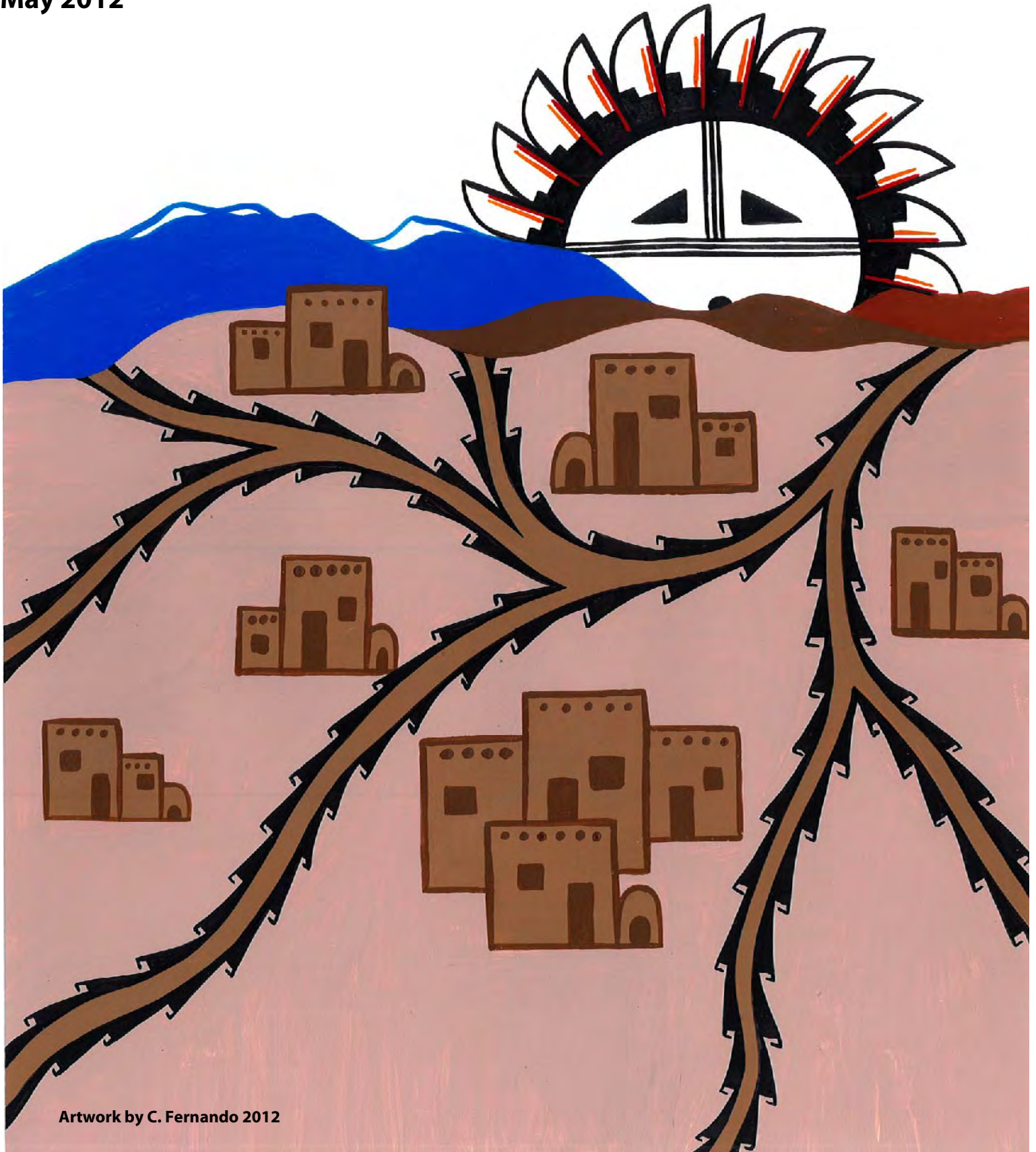


# Bicycle and Pedestrian Route Plan Pueblo of Laguna

May 2012



Artwork by C. Fernando 2012

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# Acknowledgements

## **Pueblo of Laguna Planning**

Sharon Hausam, Tribal Planner

## **Pueblo of Laguna Community Walking and Biking Advocacy Group**

Thelma Antonio	Alice Lucero
Jeanette Sarracino	Nathan Lucero Jr.
Vernon Valdez	Byron (Jay) Herrera
Byron Sarracino	Christine Lowery
Edna Kidwell	Geri Yahnozha
Ruth Remillard	Michelle Ray
Margaret Cerno	Camille Poncho-Pack
Governor Richard Luarkie	

## **Consulting Team**

### **Alta Planning + Design**

George Hudson, Principal in Charge

Mike Rose, Project Manager

Sherie Moore, Designer

Drew Meisel, Planner

Erin Machell, Designer

## **Harwick Transportation Group**

Nevin Harwick, PE, PTOE

## **Consensus Builder**

Ric Richardson

Kate Hildebrand

# **Pueblo of Laguna**

## **Staff officers**

Governor Richard Luarkie  
1st Lt. Governor Harry Antonio, Jr.  
2nd Lt. Governor Charles Poncho  
Head Fiscale Keith Day  
1st Fiscale Larson Romero  
2nd Fiscale Darwin DeLoris  
Tribal Secretary Michael Silva  
Tribal Treasurer David Martinez  
Tribal Interpreter Gaylord Siow

## **Mayordomos**

**Encinal**  
Nolan DeLoris (2011-2012)  
Ben Tsoi (2011)  
Taylor Aragon (2011)  
Jarvis Aragon (2012)  
Ryan Yawea (2012)

**Mesita**  
Alvin Martin (2011)  
Nathan Lucero Jr. (2011)  
Sabin Chavez (2012)  
John Kayate (2012)

**Paraje**  
Victor Day (2011-2012)  
Michael Martin (2011-2012)  
Loren Maria (2011)  
Robert Touchin Sr. (2011)  
Michael Williams (2012)  
Damon Clark (2012)

**Laguna**  
Don Siow Jr. (2011)  
Norbert Wacondo (2011)  
Kenneth Lucas Jr. (2011)  
Lawrence Martinez (2011)  
Evan Riley (2012)  
Ruben Cheromiah (2012)  
Derek Koyona (2012)  
Jeffrey Antonio (2012)

**Paguete**  
Ron Ray (2011)  
Ed Bautista Jr. (2011)  
Derek Martin (2011)  
Russell Martin (2012)  
Robert Graham (2012)  
David Bautista (2012)

**Seama**  
Harvey Thomas Sr. (2011-2012)  
Edward (Oscar) Carrillo (2011-2012)  
Frederick Silva (2011)  
Harold Analla (2011)  
Bennett Lewis (2012)  
Walter Beardsley (2012)

## **Council representatives**

**Encinal**  
Tina Granger  
Andrew DeLoris

**Mesita**  
Wil Herrera, Jr.  
Wilbur Lockwood

**Paraje**  
Marvin Trujillo, Jr.  
Francis Bautista, Jr.

**Laguna**  
Virgil Siow  
Norbert Wacondo

**Paguete**  
Pat Pruitt  
Josephine Cochran

**Seama**  
Robert Analla III  
Ryan Riley



## **Project Partners**

### **Pueblo programs and departments**

Denise Price, GIS Program

Public Works Department

Community Health and Wellness Department

Sports and Wellness Program

Diabetes Program

Healthy Heart Program

Shaasrka Transit

Environmental and Natural Resources Department

Public Safety Department

Chief of Operations

### **Pueblo entities**

Laguna Department of Education

Laguna Development Corporation

Laguna Housing Development and Management Enterprise

Pueblo of Laguna Utility Authority

### **Other agencies**

New Mexico Department of Transportation

Mid-Region Council of Governments

Northwest New Mexico Council of Governments

Northwest Regional Planning Organization

National Park Service Rivers & Trails

Conservation Assistance Program

Bureau of Indian Affairs Southwest Region

*Thank you to community members that assisted with the village field tours for all of their time, help and knowledge.*

*Thank you to all of the Pueblo of Laguna residents that participated in open houses, focus groups, the community survey, and other parts of the public involvement process.*

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Any opinions, findings and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the FHWA.

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Office of:

The Governor  
The Secretary  
The Treasurer

## PUEBLO OF LAGUNA

P.O. BOX 194  
LAGUNA, NEW MEXICO 87028



(505) 552-8598  
(505) 552-8854  
(505) 552-8855

## PUEBLO OF LAGUNA

### Resolution No. 32-12

#### **Re: Adoption of Pueblo of Laguna Bicycle and Pedestrian Route Plan**

At a duly called meeting of the Pueblo of Laguna Council held on the 21<sup>st</sup> day of April 2012, the following resolution was adopted.

**WHEREAS**, the Pueblo of Laguna is a federally recognized Indian tribe with all the inherent sovereign governing powers; and

**WHEREAS**, the Constitution of the Pueblo of Laguna, Article IV, Section 2(k), authorizes the Pueblo Council to promote and protect the public health and welfare of the members of the Pueblo; and

**WHEREAS**, bicycle and pedestrian trails in the Pueblo of Laguna will promote alternative transportation access, safety, health and fitness, and revitalization of the Pueblo's villages; and

**WHEREAS**, the Federal Highway Administration awarded the Pueblo of Laguna a TIGER II Planning Grant in the amount of \$1,470,000 (one million four hundred seventy thousand dollars and no cents) for bike and pedestrian planning and design; the Pueblo of Laguna Council approved the acceptance of this funding from the Federal Highway Administration on November 23, 2010, through Resolution 116-10; and the Federal Highway Administration obligated the TIGER II Planning Grant funds for the Pueblo of Laguna's project on March 2, 2011; and

**WHEREAS**, the Pueblo of Laguna Council approved the bike and pedestrian route planning and design work plan, which emphasizes community involvement in the planning process, on November 23, 2010, through Resolution 116-10; and

**WHEREAS**, the Pueblo of Laguna Council appointed representatives and alternates from each of the six villages to a Community Biking and Walking Advisory Group; and

**WHEREAS**, the Pueblo of Laguna Council approved an independent services agreement with Alta Planning + Design, Inc. for bike and pedestrian route planning on April 15, 2011, through Resolution 17-11; and

**WHEREAS**, the Community Biking and Walking Advisory Group has guided community involvement in the planning process, which has included development of a community involvement plan; focus groups with elders, youth, and people with disabilities; a mapping workshop; a community survey; field tours; digital mapping conducted with community members; two open houses, two presentations to the mayordomos' association, and numerous advisory group meetings; and

**WHEREAS**, the consulting team has provided expertise in meeting facilitation, survey design and analysis, route mapping and assessment, conceptualization of bike and pedestrian networks, improvements to existing routes and proposals for new routes, trail features and amenities, cost estimates, coordination with other agencies, project prioritization, and development of mode share studies; and

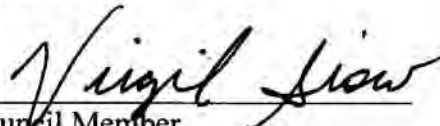
**WHEREAS**, the combined efforts of the Community Biking and Walking Advisory Group, consulting team, and Pueblo of Laguna planning program staff, with support from other Pueblo programs, departments, and entities, have resulted in the preparation of the Pueblo of Laguna Bicycle and Pedestrian Route Plan, which contains information on community involvement, existing conditions, user needs, proposed trails and infrastructure, design guidelines, priorities and phasing, encouragement programs, and a mode share study; and

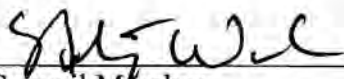
**WHEREAS**, the Pueblo Council has reviewed the Plan and finds that it is acceptable and supports the Pueblo's goals.

**NOW, THEREFORE BE IT RESOLVED**, that the Pueblo Council hereby approves and adopts the Pueblo of Laguna Bicycle and Pedestrian Route Plan; and


**BE IT FURTHER RESOLVED** that the Council authorizes and directs the Governor and the Chief of Operations to move forward with the implementation of the plan, including development of engineering designs for prioritized bike and pedestrian routes, and to execute any documents necessary to carry out the intent of this resolution.

  
Governor

  
Council Member

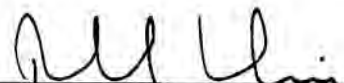
  
Council Member

**ATTEST:**

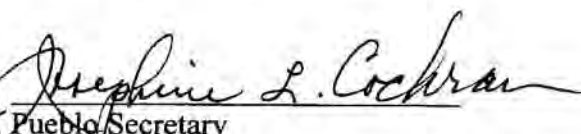
  
Acty Pueblo Secretary

**CERTIFICATION**

The foregoing resolution was enacted upon by the Pueblo of Laguna Council on the 21<sup>st</sup> day of April, 2012, by a vote of 17 for and 1 opposed, at a duly called meeting at which a quorum of the Council was present.

  
Governor

**ATTEST:**

  
Acty Pueblo Secretary

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## Executive Summary

The Pueblo of Laguna was notified in October of 2011 that their application to fund a bicycle and pedestrian route planning project through a U.S. Department of Transportation TIGER II Planning Grant was successful. A bicycle and pedestrian route plan was intended to reconnect the six Pueblo communities, connect the villages to the subdivisions, promote housing redevelopment in the villages, and revitalize the Pueblo's economic centers. The primary objectives of the Bicycle and Pedestrian Route Plan (Plan) were to:

- Establish a strategic vision for advancing walking and bicycling opportunities
- Address the community concern of improving pedestrian and bicyclist safety
- Address the funding source's principles and conditions

The resultant Plan effectively outlines a feasible non-motorized transportation network that connects all six villages, while providing local "loops" in, and around, each village. The Plan guides the development of the bicycle and pedestrian route network that accommodates both commuters and recreational users. The improved network will not only make bicycling and walking more viable modes of transportation, but will contribute to economic development opportunities and an enhanced quality of life. This is a 20 to 30 year plan and is expected to be implemented incrementally and as funding allows.

## Gathering Information

Extensive community collaboration to create the Plan was a cornerstone of the planning process. Community input and feedback enabled the project team to accurately understand and document community concerns, needs, the preferred trail network, and desired characteristic of the trails. A community involvement plan was designed by the Community Bicycling and Walking Advisory Group (CBWAG) and included four basic components:

### Community Involvement Plan



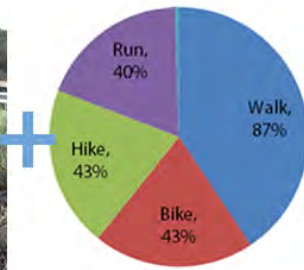
**Workshops and Open Houses**  
Over 230 participants at workshops, open houses and stakeholder meetings



**Focus Groups**  
Elders, Youth, CBWAG and Persons with Disabilities (40 participants) provided input from unique perspectives

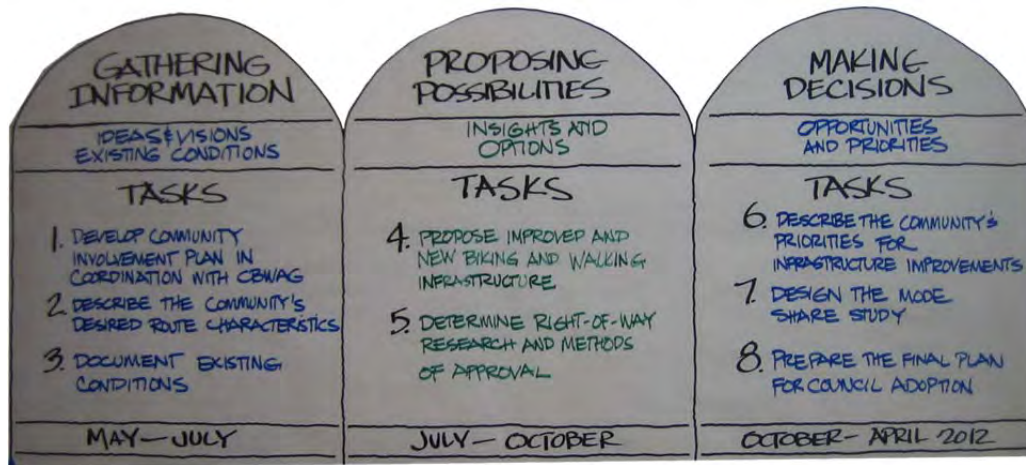


**Field Tours**  
Village leaders, CBWAG representatives and the project team met and toured significant areas



**Survey**  
171 responses received in both electronic and paper form

Community involvement activities were woven into the planning process at regular intervals to ensure that the project team received feedback at project milestones. This strategy kept the project team on course and made sure any concerns or deficiencies were addressed in a timely manner.



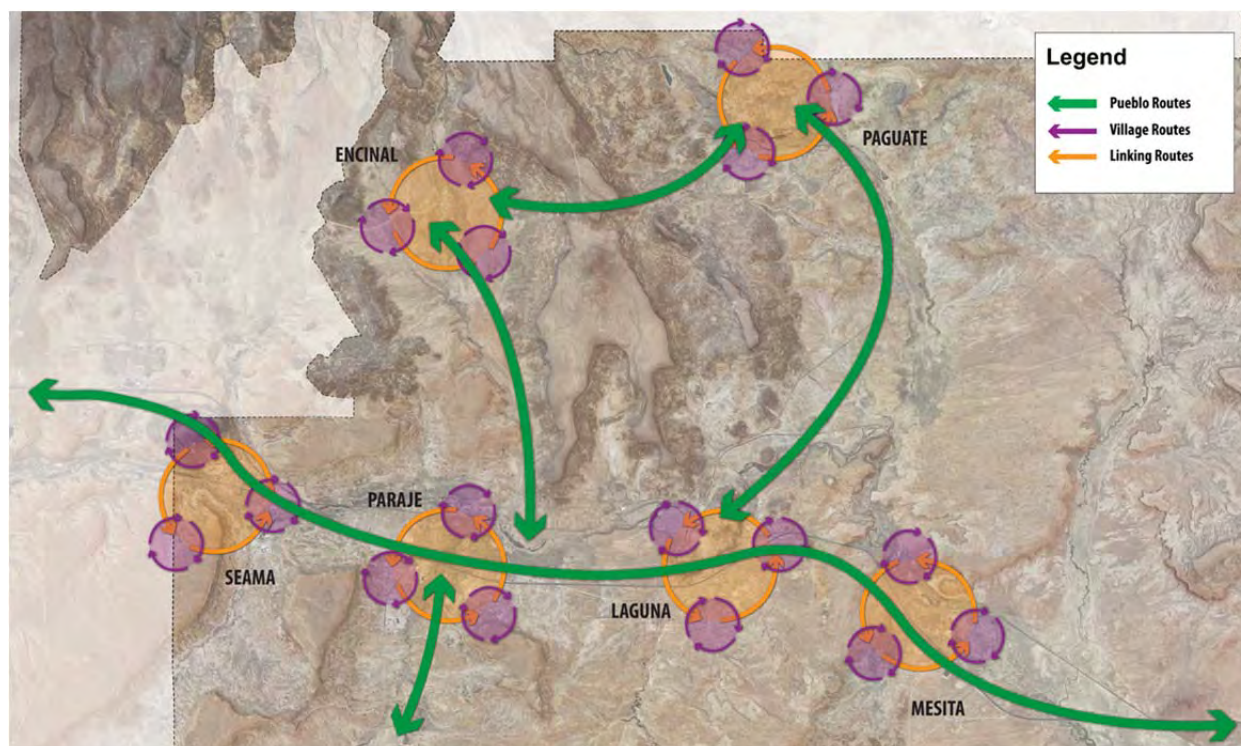
*At the onset of the project, planning process was grouped into categories to divide the project into manageable chunks and keep the project on-track.*

Over 236 miles of routes (existing and desired) identified by the community were inventoried. This comprehensive inventory provided valuable data on the suitability of routes to accommodate bicycle and pedestrian facilities. The route inventory served as the basis for an evaluation, selection and prioritization exercise to refine the routes down to a cohesive and manageable network that connects the residents to each other; and connects residents to essential and favorite destinations.

## Proposing Possibilities

The Plan proposes 103 miles of routes under three classifications: Pueblo routes, village routes and linking routes. The three tier classification scheme grew from an early organizing concept that illustrated the guiding philosophy of the non-motorized transportation network. The Mayordomos, traditional village officials, were consulted early in the process and had an opportunity to provide feedback on the preliminary proposed routes.

The types of routes proposed for the Pueblo evolved over the course of the project. Early on, the majority of the feedback indicated that an asphalt path along New Mexico Highway 124 (NM 124) and Old Route 66 would serve the community well, as the route would connect a large number of residents for both recreation and transportation needs. However, for many of the local roads, signing a route with pedestrian-scaled mile marker signs would suffice. As the community started critically thinking about specific routes and associating them with specific trail treatments (e.g. an asphalt path, a widened shoulder or a simple pedestrian-scaled sign along a dirt road) it became clear that some initial thoughts about treatment types should be reconsidered. For example, the route treatment on a segment of Deer Dancer Road (Seama) between the subdivision and the ball park changed from a signed route to a multi-use asphalt path after the residents cited safety concerns (vehicle speeding and limited sight lines) and the number of youth traveling between the two destinations.



*The concept map drafted to illustrate the overall idea of the routes network*

## Making Decisions

To assist the Pueblo of Laguna with funding priorities, decision matrices were formulated to inform the strengths and weaknesses of each potential alignment, as well as highlighting the alignments that would most likely result in a successful route. Safety, connectivity and cost were the major drivers in prioritizing the Pueblo routes. The prioritization of the village routes was determined at the village level. The prioritization of the linking routes centered on connectivity, ensuring that there were no gaps in the overall system.

## Recommendations

Of the 103 miles of routes proposed in the Plan, 48 miles of routes are listed as Priority Projects. The priority projects include the top ranked village route in each village, and backbone of the system, the Pueblo routes: NM 124/Old Route 66, Casa Blanca Road, Paguate Road, Encinal Road and intersection improvement at the NM 124/Old Route 66/School House Road intersection.

Planning-level cost estimates for each project are provided, creating a foundation for the next stage, the design phase, once the Plan is adopted. Costs are broken out into different phases for design, trail construction, crossing improvement construction, and amenities, so that the Pueblo can move forward with individual components of the different trail projects in a phased manner, as funding becomes available.

The Plan contains a design standard section detailing the characteristics of each recommended trail type. The design standards clarify the intent of each treatment type and are based on current walkway, bikeway and multi-use path design guidelines.

#### 4 | PUEBLO OF LAGUNA BICYCLE AND PEDESTRIAN ROUTE PLAN

A common theme heard at almost every community meeting was the importance of maintenance. Residents expressed a strong desire that any trail improvements be adequately maintained in the near and long-term. Residents indicated that to reduce the cost of long-term maintenance, high-quality, durable materials be used for trail amenities such as shade structures and benches. A maintenance section is incorporated into the plan that outlines basic maintenance practices and schedules. Operation and maintenance (O & M) costs are in the Plan, giving the Pueblo a general idea of the ongoing maintenance costs associated with trail improvements.

To measure the impact of new trail infrastructure, a mode share study has been designed to document any changes in travel behavior on the Pueblo. It is anticipated that the mode share study will begin prior to implementation of new trail improvements and continue annually or bi-annually.

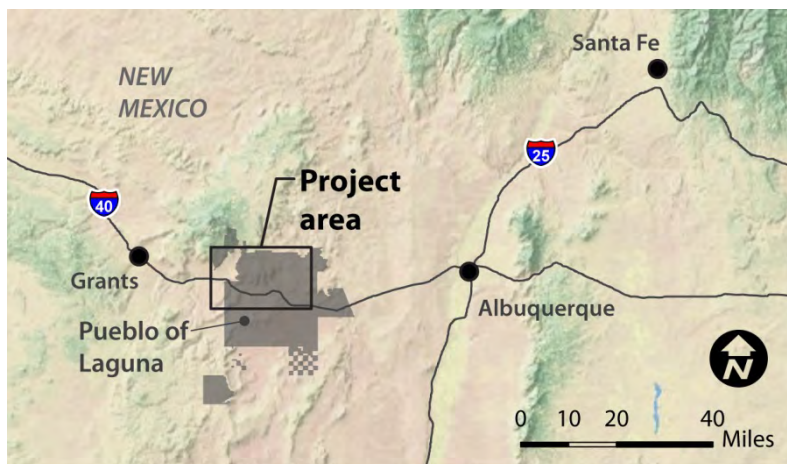
The plan is a culmination of a thoughtful process that when implemented, will bring a high-quality and functional non-motorized transportation network that is the hallmark of active communities.



## Introduction

The Pueblo of Laguna is a federally-recognized sovereign Indian tribe located in western New Mexico with around 4,000 community members. In recent years Pueblo residents have expressed a strong desire for better and safer infrastructure to support walking and bicycling. Driving is currently the dominant mode of transportation in the Pueblo, in part because of a lack of infrastructure for walking and bicycling.

In March 2011 the Pueblo of Laguna received a Federal Highway Administration (FHWA) TIGER II grant to develop and begin to implement a plan for a network of bicycle and pedestrian routes through a robust public involvement process.



*The project area*

## Project Background

The Laguna people began to settle in the area that now includes the Laguna reservation at least as early as the 1300's, according to oral tradition and the archaeological record.

Today, most of the Pueblo's community members live in six distinct villages along and near Interstate 40: Encinal, Pagate, Seama, Paraje, Laguna and Mesita. Though the Pueblo's land area is considerably larger, this project will focus on the area around the villages.

