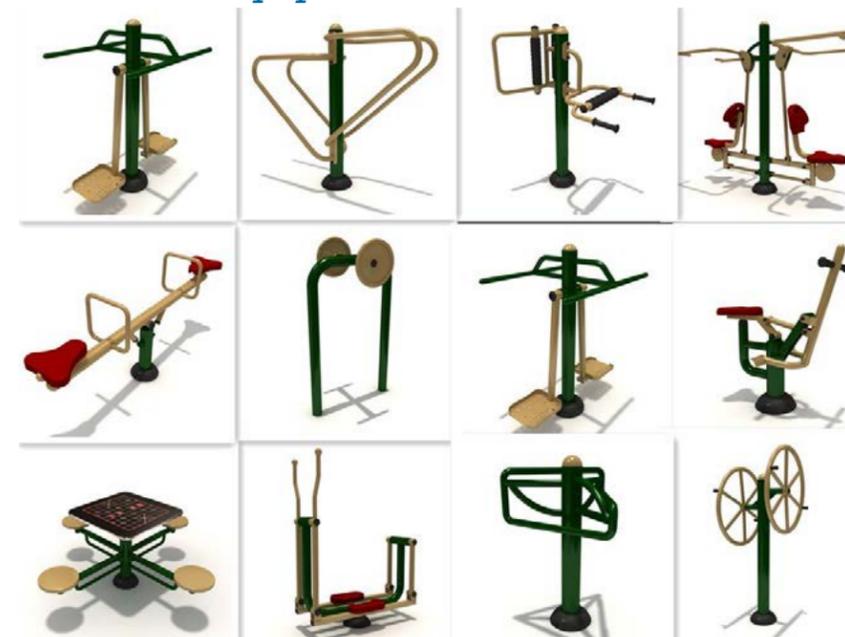
Placement Criteria

- Furnishings should be associated with landscape nodes, linear parks and trailheads
- Furnishings should be placed to be accessible from the trail

Design Elements

- Furnishings should be accessible and vandalism resistant
- Metal finishes
- Blue or green color palettes

FIGURE 82. Outdoor Fitness Equipment



12. OUTDOOR EXERCISE EQUIPMENT

Description

In section [“Outdoor exercise equipment” on page 52](#), outdoor exercise equipment was discussed. The placement of the equipment should be coordinated with landscape areas to shade exercisers. Equipment should be geared towards adults and may also include ADA-Accessible equipment for those in wheelchairs. The equipment should be clustered to allow groups to exercise together.

Placement Criteria

- Place in areas that are expected to experience higher trail traffic
- Equipment should be associated with landscape nodes, the linear park and trailheads
- Equipment should be placed to be accessible from the trail
- Equipment should be clustered in groups
- Address security concerns by employing CPTED guidelines.
- Incorporate the Principles of Universal Design

Design Elements

- Metal finishes
- Blue or green color palette
- Incorporate the Principles of Universal Design
- Equipment should be vandalism resistant

4.6 Water Features



In the “Water Features” on page 54, a range of potential water features were introduced. These features appear periodically along the trail and provide opportunities for trail users to interact with, observe, and experience the movement and sound of water.

The following section details the variety of water features that are recommended by the project team for the trail corridor.

FIGURE 83. *Dripping Bridge Concept*



13. DRIPPING BRIDGE

Description

The “dripping bridge” is proposed as a potential water feature to appear at strategic locations along the project corridor.

This feature should employ a solar pump to pump water from the Drain to the underside of a bridge. It should be installed within higher traffic areas as to benefit the greatest number of users. Interpretive signage should be installed to detail the function of the “dripping bridge”. The dripping bridge may be operated throughout the winter to create icicles in freezing weather.

Placement Criteria

- Highly visible location
- Bridge
- Could be associated with a Drain inlet

Design Elements

- Solar powered
- Minimize water loss by evaporation by making water features simple
- Minimize maintenance by simple use of a pump
- Signage

Context Map

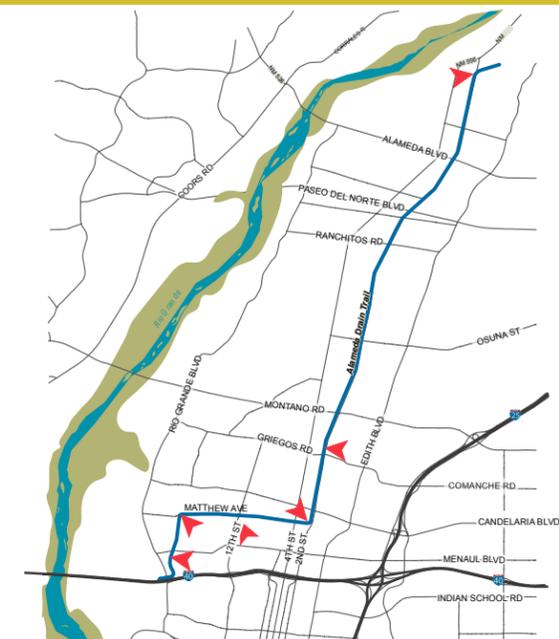


FIGURE 84. *Drain Overlook Concept*



Context Map

14. DRAIN OVERLOOK

Description

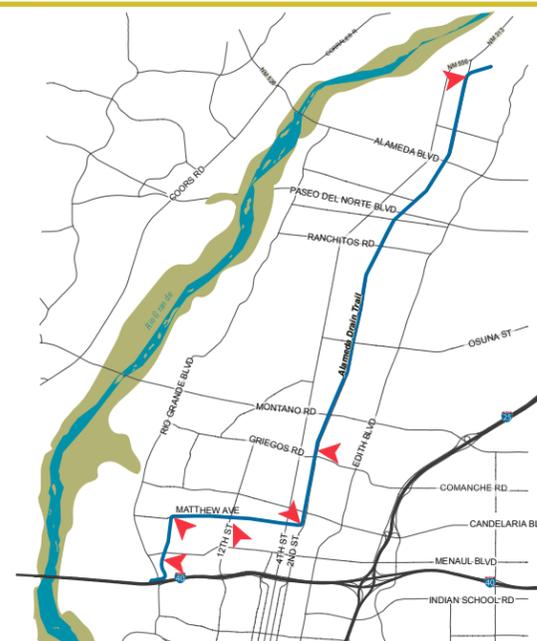
The Drain overlook was also identified as a desired feature to be installed along the project corridor to allow trail users to experience water. The overlook is a deck feature that cantilevers out over the Drain to bring people closer to water. The overlook should be constructed of steel grating, beams, and structural concrete footings that cantilever a steel deck over the drain.

Placement Criteria

- Highly Visible location
- Sufficient right-of-way
- Available access for maintenance
- Away from fast moving traffic
- Proximity to landscape features

Design Elements

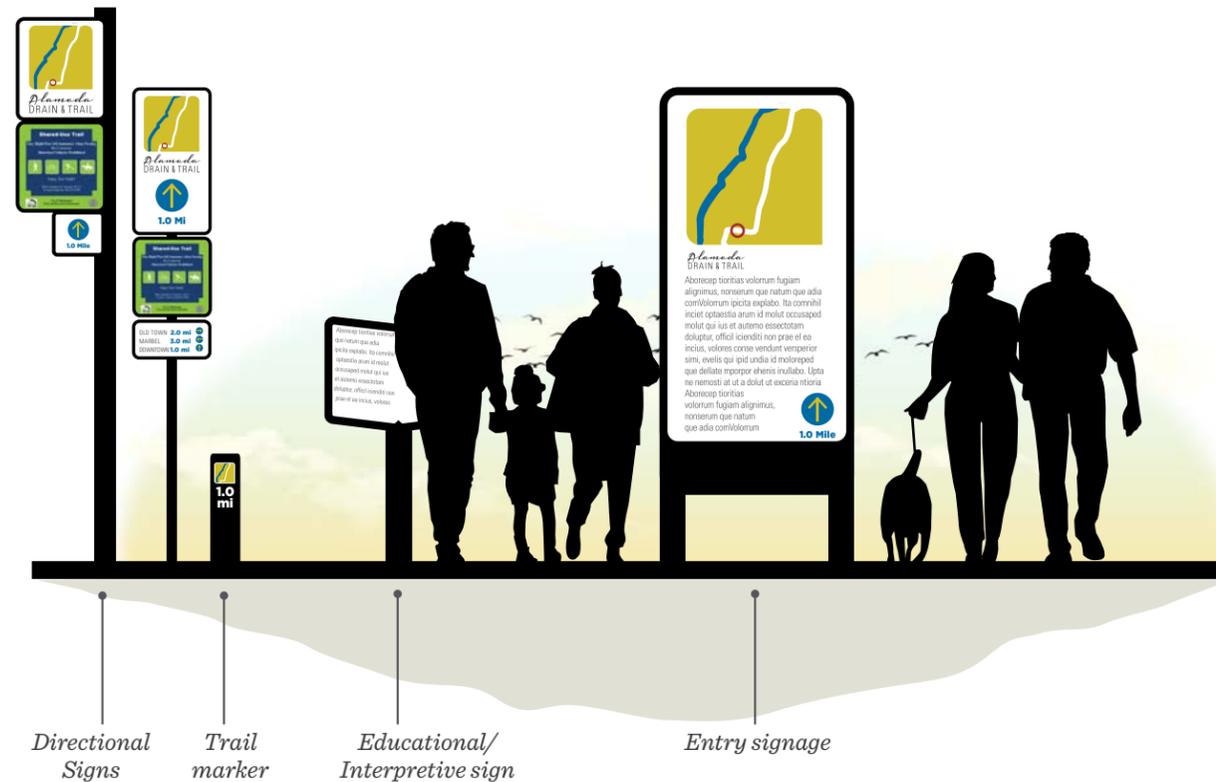
- Accessible from trail
- 10' from the edge of the drain slope
- Constructed from materials that allow the water to be viewed through the grate
- The drain overlook may be combined with a dripping bridge water feature



4.7 Design Concepts - Signage

↑ As discussed in “3.5 Signage” on page 55, signage is an integral component of the trail, helping users to orient themselves, providing information, and creating both a visual continuity and unique identity for the corridor. Trail signage provides information in a wide range of formats including: markers, directional/ wayfinding signs, trailhead signs, and kiosks/gateway signs, interpretive signs, and educational signs. Additional information can be presented on websites, apps, fliers, and trail guides.

FIGURE 86. Signage Hierarchy



15. ALAMEDA DRAIN & TRAIL SIGNAGE TYPE

Description

Successful signage programs are based on a recognizable signage hierarchy, with different types of signage determined by the decision points along the user’s wayfinding path. The project team identified a number of sign types to be installed along the project corridor. The signs vary in their intended function and allow the user to quickly recognize information through the consistency of signage.

There are four types of signs that should be installed along the Alameda Drain corridor; entry, directional, education/interpretive, and marker signs.

Entry signage, such as trailheads, announce to users that they have arrived and should help

with trail identification and navigation. Entry signs should be placed at all major trail access points and trailheads.

Directional signage should be located along the trail to guide users toward desired destinations or amenities. Directional signs should be placed at all major intersections, trail access and key decision points as well as trailheads.

Educational/interpretive signage should be located at key trail features and should educate trail users of elements like Drain functions, maintenance needs, area history and heritage.

Trail markers clearly mark the location and distance traveled along the trail in order to aid users with trail navigation. Trail markers should be placed every 1/4 mile.

City of Albuquerque Trail Multi-Use signage should be installed along with entry signage at

all major trail access points.

Customised branding specific to the Alameda trail should be incorporated into all signs utilized along the project corridor.

Placement Criteria

- Trailhead signs at entries
- Directional signs at key decision points
- Interpretive signs at locations that provide educational opportunities
- Trail markers every 1/4 mile along the trail
- City of Albuquerque Multi-Use signage should be installed at entries

FIGURE 85. City of Albuquerque Multi-Use Trail sign



FIGURE 87. *Preferred Signage Concept*



16. MATERIAL & DESIGN

Description

Section [“3.5 Signage” on page 55](#), introduced signage design concepts. Signage is a crucial component in creating a successful trail experience. Well programmed, placed and designed signage will enable the user to overcome barriers and help orient them within the greater trail network.

The preferred signage concept incorporates treated or untreated metal with acrylic elements to create a rustic and natural look. All materials used for trail signage should be weather and vandalism resistant. Information displayed on signs should be easy to read from a distance.

While it is a desire to create a unique identity for the project corridor, it is important to incorporate these signage

components into the existing City and County signage program. This will tie the trail back into the greater network of recreational facilities and help create a unified trail network identity.

[Chapter 7](#), of the [Bikeways & Trails Facilities Plan](#), details placement, design and content displayed of trail signage and should be referenced in the final design phase for placement and signage design.

Placement Criteria

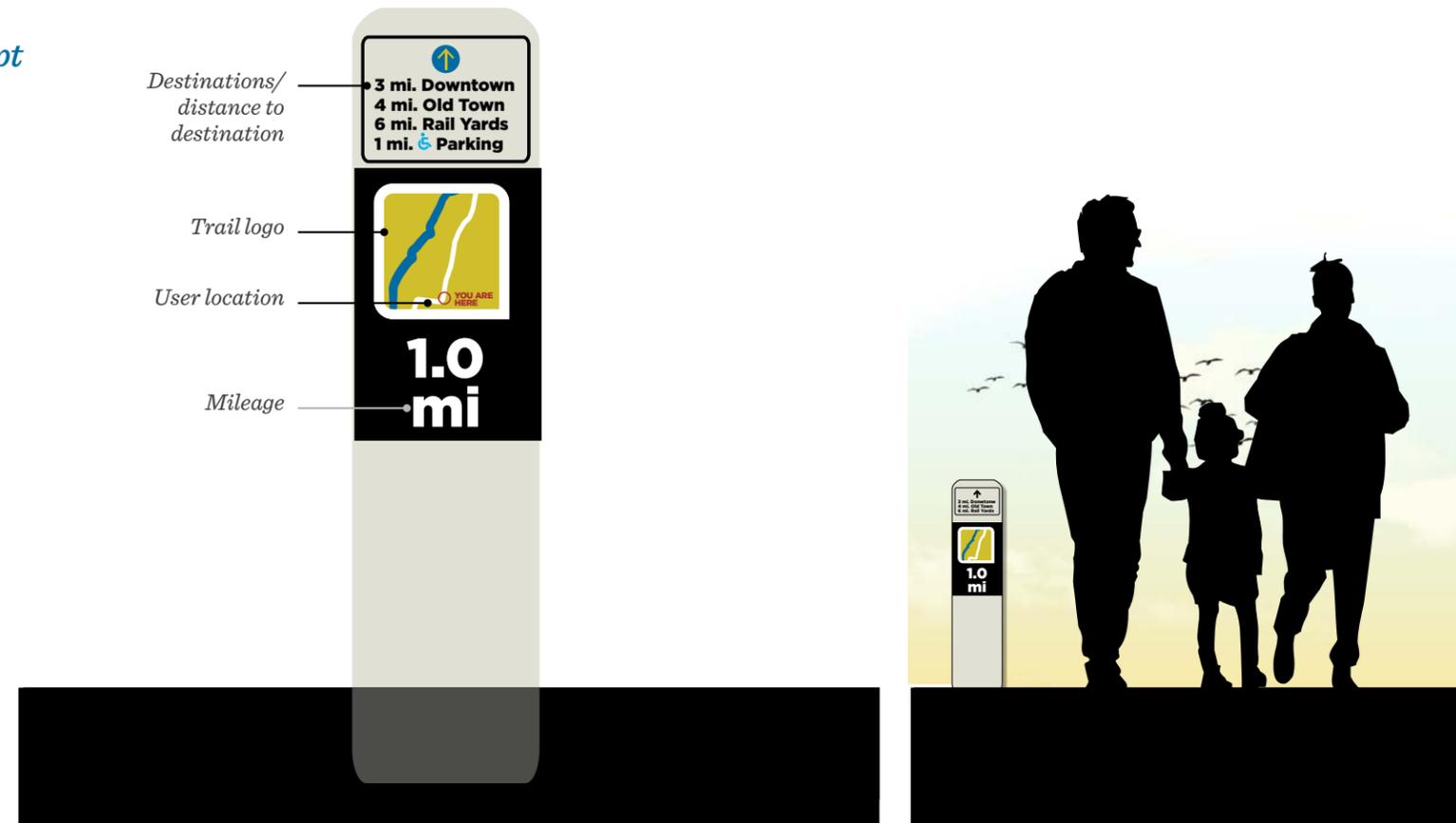
- Placed where most visible and effective
- In close proximity to activity centers and public facilities
- In close proximity to regional or local parks and trails

- In close proximity to public transit sites
- In close proximity to area destinations
- Placed at major intersections, trail intersections
- Visible from trail

Design Elements

- Include Trail name, trail segment name (SW, SE etc.)
- Signage sizing and placement should be in accordance with the most recent version of the Federal Highway Administration’s Manual on Uniform Traffic Control Devices (MUTCD)
- Materials used should be weather and vandalism resistant

FIGURE 88. Trail Marker Concept



17. TRAIL MARKERS

Description

As described in the Signage section, [“Trail Markers.” on page 55](#) markers are typically small signs marking the trails path to reassure the trail users that they are on the trail. The Alameda Drain & Trail master plan recommends installing markers that are attached to small posts and fixed in the ground.

Marker should be installed every 1/4 mile and display information including: current location, trail mile markers, proximity to nearby destinations and may indicate trail length.

Design Elements

- Post 9” wide x 3’ length
- Trail logo
- User location
- Indicate mileage
- Larger font type
- Clean easy to read sans serif font
- Total trail length
- Destinations
- Distance to each destination

Context Map

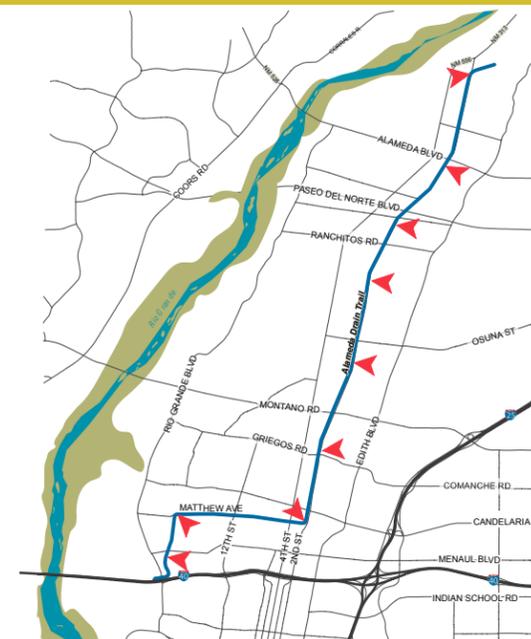
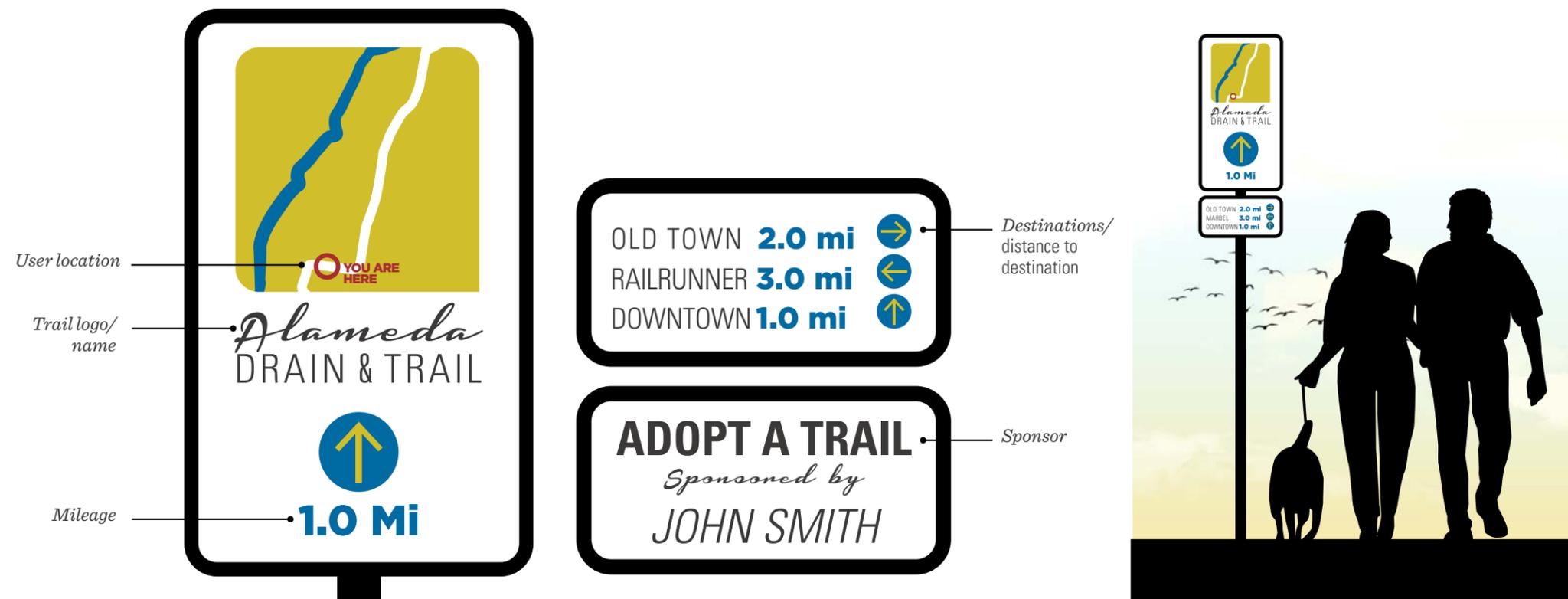


FIGURE 89. Directional Sign Concept



18. DIRECTIONAL SIGN

Description

Directional signs were introduced in the [“Directional/ Wayfinding Signs.” on page 56](#) . They are utilized to inform about nearby destinations that can be reached from various locations along the trail.

The Alameda Drain & Trail master plan recommends placing directional signs at all major intersections, access points, key decision points, and trailheads.

Directional signs could be paired with the adopt-a-trail Program.

Design Elements

- Include logo of trail name
- Map of trail
- Utilize easy to read sans serif fonts
- Indicate mileage
- Include destinations. These may include, but are not limited to: public facilities, places of interest, cultural institutions, popular food and beverage venues
- Include distance to each destination
- Include direction to each destination (an arrow, unless the direction is obvious by the placement of the sign)
- Include total trail length

FIGURE 90. Entry Sign Concept



19. ENTRY SIGN CONCEPT

Description

Entry signs were discussed in [“Entry Signs” on page 56](#) and are recommended to be placed at all major trail access points and trailheads.

Design Elements

- Include logo of trail name
- Map of trail
- Utilize easy to read sans serif fonts
- Indicate mileage
- Include total trail length
- Include general information about the trail to reflect the condition of the trail, when it was constructed or assessed last, and that events beyond the control of the agency staff can make trails temporarily inaccessible
- Include information about maintenance and operation of the trail
- Allowable uses of the trail

Context Map

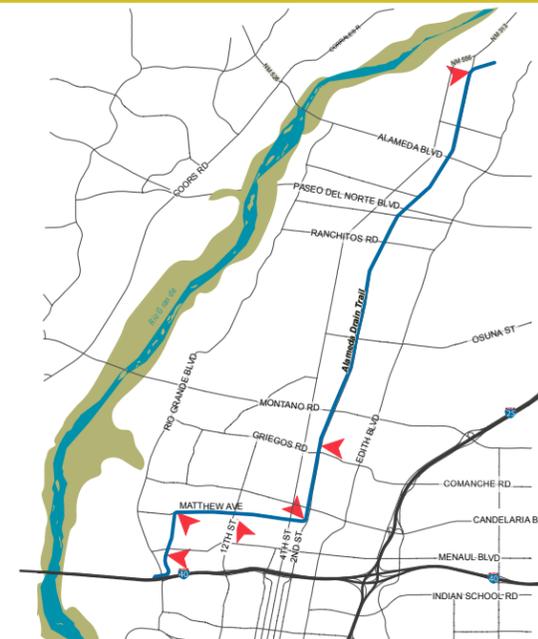
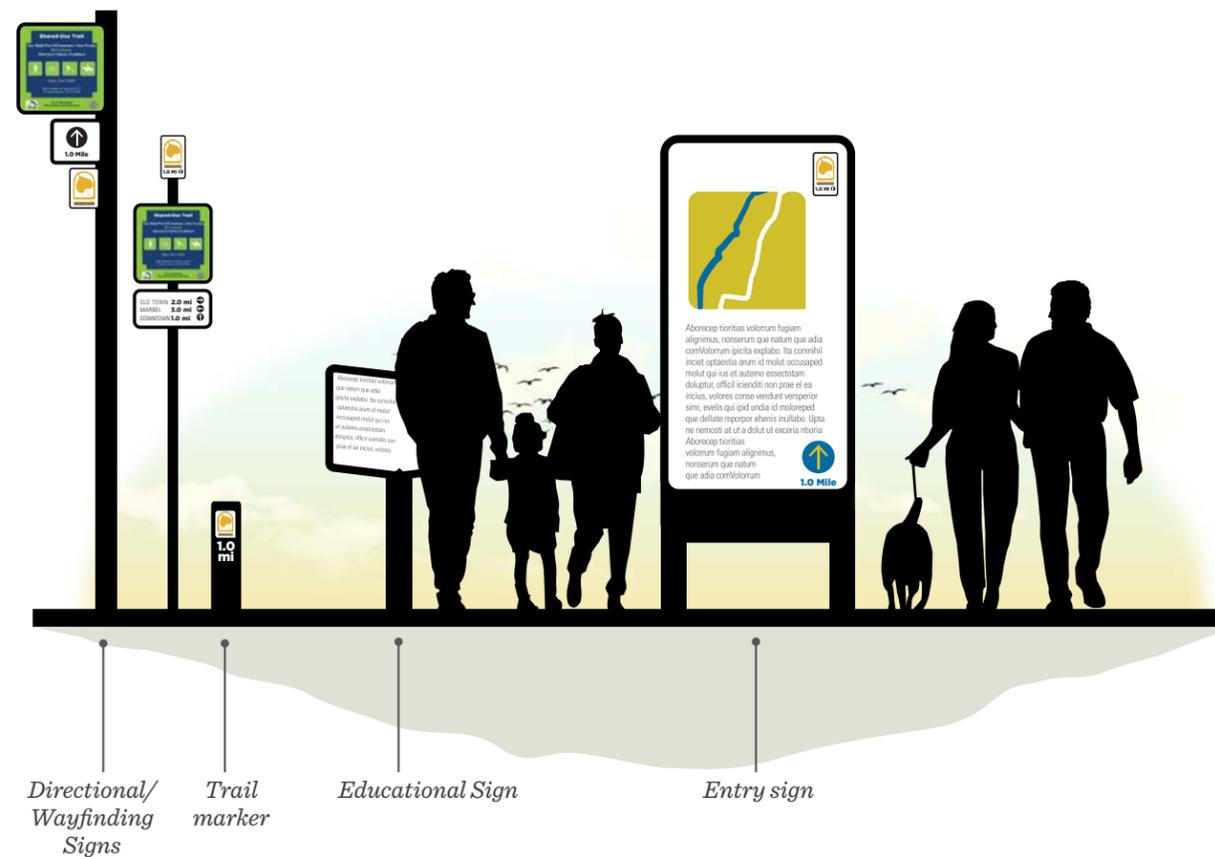
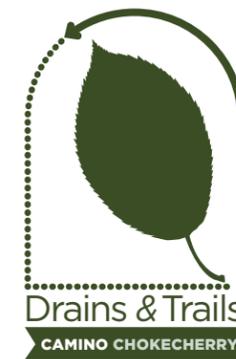
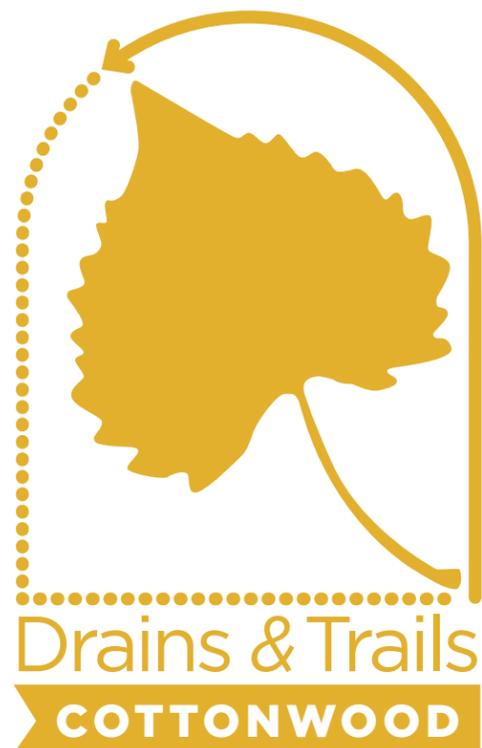


FIGURE 91. MRGCD Trail Signage & Branding

MRGCD
Trail Logo Color
Palette



Directional/
Wayfinding
Signs

Trail
marker

Educational Sign

Entry sign

20. MRGCD TRAIL SIGNAGE & BRANDING

Description

The MRGCD desires to develop a unique brand for trails that are placed along their facilities. Uniquely branding trails that run along ditches and drains will visually distinguish them within the greater trail system.

The above trail logo was developed as part of this master plan effort to implement a visually cohesive wayfinding system for trails along MRGCD facilities. The branding concept envisions that drain trails be associated with the predominant native tree species that grow along their path. The trees name and leaf would become woven into the individual trail names and icons to create a unique, but consistent trail brand.

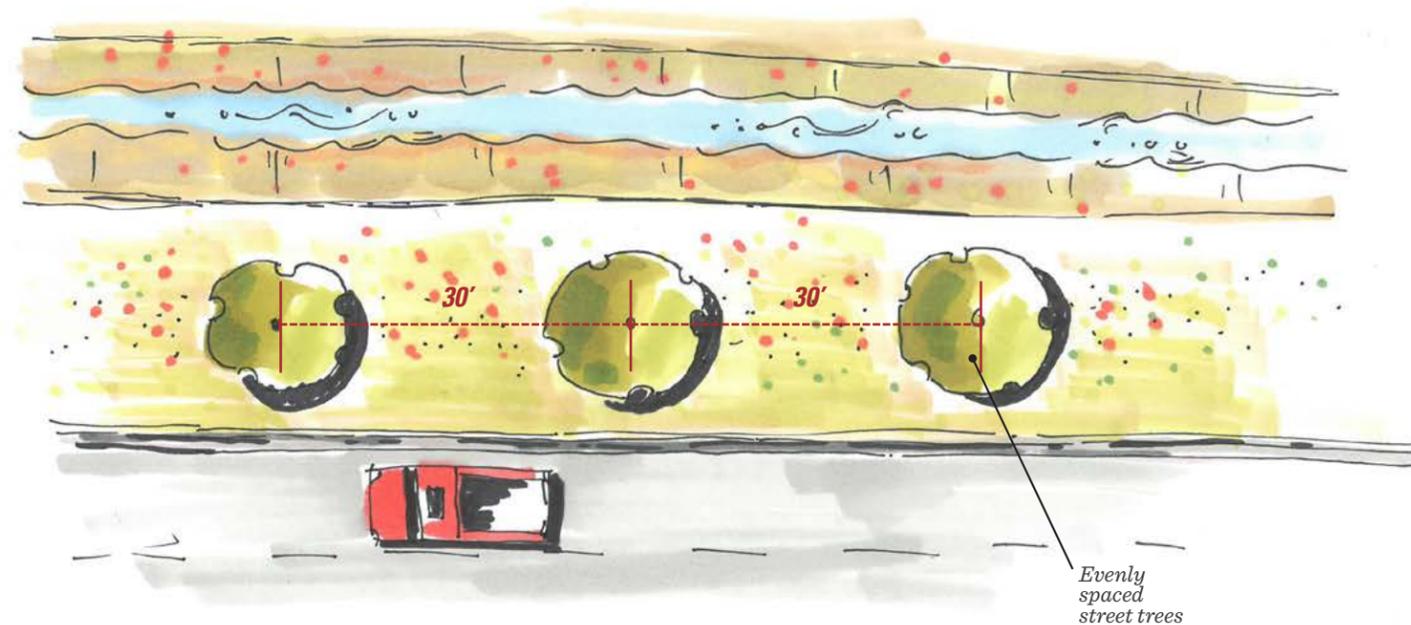
4.8 Landscape



Section “3.6 Landscape” on page 58 introduced landscape design concepts, the recommended plant palette, and noxious weed control methods.

The following section describes the preferred landscape design concepts, their functions, and associated plant selections.

FIGURE 92. *Street Trees Concepts*



21. STREET TREES

Description/Function

Street trees enhance the appearance of the streets by buffering pedestrians and fast moving traffic. Streetscapes also improve the desirability of walking.

Street trees should be established where possible along the project corridor. Within the vicinity of the City of Albuquerque and proximate to existing irrigation street trees should be established as recommended in the ‘[Street Tree Ordinance](#)’. According to the Street Tree Ordinance a list of appropriate trees can be obtained from the Parks and Recreation Department. Tree spacing should be 30 feet, however, because of the extend of the corridor, tree spacing may be expanded to measure 50 feet.

The Alameda Drain & Trail master recommends to establish street trees along major roads, in specific, along 2nd Street and Matthew Ave.

Size of the trees at maturity should be in proportion to the planting space provided for them.

Placement Criteria

- Proximate to existing irrigation
- Placed where appropriate right-of-way is available, including a 20 feet minimum maintenance clear zone from the Drain banks

Design Elements

- Evenly spaced trees, max. distance 45'-0"
- Streets must comply with the requirements established within the City of Albuquerque Street Tree Ordinance
- Choose trees on approved plant City/County plant lists

Context Map

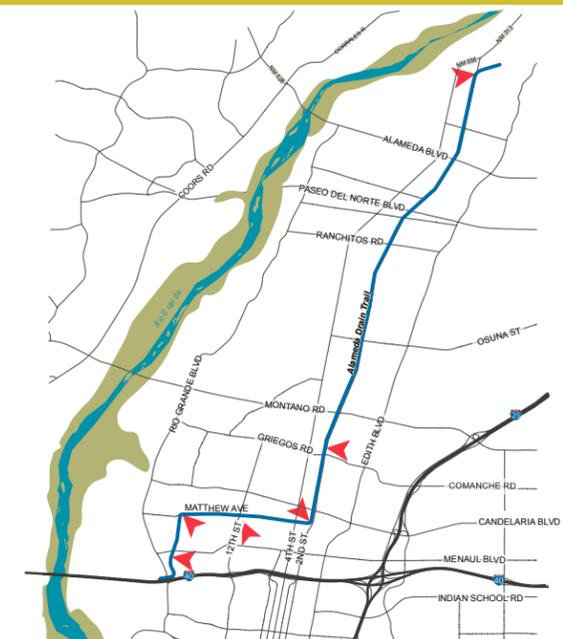
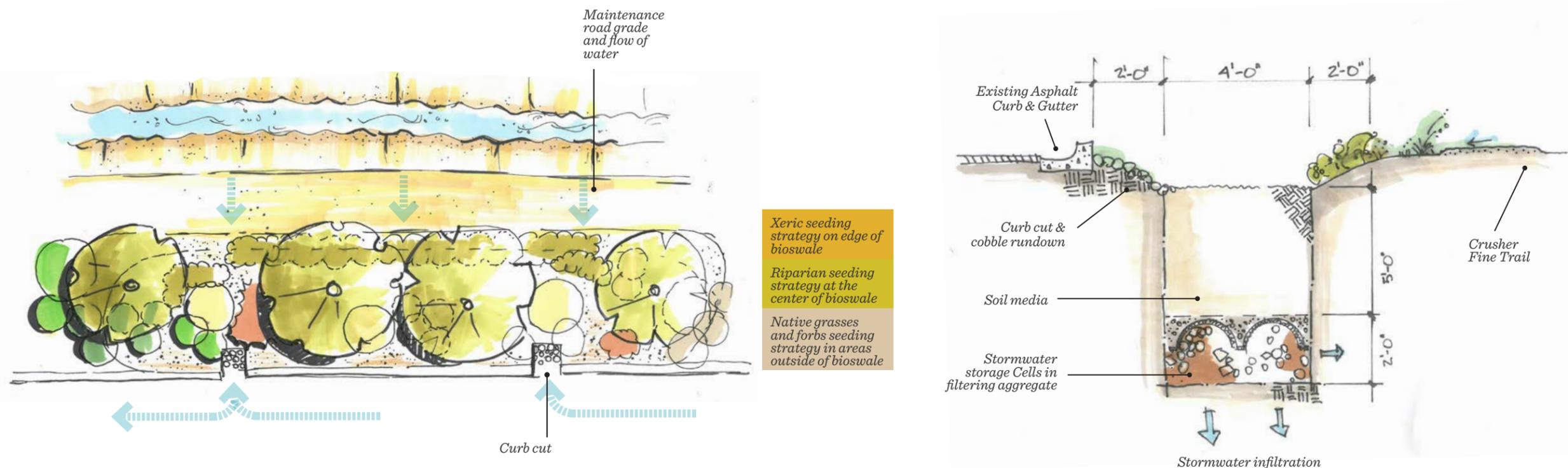


FIGURE 93. Bioswale Concept



22. LOW-IMPACT-DEVELOPMENT (LID) LANDSCAPE BIO RETENTION/BIO SWALE

Description

Low Impact Development (LID) features are recommended to be installed along the project corridor, especially along 2nd Street.

LID techniques are recommended to be employed along the trail corridor to improve water quality issues. Bioswales are designed to trap and remove silts and pollutants - inorganic contaminants or metallic compounds such as lead, organic chemicals like pesticides, and pathogens from stormwater runoff.

Ancillary benefits include infiltration of stormwater into growing mediums for food bearing and habitat creating plants.

Within the project corridor LID techniques should be employed to meet some of the master plan goals, including improving water quality and reducing MRGCD

maintenance needs. LID techniques filtering stormwater of floatable pollutants, addressing pollutants by subjecting stormwater to sunlight and soil contact. Ancillary benefits include infiltration of stormwater into growing mediums for food bearing and habitat creating plants.

Placement Criteria

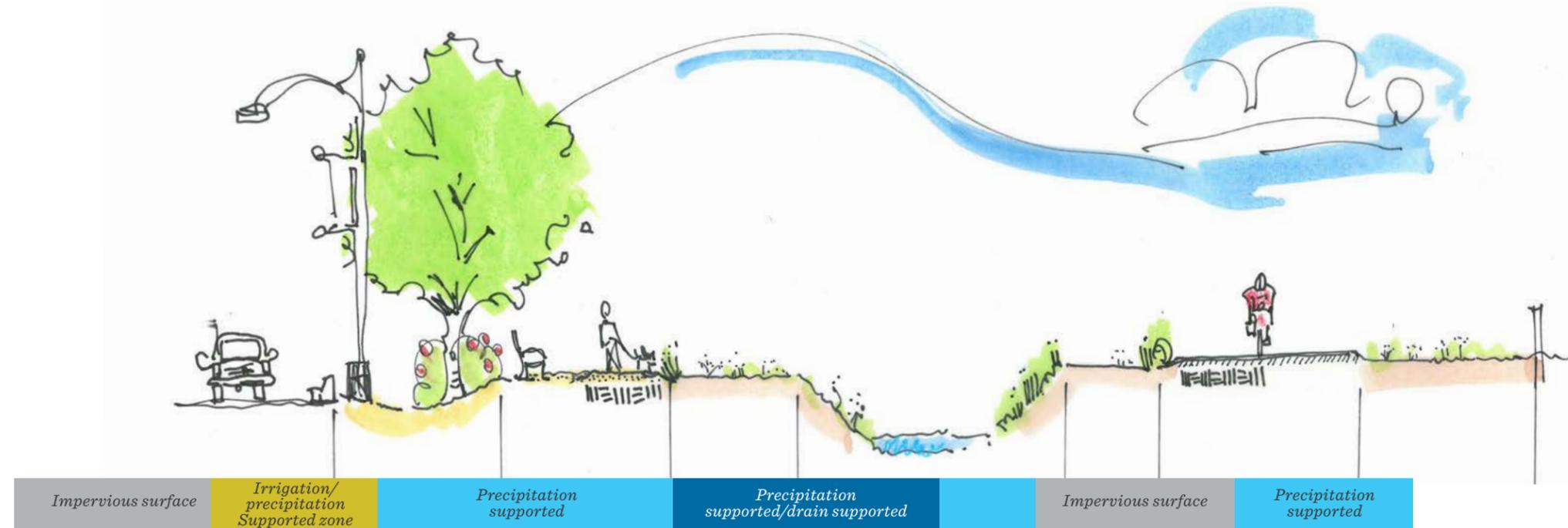
- Sufficient right-of-way
- Maintain 20 feet maintenance clear zone between Drain banks and bioswale to avoid damaging trees and landscape features during maintenance activities

Design Elements

- Min. width 10' min. length 30'
- Locate bioswales where possible along the length of the Trail
- Seeding strategies should include special mixes of riparian plant species within water-harvesting areas that are located in the center of the bioswale
- Utilize xeric plant mix for area at the edge of bioswale
- Utilize native grasses and forbs for areas outside of bioswale

Planting Specifications

- Utilize native plant material capable of being periodically inundated with stormwater and (when ever feasible) capable of removing surface water pollution through phytoremediation.
- Utilize plant material capable of surviving and propagating without additional resources such as water or fertilizers.
- Utilize plant material that may be planted as pole or whip plantings that can take advantage of high water tables near the MRGCD drain.



23. PLANTING ZONES

Description:

The Drain section was divided into three distinct planting zones, each of which have different water availabilities and access.

■ Irrigation/precipitation supported zone

The proximity to existing infrastructure and large paved areas allows for a wider range of passive water harvesting /irrigation options. In this zone access to existing irrigation infrastructure may be possible. In addition, LID facilities can be installed to capture additional water/runoff from the adjacent impervious surface. Species suitable for this environment range from low, medium to high water use plants.