## Transportation in Laguna

Prior to the arrival of Europeans, walking was virtually the only mode of transportation available to the indigenous peoples of the Southwest. As a result, the villages in the Pueblo developed as compact, walkable communities. Over time, Pueblo residents adopted other forms of transportation such as horses, wagons, railroads, and eventually automobiles. Today, individually-owned cars and trucks are the dominant form of transportation within the Pueblo. The transportation infrastructure reflects the dominance of the motor vehicle and is primarily comprised of state, federal and Bureau of Indian Affairs, roads and highways. There are limited opportunities for bicyclists and pedestrians to safely travel within each village and between other villages.

Safety for pedestrians and bicyclists is a major concern in the Pueblo of Laguna. A 19-year old cross country bicyclist was fatally injured in 2010 on NM 124, after being struck by a motor vehicle. The incident raised awareness of how dangerous non-motorized transportation can be in the Pueblo, especially along the highways.

Pueblo of Laguna residents have indicated a strong desire to have a bicycle and pedestrian infrastructure that is safe and well connected. A community survey on trail issues in 2005 generated 178 responses.

- 24% of respondents walked along the main paved highways
- 41% of respondents walked along the smaller paved roads
- 60% of respondents walked along dirt roads
- 80% of respondents thought that Pueblo should build new trails to promote walking in the villages
- 82% of respondents indicated that the Pueblo should build new trails to connect the villages together.



*Walking and bicycling is prohibited along Encinal Road*

## Public Health

The lack of safe bike and pedestrian infrastructure may be a contributing factor to severe health problems on the Pueblo. Diabetes and obesity are both widespread in the Pueblo of Laguna. Approximately 17% of Pueblo residents have been diagnosed with diabetes, compared to a national rate of 7.8% for diagnosed and estimated-undiagnosed cases combined. This is in keeping with racial health disparities observed nationally. Approximately 17% of adult American Indians and Alaska Natives have diabetes in the United States, compared with 6.6 % of non-Hispanic whites.

Research has shown that providing safe and accessible infrastructure can lead to increases in bicycling and walking, and that the resulting increases in physical activity can have measurable impacts on health and well-being. The greatest improvements to physical and mental health from physical activity occur when mostly sedentary individuals become moderately active by engaging in small amounts of moderate activity on a regular basis. Regular walking and bicycling, even at slow speeds and for short distances, is sufficient activity to be considered as moderate activity, and lead to substantial gains in health and wellbeing.

## Project Goals and Tasks

The Pueblo of Laguna received a FHWA Tiger II grant to fund the planning of a bicycle and pedestrian route network for the Pueblo of Laguna, and design of top-priority infrastructure. This plan fulfills the planning portion of the grant.

The primary goal of the project is to:

- Provide more transportation choices for community members in the Pueblo of Laguna

Increased transportation choices will:

- Increase bicycle and pedestrian mode share
- Encourage active modes of transportation to improve public health
- Reconnect residential areas within and between Laguna communities, promoting housing redevelopment and village revitalization
- Reconnect the communities and villages to the Pueblo's economic centers, revitalizing the local Pueblo economy

The above goals will be achieved through the following project tasks:

- Create a community involvement plan for engaging Pueblo residents throughout the process
- Describe the community's vision for bicycling and walking infrastructure in Laguna
- Inventory existing walking and bicycling routes
- Propose alternative routes, route characteristics, and design guidelines
- Develop a pedestrian and bicycle route plan for the Pueblo of Laguna that prioritizes route alternatives, assesses right-of-way requirements, proposes project phasing, and gives cost estimates
- Design a mode share study in order to measure changes in mode share over time

## Pueblo of Laguna

### Population

The Pueblo of Laguna is a predominantly American Indian community of 4,043 people living in a group of six villages. The communities are located approximately 45 miles west of Albuquerque (the actual Pueblo boundary begins further east, at Rio Puerco). The population is concentrated in the villages of Laguna, Mesita and Paraje along Interstate 40, with smaller populations in Seama, Pagate and Encinal. Each of the six communities one core traditional area, known as a village, and at least one more modern housing subdivision.

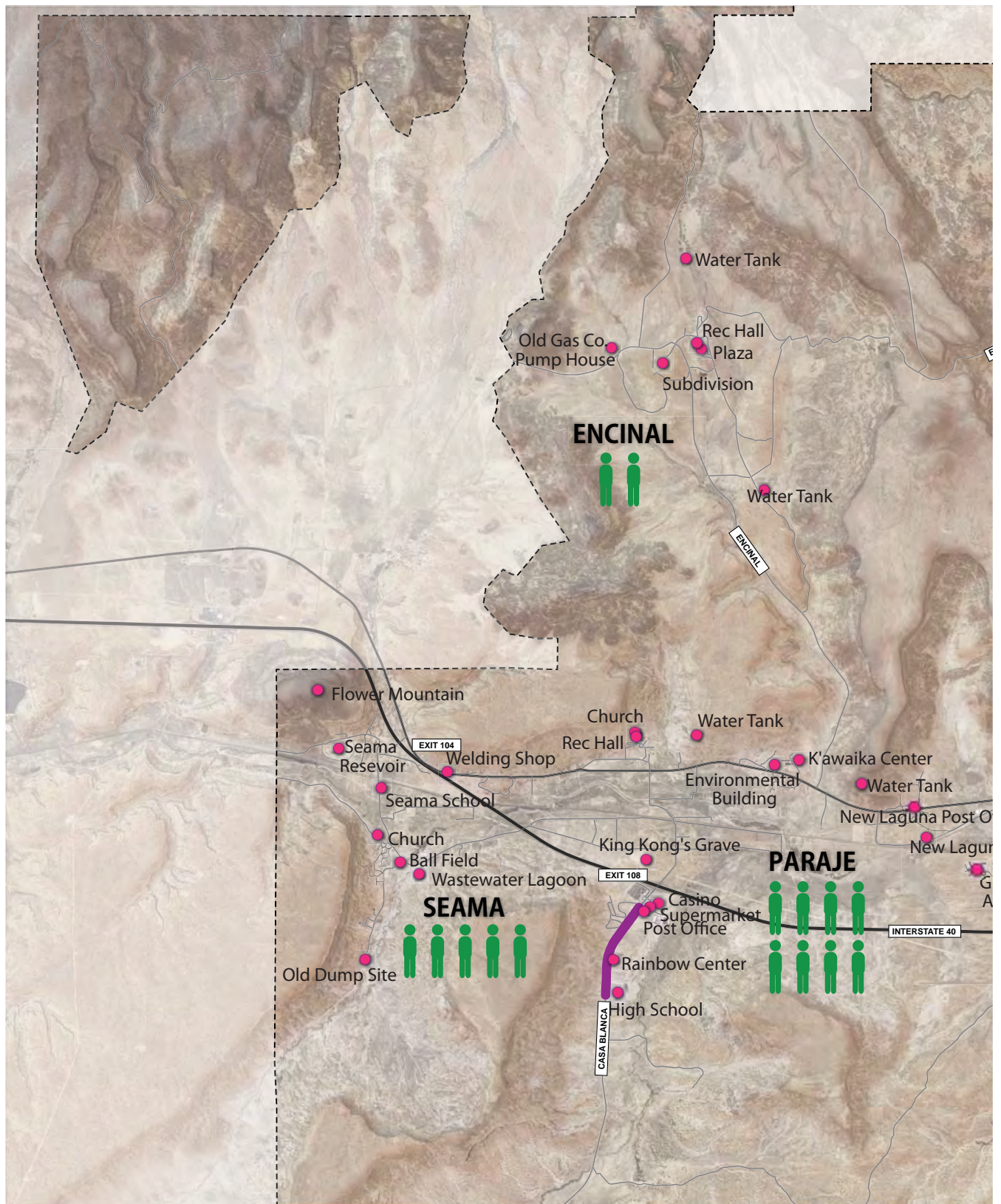
Characteristics of the Pueblo of Laguna:<sup>1</sup>

- Population 4,043 people
- American Indians comprise 95% of the population (compared to 9% statewide)
- The population is slowly growing (6% population growth from 2000 – 2010)
- 6 villages: Laguna, Paraje, Seama, Pagate, Mesita, Encinal
- The map on the following page shows the location and relative populations of the six communities, and important landmarks and destinations that have been identified by community members

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<sup>1</sup> Demographic data from the 2010 U.S. Census and comparison with the 2000 U.S. Census



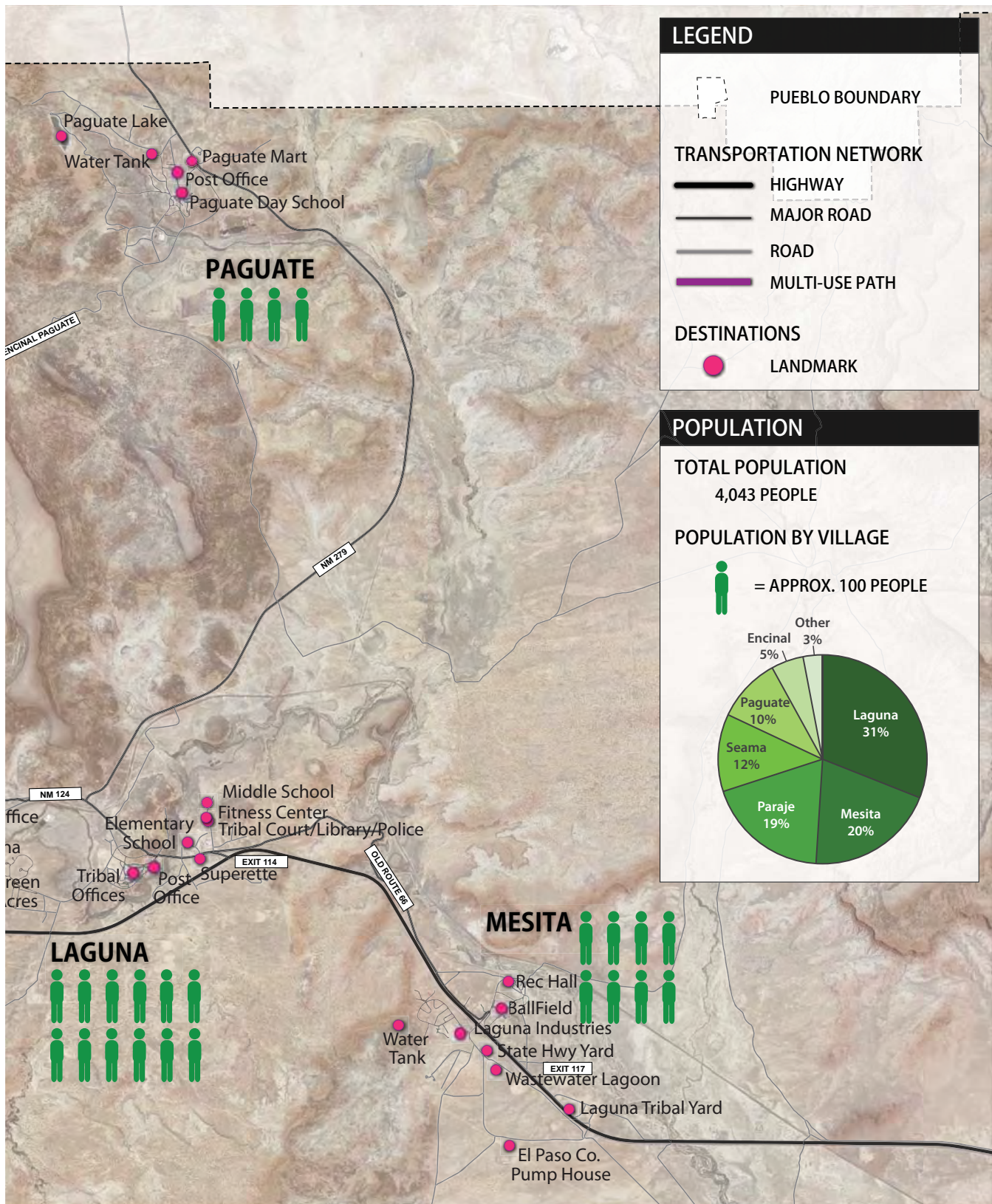


## Pueblo of Laguna Deomographics and Landmarks

Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program and 2010 US Census  
 Author: Alta Planning + Design  
 Date: March 2012

Figure 1. Existing Conditions Map





0 1.5 3 Miles



Figure 1. Existing Conditions Map

## Climate and Terrain

The Pueblo of Laguna is in a high desert environment with terrain characterized by flat to rolling terrain interspersed with steep mesas and rugged hills. The flatter terrain is well suited to walking and bicycling, while the mesas and more mountainous terrain are more challenging.

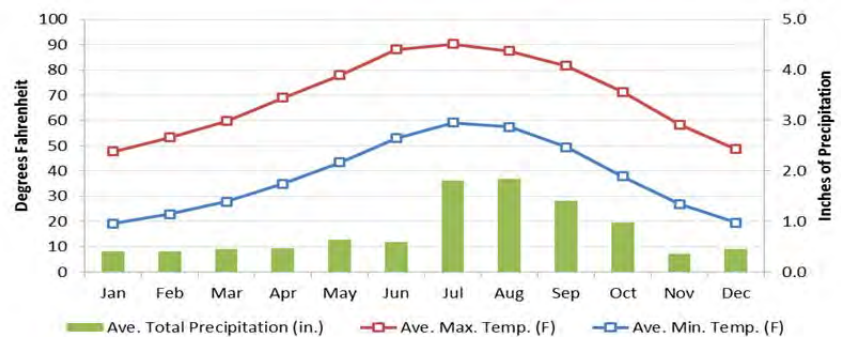
The climate is hot and dry in summer, and cold and dry in winter. Average rainfall is less than two inches per month, with average high temperatures ranging from the high 40s in January to around 90 in July, as shown in the chart at right. This indicates an excellent climate for year around walking and bicycling, as well as a need for shade and seating amenities along routes.



*View from the mesa above Encinal*

## Potential Hazards

Several types of snakes, including venomous snakes, can be found in the Pueblo of Laguna. Although snakebites are very rare, the fear of encountering snakes while walking is widespread amongst Pueblo residents. Residents have reported that unrestrained dogs and mountain lion sightings can impact decisions about traveling by foot or by bicycle.



*Figure2. Average monthly temperatures and precipitation in Pueblo of Laguna*



## Community and Partner Involvement

The support of the community is critical to the implementation of the Pueblo of Laguna Bicycle and Pedestrian Route Planning project. A community involvement plan developed early in the process helped to ensure that the Pueblo community and other relevant stakeholders were consulted throughout the process, from its earliest stages through to plan adoption.

The community involvement process included a Community Biking and Walking Advisory Group of interested Laguna community members; and a series of meetings and events with the Pueblo of Laguna community, project partners, and local Laguna government representatives, such as the Mayordomos.

The community involvement plan and summaries of all public meetings and events are on file at the Pueblo of Laguna planning program.



*Mapping existing routes for biking and walking in Paraje.*

### Community Biking and Walking Advisory Group

In November and December 2010, the Pueblo of Laguna planning program began working with the Pueblo Council to create the Community Biking and Walking Advisory Group (CBWAG) to guide the forthcoming Bicycle and Pedestrian Route Planning project. Each village appointed two representatives to represent them on the CBWAG to ensure the project was community-driven. The CBWAG was an integral part of the project team providing valuable insight and feedback throughout the planning process.

The CBWAG:

- Met regularly with the project team, usually on a monthly basis
- Organized and attended field tours
- Assisted the project team to publicize Plan related activities and events
- Staffed community events and often provided food
- Suggested venues to distribute and retrieve the survey
- Administered the survey at village meetings
- Notified village officials about the status of the project and solicited feedback
- Reviewed draft interim products of the plan, including the community involvement plan
- Helped design the methodology for the mode share study
- Served as facilitators at the Community Mapping Workshop

The CBWAG's commitment and dedication during the Bicycle and Pedestrian Route Planning project contributed to the successful integration of local context, culture and unique needs into the fabric of the Plan. (See the meetings list below for the dates of all CBWAG meetings).

## Community Meetings and Events

The community involvement process included more than 30 meetings overall (including the CBWAG meetings). Below is a list of all of the community and partner meetings for the Laguna non-motorized planning process, followed by descriptions of each meeting type.

May 17, 2011	Partners Meeting	Oct 21, 2011	Partners: Community Health and Wellness
May 17, 2011	CBWAG Meeting #1		
June 7, 2011	Partners Meeting	Oct 21, 2011	Partners: Laguna Housing
June 7, 2011	CBWAG Meeting #2	Oct 21, 2011	Partners: Pueblo of Laguna Development Corporation
June 27, 2011	CBWAG Meeting #3		
July 1, 2011	Focus Group: Elders	Oct 22, 2011	Community Open House #1
July 6, 2011	Focus Group: Middle School	Nov 8, 2011	CBWAG Meeting #7
July 6, 2011	Focus Group: Disabilities	Nov 9, 2011	Mayordomos Meeting
July 6, 2011	Field Tours: Laguna, Encinal, Mesita	Nov 29, 2011	CBWAG Meeting #8
July 7, 2011	Field Tour: Paraje	Jan 17, 2011	CBWAG Meeting #9
July 19, 2011	CBWAG Meeting #4	Jan 24, 2012	Partners: Infrastructure (NMDOT)
July 22, 2011	Field Tours: Seama, Paguate	Jan 25, 2012	Partners: Right-of-way discussion (Ray Lucero)
July 23, 2011	Community Mapping Workshop		
July 23, 2011	Partners: Just Move It (Ron Ray)	Feb 21, 2012	CBWAG Meeting #10
Aug 10, 2011	Mayordomos Meeting	Feb 21, 2012	Partners: LDOE (Darlene Waseta, Kevin DeGraauw)
Aug 23, 2011	CBWAG Meeting #5		
Oct 12, 2011	CBWAG Meeting #6	March 17, 2012	Community Open House #2
Oct 12, 2011	Partners: LDOE (Darlene Waseta)		

## Focus Groups

Small group of Pueblo elders, middle school students, and people with disabilities were gathered to discuss their walking and bicycling habits. The groups ranged in size from 8 to 14 people. Each of the three groups documented existing routes, problem spots, and needed connections on a set of maps. Each focus group also answered questions pertaining to their unique needs.

## Mapping Workshop

A community-wide mapping workshop drew 36 Pueblo residents, representing all six villages. Participants broke into small groups and were asked to identify the following on maps: a) special trails; b) unsafe conditions; c) components of a “perfect trail system;” d) actions that are first priorities; and e) connections between the villages.

## Open Houses

### First Open House

The Open House at the Dancing Eagle Events Center provided Pueblo residents the opportunity to comment on and influence preliminary thinking about the bicycle and walking route network, safety, trail surfaces, amenities, signage and wayfinding.

The event, held on October 22, from 10:00am to 3:00pm, attracted 59 participants with good representation from each village. Displays of maps, graphics and other information were stationed around the room. At the welcome table participants signed in and registered for door prizes. At four additional stations participants met with members of the consultant team to review maps of the network, look at treatment options displayed on poster boards, and make suggestions. The stations included:

- The Network and Routes
- Crossings and Safety
- Surfaces
- Wayfinding and Trail Amenities



*Pueblo residents learn about trail amenities at the first open house*

## Second Open House

The final Open House for the Bike and Pedestrian Route Plan was held on March 17, 2012, from 10:00am to 3:00pm at the K'awaika Center. The event provided participants the opportunity to review and comment on the draft Bike and Pedestrian Route Plan as well as comment on the upcoming draft survey for the Mode Share Survey. Participants could also make comments on displays of key aspects and components of the plan including the planning process, trail amenities, route priorities, and route characteristics.

The Open House was held in conjunction with the Just Move It! Walk/Run. Eighty-eight people participated in the open house, an enthusiastic turnout for the combined events. After registering and getting a draft of the Mode Share Survey, participants could get t-shirts for the Walk/Run, informally review, comment on the project information displayed throughout the room and enjoy lunch. Members of the consultant team met with participants at three additional stations to review events in the planning process to date, maps of the initial set of priorities for the Pueblo and village routes, locations and examples of trail amenities and characteristics of the routes. The stations included:

- The Mode Share Survey
- The Planning Process
- Route Priorities
- Route Characteristics



*Residents taking a lunch break and chatting at the second open house*

## Field Tours

CBWAG members and residents of each village led the project consultants on field tours in each of the six villages. Existing and potential routes were driven and the groups stopped at various locations to document and discuss specific conditions.

Each field tour included two members of the consulting team and one or more residents of the village. The field tours highlighted potential routes, key destinations, challenging areas, and the best existing trails and routes.

## Partner Meetings

Teaming partners were consulted as necessary for issues such as right-of-way jurisdiction, existing and future infrastructure, and community programs. Project partners include the following:

- GIS Program
- Public Works Department
- Community Health and Wellness Department
- Sports and Wellness Program
- Diabetes Program
- Healthy Heart Program
- Shaasrka Transit
- Environmental and Natural Resources Department
- Public Safety Department
- Laguna Department of Education
- Laguna Development Corporation
- Laguna Housing Development and Management Enterprise
- Pueblo of Laguna Utility Authority



*Seama residents and a member of the consultant team evaluate the potential for pedestrian and bicycle accommodation on new bridge.*

## Mayordomos

The planning team was invited to attend two Mayordomos Meetings to provide information about the project and to take comment about the plan and process. The first meeting was on August 10, 2011 and was an opportunity for the Mayordomos to be introduced to the project and the process. Sharon Hausam with POL and Nevin Harwick of Harwick Transportation Group summarized the project and the progress to date.

The second meeting was on November 9, 2011. Sharon Hausam with POL, Mike Rose of Alta Planning + Design and Kate Hildebrand of Consensus Builder presented the preliminary proposed routes. The Mayordomos of each village were provided a map of the proposed routes within their village and given the opportunity to review and comment.

## Village Meetings

Village meetings were used by each of the six villages to select and prioritize the local routes of greatest importance to each village. These routes became the village routes, one of the three types of routes that will become the Laguna non-motorized route network. These decisions were made at the following village meetings:

### **Paraje 12/1/11**

Margaret Cerno and Sharon Hausam summarized the route planning process for the village members and asked them to prioritize the village loops.

### **Seama 12/5/11**

Byron Sarracino summarized the route planning process for the village members in attendance and asked them to prioritize the village loops. They voted using slips of paper.

### **Encinal 12/7/11 & 12/8/11**

Camille Poncho-Pack led a special meeting in Encinal to discuss the route planning process and prioritize the village loops for Encinal. The attendees made some changes to the routes and identified their priorities. The village identified one loop as the highest priority and left the remaining three as an equal priority. The following night these preferences were confirmed at a village meeting.

### **Laguna 12/15/11**

Thelma Antonio provided a map with notes indicating the priorities for the Village of Laguna. The notes indicated thoughts and concerns by the village members.

### **Paguate 1/17/12**

The Paguate representatives of the CBWAG provided the loop prioritization information at the CBWAG meeting on 1/17/12.

### **Mesita 2/28/12**

Byron (Jay) Herrera and Mayordomo John Kayate spoke with community members about their preferences. The Village planning committee determined the prioritization of the Village Loops for Mesita.



## Existing Route Conditions

### Existing Routes

Most routes that residents are currently using for walking and bicycling are not well-suited for non-motorized transportation. Residents feel the most comfortable walking on unpaved roads that have low vehicle volumes and low speed limits.

The six villages are connected mostly by state highways characterized by:

- High-speed traffic
- Lack of bicycle facilities
- Steep slopes from the pavement edge to the adjacent land
- Over- or under passes that do not accommodate pedestrian or bicycle traffic
- Non-existent, deteriorated, overgrown, and/or unpaved shoulders



*The road condition on old Route 66 typifies the limited shoulder on many of the paved roads on the Pueblo.*

There are exceptions to the above conditions. NM 279 (Pagate Road) has wide shoulders that could potentially work well for bicyclists once the shoulders are rehabilitated.

The remaining transportation network includes a mix of:

- Paved local streets that usually lack improvements for non-motorized users
- A network of unpaved gravel, dirt and ditch roads that connect within and between villages, sometimes over rough terrain
- A one-mile multi-use path on Casa Blanca Road between the post office and the high school

### Trail Inventory

Laguna residents, project partners and the CBWAG were asked to identify routes that are already used for walking and bicycling, as well as historic routes, and routes that have a strong community interest. Based on the identified routes, over 236 miles of roadways, trails and paths were inventoried as an existing routes network. The data collected for the inventory included the following:

- |                          |   |
|--------------------------|---|
| • Surface type           | • Presence and width of shoulder        |
| • Surface condition      | • Drainage facilities or infrastructure |
| • Roadway or route width | • Posted speed limit                    |
| • Grade                  | • Right-of-way width                    |
| • Jurisdiction           | • Bicycles allowed or prohibited        |



The routes were then evaluated for their current suitability as a bicycling and walking route based on the following criteria:

- Road surface type (paved; gravel; earth)
- Road surface condition (excellent; good; adequate; poor)
- Grade (flat; rolling; steep inclines)
- Presence or absence of a paved shoulder

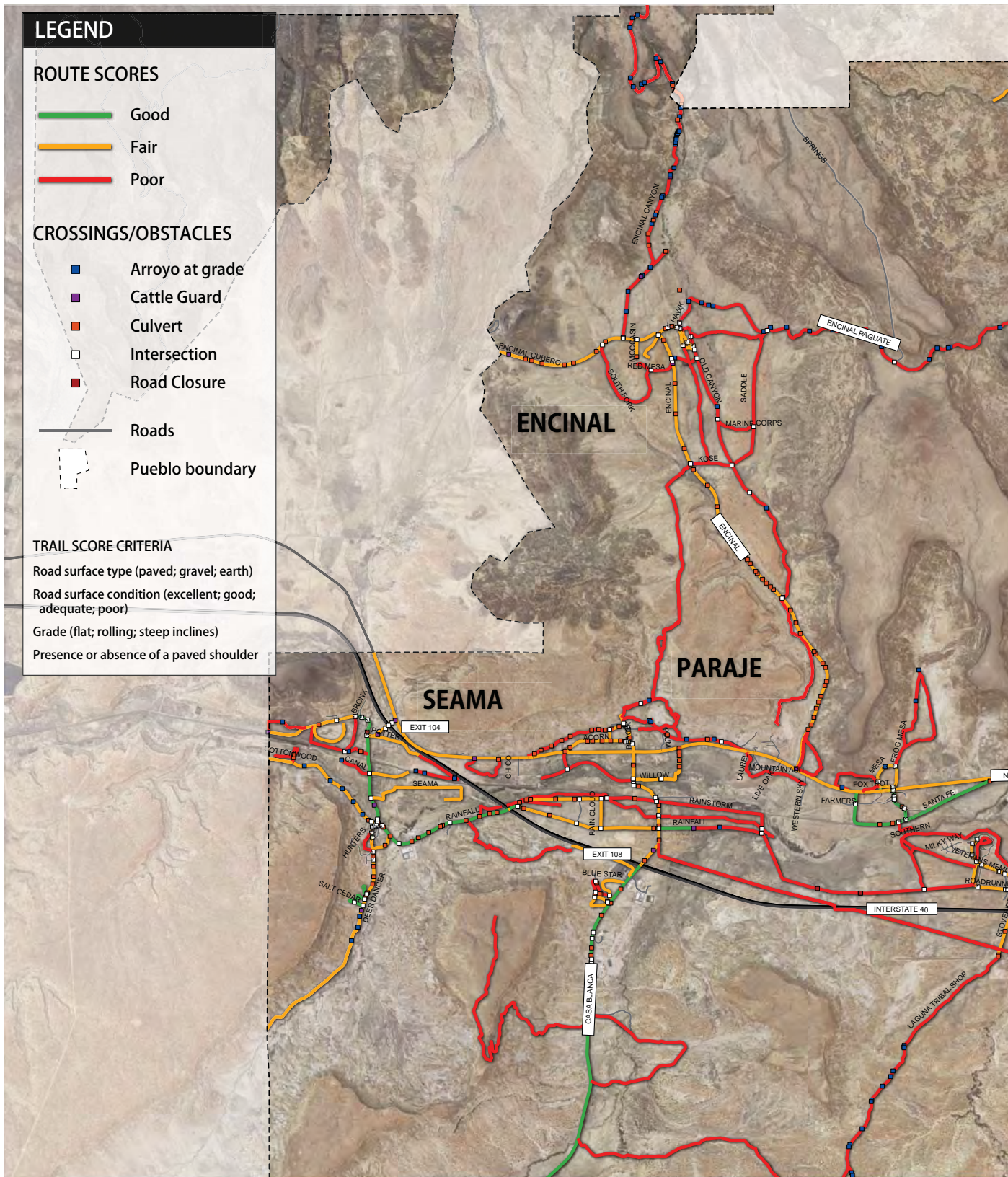
Based on this information each route was scored as good, fair or poor as an existing bicycle or pedestrian route. The results of the trail score analysis are shown in Figure 3, along with the locations of existing crossings and obstacles. Though a few routes were considered good, most were considered fair or poor.

## Laguna Rights-of-Way

Right-of-way, as it pertains to transportation, is land that is held in the public trust for the use of transportation facilities, including railroads, roadways, trails, and pathways. Right-of-way was examined for all of the inventoried and proposed routes in the Pueblo of Laguna in order to ensure that the proposed routes will be feasible from a land use and acquisition standpoint. This included discussions with Pueblo of Laguna Public Works officials and the village Mayordomos. The findings included the following:

- Of the inventoried routes, two are under the jurisdiction of the New Mexico Department of Transportation (NMDOT), state highways NM 124 and NM279. Old Route 66 is maintained by the NMDOT, but right of way is not well documented.
- All of the other inventoried routes are under the jurisdiction of the Bureau of Indian Affairs (BIA), or tribal routes. Many have designated rights-of-way, which have been catalogued, and many do not.
- Many existing roads have adequate right-of-way for additional transportation facilities. Official rights-of-way should not be required for new non-motorized routes paralleling existing roads.
- Routes that are new but cannot be constructed within the existing roadway area or right-of-way may require reallocation of land assignments by the Mayordomos to accommodate new facilities. This will require individual meetings with each village's Mayordomos to determine feasibility, and should be vetted prior to the commencement of a design project. The Mayordomos indicated at a previous meeting that it was appropriate for routes that do not fit within the existing right-of-way to remain in the plan. At this time, it is specifically known that this concern is likely to apply to the route on Casa Blanca Road, a key route in the network.
- One proposed route, between Laguna and Mesita villages, will encroach into the I-40 right-of-way. This encroachment is not anticipated as a problem because the route will not cross into the freeway clear zone. However, coordination with NMDOT and the FHWA via the NMDOT Access Control Committee will be required.

Please see Appendix A for a more detailed discussion of ROW in Laguna, and a list of ROW jurisdiction and width for the Pueblo of Laguna inventoried existing routes. Detailed ROW information by road segment in GIS format is on file with the Pueblo of Laguna planning program.

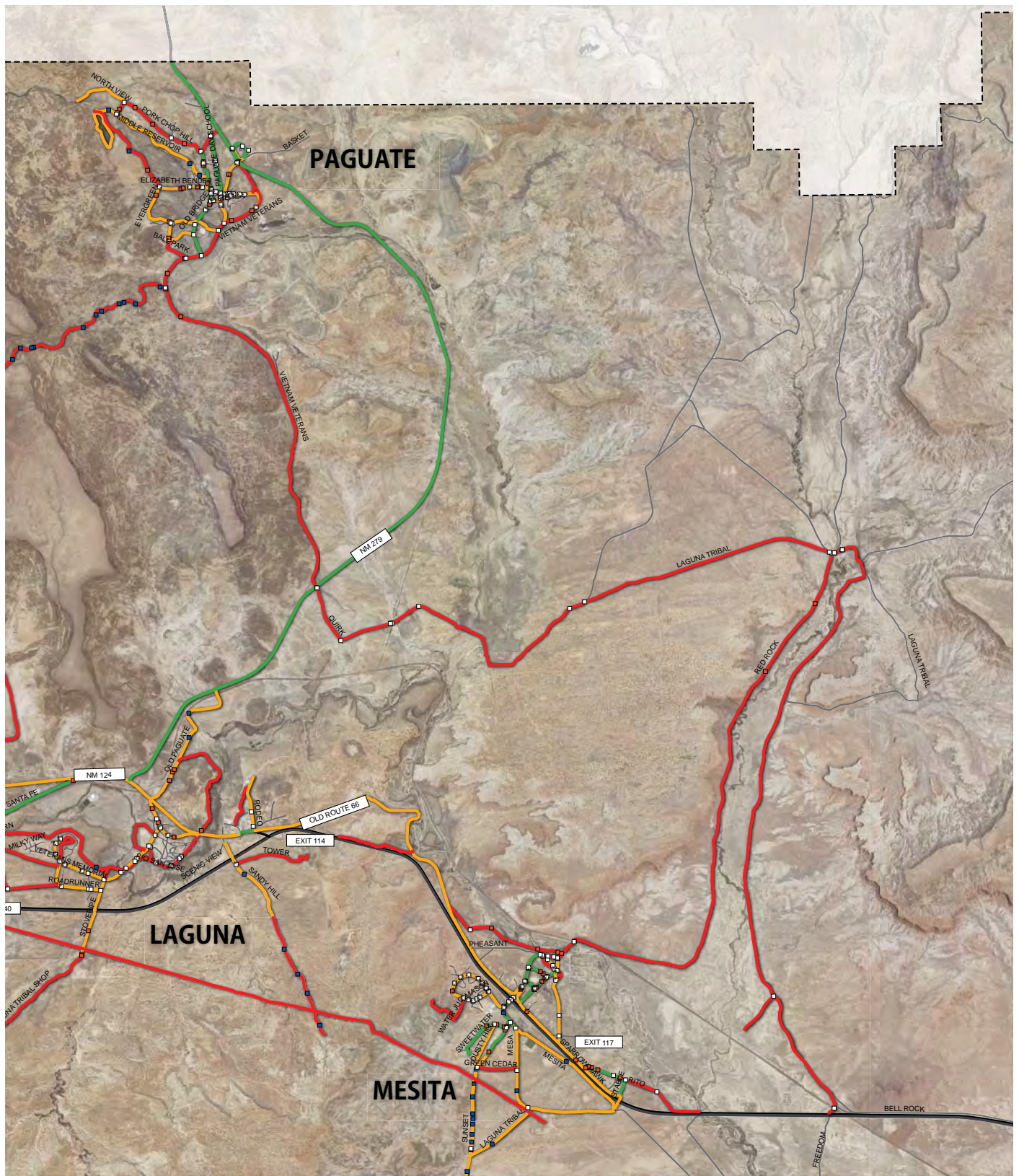


## Pueblo of Laguna Existing Routes

Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program, Pueblo of Laguna GIS, and field assessments  
 Author: Alta Planning + Design  
 Date: March 2012

Figure 3. Existing Routes Map





0 1.5 3 Miles



Figure 3. Existing Routes Map

## User Needs

### Pedestrian and Bicyclist Needs

Pedestrians and bicyclists have specific needs that are different from those of other travel modes and different from each other. The better these needs are met, the more appealing and safe walking and bicycling will be.

#### Pedestrian Needs

- For utilitarian trips, pedestrians have a strong preference for short trips, direct routes, and safe and accessible roadway crossings. A general rule of thumb is that most pedestrians are willing to walk approximately 1/4 to 1/2 of a mile for utilitarian trips
- For recreation or exercise, pedestrians often care more about aesthetics, comfort, and shade. They tend not to mind meandering routes
- All pedestrians have a shared need for safety, connectivity, and accessibility, including:
  - Safe, visible roadway crossings
  - Adequate facilities that provide a buffer from traffic where applicable
  - Continuous pedestrian facilities without gaps
  - Slow traffic speeds and low traffic volumes
  - Direct connections; even small detours can be a strong deterrent to pedestrians

#### Bicyclist Needs

- A bicyclist's skill and comfort level varies widely, and will have a large impact on the types of facilities on which the bicyclist is comfortable and willing to ride. Types include:
  - Strong and fearless (less than 2% of the US population)
  - Enthused and confident (10% - 13% of the population)
  - Interested but concerned (50 - 60% of the population)
  - Not interested (20- 30% of the population)
- This indicates that there is a large pool of potentially interested bicyclists that will consider bicycling with adequate bicycle facilities
- Most bicyclists prefer dedicated bicycle facilities such as bike lanes, multi-use trails and/or bicycling on low-traffic streets with low vehicle speeds
- For utilitarian (transportation) bicycle trips
  - Directness of the route and connected, continuous facilities are more important than aesthetics
  - Trips are typically one to five miles in length
  - Flat topography is desired
  - Trips typically during commute hours and on weekends
  - Typically use on-street facilities (unless a separated path happens to be available)
- For recreational bicycle trips:
  - Visual interest and shade are more important than directness of the route
  - Trips may be very short or very long
  - A variety of topographies and difficult levels may be desired
  - Trips are typically on the weekend, or weekdays in the early morning or evening
  - Facilities vary depending on bicyclist skill. Trails and highways with or without shoulders are common facilities



## Community Input

### Resident Survey

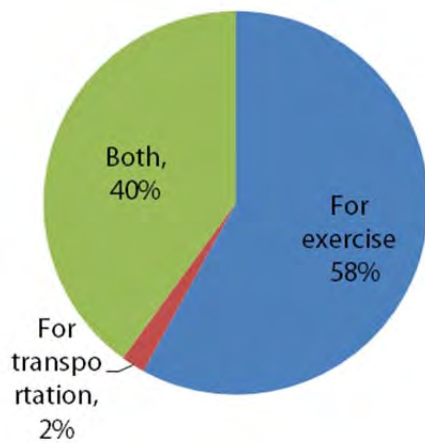
A survey was given to Pueblo of Laguna residents to learn more about their bicycling and walking habits, preferences, needs and desires. Residents could fill out the survey in paper form or online. Surveys were received from 171 respondents, with 99% listing residency within the Pueblo of Laguna.

The survey showed that:

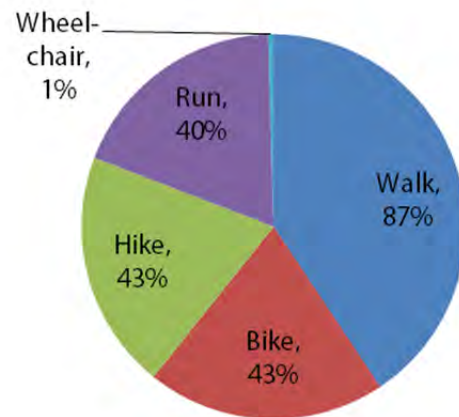
- **Walking** is by far the preferred form of active transportation for respondents, followed by **biking, running and hiking**
- Respondents report walking and bicycling for **exercise** much more than for **transportation**

Other relevant results are located below.<sup>2</sup>

**Why do you/your family walk and/or bike?**



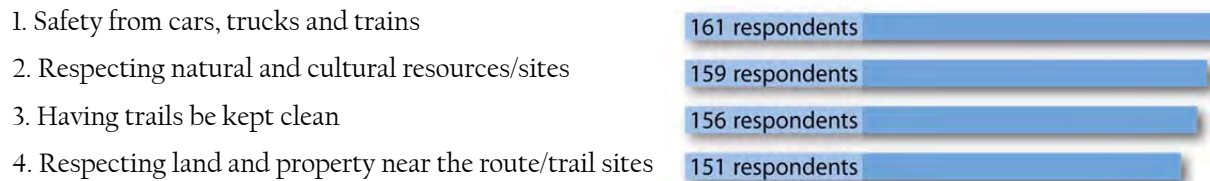
**Preferred Mode(s) of Activity**



*Figure 4. Survey results indicate that respondents mostly walk for exercise, and that walking is the preferred mode of active transportation, followed by bicycling, hiking and running*

<sup>2</sup> Full survey results and a more detailed summary on file with the Pueblo of Laguna planning program.

### Top four factors of importance to pedestrians and bicyclists



### Top four barriers to walking and bicycling



### Four most desired improvements



### Four most desired destinations



### Pedestrian facility surface preferences



### Bicycle facility surface preferences



171 total respondents

Figure 5. Survey results give respondents' preferences in a range of areas

## Summary of User Needs

The following is a summary of the preferred characteristics the Pueblo community would like to see in their pedestrian and bicycle network, based on information gathered at the various public meetings and events, and from the community survey. These characteristics shaped the routes and design guidelines proposed in this plan. Please see Appendix B for a detailed summary that includes information on specific routes and crossings identified by residents, as well as some of the differences between each village. Detailed documentation of the input gathered from the community at each meeting is located in the meeting summaries on file with the Pueblo of Laguna planning program.

### Summary of User Needs

#### Connections

Most important

- Routes between villages
- Routes between housing subdivisions and old village centers

Other priorities

- Commercial areas
- Churches and schools
- Post offices
- Recreation halls
- Official buildings
- Water tanks
- Recreation areas and natural landmarks
- Hiking and mountain biking trails

#### Health and Safety

Identify routes and loops in each village that can be used for daily recreation and exercise.

Understand and reduce barriers to walking and bicycling:

- Fears of dogs, snakes and mountain lions
- High speed traffic and blind corners in some locations
- Narrow roads that lack shoulders
- Unsafe crossings at major road intersections, railroad crossings and commercial areas
- Lack of sidewalks and trails
- Need to separate bicyclists and pedestrians from roadways

#### Route surfaces

Pedestrian routes

- Unpaved hard-packed surfaces

Bike routes

- Paved surfaces

#### Improvements

- Safer road crossings
- Pedestrian mile marker signs
- Benches and shade structures
- Surfaces for children on bicycles, strollers and wagons, and ADA accessibility
- Minimal, low-intensity improvements are preferred over higher-intensity improvements
- High-quality materials to keep maintenance costs lower

#### Other Priorities

- Respect for cultural sites
- Equity amongst the six villages
- All-purpose routes on flat terrain are a high priority
- Routes that cover a variety of terrain and levels of difficulty
- A routine maintenance plan

## Route Alignments

The proposed route alignments create a non-motorized transportation network that connects all six villages, while providing local “loops” in, and around, each village in a bicycle and pedestrian network that will accommodate both commuters and recreational users.

The proposed alignments are based on the priorities and preferences given by the Pueblo community at public workshops, focus groups and meetings. Community members indicated a need for a network that:

1. Connects the villages to each other
2. Provides recreational routes
3. Connects key village locations and housing developments to each other
4. Promotes equity between the six villages

The proposed bicycle and pedestrian routes network for the Pueblo of Laguna is organized into three classes of routes, each with different purposes and treatments, in order to meet the above four goals. Figure 6 illustrates the general guiding concept for the three types of routes. Figure 7 shows the route alignments envisioned for the completed network, on a 20 to 30-year time horizon. Table 2 lists and each of the proposed routes by type and village, and gives the route’s description, length, and ranking score.

## Route Types and Alignments

### Pueblo Routes

- Pueblo routes are the backbone of the network. They are longer routes that connect the villages and the most important Pueblo destinations
- Pueblo routes are primarily for transportation between villages, and for longer recreational trips
- Pueblo routes are mostly located along existing highways with higher traffic volumes and speeds
- Safety is a major design consideration for Pueblo routes

Table 1. Proposed Route Miles	
Route Type	Miles
Pueblo Routes	42
Village Routes	43
Linking Routes	18
<b>Total</b>	<b>103</b>

### Village Routes

- Village routes are smaller loops and segments within each village, mostly located on local roads
- The proposed village route alignments were chosen by the residents of each village
- Village routes will be used for daily recreational trips and utilitarian trips between local destinations

### Linking Routes

- Linking routes complete the gap between the Pueblo routes and/or village routes
- Linking routes will make connections to key destinations that are not accounted for by other routes

### Remaining Routes

The remaining routes may still continue to be used by residents, but are not recommended for specific improvements at this time. However, should any of these routes receive funding for improvements in the future, they should be considered for complete street improvements that will accommodate bicyclists and pedestrians safely and comfortably.



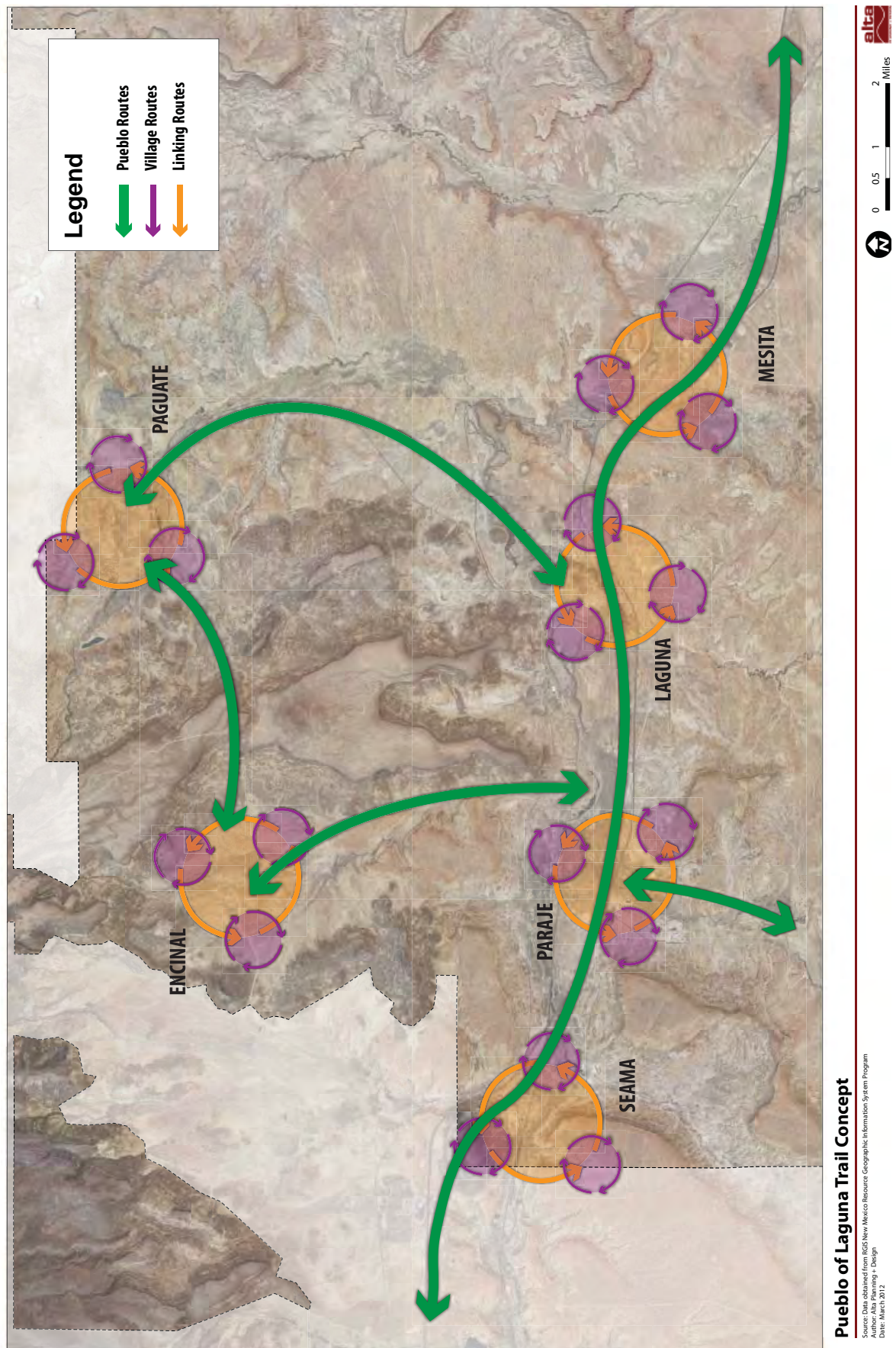
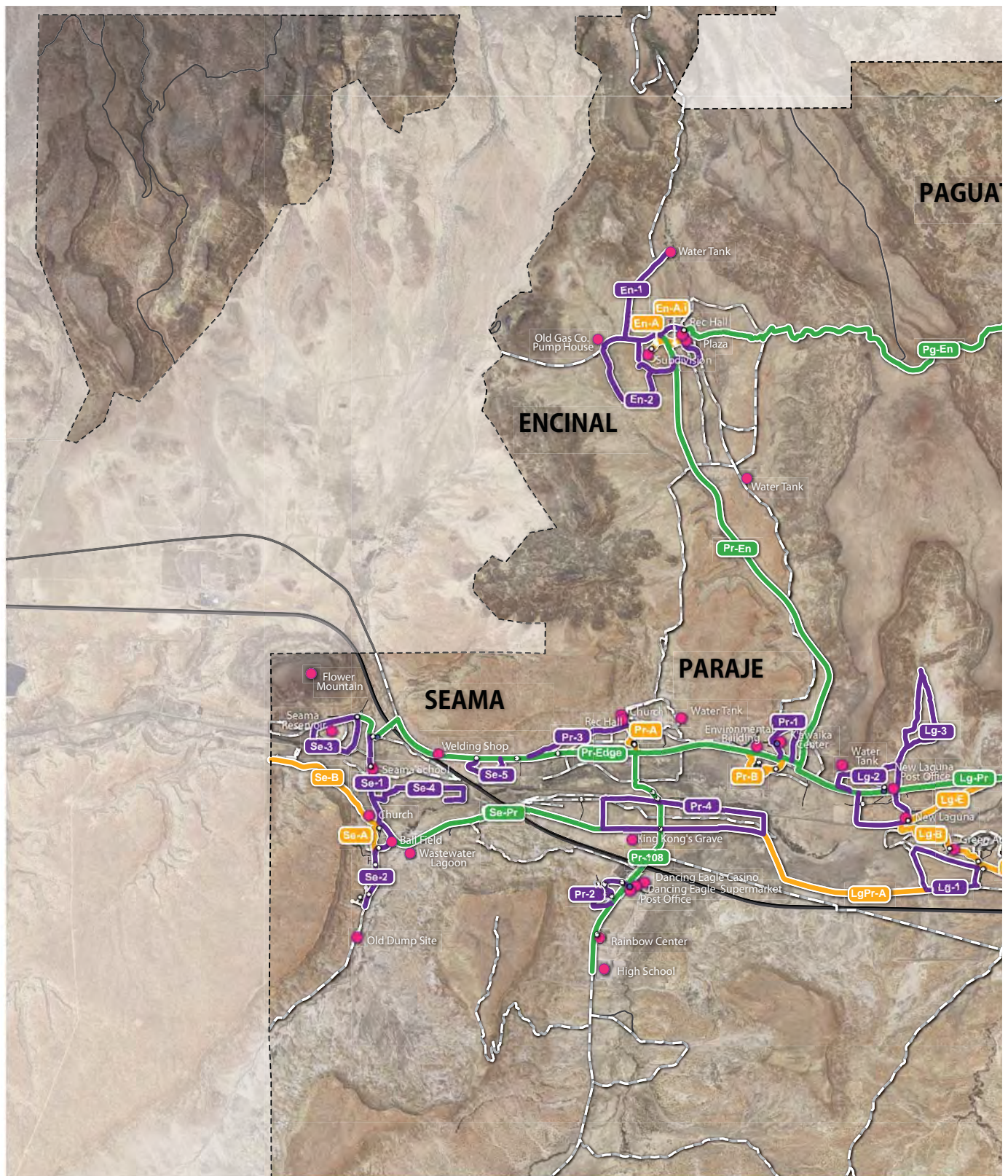