Site Preparation

- Construct LID features as detailed
- Till and amend soils
- Construct irrigation systems
- Plant material as directed

Plant Palette

- See "[Plant Palette](#)" on page 58

Maintenance

- Mechanically remove weeds twice a year
- Prune dead wood, diseased and inferior branches from trees, and shrubs once a year
- Cut ornamental grasses to the ground once a year
- Test and repair irrigation system twice a year

Specialty planting in irrigation/precipitation zone

- Street trees may be considered from Candelaria to Griegos as irrigation controls and water sources are available

■ Precipitation supported zone.

This zone is not adjacent to existing irrigation infrastructure and landscape established here can only be supported by passively harvested water precipitation. Species suitable for this environment range from low water use plants to xeric plant species.

Site Preparation

- Grade in length of swale to accommodate storm-water
- Provide overflow points per civil grading plan
- Mechanically remove weeds
- Till soils
- Seed areas with special seed mixes

Plant Palette

- Possible tree seeding plantings
- See "[Plant Palette](#)" on page 58

Maintenance

- Mechanically remove weeds for two years
- Provide supplemental water during growing season for six months
- Mow vegetation to no lower than 6"
- Yearly mechanically remove weed trees

■ Precipitation supported/Drain supported zone.

The ephemeral flow of water and high water table in the Drain provides water for species established here. Species suitable for this environment range from wetland plants to medium water use plants.

Site Preparation

- Repair eroding ditch banks
- Seed areas with special seed mixes

Plant Palette

- Grass seeding tolerant of moist soils
- Phreatophyte seeding of species requiring moist soils

Maintenance

- Mow vegetation to no lower than 6"
- Reseed disturbed/dredged areas by hand broadcasting special seed mixes.

LANDSCAPE CONSIDERATIONS

Landscaping along trails typically falls into one of two categories: revegetation or enhancement. [Section 1012 of the City of Albuquerque Standard Specifications](#) requires that at a minimum, disturbed land within trail corridors should be re-seeded with native grasses (and wildflowers, where appropriate). Those specifications list two generic seed mixes (for sand or clay soils) which may be used city-wide, with the condition that the shrub component (four-wing saltbush, etc.) be eliminated from seeding within 5 feet of recreational trail edges. Despite this requirement the inclusion of xeric shrubs in seed mixes may be desirable for slope stabilization in areas of significant cut or fill.

As an alternative to the generic mixes listed in city specs, trail developers may use a more site-specific mix, specified by the project landscape architect, planner, or in consultation with the City Open Space Division.

A typical mixture should consist of 4 or 5 grasses, several legumes, and wildflower species. The addition of wildflower seed to a revegetation mix will provide color and seasonal interest to the trailside, and is particularly effective where the seeding can take advantage of any supplemental water that is available (e.g. sprinkler overspray from adjacent properties, collected storm water, etc.). The seed mix should match the unique qualities of the specific roadside being seeded. A cover crop of oats, rye or some quick growing vegetation should be planted along with the native seed mix to protect the soil from erosion and shade out competing weeds while the native grasses and wildflowers establish. Specifically where goat heads (puncture vine) are present or a nuisance, native plants that can out-compete them should be considered.

More intensive “enhancement” landscaping may be appropriate for highly used or visible areas like trailheads, segments through neighborhood developments, or in conjunction with a major trail amenities identified in the [Master Plan Concept](#) section. The viability of enhanced landscaping is dependent upon the availability of water and electricity (or alternative power) for irrigation systems and the establishment of a maintenance agreement with

the City Parks Department or a private entity, prior to implementation. Street trees should also be considered along 2nd Street.

Regardless of the type of landscaping considered, shoulder and clear-zone requirements, as identified in the Trail Dimensions section of the City of Albuquerque Bikeways and Trails Facility Plan, shall be followed. Native seeding should be kept two feet from the edge of the trail (unless it is strictly grasses) to allow for graded, compacted shoulders. Trees are encouraged along trails for the shade that they provide. Trees should be planted a minimum of 6-10 feet from trail edges to maintain the necessary three-foot clear zone when they reach maturity. Likewise, shrubs should be located such that their branches do not interfere with the trail as they mature.

NOXIOUS WEED CONTROL METHODS

The Alameda Drain right-of-way consists of 10 to 60 feet of land on either side of the channel. MRGCD maintenance activities are focused on maintaining the Drain’s functions and at present only pay limited attention to the eradication of noxious weeds or the preservation of plants along the Drain. The right-of-way therefore consists of largely bare soil, heavily affected by erosion, off road driving, and invaded by weeds. This, in turn, has increased the needs for maintenance and decreased the visual quality of the Drain. The master plan aims to reduce MRGCD maintenance needs, reduce erosion, improve water quality, stabilize the Drain’s banks, and eradicate weeds and invasive species. Goatheads (Puncture Vine, Tribulus Terrestris) in particular are classified as noxious weeds, and considered a nuisance, injuring pets and people, and puncturing bike tires. The control and reduction of goatheads is therefore critical to improve the user’s experience of the trail.

There are a number of methods to reduce erosion, eradicate weeds, stabilize drain shoulders, and improve water quality issues.

Stabilizing banks can reduce erosion, which in turn reduces sedimentation, improves water quality, and reduces the need for maintenance. Many of the mitigation methods go hand in hand.

Bank stabilization is best achieved by native forbs, shrubs, and grasses. The roots of established plant communities stabilize and support earth slopes that control soil erosion. Many of the plant species currently established within the Drain’s right-of-way are invasive or noxious weed species which are outcompeting the few desired, native plant communities which exist. The growth of undesired species also makes it necessary to employ weed management practices which further prevent desired species to take root. One of the first steps is to engage in both weed management and the establishment of desired plant communities. If successful, such a strategy can eliminate many of the Drains challenges including erosion, sedimentation, some water quality issues, and weed populations while preserving native plant communities and greatly improving the visual quality of the Drain.

[“Table 11. Weed Control Methods” on page 108](#), outlines established weed management methods and illustrates their benefits and constraints.

PREFERRED WEED CONTROL METHOD

The Alameda Drain & Trail master plan recommends a hybrid of the methods discussed in [“Table 11. Weed Control Methods” on page 108](#), to control weeds along the Drain corridor. Specifically, a short period of the mechanical method followed by the cultural control method is recommended in addition to limited use of the chemical control method. This recommendation is based on the potential ability of the mechanical method to remove and reduce the weed seed bank in the soil and to culturally control weed growth with desired plant species. The chemical control method can supplement these efforts. Furthermore, the master plan recommends a seeding regime to be employed by MRGCD at instances in which the Drain bank or maintenance road are disturbed due to maintenance activities.

MECHANICAL CONTROL METHOD

Mechanical control may be the more labor intensive method but has the best success rate for long-term control of weed species. Engaging the local community can help to alleviate the labor intensiveness of this method while simultaneously generating a sense of community ownership of the trail. A cooperative maintenance program is therefore recommended that consists of both a training and cooperative weeding component.

A training program with a master gardener should be developed to train both maintenance staff and local community groups to recognize the benefits of native species and the need for weed control. Training such as this offers an opportunity to engender a respect for native vegetation and generate an understanding of the usefulness of every plant- even weeds!

This training program should be coupled with a cooperative weeding effort in which maintenance staff and the local community walk the length of trail four times a year to conduct a cooperative, trail wide weeding effort. The effort should include both the removal and collection of noxious weeds. Stirrup hoes or shovels should be utilized to lopp off full grown weeds at the root crown, 1” above the ground, so that the root mass still stabilizes the soil, but the seeds are removed from the site. Cooperative programs such as this would help to alleviate the maintenance responsibility of staff, build community, and generate a sense of trail ownership among trail users and the local community.

CULTURAL CONTROL METHOD APPLICATION

Establishing native plant communities to outcompete undesired species is challenging with the limited precipitation and extreme temperatures of the New Mexican climate. A study found that the optimum condition for the germination of Blue Grama, a native grass, occurs in New Mexico only every 30 to 50 years (Lauenroth et al., 1994). This shows how challenging

New Mexico's climate conditions can be. Measures that increase water availability for desired species can greatly benefit plant growth and increase overall survivability rates. Along the proposed trail runoff should be captured from the trails impervious surface and funneled to aid plant growth.

The following is a guide to implementing the Cultural Control Method.

1. Design and grade the site to harvest the optimum amount of water in seeded areas.

The trail stormwater runoff should be captured from the impervious trail surface and funneled into planting beds to aid plant germination. Such measures increase water availability for desired species in order to benefit plant growth and increase overall germination rates.

2. Generate and maintain a seeding schedule.

- Warm season grasses germinate when soil temperatures rise to over 60 degrees for long periods of time.
- If seeding operations occur during colder months the seed mix should include cool and warm season grasses, and a cover crop
- Seeded areas have a better chance of germination if beds are watered periodically during the warm season months. It is recommended that the landscape maintenance period be extended to provide for watering from a watering truck.

3. Select a regionally appropriate seed mix. Seed mixes should be selected to match the unique qualities of the specific roadside segment being seeded and tailored to conditions encountered in the drain including available water. Unique qualities include: soil type, soil slope or aspect, and proximity to perennial and/or ephemeral water sources. Appropriate seed mixes are available from many local and state seed brokers.

4. Utilize native topsoil. Despite perceptions, native topsoil is adequate for the growth of native plants as it is consistent with the typical growing conditions for native plant material.

5. Mulch native topsoil. Mulch greatly aids in preserving the limited soil moisture of semi-arid New Mexico and

TABLE 11. Weed Control Methods

Weed Control Methods	Mechanical Method	Cultural Control	Biological Control	Chemical Control
Description.	<i>The mechanical method employs laborers to mechanically remove weeds. Often used in only small areas, as this method is very labor intensive.</i>	<i>The so-called cultural control (Integrated Noxious weed management, NMDOT 2002) method employs desired species to outcompete undesired ones. Cultural control methods utilize weed free seeds and mulches, such as native grasses and wildflowers, to reseed infested areas. Once the wildflower and/or grasses are established they slowly outcompete the unwanted species.</i>	<i>The biological controls method employs the use of organisms such as goats, sheep, cattle, insects and fungi to disrupt the growth of undesirable plants. This method, however, is costly and involves repetitive actions.</i>	<i>Chemical control methods use herbicides or plant regulators to disrupt the growth of undesirable plants. This method can be harmful to desired plants as well. Some of the concerns with chemical control methods are listed below</i>
Benefit	<ul style="list-style-type: none"> • Not intrusive to other plant species • Non-toxic • No need for herbicides and/or fertilizers 	<ul style="list-style-type: none"> • Reduced need for herbicides and/or fertilizers • Native plants are self-sustaining, less maintenance required • Dense roots force out competing plants • Soil stabilization through the use of native grasses prevents erosion and slope failure. • Beautification and enhanced wildlife habitat. • Reduction in mowing and spraying needs. • Reduced environmental impacts from maintenance operations • Improved water and air quality 	<ul style="list-style-type: none"> • Short-term impact is high • Add fertilizer to soil • Grassland benefit from grazing action • Returns livestock/ agriculture to the Drain corridor. 	<ul style="list-style-type: none"> • Immediate eradication of nuisance species • Labor less costly
Constraint	<ul style="list-style-type: none"> • Very costly and labor intensive 	<ul style="list-style-type: none"> • Long-term monitoring of results is advised • High capital cost 	<ul style="list-style-type: none"> • Can increase erosion • Can decrease water quality • Accidental introduction of pathogens • Frequent use of agent(s) is required 	<ul style="list-style-type: none"> • Individuals with serious chemical reactions • Effect on children who are more susceptible to chemicals than adults • Negative reactions by pets, fish and wildlife • Environmental concerns such as residue • Over spraying and over use • Toxicity of inert ingredients such as surfactants, that can be more dangerous than the listed and tested chemical • The cumulative synergistic effects of mixing chemicals

provides erosion protection until a vegetative cover can be established. A variety of materials such as gravel, straw or hydromulch can provide effective mulch. The length of time the mulch will need to stay in place prior to, and during supplemental watering or monsoon rains should be considered when choosing a mulch material.

6. Employ supplemental water applications during seeding. Summer rains are highly variable and cannot be solely relied on for adequate moisture. Adhering to a pre-planned watering schedule is critical to ensuring adequate germination and growth. Supplemental water applications

are therefore recommended be part of any construction contract. Such strategies ensure that the top few inches of soil remain moist during initial germination and seedling development. As seedlings progress the soil should progressively be watered more deeply and less frequently.

7. Ensure proper seeding techniques. Drill seeding is the most reliable method for seeding operations as the seed gets in contact with the soil medium and is therefore recommended.

8. Employ proper soil preparation. Proper soil preparation enhances the growth of seeded vegetation and aids in reducing soil erosion. Proper soil preparation should entail the scarification, tilling and grading of seed beds to aerate soils prior to seeding operations. Aspects such as soil compaction, surface roughness, native topsoil, compost and adverse soil amendments should be addressed in specifications for construction.

Generally, the mechanical and cultural method are preferred, however, should be supplemented by the chemical control method to achieve the greatest result.

4.9 Design Concepts - Water Quality Features

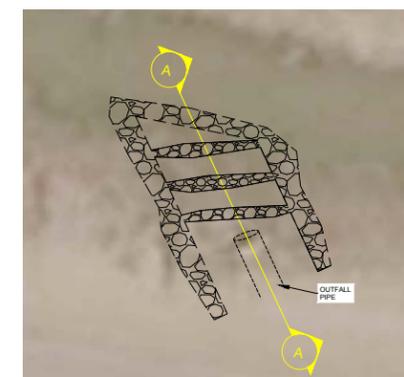
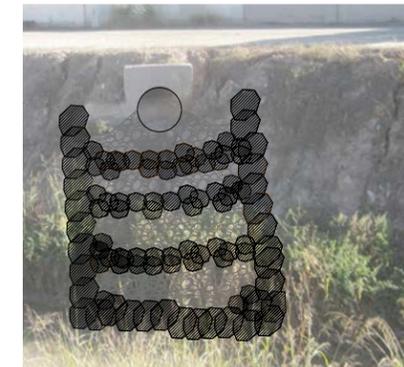
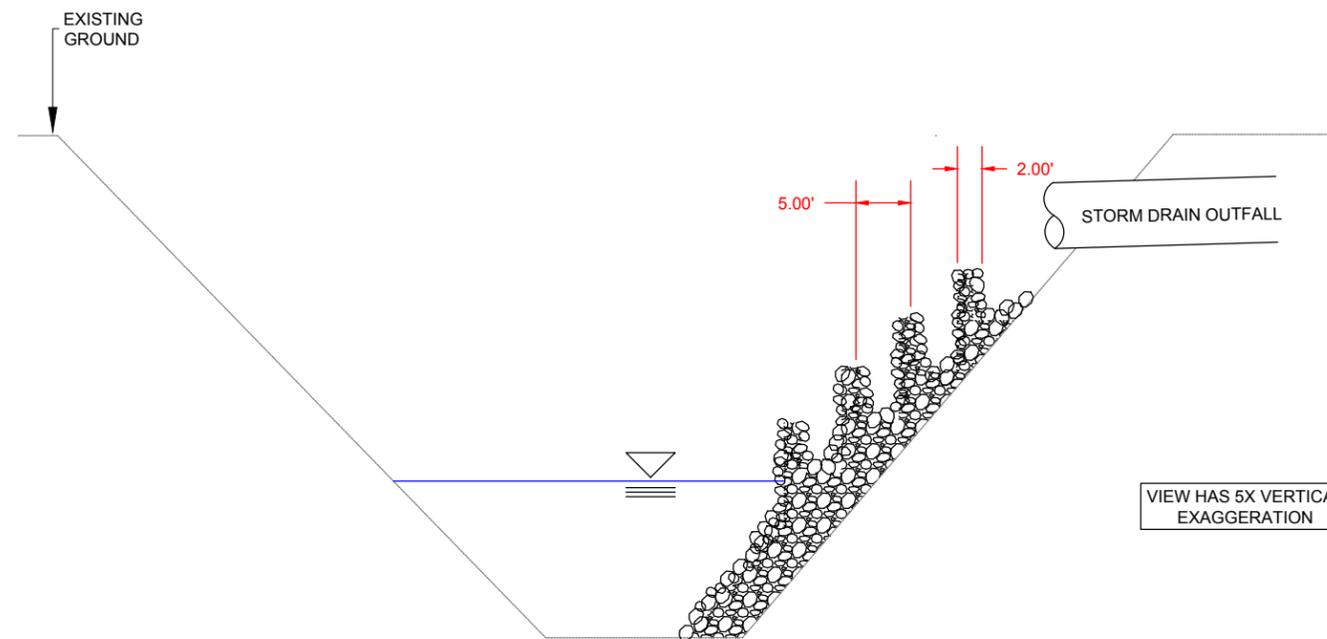
 As discussed in ["Water Quality" on page 14](#), it is a goal of the Alameda Drain & Trail Master Plan to improve water quality in MRGCD facilitates.

Water quality control measures include the management and capture of bulk solids, floating debris, and biological pollutants.

The following section discusses proposed measures to implement structural Best Management Practices (BMPs) to enhance water quality within the Alameda Drain.

Drainage outfalls must be evaluated, during the design process, to identify expected flow rates and determine the appropriate water quality BMPs for each location.

As previously mentioned, upstream network treatment methods are important to improving water quality in the Drain, but developing these methods is beyond the scope of this plan.



1. STEP DROP STRUCTURES

Description

The step drop structure consists of multiple vertical steps that are placed on the side slope of the drain sections. The structures themselves are made out of rock rip-rap and include three to four terraces, about two feet wide, placed two to three feet apart from each other horizontally.

Function

Terraced step drop structures promote aeration from cascading water that flows over rock structure. The cascading water aids in the degradation of bacterial population levels and oil/grease through natural UV treatment, the removal of metals through soil binding and an overall increase in dissolved oxygen content through aeration.

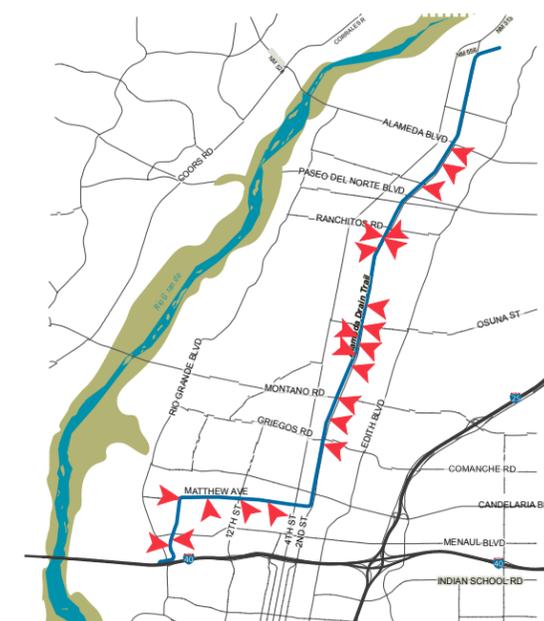
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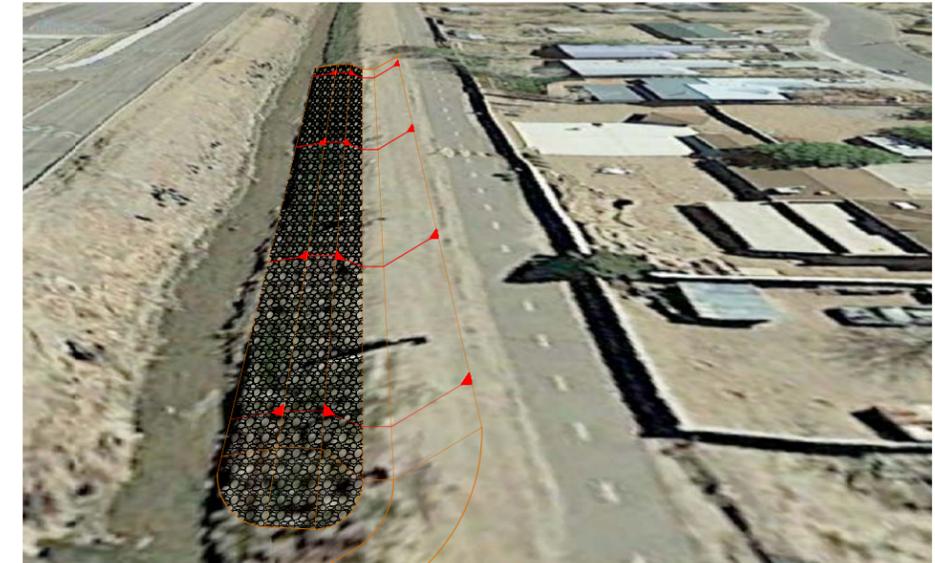
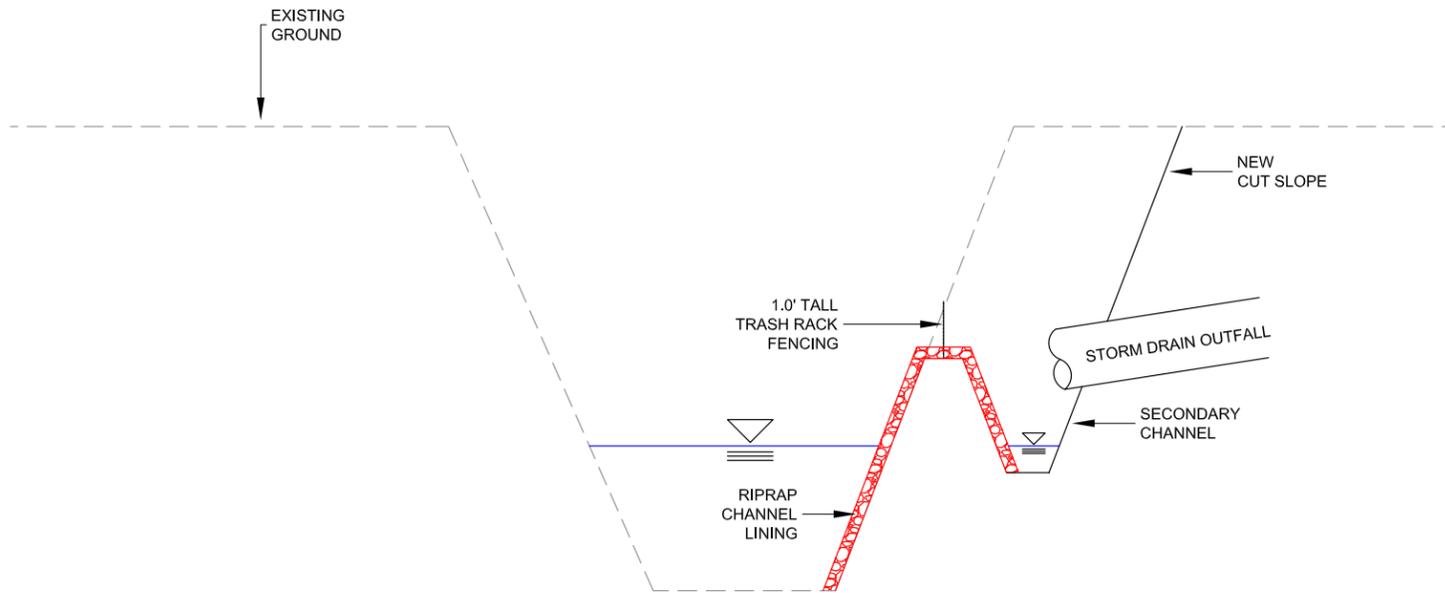
- Near storm drain outfall pipe sizes that are less than or equal to 24 inches in diameter and are at least three feet above the channel bottom

Design Elements

- Three to four rock rip-rap terraces, about two feet wide, placed two to three feet apart horizontally

Context Map





2. IN-DRAIN STORMWATER TREATMENT BIOSWALE

Description

The in-drain stormwater treatment bioswale structure consists of a secondary channel that is constructed parallel along 50 feet of one of the side slopes of the existing Drain. A rip rap lining is utilized on the new secondary channel slope opposite the storm drain outfall to prevent channel slope erosion. An additional riprap lining is also placed on the existing channel side slope to assist with erosion control of the channel.

Function

Bioswale structures create an area in which trash can settle as well as provide for reduction in aqueous and suspended contaminants before the water re-enters the main channel. The secondary channel slows the flow of water, allowing sediment and floating trash to settle out. Discharges also have sufficient contact with soil and plant life to aid in physical and biochemical treatment processes. Bacteria and oil/grease are degraded through natural processes and the overall dissolved oxygen content of the water are increased through aeration.

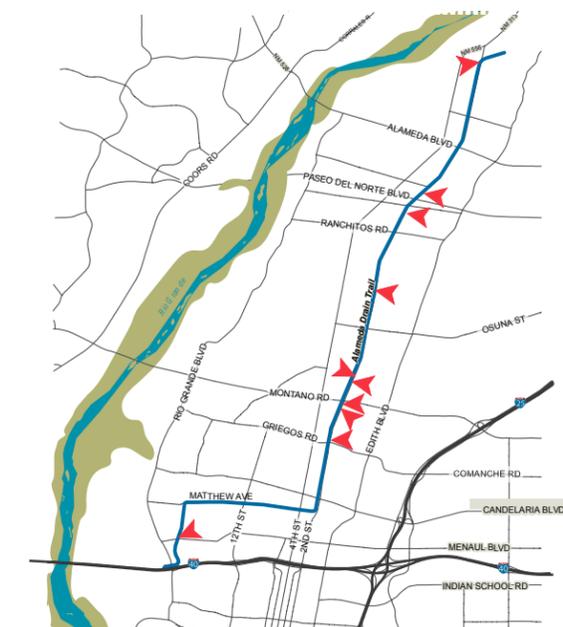
Placement Criteria

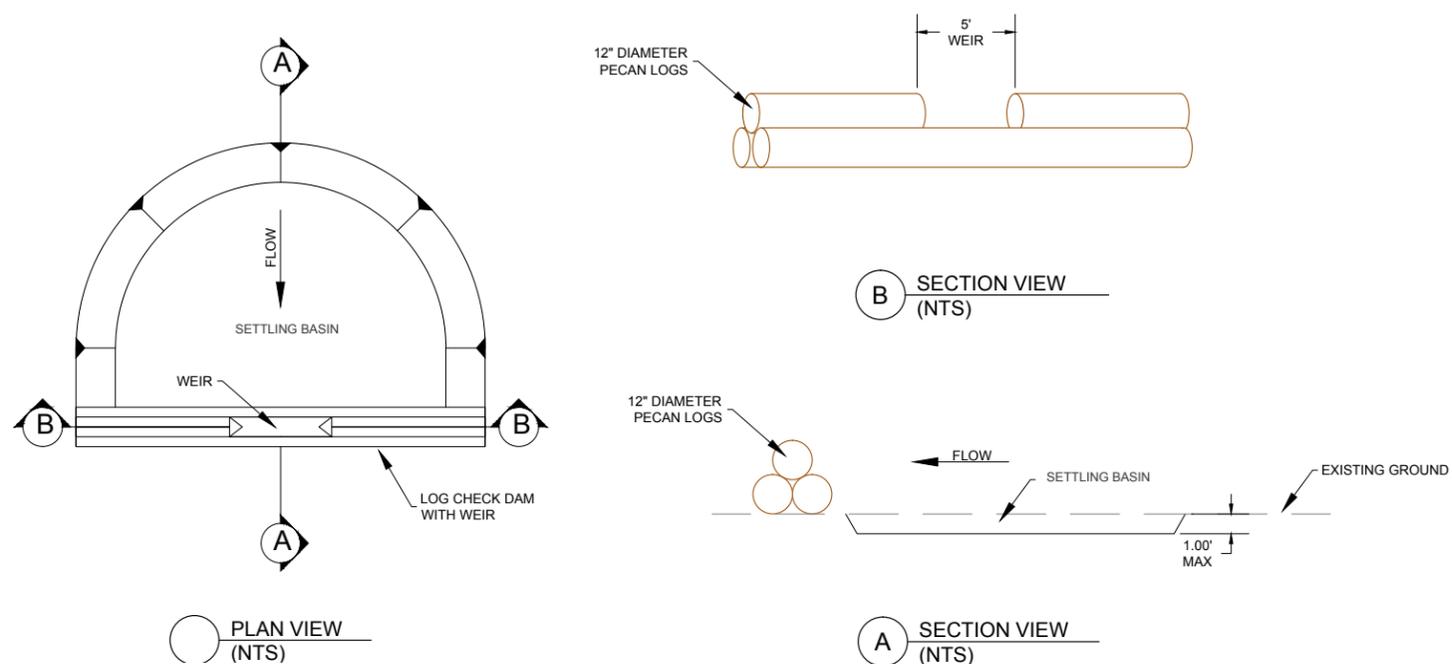
- Where the storm drain outfall are less than or equal to 18 inches and between 2 to 3 feet from the channel bottom

Design Elements

- 50 feet in length
- Run alongside the existing channel
- Lined with rip rap
- Seeded with appropriate revegetation seed; mix
- Include native plantings
- Identify available right-of-way

Context Map





3. LOG CHECK DAM

Description

The log check dam structure is a proposed BMP that would be placed within the Alameda Drain channel bottom. The structure consists of 2 full 12 inch diameter pecan logs and one partial 12 inch diameter pecan log laid perpendicular to the direction of flow in the channel bottom. The two base logs stretch the entire length of the channel bottom, however the top log has a notch cut into it to create a three foot long weir opening.

Function

The purpose of the check dam is to create a settling basin upstream of the structure and create a cascading water effect over the structure. This type of structure is not dependent on any type of storm drain outfall and will aid in the removal of sediment through settling upstream of the structure, as well as create an overall increase in dissolved oxygen content of the water through aeration.

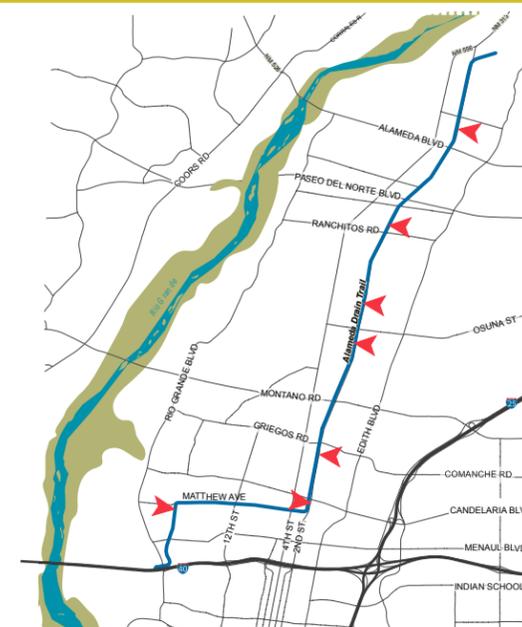
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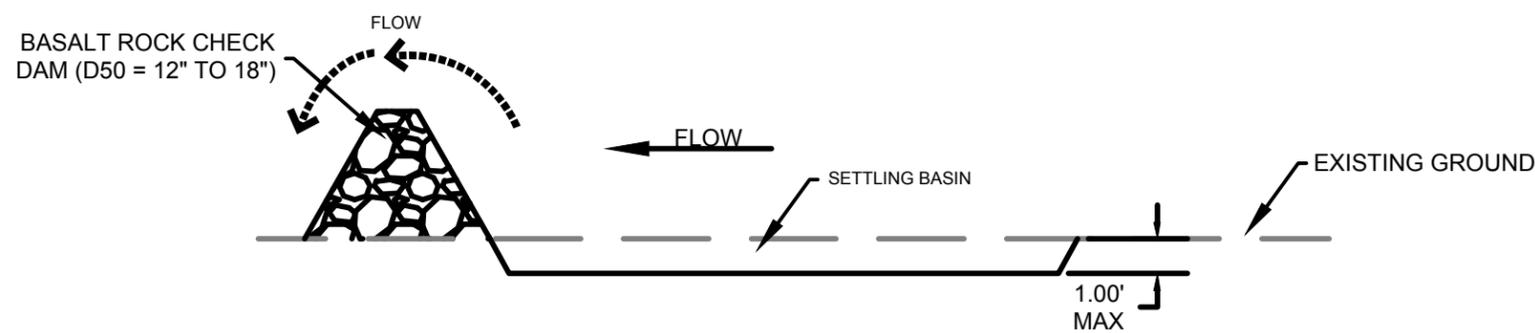
Within the Alameda Drain channel invert

Design Elements

- Two full-width 12 inch diameter pecan logs, and one notched 12' inch diameter pecan log
- Place logs perpendicular to the flow at channel invert
- Weir opening width of 3 feet in notched log
- Embed logs sufficiently in bank to prevent short circuiting of flow

Context Map





4. ROCK CHECK DAM

Description

Similar to the log check structure, rock check dam structures are constructed primarily of riprap and would be placed within the Alameda Drain channel invert. Rock Check Dams are more effective in ditches where the velocity of runoff is expected to be high, or in situations where the surface area exceeds 5 acres and drainage is funneled into a ditch or channel. These structures would consist of a basalt rock check dam composed of individual rocks with D50 sized 12 to 18 inch rock laid perpendicular to the direction of flow in the channel bottom. The check dams would extend across the entire width of the channel bottom.

Function

The purpose of the check dam is to create a settling basin upstream of the structure and create a cascading water effect over the structure. This type of structure is not dependent on any type of storm drain outfall and will aid in the removal of sediment through settling upstream of the structure, as well as create an overall increase in dissolved oxygen content of the water through aeration.

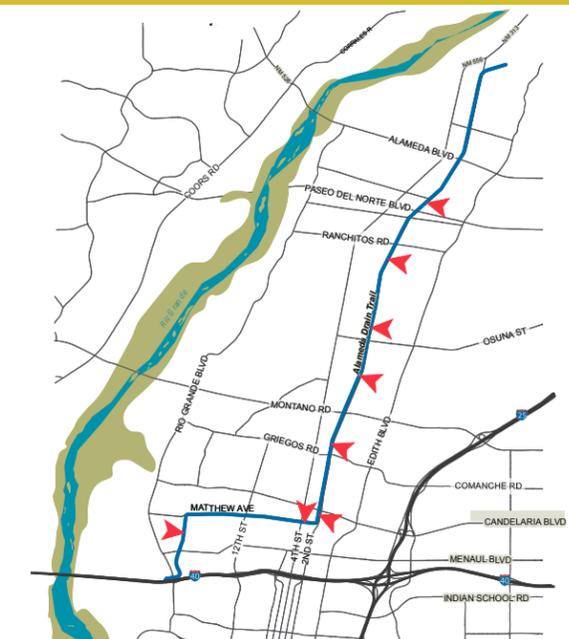
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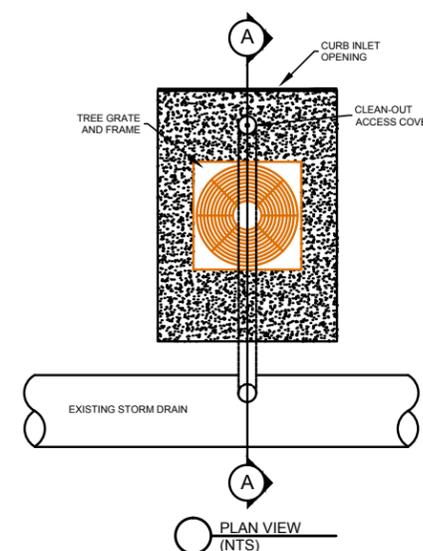
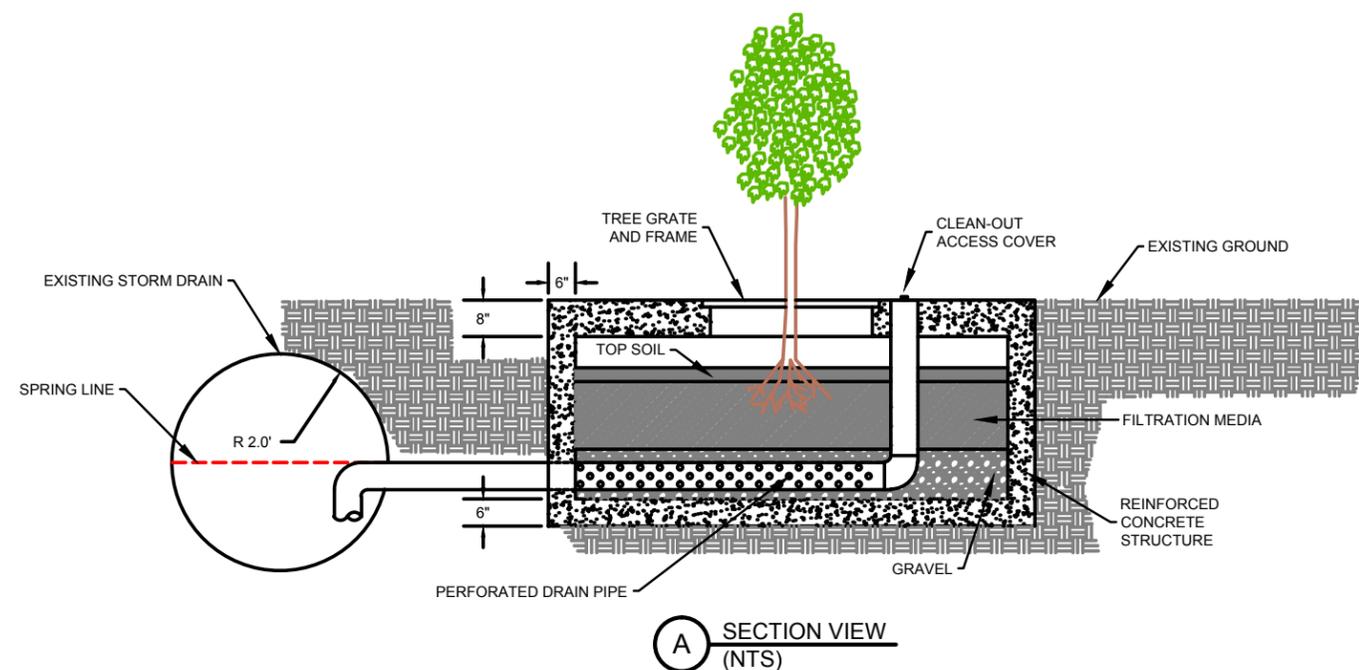
- Within the Alameda Drain channel invert

Design Elements

- Basalt rock check dam composed of individual rocks with a D50 sized 12 to 18 inch rock
- Rocks are laid perpendicular to the direction of flow in the channel bottom

Context Map





5. TREE BIO-WELLS

Description

Tree bio-wells are an engineered structure that tap into the existing storm drain to divert water into a concrete tree well structure. A four to six inch diameter lateral with a downturned elbow is tapped into an existing storm drain pipe 36 inches or greater in diameter. The downturned elbow helps to reduce the plugging of the lateral by preventing entry of floating debris. The pipe then extends into a reinforced concrete structure that is filled with a three part soil profile. The drain pipe is perforated once inside the reinforced concrete planter box structure and flows into the gravel section of the soil horizon. It then turns 90 degrees upward, extending to the surface for clean out access. Above the gravel soil horizon is a horizon of highly engineered soil or filtration media and above that is a horizon of top soil. The tree is planted into the soil and is

surrounded by a tree grate and frame at the surface. This type of BMP is specifically designed for storm drain inlets that are greater than or equal to 36 inches.

Function

Tree bio-wells aid in the reduction of sediment, bacteria, and metal content, as well as increasing the overall aesthetics of the area around the Alameda Drain.