Figure 6. Pueblo of Laguna Trail Concept





## PUEBLO OF LAGUNA ROUTES MAP

### Pueblo of Laguna Bicycle and Pedestrian Route Plan

Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program and Pueblo of Laguna GIS

Author: Alta Planning + Design

Date: April 2012

Figure 7. Map of Proposed Routes



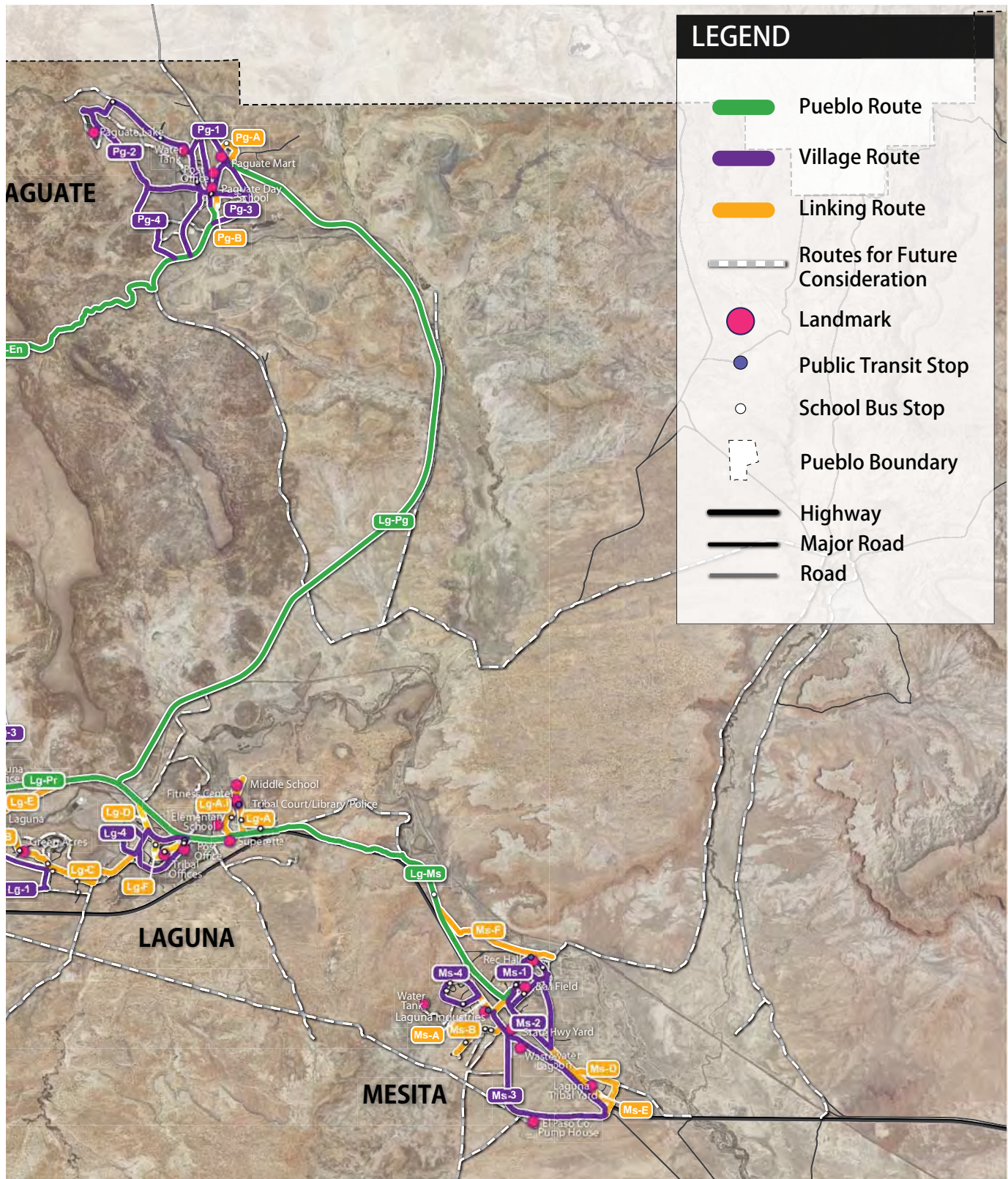


Figure 7. Map of Proposed Routes

Table 2. Proposed Routes and Priorities

Route ID	Length (miles)	Description	Prior-ity Rank
<b>Pueblo Routes*</b>			
Lg-Ms	4.0	Old Route 66 from Rodeo Drive to Mesita Road and new trail down escarpment next to I-40	Med
Lg-Pg	9.6	NM 279 from NM124 to Postal Road	Med
Lg-Pr	6.3	NM 124 from Casa Blanca Road to Old Route 66, Old Route 66 from NM 124 to Rodeo Drive	High
Pg-En	7.0	Encinal-Paguate Road from Hawk Loop Road to Cedar Road	Low
Pr-108	2.8	Casa Blanca Road from NM 124 to the Post Office	High
Pr-Edge	3.5	From the Rainfall Road and Bronx Road intersection to NM 124; and along NM 124 to Casa Blanca Road	Low
Pr-En	5.3	Encinal Road from Old NM 124/Bridge alignment to Mount Taylor Vista Road	Low
Se-Pr	3.1	Seama to Exit 108 via Rainfall Road (Deer Dancer Road to Casa Blanca Road)	Med
<b>Total</b>	<b>41.6</b>		
<b>Village Routes</b>			
<b>Encinal</b>			
En-1	2.3	Encinal Cubero Road from Encinal Canyon Road to Mount Taylor Vista Road; Mount Taylor Vista Road to Hawk Road; Encinal Canyon Road from Encinal Cubero Road to the Water Tank	1 (Priority)
En-2	2.5	Encinal Cubero Rd from South Fork to Encinal Canyon Rd; Red Mesa Road; South Fork Road; Village Rd; Old Canyon Road from Village Rd to South Mesa Rd; South Mesa Rd	2 (High)
<b>Paguate</b>			
Pg-1	2.4	Postal Road; Elizabeth Bender between Postal Road and Old Bridge Road; Old Bridge Road; Pork Chop Hill Road between Old Bridge Road and NM 279; NM 279 between Pork Chop Hill Road and Postal Road; Paguate Day School Road between Pork Chop Hill Road and Elizabeth Bender Road	1 (Priority)
Pg-2	3.2	Elizabeth Bender Road from Old Bridge Road north to Middle Reservoir Road; Middle Reservoir Road between Elizabeth Bender Road and Pork Chop Hill Road; Pork Chop Hill Road from Middle Reservoir Road to Old Bridge Road	2 (High)
Pg-3	1.6	Vietnam Veterans Rd from Postal Rd to Paguate Day School Rd; Elizabeth Bender Road between Vietnam Veterans Rd and Postal Rd; Paguate Day School Rd between Elizabeth Bender Rd and Cedar Rd	3 (Med)
Pg-4	1.9	Old Bridge Road from Elizabeth Bender Road to Vietnam Memorial Road; Evergreen Road	4 (Low)
<b>Seama</b>			
Se-1	1.0	Rainfall Road from Pottery Road to Sacred Shield Road	1 (Priority)
Se-2	1.1	Rainfall Rd from Sacred Shield Rd to Deer Dancer Rd; Deer Dancer Rd from Rainfall Rd to Salt Cedar Lp	2 (High)
Se-3	1.4	Reservoir Road	3 (Med)
Se-4	1.4	Seama Road	4 (Low)
Se-5	0.7	Harrisburg Loop	4 (Low)
<b>Paraje</b>			
Pr-1	0.9	K'awaika Center Loop	1 (Priority)
Pr-2	1.0	Blue Star Loop, Blue Corn, Blue Sky	2 (High)
Pr-3	1.1	Irrigation Ditch Road	3 (Med)
Pr-4	4.1	Rainfall Rd from Raincloud to Casa Blanca Rd; Rainfall Road from Casa Blanca Rd to Rainstorm Rd	4 (Low)
<b>Laguna</b>			
Lg-1	2.0	Dam Road; Laguna-Paraje Road and Roadrunner Loop from Laguna-Paraje Road to Dam Road	1 (Priority)
Lg-2	2.6	Santa Fe Rd; Central Park Rd; Mesa Road; Sun Dial Rd from NM 124 to Mesa Road; Water Tank Trl	2 (High)
Lg-3	2.2	Frog Mesa Road and Frog Springs Loop	3 (Med)
Lg-4	2.2	Veterans Memorial from Rio San Jose Road to Old Route 66; Old Route 66 from Veterans Memorial to Rio San Jose Road; Rio San Jose Road from NM 124 to Veterans Memorial; Ball Park Loop	4 (Low)
<b>Mesita</b>			
Ms-1	1.8	Mesita Road from Old Route 66 to Prosperity Road; Prosperity Road from Roadrunner Road to Morningside Road; Mesa Bottom Road; Lava Bed Road	1 (Priority)
Ms-2	1.4	Mesita Day School Road; Sparrow Hawk from Mesita Day School Road to Morningside Road	2 (High)
Ms-3	3.6	Mesita Road from Sunset Road to Mesa Road (E); Mesa Road from Mesita Road (W) to Mesita Road (E)	3 (Med)
Ms-4	1.0	Industrial Parkway Subdivision Loop	4 (Low)
<b>Total</b>	<b>43.5</b>		

Table 2. Proposed Routes and Priorities

Route ID	Length (miles)	Description	Priority Rank
<b>Linking Routes</b>			
<b>Encinal</b>			
En-A	0.3	Mount Taylor Vista from Encinal Road, southwest to the subdivision	High
En-A.i	0.4	Route between subdivision and the old village center	Low
<b>Paguate</b>			
Pg-A	0.4	Rio Moquino Road; Postal Road Trail between Rio Moquino Road and NM 279	Low
Pg-B	0.1	Stone Ridge Road	Med
<b>Seama</b>			
Se-A	0.4	Sacred Shield Road	High
Se-B	1.5	Cottonwood Trail	Low
<b>Paraje</b>			
Pr-A	0.5	Acorn Road from NM 124 to Paraje Road; Paraje Road from Acorn Road to church	High
Pr-B	0.8	North Irrigation Ditch Trail and NM 124 connector	Low
<b>Laguna</b>			
Lg-A	0.6	Rodeo Road	High
Lg-A.i	0.6	Route from the existing Elementary School building and the future Elementary School building site	Med
Lg-B	1.2	New Laguna-Laguna Connection. Southern Road over the Rio San Jose, along dirt road above Green Acres, connecting to Pluto Road, Milky Way Road, then Green Acres Road to Veterans Memorial Road	Med
Lg-C	1.5	Veterans Memorial from Roadrunner Loop to Stovepipe Road; River Trail from Stovepipe Road to Veterans Memorial Road; Veterans Memorial Road from River Trail to Rio San Jose	Priority
Lg-D	0.3	Old Route 66 from NM 124 to Veterans Memorial Road	Priority
Lg-E	1.1	Santa Fe Road from Central Park Road to NM 124	Low
Lg-F	0.5	Capital Road from St. Josephs Boulevard to Rio San Jose Road, St. Josephs Boulevard from Old Route 66 to Capital Road	Priority
<b>Mesita</b>			
Ms-A	0.5	Mesita Road from Old Route 66 to Industrial Parkway; Industrial Parkway from Mesita Road to Industrial Parkway loop around the subdivision	Priority
Ms-B	0.6	Sunset Road between Mesita Road and Sweetwater Road; Sweetwater Road	Med
Ms-D	1.1	Sparrow Hawk Road between Mesita Day School Road and Rito Road; Rito Road to Stable Road: Stable Road	Med
Ms-E	0.7	Sparrowhawk Road from Rito Road to Mesita Road	Low
Ms-F	1.4	Old Ditch Trail	Low
<b>Other</b>			
LgPr-A	3.2	Rainfall Road from Casa Blanca Road to Laguna-Paraje Road; Laguna Paraje Road from Rainfall Road to Dam Road	High
<b>Total</b>	<b>17.9</b>		
<b>Grand Total</b>	<b>103.0</b>		

\*All of the Pueblo routes are priority projects. The ranking here is meant to give guidance on which of the priority Pueblo priority projects to fund first, as funding becomes available.

## New Alignments

Most of the proposed route alignments are existing routes on which improvements are being proposed. There are two new routes being proposed. These include:

- Lg-B, a linking route between Laguna and New Laguna, will provide a new river crossing
- A segment of Lg-Ms will run alongside I-40 between Laguna and Mesita, creating a shortcut across the meandering path of Old Route 66 along this stretch

## Connection to Transit

All 9 stops for the Shaasrka transit system are located along priority non-motorized routes (see prioritization section later in this document) for the Pueblo of Laguna Bicycle and Pedestrian Route Plan. This will increase multimodal access for Pueblo residents.

## Route Selection and Scoring

Each of the three types of routes were selected in different ways, in order to balance the needs of connecting the villages safely, creating the routes most valued by each village, and creating an interconnected network that can get Pueblo residents where they need to go.

Route evaluation and ranking also varied. Ranking for the Pueblo routes was focused on safety, cost and feasibility, as well as connectivity and comfort. Ranking for the village routes was based on village preference, and ranking for the linking routes focused on connectivity of the network, as well as linking local village destinations and housing.

## Pueblo Routes

### Selection

All major routes that could connect the villages to each other were examined as potential Pueblo routes. For example, between Laguna Village and Pagate Village, NM 279, Old Pagate Road, and Vietnam Veterans Road, and the old railroad bed were all considered. These routes were then evaluated for safety, connectivity, walking and bicycling comfort, and cost.<sup>3,4</sup> The top route for each connection were then recommended as a Pueblo route. For the Paraje-Seama link, two Pueblo routes were proposed, to link two sets of destinations. Figure 8 shows a map of all considered Pueblo routes and their evaluation rankings. See Appendix C for the detailed Pueblo routes alternatives analysis.

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<sup>3</sup> Because many of the different potential Pueblo routes had one or more overlapping segments, the alternatives analysis was done in two phases. First each possible segment was evaluated according to the criteria and given a score. The different combinations of segments were then added together to give evaluation scores to each possible route.

<sup>4</sup> Certain routes were considered infeasible, and so did not undergo the detailed evaluation. For example, the old railroad bed from Laguna to Pagate was considered infeasible because of possible uranium contamination from the trains that used to carry uranium along this route. Testing of this route to determine feasibility would be excessively costly, especially when several more direct routes are available instead. See



### Scoring

The recommended Pueblo routes were then ranked in order of priority based on a similar evaluation of safety, connectivity, walking and bicycling comfort, and cost. See Appendix D for the Pueblo routes ranking.

## Village Routes

### Selection and Scoring

The residents of each village were asked to identify the top four local loops or routes that they would most like to see as walking and bicycling routes. The routes could be for recreation, transportation, or both. These became the village routes. Village residents were then asked to rank their village routes from highest to lowest priority. This helped to ensure equity amongst the six villages in the proposed route system.

Route selection and prioritization typically took place at village meeting. See the community involvement section for further details. Appendix D gives a detailed description of the village routes with their rankings.

## Linking Routes

### Selection and Scoring

After the Pueblo and village routes were identified, a list of remaining routes was compiled. These remaining linking routes were instrumental in creating a well-connected trail system through elimination of connectivity gaps and tying key destinations to the network. The linking routes were prioritized primarily according to their connectivity to valued destinations. See Appendix D for details.

## Connectivity Analysis

Funding for building non-motorized routes is often dependent on the degree to which a route increases the connectivity of the non-motorized network. Accordingly, all routes and projects were given a connectivity score in order to determine eligibility for such funding. Connectivity was calculated as follows:

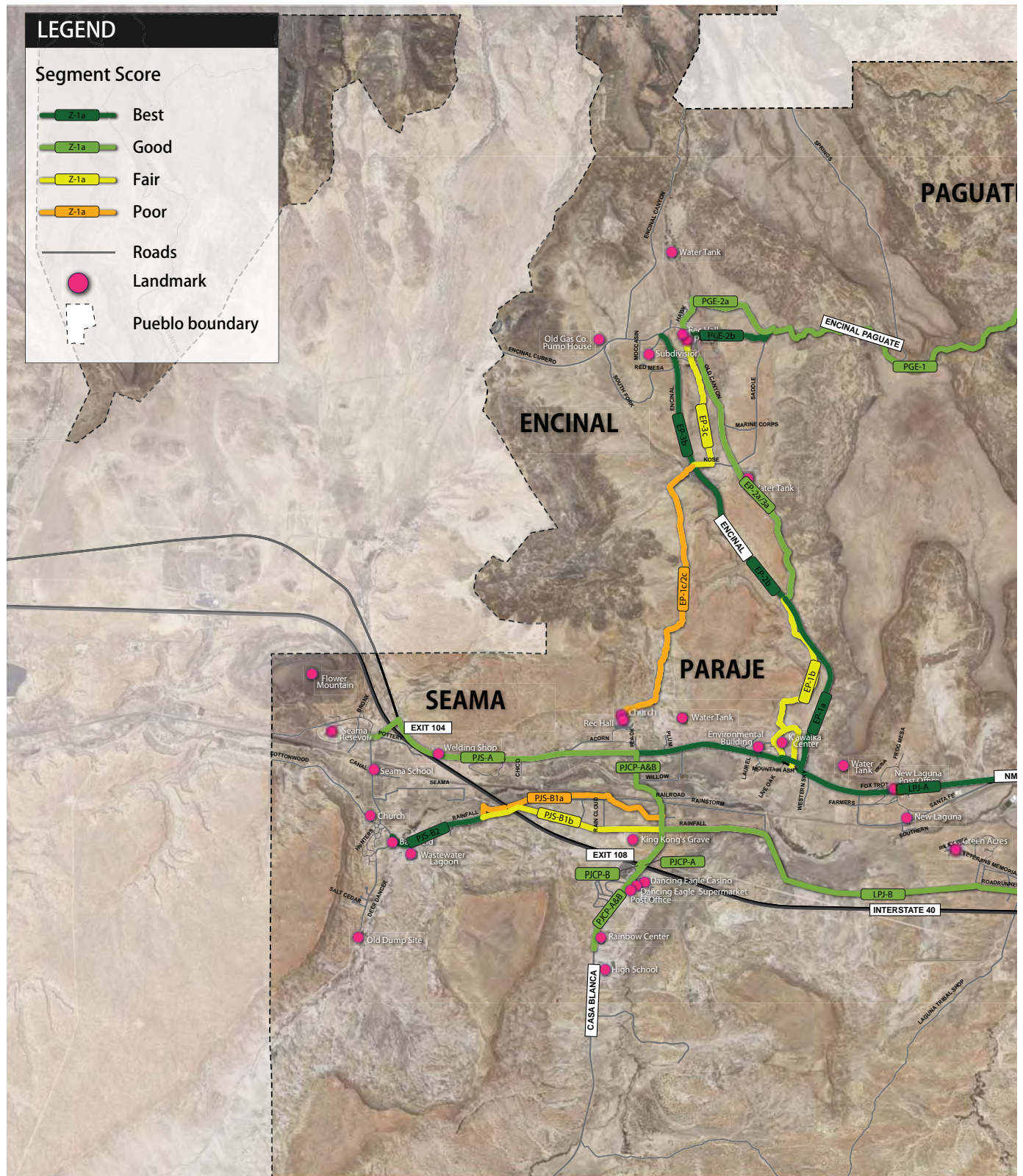
**Pueblo routes.** Routes that connected dense population centers or areas with more Pueblo-wide destinations were given higher connectivity scores; routes that connected less population-dense areas were given lower connectivity scores.

**Village and Linking Routes.** Routes that connect housing areas to village centers were given the highest connectivity ratings, since these were considered the most important local connections by Pueblo residents. Routes that connect housing areas or village centers to Pueblo routes were given moderate connectivity ratings. Redundant connections and connections to less-frequented destinations were given low connectivity scores. Finally, routes that have recreational value but do not increase connectivity were given a zero.

See Appendix D for the connectivity score of each route.<sup>5</sup>

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<sup>5</sup> Each project has also been given a connectivity score. See the project list section.



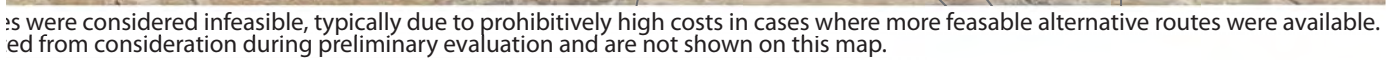
## Pueblo of Laguna Pueblo Routes Alternatives

Please note that some routes were considered but were eliminated from the final plan.

Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program  
 Author: Alta Planning + Design  
 Date: February 2012

Figure 8. Pueblo Routes Alternatives Analysis Map





A horizontal scale bar with tick marks at 0, 1.5, and 3. The word "Miles" is at the right end.



Alta Planning + Design



## Special Cases

### Historic Wagon Trail

The Wagon Trail has not been recommended as a high-priority route at this time, due to the high cost of restoration and indirectness of the route. However, it is a unique route in the Pueblo and deserves special consideration as a historically significant trail that has fallen into disrepair. Due to its historical significance, the Pueblo may still want to consider restoring the route at some point.

If this route were to be restored there are a number of items for consideration.

1. Should the road be improved or should it remain as a rugged trail? The existing condition is very rough, and where washouts have occurred, it has been rerouted as a single track trail. If it remains a rugged route, it will not be accessible to all community members.
2. How should the road be improved? Should it be improved to its historic condition, using similar materials; or should it be improved using modern design and construction materials to reduce costs?
3. A thorough study must be conducted of the hydrology, structures and soils. It is estimated that this study could cost approximately \$50,000. Once this study has been conducted, estimates can be developed based upon the desired improvement (#2 above) for the climb up the escarpment.
4. Funding for improvements may be available depending on the approach the Pueblo chooses. Using historical materials and methods may open up funding sources that focus on historic preservation.



*The wagon trail*

### Laguna to Mesita Connection

There are two potential routes across the mesa between Laguna and Mesita villages, one following Old Route 66, and one that creates a new trail immediately north of I-40, and connects to an abandoned stretch of Old 66. The second route is recommended because it reduces the distance between the villages by approximately 0.63 miles and provides safer separation from the roadway environment. This route would require encroachment into the I-40 right-of-way for a distance of approximately 300' to 500'. The encroachment is not seen as an issue because the new trail would not encroach into the freeway clear zone, maintaining at least 40' of clearance from the edge of travel lanes. This route will require coordination with FHWA and the NMDOT via the NMDOT Access Control Committee because of entry into the I-40 right-of-way.

### Jogs off the Roadway

Two routes have small portions that jog off the main roadway. Lg-Pr near the K'awaika Center and Encinal Road, and Lg-C near where Veterans Memorial Rd meets Stovepipe Rd. In both cases this is due to existing roadway bridges have very narrow shoulders and high posted speed limits, leading to unsafe conditions for pedestrians and cyclists unless there is a costly bridge widening. To minimize path construction costs and maximize pedestrian and bicyclist safety, these routes divert pedestrians and cyclists onto neighboring facilities for a short stretch. On Lg-Pr they are diverted to neighboring old bridges that can have dedicated bicycle and pedestrian facilities.

## Proposed Improvements

Pueblo residents had the opportunity to compare different types of route improvements and give their preferences at open houses and other public involvement events. Pedestrian and bicyclist safety on roadways is a top concern of Pueblo of Laguna residents. In general, residents prefer pedestrian and bicycle facilities that are separated from the roadway on busy roads, or where road shoulders are narrow and drop off sharply; residents prefer less intensive trail treatments within the village core areas, where pedestrians and bicyclists share the road with motor vehicles.

The proposed improvements include several types of route improvements, ranging from adding pedestrian and bicyclist signage to existing roadways, to dedicated multiuse paths for bicycling and walking. It also includes proposals for a new roundabout, a road diet, several types of crossing safety improvements, and trail amenities.

Figures 9 – 15 show the proposed improvement types for each route, and the locations of a proposed new roundabout, road diet, crossing treatments, and amenities. The remainder of this section will explain and define the recommended route types and associated improvements. See Appendix E for a detailed list of proposed improvements and their associated costs. Note that costs are separated out to delineate possible project phases, including design, trail construction, crossing improvements, and operation and maintenance (O&M) costs. See the amenities section for details on the costs for amenities, which will vary based on the amenities chosen by the Pueblo during implementation.

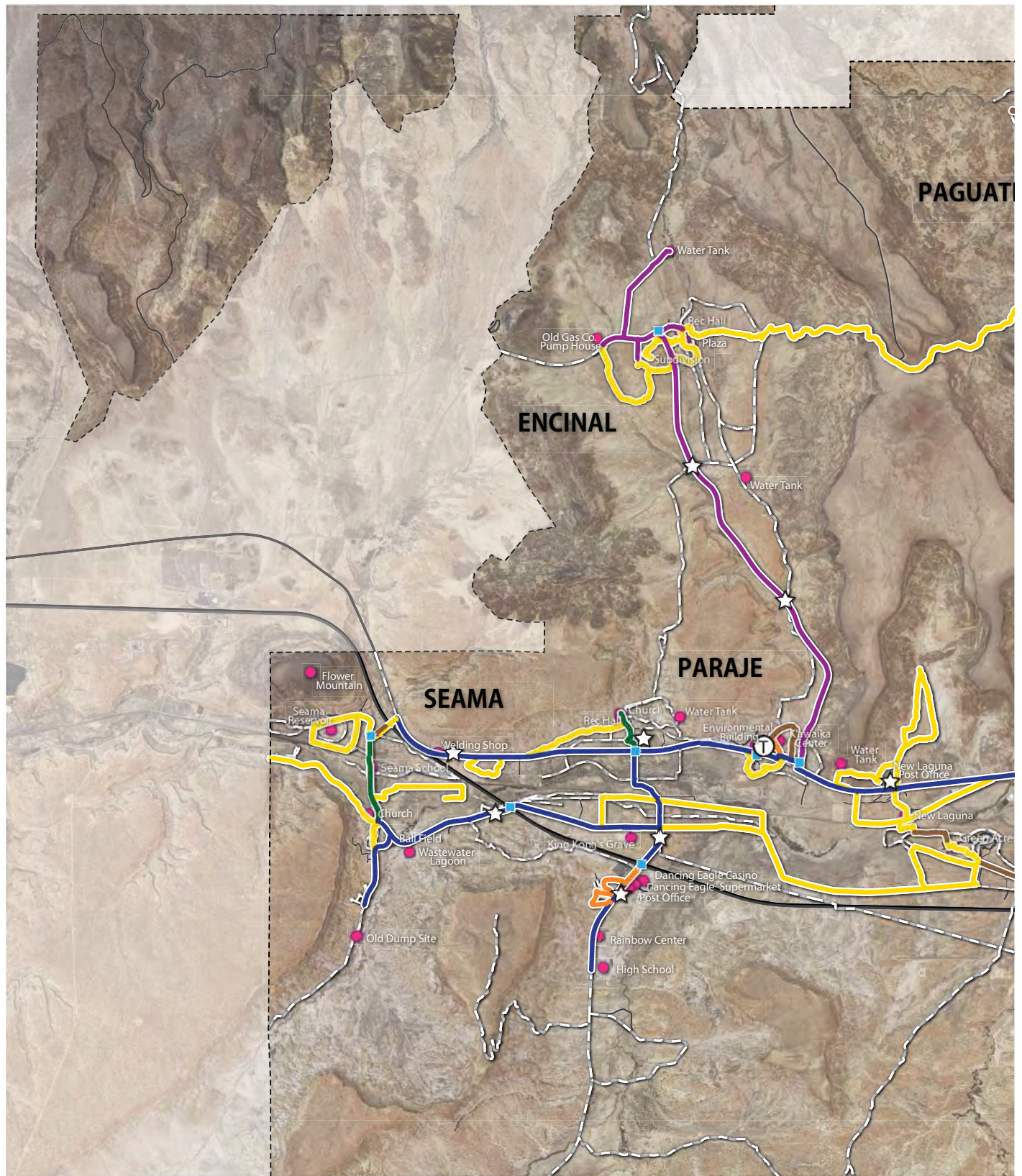
## Trail Improvement Types

The following trail types are proposed.

- A. Multi-purpose asphalt path, separated from the road
- B. Multi-purpose crusher fine path, separated from the road
- C. Graded and compacted natural surface path
- D. Shoulder bikeways
- E. Shared roadways
- F. Sidewalks
- G. Signed routes

Detailed descriptions of each trail type follow the improvement maps on the following pages.





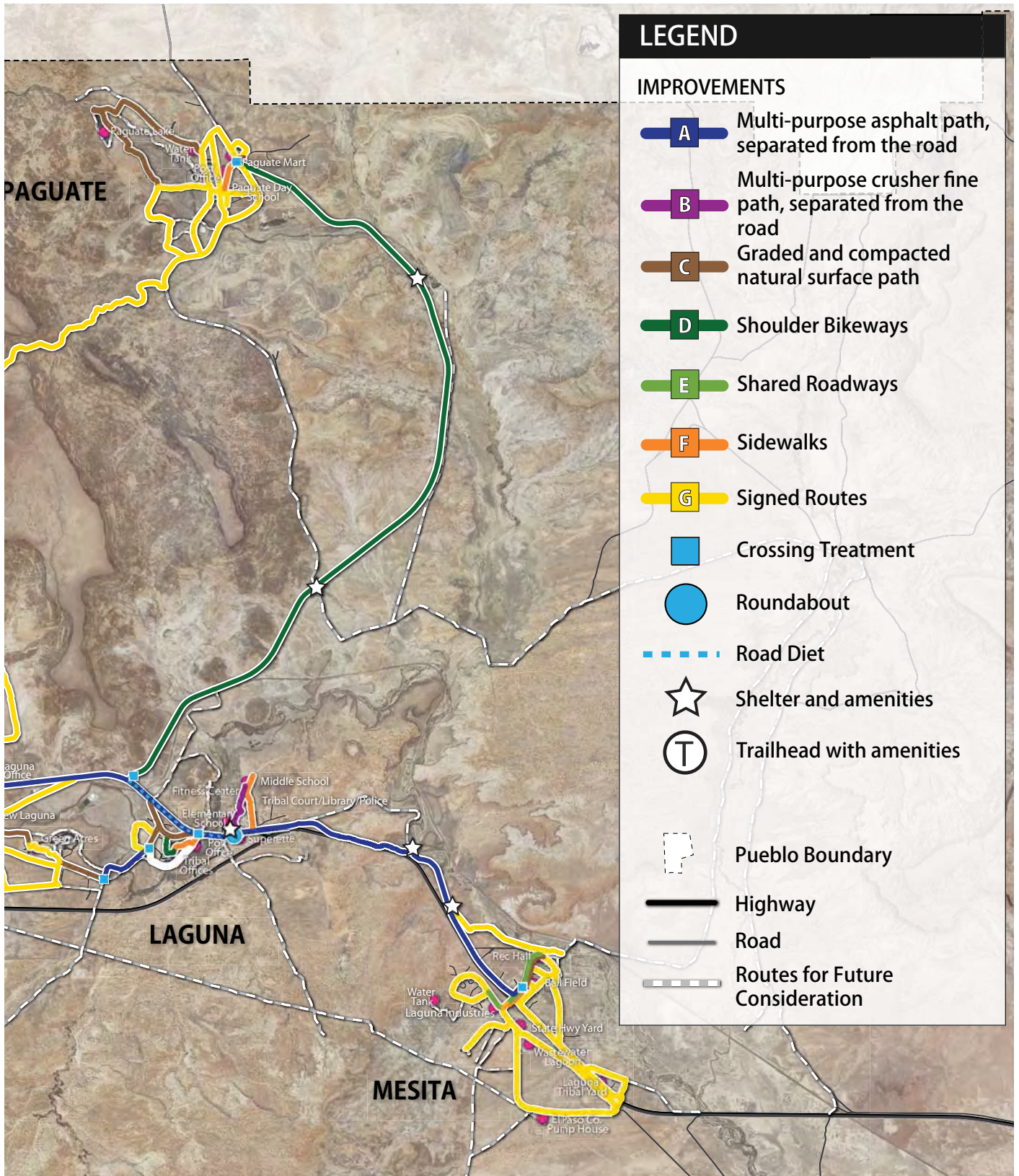
## PUEBLO OF LAGUNA IMPROVEMENTS MAP

### Pueblo of Laguna Bicycle and Pedestrian Route Plan

Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program and Pueblo of Laguna GIS  
 Author: Alta Planning + Design  
 Date: April 2012

Figure 9. Proposed Improvements Map







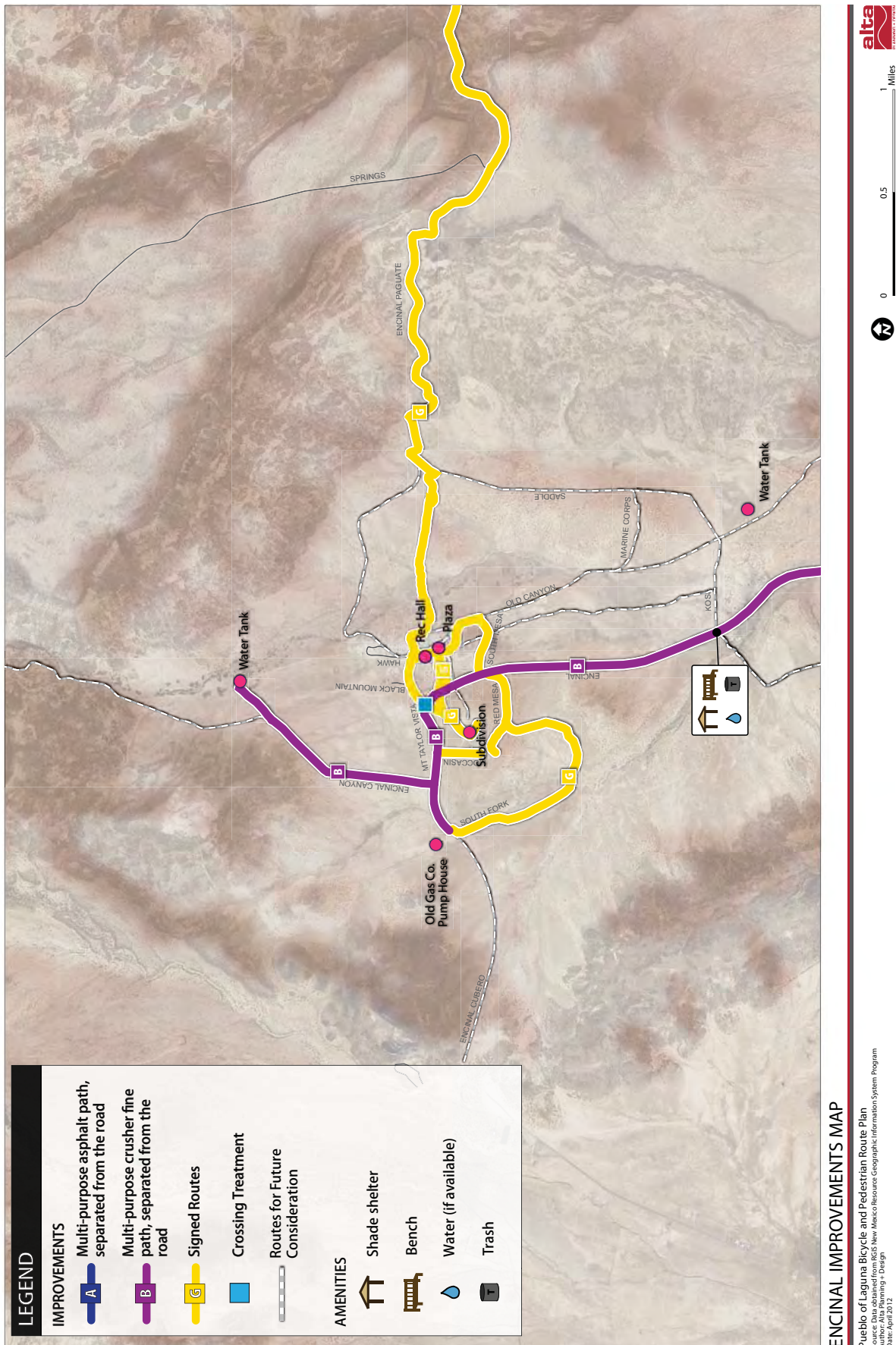


Figure 10. Encinal Proposed Improvements Map



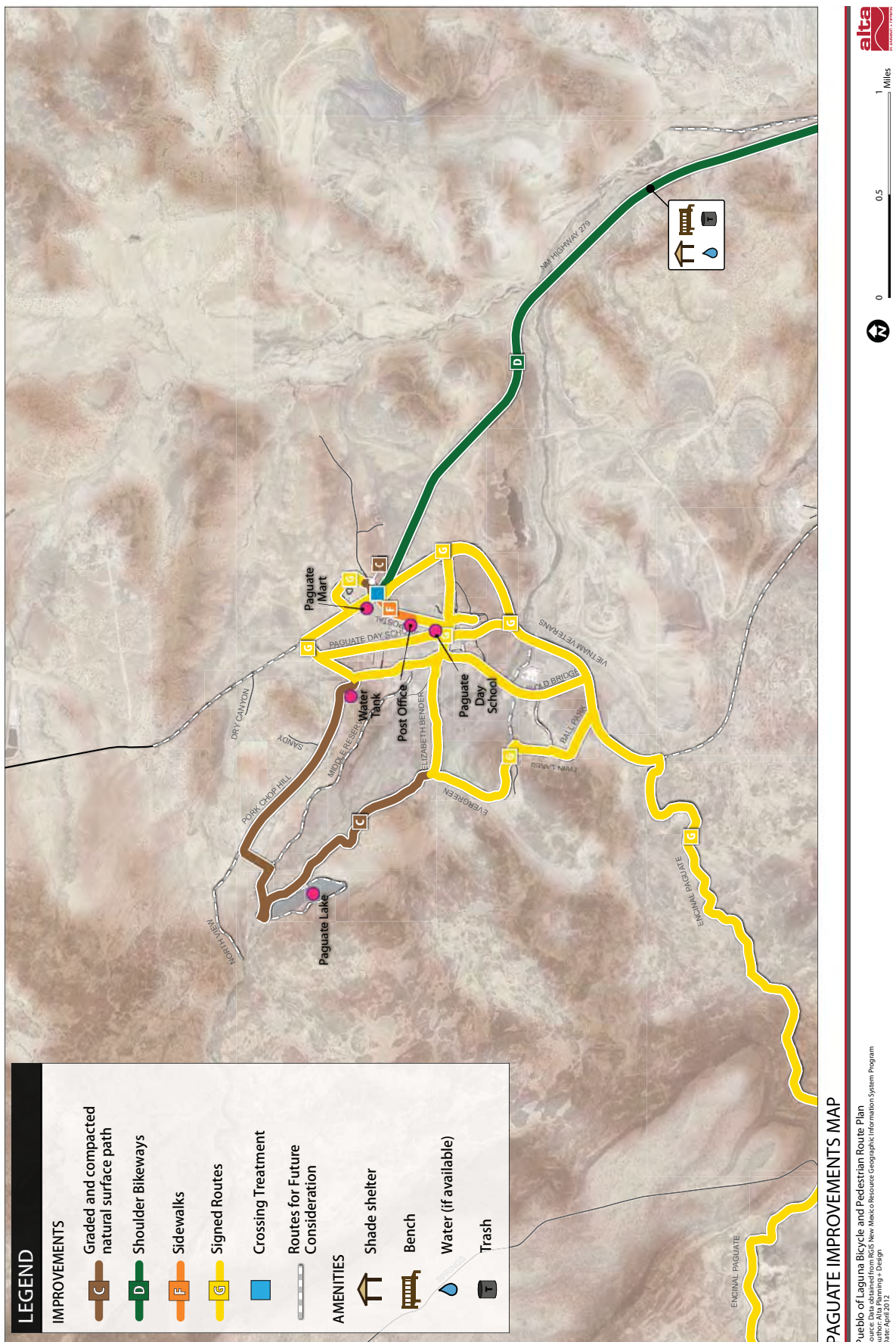
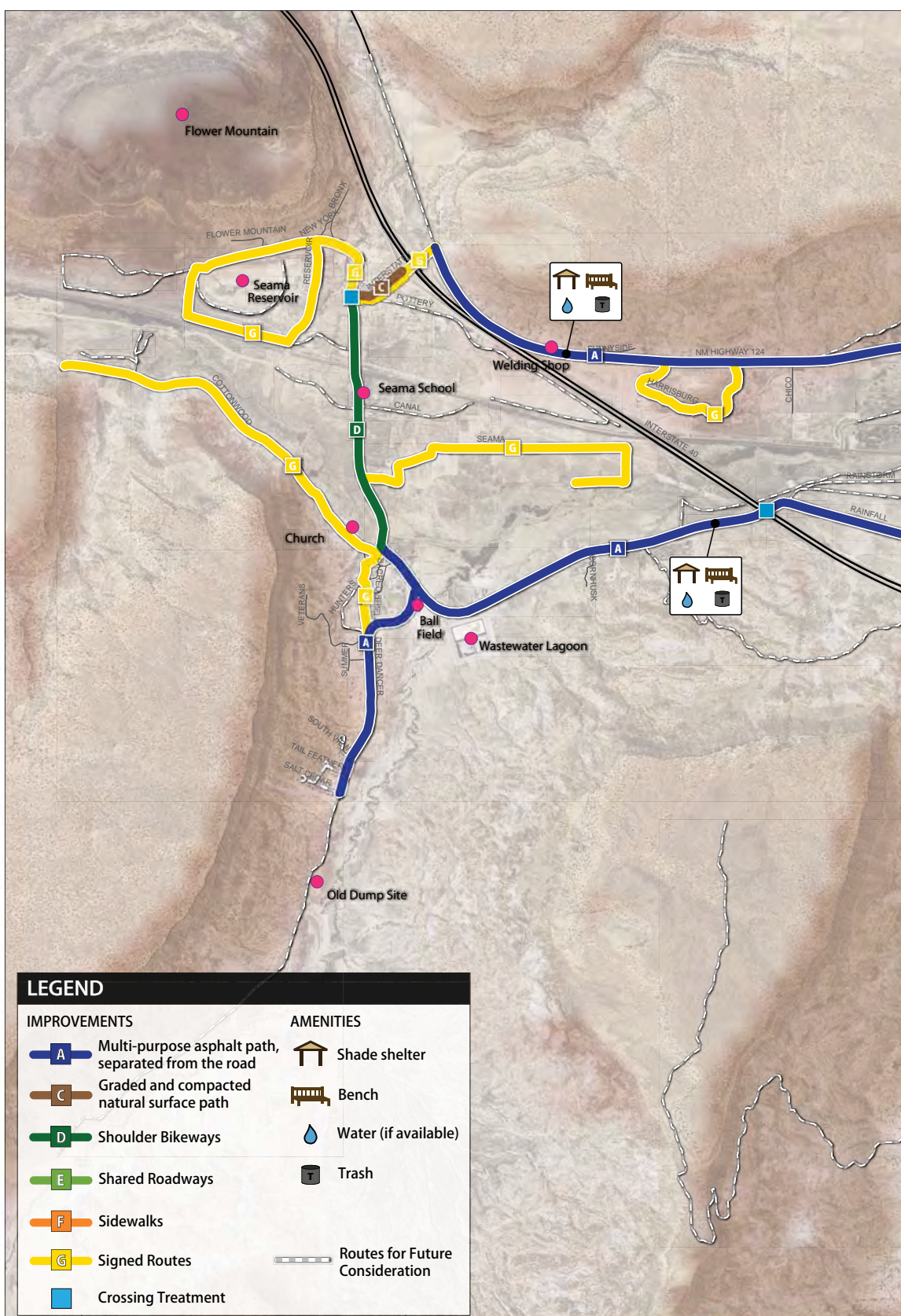


Figure 11. Paguate Proposed Improvements Map





### SEAMA IMPROVEMENTS MAP

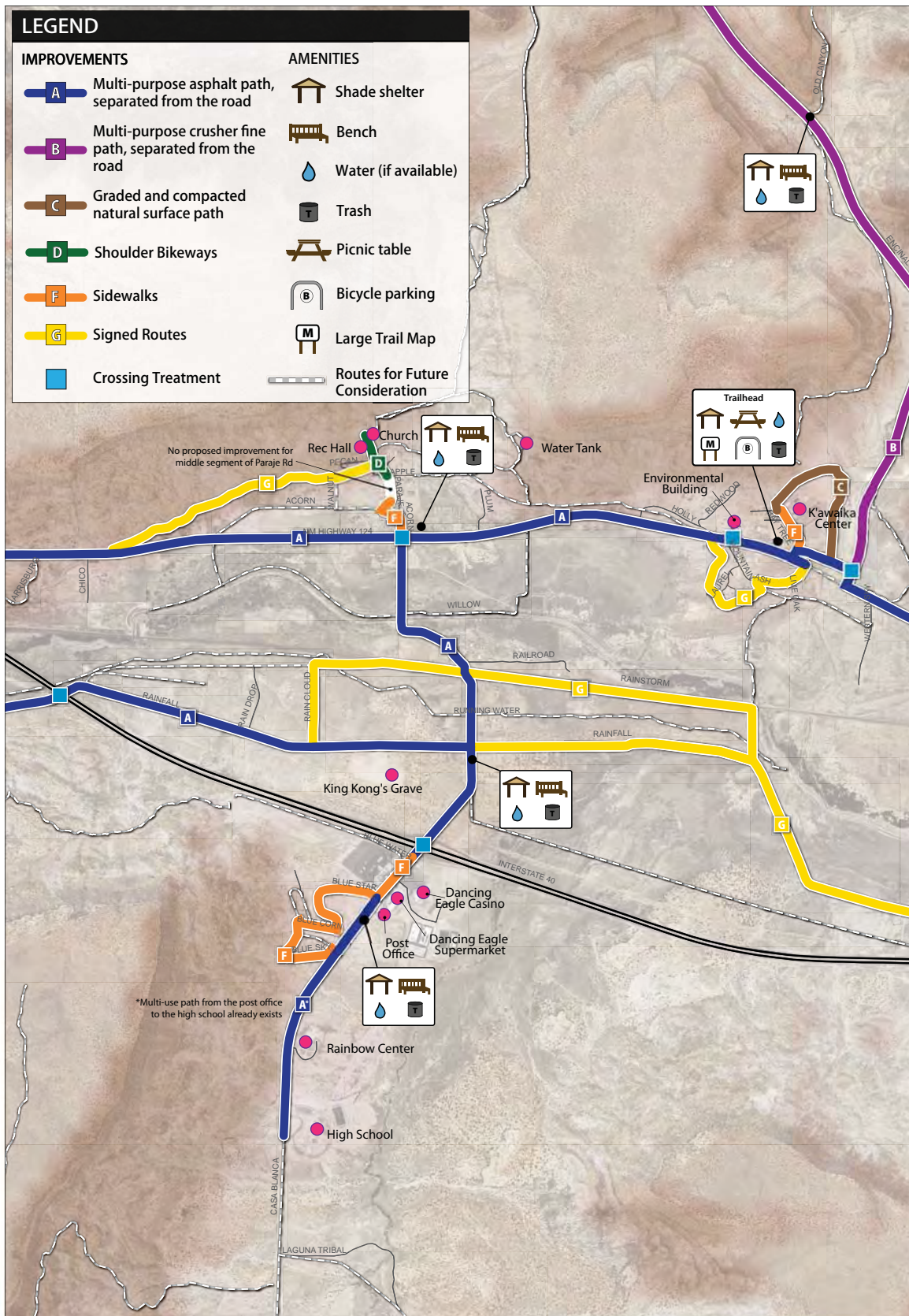
Pueblo of Laguna Bicycle and Pedestrian Route Plan  
Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program  
Author: Alta Planning + Design  
Date: April 2012

0 0.25 0.5 Miles



Figure 12. Seama Proposed Improvements Map





### PARAJE IMPROVEMENTS MAP

Pueblo of Laguna Bicycle and Pedestrian Route Plan  
 Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program  
 Author: Alta Planning + Design  
 Date: April 2012