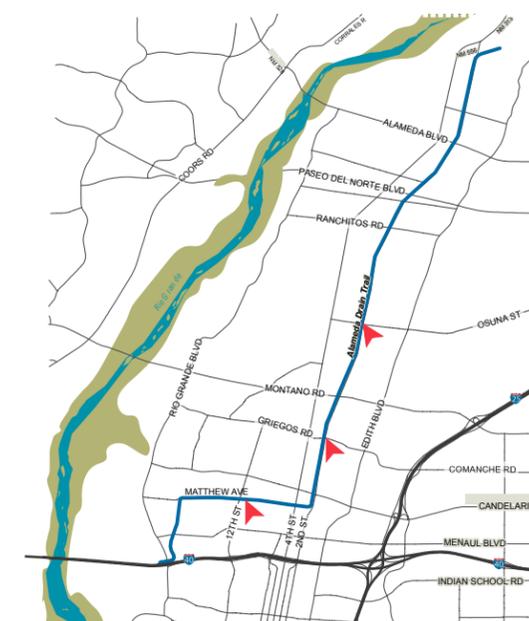
Placement Criteria

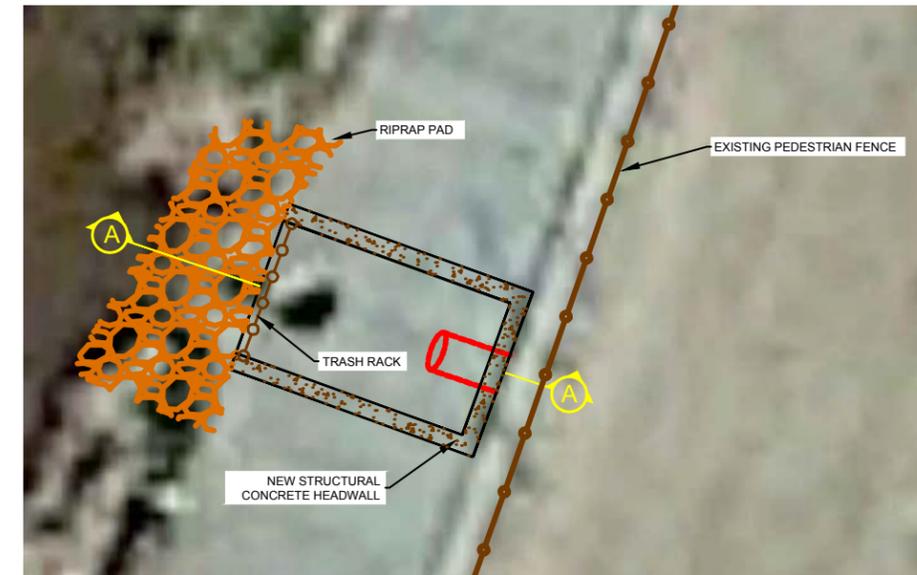
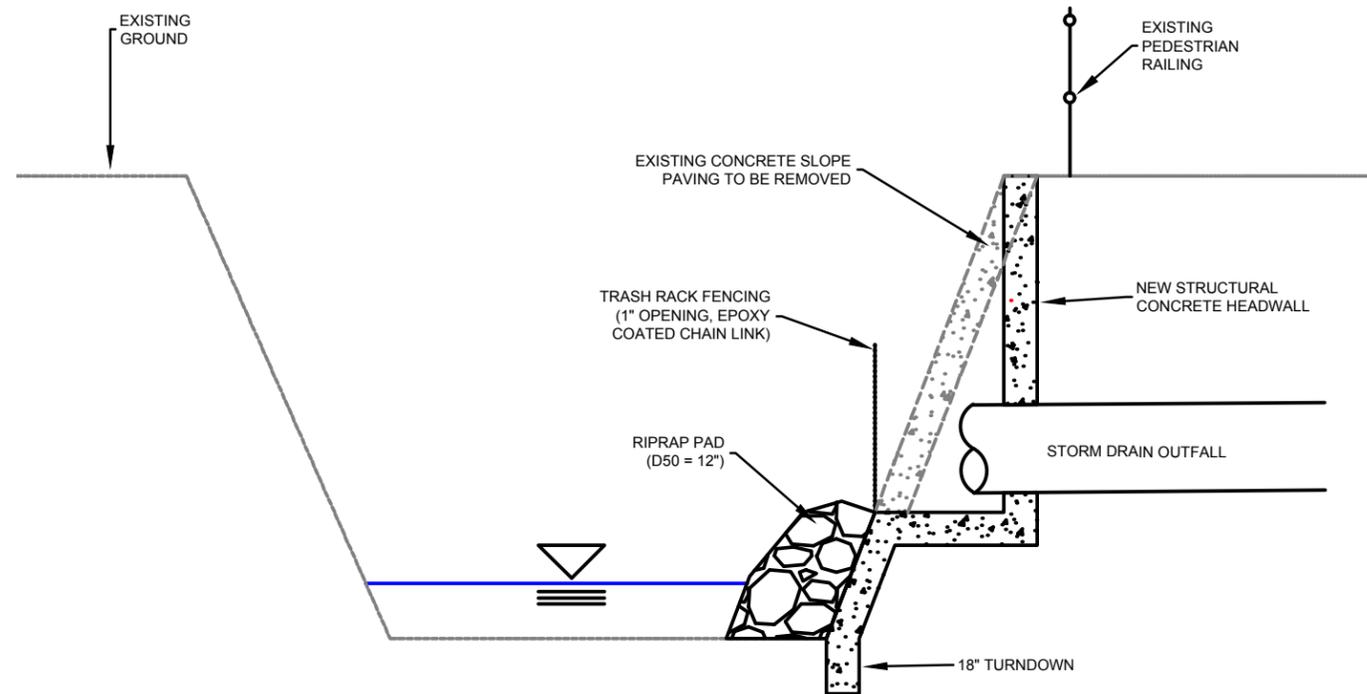
- Storm drain inlets that are greater than or equal to 36 inches
- Locate outside of maintenance roads and access

Design Elements

- A four to six inch diameter lateral with a downturned elbow is tapped into an existing storm drain pipe 36 inches or greater in diameter
- Tree is planted in a concrete tree well structure containing a three-part soil profile
- Consider constructing in series
- Concrete floor can be eliminated to promote deeper rooting within soil profile

Context Map





6. STRUCTURAL TRASH SCREEN

Description

Structural trash screens are structures placed on a watercourse to collect debris discharged from a culvert. Structural trash screens are placed in the section of channel in which there is existing concrete slope paving and for pipe outlets 24 inches and greater in diameter. The existing concrete slope paving is removed and the wall of the channel is opened up to expose the storm drain outfall. A new concrete structure and headwall is installed around the existing storm drain outfall to create a box structure, open on the channel side. A trash rack fence located at the terminus of the box opening ensures that storm drain discharge is filtered prior to discharge. Once filtered by the

trash fence, the flow enters the channel, discharging down a rip-rap pad consisting of D50 12 inch below the storm drain outfall.

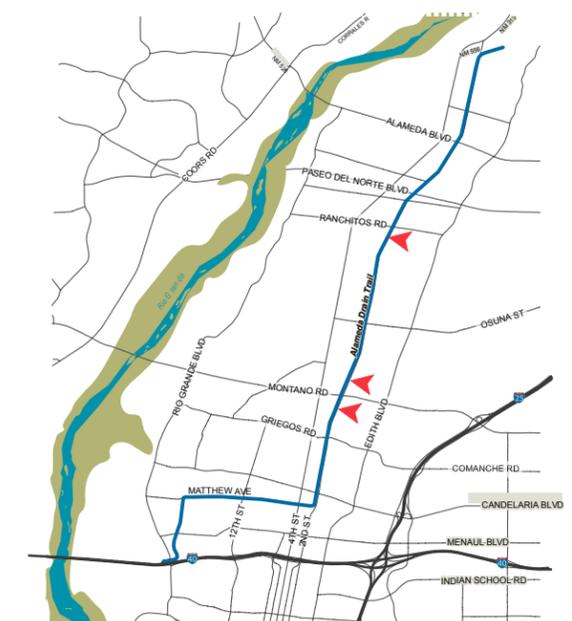
Function

Structural trash screens reduce the amount of floatable and neutrally buoyant debris entering the drain.

Placement Criteria

- Placed in the section of channel in which there is existing concrete slope paving and where pipe outlets are 24 inches and greater in diameter

Context Map



5. Programmatic Recommendations

5.1 Implementation Actions

As the Alameda Drain & Trail project moves through the planning phase and into design, the participating agencies will need to continue to work together to implement the proposed improvements. The following actions will need to be taken as project phases advance.

1. MRGCD License Agreements

The MRGCD has a licensing program for the issuance of permits, licenses and crossing agreements over the benefited lands of the District. Crossing of benefited District lands by utilities as well as for the use of the lands by others for various types of structures or facilities requires a License Agreement. Exception may be made only for certain types of land use which result in benefits to the District, for agencies having reciprocal arrangements with the District, or in special situations requiring special considerations.

To initiate the license process, applicants must submit to the District a letter of request along with construction plans for the proposed installation, together with the District's License Application Form and payment of the associated fees. Designs for major works must be prepared by or under the direct supervision of a registered New Mexico professional engineer. Completion of the processing and administration of the licensing may take a minimum of 30 days.

The District, and Bureau of Reclamation (Bureau) if required, will review the license application and construction plans and will grant written approval or disapproval of the proposed installation. An environmental evaluation of each license request for a right-of-way crossing or special use permit may be made by the Bureau to determine if the proposed installation has:

- Significant adverse effects on public health and safety,

- Controversial or uncertain environmental effects,
- Cumulative significant environmental effects,
- Properties listed on or eligible for the National Register of Historical Places,
- Listed or proposed to be listed endangered or threatened flora and fauna, and
- Potential violations of Federal, State, or local laws.

Following the evaluation and determination that the proposed action falls within the Bureau guidelines for a categorical exclusion to the National Environmental Policy Act (NEPA) process, the appropriate license will be issued. Should the action not qualify for a categorical exclusion, then it will be the responsibility of the applicant to supply, at their expense, the necessary environmental assessment.

2. Access Control

There are several locations along the Drain that are currently being used for parking and other unauthorized uses. South of Shannon Place parents of Mountain Mahogany Community School students use a gated entrance to the school on the west side of the Drain right-of-way for drop-off and pick-up. Semi trailers are routinely parked along the west side of 2nd Street, between the curb and Drain, approximately midway between Montañó Road and Osuna Road. Employees of businesses along the east side of 2nd Street at Vineyard Road park between the west curb and the Drain.

Elimination of unauthorized parking and uses is imperative to retain the rural nature of the Drain and to reduce the potential for conflicts with users of the proposed trail and Drain right-of-way. Implementing access control measures and eliminating unnecessary drive pads to the Drain, without restricting access for trail users and the MGRCD, will be needed as elements of the plan are implemented.

Additionally, a determination will need to be made regarding vehicular access to properties along the Drain. There are currently approximately 164 accesses to private property along the Drain. Of these 28 are primary access points that are licensed, 30 are primary access points that are not licensed, one is a secondary access point that is licensed, and 105 are secondary access points that are not licensed. Eliminating access to adjacent properties, especially in the case of secondary access points, will significantly reduce

the vehicular traffic that currently uses the Drain right-of-way and reduce the potential for conflicts with trail users.

3. Property Ownership

Review of the MRGCD's GIS data for the corridor suggests that the District has easement interest in the majority of the corridor from I-40 to Alameda Boulevard, and fee simple ownership from Alameda Boulevard north to the San-dia Pueblo Boundary. The MRGCD as 257 existing license agreements for installations such as public and private utilities, culverts for access drives, traffic signal equipment, turn lanes along 2nd Street, and other special uses.

As trail segments are developed determinations will be needed on whether underlying property ownership in easement areas will permit the use of the property for a trail and trail amenities. It is anticipated that, at a minimum, a license agreement between the lead agency planning a trail segment and the MRGCD will be required.

4. Design Reviews and Coordination

Planning and design of trail segments by Bernalillo County or the City of Albuquerque will require further coordination with MRGCD and AMAFCA. The MRGCD licensing process will need to be followed and includes design reviews by the District. AMAFCA will need to review plans to confirm that their facilities are accommodated with the proposed improvements. Coordination with public and private utility owners will be needed to identify and mitigate possible impacts to their facilities.

5. Compliance with the National Environmental Policy Act.

Compliance with the National Environmental Policy Act (NEPA) will also be required as trail segments are developed. This process may involve coordination with state and federal agencies such as the State Historic Preservation Office, the Army Corps of Engineers and the Bureau of Reclamation to obtain regulatory approval and environmental clearance. If state or federal transportation funds are being used for project development coordination with the NMDOT will also be required.

6. Other Considerations

As trail segments are developed the following items will need to be considered in the process.

6.A Future widening on 2nd Street. *Other planned improvements within the 2nd Street corridor will need to be considered during development of trail segments. Referring to the 2040 Metropolitan Transportation Plan (MTP) proposed Roadway Network Projects map, widening of 2nd Street from Alameda Boulevard to the 4th Street/NM 556 intersection is planned to add a center two-way left turn lane. And referring to the 2040 MTP Long Range Bikeway System Map, bicycle lanes are planned for 2nd Street from south of Matthew Avenue to the north end at the 4th Street/NM 556 intersection.*

6.B Monitoring trail traffic. *As trail segments are developed it can be expected that user volumes will increase with the completion of new segments, as trail connectivity improves. Monitoring trail traffic volumes at minor street intersections should be done periodically to confirm that previously installed traffic control measures that assign right-of-way to either the roadway or trail are appropriate for increases in trail traffic.*

5.2 Maintenance, Operations and Management

The maintenance and operation of both the Trail & Drain is an imperative component to the overall project. Due to the multi-jurisdictional nature of the corridor, these activities need to be carefully coordinated and facilitated to allow for successful operation and maintenance outcomes. The following are recommendations pertaining to maintenance and operation that provide a framework for future inter-agency cooperation, and action items that will help facilitate a successful Drain & Trail project.

1. Trail Management Responsibilities

In the interest of clearly delineating maintenance and operation responsibilities, it is recommended that the following actions be implemented going forward.

- 1.A OMRRR.** To coordinate responsibilities an Inter-agency Operations, Maintenance, Repair, Rehabilitation and Replacement (OMRRR) plan should be developed similar to the existing Isleta Drain plan. The OMRRR will establish jurisdictional responsibilities for facilities throughout the systems that discharge to the Drain.
- 1.B Trail Management Committee.** A Trail management committee should be created consisting of all agencies involved to implement individual sections of the Alameda Drain & Trail Master Plan.
- 1.C Regular Project Evaluations.** Agencies involved should meet on a regular base to evaluate management activities.

2. General Maintenance Recommendations

- 2.A Coordination of Maintenance.** Maintenance activities for Drain & Trail should be coordinated amongst agencies to ensure timely and proper management.
- 2.B Trail Closure during Maintenance.** Sections of the trail should be closed during maintenance activities. Closures should be communicated to the public at least two weeks prior to the closure. If convenient, alternative routes exist signing should be placed to detour trail users during the closure.
- 2.C Signage to Inform about Maintenance.** Signage should be installed at trailheads and major trail access points detailing operation and maintenance needs, ownership and purpose of the Drain and trail.
- 2.D Public Outreach.** Engage in public outreach to educate about purpose, maintenance and operations activities.

3. Trail Maintenance

- 3.A Damage to Trail.** Damaged trail, maintenance road and landscape should be repaired.
- 3.B Dredged Material.** Dredged material should not be deposited on trail surfaces.
- 3.C Access roads.** Access roads should be graded and reseeded after removing debris and dredge piles.

4. Landscape Maintenance

- 4.A Landscape Plan.** A landscape plan with seeding strategies and maintenance instructions should be developed. Maintenance personnel should be trained to be able to implement and maintain revegetation strategies.
- 4.B Landscape Maintenance.** Landscape should be irrigated and maintained as established by the landscape plan developed during the design phase.
- 4.C Undesired species.** Undesired vegetation growing on the Drains bank and edges should be controlled and should not surpass three feet high during the irrigation season to maintain visibility.

- 4.D Mowing.** Drain maintenance roads should be mowed, however, strategies to encourage and preserve native grasses and desired species should be explored and implemented.

5. Stormwater Management

Currently, the Alameda Drain collects and conveys stormwater from numerous storm sewer systems owned and operated by a collection of agencies including the City of Albuquerque, Bernalillo County, the Village of Los Ranchos de Albuquerque, AMAFCA and others. The following recommendations are made regarding stormwater management:

- 5.A** Develop a Hydrology and Hydraulics study with governments and agencies that have jurisdiction within the valley. The study objective is to identify flow rates and volumes that discharge into the drain to assess flood hazards and water quality impacts from stormwater. This study should include a hydraulic evaluation of all Drain crossings and strongly consider detention upstream of and within the Drain.
- 5.B** The OMRRR should outline primary and secondary treatment opportunities on existing conveyance systems.
- 5.C** Beyond BMPs discussed in [“3.7 Stormwater Best Management Practices” on page 67](#), it is important to consider improvements that could be installed on the numerous storm drain systems that discharge into the Drain (e.g. Osuna Road storm drain) from a “treatment train” standpoint. That is, there are opportunities to construct primary treatment and potentially secondary treatment systems within the storm drain conveyance network to treat flows prior to discharge into the drain. Primary treatment could include ported risers and baffle walls within the ponding and conveyance system to remove floating debris and trash. Storm water quality manholes are also a recommended option. Secondary treatment could be achieved through improving opportunities for water/soil contact by opening curb cuts and regrading medians to accept inflow to promote in-line treatment.

- 5.D** A formal licensing procedure should be developed to establish requirements and processes needed to address storm water discharges into the Drain. This would allow for planning and design approval to incorporate water quality improvements into existing conveyances and any new ones planned.

- 5.E** Provide for the development of a MRGCD procedure to review and license projects prior to the development of the OMRRR plan. The District will allow for projects to move forward if they do not discharge into the Drain.

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6. Project Costs and Priority Plan

6.1 Project Cost

Estimated project costs are summarized in [“Table 11. Project Cost”](#) and include segment-by-segment costs and the overall estimated cost of **\$14,845,000**. The estimated construction costs have been separated into those related to the trail including paving, pavement markings, and traffic signs and signals, storm drainage and water quality improvements, and the landscape, irrigation and aesthetic improvements within the corridor. A contingency has been added because of the conceptual level of the estimate, to account for construction items that are not quantifiable at this early stage of project development. Design development costs and construction management costs were added to the construction costs as percentages to arrive at the total estimated project costs. It should be noted that right-of-way costs are not included in the estimates.

6.2 Project Priorities

Prioritizing the implementation of the improvements will be driven by funding availability, jurisdictional priorities, connectivity to existing trail facilities, and to some extent private developments within the corridor. Bernalillo County currently has funding programmed for a portion of the proposed trail within their jurisdiction and is taking steps to initiate the design development phase. At this time the City of Albuquerque, has not identified specific project segments to move forward. MRGCD and AMAFCA have not identified specific improvements to their facilities within the project corridor at this time.

The project priorities are shown in [“Table 10. Project Priority”](#). The Montañó Road to Paseo del Norte segment is the first priority since this is the portion that has been programmed by the County. The second priority is the Mildred Avenue to Montañó Road segment. If this segment could be extended south, or a temporary trail provided, to the existing trail along the south side of the Drain south of Mildred Avenue, the result would be a continuous north-south trail connected to the existing east-west trail which would provide trail users with a more complete system for recreation and transportation.

The segment from Rio Grande Boulevard/I-40 to Mildred Avenue could be divided into two separate projects. If this were done, the section from Rio Grande Boulevard to Matthew Avenue is recommended as the next highest priority project. Completing this section would then provide a complete trail from Paseo del Norte to Rio Grande Boulevard and the I-40 trail system. The section along Matthew could then be completed next or delayed until after completion of the final segment from Paseo del Norte to Cynthia Loop (North Diversion Channel).

TABLE 12. Project Priority

Segment	Priority	Estimated Project Cost
I-40 to Mildred	3 *	\$3,891,000
Mildred to Montañó	2	\$2,545,000
Montañó to Paseo del Norte	1	\$4,710,000
Paseo del Norte to Cynthia Loop	4	\$3,698,000

* Could program I-40 to Matthew section separate from the section that parallels Matthew to 2nd Street.

TABLE 13. Project Cost

ITEM DESCRIPTION	UNIT	UNIT COST	SEGMENT							
			I-40 TO MILDRED		MILDRED TO MONTAÑO		MONTAÑO TO PASEO Del NORTE		PASEO Del NORTE TO CYNTHIA LOOP	
			SEGMENT LENGTH (MILES)							
			2.4		1.5		2.8		2.3	
	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST		
TRAIL PAVING, SIGNING & STRIPING										
BASIC PAVED TRAIL	LF	\$40	12,672	\$506,880	7,920	\$316,800	14,784	\$591,360	12,144	\$485,760
MAJOR INTERSECTION CROSSING (SIGNALIZED)	EA	\$25,000	0	\$-	2	\$50,000	5	\$125,000	1	\$25,000
MINOR INTERSECTION CROSSING (RAISED CROSSWALK)	EA	\$16,000	3	\$48,000	8	\$128,000	10	\$160,000	9	\$144,000
DRIVEWAY CROSSING	EA	\$3,000	0	\$-	0	\$-	13	\$39,000	13	\$39,000
MID-BLOCK CROSSING	EA	\$13,000	3	\$39,000	0	\$-	0	\$-	0	\$-
MID-BLOCK CROSSING WITH MEDIAN REFUGE	EA	\$20,000	1	\$20,000	0	\$-	0	\$-	3	\$60,000
PEDESTRIAN HYBRID BEACON (HAWK) CROSSING	EA	\$50,000	2	\$100,000	1	\$50,000	2	\$100,000	0	\$-
DRAIN CROSSING STRUCTURE (PEDESTRIAN BRIDGE)	EA	\$60,000	4	\$240,000	1	\$60,000	2	\$120,000	3	\$180,000
EXISTING DRAIN STRUCTURE EXTENSION	EA	\$5,000	0	\$-	1	\$5,000	2	\$10,000	0	\$-

TABLE 12. Project Cost (Cont.)

			SEGMENT							
			I-40 TO MILDRED		MILDRED TO MONTAÑO		MONTAÑO TO PASEO Del NORTE		PASEO Del NORTE TO CYNTHIA LOOP	
			SEGMENT LENGTH (MILES)							
			2.4		1.5		2.8		2.3	
ITEM DESCRIPTION	UNIT	UNIT COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
SUBTOTAL				\$953,880		\$609,800		\$1,145,360		\$933,760
STORM DRAINAGE & WATER QUALITY										
BIOSWALE, 50' LONG, RIP RAP LINED	EA	\$4,800	2	\$9,600	2	\$9,600	3	\$14,400	2	\$9,600
STEPPED DROP STRUCTURE AT PIPE OUTLET, RIP RAP LINED	EA	\$2,500	5	\$12,500	5	\$12,500	19	\$47,500	3	\$7,500
CHECK DAM, ROCK OR LOG, WITHIN DRAIN	EA	\$2,200	3	\$6,600	4	\$8,800	6	\$13,200	2	\$4,400
RIP RAP OR OTHER LINING AROUND EXISTING PIPE OUTLETS	EA	\$3,000	0	\$-	0	\$-	0	\$-	0	\$-
STRUCTURAL TRASH SCREEN	EA	\$5,200	0	\$-	0	\$-	1	\$5,200	0	\$-
BIO-TREE WELLS	EA	\$25,000	1	\$25,000	1	\$25,000	1	\$25,000	0	\$-
SUBTOTAL				\$53,700		\$55,900		\$105,300		\$21,500
LANDSCAPING, IRRIGATION & AESTHETICS										
LANDSCAPE SEEDING	SF	\$0.10	950,400	\$95,040	594,000	\$59,400	1,108,800	\$110,880	910,800	\$91,080
LANDSCAPING AND IRRIGATION (ASSUMES 10% OF TOTAL AREA)	SF	\$3.50	95,040	\$332,640	59,400	\$207,900	110,880	\$388,080	91,080	\$318,780
LANDSCAPED SWALE (ASSUMES 5' STRIP)	SF	\$1	63,360	\$63,360	39,600	\$39,600	73,920	\$73,920	60,720	\$60,720
SITE FURNISHINGS	MILE	\$25,000	2.4	\$60,000	1.5	\$37,500	2.8	\$70,000	2.3	\$57,500
CRUSHER FINE PATH (6 FT WIDE)	LF	\$10	12,672	\$126,720	7,920	\$79,200	14,784	\$147,840	12,144	\$121,440
TRAIL HEAD	EA	\$5,000	1	\$5,000	2	\$10,000	1	\$5,000	1	\$5,000
GABION OVERLOOK	EA	\$4,500	2	\$9,000	2	\$9,000	3	\$13,500	1	\$4,500
INFORMATIONAL SIGNAGE	MILE	\$8,000	2.4	\$19,200	1.5	\$12,000	2.8	\$22,400	2.3	\$18,400
LINEAR PARK/COMMUNITY GARDEN	EA	\$10,000	1	\$10,000	1	\$10,000	1	\$10,000	1	\$10,000
REST AREA (IN CONJUNCTION WITH BIOSWALE)	EA	\$5,000	2	\$10,000	2	\$10,000	3	\$15,000	2	\$10,000
PUBLIC ART	SEG	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000
SUBTOTAL				\$780,960		\$524,600		\$906,620		\$747,420
SUBTOTAL				\$1,728,540		\$1,130,300		\$2,092,280		\$1,642,680
MOBILIZATION, STAKING, TRAFFIC CONTROL	--	20%		\$345,708		\$226,060		\$418,456		\$328,536
CONTINGENCY	--	25%		\$518,562		\$339,090		\$627,684		\$492,804
CONSTRUCTION COST SUBTOTAL				\$2,682,810		\$1,785,450		\$3,235,420		\$2,554,020
DESIGN DEVELOPMENT	--	25%		\$648,203		\$423,863		\$784,605		\$616,005
CONSTRUCTION MANAGEMENT	--	15%		\$388,922		\$254,318		\$470,763		\$369,603
PROJECT COST SUBTOTAL				\$3,755,934		\$2,499,630		\$4,530,788		\$3,575,628
NMGRT (7.1875%)	--	7.1875%		\$260,902		\$170,605		\$315,804		\$247,942
TOTAL SEGMENT COST (ROUNDED)				\$4,026,000		\$2,680,000		\$4,856,000		\$3,833,000
TOTAL PROJECT COST										\$15,395,000

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7. Appendix A

Existing Planning Documents

DOCUMENT NAME	MAIN INTENT/STATEMENT	STATEMENTS CONCERNING TRAILS
Alameda Boulevard Design Overlay Zone, 1996	<i>to protect visual qualities and the unique and historic character of the corridor</i>	<ul style="list-style-type: none"> • Sidewalks should be developed as a continuous system. • New sidewalks should be set back a minimum of three to five feet from the curb. The setback should be landscaped. • All sidewalks will comply with ADA standards. • Provide bridle paths wherever possible. • Provide pedestrian-only trails connecting Alameda Boulevard and neighborhoods along the acequias, and multi-use trails along acequia rights-of-way no longer used.
Albuquerque/BernCo Comprehensive Plan	<ul style="list-style-type: none"> • <i>Elimination of travel barriers</i> • <i>Encourage pedestrian and bike activities</i> • <i>Offer opportunities for education, recreation, cultural activities, and conservation of natural resources by setting aside Major Public Open Space, parks, trail corridors, and open areas throughout the Comprehensive Plan area</i> 	<ul style="list-style-type: none"> • A multi-purpose network of open areas and trail corridors along arroyos and appropriate ditches shall be created. Trail corridors shall be acquired, regulated, or appropriately managed to protect natural features, views, drainage and other functions or to link other areas within the Open Space network. • The design of parks and other open areas shall incorporate the following criteria: <ul style="list-style-type: none"> ○ Multi-functional use of resources and compatible facilities. ○ Maintenance and landscaping appropriate to the location, function, public expectations and intensity of use. ○ Integration into residential design for easy accessibility and orientation to encourage use. ○ Lighting, site design, or other methods to minimize vandalism. ○ Connections between other Open Space network areas and public facilities. • Landscaping shall be encouraged within public and private rights-of-way to control water erosion and dust, and create a pleasing visual environment; native vegetation should be used where appropriate. • A metropolitan area-wide recreational and commuter bicycle and trail network which emphasizes connections among Activity Centers shall be constructed and promoted. • Variety and flexibility in educational and recreational resources shall be encouraged through joint use of facilities.
Bern. County Pedestrian/Cyclist Safety Action Plan	<ul style="list-style-type: none"> • <i>Ensure safety for all travelers along county roadways, especially children on routes to school and access for Provide choice in transportation to work, school, and shopping for all ages and abilities,</i> • <i>Promote healthy lifestyles and recreational opportunities for all ages</i> 	<ul style="list-style-type: none"> • Sidewalks should be a minimum of 5 ft. wide with a 5 ft. buffer. Bike lanes are to be a minimum of 6 ft. wide. Multi-use trails are to be a minimum of 10 ft. wide. • Flexibility is desired when retrofitting existing roadways by considering urban and rural environments, available rights-of-way, adjoining land use, roadway classification, traffic volume, speed, drainage, and other factors. • Improve intersections with continental crosswalk markings, adequate lighting, shorten crosswalk length with smaller turning radii, install countdown walk signals, and set signal



DOCUMENT NAME	MAIN INTENT/STATEMENT	STATEMENTS CONCERNING TRAILS
	<p><i>and abilities by encouraging residents to exercise daily</i></p> <ul style="list-style-type: none"> • Reduce energy use and improvement of air quality 	<p>timing to accommodate elderly and children. Midblock crossings at schools and other locations may require refuge islands and beacons or signals.</p> <ul style="list-style-type: none"> • County will continue to coordinate with Mid Region Council of Governments (MRCOG) for regional transportation planning and federal funding of County pedestrian and bicycle projects. • Coordination is also necessary with other agencies including Albuquerque Public Schools (APS), Middle Rio Grande Conservancy District (MRGCD), Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA), New Mexico Department of Transportation (NMDOT), utility providers, federal agencies, and local municipalities
Complete Street ordinance	<ul style="list-style-type: none"> • Improve Multimodal Level of Service (MLOS) on roadways in the County • Ordinance aims to achieve, amongst other, connectivity of sidewalks and paths throughout an area, the availability and safety of road crossings for pedestrians, the separation of non-motorized traffic from motorized traffic, way finding, sense of security, and more. 	<ul style="list-style-type: none"> • Design features shall be based on improving Multimodal Level of Service (MLOS) as described in the National Cooperative Highway Research Program's Report 616, Multimodal Level of Service Analysis for Urban Streets and generally defined as safe and efficient accommodation for all users, including pedestrians, bicyclists, the disabled, motorists and transit vehicles. • On-street bicycle facilities shall be as identified by the Mid-Region Council of Governments' Long Range Bikeway System Map and the Bernalillo County Pedestrian and Bicyclist Safety Action Plan. All projects on any applicable roadway shall include appropriate safety measures to facilitate the crossing of bicycle traffic wherever a designated bicycle facility crosses the street.
Facility Plan for Arroyos	<ul style="list-style-type: none"> • The Facility Plan for Arroyos establishes guidelines and procedures for implementing the goals of the ABQ/BernCo Comp. 	<ul style="list-style-type: none"> • Plan to create multi-use networks of trails and open space along arroyos.
Los Duranes Sector Plan (LDSDP)	<ul style="list-style-type: none"> • Provides policies and regulatory frameworks guiding future development in the Los Duranes neighborhood. It speaks to the unique features of this area including the semi-rural character and its acequias. The following lists what LDSDP discusses pertaining to the ADTMP 	<ul style="list-style-type: none"> • Retain rural, low-density character • Enhance character of area through interpretive signage for acequias • Promote safer and more pleasant experience for pedestrians and cyclists • Improve transit facilities and service for Los Duranes. • Improve roadway safety by reviewing and updating roadway signing and striping. • Preserve and maintain pedestrian/biking/equestrian opportunities and walkability in the neighborhood streets and acequias. • Preserve and maintain the connections to the riverside trail along the bosque. • Improve neighborhood identity through entry and interpretive signage and lighting. <ul style="list-style-type: none"> ○ Establishing a formal trail system may increase the use of the right-of-way associated with the Duranes Ditch.

DOCUMENT NAME	MAIN INTENT/STATEMENT	STATEMENTS CONCERNING TRAILS
		<ul style="list-style-type: none"> ○ Develop sidewalk and street design standards that improve pedestrian comfort and safety while maintaining neighborhood character.
Los Griegos Design Overlay Zone	<i>Los Griegos Sector Development Plan articulates community's vision and goals and provide strategies for future growth and development. It encourages historic scale and pattern of development that has occurred here historically, and consolidated open space and agricultural land.</i>	<ul style="list-style-type: none"> ● Study the feasibility of preserving rural character and land uses In the North Valley. If feasibility is proven, Initiate programs to preserve rural land and the Irrigation system as part of the North Valley Area Plan. ● Initiate a sidewalk needs assessment for the portions of Griegos Road and Fourth Street that are within the plan area. ● Initiate a program to install wheelchair ramps at all street Intersections and to install sidewalks on both sides of the street for the portions of Griegos Road and Fourth Street that are within the plan area. ● Where feasible install landscaping and benches in the public right-of-way for the entire length of the portions of Griegos Road and Fourth Street that are within the plan area.
Los Griegos Sector Development Plan	The Los Griegos Design Overlay Zone establishes requirements for fencing and setbacks along Griegos Road. The overlay zone does discuss pedestrian and bicycle amenities or discusses overall street layout and design.	<ul style="list-style-type: none"> ● Study the feasibility of preserving rural character and land uses In the North Valley. If feasibility is proven, Initiate programs to preserve rural land and the Irrigation system as part of the North Valley Area Plan. ● Initiate a sidewalk needs assessment for the portions of Griegos Road and Fourth Street that are within the plan area. ● Initiate a program to install wheelchair ramps at all street Intersections and to install sidewalks on both sides of the street for the portions of Griegos Road and Fourth Street that are within the plan area. ● Where feasible install landscaping and benches in the public right-of-way for the entire length of the portions of Griegos Road and Fourth Street that are within the plan area. ● Recommend to the Urban Transportation Policy Planning Board (UTPPB) that Griegos Road be designated as a bicycle route or lane based upon the Greater Albuquerque Bicycle Advisory Committee recommendations.
Major Public Open Space Facility Plan	<i>The Major Open Space Facility Plan establishes guidelines for the Albuquerque/BernCo Major Open Space (MPOS) network. It also addresses Arroyos. The below details what this plan proposes for Arroyo open space.</i>	<ul style="list-style-type: none"> ● The City's Major Open Space (MPOS) Network provides an opportunity for environmental protection and heritage conservation. ● Public comments indicate strong support for an expanded trail system, including trail linkages to and within Major Public Open Space. ● Trails should include wheelchair accessible trails at different challenge levels.



DOCUMENT NAME	MAIN INTENT/STATEMENT	STATEMENTS CONCERNING TRAILS
MRGCD Ditches-with-Trails Survey	<i>This survey was conducted for the Middle Rio Grande Conservancy District (MRGCD) to help understand how and why people currently use trails along MRGCD ditches, and to understand what improvements would be most, if at all, welcome.</i>	<ul style="list-style-type: none"> ○ Policy B.2.J. The Open Space trail system shall accommodate a variety of users on single and multi-purpose trails. ● Permissive uses: <ul style="list-style-type: none"> ○ Active management for benefit of wildlife and vegetation. Paved or unpaved. Picnic areas. Picnic tables. Drinking water. Restrooms. Trash receptacles. Max. 25 spaces parking lot. Paved access to parking. Bus stop shelters, bike shelters. Drainage structure necessary for resource protection, management of on-site or historic flow. ● Conditional use: <ul style="list-style-type: none"> ○ Interpretive Center <hr/> <ul style="list-style-type: none"> ● About 80% of residents of along MRGCD ditches participated in at least one activity (walking, running or jogging, bicycling or horseback riding). Walking was the most common and the most frequent activity. ● The most common reasons for participating in all four activities along the ditches/canals were for physical activity and pleasure. ● <i>Trail Surface:</i> About 80% of bicyclists preferred a paved or stabilized dirt surface and 80% of horseback riders preferred an unimproved or graded dirt surface. Most walkers and runners/joggers preferred graded or stabilized dirt. ● <i>Trail Length:</i> Bicyclists and horseback riders prefer about trail length of 5 miles or more. Most walkers and runners/joggers were content with 1-5 miles of trails. ● <i>Rating of Preferred Characteristics:</i> Keeping trails pristine and safe (safety on road crossings safety from crimes) and was rated highest. <ul style="list-style-type: none"> ○ Also rated as high where: <ul style="list-style-type: none"> ▪ Access ▪ Ability to take baby stroller ▪ Keeping pets on leash ▪ Privacy concerns of property owners along the trails
North 4th Street Rank III Corridor Plan	<i>Spur development and redevelopment along the corridor through TOC and design Overlay Zone</i>	<ul style="list-style-type: none"> ● Create a highly walkable, livable and distinctive place ● Create a roadway friendly to various forms of transportation and commerce
North Valley Area Plan		<ul style="list-style-type: none"> ● Undertake a study to analyze multiple-use of ditches and associated rights-of-way (Ditches to Trails). ● Trails and bikeways identified in the plan were incorporated into the subsequent Long Range Bikeway System (LRBS) and North Valley Area Plan.

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8. **Appendix B**

*Technical Memorandum,
Review of Environmental Conditions*

TECHNICAL MEMORANDUM

DATE: August 17, 2015
TO: Diane Sholtis, P.E., Project Engineer
 Bernalillo County Public Works Division
FROM: Jennifer von Rohr *Jennifer von Rohr*
SUBJECT: Alameda Drain Master Plan
 Review of Environmental Conditions
CC: Karen Aspelin,
 Teresa Hurt,
 Jerry Parker
PROJECT NUMBER: 564-5795-009/01
PROJECT NAME: Alameda Drain Trail Master Plan

Introduction

In order to identify environmental conditions with the potential to significantly impact the proposed Alameda Drain Trail project, Parametrix conducted a high level review of the project area depicted in **Figure 1**, (Attachment 1). This review consisted of the following components:

- A pedestrian/bicycle/windshield survey of the proposed project area;
- Desktop research for listings of threatened/endangered species and critical habitat within the project area;
- Desktop research for listings of cultural and historic resources within the project area;
- Desktop research for listed sites of environmental concern within the project area;
- Research of readily available information to document likely site conditions.

Recognizing the preliminary nature of the project, Parametrix has prepared this memorandum to highlight significant regulatory requirements and potential impediments that will likely apply to the Alameda Drain Trail project as currently proposed. This information is intended for planning purposes only, and additional investigation, review, and documentation will be necessary to fully understand project impacts and to comply with applicable regulatory requirements. Results of data and information searches referenced below are provided in **Attachment 2**. Information sources are summarized in **Attachment 3**.

Project Summary

The Alameda Drain Trail project encompasses an approximately 8.5-mile corridor, which extends from the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) North Diversion Channel to Interstate 40 (I-40) in the area west of Interstate 25 (I-25) in Albuquerque, Bernalillo County, New Mexico. The length of the proposed corridor is adjacent to existing roadways and developed areas. The project bisects a large variety of land uses. In general, the northern section from the AMAFCA North Diversion Channel to 2nd Street is rural/residential, the length of 2nd Street is predominantly commercial/industrial with nearby residential sections, and the Matthew Avenue and southern section to I-40 is mostly residential.

Field Observations

A combination pedestrian/bicycle survey was conducted of the project area by Parametrix on July 20, 2015. Short sections of the project corridor were later revisited by vehicle. The following observations were noted:

- The proposed trail follows the existing Alameda Drain, a soft drainage channel owned by the Middle Rio Grande Conservancy District. Throughout much of the corridor, the planned trail area involves an existing gravel access way along one or both sides of the drain. This access way is readily accessible to bicycles and pedestrians.
- The east-to-west oriented section of the project corridor (beginning west of 2nd Street and running parallel to Matthew Avenue), and the northernmost section (between the AMAFCA North Diversion Channel and 2nd Street) are currently isolated from vehicle traffic; the Matthew Avenue section is a dedicated, paved, multi-use trail, and the northernmost section is a dirt trail not intended for vehicle access.
- Urban infrastructure, including roadways, sewer utilities, light fixtures, storm drains, utility poles, electrical transformers, and other improvements, were observed throughout the project corridor and immediately surrounding area.
- Numerous signalized and non-signalized vehicle crossings intersect the planned project location.
- Although sidewalks are not present throughout much of the corridor, many of the roadway intersections along 2nd Street have been modified to include curb ramps.

Environmental Conditions

The project is located within the Rio Grande Floodplain and Albuquerque Basin Ecoregions of the Arizona/New Mexico Plateau. These regions are characterized by river channels, floodplains, plains and piedmont plains with alluvial fans and some scattered hills. Natural vegetation throughout these areas includes cottonwood and willow, New Mexico olive, sand scrub, and desert grasses. According to the US Department of Agriculture's Web Soil Survey website, dominant soils present throughout the project corridor include Gila loam, 0-1 percent slopes (MLRA 42-1); Gila clay loam (MLRA 42); Vinton sandy loam, 0 to 1 percent slopes; and Vinton clay loam (MLRA 42). These soil types are broadly characterized as deep, well- to excessively-drained soils, which are formed in alluvial deposits. Permeability is considered moderate for the Gila series and moderately rapid for the Vinton series.

A review of National Wetland Inventory maps for the project area indicates federally mapped wetlands including a freshwater emergent wetland and a riverine wetland, both associated with the AMAFCA North Diversion Channel, are located in close proximity (within approximately 500 feet) to the northernmost extent of the project corridor. No other federally mapped wetlands were identified within the immediate vicinity; at the closest point, the Rio Grande River is approximately one mile to the west of the project corridor. In order to verify the presence/absence of wetlands within the project corridor, a pedestrian survey for this purpose will be necessary during the early stages of the design phase.

Biological Resources

A review of federal and New Mexico listings of threatened, candidate, and endangered species for Bernalillo County, New Mexico, indicate that 16 bird species, two mammals, and one fish species are listed and have the potential to occur within the project area. Information was not encountered as to whether any listed species have been documented within the vicinity of the project. A biological investigation, including field survey, will be necessary in order to proceed with the design and construction of this project. In the event that this results in the identification of protected or sensitive species or habitat within the project area, agency consultation and mitigation of any project impacts will be necessary. In addition, in order to comply with the Migratory Bird Treaty Act, pre-construction nest surveys are recommended for the project corridor if construction occurs between April and September (nesting season).

Cultural and Historic Resources

A review of cultural and historic resource data from the New Mexico Cultural Resource Information System (NMCRIS) was conducted for the purpose of identifying previously documented cultural and historic resources with the potential to be impacted as a result of this project. This research indicates that the Alameda Drain alignment is a historic linear resource (Historic Cultural Property Inventory [HCPI] No. 3164) that is eligible for listing on the State and National Registers. Potential impacts to this historic property by the proposed trail would need to be assessed during the design phase. Three previously recorded irrigation ditches also connect with the Alameda Drain within, or adjacent to, the project area:

- The Derramadura Lateral (LA 125852) is located on the east side of the project area between Sandia Lane NW and Alameda Boulevard.
- An (unnamed) acequia system (LA 125071) is located on the east side of 2nd Street at Los Ranchos Road.
- The Griegos Lateral (LA 132368) is located adjacent to the Matthew Road section of the project corridor, in the area west of 2nd Street.

In addition, the proposed project is adjacent to or within the Los Alamos Addition Historic District (State Register Number 1893). This residential historic district extends from 2nd Street westward to 4th Street between the area north of Alamosa to the area south of Sandia.

Portions of the project area that have not been subjected to an intensive cultural resources survey within the last 10 years will require a pedestrian survey by qualified archaeologists and historians during early stages of design. In addition to an archaeological survey, standing structures and other built-environment resources within the project's area of potential effects (APE) will need to be documented and assessed for their eligibility status and potential project-related effects. Further evaluation will be necessary to update previously recorded resources and assess potential effects in accordance with applicable federal and state requirements.

Given that the proposed trail project is adjacent to and/or intersects potentially eligible and listed historic properties, it is recommended that the County consult with the New Mexico State Historic Preservation Officer early in the project planning process to determine the APE for the surveys and to discuss options for project design that could avoid adverse effects to eligible or listed cultural resources. Such consultation, incorporating design criteria that minimize the potential visual and vibratory effects of the project on important cultural resources, could aid in streamlining the environmental compliance process.