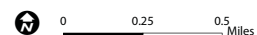


Figure 13. Paraje Proposed Improvements Map



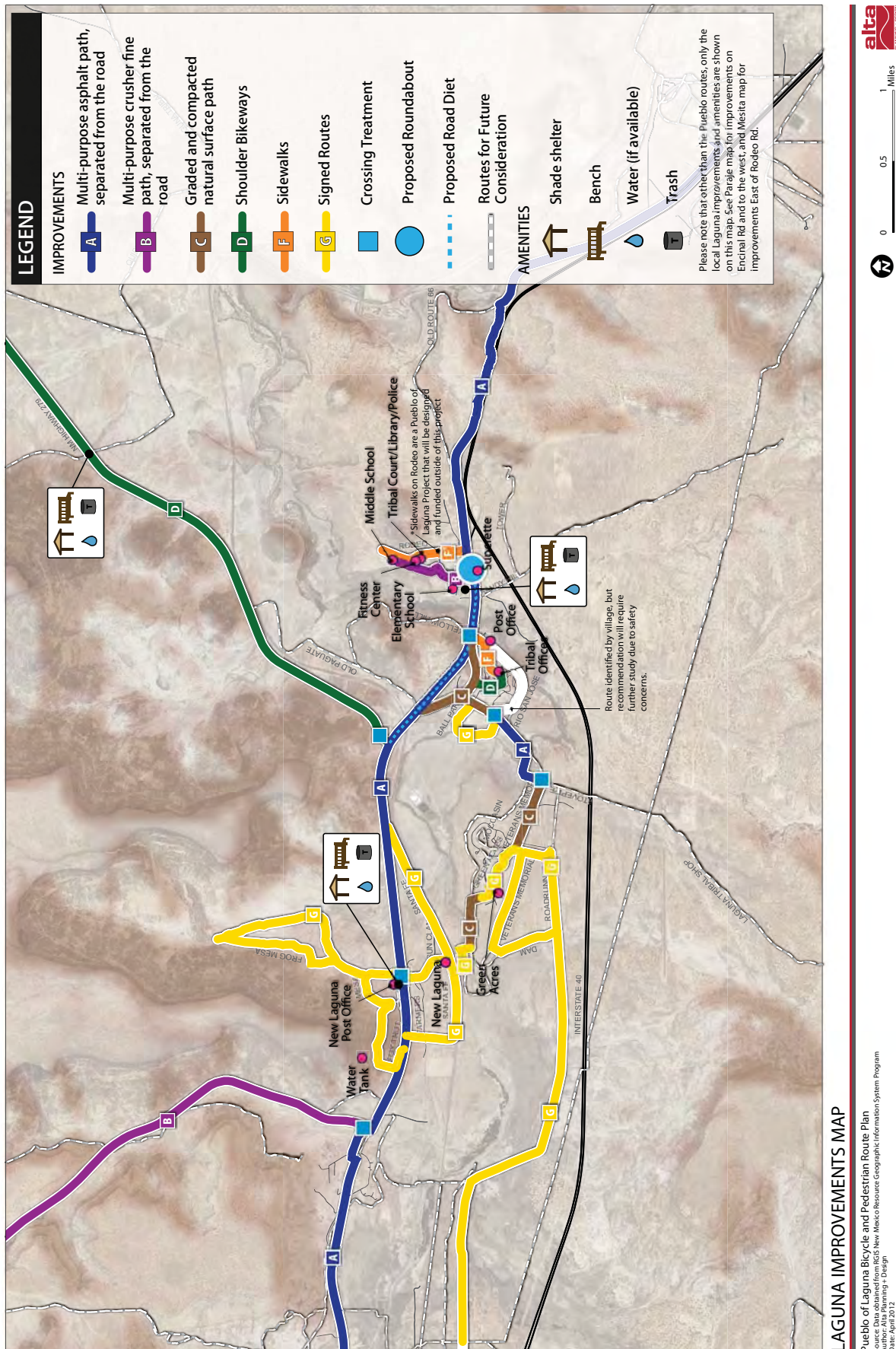
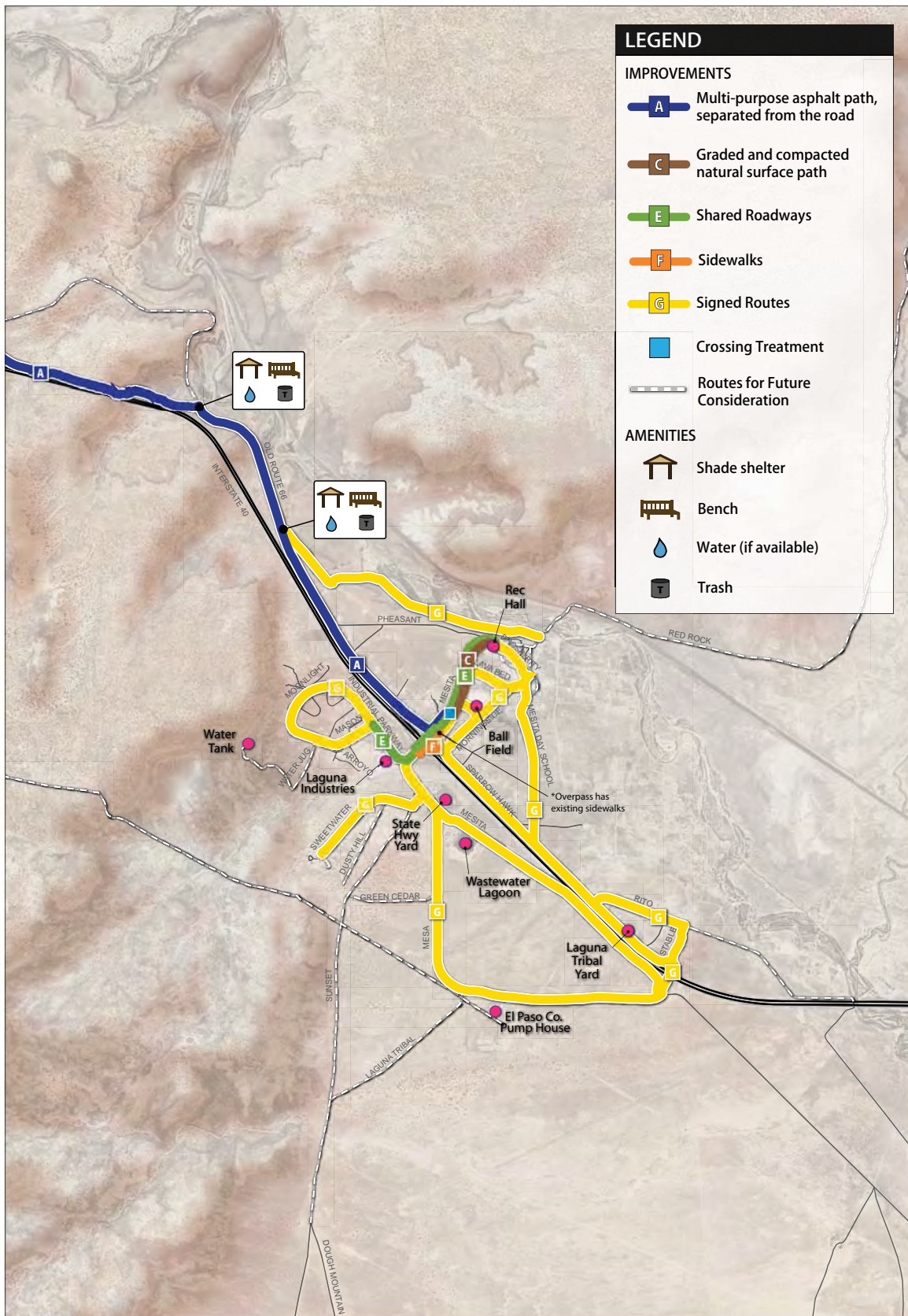


Figure 14. Laguna Proposed Improvements Map





### MESITA IMPROVEMENTS MAP

Pueblo of Laguna Bicycle and Pedestrian Route Plan  
 Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program  
 Author: Alta Planning + Design  
 Date: April 2012



0 0.25 0.5 Miles



Figure 15. Mesita Proposed Improvements Map

## A & B. Separated Multi-Use Paths

In the Pueblo of Laguna, the multi-use paths are designed to have a single tread that can accommodate all non-motorized users. Multi-use paths are typically designed to have a single tread that can accommodate all non-motorized users. They are designated along busy or high speed roadways or where heavy foot traffic is anticipated.

### Width standards

10 feet is the minimum allowed for a two-way shared-use path and is only recommended for low traffic situations.

12 feet or greater is recommended for high-use areas, or in heavy use situations with high concentrations of multiple users such as joggers, bicyclists, rollerbladers and pedestrians.

### Lateral Clearance

A 2 foot (or greater) shoulder on both sides.

### Overhead Clearance

Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

### Design Speed

The maximum design speed for bike paths is 20 mph. Speed bumps or other surface irregularities should never be used to slow bicycles.

### Grade

To increase accessibility, the recommended maximum gradient is 5%. Steeper grades can be tolerated for short distances (500 feet max).

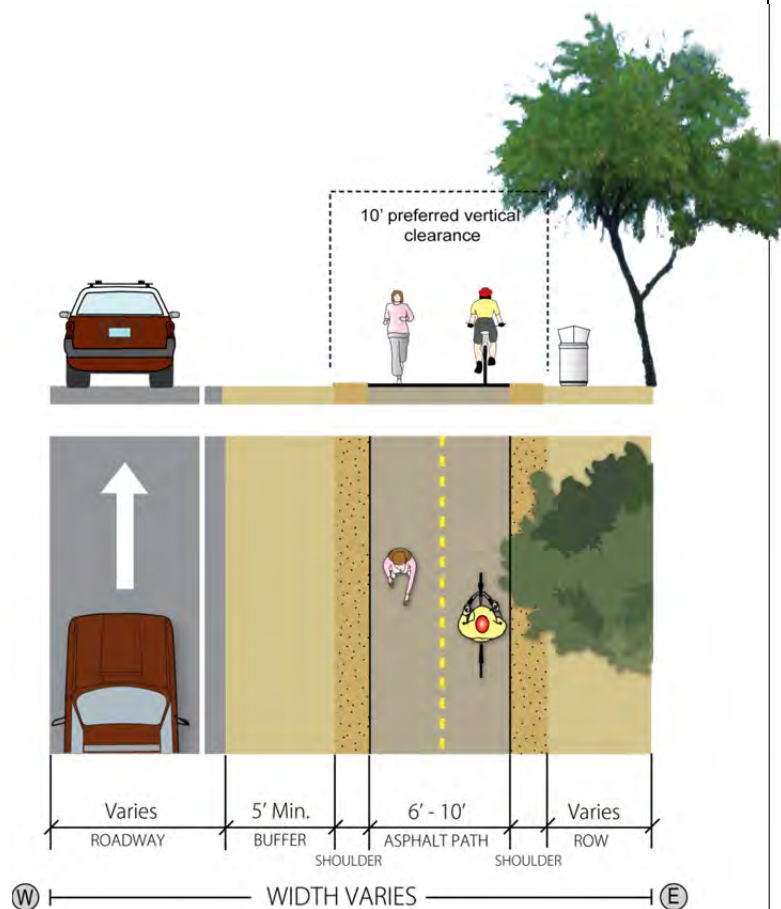
When impervious pavement is used, cross-slope pathways at 2% to direct storm water to infiltration trenches or swales. The trenches or swales then direct the water to the nearest water body.

Install a guard rail where a vertical drop of 18 inches or greater exists at the edge of the trail. Guardrails should be 36 inches high (min.) to meet ADA guidelines.

### Color

Most asphalt is black, although dyes (such as reddish pigments) can be added to increase the aesthetic value of the shared-use path itself.

### A. 10' Asphalt Path





## Separated Multi-Use Paths (Cont.)

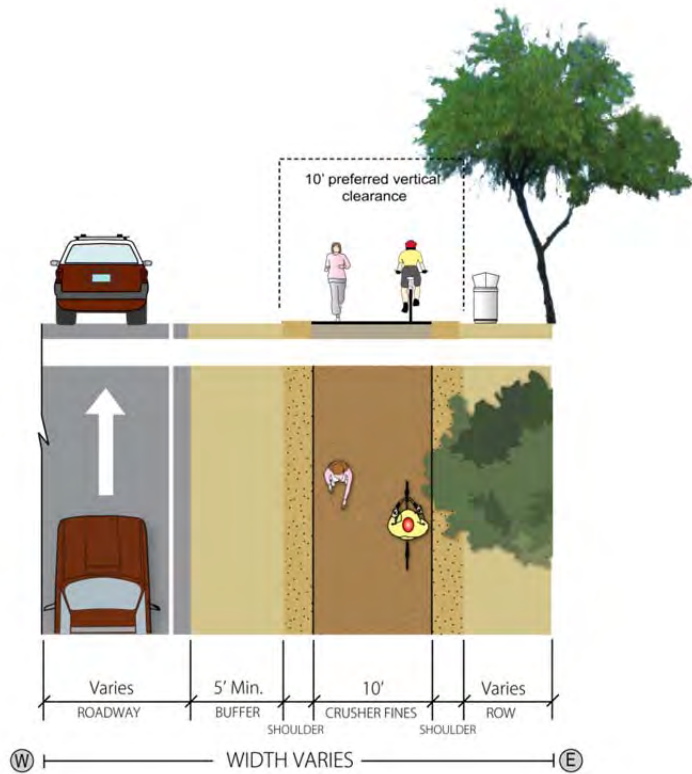
### Other

Where possible, multi-use-use paths should be designed according to ADA standards. Constructing shared-use paths may have limitations that make meeting ADA standards difficult and sometimes prohibitive. Prohibitive impacts include harm to significant cultural or natural resources, a significant change in the intended purpose of the shared-use path, requirements of construction methods that are against federal, state or local regulations, or presence of terrain characteristics that prevent compliance.

### Application

Multi-use paths form the spine of the Pueblo's route network. Both asphalt and crusher fines paths are recommended, based on community feedback and site conditions.

### B. 10' Crusher Fines Path



### References

AASHTO Guide for the Development of Bicycle Facilities  
 U.S. Access Board. Public Rights-of-Way Accessibility Guidelines (PROWAG).  
 FHWA. Designing Sidewalks and Trails for Access.

## C1. 6' Graded and Compacted Path with 5' Buffer from the Curb

The 6' graded and compacted path is a natural surface path and a low intensity treatment for roadways with a curb. Natural surface trails serve a variety of user groups and can serve transportation needs such as: school access, commuter use, or local errands.

### Width standards

There is no one set of standards for natural surface paths. As this path is recommended in lieu of a sidewalk, a 6' foot width is recommended to allow two people to walk comfortably side-by-side

### Lateral Clearance

A 2 foot (or greater) shoulder on both sides.

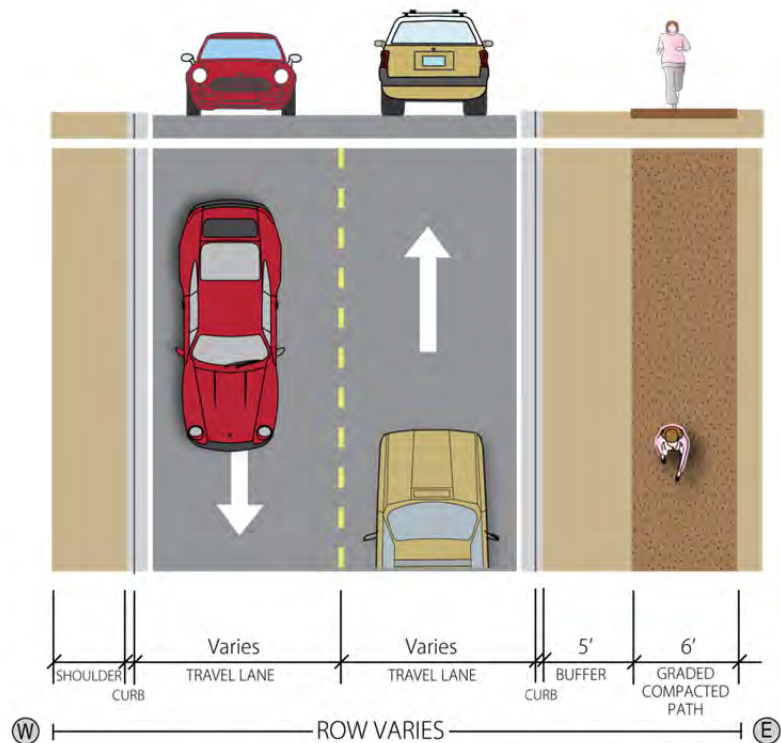
### Overhead Clearance

Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

### Application

The application of this path type will be along paved roads with a curb.

Natural surface trails are recommended on routes that have relatively low pedestrian volumes and along roads with low vehicle volumes.



### References

The U.S. Forest Service's *Trail Construction and Maintenance Notebook*

*Natural Surface Trails by Design: Physical and Human Essentials of Sustainable, Enjoyable Trails.*

## C2. 5' – 10' Graded and Compacted Path

The 5' – 10' graded and compacted path is a natural surface path. This path type is recommended as a low impact treatment along roadways and for off-street locations. Natural surface trails serve a variety of user groups and can serve transportation needs such as: school access, commuter use, or local errands.

### Width standards

There is no one set of standards for natural surface paths  
6 foot is the recommended, 5 foot where right-of-way is constrained

### Lateral Clearance

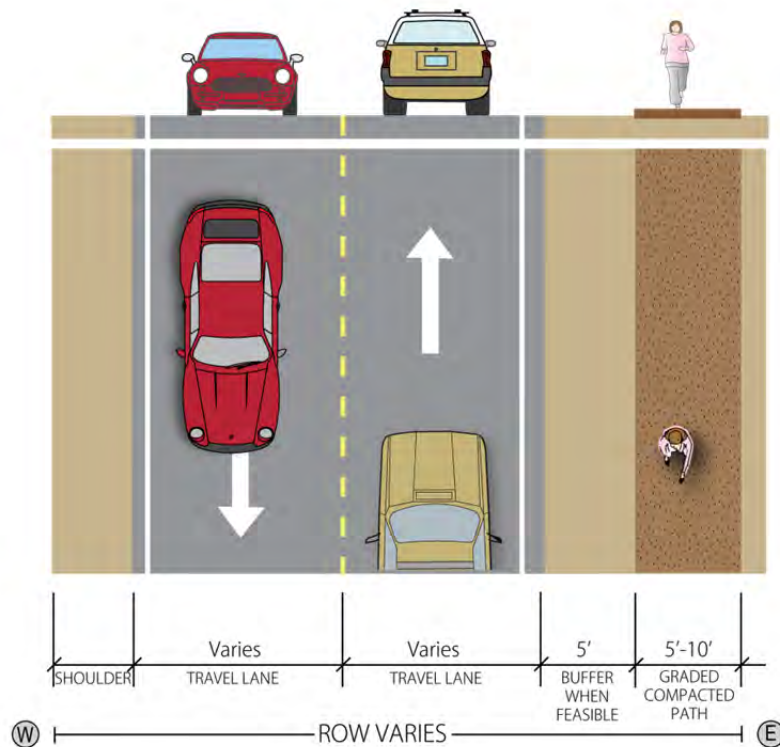
A 2 foot (or greater) shoulder on both sides.

### Overhead Clearance

Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

### Application

The application width in the Pueblo will range from 5 feet to 10 feet in width depending on the location and the anticipated pedestrian volumes.



### References

The U.S. Forest Service's *Trail Construction and Maintenance Notebook*

*Natural Surface Trails by Design: Physical and Human Essentials of Sustainable, Enjoyable Trails.*

## D. Shoulder Bikeways

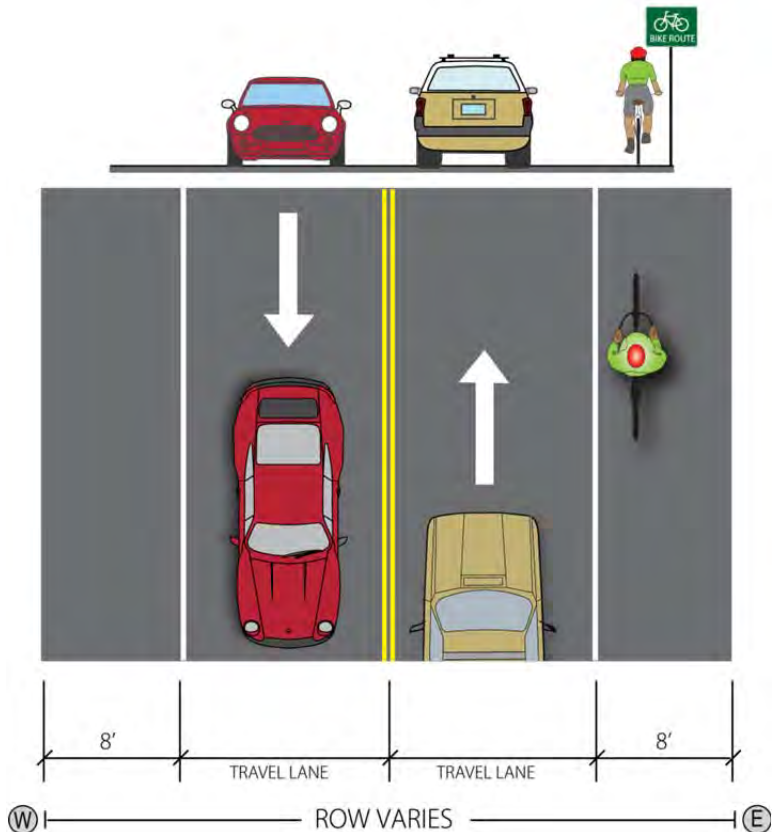
On streets without adequate space for bike lanes, or on rural roads with a large shoulder, shoulder bikeways can accommodate bicycle travel. Shoulder bikeways are generally used by commuter and long-distance recreational riders, rather than families with children or more inexperienced riders. Parking is generally not allowed along shoulder bikeways.

### Width standards

- Recommended widths (measured from painted fog line to edge of pavement):
  - 6' on roadways with posted speed limits > 40 mph
  - 5' on roadways with posted speed limits < 35 mph
  - 4' on low-speed, low-volume streets where right-of-way constraints exist
- Can include pavement markings and 'Share the Road' signage.

### Application

- Shoulder bikeways are recommended along roads that already have wide shoulders (such as NM Highway 279).



### References

- AASHTO Guide for the Development of Bicycle Facilities.
- MUTCD.



## E. Shared Roadways (Bicycles and Vehicles)

Signed shared roadways are appropriate for roadways with low vehicle volumes, low vehicle speeds and neighborhood routes. A shared roadway is defined as “a roadway which is open to both bicycle and motor vehicle travel.” Signed shared roadways are identified as preferred bike routes.

### Shared Lane Markings Design Summary

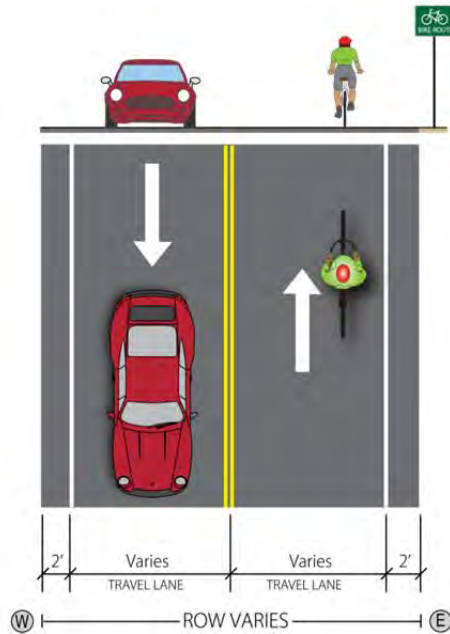
Shared lane markings are high-visibility pavement markings that help position bicyclists within the travel lane. These markings are often used on streets where dedicated bike lanes are desirable but are not possible due to physical or other constraints. Shared lane markings are placed strategically in the travel lane to alert motorists of bicycle traffic, while also encouraging bicyclists to ride at an appropriate distance from the “door zone” of adjacent parked cars. Placed in a linear pattern along a corridor, shared lane markings also encourage bicyclists to ride in a straight line so their movements are predictable to motorists. Placing shared lane markings between vehicle tire tracks (if possible) will increase the life of the markings.

- Shared lane markings should not be used on roadways with speed limits above 35 mph or on paved shoulders.
- Shared lane markings should be placed:
  - 11 feet from face of curb (or shoulder edge) to the center of the marking where there is on-street parking.
  - 4 feet from face of curb (or shoulder edge) to the center of the marking where there is no on-street parking.
  - Immediately after an intersection and spaced at intervals not greater than 250 feet.

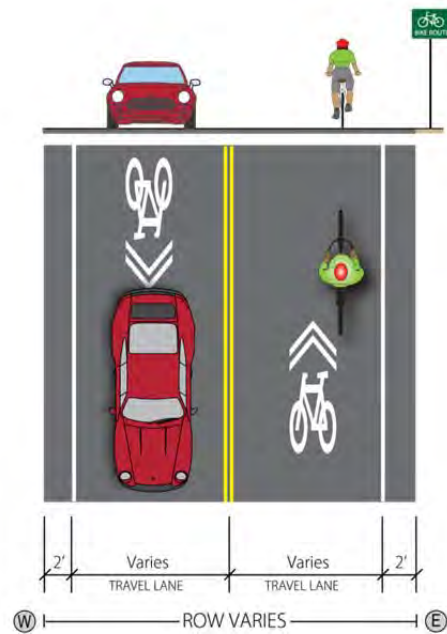
### Bike Route Sign

Bike Route sign color, dimensions and placement requirements are listed in the MUTCD, Chapter 9B.

#### Signed Only Route



#### Signed Route with Shared Lane Markings



### References

- MUTCD.

## F. Sidewalks

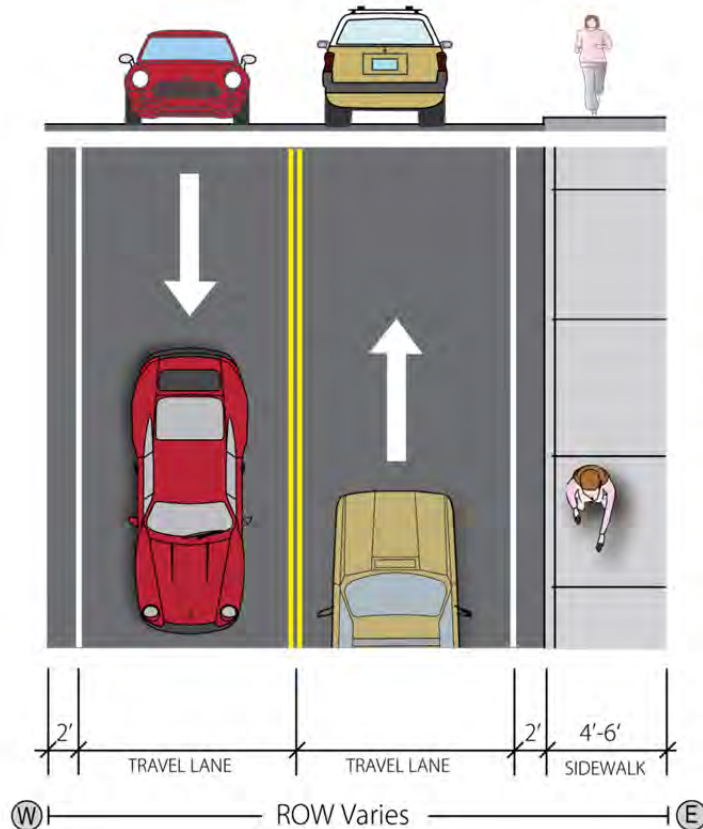
Sidewalks are typically recognized as pedestrian facilities and are not recommended for bicycles. Dedicated pedestrian facilities provide a visual cue that walking is an encouraged activity in a community.

### Width standards

- Sidewalk or pedestrian pathways along rights-of-way may be located within/upon the landscape area and are recommended to be a minimum of five feet (5') wide., with a six foot (6') width preferred.
- Constrained areas may require a narrower sidewalk. In constrained areas, sidewalks should be a minimum of four foot (4') wide.

### Application

- Sidewalks will only be recommended along paved roadways.
- The application width in the Pueblo will range be 4' and 6' depending on location and anticipated pedestrian volumes.



### References

- U.S. Access Board. Public Rights-of-Way Accessibility Guidelines (PROWAG).
- FHWA. Designing Sidewalks and Trails for Access.

## G. Signed Routes

Metal pedestrian-scaled mile marker signs provide a low impact treatment that is cost effective. Pedestrian-scaled mile marker signs are wayfinding devices that assist users in navigating preferred routes and emergency responders to situations on a route. Distance markers are also used to help pedestrians and bicyclists pace themselves along a route and track their accomplishments.

### Placement

- Place mile-marker signs every ¼ mile along a route
- Mile-marker signs should be located along a route in both directions

### Design

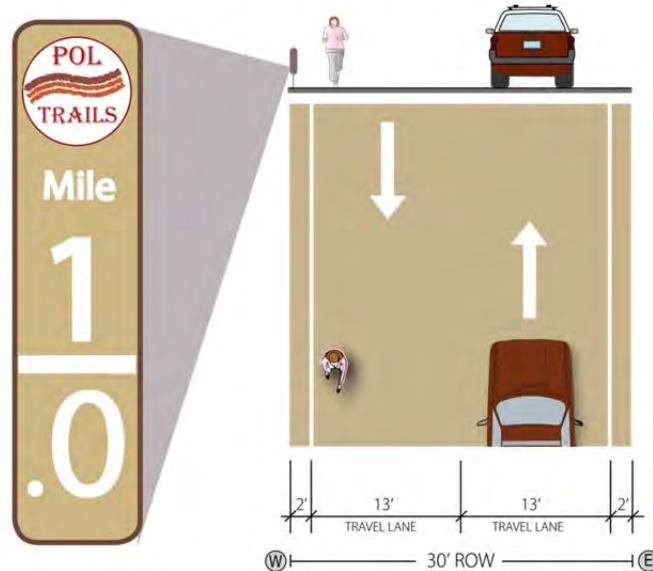
- Adding a customized logo and sign color can increase route visibility and community ownership of the trail
- For isolated routes, including geographic coordinate information may also be desired
- Anti-graffiti film is recommended

### Application

Most routes recommended in the Pueblo of Laguna Bicycle and Pedestrian Route Plan are on existing unpaved roadways. Residents expressed a strong preference for a very low impact treatments on these routes.

### Blading

- Pueblo community members expressed interest in tending to the dirt areas off of signed roadways to make them more walkable
- Blading and smoothing these areas would cost \$10,600 per mile according to NMDOT estimates
- The Pueblo could investigate the possibility of doing this internally in order to save money.



## Crossings

The need to cross busy roadways, such as NM Highway 124, Casa Blanca Road, Pagate Road, and Old Route 66 were noted in the resident survey and all public meetings as being a major barrier to walking and bicycling. Community members identified the crossing of NM 279 at the Pagate Mart and Pagate Subdivision, and major road crossings near the K'awaika Center as particularly important locations.

### Guidance

It is highly desirable to minimize the number of potential vehicle-trail user conflicts. As a general rule, when roadway crossings are required, they should occur at established pedestrian crossings. Trail approaches at roadways should always have Stop or Yield signs to minimize conflicts with autos. Bike crossing stencils may be placed in advance of trail crossings to alert motorists. Curb ramps should be designed to accommodate the range and number of users.

When considering a proposed off-street multi-use path and required at-grade crossings of roadways, it is important to remember two items: 1) trail users will be enjoying an auto-free experience and may enter into an intersection unexpectedly; and 2) motorists may not anticipate bicyclists riding out from a perpendicular trail into the roadway. However, in most cases, an at-grade trail can be properly designed to a reasonable degree of safety and meet existing traffic engineering standards.

Evaluation of multi-use trail crossings should involve an analysis of vehicular traffic patterns, as well as the behavior of trail users. This includes traffic speeds, street width, traffic volumes (average daily traffic and peak hour traffic), line of sight, and trail user profile (age distribution, range of mobility, destinations). A traffic safety study should be conducted as part of the actual civil engineering design of the proposed crossings to determine the most appropriate design features. This study would identify the most appropriate crossing options given available information, which must be verified and/or refined through the actual engineering and construction document stage.

### Trail crossing improvement locations

Table 3 lists the recommended crossing treatments and locations, and the route that these crossing improvements are a part of (treatments are described below).

<b>Table 3. Recommended Crossing Safety Improvements</b>			
Marked Crosswalks		Marked Crosswalks with Rapid Flashing Beacons	
<b>Intersection</b>	<b>Route</b>	<b>Intersection</b>	<b>Route</b>
Interstate Ext and Rainfall Rd	Pr-Edge	NM 124 at Casa Blanca Rd	Pr-Edge
Encinal Rd at NM 124	Lg-Pr	NM 124 at Central Park Rd/Sun Dial Rd	Lg-Pr
Encinal Rd at Mount Taylor Vista Rd	Pr-En	Old Route 66 at Mesita Rd	Lg-Ms
NM279 at NM 124	Lg-Pg	NM 279 and Postal Rd	Lg-Pg
Veterans Memorial Rd at Stovepipe	Lg-C	NM124 and Basswood Rd	Pr-B
Veterans Memorial Rd at Rio San Jose	Lg-C		

### I-40 Crossings:

Two major infrastructure projects are proposed to improve crossings under/over I-40 for bicycles and pedestrians.



- The current I-40 underpass on Rainfall Road is currently only wide enough for a two-line road, with no space on the sides for pedestrians or cyclists, forcing them to use the vehicle lane if they want to cross I-40 here. A second tunnel to accommodate a multi-use path is proposed here.
- Similarly, the current I-40 overpass in Casa Blanca Road is narrow and lacks a shoulder for bicycle and pedestrian use. A widened replacement overpass is recommended.

## Crossings

### Design Summary

At grade crossings:

- Type 1: Marked/Unsignalized - Unprotected crossings include shared-use path crossings of residential, collector, and sometimes major arterial streets or railroad tracks.
  - Type 1+: Marked/Enhanced – Flashing beacons and other treatments can provide additional visibility at unsignalized crossings.
- Type 2: Direct Users to Existing Intersection - Shared-use paths that emerge near existing intersections may be routed through those intersections, provided that the crossing provides sufficient protection for non-motorized users.
- Type 3: Signalized/Controlled - Shared-use path crossings that require signals or other control measures due to traffic volumes, speeds, and shared-use path usage.

Grade-separated crossings:

- Bridges or under-crossings provide the maximum level of safety but also generally are the most expensive and have right-of-way, maintenance, and other public safety considerations.

### Discussion

While at-grade crossings create a potentially high level of conflict between path users and motorists, well-designed crossings have not historically posed a safety problem for path users. This is evidenced by the thousands of successful paths around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to a reasonable degree of safety and can meet existing traffic and safety standards.

Evaluation of path crossings involves analysis of vehicular and anticipated path user traffic patterns, including:

- Vehicle speeds.
- Street width.
- Sight distance.
- Traffic volumes (average daily traffic and peak hour traffic).
- Path user profile (age distribution, destinations served).

Crossing features for all roadways include warning signs both for vehicles and path users.

Consideration must be given for adequate warning distance based on vehicle speeds and line of sight, with visibility of any signing absolutely critical. Catching the attention of motorists who are overly-exposed to roadway signs may require additional alerting devices such as a flashing light, roadway striping or changes in pavement texture. Signing for path users must include a “STOP” sign and pavement marking, sometimes combined with other features such as bollards.

### Reference

- Highway Administration (FHWA) Report, “*Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations.*”

## Marked Crosswalks

Crosswalks are used to increase visibility of pedestrians at high-use locations. Marked crosswalks indicate to pedestrians (and motorists) the appropriate route to cross traffic, to facilitate crossing by the visually impaired and to remind turning drivers of potential conflicts with pedestrians.

Ladder pavement markings are recommended at crossings with high pedestrian use or where vulnerable pedestrians are expected, including:

- School crossings.
- Across arterial streets for pedestrian-only signals.
- At stop-controlled intersections.

### Design Summary

- A parallel marking consists of two 8 inch lines separated by 8 feet. Or,
- A “High Visibility” or “Continental” pavement marking consists of 2-foot by 10-foot-wide bars spaced 3 feet apart.

At un-signalized intersections, crosswalks should be marked at:

- A complex intersection, to orient pedestrians in finding their way across.

“High Visibility” or “Continental” pavement markings are recommended at crossings with high pedestrian use or where vulnerable pedestrians are expected, including:

- School crossings.
- At stop-controlled intersections.

### Application

Recommended in the following locations:

- Interstate Ext & Rainfall Rd
- Encinal Rd at NM 124
- Encinal Rd at Mount Taylor Vista Rd
- NM 279 at NM 124
- Veterans Memorial Rd at Stovepipe Rd
- Veterans Memorial Rd at Rio San Jose



### References

- U.S. Access Board. Public Rights-of-Way Accessibility Guidelines (PROWAG).
- FHWA. Designing Sidewalks and Trails for Access.

## Rapid Rectangular Flashing Beacon

Rapid Rectangular Flashing Beacons (RRFBs) are user-actuated amber LEDs that supplement warnings signs at unsignalized intersections or mid-block crosswalks. (User-actuated devices are only light up when they are activated by a user who, for example, presses a button). RRFBs use an irregular flash pattern similar to flashers on emergency response vehicles and are low-cost alternatives to traditional overhead flashing beacons.

### Design Summary

- RRFB may be installed on either two-lane or multi-lane roadways
- Use with pedestrian crossing warning signs and markings
- RRFB can receive power from solar panel units or wired to a traditional power source
- Received interim approval for use from MUTCD in July 2008

### Application

Recommended in the following locations:

- NM 124 at Casa Blanca Rd
- NM 124 at Central Park Rd/Sun Dial Rd
- Old Route 66 at Mesita Rd
- NM 279 and Postal Rd
- NM 124 and Basswood Rd



### References

- MUTCD: [http://mutcd.fhwa.dot.gov/resources/interim\\_approval/ia11/fhwamemo.htm](http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/fhwamemo.htm).

## Railroad Crossing

There is an active rail line bisecting the Pueblo and some recommended routes cross the railroad. Establishing a new railroad crossing for non-motorized users is a long and challenging process and is not recommended. Using an existing crossing within existing road right-of-way is an allowed use. Any routes crossing the railroad are recommended to cross within the existing road right-of-way. One example is Casa Blanca Road. The recommended improvement along Casa Blanca Road is a separated multi-use path. Part of this will be outside of the existing road right-of-way. It will be necessary for this path to be placed within the existing road right-of-way where it crosses the railroad tracks.



*Railroad crossing on Casa Blanca Road*



## Roundabout and Road Diet

### Roundabout

The five-way intersection on Highway 124 that includes the entrance to the Superette, School House Road and Old Route 66 was identified by Pueblo residents and the CBWAG as a particularly challenging intersection for bicycles, pedestrians and automobiles to navigate. Ordinary crossing treatments are considered inadequate, and the installation of a roundabout is recommended at that location. Other options that were considered included a grade-separated crossing or a median refuge island. However, a grade-separated crossing would be prohibitively costly, and neither of these options would slow the cars coming off the freeway. The roundabout will not only create safer crossings, but it will also reduce the speeds of motor vehicles entering the Laguna from Interstate 40. It is the only solution that improves intersection safety for all transportation modes. This is a critical project and should be implemented as soon as possible. Figure 16 shows a concept design.

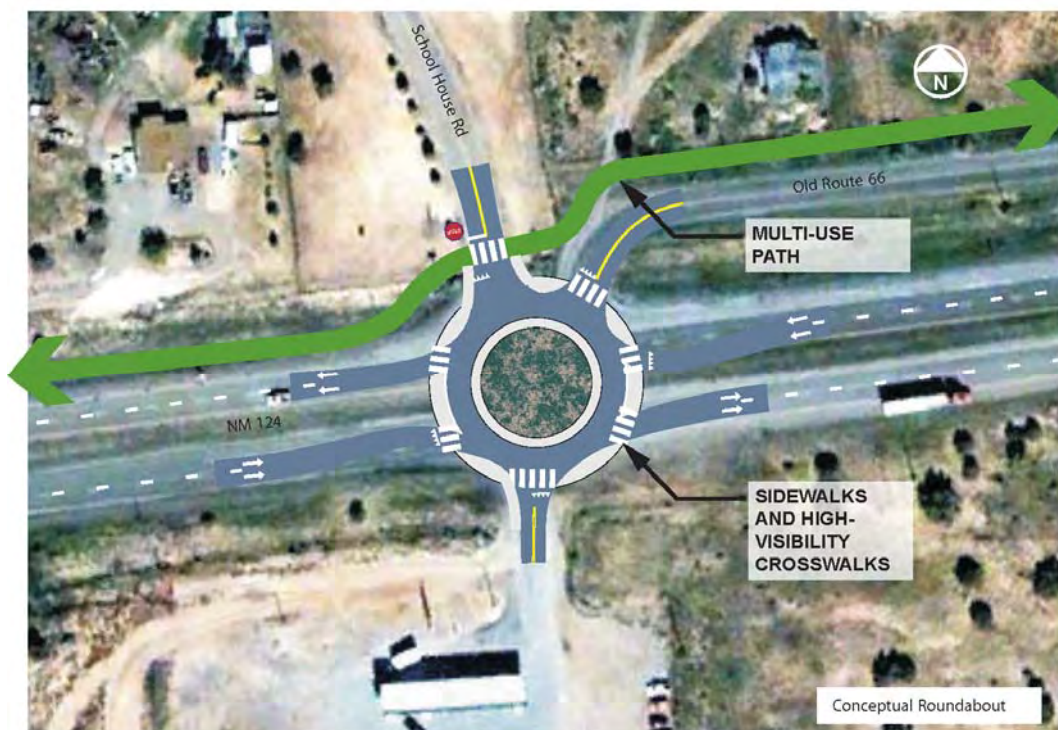


Figure 16. Roundabout concept for the intersection of NM 124, Old Route 66, and School House Rd

### Road Diet and Bike Lanes

A road diet is proposed along the section of NM124 from NM 279 to the intersection with Old Route 66 and Schoolhouse Road. A road diet reduces the number of travel lanes and/or reduces travel lane width on a roadway with excess capacity in order to accommodate bike lanes and/or a multi-use path.

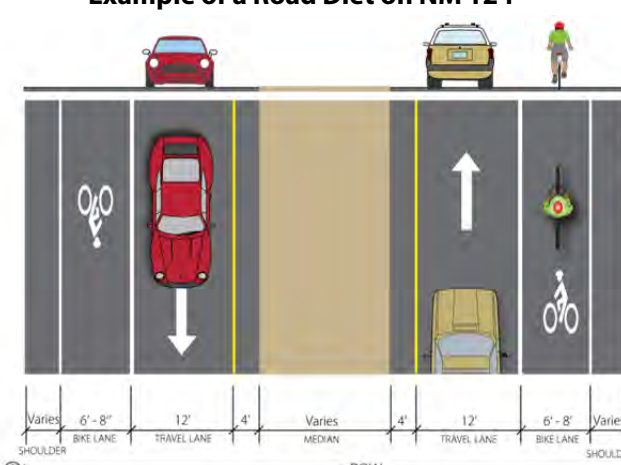
NM 124 provides a critical transportation connection for the Pueblo of Laguna. The segment in question is particularly critical, as the roadway traverses over the Burlington Northern Santa Fe railroad tracks and the Rio San Jose via bridges. In its current configuration the corridor primarily serves motor vehicles with two travel lanes in each direction. However, during course of the planning process NM 124 was identified as an

opportunity to carry bicycle and pedestrian traffic, if adequate facilities and safety could be improved. An analysis of this segment of NM 124 showed that the average daily traffic count (ADT) is less than 4,000 vehicles per day. The current travel lane widths, combined with the low numbers of vehicles using the road, make NM 124 a good candidate for a road diet.

On NM 124 a road diet is proposed to reduce the number of travel lanes in each direction down to one, freeing up the remainder of the roadway for bicycle and pedestrian facilities. A multi-use path is recommended where feasible, so as to accommodate pedestrians as well as bicyclists. Where the right-of-way is constrained, such as at bridges, the road diet configuration should provide adequate pedestrian accommodation.

Several residents, along with NMDOT staff, noted that NM 124 serves as an alternative facility when an incident requires the closure of I-40. I-40 can carry up to 23,000 vehicles per day which exceeds the capacity of a 2-lane road. When a closure on I-40 is necessary, vehicles are detoured onto NM 124 at Exit 104 or Exit 114 and travel along the 8.8 miles between the two exits. Currently, 7.4 of those miles are along a two-lane road, with the 1.4 mile balance of the trip on the four-lane segment discussed above. Reducing the 1.4 miles of four-lane roadway down to a one travel lane in each direction should not significantly impact detoured travelers. The road would still be designed to accommodate trucks and heavy equipment.

Applying a road diet to NM 124 between the intersection of New Mexico Highway 279 (NM 279); and the intersection of NM 124, Schoolhouse Road and Old Route 66 would significantly improve pedestrian and bicycle safety and provide a low cost alternative to constructing parallel pedestrian/bicycle bridges over the Rio San Jose River and over the railroad corridor.

Road Diet and Bike Lanes	
<p>Bike lanes or multi-use paths can be accommodated on roadways with excess roadway capacity. The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Bike lanes could be added to roadways currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction. Depending on a street's existing configuration, traffic operations, user needs, and safety concerns, various lane reduction configurations can be applied. Prior to implementing this measure, a traffic analysis should identify impacts.</p>	
<p><b>Design Summary for Bike Lanes</b></p> <p>Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and also include pavement stencils. Bike lanes are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.</p> <p>Bike lanes help to define the road space for bicyclists and motorists, reduce the chance that motorists will stray into the bicyclists' path, discourage bicyclists from riding on the sidewalk, and remind motorists that bicyclists have a right to the road.</p> <p><b>Bike Lane Widths</b></p> <ul style="list-style-type: none"> <li>6 feet minimum when there is no on-street parking and no curb &amp; gutter</li> <li>Maximum width: 8 feet adjacent to arterials with high travel speeds (45 mph+)</li> </ul>	<p><b>Example of a Road Diet on NM 124</b></p> 
<p><b>Reference</b></p> <p>AASHTO Guide for the Development of Bicycle Facilities</p>	

## Amenities

### Signs and Wayfinding

A comprehensive sign system makes a trail system memorable as well as navigable. Trail sign systems typically include signs in the following categories: identity, wayfinding, regulatory, trail etiquette and wildlife. Signs should be consolidated to avoid sign clutter.

#### Identity

Gateways at major access points with trail identity information should be considered. Trail branding or identity may also be conveyed through the use of a logo throughout the Pueblo. Trail themes, colors and forms should be consistent with other elements found along the trail. A monument sign is the first step in the trail visitor's wayfinding experience. Monument or identity signs should be placed at each major and secondary entry way to the trail system. Images and text on a monument sign should be clear and legible from a roadway when oriented towards those arriving via motorized vehicle. Smaller pedestrian-scaled signs are recommended for neighborhood gateway points.

Several popular ideas amongst Pueblo residents included:

- Adopting a unifying design theme for wayfinding. Villages could differentiate themselves through different color schemes or different logos.
- Trailhead signs where each village has a “you are here” indicator.



*Example bicycle and pedestrian mile marker sign*

#### Wayfinding

A clear, pedestrian-scaled system of wayfinding signs and markers is important for trail legibility, navigation and identity. Pedestrian-scaled signs and markers to aid in wayfinding should include a variety of components such as:

- Trail map that indicates current location, nearby destinations and prominent natural and built features. Wayfinding maps are recommended at trailhead facilities and other pedestrian generators (locations that create pedestrian activity, such as major housing, commercial attractions, and schools) for orientation.
- Gateways or entry markers at major access points with trail identity information. These should be visually clear and distinctive while maintaining consistency with other sign features found on the trail.
- Directional guidance should be placed at key decision points.
- Directional signs should impart a unique theme so trail users know which trail they are following and where it goes. The theme may be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers.



*This low-to-the-ground inconspicuous directional sign was a very popular design choice at the October 2011 Open House. Sandcarving distance markers was recommended.*



- Placing distance markers every 1/4 of a mile is recommended. Time required to walk or bicycle between markers may also be listed.
- Trail users who wish to pace themselves may use distance markers to track accomplishments.
- Distance markers are also used to orient emergency response staff to situations on a trail.

Pueblo residents preferred signs that were low to the ground and blended with the landscape where possible. For example, a rock sand carved with an arrow, or short trail markers made of caged rock.

### Regulatory and Trail Etiquette

Regulatory signs should state the rules and regulations associated with trail usage, as well as the managing agency, organization or group. The purpose of trail regulation is to promote user safety and enhance the enjoyment of all users. It is imperative that before the trail is opened, trail use regulations are developed and posted at trailheads and key access points. Trail maps and informational materials might include these regulations as well. Establishing that the trail facility is a regulated traffic environment just like other public rights-of-way is critical for compliance, and often results in a facility requiring minimal enforcement. An attorney should review the trail regulations for consistency with existing ordinances and enforceability. In some locations, it may be necessary to pass additional ordinances to implement trail regulations.

Below is a sample of the most common items that should be covered in trail regulations:

- Hours of use
- Motorized vehicles, other than power-assisted wheelchairs, are prohibited
- Keep to the right except when passing
- Yield to on-coming traffic when passing
- Bicyclists yield to pedestrians
- Give an audible warning when passing
- Pets must always be on short leashes
- Travel no more than two abreast
- Alcoholic beverages are not permitted on the trail
- Do not wander off of trail onto adjacent properties



*Snake hazard warning sign*

In addition, other warning signs informing users of approaching intersections and crossings of driveways will need to be installed. Care must be taken not to place too many signs at crossings lest they overwhelm the user and lose their impact.

### Wildlife

It is important to have warning signs on routes where snakes and mountain lions are frequently sighted.

### Trail Amenities

Amenities enhance the trail experience, encourage use and make trails more comfortable and safe for the user. In the high desert, shade and water are important amenities for trails and trailheads. Other trail amenities include seating, lighting, bicycle parking, public art and waste receptacles. Trail elements should be

constructed of durable, low maintenance materials such as concrete, stone and metals. Amenities and trail support features should be placed a minimum of three feet from edge of trail. Pueblo residents indicated a preference for amenities that fit the landscape and context of the Laguna Pueblo.

### Trailheads

Trailheads help to make trails inviting, legible, and will be a visible reminder of the trail network to Laguna residents. Trailheads should provide the appropriate facilities to accommodate the permitted user types and expected user volumes.

Trailheads should:

- Provide signage displaying permitted uses, regulations and emergency contact information.
- Provide wayfinding and informational signage.
- Provide the appropriate number of automobile and bike parking stalls for expected user volume.
- For major trail heads, provide restrooms and drinking fountains.



*Examples of signs that might be located at a trail head*

### Seating and Shade Structures



*This was the preferred shelter among the choices provided at the open house.*



*Caged rock benches were preferred by participants at the October open house. A combination of minus range (up to one inch) and chunky rock materials (up to 4") are recommended to deter snakes from nesting in the rock materials*

Providing benches at key rest areas and other appropriate locations encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches should ideally utilize shady areas to provide trail users relief from the sun.

Where natural shading is not possible, trees or shade structures to provide shade at each seating node will increase functionality and user enjoyment. Trees or shade structures should be located to provide a cast shadow over the seating area during the spring, summer and fall months.

## **Water**

Water fountains that provide drinking water for people and pets are highly desirable trail amenities in arid environments. Drinking fountains should be located at key destinations including commercial areas, parks, public service buildings and trailheads. They should also be installed in combination with seating where topography requires extra exertion from the trail user and where access to potable water is available.