Nearby Listed Sites of Concern

Federal and New Mexico databases were consulted for listed sites of environmental concern in the vicinity of the project. These databases identify a variety of sites which are documented or suspected of environmental contamination. Listed sites may include known or suspected releases of contamination, locations of leaking underground storage tanks, land uses considered to pose a high risk of environmental contamination, or sites subjected to environmental cleanup or restoration. A review of these databases revealed two active, leaking petroleum cleanup sites located in close proximity to the project corridor. Both sites, Graves Oil Transfer YD and A&C Auto, are noted as located at 3400 2nd Street NW, approximately 350 feet east of the project corridor. This information alone is insufficient to conclude whether nearby listed sites pose a potential to impact the project. Further investigation will be necessary early in design to delineate whether nearby listed sites may impact the planned project improvements.

Regulatory Considerations

Based on our current understanding, this project will likely be subject to National Environmental Policy Act (NEPA) documentation as either a Categorical Exclusion (CE) or an Environmental Assessment (EA). The lead agency for

this project will be Bernalillo County. The process will require that the purpose and need for the project be articulated and alternatives to the proposed improvements be considered.

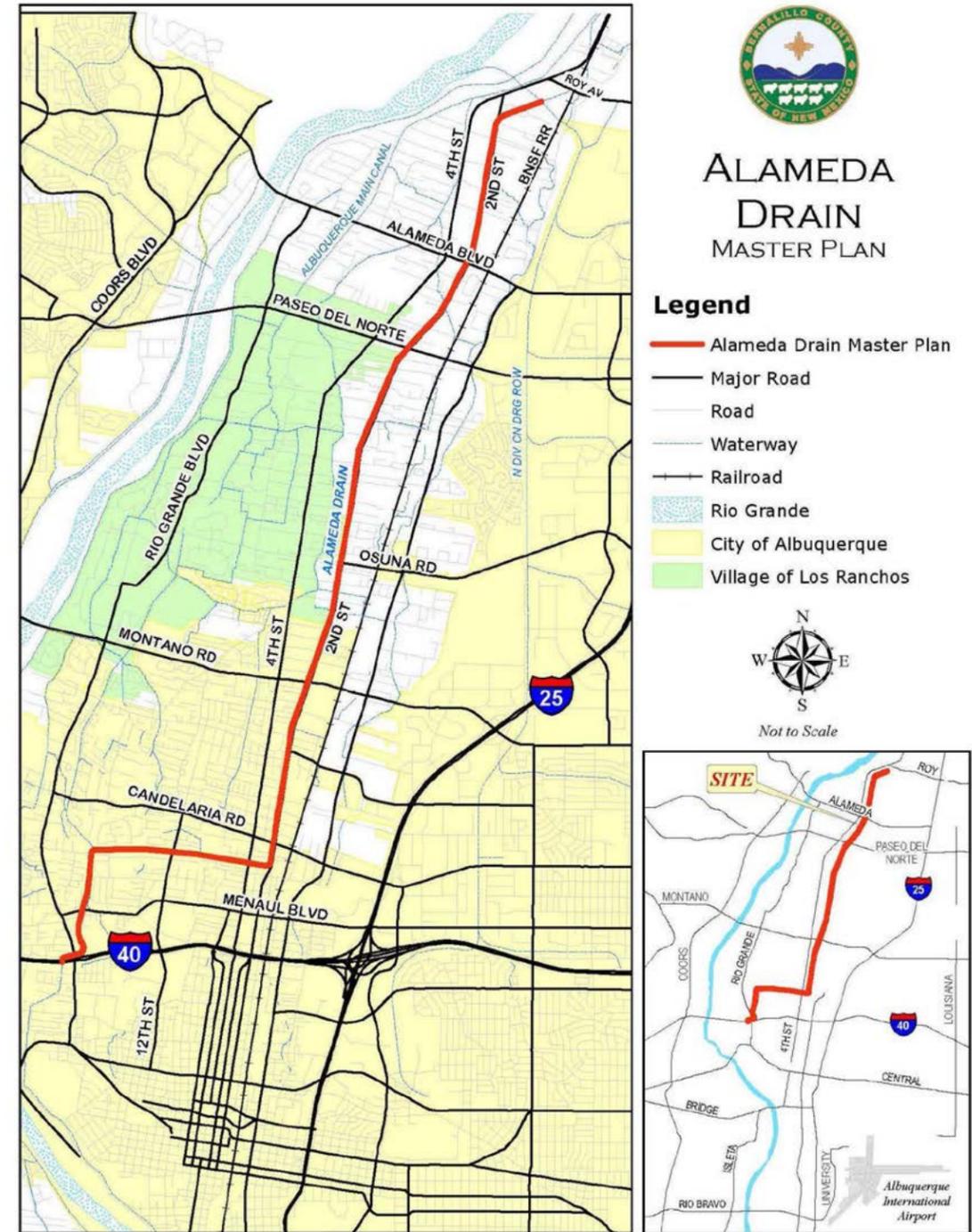
Depending on actual project impacts, other state and federal regulations such as the Endangered Species Act, National Historic Preservation Act, Clean Air Act, Clean Water Act, and Migratory Bird Treaty Act may trigger additional regulatory requirements. Further evaluation of regulatory requirements will be necessary as the project details are defined.

Attachments:

- 1 Figure 1
- 2 Database Information
- 3 Sources

Attachment 1

Figures



Site Survey Photographs
Alameda Drain Trail
August 17, 2015



Gravel access way along the west side of 2nd Street. The Alameda Drain is visible in the right side of the photo.

Site Survey Photographs
Alameda Drain Trail
August 17, 2015



Paved, multi-use trail along the Alameda Drain, west of 2nd Street heading west.



Looking north along the Alameda Drain adjacent to 2nd Street.



Signage located adjacent to Matthew Street near the western extent of the project corridor.

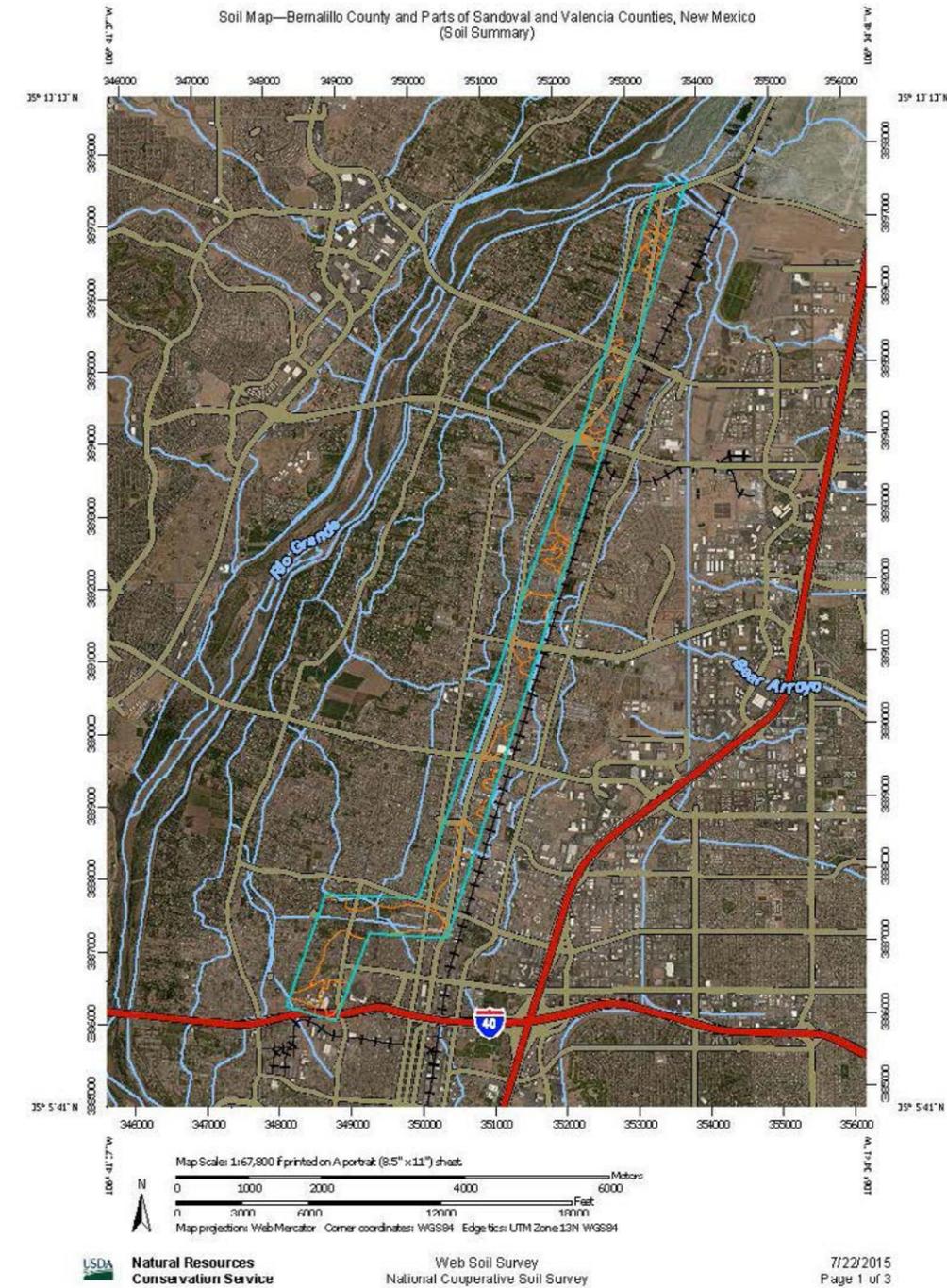
Site Survey Photographs
Alameda Drain Trail
August 17, 2015



Existing pathway in the area south of the Matthew Street section of the project corridor.



Alameda Drain and adjacent pathways in the northern portion of the project corridor between the AMAFCA North Diversion Channel and 2nd Street.



Soil map—Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
(Soil Summary)

MAP LEGEND

- | | | | |
|--|--|---|--|
| Area of Interest (AOI) | |  Spoil Area | |
|  Area of Interest (AOI) | |  Stony Spot | |
| Soils | |  Very Stony Spot | |
|  Soil Map Unit Polygons | |  Wet Spot | |
|  Soil Map Unit Lines | |  Other | |
|  Soil Map Unit Points | |  Special Line Features | |
| Special Point Features | | Water Features | |
|  Blowout | |  Streams and Canals | |
|  Borrow Pit | | Transportation | |
|  Clay Spot | |  Rails | |
|  Closed Depression | |  Interstate Highways | |
|  Gravel Pit | |  US Routes | |
|  Gravelly Spot | |  Major Roads | |
|  Landfill | |  Local Roads | |
|  Lava Flow | | Background | |
|  Marsh or swamp | |  Aerial Photography | |
|  Mine or Quarry | | | |
|  Miscellaneous Water | | | |
|  Perennial Water | | | |
|  Rock Outcrop | | | |
|  Saline Spot | | | |
|  Sandy Spot | | | |
|  Severely Eroded Spot | | | |
|  Sinkhole | | | |
|  Slide or Slip | | | |
|  Sodic Spot | | | |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 11, Sep 26, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 23, 2011—May 17, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico (NM600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Af	Agua loam MLRA 42	0.4	0.0%
An	Anapra silt loam MLRA 42	4.0	0.3%
Br	Brazito fine sandy loam MLRA 42	5.0	0.3%
Gb	Gila loam, 0 to 1 percent slopes mlra 42-1	580.6	37.0%
Gd	Gila loam, moderately alkali	15.0	1.0%
Ge	Gila clay loam MLRA 42	378.9	24.2%
Gk	Glendale loam MLRA 42	15.3	1.0%
Gm	Glendale clay loam, 0 to 1 percent slopes MLRA 42.1	118.8	7.6%
Va	Vinton loamy sand	74.9	4.8%
VbA	Vinton sandy loam, 0 to 1 percent slopes	209.0	13.3%
Vc	Vinton clay loam MLRA 42	167.1	10.6%
Totals for Area of Interest		1,568.8	100.0%

LOCATION GILA AZ+NM NV TX
Established Series
Rev. YHH/DLR
04/2009

GILA SERIES

The Gila series consists of very deep, well drained soils formed in stratified alluvium. Gila soils are on alluvial fans and flood plains and have slopes of 0 to 5 percent. The mean annual precipitation is about 7 inches and the mean annual air temperature is about 65 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents

TYPICAL PEDON: Gila loam - irrigated cropland. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 6 inches; grayish brown (10YR 5/2) loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular and few very fine irregular pores; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (6 to 8 inches thick)

C1--6 to 22 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; very few fine irregular accumulations of calcium carbonate; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (8 to 30 inches thick)

C2--22 to 27 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 5 inches thick)

C3--27 to 39 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few medium roots; common very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (10 to 20 inches thick)

C4--39 to 60 inches; stratified brown (10YR 5/3) silt loam and gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and slightly sticky; common very fine tubular and irregular pores; few very fine irregular accumulations of calcium carbonate; strongly effervescent; moderately alkaline (pH 8.0).

TYPE LOCATION: Graham County, Arizona; about 1 mile north of Safford; 2,600 feet east and 2,620 feet north of the southwest corner of Section 5, T.7 S., R. 26 E. Latitude of 32 degrees, 51 minutes, 10 seconds N., Longitude of 109 degrees, 42 minutes, 39 seconds W., NAD 83.

RANGE IN CHARACTERISTICS:

Soil Moisture: Intermittently moist in some part of the soil moisture control section during July-September and December-February. Driest during May and June. Typic aridic soil moisture regime.

Soil temperature: 59 to 72 degrees F.

Rock fragments: 0 to 15 percent

Organic Matter: Less than 1 percent that decreases irregularly with depth

Reaction: Neutral to very strongly alkaline

Stratification: Usually 1 to 6 inch thick strata of finer or coarser material

Salinity: Nonsaline to strongly saline

A horizon

Hue: 7.5YR, 10YR

Value: 4 to 7 dry, 3, 4 or 5 moist

Chroma: 2 to 6, dry or moist

C horizon

Hue: 7.5YR, 10YR

Value: 4 to 7 dry, 3 to 6 moist

Chroma: 2 to 6, dry or moist

Texture: loam, silt loam, very fine sandy loam

Calcium carbonate: slightly to violently effervescent as disseminated or as fine irregular accumulations

COMPETING SERIES: These are the [Anthony](#) (AZ), [Excelsior](#) (CA), [Grabe](#) (AZ), [Ireteba](#) (NV), [Junction](#) (UT), [Popson](#) (I)(CA), [Rucker](#) (AZ), [Tobler](#) (UT), and [Victorville](#) (CA) series. Anthony and Rucker soils are coarse sandy loam, sandy loam or fine sandy loam in the control section. Excelsior and Victorville soils are moist in some part of the soil moisture control section for less than 20 days cumulative between July and September. Grabe and Rucker soils contain more than 1 percent organic matter in the surface and are moist in the soil moisture control section for longer periods due to a higher rainfall component. Ireteba soils contain horizons of distinct calcium carbonate accumulations. Junction and Tobler soils have hue redder than 7.5YR. Popson soils are inactive.

GEOGRAPHIC SETTING: Gila soils are on alluvial fans and flood plains at elevations of 1,750 to 5,000 feet. These soils formed in stratified alluvium from mixed sources. Slopes range from 0 to 5 percent. The mean annual precipitation is 4 to 12 inches. The mean annual air temperature is 57 to 70 degrees F. The frost-free period is 180 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Arizo](#), [Brazito](#), [Glendale](#), [Guest](#) and the competing [Anthony](#) soils. Arizo soils are sandy-skeletal. Brazito soils are sandy. Glendale soils are fine-silty. Guest soils are fine textured.

DRAINAGE AND PERMEABILITY: Well drained; low to medium runoff; moderate permeability.

USE AND VEGETATION: Gila soils are used for livestock grazing and irrigated cropland. The vegetation is mesquite, catclaw, creosotebush, arrowweed, saltbush, cottonwood, willow, and tamarisk.

DISTRIBUTION AND EXTENT: Arizona, New Mexico, and Texas. This series is extensive. Total extent is about 220,000 acres. This soil occurs in LRR-D, MLRAs 40, 41, and 42.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Phoenix, Arizona

SERIES ESTABLISHED: Salt River Valley, Arizona; 1900.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from 0 to 6 inches (Ap horizon)

Entisol feature - The absence of diagnostic subsurface horizons

Classified according to Soil Taxonomy, Second Edition, 1999; Keys to Soil Taxonomy, Tenth Edition, 2006.

Revised for the correlation of AZ661, 1/2009, WWJ

National Cooperative Soil Survey
U.S.A.

LOCATION VINTON AZ+NM TX
 Established Series
 Rev. YHH/JEJ
 05/2009

VINTON SERIES

The Vinton series consists of deep, somewhat excessively drained soils that formed in mixed alluvium. Vinton soils are on flood plains and have slopes of 0 to 3 percent. The mean annual precipitation is about 10 inches and the mean annual air temperature is about 62 degrees F.

TAXONOMIC CLASS: Sandy, mixed, thermic Typic Torrifluvents

TYPICAL PEDON: Vinton loamy sand-cropland. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 12 inches; brown (10YR 5/3) loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; many fine irregular pores; 12 percent fine gravel; slightly effervescent; slightly alkaline (pH 7.5); clear smooth boundary. (6 to 16 inches thick)

C1--12 to 24 inches; yellowish brown (10YR 5/4) stratified loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine irregular pores; 10 percent fine gravel; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (10 to 20 inches thick)

C2--24 to 36 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many fine irregular and few very fine tubular pores; 10 to 15 percent fine gravel; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (10 to 20 inches thick)

C3--36 to 48 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many fine irregular pores; 10 to 15 percent fine gravel; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 18 inches thick)

C4--48 to 60 inches; yellowish brown (10YR 5/4) fine sand, dark yellowish brown (10YR 3/4) moist; single grained; loose, nonsticky and nonplastic; many fine irregular pores; few fine gravel; strongly effervescent; moderately alkaline (pH 8.0).

TYPE LOCATION: Pima County, Arizona; intersection of Continental Road and Highway 89 - in the San Ignacio De La Canoa Land Grant - 75 feet south of Continental Road, 500 feet east of U. S. Highway 89 - in the northwest corner of field; west of Continental, T. 18 S., R. 13 E.

RANGE IN CHARACTERISTICS:

Soil Moisture: Usually dry but may be intermittently moist in some part of the soil moisture control section during July-September and December- February. Driest during May and June. Typic aridic soil moisture regime.

Rock Fragments: Usually nongravelly, but may range to 20 percent in any one horizon

Organic Matter: Less than 1 percent that decreases irregularly with depth

Reaction: Neutral to moderately alkaline

Stratification: Usually .5 to 2 inches thick of finer or coarser material. Some strata may range to 5 inches thick

A horizon
 Hue: 7.5YR, 10YR
 Value: 4 through 7 dry, 3 through 5 moist
 Chroma: 2 through 4, dry or moist

C horizon
 Hue: 7.5YR, 10YR
 Value: 4 through 7 dry, 3 to 5 moist
 Chroma: 2 through 4, dry or moist
 Texture: loamy sand, loamy fine sand, fine sand; contains strata of finer or coarser material

COMPETING SERIES: These are the [Franconia](#) (AZ), [Manet](#) (CA), [Villa](#) (CA), and [Vineland](#) (T) (CA) series. Franconia, Manet, and Villa are in the [Mohave](#) Desert and Vineland is in the [San Joaquin Valley](#). All are moist in the soil moisture control section for less than 20 days cumulative between July and September.

GEOGRAPHIC SETTING: Vinton soils are on flood plains at elevations of 1,750 to 5,300 feet. These soils formed in stratified alluvium from mixed sources. Slopes range from 0 to 5 percent. The mean annual precipitation is 7 to 12 inches. The mean annual air temperature is 56 to 70 degrees F. The frost-free period is 165 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Anthony](#), [Brazito](#), and [Gila](#) soils. Anthony and Gila soils are coarse-loamy. Brazito soils are coarser than loamy fine sand in all parts.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained. Very low and low runoff. Moderately rapid permeability.

USE AND VEGETATION: Vinton soils are used for grazing and irrigated cropland. The present vegetation is mesquite, catclaw and annual grasses.

DISTRIBUTION AND EXTENT: Southern and west central Arizona, southern New Mexico, and west Texas. This soil occurs in LRR-D, MLRAs are 40, 41, and 42. This series is moderately extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Phoenix, Arizona

SERIES ESTABLISHED: Lower Rio Grande Watershed Conservation Survey, New Mexico, 1940.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from 0 to 12 inches (Ap horizon)

Entisol feature - The absence of diagnostic horizons

Fluvial feature - Irregular decrease in organic carbon in the zone from 12 to 60 inches (C1, C2, C3, C4 horizons)

Classified according to Soil Taxonomy, Second Edition, 1999; Keys to Soil Taxonomy, Tenth Edition, 2006.

Revised for the correlation of AZ661, 2/2009, WWJ

National Cooperative Soil Survey
U.S.A.





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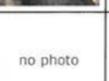
Report County Federal/State Species Status for
Bernalillo

40 species returned.

Taxonomic Group	# Species	Taxonomic Group	# Species
Fish	2	Mammals	14
Reptiles	1	Molluscs	1
Birds	22		

[Export to Excel](#)

Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo	Status
050025	Pale Townsend's Big-eared Bat	Pale Townsend's Big-eared Bat	Corynorhinus townsendii	Yes		Federal: FWS Species of Concern (no longer maintained) State NM: Sensitive taxa (informal)
050032	Arizona Myotis	Arizona Myotis	Myotis occultus	Yes	no photo	State NM: Sensitive taxa (informal)
050047	Fringed Myotis	Fringed Myotis	Myotis thysanodes	Yes	no photo	State NM: Sensitive taxa (informal)
050059	Long-legged Myotis	Long-legged Myotis	Myotis volans	Yes		State NM: Sensitive taxa (informal)
050093	Western Small-footed Myotis	Western Small-footed Myotis	Myotis ciliolabrum	Yes		State NM: Sensitive taxa (informal)
050095	Spotted Bat	Spotted Bat	Euderma maculatum	Yes		State NM: Threatened
050103	Yuma Myotis	Yuma Myotis	Myotis yumanensis	Yes		State NM: Sensitive taxa (informal)
050037	Big Free-tailed Bat	Big Free-tailed Bat	Nyctinomops macrotis	Yes	no photo	State NM: Sensitive taxa (informal)
050240	Red Fox	Red Fox	Vulpes vulpes			State NM: Sensitive taxa (informal)

						
050735	Common Hog-nosed Skunk	Common Hog-nosed Skunk	Conepatus leuconotus	Yes		State NM: Sensitive taxa (informal)
050747	Western Spotted Skunk	Western Spotted Skunk	Spilogale gracilis	Yes	no photo	State NM: Sensitive taxa (informal)
050670	Ringtail	Ringtail	Bassariscus astutus			State NM: Sensitive taxa (informal)
050205	Gunnison's prairie dog (prairie subspecies)	Gunnison's prairie dog (prairie subspecies)	Cynomys gunnisoni zuniensis	Yes		State NM: Sensitive taxa (informal)
050410	Meadow Jumping Mouse	Meadow Jumping Mouse	Zapus hudsonius luteus	Yes		Federal: Endangered State NM: Endangered
041400	Brown Pelican	Brown Pelican	Pelecanus occidentalis	Yes		State NM: Endangered
040040	Common Black Hawk	Common Black Hawk	Buteogallus anthracinus	Yes		Federal: FWS Species of Concern (no longer maintained) State NM: Threatened
040370	Bald Eagle	Bald Eagle	Haliaeetus leucocephalus	Yes		State NM: Threatened
040610	Northern Goshawk	Northern Goshawk	Accipiter gentilis		no photo	Federal: FWS Species of Concern (no longer maintained) State NM: Sensitive taxa (informal)
040380	Aplomado Falcon	Aplomado Falcon	Falco femoralis	Yes		Federal: Endangered State NM: Endangered
040384	Peregrine Falcon	Peregrine Falcon	Falco peregrinus	Yes		Federal: FWS Species of Concern (no longer maintained) State NM: Threatened
040385	Arctic Peregrine Falcon	Arctic Peregrine Falcon	Falco peregrinus tundrius	Yes	no photo	Federal: FWS Species of Concern (no longer maintained) State NM: Threatened
041500	Mountain Plover	Mountain Plover	Charadrius montanus	Yes		State NM: Sensitive taxa (informal)
042050	Black Tern	Black Tern	Chlidonias niger			Federal: FWS Species of Concern (no longer maintained)

<http://www.bison-m.org/reports.aspx?rtype=14>

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040195	Neotropic Cormorant	Neotropic Cormorant	Phalacrocorax brasilianus	Yes		State NM: Threatened
040250	Yellow-billed Cuckoo (western pop)	Yellow-billed Cuckoo (western pop)	Coccyzus americanus occidentalis			Federal: Threatened State NM: Sensitive taxa (informal)
041320	Burrowing Owl	Burrowing Owl	Athene cunicularia	Yes		Federal: FWS Species of Concern (no longer maintained)
041375	Mexican Spotted Owl	Mexican Spotted Owl	Strix occidentalis lucida	Yes		Federal: Critical Hab. Designated (NM) Federal: Threatened State NM: Sensitive taxa (informal)
041990	Black Swift	Black Swift	Cypseloides niger	Yes		State NM: Sensitive taxa (informal)
040905	Broad-billed Hummingbird	Broad-billed Hummingbird	Cynanthus latirostris	Yes		State NM: Threatened
040955	White-eared Hummingbird	White-eared Hummingbird	Hylocharis leucotis	Yes		State NM: Threatened
040521	Southwestern Willow Flycatcher	Southwestern Willow Flycatcher	Empidonax traillii extimus	Yes		Federal: Critical Hab. Designated (NM) Federal: Endangered State NM: Endangered
041750	Loggerhead Shrike	Loggerhead Shrike	Lanius ludovicianus			State NM: Sensitive taxa (informal)
042190	Bell's Vireo	Bell's Vireo	Vireo bellii			Federal: FWS Species of Concern (no longer maintained) State NM: Threatened
042200	Gray Vireo	Gray Vireo	Vireo vicinior	Yes		State NM: Threatened
041475	Sprague's Pipit	Sprague's Pipit	Anthus spragueii	Yes	no photo	Federal: Candidate
041785	Baird's Sparrow	Baird's Sparrow	Ammodramus bairdii	Yes		Federal: FWS Species of Concern (no longer maintained) State NM: Threatened
030056	Southwestern Fence Lizard	Southwestern Fence Lizard	Sceloporus cowlesi	Yes		State NM: Sensitive taxa (informal)
010140	Rio Grande Chub	Rio Grande Chub	Gila pandora	Yes		State NM: Sensitive taxa (informal)

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BISON-M

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010310	Rio Grande Silvery Minnow	Rio Grande Silvery Minnow	Hybognathus amarus	Yes		Federal: Critical Hab. Designated (NM) Federal: Endangered State NM: Endangered
060076	Socorro Mountainsnail	Socorro Mountainsnail	Oreohelix neomexicana		no photo	State NM: Sensitive taxa (informal)

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8/17/2015



PSTB Active Leaking Petroleum Sites

Ordered by: County/City
Generated on: Feb 17, 2015

Release Name	RID	FID	Address	City	County	Status	Project Manager
ATEX/T-GAS 1315	1170	26706	2440 ISLETA BLVD	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	ALLISON URBON
CEI ENTERPRISES	802	27280	6501 BROADWAY SE	ALBUQUERQUE	BERNALILLO	Pre Investigation, Confirmed Release	DAWN BASCOMB
SANL CCTF BLDG 9939 - 1	3191	27149	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
CONTRACT CARRIERS	411	27513	830 BROADWAY NE	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	BRUCE FURST
KIRTLAND ANG #112	1636	28929	BUILDING 1070	ALBUQUERQUE	BERNALILLO	Pre-Investigation, Suspected Release	DAWN BASCOMB
ATEX 218 (GASHOUSE)	317	31817	937 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	ALLISON URBON
ATEX/T-GAS #54	1990	1918	7324 FOURTH NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
WESTERN MOBILE	2009	2007	1302 MENAUL NE	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
RODGERS DRILLING	407	30287	2615 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
LEE AND BLAKELY FEED STORE	3380	29071	3031 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
OLD TOWN CHEVRON F#1558	4699	1558	1000 RIO GRANDE NW	ALBUQUERQUE	BERNALILLO	Pre-Investigation, Confirmed Release	DAWN BASCOMB
JIM'S AUTOMOTIVE/2	2624	28769	4411 LEAD AVE SE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
GAS CARD 1	3368	1279	3319 CARLISLE NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
CIGARETTE SHOP	2175	27383	2401 ISLETA SW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	ALLISON URBON
CONSERVANCY OIL CO INC	4405	27501	2220 2ND SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	MICHAEL LEGER
GRAVES OIL TRANSFER YD	2185	26314	3400 2ND NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
A&C AUTO	2131	26314	3400 2ND NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
ATEX/AL SUPS #149	1169	20490	1125 ALAMEDA NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
SCHWARTZMAN TRUST A	1160	30515	3301 2ND STREET SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
SANL/605	672	27095	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
SANL/888	673	27137	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
NICO DALE ST BULK PLANT	4440	52262	105 DALE ST SE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
ROBERTS OIL J	3235	1746	1001 COORS BLVD SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
LOVES BUDGET FUEL 21	3686	29166	2201 6TH ST NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
LOVES BUDGET	715	29166	2201 6TH ST NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
LOVES COUNTRY STORE 210	4554	29166	2201 6TH ST NW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
LOVES #210 TRUCKSTOP	4585	29166	2201 6TH ST NW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
ATEX 213	28	31815	3501 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
OLD HORN ISLETA	051	20600	430 ISLETA SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
TITO'S GARAGE	688	27641	829 BRIDGE ST	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	TERRY HERTEL
ATEX/T-GAS #156	2189	26712	3600 WYOMING NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	ALLISON URBON
TEX TERM KO TAN	1247	28327	3209 BROADWAY SE	ALBUQUERQUE	BERNALILLO	Referred to Ground Water Quality Bureau	BRUCE FURST
CHEVRON TERMINAL	1054	28453	3200 S BROADWAY	ALBUQUERQUE	BERNALILLO	Referred to Ground Water Quality Bureau	BRUCE FURST
K & M CONST	1615	28815	1914 MENAUL NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
SANL 6720-1	2268	27127	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB

NMED-PSTB

PSTB Active Leaking Petroleum Sites

Release Name	RID	FID	Address	City	County	Status	Project Manager
YALE AUTO SALES	678	1361	523 YALE SE	ALBUQUERQUE	BERNALILLO	Cleanup, State Lead with CAF	ALLISON URBON
VICKERS 2494	7	31488	2523 4TH NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
ANTHEM OIL 108	4568	1832	8814 CENTRAL NE	ALBUQUERQUE	BERNALILLO	Pre-Investigation, Confirmed Release	MICHAEL LEGER
STEWART SITE	1228	30784	7540 ISLETA SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	BRUCE FURST
PNM TRANSFER STATION	3219	1960	FIRST AND LOMAS	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
BARELAS BRIDGE	54	29854	800 BRIDGE SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	DAWN BASCOMB
PIT STOP	3379	29986	305 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	ALLISON URBON
KIRTLAND FOOD PLAZA	3688	28944	1620 CARLISLE SE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
THRIFTWAY(ABANDONED PLATEAU)	2531	26353	1720 CENTRAL AVE SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
SANL TA3 BLDG 6523	3227	27102	TECH AREA III	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
SANL 9970-1	2269	27150	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
BERN COUNTY YD	67	970	2400 BROADWAY SE	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
SANL/6597	1811	27117	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
KAFB - MANZANO SITE 58	914	28919	MANZANO AREA	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
GAS AND SAVE	4616	31053	2901 EUBANK BLVD NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
TRAVEL CENTERS OF AMERICA	3742	31184	2501 UNIVERSITY NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	TERRY HERTEL
TRUETT'S CONOCO	1271	31218	4100 PENNSYLVANIA	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
TEXACO I	978	30754	2401 SAN MATEO NE	ALBUQUERQUE	BERNALILLO	Pre-Investigation, Confirmed Release	DAWN BASCOMB
ROBERTS OIL-CENTRAL	2792	1741	4817 CENTRAL AVE NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
PUMP N SAVE	2236	1744	2204 MENAUL NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
EVERREADY ISLETA	78	1421	7630 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
MANZANO WESTERN	2535	29258	615 WYOMING SE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	BRUCE FURST
ATEX 212 (GASHO)	1059	31816	1312 BRIDGE SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	TERRY HERTEL
SANL 6587	369	27107	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
EAST MOUNTAIN CONST	2330	27830	3625 HIGH ST NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	DAWN BASCOMB
ATEX/T-GAS 380	677	1919	2990 GUN CLUB RD	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
THRIFTWAY ISLET	1244	1923	3339 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
CIRCLE K 479	614	28102	5801 BLUEWATER RD NW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
FORMER PAULS PLACE	3110	28121	7026 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	MICHAEL LEGER
POLLO MEXICANO (BOBS BURGER)	189	27184	3627 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
HYDRO-CONDUIT	1494	27234	2800 2ND ST SW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	DAWN BASCOMB
SANL/6587	2093	27108	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
SANL 6500	291	27099	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
SANL 6596-5	2266	27115	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	DAWN BASCOMB
SANL 6630-1	2267	27125	PO BOX 5800	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
COOK CONSTR CO	1911	27516	506 CARMONY LANE NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
BONDED PLUMBING/HEATING	2636	27006	721 FOURTEENTH ST SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
ALLSUP 152	2631	26498	2801 COORS SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
BUILDING 605	4452	30432	1515 EUBANK SE	ALBUQUERQUE	BERNALILLO	Investigation Federal Facility	DAWN BASCOMB
BASS SITE	79	26861	4257 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON

NMED-PSTB

PSTB Active Leaking Petroleum Sites

Release Name	RID	FID	Address	City	County	Status	Project Manager
FINA TRUCK STOP	1685	28027	1915 MENAUL BLVD NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
G&S COMMUNITY	53	28207	8100 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	ALLISON URBON
ITRI #2	1825	28876	AREA Y BLDG 9200	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
KARLER PACKING	193	28825	9111 BROADWAY SE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	DAWN BASCOMB
GAS MAN #447	2505	30372	6502 4TH ST NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
PLATEAU #119	12	30001	5585 FOURTH ST NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
PLATEAU 119A	3130	30001	5585 FOURTH ST NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	TERRY HERTEL
BREWER GASCARD #	2523	1280	1816 FOURTH NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	TERRY HERTEL
BREWER GASCARD	4	1280	1816 FOURTH NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	TERRY HERTEL
GAS CARD 2C	4527	1280	1816 FOURTH NW	ALBUQUERQUE	BERNALILLO	Pre-Investigation, Confirmed Release	TERRY HERTEL
LEE'S CONOCO	2618	27606	3900 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
LEE'S CONOCO #2	4517	27606	3900 ISLETA BLVD SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
FIRESTONE STORE #44W2	2845	28045	701 CENTRAL NW	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	MICHAEL LEGER
CARNUE/DEADMANS	34	27249	HWY 66 CARNUEL EXIT	ALBUQUERQUE	BERNALILLO	Referred to Ground Water Quality Bureau	ALLISON URBON
SNODGRASS WELL	30	27249	HWY 66 CARNUEL EXIT	ALBUQUERQUE	BERNALILLO	Referred to Ground Water Quality Bureau	ALLISON URBON
CLIMATE ROOFING	1028	27427	2700 ISLETA SW	ALBUQUERQUE	BERNALILLO	Cleanup, State Lead with CAF	ALLISON URBON
BREWER ABQ BULK PLANT	2092	835	3200 CANDELARIA NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	BRUCE FURST
ALLSUPS 197/ATEX 376	27	26501	1525 ARENAL SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	ALLISON URBON
SE PUBLIC SERVICE	18	28784	523 COMMERCIAL ST NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
KAFB LOVELACE	278	28882	E OF LOVELACE RD AND	ALBUQUERQUE	BERNALILLO	Cleanup, Federal Facility	DAWN BASCOMB
BUILDING 1033	3097	28884	BUILDING 1033	ALBUQUERQUE	BERNALILLO	Referred to Ground Water Quality Bureau	DAWN BASCOMB
RYDER TRUCK 2	3551	30366	2225 FIRST ST	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
RYDER TRUCK 3	3552	30366	2225 FIRST ST	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
RYDER TRUCK	6	30366	2225 FIRST ST	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	MICHAEL LEGER
SUPERVALU BELLA	459	30842	1239 BELLAMAH AVE NW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, Resp Party	DAWN BASCOMB
ROBERTS OIL E	3446	1737	5231 SAN MATEO NE	ALBUQUERQUE	BERNALILLO	Investigation, Responsible Party	TERRY HERTEL
CHEVRON ISLETA	314	30681	3401 ISLETA SW	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	TERRY HERTEL
QUALITY PONTIAC	3534	1696	1300 LOMAS BLVD NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	TERRY HERTEL
ANTHEM OIL #5 DBA TEXACO	4548	29845	9160 COORS NW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	BRUCE FURST
PLATEAU #124/2	2467	30002	2124 SAN MATEO NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	DAWN BASCOMB
EVERREADY LOMA	17	29101	400 LOMAS NE	ALBUQUERQUE	BERNALILLO	Cleanup, State Lead with CAF	MICHAEL LEGER
FINA OIL LOMAS	2322	29101	400 LOMAS NE	ALBUQUERQUE	BERNALILLO	Cleanup, State Lead with CAF	MICHAEL LEGER
FORMERLY PLATEAU 123	3723	47620	7524 MENAUL BLVD NE	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	ALLISON URBON
GASAMAT 552	3304	1283	915 BRIDGE SW	ALBUQUERQUE	BERNALILLO	Cleanup, Responsible Party	BRUCE FURST
SULLIVAN STABLE	400	26828	9521 RIO GRAND	ALBUQUERQUE	BERNALILLO	Aggr Cleanup Completed, St Lead, CAF	TERRY HERTEL

NMED-PSTB

PSTB Active Leaking Petroleum Sites

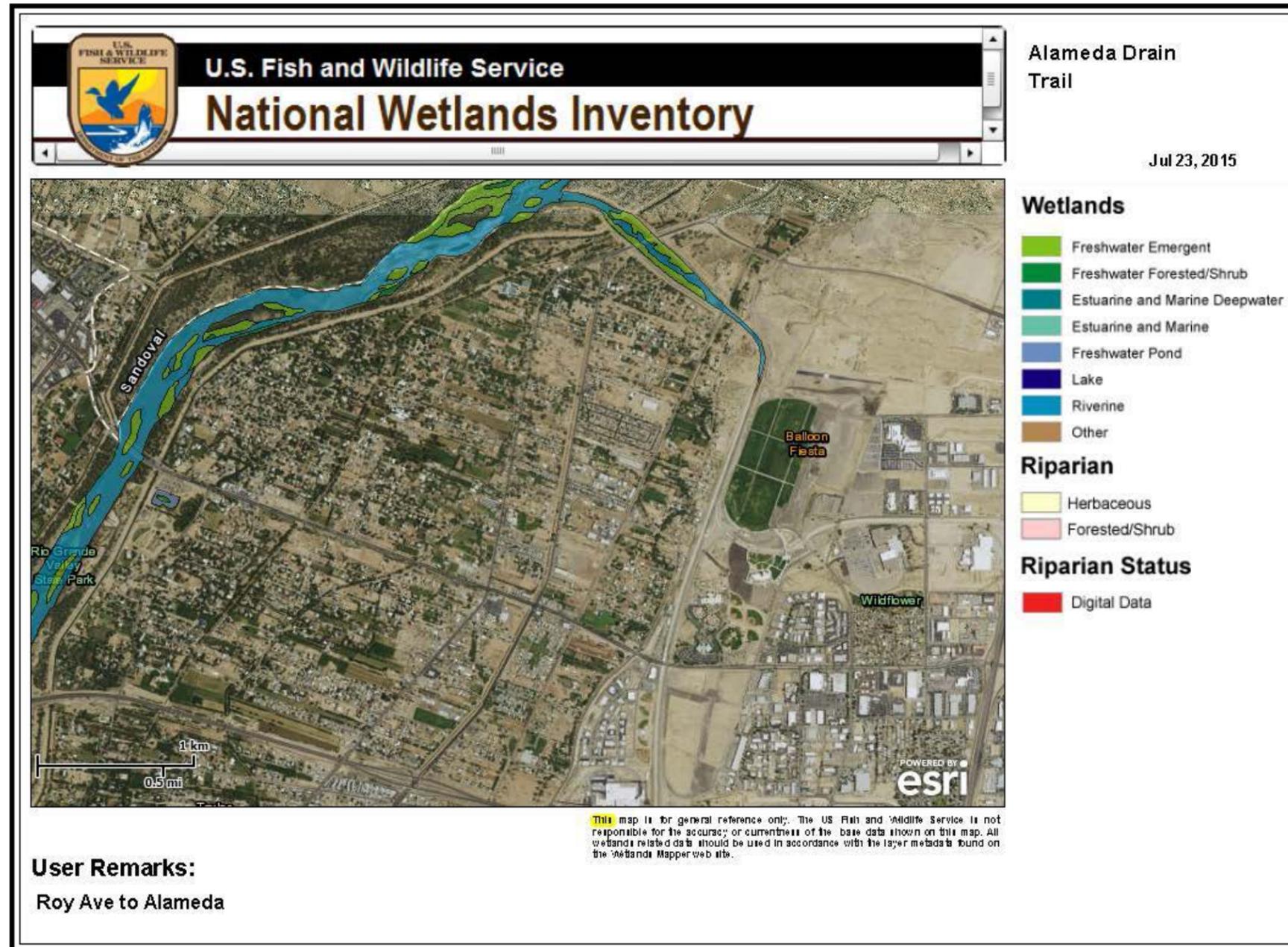
Release Name	RID	FID	Address	City	County	Status	Project Manager
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Terminology Definitions

Pre-Investigation, Suspected Release: release not confirmed by definition
 Pre-Investigation, Confirmed Release: confirmed release as by definition
 Investigation: ongoing assessment of environmental impact
 Cleanup: physical removal of contamination ongoing
 Aggressive Cleanup Completed (Aggr Cleanup Completed): effective removal of contamination complete
 No Further Action: release considered mitigated at this time

Responsible Party (Resp Party): Owner/Operator responsible for mitigation of release
 State Lead: State has assumed responsibility for mitigation of release
 Federal Facility: responsibility under the Federal Govt
 CAF: corrective action fund

RID: release ID
 FID: facility ID



Web Soil Survey, United States Department of Agriculture, Natural Resources Conservation Service, July 23, 2015. <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

Wetlands Mapper, United States Fish and Wildlife Service, National Wetlands Inventory, July 22, 2015. <http://www.fws.gov/wetlands/data/mapper.HTML>

Biota Information System of New Mexico, New Mexico Game and Fish and Natural Heritage New Mexico, July 17, 2015. <http://www.bison-m.org/>

Enviromapper, United States Environmental Protection Agency, July 22, 2015. <http://www.epa.gov/emefdata/em4ef.home>

Envirofacts, United States Environmental Protection Agency, July 22, 2015. <http://www.epa.gov/enviro/index.html>

New Mexico Environment Department, Petroleum Storage Tank Bureau, July 22, 2015. <https://www.env.nm.gov/ust/ustbtop.html>

GoNM Mapper, New Mexico Environment Department, July 23, 2015. <https://gis.web.env.nm.gov/GoNM/>

New Mexico Cultural Resources Information System, New Mexico Department of Cultural Affairs, July 2015. <http://www.nmhistoricpreservation.org/arms.html>

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9. Appendix C

Ownership and Agreements



OWNERSHIP & AGREEMENTS



LEGEND*

- EASEMENT
- EASEMENT (INDIAN LAND)
- EASEMENT (QUIT CLAIMED)
- FEE SIMPLE
- PRESCRIPTIVE
- QUIT CLAIM
- WARRANTY DEED
- XXX LICENSE AGREEMENT ID # (SEE APPENDIX D)

ALAMEDA DRAIN CORRIDOR

*Easement and other parcel boundaries are derived from geographic information systems (GIS) geodatabase provided to Parametrix from MRGCD on July 17, 2015

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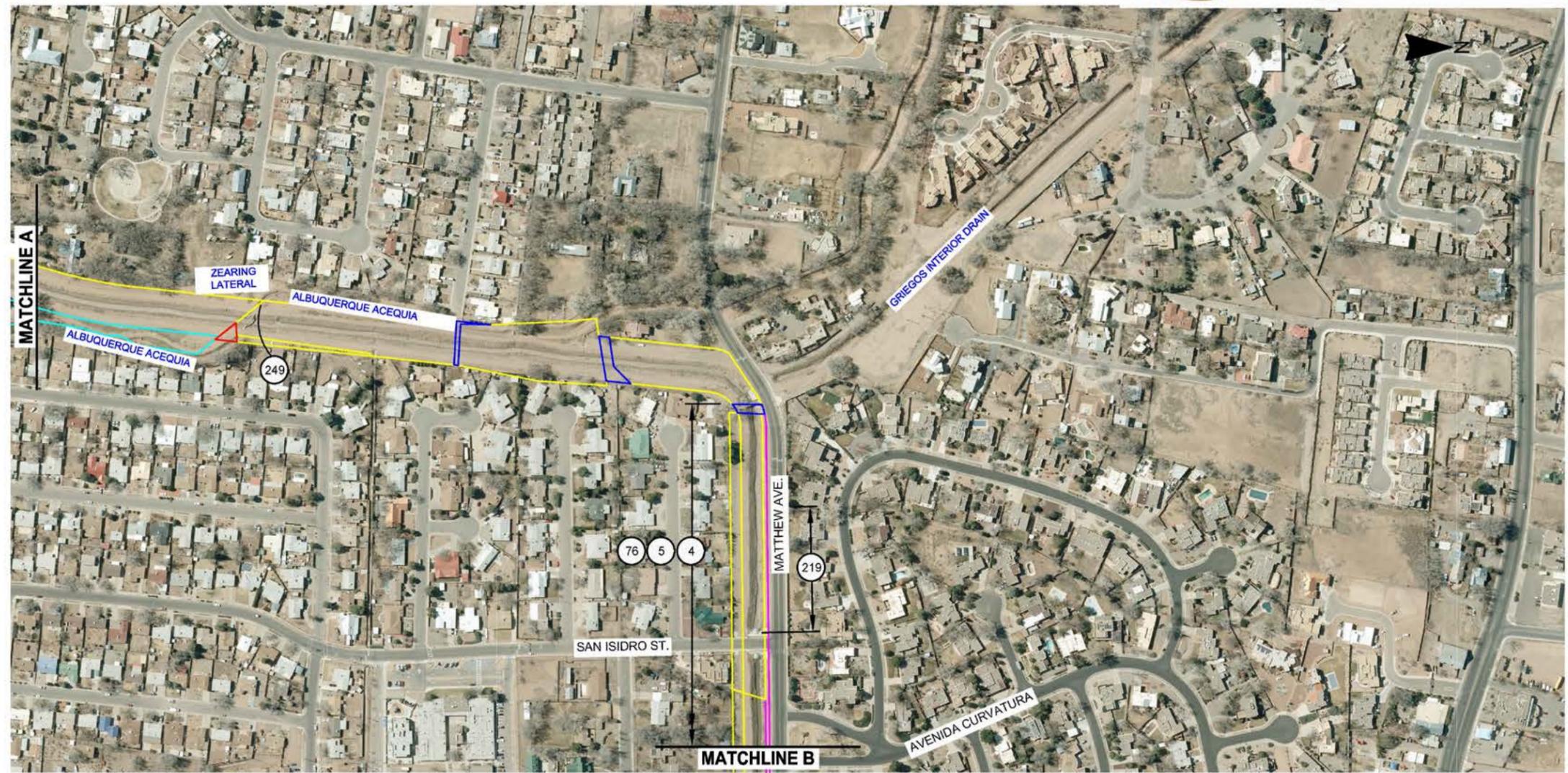
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OWNERSHIP & AGREEMENTS



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OWNERSHIP & AGREEMENTS



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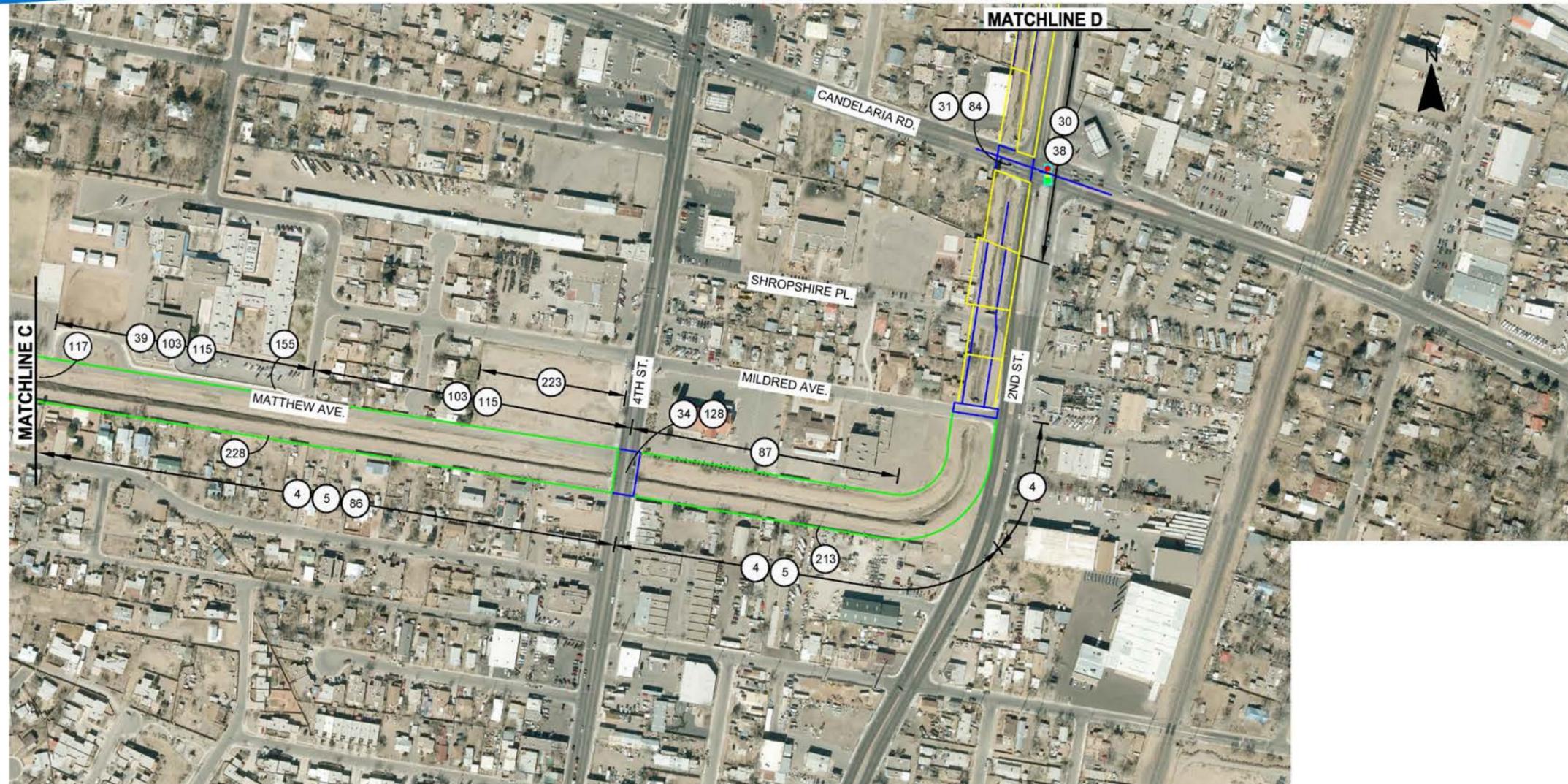
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OWNERSHIP & AGREEMENTS



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OWNERSHIP & AGREEMENTS



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OWNERSHIP & AGREEMENTS



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OWNERSHIP & AGREEMENTS



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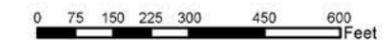


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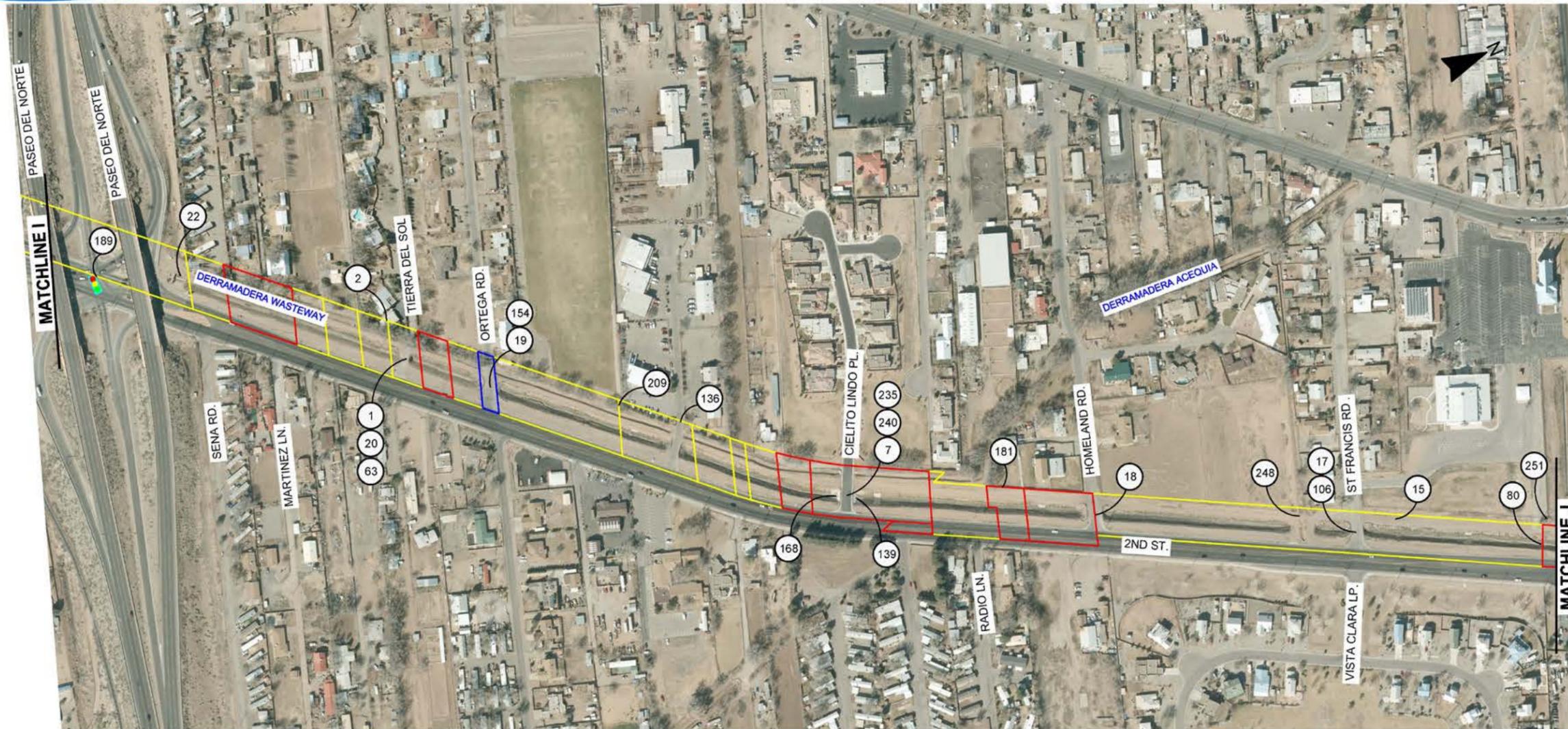
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OWNERSHIP & AGREEMENTS



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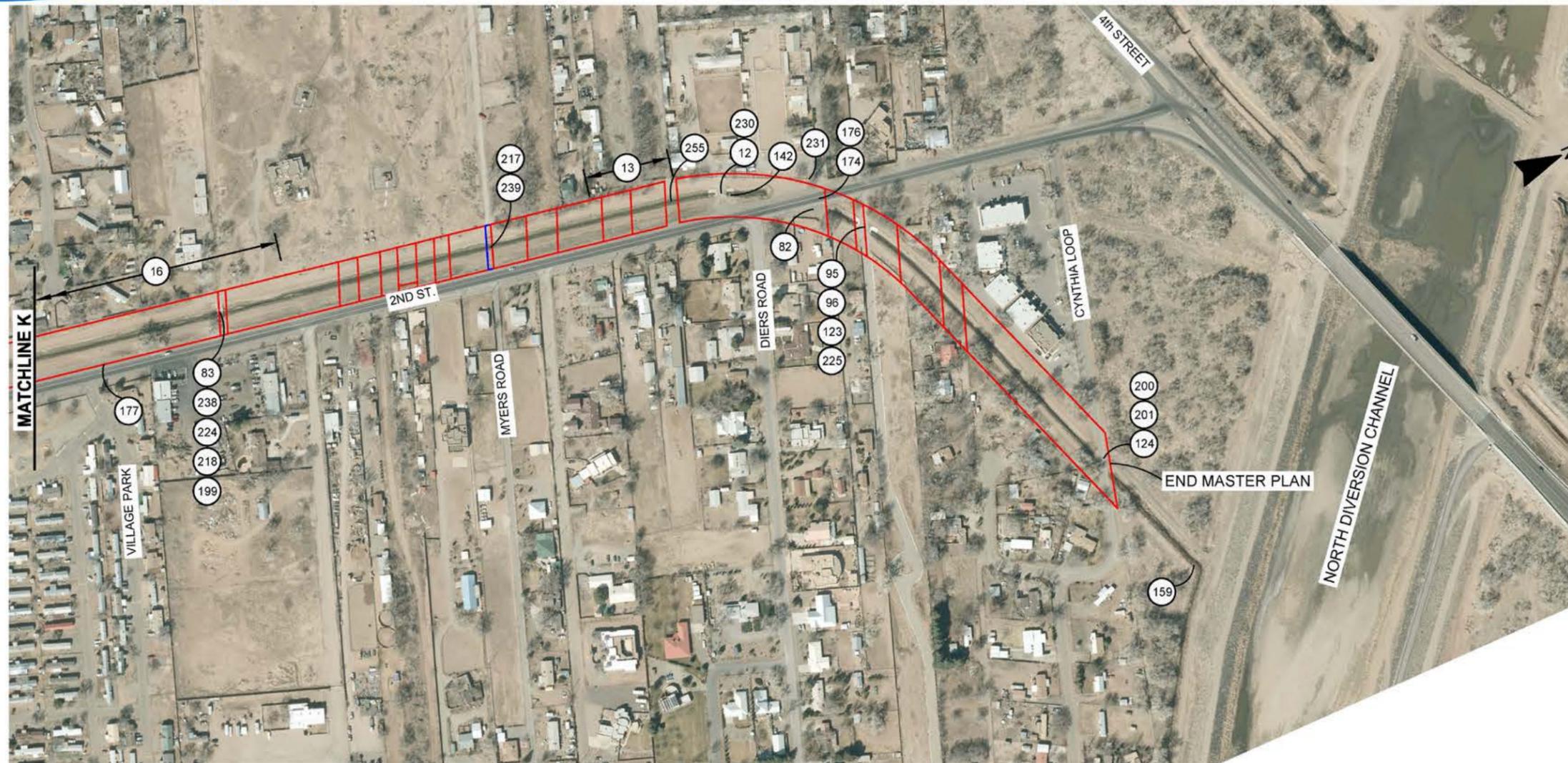
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OWNERSHIP & AGREEMENTS



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10. Appendix D

MRGCD License Agreement Summary

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD RW Type	Comments
				From	To							
1	2-031-2013	1/6/2015	50	434+13	--	Access and maintain existing culvert	72	CMP	in-line	Aaron Dixon	easement	
2	2-030-2013	1/6/2015	5	432+78	434+65	Existing encroachment	--	--	--	Aaron Dixon	easement	
3	2-075-2011	2/1/2012	50	291+55	--	Install and maintain waterline	6	steel casing	crossing	ABCWUA	easement	
4	2-225-2005	12/5/2005	50	114+60	195+00	Install and maintain transmission waterline	66	steel	parallel	ABCWUA	easement	San Juan Chama
5	2-227-2005	12/5/2005	50	114+60	195+00	Install and maintain asphalt trail	--	asphalt	parallel	ABCWUA	easement	
6	2-060-2014	9/22/2014	50	408+95	413+84	Install and maintain waterline	8		parallel	ABCWUA	easement	
7	2-031-2007	5/30/2007	50	446+70	--	Maintain existing culvert	72	CMP	in-line	Bernalillo County	fee simple estate	
8	2-015-2003	1/17/2006	50	348+25	--	Install and maintain culvert	60	CMP	in-line	Bradley Root	easement	
9	2-081-2012	10/9/2012	50	389+90	--	Install and maintain buried fiber cable	4	conduit	crossing	CenturyLink	easement	
10	2-087-2012	10/9/2012	50	205+38	--	Install and maintain buried fiber cable	2	conduit	crossing	CenturyLink	easement	
11	2-064-2014	10/24/2014	50	228+25	240+55	Install and maintain aerial cable	100 pair	--	parallel	CenturyLink	easement	
12	2-124-2003	2/3/2004	50	531+60	--	Install and maintain water service line	0.75	--	crossing	City of Albuquerque	fee simple estate	
13	2-036-2004	4/14/2004	50	527+82	530+29	Install and maintain vacuum sewer line	4	--	parallel	City of Albuquerque	fee simple estate	
14	2-146-2001	12/10/2001	50	490+80	498+50	Install and maintain sewer line	6	PVC	parallel	City of Albuquerque	fee simple estate	
15	1-LM-4L-01870	11/1/1991	50	496+39	--	Joint-use for install and maintain ground water test well	--	--	spot	City of Albuquerque	easement	
16	2-037-2004	4/14/2004	50	506+75	520+00	Install and maintain vacuum sewer line	4	--	parallel	City of Albuquerque	fee simple estate	
17	8-LM-53-01271	8/1/1988	50	462+62	--	Joint-use for install and maintain sewer line	8	--	crossing	City of Albuquerque	easement	
18	8-LM-53-01268	8/1/1988	50	454+75	--	Joint-use for install and maintain sewer line	8	--	crossing	City of Albuquerque	easement	
19	8-LM-53-01269	8/1/1988	50	436+85	--	Joint-use for install and maintain sewer line	8	--	crossing	City of Albuquerque	easement	
20	8-LM-53-01270	8/1/1988	50	434+80	--	Joint-use for install and maintain sewer line	8	--	crossing	City of Albuquerque	easement	
21	2-046-2002	7/8/2002	50	493+30	--	Install and maintain nonpotable water line	24	--	crossing	City of Albuquerque	easement	
22	2-062-2005	5/25/2005	50	427+60	--	Install and maintain water line	72	steel	crossing	City of Albuquerque	easement	San Juan Chama
23	--	4/2/1975	--	368+64	--	Install and maintain water line	6	AC	crossing	City of Albuquerque	--	
24	6-LM-53-01005	4/4/1986	50	348+30	--	Install and maintain sewer line	8	--	crossing	City of Albuquerque	--	
25	6-LM-53-01007	4/4/1986	50	343+70	--	Install and maintain sewer line	8	--	crossing	City of Albuquerque	--	
26	8-LM-53-01253	4/29/1988	50	272+40	--	Joint-use for install and maintain culvert	154 x 100	CMP	in-line	City of Albuquerque	easement	
27	2-133-2006	6/1/2006	50	261+55	283+45	Concrete line east slope of drain	--	concrete	in-line	City of Albuquerque	easement	
28	2-131-2006	6/1/2006	50	272+50	--	Extend and maintain culvert	12' x 4'	steel	in-line	City of Albuquerque	easement	
29	2-212-2007	1/23/2008	50	273+05	--	Install and maintain fiber conduit	3	conduit	crossing	City of Albuquerque	easement	
30	1-LM-4L-01100	3/26/1991	50	195+56	208+26	Joint-use for turn lane	--	--	parallel	City of Albuquerque	easement	
31	1-LM-4L-01090	3/26/1991	50	201+00	--	Joint-use to extend upstream culvert	12' x 8'	CMP	in-line	City of Albuquerque	easement	
32	8-LM-53-01227	2/12/1988	50	241+11	--	Install and maintain sewer line	21	--	crossing	City of Albuquerque	easement	
33	2-LM-4L-01890	4/28/1992	50	235+65	247+15	Joint-use for turn lane	--	--	parallel	City of Albuquerque	easement	
34	5-LM-53-00039	4/8/1985	50	179+20	--	Install and maintain storm drain inlet	36	concrete	spot	City of Albuquerque	--	
35	2-LM-4L-01900	4/28/1992	50	238+43	247+40	Joint-use for install and maintain existing inlets for turn lanes	--	--	spot	City of Albuquerque	easement	
36	--	4/29/1971	--	157+00	--	Install and maintain water line	0.75	copper	crossing	City of Albuquerque	--	
37	2-LM-4L-01880	12/20/1991	50	241+15	--	Joint-use for install and maintain CBC	10' x 4'	concrete	in-line	City of Albuquerque	easement	
38	1-LM-4L-01080	3/26/1991	50	197+20	204+70	Joint-use for install and maintain existing inlets for turn lanes	--	--	spot	City of Albuquerque	easement	
39	2-135-2001	11/9/2001	50	161+10	182+65	Install and maintain water line	8	--	parallel	City of Albuquerque	easement	
40	2-130-2004	12/15/2004	50	220+45	--	Install and maintain storm drain	24	RCP	crossing	City of Albuquerque	easement	
41	2-129-2004	12/15/2004	50	224+00	--	Install and maintain CBC	10' x 6'	concrete	in-line	City of Albuquerque	easement	
42	2-126-2004	12/15/2004	50	210+50	--	Install and maintain CBC	10' x 6'	concrete	in-line	City of Albuquerque	easement	
43	2-135-2004	12/15/2004	50	220+55	--	Install and maintain water line	8	--	crossing	City of Albuquerque	easement	
44	2-128-2004	12/15/2004	50	220+50	--	Install and maintain CBC	10' x 6'	concrete	in-line	City of Albuquerque	easement	
45	2-127-2004	12/15/2004	50	215+25	--	Install and maintain CBC	10' x 6'	concrete	in-line	City of Albuquerque	easement	
46	2-125-2004	12/15/2004	50	205+50	--	Install and maintain CBC	10' x 6'	concrete	in-line	City of Albuquerque	easement	
47	2-132-2004	12/15/2004	50	227+50	--	Install and maintain storm drain	42	RCP	crossing	City of Albuquerque	easement	
48	2-133-2004	12/15/2004	50	224+05	--	Install and maintain water line	6	--	crossing	City of Albuquerque	easement	
49	2-134-2004	12/15/2004	50	227+55	--	Install and maintain water line	6	--	crossing	City of Albuquerque	easement	
50	2-137-2004	12/15/2004	50	210+55	--	Install and maintain water line	6	--	crossing	City of Albuquerque	easement	
51	2-138-2004	12/15/2004	50	205+55	--	Install and maintain water line	6	--	crossing	City of Albuquerque	easement	

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD R/W Type	Comments
				From	To							
52	2-131-2004	12/15/2004	50	223+95	--	Install and maintain storm drain	30	RCP	crossing	City of Albuquerque	easement	
53	2-136-2004	12/15/2004	50	215+30	--	Install and maintain water line	6	--	crossing	City of Albuquerque	easement	
54	5-LM-53-00040	4/8/1985	50	147+07	--	Install and maintain storm drain inlet	60	RCP	spot	City of Albuquerque	--	
55	--	4/13/1960	--	77+87	--	Install and maintain water line	2.25	copper	crossing	City of Albuquerque	--	
56	2-121-2010	1/26/2011	50	493+10	--	Install and maintain aerial cable	--	--	crossing	Comcast Cable	fee simple estate	
57	2-039-2015	4/21/2015	50	304+95	--	Install and maintain aerial cable	--	--	crossing	Comcast Cable	easement	
58	2-111-97	7/11/1992	50	247+00	--	Install and maintain irrigation pipe	--	--	spot	Ernie Lopez	easement	
59	2-192-2005	8/10/2005	50	60+50	65+20	Install and maintain storm drain outfall and pond	12	ductile iron	parallel	Evergreen-Duranes, LTD.	easement	
60	8-LM-53-01243	3/21/1988	50	483+35	--	Install and maintain gas line	2	--	crossing	Gas Co. of NM/PNM	--	
61	--	8/16/1976	--	498+66	500+16	Install and maintain gas line	0.75	steel	parallel	Gas Co. of NM	--	
62	6-LM-53-01010	2/19/1986	50	470+22	--	Install and maintain gas line	2	--	crossing	Gas Co. of NM	--	
63	4-LM-4L-04730	4/20/1994	50	434+13	436+28	Joint-use for install and maintain gas line	2	PE	para/cross	Gas Co. of NM	easement	
64	8-LM-53-01218	11/24/1987	50	404+88	--	Joint-use for install and maintain gas line	2	--	crossing	Gas Co. of NM/PNM	easement	
65	2-LM-4L-02450	4/13/1992	50	240+87	--	Joint-use for install and maintain gas line	4	--	crossing	Gas Co. of NM/PNM	easement	
66	2-066-2009	6/23/2009	50	510+00	--	Install and maintain culvert	48	CMP	in-line	Joe Romero	fee simple estate	
67	2-159-2006	8/24/2006	5	87+65	100+00	Special use for ingress and egress	--	--	parallel	Joe Thompson	easement	
68	2-042-2011	7/5/2011	50	88+60	90+45	Install and maintain sewer line	4	PVC	parallel	Joe Thompson	easement	
69	2-043-2011	7/5/2011	50	88+60	--	Install and maintain electronic traffic gate	--	--	spot	Joe Thompson	easement	
70	2-041-2011	6/29/2011	50	156+30	--	Install and maintain electric meter pedestal	--	--	spot	Michelle Lujan Grisham	easement	
71	8-LM-53-01263	5/3/1988	50	470+00	--	Joint-use for install and maintain aerial electric line	--	--	crossing	Public Service Co. of NM	easement	
72	6-LM-53-00971	10/30/1985	50	372+71	--	Install and maintain aerial electric line	--	--	crossing	Public Service Co. of NM	--	
73	2-071-2006	8/2/2006	50	380+36	--	Raise and maintain existing electric service line	--	--	crossing	Public Service Co. of NM	easement	
74	2-247-98	1/19/1999	50	367+00	--	Install and maintain gas line	2	PE	crossing	PNM Gas Services	easement	
75	2-065-2008	6/16/2008	50	227+50	--	Install and maintain aerial electric line	--	--	crossing	Public Service Co. of NM	easement	
76	2-012-2006	3/20/2006	50	116+75	149+50	Relocate and maintain existing aerial electric line	--	--	parallel	Public Service Co. of NM	easement	
77	5-LM-4L-06670	7/25/1995	50	67+29	--	Joint-use for install and maintain buried electric line	--	--	crossing	Public Service Co. of NM	easement	
78	2-003-2009	1/27/2009	50	489+00	--	Install and maintain buried 25 pair cable	4	conduit	crossing	Qwest	easement	
79	2-076-2009	9/11/2009	50	470+00	479+00	Install and maintain buried fiber optic cable	6 & 4	conduit	para/cross	Qwest	fee simple estate	
80	2-004-2009	1/27/2009	50	467+66	--	Install and maintain buried 25 pair cable	4	conduit	crossing	Qwest	easement	
81	2-024-2009	7/7/2009	50	149+00	--	Install and maintain buried fiber optic cable	4	conduit	crossing	Qwest	easement	
82	2-120-2004	11/2/2004	50	531+75	--	Install and maintain buried telephone cable	4	conduit	crossing	Qwest	fee simple estate	
83	2-132-2003	1/29/2004	50	517+25	--	Install and maintain buried 200 pair cable	4	conduit	crossing	Qwest	fee simple estate	
84	2-176-2006	10/23/2006	50	201+00	--	Install and maintain buried 200 pair cable	4	conduit	crossing	Qwest	easement	
85	2-029-2003	5/23/2003	50	87+33	--	Raise and maintain existing aerial cable	--	--	crossing	Qwest	easement	
86	2-031-2010	6/8/2010	50	149+50	182+50	Install and maintain buried fiber optic cable	4	conduit	parallel	Qwest	easement	
87	2-047-2008	4/11/2008	50	182+95	189+05	Allow 10-foot encroachment	--	--	parallel	Saint Therese Church	easement	
88	2-055-2009	7/14/2009	50	302+62	--	Access and maintain existing culvert	72	CMP	in-line	Second Street Partners, LLC	easement	
89	2-057-2009	7/14/2009	50	302+62	--	Maintain existing sanitary sewer force main and existing water line	2 & 6	--	crossing	Second Street Partners, LLC	easement	
90	2-029-2014	9/23/2014	50	336+00	--	Install and maintain culvert	72	CMP	in-line	Stacey Seidel	easement	
91	2-028-2013	6/4/2013	50	378+39	--	Access and maintain existing culvert	60	CMP	in-line	Trail House, LLC	easement	
92	2-073-2011	2/8/2012	50	389+80	--	Install and maintain buried fiber cable	2	conduit	crossing	TW Telecom of NM, LLC	easement	
93	2-047-2006	4/13/2006	50	317+70	--	Install and maintain storm drain outfall	24	RCP	spot	Village of Los Ranchos	easement	
94	2-049-2006	4/13/2006	50	317+75	--	Maintain existing culvert	60	CMP	in-line	Village of Los Ranchos	easement	
95	2-056-2008	7/1/2008	50	535+60	--	Install and maintain culvert and concrete channel lining	71 x 47	CMP	in-line	Visa Project Group, LLC	fee simple estate	
96	2-066-2004	5/13/2004	50	535+60	--	Install and maintain culvert road crossing	71 x 47	CMP	in-line	William A. and Robert T. Chavez	fee simple estate	
97	2-024-2003	3/17/2003	--	51+40	55+80	Install and maintain culvert crossing and drain	--	--	--	William Osofsky	easement	S. of I-40 - outside project limits
98	2-071-2013	6/6/2014	50	493+00	--	Install and maintain buried fiber cable	4	conduit	crossing	Zayo Group, LLC	easement	
99	2-034-2013	7/30/2013	50	269+35	--	Install and maintain buried fiber cable	3	conduit	crossing	Zayo Group, LLC	easement	
100	2-009-2007	3/9/2007	50	368+50	--	Install and maintain Conspan bridge	20' x 9'	concrete	crossing	Zitro Properties, LLC	easement	
101	--	7/19/1974	--	246+40	--	Erection & Maintenance of Structures	12"	Drain Inlet	Crossing	Bill Miller	--	

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD R/W Type	Comments
				From	To							
102	3-LM-4L-04140	12/15/1993	50	265+50	--	Joint-Use w/APD - install and maintain storm drain inlet	18"	RCP	Crossing	Bob V. Stover	--	
103	2-134-2001	11/9/2001	50	166+98	182+30	Special Use w/APS for Parent Drop-off & Pick-up road	--	asphalt	Parallel	(Stella Lucero) APS	Easement	
104	--	3/24/1978	--	506+70	--	Erection & Maintenance of Structures (Private Crossing)	48"	CMP Culvert	Crossing	Arthur Saiz	--	
105	--	10/6/1983	--	404+76	--	Erection & Maintenance of Structures (public Crossing)	72"	CMP Culvert	In drain	B.K. Horton	--	
106	--	8/12/1983	--	--	--	Erection & Maintenance of Structures	72"	CMP Culvert	Crossing	Joe Chavez	--	
107	--	2/8/1958	--	317+29	--	Erection & Maintenance of Structures	60"	CMP Culvert	parallel	Hubert Ball	--	
108	--	8/11/1955	--	350+00	116+75	Erection & Maintenance of Structures (6)	--	--	Crossing	Bernalillo Co.	--	
109	--	8/16/1972	--	--	--	Erection & Maintenance of Existing Structures (private Crossing)	--	Timber Bridge	Crossing	B.L.	--	
110	2-151-2000	8/25/2000	50	385+00	--	Erection & Maintenance of Existing Structure	48"	CMP Culvert	Crossing	Lucille Thomson & Norma Thomson Lynch	Easement	
111	9-LM-4U-01456	7/21/1989	50	495+73	494+73	Erection & Maintenance of Structure	24"	CMP Culvert	Parallel	Boyd Mazer	--	
112	0-LM-4L-00070	1/3/1990	50	496+39	--	Erection & Maintenance of Structure	47"X71"	Arch CMP	Parallel	Boyd Mazer	--	
113	2-075-99	8/6/1999	50	368+70	370+00	Erection & Maintenance of Structure (water service line)	1"	--	Parallel	Carolee Brown	Easement	
114	--	8/10/1984	--	403+05	405+55	Erection & Maintenance of Structure (water main)	6"	--	Parallel	William Zimmerman		
115	--	5/20/1983	--	182+64	166+98	Access Road Easement from 4th St. up to Griegos lateral Crossing	--	asphalt	Parallel	Orlando Sedillo	Easement	
116	--	9/27/1983	--	162+24	--	Erection & Maintenance of Structure (storm drain inlet)	6"	PVC	Crossing	Patricia Westbrook	--	
117	--	4/20/1989		--	--	request for pedestrian bridge, no license agreement shown	--	--	Crossing		--	
118	--	12/7/1971	--	--	--	Erection & Maintenance of Structure (5) (storm drain inlets w/ concrete headwall)	4"	PVC	Parallel	John Arfman	--	
119	2-LM-4L-02740	8/22/1992	50	374+99	--	Erection & Maintenance of Structures (private culvert crossing)	--	Arch CMP	Crossing	Phillos McGuire	--	
120	2-LM-4L-02740	8/23/1992	50	374+100	--	Erection & Maintenance of Structures (private culvert crossing)	--	Arch CMP	Crossing	Phillos McGuire	--	
121	--	2/26/1977	--	255+83	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	Coda Roberson Construction	--	
122	--	9/17/1977	--	255+95	--	Erection & Maintenance of Structure	12"	Drain Inlet	Crossing	Coda Roberson Construction	--	
123	2-190-2000	11/3/2000	50	531+75	539+47	Erection & Maintenance of COAX Cable Line	.875"	COAX Cable	Crossing	Comcast Cable	Easement	
124	2-191-2000	11/3/2000	50	545+00	--	Erection & Maintenance of COAX Cable Line	.875"	COAX Cable	Crossing	Comcast Cable	Easement	
125	2-161-2000	9/26/2000	50	322+67	326+48	Erection & Maintenance of Fiber Cable Line	--	Fiber Cable	Crossing	Comcast Cable	Easement	
126	2-086-2000	5/16/2000	50	271+92	--	Erection & Maintenance of COAX Cable Line	.875"	COAX Cable	Crossing	Comcast Cable	Easement	
127	2-155-2000	9/26/2000	50	273+00	--	Erection & Maintenance of Fiber Cable Line	--	Fiber Cable	Crossing	Comcast Cable	Easement	
128	2-154-2000	9/27/2000	50	182+50	--	Erection & Maintenance of Fiber Cable Line	--	Fiber Cable	Crossing	Comcast Cable	Easement	
129	--	4/21/1978	--	471+00	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	County of Bernalillo	--	
130	--	3/24/1978	--	326+96	--	Erection & Maintenance of Structure	48"	CMP Culvert	Crossing	County of Bernalillo	--	
131	--	8/9/1983	--	479+02	--	Erection & Maintenance of Structure	60"	CMP Culvert	Crossing	Orlando Pedilla	--	
132	--	8/26/1992	--	473+65	--	Erection & Maintenance of Structure (private crossing)	60"	CMP Culvert	Crossing	Oliver Myers & Charles Price	--	
133	2-229-98	12/10/1998	--	418+19	--	Erection & Maintenance of Fiber Cable Line	--	Fiber Cable	Crossing	E-Spire Communications	Easement	
134	2-116-2003	12/3/2003	50	418+85	421+25	Use of Surface Area for parking lot on top on 42" CMP	--	--	Parallel	El Paseo II Limited Partnership	Easement	
135	8-LM-53-01236	3/10/1988	--	393+28	--	Erection & Maintenance of Structure (culvert crossing)	60"	CMP Culvert	Crossing	Elicia Rodarte	--	
136	--	11/28/1977	--	440+90	--	Use of Surface Area for parking lot on top on 42" CMP	48"	CMP Culvert	Crossing	Elmer Bunker	--	
137	9-LM-4U-01477	8/30/1989	50	497+89	--	Erection & Maintenance of Structure (culvert crossing)	60"	CMP Culvert	Crossing	Eric Baca	--	
138	--	10/18/1982	--	484+02	--	Erection & Maintenance of Structure (culvert crossing)	60"	CMP Culvert	Crossing	Flora Sandoval	--	
139	2-116-97	8/3/2005	--	446+70	--	Erection & Maintenance of Structure (culvert crossing)	72"	CMP Culvert	Crossing	Jody Pauza (Fuller Homes Inc.)	--	
140	--	3/15/1972		249+25	--	Erection & Maintenance of Structure (Private crossing)	--	--	Crossing	Howard Fenley	--	
141	5-LM-53-00091	9/13/1985	50	372+47	--	Erection & Maintenance of Structure (culvert crossing)	72"	CMP Culvert	Crossing	Gary Mallory	--	
142	--	4/4/1984	--	530+34	--	Erection & Maintenance of Gas Line	3/4"	Gas Line	Crossing	C.P. Clements	--	
143	--	1/25/1980	--	490+40	491+00	Erection & Maintenance of Gas Line	3/4"	Gas Line	Parallel	Gas Co. of NM	--	
144	--	11/29/1977	50	417+34	417+84	Erection & Maintenance of Gas Line	3/4"	Gas Line	Parallel	Gas Co. of NM	--	
145	6-LM-53-01068	7/24/1986	50	372+47	--	Erection & Maintenance of Gas Line	3/4"	Gas Line	Crossing	Gas Co. of NM	--	
146	3-LM-4L-03750	6/30/1993	50	375+50	--	Erection & Maintenance of Gas Line	2"	Gas Line	Crossing	Gas Co. of NM	--	

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD R/W Type	Comments
				From	To							
147	--	11/23/1976	--	500+90	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	Gerald Pratt	--	
148	2-217-95	12/1/1995	--	353+80	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	Rick Quant	--	
149	2-110-96	7/30/1996	50	372+21	--	Erection & Maintenance of Structure and Asphalt Pave Across Existing Culvert	72"	CMP Culvert	Crossing	Barbara Tafoya	Easement	
150	--	9/20/1979	--	378+39	--	Erection & Maintenance of Structure	60"	CMP Culvert	Crossing	Helweg & Farmer Transportation Co.	--	
151	--	6/14/1984	--	476+15	--	Erection & Maintenance of Structure	42'	CMP Culvert	Crossing	Herman Kling	--	
152	--	6/14/1984	--	474+35	--	Erection & Maintenance of Structure (Timber Bridge)	--	Timber	Crossing	Herman Kling	--	
153	--	3/10/1960	--	156+39	--	Erection & Maintenance of Structure (Metal Pipe)	12"	Corrugated Metal	Crossing	Hubert Ball	--	
154	--	11/5/1969	--	436+77	--	Erection & Maintenance of Structure	48"	CMP Culvert	Crossing	Carl Allen	--	
155	--	8/28/1979	--	181+95	--	Erection & Maintenance of Water Line	2"	Water Line	Crossing	James Grebe	--	
156	2-085-2001	7/25/2001	50	77+50	--	Discharge Strom Water From Luna Vista Subdivision	6"	--	Crossing	Jim Shill Jr.	Easement	
157	2-096-1996	7/10/1996	--	300+60	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	Joe Craig	Easement	
158	--	11/6/1957	--	--	--	Erection & Maintenance of Structure (drain Inlet metal pipe)	12"	Corrugated Metal	Crossing	Hubert Ball	--	
159	--	10/25/1972	--	548+60	--	Erection & Maintenance of Structure (drain Inlet)	24"	--	Crossing	John Robert	--	
160	--	5/21/1968	--	140+00	--	Erection & Maintenance of Structure (Dishcharge water)	--	--	Crossing	John Arfman	--	
161	5-LM-4L-06630	6/25/1995	50	468+04	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	Joint-Use	
162	5-LM-4L-05800	1/11/1995	50	418+85	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	Joint-Use	
163	5-LM-4L-06110	3/22/1995	50	379+58	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	Joint-Use	
164	2-268-98	2/22/1998	50	398+30	--	Aerial Television Cable Crossing	--	fiber Cable	Crossing	Jones Intercable	Easement	
165	2-086-99	10/8/1999	50	241+30	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	Easement	
166	0-LM-4L-00880	9/11/1991	50	51+25	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	Joint-Use	
167	9-LM-4U-01466	9/7/1989	50	481+75	--	Aerial Television Cable Crossing	--	--	Crossing	Jones Intercable	--	
168	--	4/18/1972	--	446+70	--	Erection & Maintenance of Structure (PRIVATE crossing)	62"	CMP Culvert	Crossing	Joseph C Johnson	--	
169	--	Mar-71	--	486+80	--	Erection & Maintenance of Structure	36'	CMP Culvert	Crossing	Joseph Quintero	--	
170	8-LM-53-01230	1/22/1988	50	315+90	--	Erection & Maintenance of Structure	60"	CMP Culvert	Crossing	Laswell Plumbing and Heating Co.	Joint-Use	
171	--	4/18/1978	--	170+00	--	Erection & Maintenance of Structure (Drain Inlet)	12"	RCP	Crossing	Louis Trujillo (APS)	--	
172	--	3/24/1994	--	372+47	--	Erection & Maintenance of Structure	72"	CMP Culvert	Crossing	Max Tafoya	--	
173	--	5/7/1974	--	--	--	Erection & Maintenance of Structure (Realignment of Acequis waterway)	18"	Concrete Culvert	Crossing	Edward Murzyn	--	
174	--	1/2/1975	--	--	--	Erection & Maintenance of Structure (Telephone Cable)	--	Telephone Cable	Crossing	(Carl Jones) Moutain States Telephone and Telegraph Co.	--	
175	--	8/15/1975	--	326+48	--	Erection & Maintenance of Structure (Telephone Cable)	--	Telephone Cable	Crossing	Frank McElyee	--	
176	5-LM-53-00023	3/20/1985	50	534+48	--	Erection & Maintenance of Structure (Telephone Cable)	--	Telecommunication Cable	Crossing	(Carl Jones) Moutain States Telephone and Telegraph Co.	--	
177	--	12/12/1973	--	517+40	--	Erection & Maintenance of Structure (Telephone Cable)	--	Telecommunication Cable	Crossing	(Carl Jones) Moutain States Telephone and Telegraph Co.	--	
178	--	7/29/1983	--	493+64	--	Erection & Maintenance of Structure (Telecommunication Cable)	4"	Telecommunication Cable	Crossing	(Tom Zdunek) Moutain States Telephone and Telegraph Co.	--	
179	--	3/27/1980	--	497+88	--	Erection & Maintenance of Structure (Telecommunication Cable)	--	Telecommunication Cable	Crossing	(John Sechrist) Moutain States Telephone and Telegraph Co.	--	
180	8-LM-53-01286	7/1/1988	50	487+50	--	Erection & Maintenance of Structure (Telecommunication Cable)	--	Telecommunication Cable	Crossing	(Becky Olsen) Moutain States Telephone and Telegraph Co.	--	
181	--	2/16/1972	50	--	--	12, 4" CONDUITS IN CONCRETE	--	--	--	MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY	--	
182	5-LM-53-00022	3/20/1985	50	--	--	--	--	--	--	MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY	--	
183	--	4/4/1984	50	--	--	505' TELECO CABLE	--	--	--	MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY	--	
184	--	1/30/1980	50	--	--	4" P.V.C 7-WAY CONDUIT	--	--	--	MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY	--	

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD R/W Type	Comments
				From	To							
185		1/30/1980	50			4" P.V.C 7-WAY CONDUIT				MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY		
186		5/4/1978	50			TELCO CABLE INCASED IN 4" GIP				MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY		
187		5/8/1974	50			BURIED CABLE CROSSING				MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY		
188	3-LM-4L-03910	8/26/1993	50	493+35±		EXISTING 72" DIA CMP & EXTENTION TO A 30" DIA STORM DRAIN INLET				NMDOT		
189	6-LM-53-01092	10/8/1986	50	424+57±		42"DIA X 519' RCP CROSSING				NMDOT		
190	5-LM-53-00073	9/13/1985	50	471+33±		24" DIA CMP CULVERT DRAIN				NMDOT		
191		4/12/1968	50			24' DRAIN INLET				NMDOT		
192	2-130-95	6/19/1996	50	58+65±	61+67±	MAINTAIN CONCRETE BOX				NMDOT	EASEMENT	
193		3/12/1979	50			72" CMP CROSSING				NORMAN A MCNEW		
194		11/20/1982	50			60" X 40' CMP CULVERT CROSSING				ORLANDO PADILLA		
195	2-147-99	1/6/2000	50			TEMP INGRESS-EGRESS				PATRICIA LORETTA KELLEY		
196	2-070-98	5/22/1998	50			3/4" WATER SERVICE LINE				PATRICIA LORETTA KELLEY		
197	2-071-98	5/22/1998	50			3/4" DIA WATER SERVICE LINE COTTONWOOD COURT				PATRICIA LORETTA KELLEY		
198		2/11/1970	50			REMOVAL OF EXISTING BRIDGE RPLACEMENT OF CULVERT				PAUL HOPPER		
199	044-1993	9/12/1993	40	517+20±		60" X 50' CMP CULVERT				PETER DEFRIES		
200		6/6/1983	50			ELECTRIC TRANSMISSION LINE				PUBLIC SERVICE COMPANY OF NM		
201		8/15/1973	50			GUY WIRE ANCHOR FROM A POLE				PUBLIC SERVICE COMPANY OF NM		
202		7/22/1981	50			SINGLE PHASE PRIMARY 7,200 VOLTS				PUBLIC SERVICE COMPANY OF NM		
203		9/26/1979	50			SINGLE PHASE 7200 VOLT POWER LINE				PUBLIC SERVICE COMPANY OF NM		
204		7/5/1973	50			OVERHEAD POWER LINE				PUBLIC SERVICE COMPANY OF NM		
205	057-1994	10/19/1994	50	418+85±		MODIFY AN EXISTING AERIAL 3-PHASE 7200 VOLT ELECTRIC SERVICE LINE				PUBLIC SERVICE COMPANY OF NM	FEE SIMPLE	
206	7-LM-53-01166	5/5/1987	50	419+20±		AERIAL ELECTRICAL LINE				PUBLIC SERVICE COMPANY OF NM	FEE SIMPLE	
207		8/21/1980	50			3 PHASE 7200 VOLT ELECTRIC POWER LINE				PUBLIC SERVICE COMPANY OF NM		
208		3/28/1962	50			115 KV TRANSMISSION LINE				PUBLIC SERVICE COMPANY OF NM		
209	4-LM-4L-04240	11/17/1993	50			AERIAL ELECTRIC LINE				PUBLIC SERVICE COMPANY OF NM		
210		12/7/1979	50			SINGLE PHASE 7200 VOLT POWER LINE				PUBLIC SERVICE COMPANY OF NM		
211		7/19/1974	50			AERIAL POWER LINE EXTENSION				PUBLIC SERVICE COMPANY OF NM		
212		9/16/1959	50			46 KV TRANSMISSION LINE AND OVERHEAD SPAN GUYS				PUBLIC SERVICE COMPANY OF NM		
213		7/9/1968	50			ELECTRICAL POLE ANCHOR AND DOWN GUY				PUBLIC SERVICE COMPANY OF NM		
214		4/4/1978	50			7200 VOLT PRIMARY LINE AERIAL ELECTRIC				PUBLIC SERVICE COMPANY OF NM		
215		2/16/1973	50			6 ELECTRICAL CIRCUITS IN 5" PVC CONDUITS ENCASED IN 4" CONCRETE				PUBLIC SERVICE COMPANY OF NM		
216		5/12/1964	50			AERIAL CABLE CROSSINGS				PUBLIC SERVICE COMPANY OF NM		
217	2-032-2002	3/4/2002	50	525+00±		BURIED GAS SERVICE LINE				PUBLIC SERVICE COMPANY OF NM	FEE SIMPLE	
218	2-030-2002	4/3/2002	50	518+00±		BURIED GAS SERVICELINE				PUBLIC SERVICE COMPANY OF NM	FEE SIMPLE	
219	2-059-2006	8/2/2006	50	117+50±	121+25±	BURIED 400 PAIR CABLE WITHIN THE SOUTH OUTSIDE 5'				QWEST COMMUNICATIONS	EASEMENT	
220	2-063-2006	8/2/2006	50	61+25±	62+50±	BURIED 200 PAIR CABLE WITHIN THE SOUTH OUTSIDE 5'				QWEST COMMUNICATIONS	EASEMENT	
221		10/7/1983	50			85" SPAN X 54" RISE X 50± CMPA W/ END SECTIONS CULVERT CROSSING				RAIN FOR RENT, INC.		
222		3/6/1979	50			60" DIA X 44' CMP CULVERT				RAMON A JACQUES		
223	2-031-2012	7/5/2012	50	178+30±	182+30±	SPECIAL USE OF AN EXISTING ASPHALT PAVED ROAD (AKA MATTHEW AVENUE) FOR EMPLOYEE ACCESS, ETC				REGENTS OF THE UNIVERSITY OF NEW MEXICO	EASEMENT	
224		4/10/1974	50			TIMBER BRIDGE				RICHARD L. MCCRARY		
225		7/16/1973	50			48' CMP CULVERT				ROBERT A. GUTIERREZ		
226	7-LM-53-01215	2/17/1988	50			60" DIA X 60' CMP ROAD CROSSING				ROBERT A. GUTIERREZ		

Table 1 - MRGCD License Agreement Summary

ID #	Contract No.	Date	Term	Alameda Drain Station		Agreement Type	Size	Material	Direction	Licensee	MRGCD R/W Type	Comments
				From	To							
227		8/6/1980	50			60" X 50' CULVERT CROSSING				ROBERT PIERROT REAL		
228	2-LM-4L-02640	6/29/1992	50	155+50±	173+55±	TWO CROSS GATES AT				RODGER CARLSON		
229	5-LM-4L-065	6/27/1995	50			3 - 8" DIA CONCRETE ENCASED DUCTILE IRON STORM SEWER PIPES				S & J ENTERPRISES		
230	2-004-2003	2/18/2003	50			71"X47"X30' ARCH CMP ROAD CROSSING				SHIRLEY SHAW		
231	2-008-2004	1/21/2004	50			INGRESS AND EGRESS				SHIRLEY SHAW HUNTON		
232		10/3/1975	50			16" V.H.P. STEEL GAS MAIN				SOUTHERN UNION GAS COMPANY		
233		10/11/1965	50			1 1/4" NATURAL GAS PIPE LINE				SOUTHERN UNION GAS COMPANY		
234		4/10/1959	50			1 1/4" NATURAL GAS LINE				SOUTHERN UNION GAS COMPANY		
235				526+70		1 1/4" GAS LINE IN A 2" CASING				SOUTHERN UNION GAS COMPANY		
236		3/13/1974	50			2" GAS LINE				SOUTHERN UNION GAS COMPANY		
237		5/29/1969	50			3/4" GAS SERVICE LINE				SOUTHERN UNION GAS COMPANY		
238		3/21/1966	50			3/4" NATURAL GAS PIPE LINE				SOUTHERN UNION GAS COMPANY		
239	004-1956	7/16/1956	50	526+70		1 1/4" NATURAL GAS LINE				SOUTHERN UNION GAS COMPANY		
240		11/18/1974	50			3/4" GAS LINE				SOUTHERN UNION GAS COMPANY		
241		7/1/1963	50			1" NATURAL GAS LINE				SOUTHERN UNION GAS COMPANY		
242		5/2/1974	50			2" STEEL GAS LINE				SOUTHERN UNION GAS COMPANY		
243		11/25/1967	50			1" NATURAL GAS PIPE LINE				SOUTHERN UNION GAS COMPANY		
244		2/18/1964	50			2" NATURAL GAS LINE				SOUTHERN UNION GAS COMPANY		
245		6/17/1959	50			TIMBER & STEEL BRIDGE ACROSS				TROY ELLIOTT		
246	2-060-2013	8/28/2013	50	306+70±		EXISTING 72"Ø X 60' RCP ROAD CULVERT				TROY H ELLIOTT TRUST	EASEMENT	
247		9/29/1971	50			66' DIA PRECAST CONCRETE PIPE CULVERT				TROY H. ELLIOTT		
248	028-1993	7/11/1993	50	460+61±		2" MONITORING WELL				US GEOLOGICAL SURVEY		
249	029-1993	7/11/1993	50	100+00±		2" MONITORING WELL WESTERN OUTSIDE 5'				US GEOLOGICAL SURVEY		
250	2-132-96	8/22/1996	50			BURIED SERVICE LINE				US WEST COMMUNICATIONS		
251	5-LM-4L-06620	11/29/1995	50			AERIAL TELEPHONE LINE				US WEST COMMUNICATIONS		
252	2-089-99	9/16/1999	50	222+60±		AERIAL 200 PAIR CABLE				US WEST COMMUNICATIONS	EASEMENT	
253	0-LM-4L-00820	10/31/1990	50			BURIED TELEPHONE LINE				US WEST COMMUNICATIONS		
254		12/1/1981	50			18" CMP DRAIN INLET				VILLAGE MOBILE HOME		
255		11/8/1972	50			TIMBER BRIGDE CROSSING				VIOLA MAYA & JIM CAS		
256		7/7/1978	50			48" X 42' CMP CROSSING				WILLIAM B. HILL		
257		9/23/1976	50			18" X 2,610' BURIED RCP				WYLIE BROTHERS CONTR		

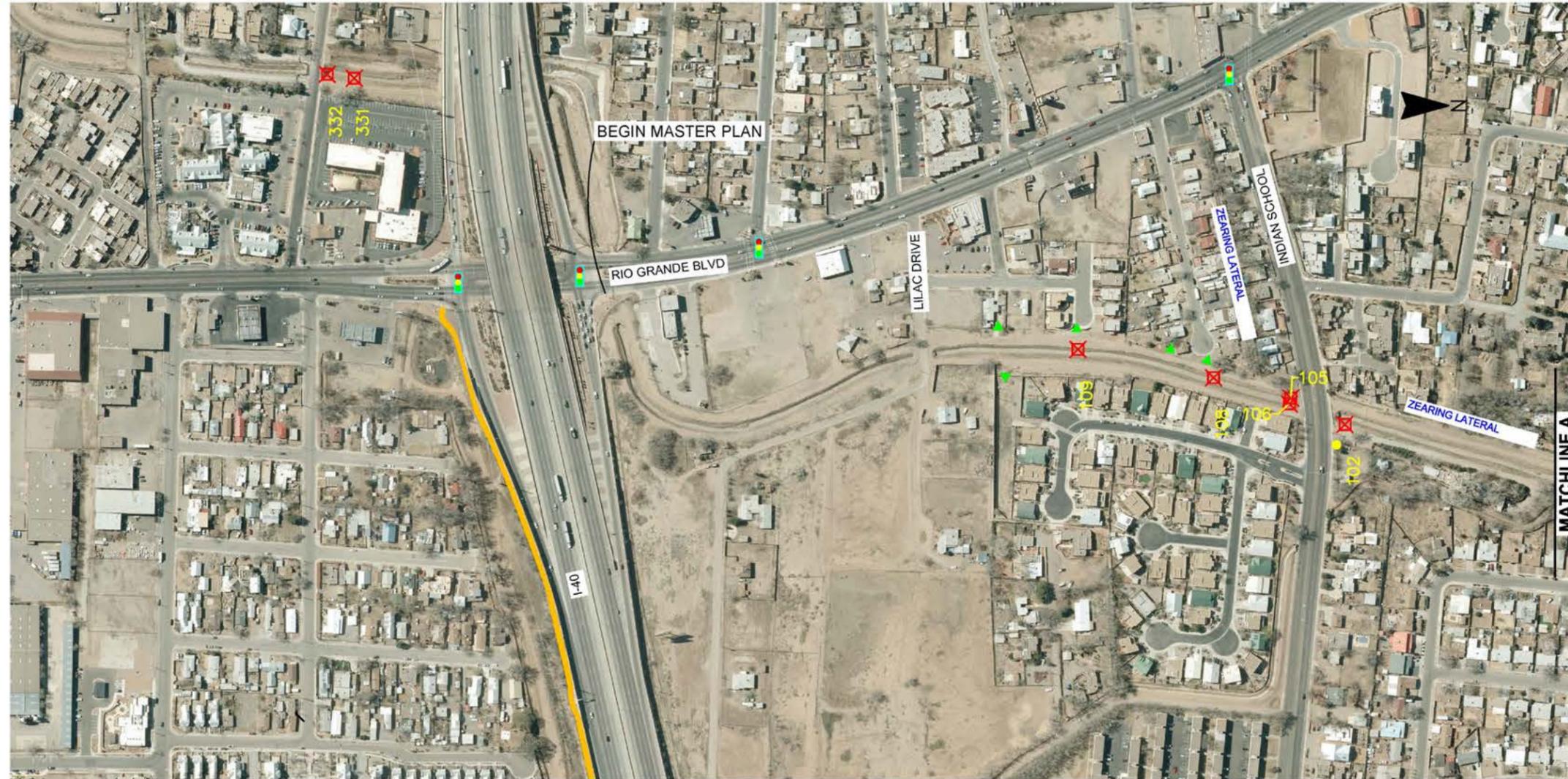
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11. **Appendix E**

Access & Use Inventory



ACCESS & USE INVENTORY



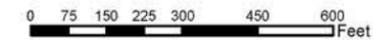
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-  DRAINAGE INLET
-  PRIMARY ACCESS-LICENSED
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-  SECONDARY ACCESS-LICENSED
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ALAMEDA DRAIN CORRIDOR

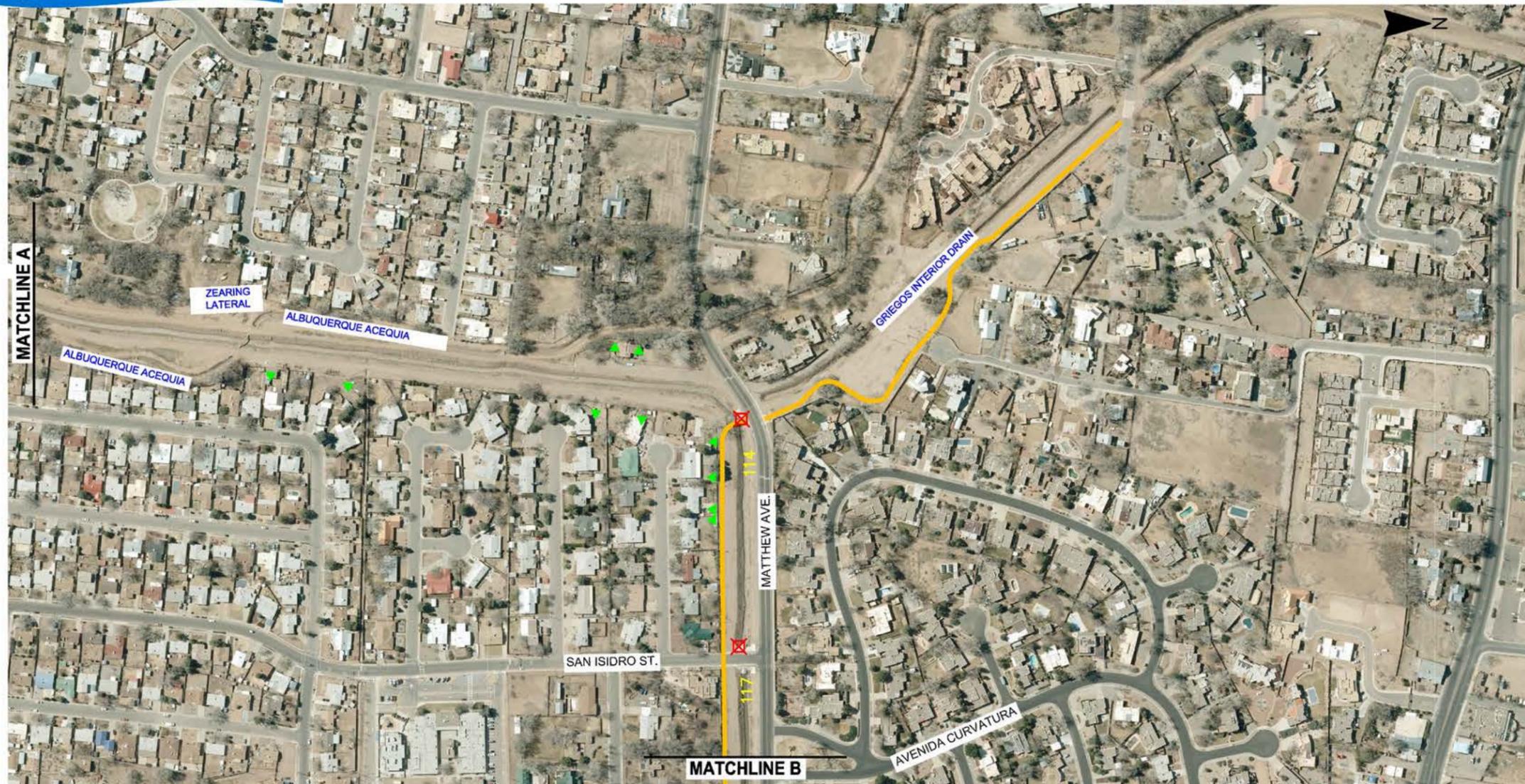
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APPENDIX E
SHEET 1 of 12

ACCESS & USE INVENTORY



LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- ✕ DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- ▲ SECONDARY ACCESS-LICENSED
- ▲ SECONDARY ACCESS-UNLICENSED

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APPENDIX E
SHEET 2 of 12

ACCESS & USE INVENTORY



LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

ALAMEDA DRAIN CORRIDOR

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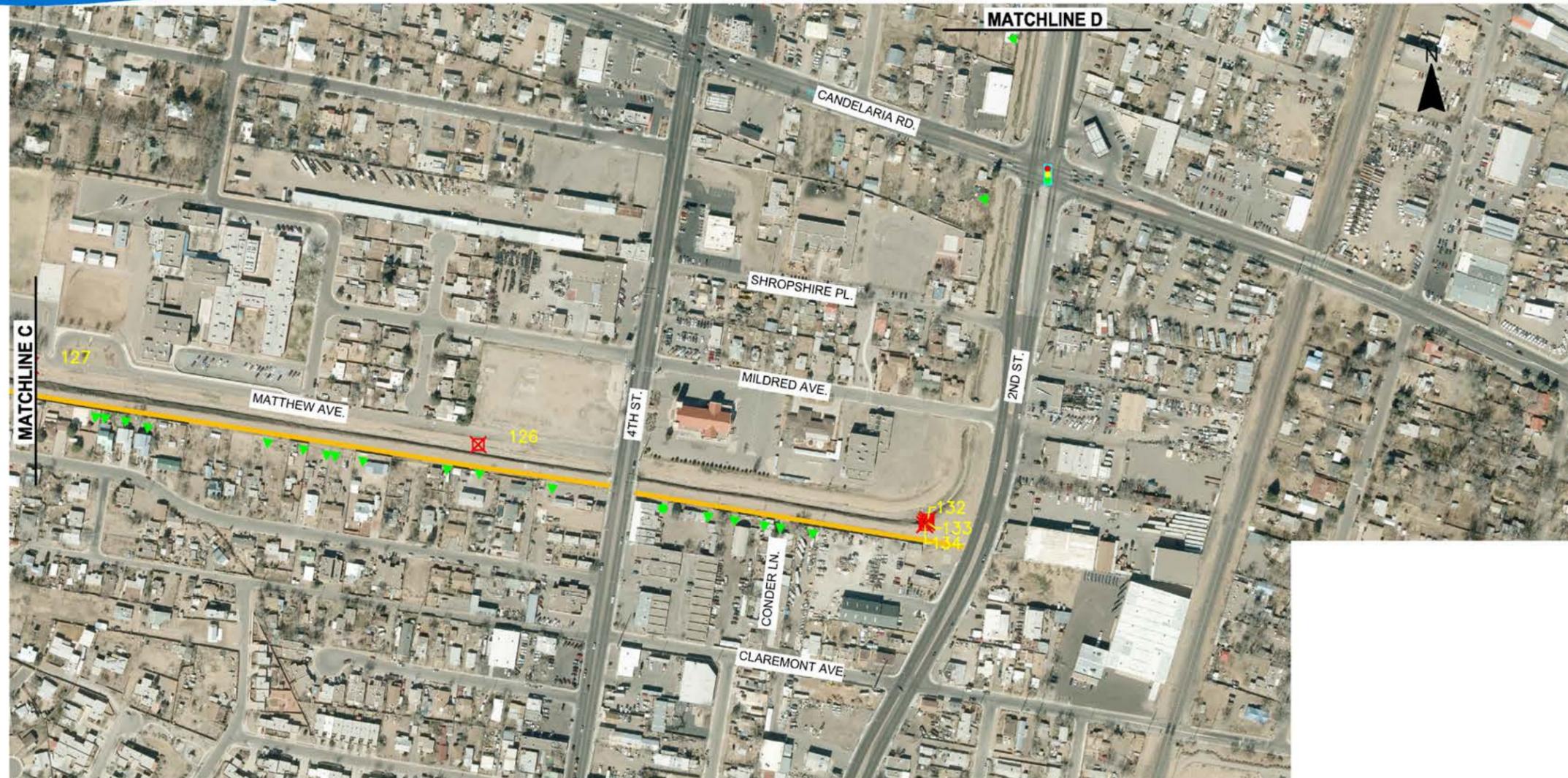
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APPENDIX E
SHEET 3 of 12



ACCESS & USE INVENTORY



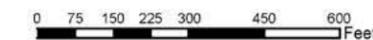
ALAMEDA DRAIN CORRIDOR

LEGEND

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- UNLICENSED PARKING
- DRAINAGE INLET
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- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

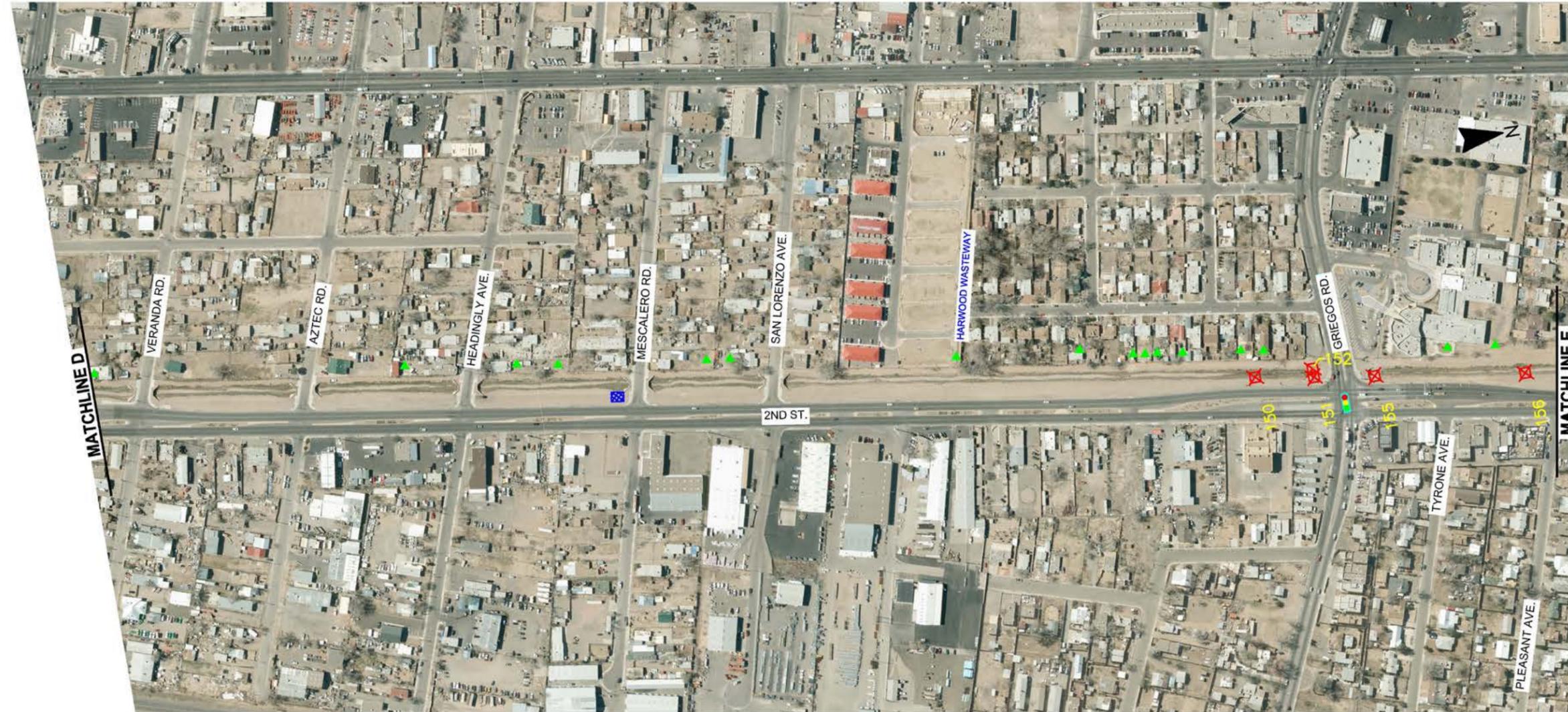
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APPENDIX E
SHEET 4 of 12

ACCESS & USE INVENTORY



LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

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APPENDIX E
SHEET 5 of 12



ACCESS & USE INVENTORY



LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
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ALAMEDA DRAIN CORRIDOR

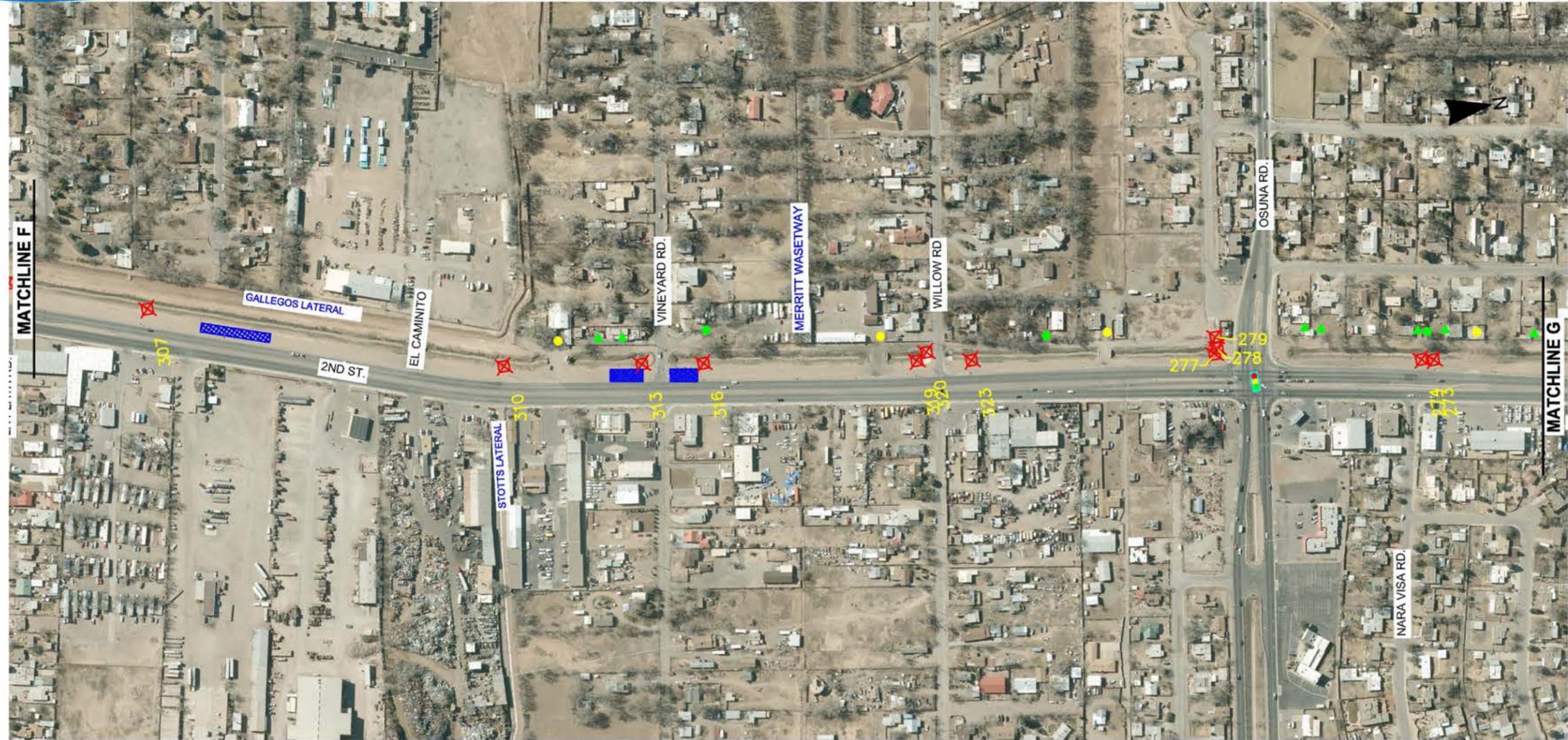
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APPENDIX E
SHEET 6 of 12

ACCESS & USE INVENTORY



ALAMEDA DRAIN CORRIDOR

LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

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APPENDIX E
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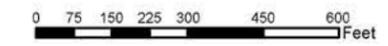
ACCESS & USE INVENTORY



LEGEND

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- DRAINAGE INLET
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- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

ALAMEDA DRAIN CORRIDOR



APPENDIX E SHEET 8 of 12



ACCESS & USE INVENTORY



ALAMEDA DRAIN CORRIDOR

LEGEND

- EXISTING MULTI-USE TRAIL
- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

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ACCESS & USE INVENTORY



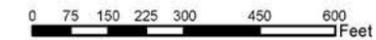
ALAMEDA DRAIN CORRIDOR

LEGEND

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- UNLICENSED PARKING
- DRAINAGE INLET
- PRIMARY ACCESS-LICENSED
- PRIMARY ACCESS-UNLICENSED
- SECONDARY ACCESS-LICENSED
- SECONDARY ACCESS-UNLICENSED

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APPENDIX E
SHEET 10 of 12

ACCESS & USE INVENTORY



LEGEND

	EXISTING MULTI-USE TRAIL
	UNLICENSED PARKING
	DRAINAGE INLET
	PRIMARY ACCESS-LICENSED
	PRIMARY ACCESS-UNLICENSED
	SECONDARY ACCESS-LICENSED
	SECONDARY ACCESS-UNLICENSED

ALAMEDA DRAIN CORRIDOR



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ACCESS & USE INVENTORY



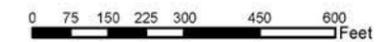
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LEGEND

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- SECONDARY ACCESS-LICENSED
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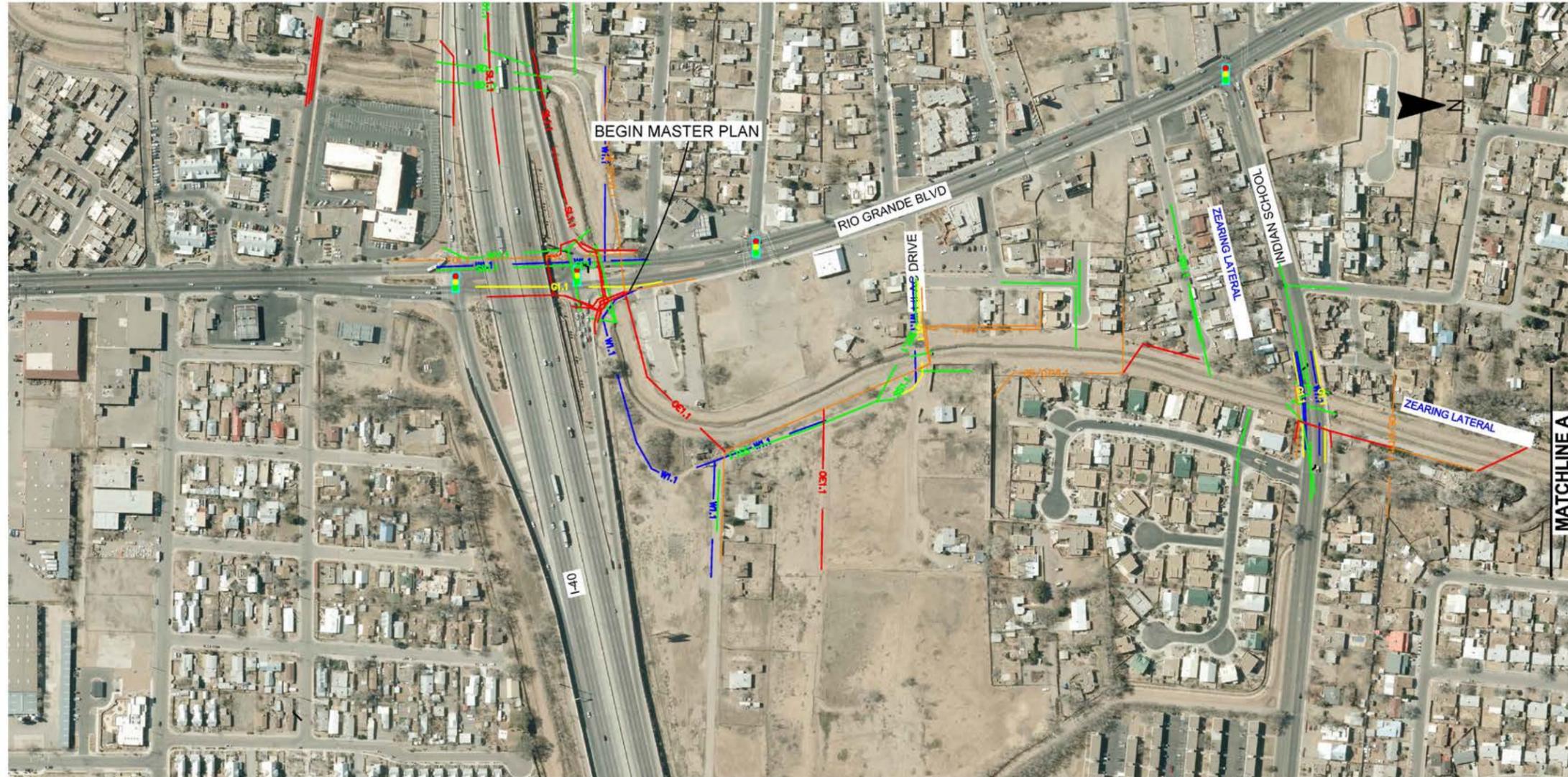
APPENDIX E
SHEET 12 of 12

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12. **Appendix F**
Existing Utilities Inventory

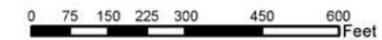


EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

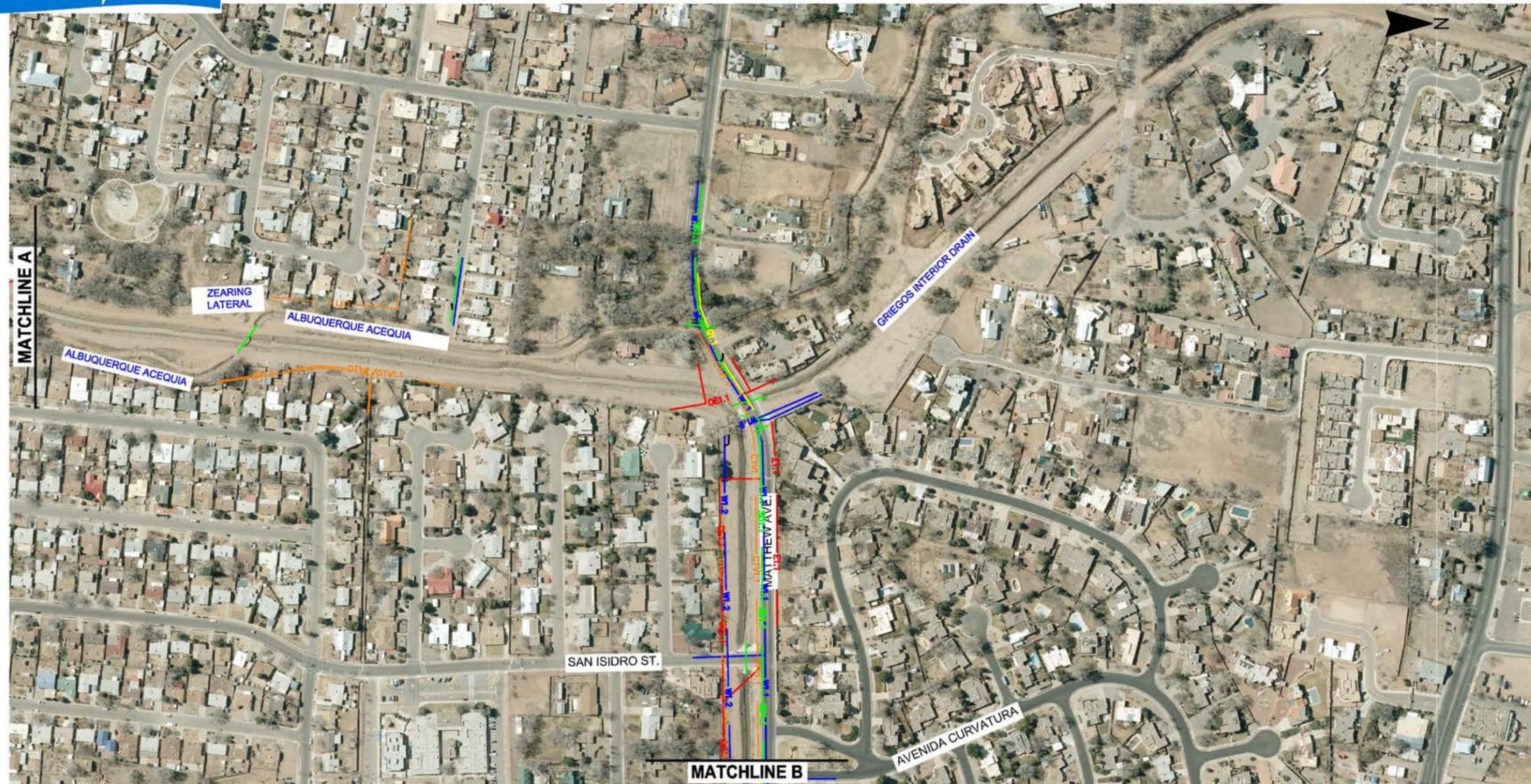
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OT1.1	OH TELEPHONE - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.1	STORM DRAIN - ABCWUA		
OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		



APPENDIX F
SHEET 1 of 12



EXISTING UTILITIES INVENTORY

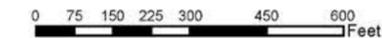


ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:	SL1.1	STREET LIGHT - PNM	FO1.2	FIBER OPTIC - Level 3
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FO1.1	FIBER OPTIC - Century link	GI.1	GAS - New Mexico Gas	FO1.X	FIBER OPTIC - Zayo
OT1.1	OH TELEPHONE - Century Link	WI.1	WATER - ABCWUA	WI.2	WATER - San Juan Chama
OF01.X	OH FIBER OPTIC - Century Link	SS1.1	SANITARY SEWER - ABCWUA		
CTV1.1	CATV - Comcast	SD1.1	STORM DRAIN - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.2	STORM DRAIN Bernalillo County		
OF03.1	OH FIBER OPTIC - Comcast	TS1.1	TRAFFIC - City of Albuquerque		
E1.1	UG ELECTRIC - PNM	OF02.1	OH FIBER OPTIC - Level 3		

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SHEET 2 of 12

EXISTING UTILITIES INVENTORY



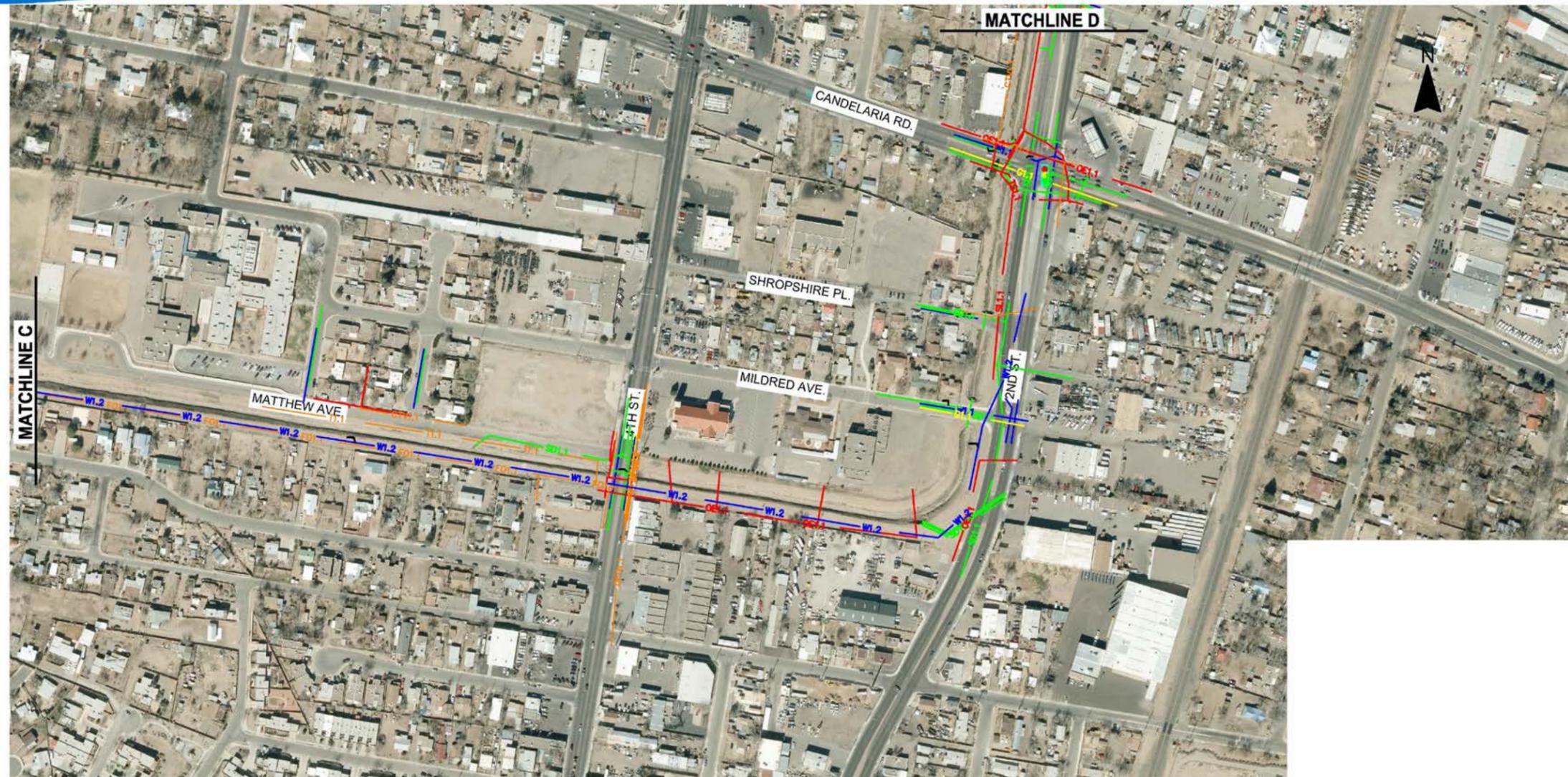
ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:				
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F01.1	FIBER OPTIC - Century link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
OT1.1	OH TELEPHONE - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.1	STORM DRAIN - ABCWUA		
OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		



APPENDIX F
SHEET 3 of 12

EXISTING UTILITIES INVENTORY

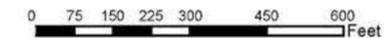


ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:				
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FO1.1	FIBER OPTIC - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
OT1.1	OH TELEPHONE - Century Link	GI.1	GAS - New Mexico Gas	FO1.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	WI.1	WATER - ABCWUA	WI.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.1	STORM DRAIN - ABCWUA		
OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		

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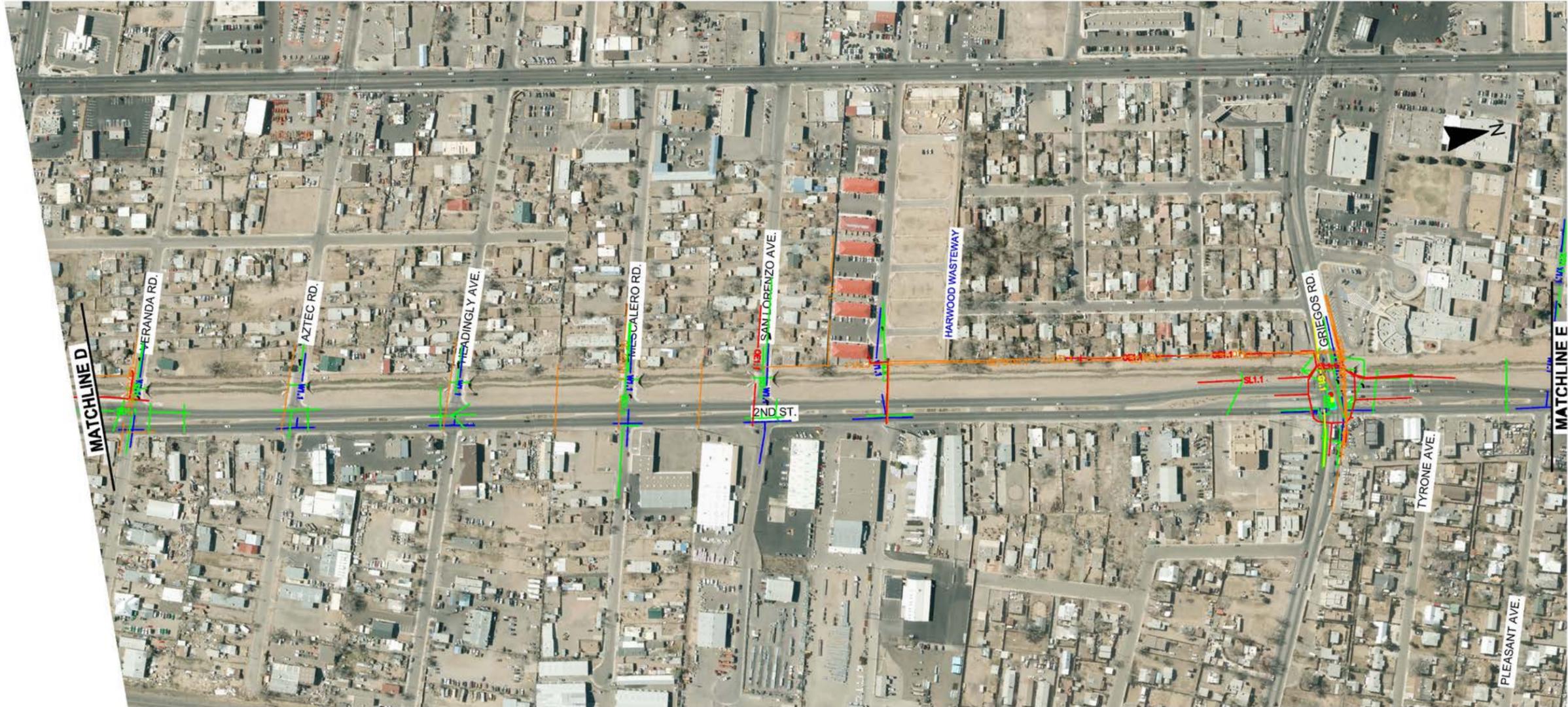
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APPENDIX F
SHEET 4 of 12



EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:	SL1.1	STREET LIGHT - PNM	F01.2	FIBER OPTIC - Level 3
T1.1	TELEPHONE - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
F01.1	FIBER OPTIC - Century link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OT1.1	OH TELEPHONE - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
OF01.X	OH FIBER OPTIC - Century Link	SS1.1	SANITARY SEWER - ABCWUA		
CTV1.1	CATV - Comcast	SD1.1	STORM DRAIN - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.2	STORM DRAIN Bernalillo County		
OF03.1	OH FIBER OPTIC - Comcast	TS1.1	TRAFFIC - City of Albuquerque		
E1.1	UG ELECTRIC - PNM	OF02.1	OH FIBER OPTIC - Level 3		

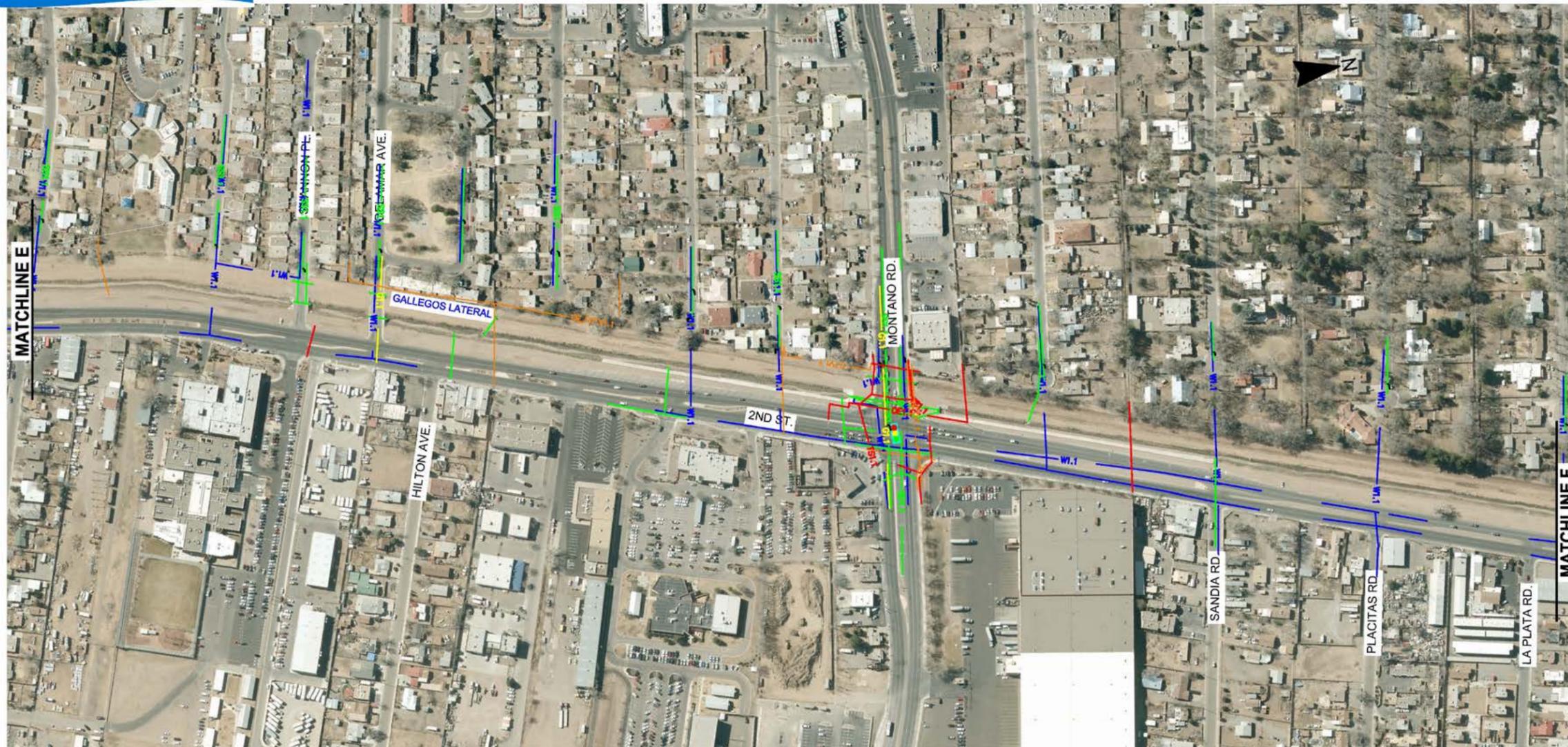


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APPENDIX F
SHEET 5 of 12

EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

<p>Quality Level C/D</p> <ul style="list-style-type: none"> T1.1 F01.1 OT1.1 OF01.X CTV1.1 OE/OTV1.1 OF03.1 E1.1 	<p>Utility:</p> <ul style="list-style-type: none"> TELEPHONE - Century Link FIBER OPTIC - Century link OH TELEPHONE - Century Link OH FIBER OPTIC - Century Link CATV - Comcast CATV/ELECTRIC - Comcast/PNM OH FIBER OPTIC - Comcast UG ELECTRIC - PNM 	<ul style="list-style-type: none"> SL1.1 OE1.1 GS1.1 W1.1 SS1.1 SD1.1 SD1.2 TS1.1 OF02.1 	<ul style="list-style-type: none"> STREET LIGHT - PNM OH ELECTRIC - PNM GAS - New Mexico Gas WATER - ABCWUA SANITARY SEWER - ABCWUA STORM DRAIN - ABCWUA STORM DRAIN Bernalillo County TRAFFIC - City of Albuquerque OH FIBER OPTIC - Level 3 	<ul style="list-style-type: none"> F01.2 OF01.1 F01.X W1.2 	<ul style="list-style-type: none"> FIBER OPTIC - Level 3 OH FIBER OPTIC - Verizon FIBER OPTIC - Zayo WATER - San Juan Chama
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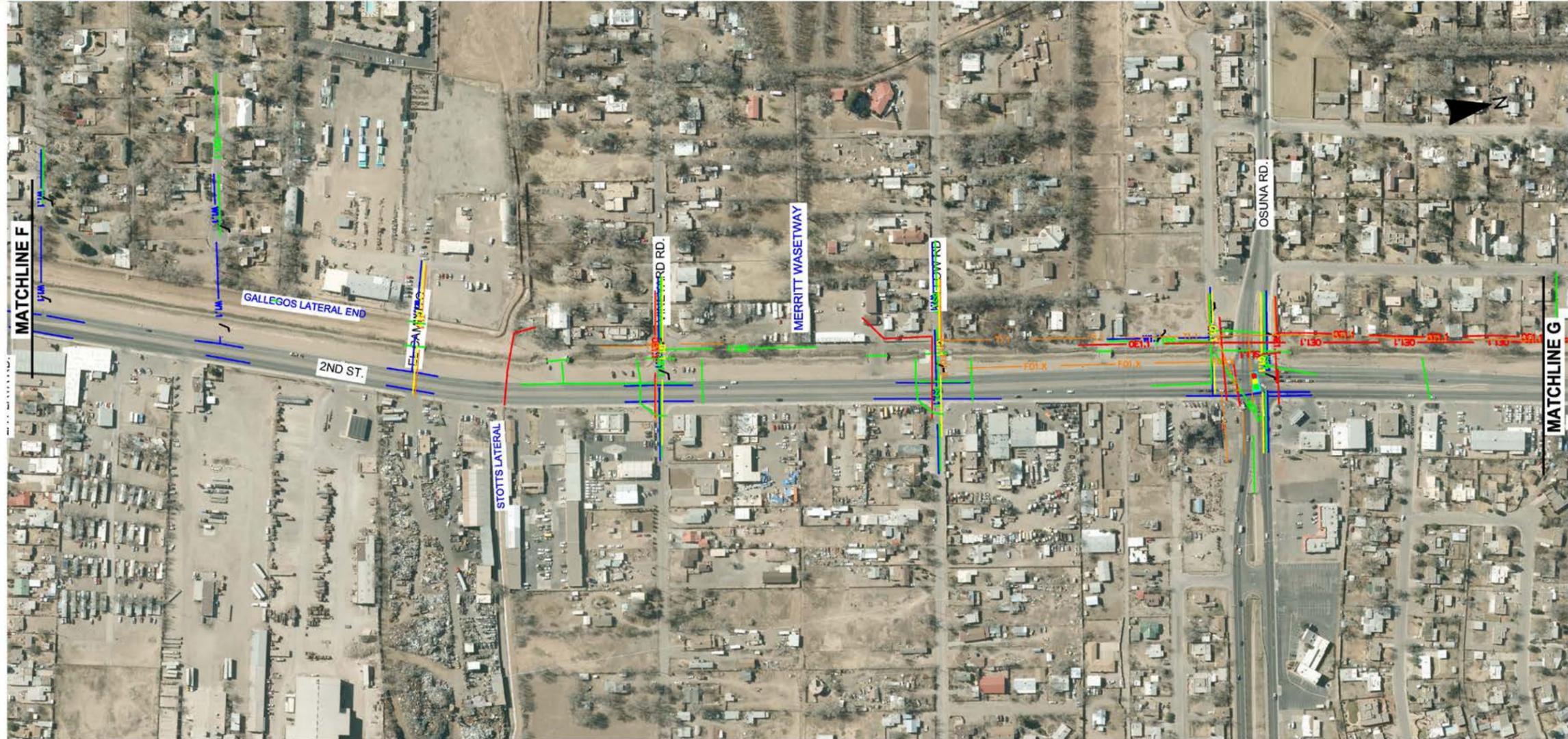
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APPENDIX F
SHEET 6 of 12



EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:	SL1.1	STREET LIGHT - PNM	F01.2	FIBER OPTIC - Level 3
TI.1	TELEPHONE - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
F01.1	FIBER OPTIC - Century link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OT1.1	OH TELEPHONE - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
OF01.X	OH FIBER OPTIC - Century Link	SS1.1	SANITARY SEWER - ABCWUA		
CTV1.1	CATV - Comcast	SD1.1	STORM DRAIN - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.2	STORM DRAIN Bernalillo County		
OF03.1	OH FIBER OPTIC - Comcast	TS1.1	TRAFFIC - City of Albuquerque		
E1.1	UG ELECTRIC - PNM	OF02.1	OH FIBER OPTIC - Level 3		

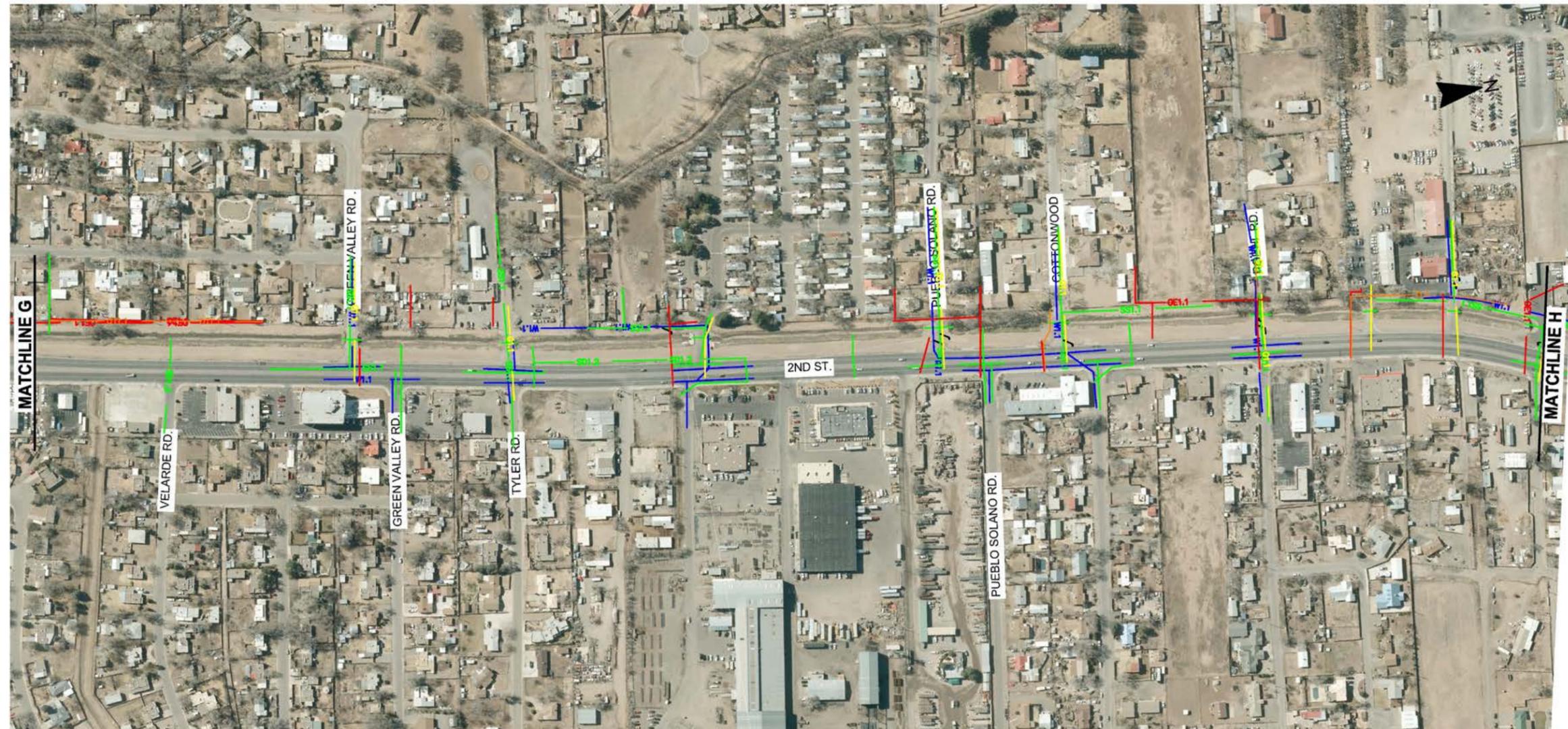


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APPENDIX F
SHEET 7 of 12

EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

Quality Level C/D	UTILITY:	SL1.1	STREET LIGHT - PNM	F01.2	FIBER OPTIC - Level 3
T1.1	TELEPHONE - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
F01.1	FIBER OPTIC - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OT1.1	OH TELEPHONE - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
OF01.X	OH FIBER OPTIC - Century Link	SS1.1	SANITARY SEWER - ABCWUA		
CTV1.1	CATV - Comcast	SD1.1	STORM DRAIN - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.2	STORM DRAIN Bernalillo County		
OF03.1	OH FIBER OPTIC - Comcast	TS1.1	TRAFFIC - City of Albuquerque		
E1.1	UG ELECTRIC - PNM	OF02.1	OH FIBER OPTIC - Level 3		

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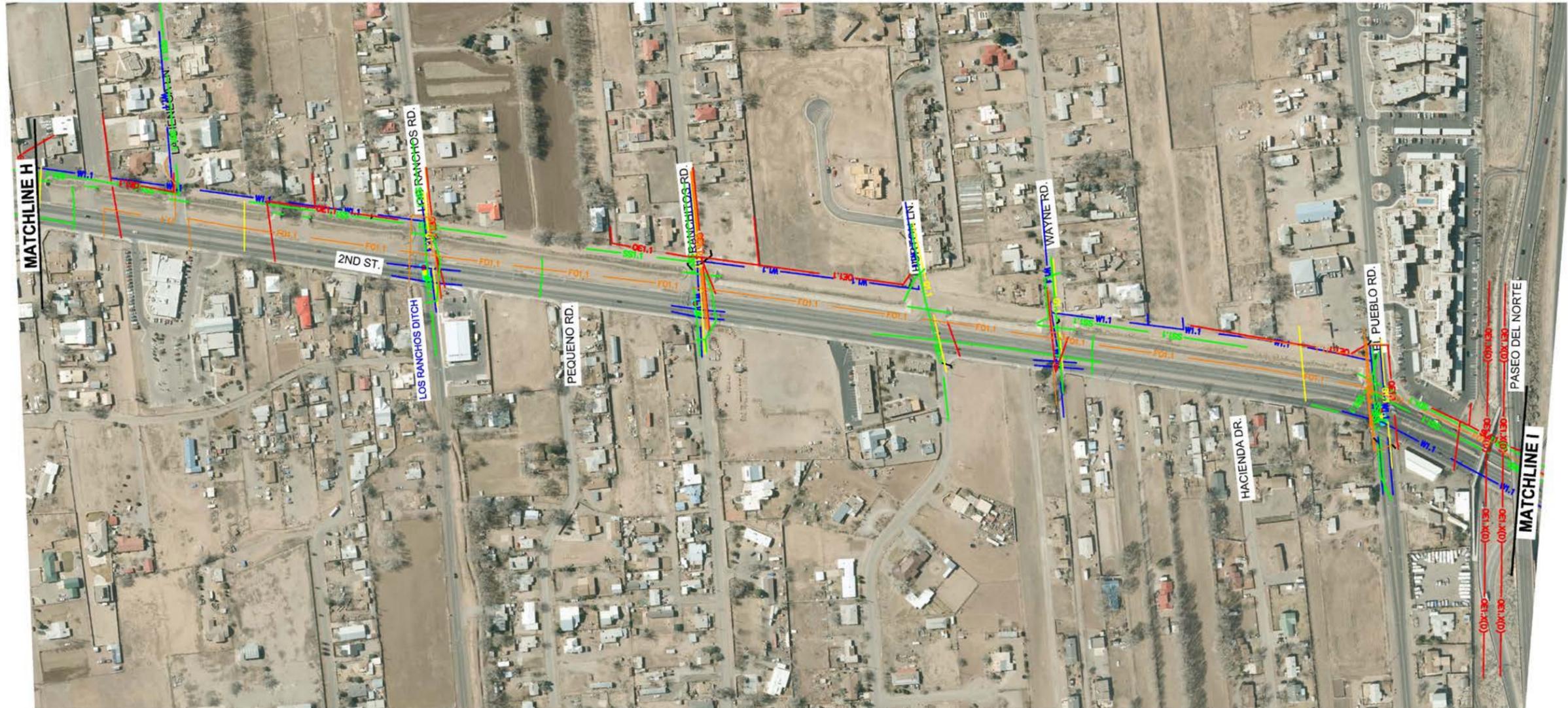
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APPENDIX F
SHEET 8 of 12



EXISTING UTILITIES INVENTORY

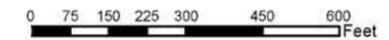


ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:				
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F01.1	FIBER OPTIC - Century link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
OT1.1	OH TELEPHONE - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
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OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		

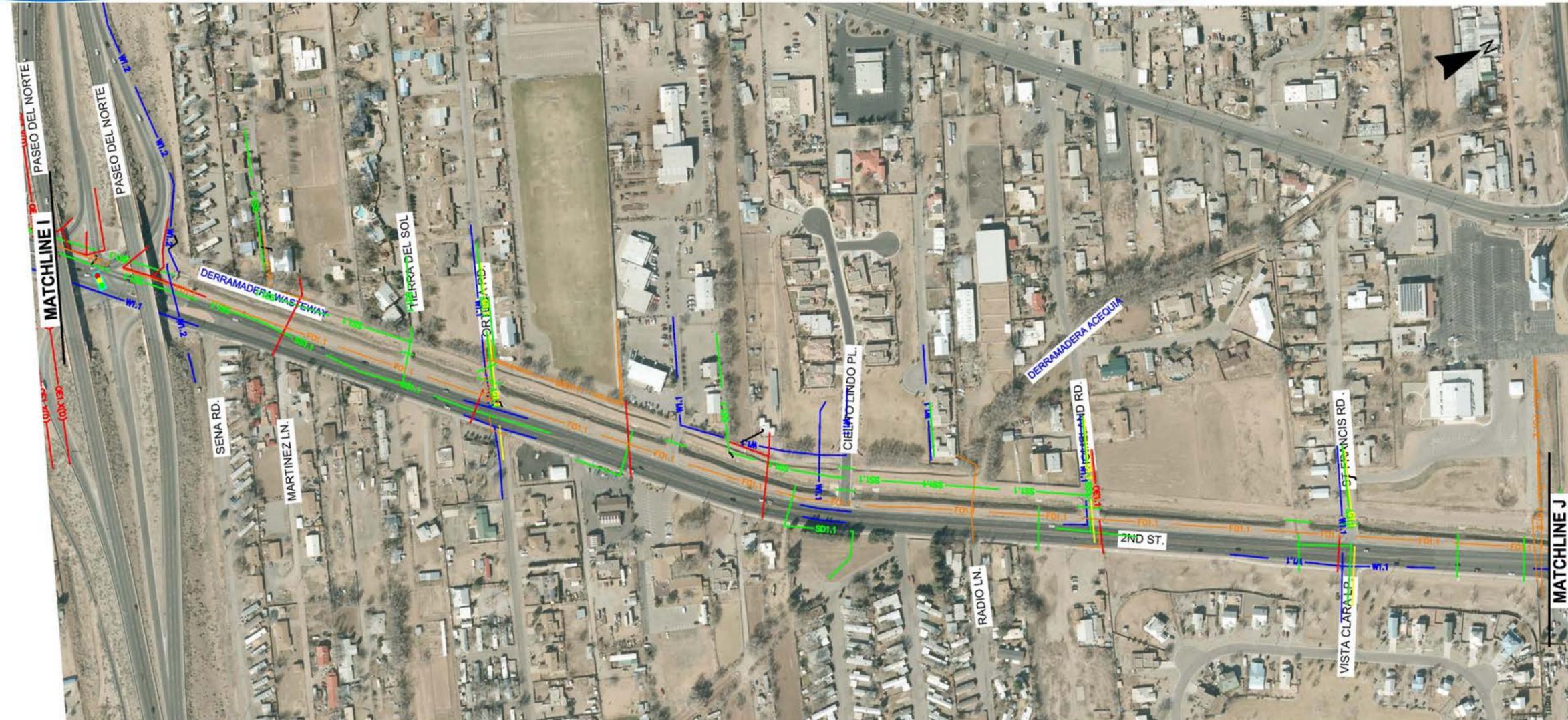
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APPENDIX F
SHEET 9 OF 12

EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility	Quality Level C/D	Utility	Quality Level C/D	Utility
TL1.1	TELEPHONE - Century Link	SL1.1	STREET LIGHT - PNM	F01.2	FIBER OPTIC - Level 3
F01.1	FIBER OPTIC - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
OT1.1	OH TELEPHONE - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.1	STORM DRAIN - ABCWUA		
OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		



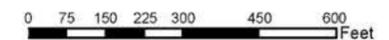
APPENDIX F SHEET 10 of 12

EXISTING UTILITIES INVENTORY



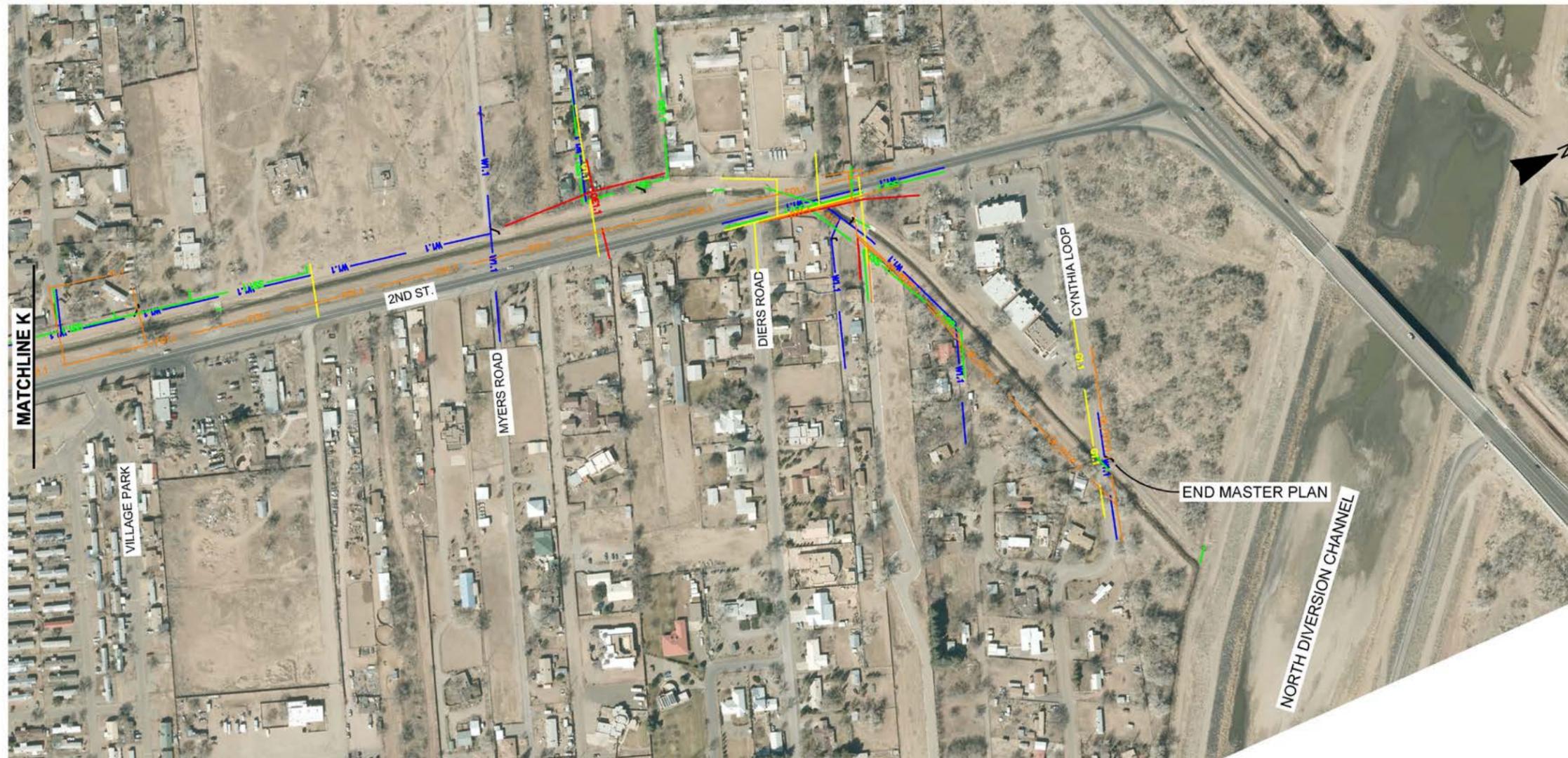
ALAMEDA DRAIN CORRIDOR

Quality Level C/D	Utility:				
T1.1	TELEPHONE - Century Link	SL1.1	STREET LIGHT - PNM	F01.2	FIBER OPTIC - Level 3
F01.1	FIBER OPTIC - Century Link	OE1.1	OH ELECTRIC - PNM	OF01.1	OH FIBER OPTIC - Verizon
OT1.1	OH TELEPHONE - Century Link	G1.1	GAS - New Mexico Gas	F01.X	FIBER OPTIC - Zayo
OF01.X	OH FIBER OPTIC - Century Link	W1.1	WATER - ABCWUA	W1.2	WATER - San Juan Chama
CTV1.1	CATV - Comcast	SS1.1	SANITARY SEWER - ABCWUA		
OE/OTV1.1	CATV/ELECTRIC - Comcast/PNM	SD1.1	STORM DRAIN - ABCWUA		
OF03.1	OH FIBER OPTIC - Comcast	SD1.2	STORM DRAIN Bernalillo County		
E1.1	UG ELECTRIC - PNM	TS1.1	TRAFFIC - City of Albuquerque		
		OF02.1	OH FIBER OPTIC - Level 3		



APPENDIX F SHEET 11 of 12

EXISTING UTILITIES INVENTORY



ALAMEDA DRAIN CORRIDOR

<p>Quality Level C/D</p> <ul style="list-style-type: none"> — T1.1 — TELEPHONE — Century Link — FO1.1 — FIBER OPTIC — Century Link — OT1.1 — OH TELEPHONE — Century Link — OF01.X — OH FIBER OPTIC — Century Link — CTV1.1 — CATV — Comcast — OE/OTV1.1 — CATV/ELECTRIC — Comcast/PNM — OF03.1 — OH FIBER OPTIC — Comcast — E1.1 — UG ELECTRIC — PNM 	<p>UTILITY:</p> <ul style="list-style-type: none"> — SL1.1 — STREET LIGHT — PNM — OE1.1 — OH ELECTRIC — PNM — G1.1 — GAS — New Mexico Gas — W1.1 — WATER — ABCWUA — SS1.1 — SANITARY SEWER — ABCWUA — SD1.1 — STORM DRAIN — ABCWUA — SD1.2 — STORM DRAIN Bernalillo County — TS1.1 — TRAFFIC — City of Albuquerque — OF02.1 — OH FIBER OPTIC — Level 3 	<ul style="list-style-type: none"> — FO1.2 — FIBER OPTIC — Level 3 — OF01.1 — OH FIBER OPTIC — Verizon — FO1.X — FIBER OPTIC — Zayo — W1.2 — WATER — San Juan Chama
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APPENDIX F
SHEET 12 OF 12

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13. Appendix G

Opportunities & Constraints

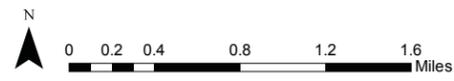
Alameda DRAIN & TRAIL Master Plan

Opportunities & Constraints



LEGEND

- Alameda Drain
- Interstate
- Multi-Use Trail - Paved Trail
- Designated Bike Lane
- Local Roads
- 50 Mile Loop
- Proposed 50 mile Loop extension
- Connectivity Opportunities
- Linkage Opportunities
- Connectivity Barriers
- Parks and Open Space
- Schools
- Places of Interest
- Existing Tree Cover & Landscaping
- Views
- Transit Connection
- Railrunner Station
- Potential Parking/Trailhead
- Prescription Rx Trails
- ABQ Ride



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Alameda DRAIN & TRAIL Master Plan

NORTHERN BOUNDARY – PASEO DEL NORTE SEGMENT



LEGEND

Alameda Drain Right-Of-Way < 41'	City Owned Parcels	Existing Tree Cover & Landscaping
Alameda Drain Right-Of-Way 20-40'	Connectivity Opportunities	Views
Alameda Drain Right-Of-Way > 20'	Transit Connection	Potential Parking/Trail-head
Existing Trail	Connectivity Barriers	Prescription Rx Trails
Existing Multi-Use Trails	Parks and Open Space	Rail Runner Station
Existing 50-Mile Loop	Schools	
County Owned Parcels	Places of Interest	

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Alameda DRAIN & TRAIL Master Plan

PASEO DEL NORTE – MONTAÑO ROAD SEGMENT



LEGEND

Alameda Drain Right-Of-Way < 41'	City Owned Parcels	Existing Tree Cover & Landscaping
Alameda Drain Right-Of-Way 20-40'	Connectivity Opportunities	Views
Alameda Drain Right-Of-Way > 20'	Transit Connection	Potential Parking/Trail-head
Existing Trail	Connectivity Barriers	Prescription Rx Trails
Existing Multi-Use Trails	Parks and Open Space	Rail Runner Station
Existing 50-Mile Loop	Schools	
County Owned Parcels	Places of Interest	

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Alameda DRAIN & TRAIL Master Plan

PASEO DEL NORTE – MONTAÑO ROAD SEGMENT



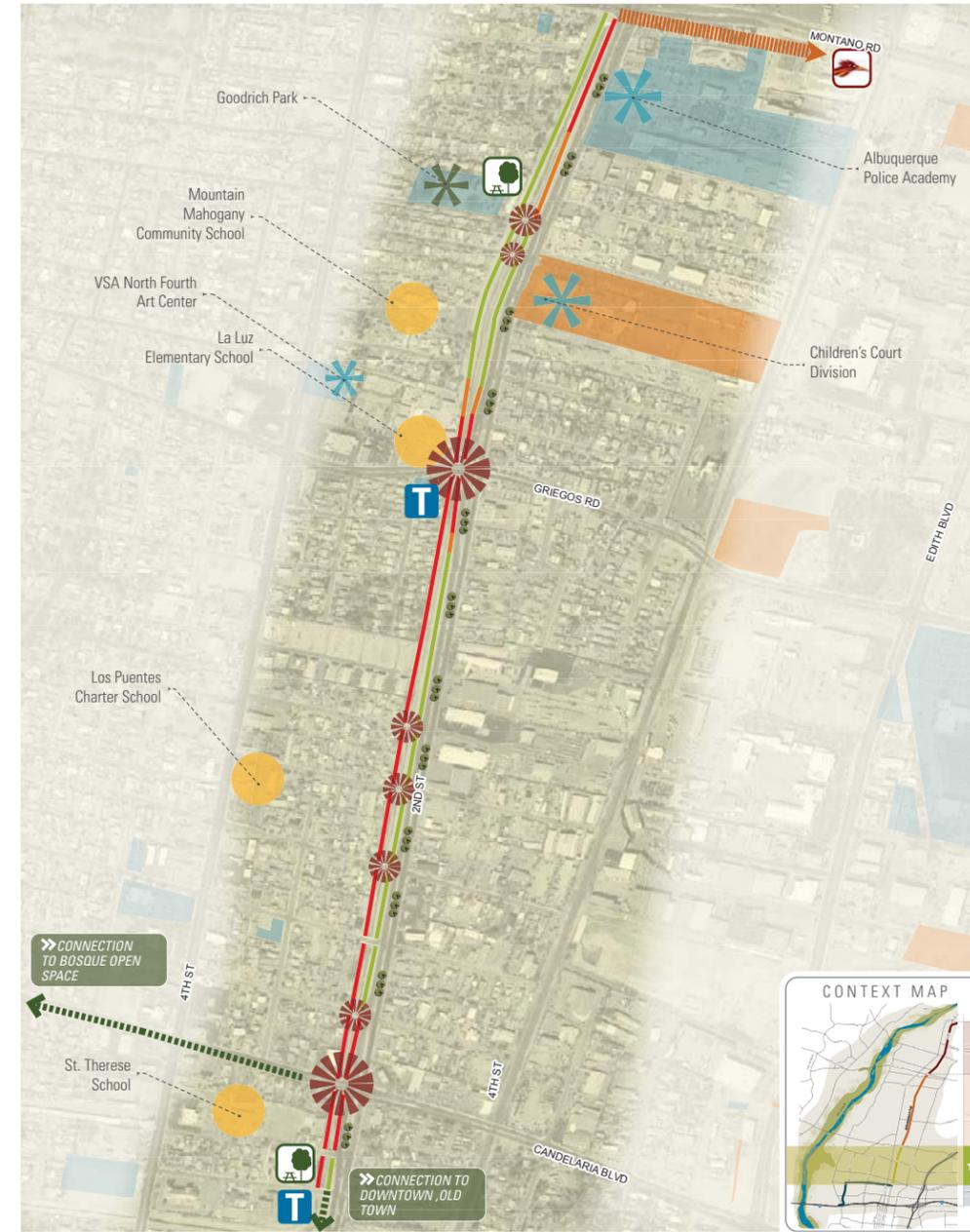
LEGEND

Alameda Drain Right-Of-Way < 41'	City Owned Parcels	Existing Tree Cover & Landscaping Views
Alameda Drain Right-Of-Way 20-40'	Connectivity Opportunities	Potential Parking/Trail-head
Alameda Drain Right-Of-Way > 20'	Transit Connection	Prescription Rx Trails
Existing Trail	Connectivity Barriers	Rail Runner Station
Existing Multi-Use Trails	Parks and Open Space	
Existing 50-Mile Loop	Schools	
County Owned Parcels	Places of Interest	

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Alameda DRAIN & TRAIL Master Plan

MONTAÑO ROAD – MILDRED AVENUE SEGMENT



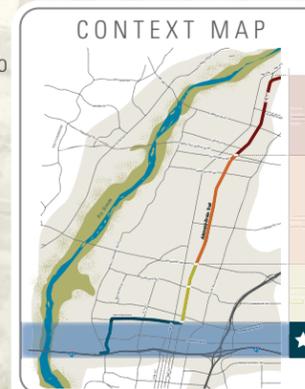
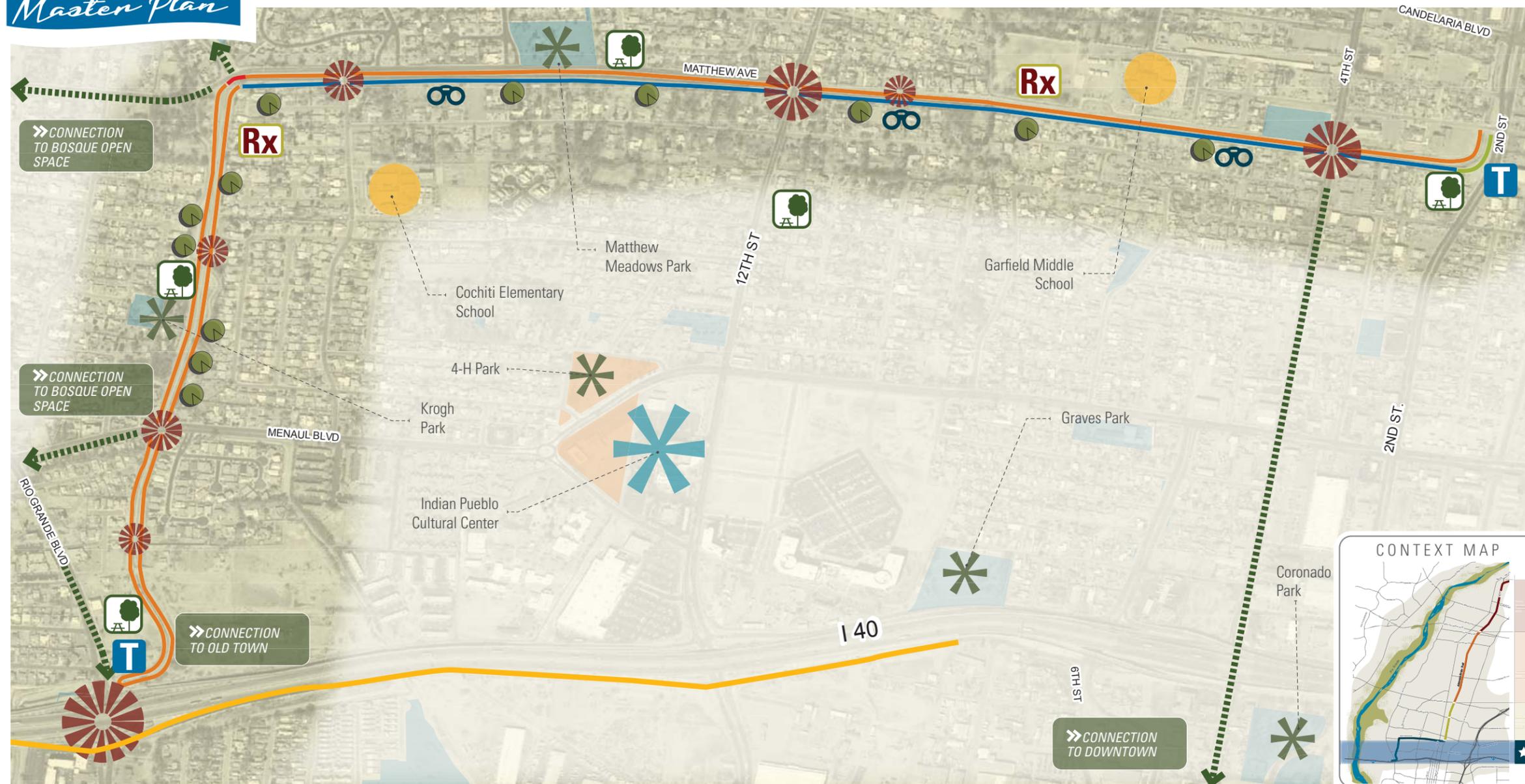
LEGEND

Alameda Drain Right-Of-Way < 41'	City Owned Parcels	Existing Tree Cover & Landscaping Views
Alameda Drain Right-Of-Way 20-40'	Connectivity Opportunities	Potential Parking/Trail-head
Alameda Drain Right-Of-Way > 20'	Transit Connection	Prescription Rx Trails
Existing Trail	Connectivity Barriers	Rail Runner Station
Existing Multi-Use Trails	Parks and Open Space	
Existing 50-Mile Loop	Schools	
County Owned Parcels	Places of Interest	

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Alameda Drain & Trail Master Plan

MILDRED AVENUE – INTERSTATE 40 SEGMENT



LEGEND

- | | | | | |
|-----------------------------------|---------------------------|----------------------------|-----------------------------------|------------------------------|
| Alameda Drain Right-Of-Way < 41' | Existing Multi-Use Trails | Connectivity Opportunities | Schools | Potential Parking/Trail-head |
| Alameda Drain Right-Of-Way 20-40' | Existing 50-Mile Loop | Transit Connection | Places of Interest | Prescription Rx Trails |
| Alameda Drain Right-Of-Way > 20' | County Owned Parcels | Connectivity Barriers | Existing Tree Cover & Landscaping | Rail Runner Station |
| Existing Trail | City Owned Parcels | Parks and Open Space | Views | |

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Alameda
DRAIN & TRAIL
Master Plan
DESIGN
OPPORTUNITIES
PRECEDENT IMAGES

Celebrating Water

Water Features -

WATER IN NEW MEXICO IS A SCARCE AND PRECIOUS RESOURCE. THE DRAIN OFFERS A UNIQUE OPPORTUNITY TO INTERACT, OBSERVE, AND EXPERIENCE THE MOVEMENT OF WATER. DRAIN OUTFALLS CREATE OPPORTUNITIES TO PREVENT EROSION AND ENHANCE WATER QUALITY. AS SEEN TO THE RIGHT AND BELOW, OUTFALLS CAN ALSO BE DESIGNED FOR THE VISUAL PLEASURE OF TRAIL USERS.



▲ WATER FEATURES INSTALLED AT DRAIN OUTFALLS.



▲ GABIONS STABILIZING RIVER BANKS



▲ GABIONS WITH PLANTS GROWING FROM THE ROCKS.



▲ DRIPPING BRIDGE TO EXEMPLIFY THE MOTION AND SOUND OF FALLING WATER



▲ WATER FEATURES



▲ GABIONS STABILIZING RIVER BANKS



▲ GABIONS WITH WATER FEATURE



Gabions

GABIONS ARE METAL CAGES, CYLINDERS, OR BOXES FILLED WITH ROCKS, CONCRETE, OR OTHER MATERIALS. GABIONS PREVENT EROSION, AND STABILIZE RIVER/CHANNEL BANKS. GABIONS CAN BE INSTALLED AT A SECTION OF THE PROPOSED TRAIL, TO STABILIZE THE DRAIN BANKS, AND BRING VISITORS CLOSER TO THE WATER, WHILE ALSO PROVIDING AN OPPORTUNITY TO ENHANCE THE WATER QUALITY AND CREATE HABITAT FOR NATIVE PLANTS AND WILDLIFE.



DESIGN OPPORTUNITIES PRECEDENT IMAGES

Trail Surfaces

Trail surfaces - TRAIL SURFACES IMPACT THE CHARACTER, FUNCTION, COST AND MAINTENANCE OF A TRAIL. THERE ARE FOUR BASIC OPTIONS: UNIMPROVED (PACKED EARTH), CRUSHER FINES (A FORM OF GRAVEL), ASPHALT AND CONCRETE. CRUSHER FINES GIVE A MORE RUSTIC CHARACTER TO A TRAIL, BUT REQUIRE MORE MAINTENANCE. HIKERS AND JOGGERS TEND TO PREFER SOFTER SURFACES SUCH AS CRUSHER FINES. EQUESTRIANS FAVOR UNIMPROVED OR PACKED EARTH SURFACES. CYCLISTS, PARTICULARLY CYCLISTS ON ROAD BIKES, PREFER EITHER ASPHALT OR CONCRETE. CONCRETE TENDS TO BE THE MOST DURABLE SURFACE. ASPHALT ALSO HAS A LOWER INSTALLATION COST.

IN SOME SECTIONS, THE ALAMEDA DRAIN IS WIDE ENOUGH TO HAVE A PAVED TRAIL ON ONE SIDE, AND AN UNIMPROVED, LESS FORMAL, TRAIL ON THE OTHER SIDE.



▲ PAVED TRAIL (BOSQUE TRAIL)



▲ PAVED TRAIL WITH UNPAVED EQUESTRIAN TRAIL (BOSQUE TRAIL)



▲ PAVED TRAIL (BOSQUE TRAIL)



▲ CRUSHER FINES (ELK MEADOW PARK, COLORADO)



▲ SECTION SHOWING THE POTENTIAL LOCATION OF THE TRAIL.



▲ PAVED TRAIL (DALLAS)



▲ PAVED TRAIL (SANTA FE)



Alameda DRAIN & TRAIL Master Plan

DESIGN OPPORTUNITIES PRECEDENT IMAGES

Intensections

Intensection crossings MARK THE INTENDED PATH OF TRAIL USERS. THEY GUIDE THE USER ON A SAFE AND DIRECT PATH THROUGH INTERSECTIONS, INCLUDING DRIVEWAYS AND RAMPS. THEY PROVIDE A CLEAR BOUNDARY BETWEEN THE PATHS OF BICYCLISTS AND MOTOR VEHICLES. TO PROMOTE THE SAFEST CROSSING, THE CROSSINGS SHOULD BE COLORED OR TEXTURED.



▲ COLORFUL INTERSECTION CROSSING MARKING



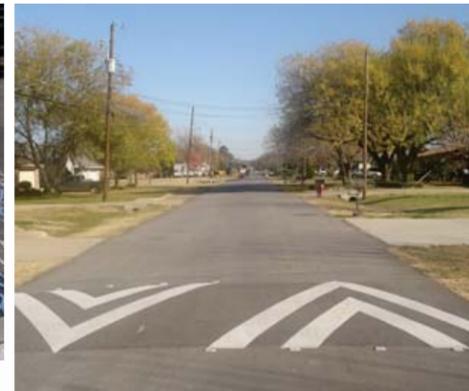
▲ CHANGING THE TEXTURE AT INTERSECTIONS



▲ CROSSWALK MARKINGS



▲ "DURATHERM" CROSSWALK MARKINGS - INDIANAPOLIS-CULTURAL-TRAIL



▲ MINI-SPEED TABLE



▲ MINI-SPEED TABLE TO PROTECT TRAIL USERS AT CROSSINGS



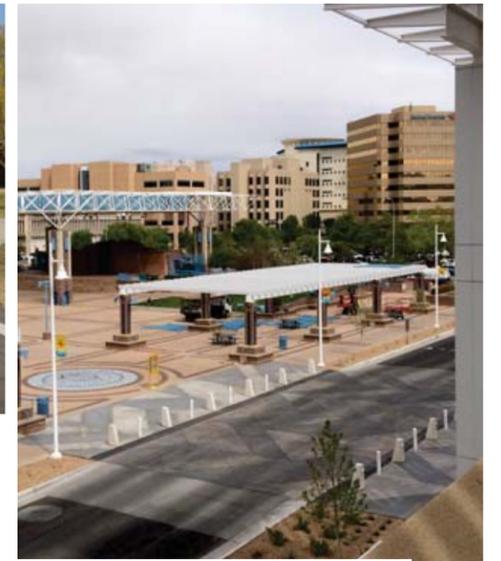
▲ INTERSECTION CROSSING MARKING



▲ INTERSECTION CROSSING



▲ INTERSECTION CROSSING



▲ MINI-SPEED TABLE AT THE CONVENTION CENTER

Mini Speed Tables - SPEED TABLES ARE TRAFFIC CALMING DEVICES THAT SLOW TRAFFIC BY RAISING THE WHOLE WHEELBASE OF A VEHICLE. AT THE SAME TIME SPEED TABLES CREATE A LEVELED CROSSWALK FOR PEDESTRIANS AND CYCLISTS. AN EXAMPLE CAN BE FOUND AT THE CIVIC PLAZA IN ALBUQUERQUE.



▲ NACTO MINI-SPEED TABLE



Alameda DRAIN TRAIL Master Plan

DESIGN OPPORTUNITIES PRECEDENT IMAGES

Art & Signage

Signage - A HIERARCHY OF SIGNAGE CAN BE INSTRUCTIONAL, FOR EXAMPLE TELLING ABOUT THE LOCAL HISTORY OR LEARNING ABOUT WATER AND DRAINAGE, INFORMATIVE, AND APPROPRIATE TO THE AREA.



▲ PUBLIC ART MADE FROM RECYCLED MATERIALS

▲ GATEWAY MADE FROM RECYCLED MATERIALS

Public Art - THERE ARE MANY OPPORTUNITIES ALONG THE TRAIL TO INTRODUCE PUBLIC ART. IT CAN BE HISTORICAL, FUN AND WHIMSICAL, USE NATURAL MATERIALS, FOUND OBJECTS, ABSTRACT OR LITERAL. MOSAICS OR MURALS COULD ALSO BE PLACED ALONG THE DRAIN, EXPRESSING LOCAL ART AND HISTORY.



▲▼ SIGNAGE EXAMPLES



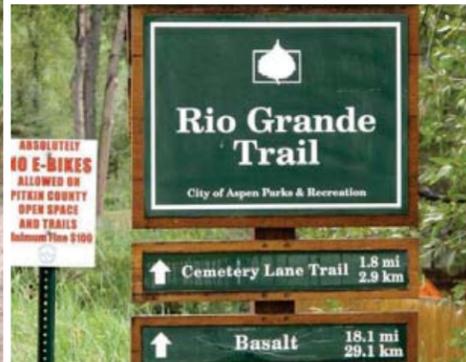
▲ COLORFUL MOSAICS, OLD TOWN ALBUQUERQUE



▲ PUBLIC ART MADE FROM RECYCLED MATERIALS



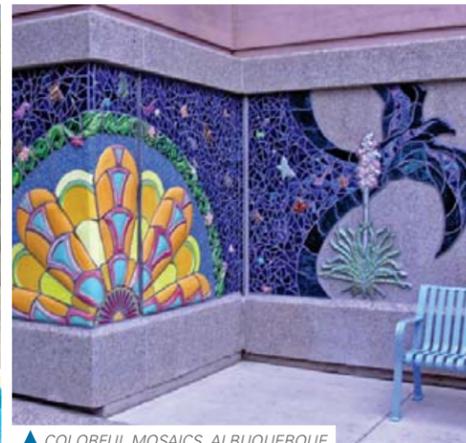
▲ MOSAIC MIMICKING WATER



▲ PUBLIC ART MADE FROM RECYCLED MATERIALS



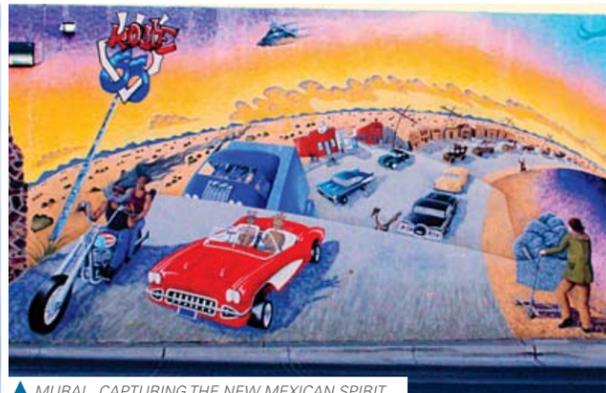
▲ EXAMPLE FOR A GATEWAY FOUND IN THE NEIGHBORHOODS SURROUNDING THE TRAIL.



▲ COLORFUL MOSAICS, ALBUQUERQUE



▲ PUBLIC ART MADE FROM RECYCLED MATERIALS



▲ MURAL, CAPTURING THE NEW MEXICAN SPIRIT



Alameda DRAIN & TRAIL Master Plan

DESIGN OPPORTUNITIES PRECEDENT IMAGES

Events & Activities

Events and activities

CAN BE HOSTED ALONG THE PATH OF THE PROPOSED TRAIL. THESE ACTIVITIES CAN BRING THE LOCAL COMMUNITY TOGETHER AND STRENGTHEN THE CONNECTION BETWEEN ADJACENT NEIGHBORHOODS.

ACTIVITIES COULD INCLUDE FOOD COURTS AS WELL AS ART INSTALLATIONS OR EVENTS THAT INCLUDE THE DRAIN.

AN ACTIVITY ALREADY PRESENT AT THE NORTHER EDGE OF THE DRAIN IS BMX SPORTS. ACTIVITIES COULD INCORPORATE THIS ELEMENT AND INTRODUCED A LINEAR BIKE OBSTACLE COURSES ALONG THE DRAIN.

THE PASEO DEL NORTE UNDERPASS CAN BE FACILITATED TO SERVE AS AN ART SPACE. THIS WILL ENHANCE THE USERS EXPERIENCE AND ALSO PROVIDE A SPACE FOR LOCAL ARTISTS.



▲ FOOD TRUCKS



▲ FOOD TRUCKS



▲ RUBBER DUCK RACE



▲ POSSIBLE INSTALLATION FOR PASEO DEL NORTE UNDERPASS



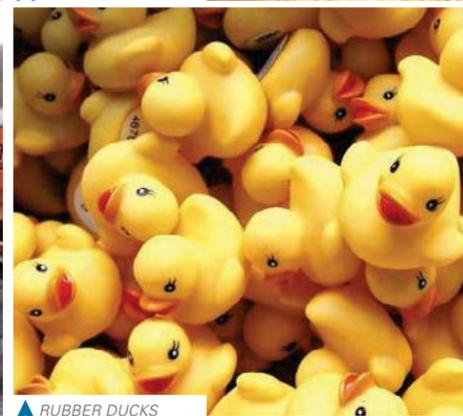
▲ BIKE OBSTACLE COURSE



▲ BIKE OBSTACLE COURSE



▲ FOOD COURT



▲ RUBBER DUCKS



▲ POSSIBLE INSTALLATION FOR PASEO DEL NORTE UNDERPASS



▲ BBQ AT A FOOD COURT



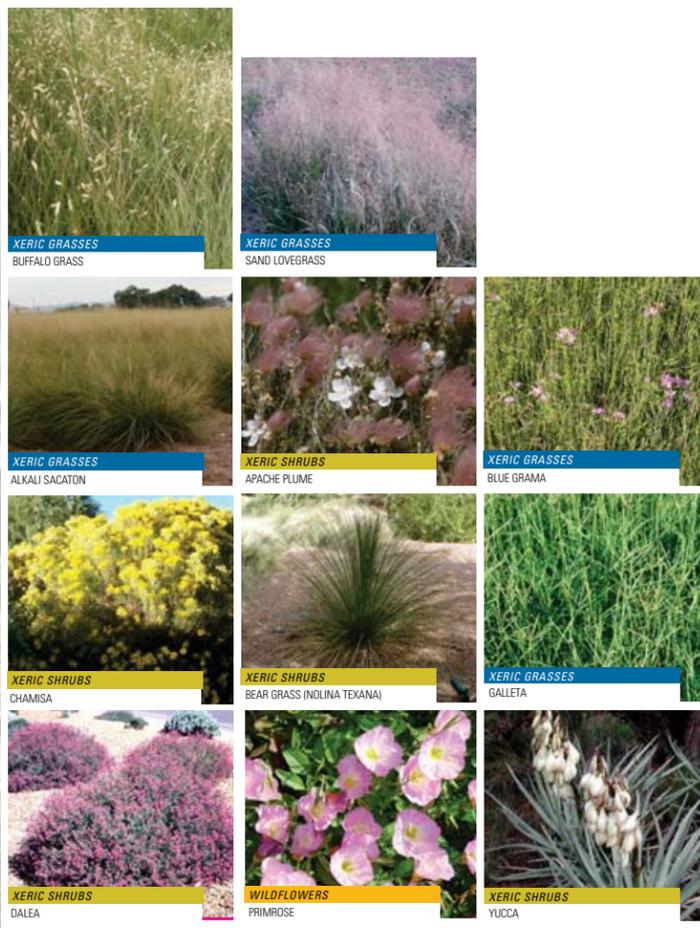
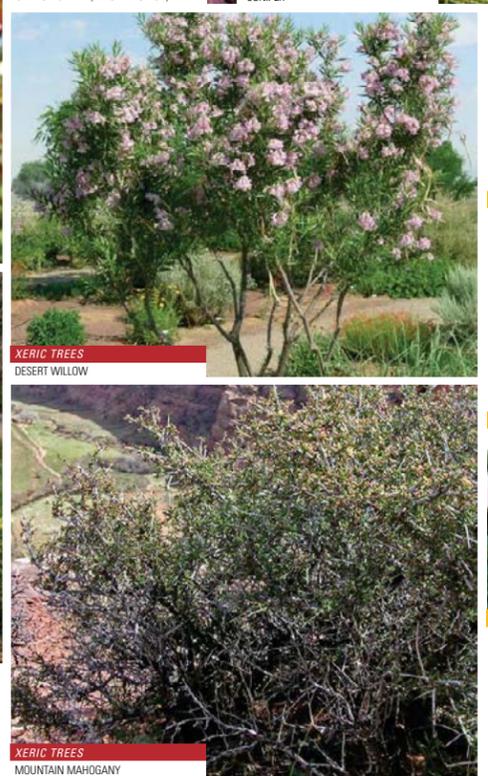
▲ TOY BOAT RACES



Alameda DRAIN & TRAIL
 Master Plan
 DESIGN OPPORTUNITIES
 PRECEDENT IMAGES

Landscape

Edibles - A LARGE NUMBER OF NATIVE PLANTS ARE EDIBLE AND CAN BE PLANTED ALONG THE TRAIL. ACCORDINGLY THE PLANTED LANDSCAPE WOULD HELP REINTRODUCE AGRICULTURE INTO THE AREA.



Native - NATIVE GRASSES, PLANTS AND WILDFLOWERS CAN TAKE ADVANTAGE OF STORM WATER RUNOFF FROM THE TRAIL. GOOD STANDS OF GRASSES AND OTHER NATIVE PLANTS CAN SIGNIFICANTLY REDUCE GOATHEADS (PUNCTURE VINE). WHEN ESTABLISHED, NATIVE GRASSES, WILDFLOWERS AND OTHER DESIRABLE PLANTS, WILL OUT-COMPETE WEEDS AND PROVIDE THE ADDED BENEFIT OF PROTECTING THE TRAIL SHOULDER FROM EROSION.



Alameda DRAIN & TRAIL Master Plan

DESIGN OPPORTUNITIES

Drain History

THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT (MRGCD) IS CHARGED WITH MAINTENANCE AND MONITORING OF DRAINAGE AND IRRIGATION SYSTEMS IN THE MIDDLE RIO GRANDE VALLEY.

THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT (MRGCD) MAINTAINS AND REHABILITATES THE INTRICATE SYSTEMS OF DITCHES, CANALS AND LEVEES THAT PREVENT THE RIO GRANDE FROM OVERFLOWING ITS BANKS WHILE ALSO ALLOWING FOR IRRIGATION, AGRICULTURE, RECREATION, AND ENVIRONMENTAL SUSTAINABILITY.

AT THE TIME OF THE CONSERVANCY'S CREATION IN 1923, THE FLOW OF THE RIO GRANDE THROUGH CENTRAL NEW MEXICO FLUCTUATED DANGEROUSLY AND UNPREDICTABLY. INCREASING LEVELS OF SILT COLLECTED IN THE MIDDLE RIO GRANDE VALLEY, RAISING THE LEVEL OF THE RIVERBED AND THE WATER TABLE.

THE SHALLOW WATER TABLE THROUGHOUT THE VALLEY TURNED OVER 60,000 ACRES OF FARMLAND INTO SWAMPS OR ALKALI AND SALT GRASS FIELDS. FREQUENT FLOODS OFTEN DESTROYED ENTIRE VILLAGES; ONE SCoured A PATH RIGHT THROUGH WHAT IS NOW DOWNTOWN ALBUQUERQUE.

THE MRGCD WAS CREATED TO PROVIDE FLOOD PROTECTION FROM THE RIO GRANDE, DRAIN SWAMPLANDS AND PROVIDE IRRIGATION WATER TO FARMLANDS. BY 1935, THE CONSERVANCY HAD DUG 17 MILES OF NEW DRAINAGE AND IRRIGATION CANALS TO FUNNEL



▲ FARMLAND TURNED INTO SWAMPS AND ALKALI SALT GRASS FIELDS DUE TO THE RAISED WATER TABLE.



▲ NEW HIGHWAY BRIDGE OVER THE ALAMEDA INTERIOR DRAIN

WATER AWAY, LOWER THE WATER TABLE, AND DRY THE LAND TO RECLAIM IT FOR AGRICULTURE.

DURING THE 1940S MRGCD FOUND ITSELF UNABLE TO EFFECTIVELY RAISE CAPITAL THROUGH TAXATION. THE MRGCD ASKED UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION FOR HELP. THE RIO GRANDE FLOOD CONTROL PROGRAM WAS ESTABLISHED TO STABILIZE THE ECONOMY OF THE MIDDLE RIO GRANDE VALLEY AND REHABILITATE AND MODERNIZE THE EXISTING MRGCD FACILITIES.

TODAY THE MRGCD CONTINUES TO PROVIDE MANY VALUABLE BENEFITS TO THE RESIDENTS OF THE RIVER VALLEY, SOME OF WHICH ARE MORE APPARENT THAN OTHERS. MANY LOCAL RESIDENTS MAY NOT REALIZE THE AMOUNT OF CONSTANT MAINTENANCE THAT THE FLOOD CONTROL, DRAINAGE, AND IRRIGATION FACILITIES REQUIRE. AGRICULTURAL PRODUCTION ON CONSERVANCY LANDS IS ESTIMATED TO GENERATE \$35 TO \$70 MILLION PER YEAR.



▲ COMPLETED BRIDGE STRUCTURE



▲ DYNAMITE BLASTING THROUGH CONCRETE TO PREPARE THE PATH OF THE DRAIN.



▲ CONSTRUCTING THE DRAIN



▲ CONSTRUCTION OF THE DRAIN



▲ CONSTRUCTION OF THE DRAIN



▲ AERIAL



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14. Appendix H

*'Competition as a weed control strategy' by
Susan Kelly*

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May 23, 2014

MEMORANDUM:

Date: May 23, 2014
To: Ben Casados, Median and Trails Program Manager, Park Management Division
Cc: Jim Dunn, Superintendent, Park Management Division
James Lewis, Trails Planner, Parks and Recreation
Joran Viers, Urban Forester
From: Susan Kelly and Diane Scena, Contractor and Subcontractor
Re: Goathead Research Summary

INTRODUCTION

Part of our work on the Bikeways and Trails Facility Plan, is to facilitate discussions regarding trail maintenance and develop draft trail maintenance policies for inclusion in the Plan. Because goatheads are such a problem for trail users, we have invested some effort in researching the issue, discussing it with Park Management Division personnel in meetings and in the field, and have sought information from various sources.

This paper is intended to put together what we have learned about puncturevine (goatheads) and to supplement the research that we know PMD is also undertaking. We hope the information is of assistance to PMD in the on-going efforts to control this noxious weed.

GOATHEADS

Goatheads (Puncture Vine, *Tribulus terrestris*) are the single biggest complaint of trail users regarding on-going maintenance. Puncturevine produces many burrs with sharp spines that can injure humans and animals, as well puncture bicycle tires. Goatheads are classified both as a summer annual and a tap-rooted herbaceous perennial – annual in our Central New Mexico climate as plants cannot tolerate freezing. Good soil moisture and warm temperatures are needed for germination. They may start flowering within 3 weeks of germination and continue flowering through the summer. A week after each flower blooms, it is followed by a burr. Each burr has two stout spines and contains two to four seeds. A single plant can produce up 200-5000 seeds in one growing season. Seeds are viable for 5-7 years, or longer. In the spring of 2014, the seed bank is enormous because of

tremendous goathead germination and growth in response to the heavy rains of the previous July.

ERADICATION

This paper summarizes four methods of eradication. There are no quick and long-lasting solutions. Two methods currently being used with limited success are mechanical and chemical. Removing the plants when they are in the early stages of growth is most effective, but given that timing of germination is highly variable and dependent upon temperature and moisture, this is no easy feat. Long-term control of puncturevine can be achieved by reducing the amount of seeds in the soil. This is best accomplished by removing plants before they produce seeds (i.e., before or at the time of flowering) and continuing to do so over several years.

A third method, competition from other more desirable plants which shade and crowd out the goathead plants, is one of the most successful methods of control. An additional method, biological, has also been proposed.

An integrated approach using all available options, carefully timed, with persistent and constant monitoring, will reduce the population but will never entirely eliminate goatheads. City of Albuquerque Open Space Division, which has a full time worker to manage about 6 miles of the Paseo del Bosque Trail, has managed to reduce the goathead population over a long period because of his ability to stay on top of the problem. Another feature of this premier Albuquerque trail that helps to combat the problem, are the healthy stands of native grasses along the trail. Limited manpower on much of the urban trail network affects the ability of maintenance personnel to monitor and respond at the critical time.

METHODS

Mechanical: This involves the cutting and removal of the growing, ground hugging vine. It is a time consuming process that should be performed before the plant's seeds mature. If the cut plants have mature seeds, care should be used in handling so as to not drop and distribute the seeds. Goathead plants are too flat for mowing to be effective, and where the plants are within reach of a mower, mowing tends to scatter the seeds. Mechanical removal requires monitoring throughout the pre-seeding time.

Chemical: Read the label! Chemicals mentioned in the footnote below are from various sources, but herbicide usage and proper application procedures should follow the label and be applied by a licensed pest control applicator, if restricted. Questions can be confirmed with the Pesticide Compliance trainer. Effective weed control is highly dependent on timing. Limited manpower affects the ability to apply herbicides at the optimum time. Overall, the better approach is to establish native grasses and limit the use of herbicides (discussed in the next section).

Steve Baca, NMSU Pesticide Compliance trainer, said that because pre-emergents work on the seed and the goathead has such a large seed, that pre-emergents are not very effective. This may explain why PM's use of pre-emergents last summer failed to prevent the huge outcrop that developed in August/September. Steve Baca said it might be possible to use a

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higher concentration of chemical, but this may be undesirable for many reasons. The most effective time to use herbicide is to catch the plants when they have just begun growing and are still small and apply post-emergent.¹

Competition: Good stands of native grasses and plants along the trails significantly reduce the goathead problem. The parties we've interviewed broadly agree that if we can get native grasses and other desirable native plants (ones that don't require irrigation and a lot of mowing) established next to the asphalt trails, the use of herbicides can be reduced over time, the weed problem can be abated, and the trails will be more pleasant to users, both aesthetically and practically. Thick stands of native grasses and other herbaceous natives have the added benefit of protecting the trail shoulder from erosion.

However, establishing native grasses and forbs without irrigation is highly dependent on rainfall and other weather variables. The first step is to protect and encourage existing stands of native plants as much as possible during initial construction or reconstruction. Reclamation seeding should be required along newly constructed or rebuilt trails (reference most recent City Standard Specifications for native seeding along trails.) Establishment may require protection from foot traffic. Other management practices impact the health of native vegetation and its ability to out-compete weeds along the trails. These include mowing height (which should be no shorter than 4-6"), mowing frequency (no more than 3 times per year), and minimizing soil disturbance. Knowledge of plants is critical, allowing for selective control of undesirables, while protecting desirable plants.

Biological control: Two weevils, *Microlarinus lareynii* and *M. lypriformis*, native to India, France and Italy, were introduced into the United States as bio-control agents in 1961. Both species of weevils are available for purchase from biological suppliers. Weevils can keep populations in check, but suppression is cyclic and not always effective.

- *Microlarinus lareynii* is a seed weevil that deposits its eggs in the young burr or flower bud. The larvae feed on and destroy the seeds before they pupate, emerge, disperse and start the cycle over again. Its life cycle time is 19 to 24 days.
- *Microlarinus lypriformis* is a stem weevil that has a similar life cycle, excepting the location of the eggs, which includes the undersides of stems, branches and the root crown. The larvae tunnel in the pith where they feed and pupate. Adults of both species overwinter in plant debris. Although the stem weevil is slightly more effective than the

¹ The following information is from the University of California, Davis (see citation). Park Management Division's licensed pest control applicators with assistance from the Pesticide Compliance trainer should independently review and make decisions regarding appropriate application: Products containing oryzalin, benefin, trifluralin will provide partial control of germinating seeds. They must be applied prior to germination. Products containing 2,4-D, glyphosate and dicamba are most effective when small and young. 2,4-D and dicamba will harm broadleaves; glyphosate will kill or injure most plants, so use only as spot treatment or on solid stands of weeds. The post-emergent herbicide Aquamaster (Rodeo) is an approved aquatic pesticide being used by AMAFCA and MRGCD which can be used as needed where there is bare ground, monotypic stands of goatheads, or spot application is done selectively with care to avoid natives.

seed weevil when each is used alone, the weevils are most effective if used together and the puncture vine is moisture-stressed.

More research is required re: suitability in our climate. The NMSU Extension Service reported "that Dr. Gerald Nielsen at NM Dept. of Ag. released the weevils in a test program in the mid- to late-1960s. The stem weevil failed to establish, apparently. The seed weevil seems widely established but not that impressive." Extension agents we spoke with are not aware of any successful introductions in NM since that time. The Extension agents also reported having checked with Kerry Bryan, the State Plant Health Director with USDA-APHIS-PPQ. who said, in the event someone wants to bring in their own seed weevils for their use, they need to file a '526 form' which is the official request for approval of interstate shipment of biological agents, beneficials included.²

Finally, as comes with no surprise, the internet is full of anecdotal information about how to handle goathead problems. Several ideas are offered below³ but they should be taken with a grain of salt since they came off the web --or perhaps more to the point, a teaspoon of vinegar!

In conclusion, one concept discussed with PMD is the idea of creating some test sections for learning about what strategies might be effective for the long term – with a goal of establishing native grasses and forbs. Attached is a portion of the preliminary report we submitted in April regarding these ideas for potential test sections. We have modified it slightly due to what we have learned during the course of this research.

² Further informal communication with extension service regarding the seed weevil include: Rear it from some puncture vines you pull or cut (the whole thing at the root) and place into a 'rearing bag.' An empty bird seed bag works. Put a couple of table-cloth sized weeds in the bag, fold over the opening, staple it, put it into a room temperature, dry situation and wait a month or two. The seed weevils can complete their life cycles in about a month. The weevils might be hard to see until you get used to their tiny size (abt 3-4mm) and pale color (about the same as the dried seeds). If you're lucky, maybe 2-5% of seeds will have weevils. I think they acclimatized for the most part but are not especially aggressive seed finders. According to some 'old timers' at several release locations in southern NM, the seed weevils were supposed to be amazingly effective the first few years after release and establishment---but then their impact dropped off significantly. Probably due to several factors---mainly who wants to give these weeds over a month to flower and set seed, especially when they set seed now when barely an inch across? "Physical removal is a necessity in yards with kids or pets. You can get some nasty wounds and infections from punctures in your feet as well. Then, more recently, some effective herbicides came along. However, there's still plenty of puncturevine left for everyone."

³ Yahoo answers: what is the best way to get rid of goatheads in your garden without killing everything else: "Pulling them before they flower and then go to seed is a really good idea. We fight them where I live (thanks to new construction for bringing them to us). Also, if you spray them with vinegar mixed with some dish soap (so it sticks to the plant), this works well. Just don't let the vinegar get on other vegetation. The vinegar dehydrates the plant (works especially well if the plant is small and on a hot day)."

From Homesteading today.com

"Its a long term battle and you never really win. if you see yellow flowers you lost round one. spray with 2-4-D every two weeks or get some weeder ducks. the saying goes that it takes seven years to kill a single plant. 5% vinegar solution works. You have to keep after it."

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SOURCES

- Gannett-Fleming/Alta draft Albuquerque Bikeways and Trails Master Plan Update
- UC Davis ucipm.ucdavis.edu/PMG/WEEDS/puncturevine.html
- http://en.wikipedia.org/wiki/Tribulus_terrestris
- NMSU Cooperative Extension Service:
 - Steve Baca, NMDA/NMSU, NMSU Pesticide Compliance trainer, 505-362-1392. SBaca@nmda.nmsu.edu
 - Cheryl Kent, County Horticulture Agent, Bernalillo County Cooperative Extension Service, 505.243.1386, kent@ad.nmsu.edu
 - Jim Wanstall, NMDA State Noxious Weed Coordinator, jwanstall@thuntek.net 505-269-7761
- Andrew Torn, COA Clean Cities, 857-8060
- Tony Barron, COA Open Space Division
- Kurt Wagener, AMAFCA
- Larry Caudill, Albuquerque Environmental Health Department (retired)
- NMDOT Tom Kratochvil, P.E., Assistant District Engineer, tom.kratochvil@state.nm.us
- Park Management Division, personal communications with various representatives

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ATTACHMENT:

TESTING WEED CONTROL STRATEGIES

There is broad agreement among the parties we've interviewed so far that if we can get native grasses and other desirable native plants that don't require irrigation and a lot of mowing established next to the asphalt trails, the use of herbicides can be reduced over time, the weed problem can be abated, and the trails will be more pleasant to users, both aesthetically and practically. However, establishing native grasses and forbs without irrigation is highly dependent on rainfall and other weather variables. The first step is to protect existing stands of native plants as much as possible during initial construction or reconstruction.

Pilot Project

We think it worthwhile for PMD to consider potential ideas for test sections to try different strategies for weed control/establishment of native grasses and plants in narrow areas along existing trails. We have discussed some ideas with PMD, and they are briefly described below, but they need to be fleshed out, and designed and implemented by Park Management personnel or a contractor. These would include various combinations of soil prep (including ways of removing or reducing the existing weed seed bank), seeding of native grasses and forbs, and mulching (principally based on City of Albuquerque reclamation seeding specifications). This is intended for the 2-3' recovery zone adjacent to the trail.

[This section is replaced by Pilot Projects as discussed in Albuquerque Multi-Use Trails: Competition as a Weed Control Strategy, Review Draft dated 2-17-15]

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