## **Lighting**

Pedestrian-scaled lighting improves user safety, enables the trail to be used year round and can improve the aesthetics of the trail. Lighting fixtures should be installed near benches, drinking fountains, bicycle racks, trailheads, and roadway crossings. Lighting is recommended along multi-use trails where users are anticipated to be using the trail during the early morning and evening hours.

Lighting should be installed to the Illuminating Engineering Society of North America (IES) standards to identify a face up to 20 yards away. IES lighting recommendations are:

- Up to 4 foot candles, with illumination coming from multiple angles to minimize shadowing, thereby increasing facial identification opportunities.
- Install Metal Halide or LED lighting with full cut-off light fixtures to provide excellent color rendition and reduce light trespass.
- Uniform lighting coverage to prevent dark or shadowed areas.

Pueblo of Laguna residents indicated they would prefer solar powered light fixtures.

## **Bicycle Parking**

Bicycle racks allow trail users to park their bicycles in a secure and organized manner along the trail. Bike racks should be located at key destinations including commercial areas, schools, parks, public service buildings and trailheads. Bicycle racks that allow two points of contact with a bicycle, such as an inverted “U” or a “staple” rack, are recommended.

## **Public Art**

Public art along a trail provides an opportunity to add interest to the trail experience and, depending on the scale and form, can become an “event” in itself and serve as a public draw. Public art can be aesthetic, functional or both. Local artists should be encouraged to produce artwork for the Pueblo of Laguna non-motorized trail system.

## **Waste Receptacles**

Trash and dog waste receptacles help encourage trail users to keep the trail and trailheads free from debris. It is recommended that both types of receptacles be placed at trailheads and key access points along the trail. The National Park Service’s ethic of “pack it in, pack it out” should be encouraged.

## **Recommended Placement and Costs**

### **Recommended Placement**

Table 4 gives suggested guidelines for the placement of trail amenities. Refer to the proposed improvements maps (Figures 9 - 15) for suggested locations of a trailhead in Paraje near the K’awaika Center, and thirteen



shelters spread throughout the routes network. (It is suggested that shelters include benches, a trash can and water, if available and desired; and that trailheads include a shelter, picnic tables, trash can, large wayfinding map sign, bicycle racks, and water if available). Additional shelters, benches and amenities should be added as desired by the individual villages.

<b>Table 4. Recommended guidelines for placement of amenities</b>	
Amenity	Suggested placement
Trail system maps	At primary access points and at village centers
Directional signs	At intersections and decision points
Mile markers	Every 1/4 mile
Seating and shade structures	Every mile or as desired by local residents
Water	At key access points, destinations, and other desired locations where access to water is available
Lighting	Along multi-use pathways and at roadway crossings
Bicycle parking	At primary access points and key destinations
Waste receptacles	At primary access points and at village centers

### Costs

The cost of amenities for a given route improvement will depend on the type and number of amenities chosen by the Pueblo. Table 5 gives estimated unit costs for individual amenities, and for some suggested amenities packages at shelter and trailhead locations.

The total cost of the thirteen shelters and one trailhead suggested in Figures 9 - 15 would come to \$437,800 - \$479,800, depending on whether water is included. These would not need to be built all at one time.

<b>Table 5. Amenity Costs</b>	
Amenity	Unit Cost
Small shelter (12' x 12')	\$24,500
Large shelter (20' x 20')	\$40,000
Water fountain	\$3,000
Benches	\$2,500
Trash cans	\$700
Bicycle racks	\$500
Picnic Table	\$1,800
Large wayfinding map sign	\$2,500
Custom trailhead entry sign (sand-carved stone)	\$9,500
Sample Amenity Package	Package Cost
Shelter: <ul style="list-style-type: none"> <li>Small shelter</li> <li>2 benches</li> <li>Trash can</li> <li>Water (if desired)</li> </ul>	<ul style="list-style-type: none"> <li>\$30,000 (without water)</li> <li>\$33,000 (with water)</li> </ul>
Trailhead: <ul style="list-style-type: none"> <li>Large shelter</li> <li>2 picnic tables</li> <li>Trash can</li> <li>2 bike racks</li> <li>Large wayfinding map</li> <li>Water (if available)</li> </ul>	<ul style="list-style-type: none"> <li>\$47,800 (without water)</li> <li>\$50,800 (with water)</li> </ul>

## Project List and Prioritization

Figures 17 - 23 show the proposed projects by priority. Table 6 lists all the projects and their associated lengths and costs.<sup>6</sup> For a more detailed project prioritization table that includes project connectivity scores, see Appendix F.

### Priority Projects

A list of top-priority projects was selected from the proposed routes. This package of projects includes:

- Most of the Pueblo routes
- The Pueblo routes were identified as a top priority by the CBWAG<sup>7</sup>
- The top-ranked village loop for each village
- This promotes equity between villages and ensures that the village-selected routes do not get lost amidst the larger Pueblo route projects
- Several linking routes were also included to connect the village routes to the Pueblo routes where necessary

Though the total cost for all of the priority projects combined is quite high, each project should be considered individually as funding opportunities arise.

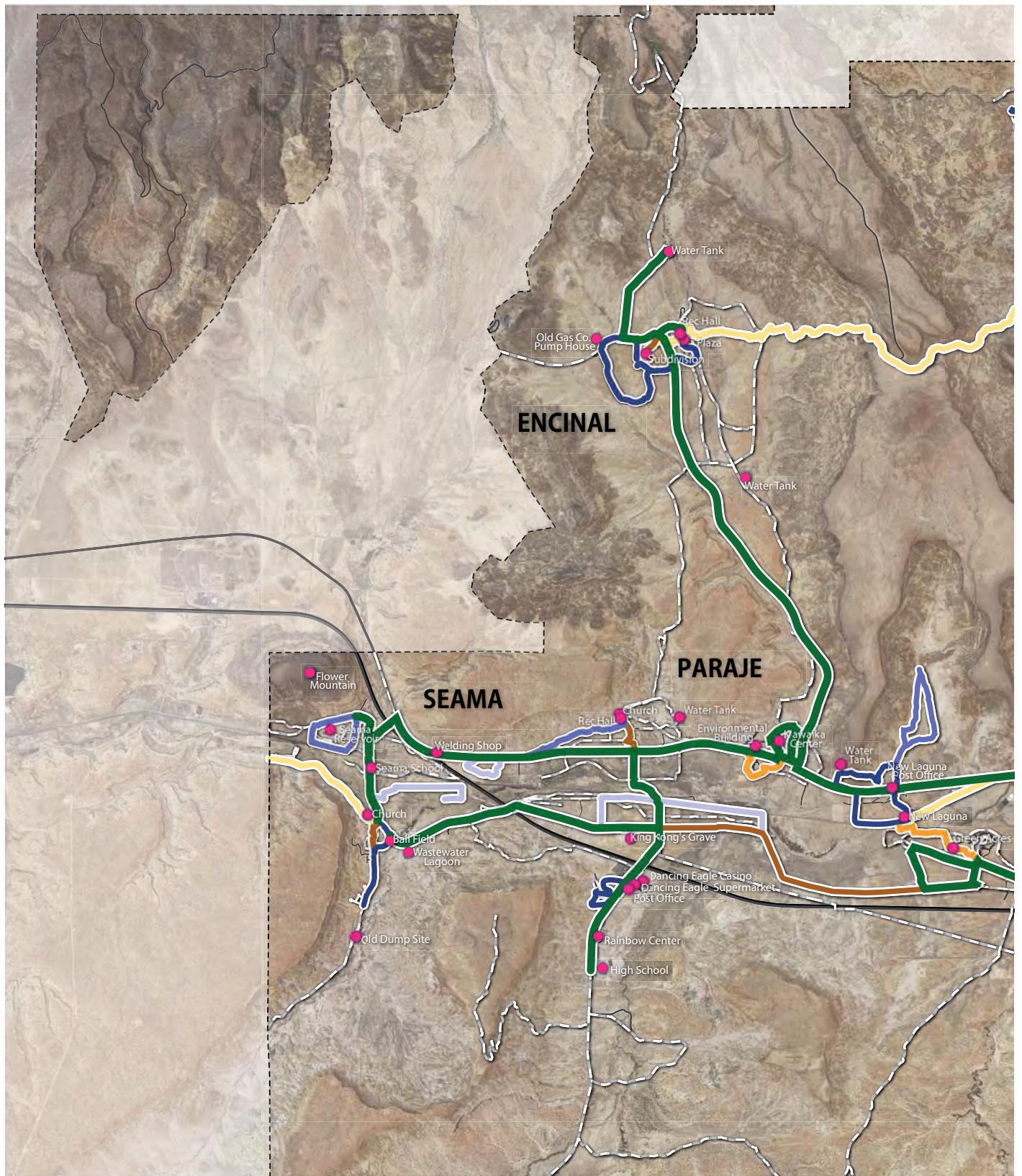
### Remaining Projects

The remaining linking and village routes retain their rankings from the route selection and ranking process (see page 30 - 31), and are kept separate in order to take advantage of different funding streams. Each route has been given a project number.

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<sup>6</sup> Note that costs are separated out to delineate possible project phases, including design costs, trail construction costs, and crossing improvement costs. Typical unit costs for the region were used to estimate the costs for each project. Construction costs, operations & maintenance costs (O&M), and design costs were all estimated for each route and each project. Costs for the amenities recommended in the Proposed Improvements section are included as well, though the costs of amenities will vary depending on the amenities actually chosen by the Pueblo at the time of implementation.

<sup>7</sup> With the exception of the Paguate-Encinal connection. This connection links two of the least populous villages over rough, steep terrain. This route was thus considered much less of a priority than the other Pueblo routes, and so was added into the linking route projects.



## PUEBLO OF LAGUNA PROJECT PRIORITIZATION MAP

Pueblo of Laguna Bicycle and Pedestrian Route Plan

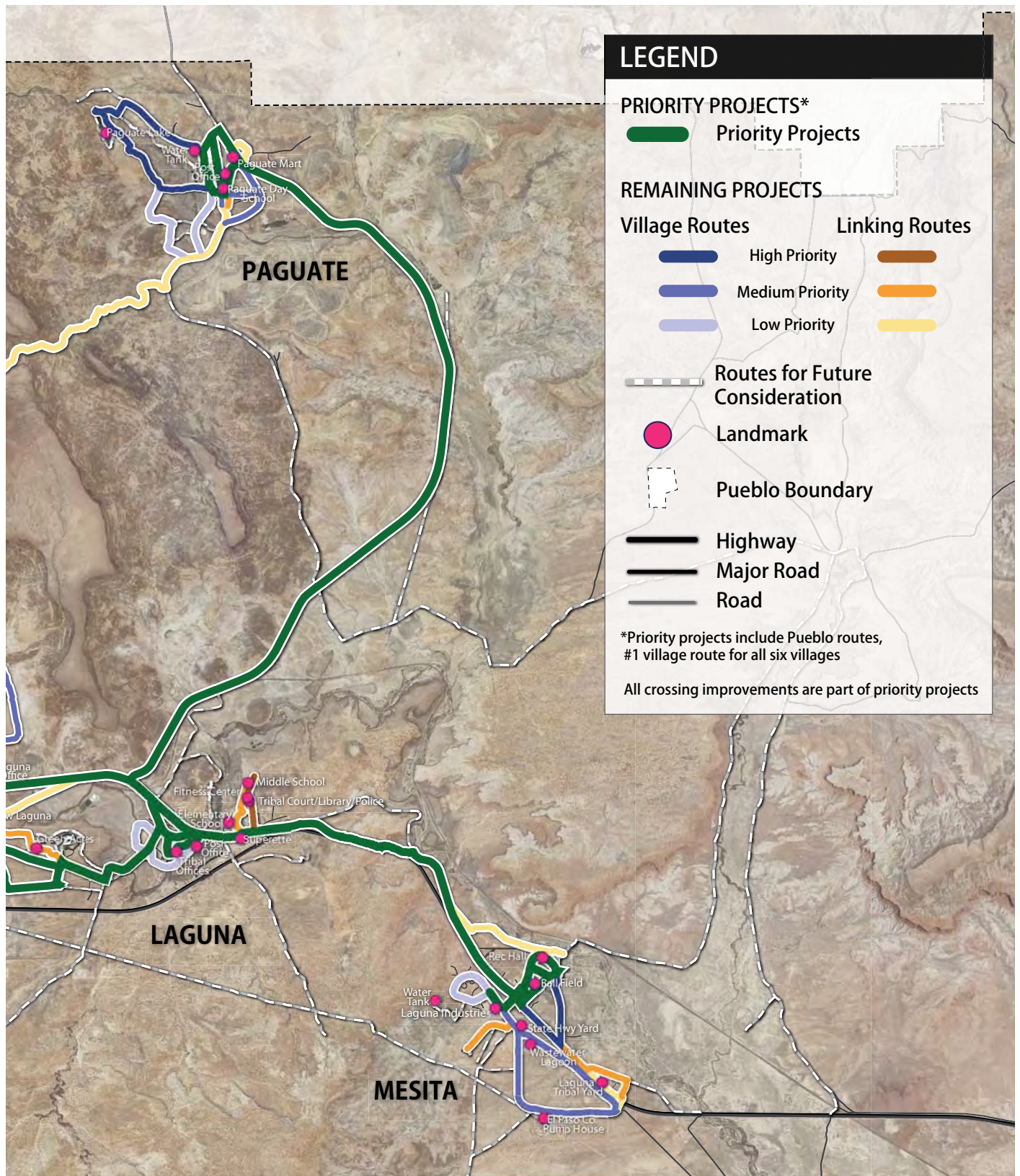
Source: Data obtained from RGIS New Mexico Resource Geographic Information System Program

Author: Alta Planning + Design

Date: April 2012

Figure 17. Project Priorities Map





0 1.5 3 Miles



Figure 17. Project Priorities Map



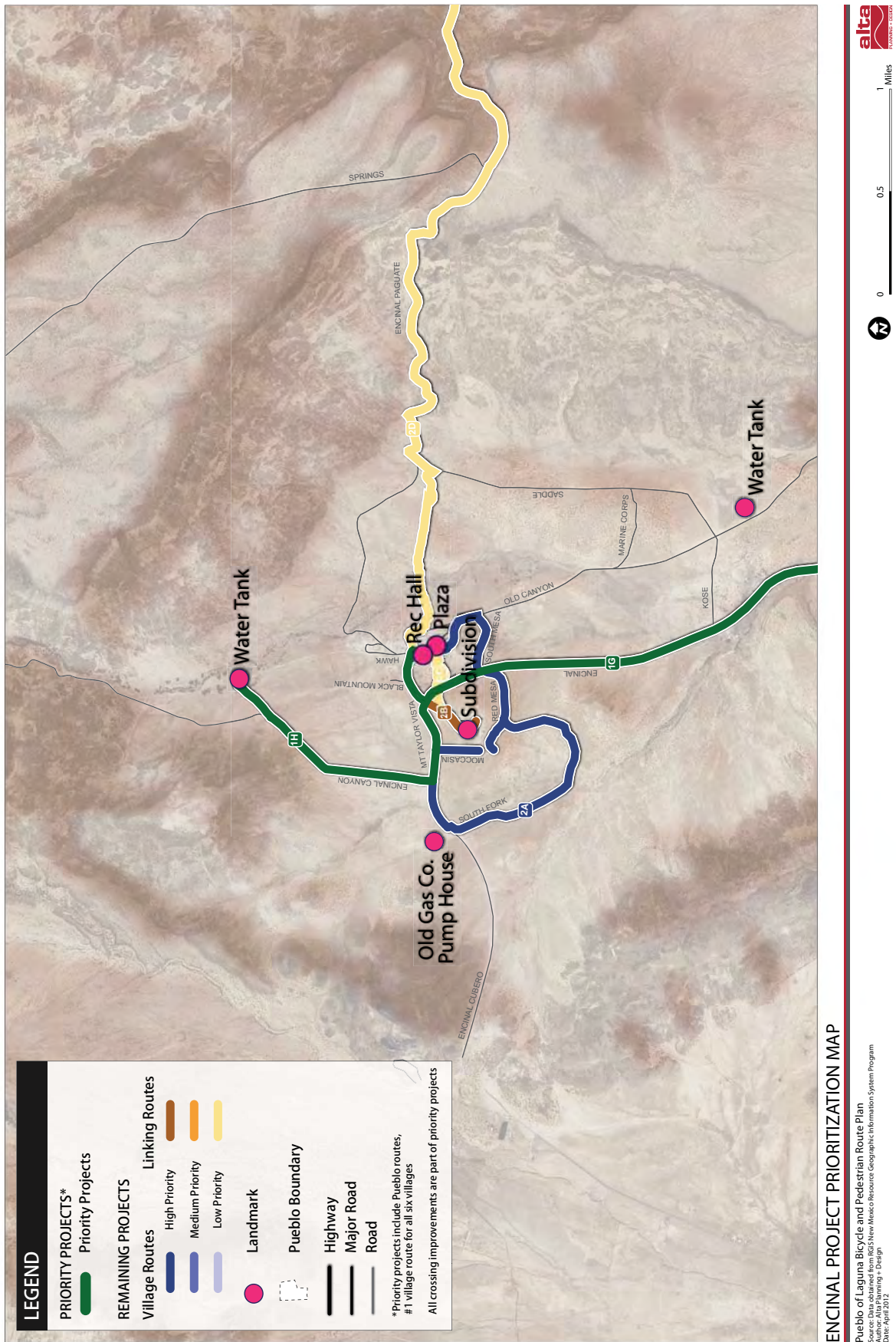


Figure 18. Encinal Project Priorities Map



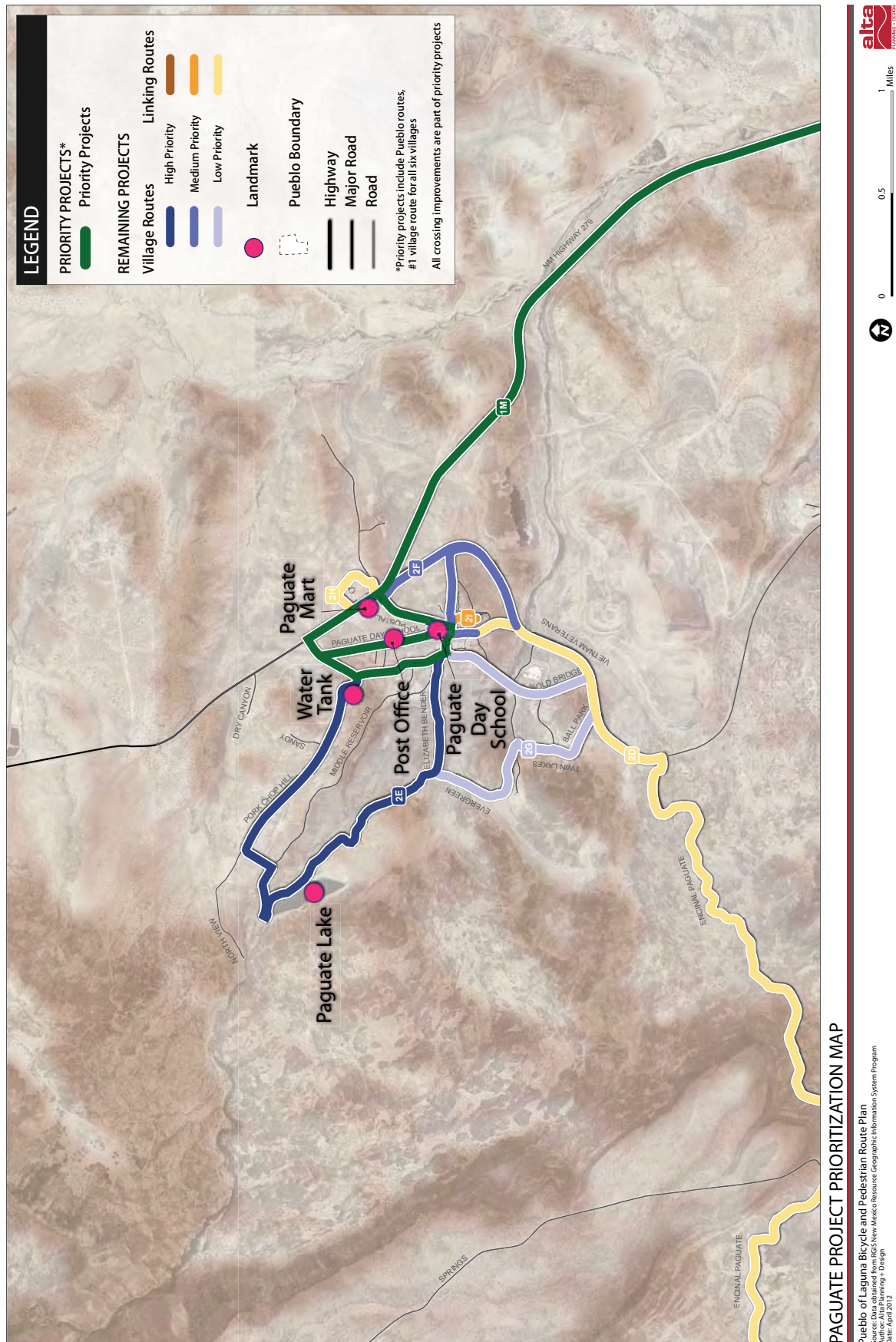
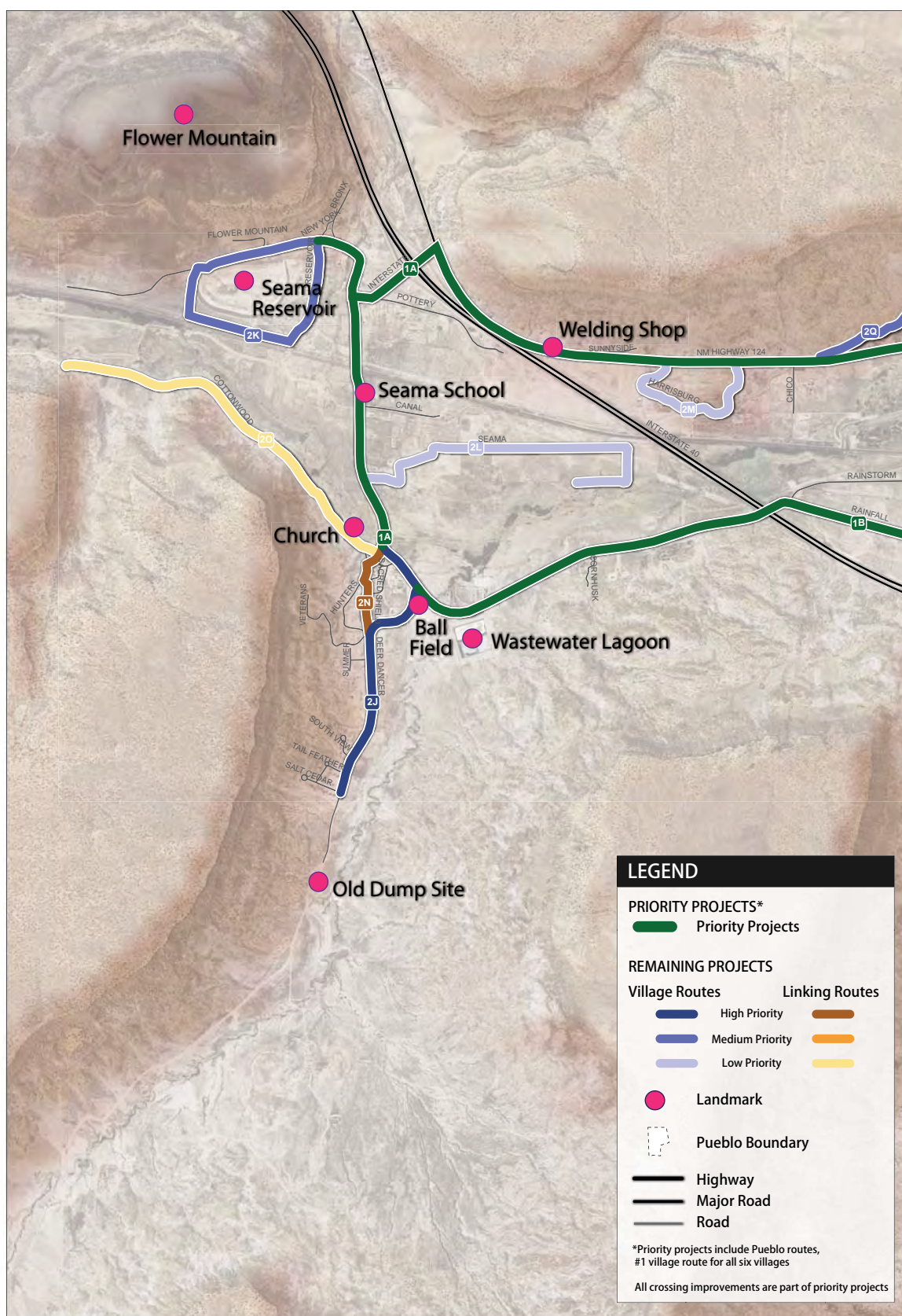


Figure 19. Paguate Project Priorities Map





## SEAMA PROJECT PRIORITIZATION MAP

Pueblo of Laguna Bicycle and Pedestrian Route Plan  
 Source: Data obtained from RIGIS New Mexico Resource Geographic Information System Program  
 Author: Alta Planning + Design  
 Date: April 2012

0 0.25 0.5 Miles



Figure 20. Seama Project Priorities Map



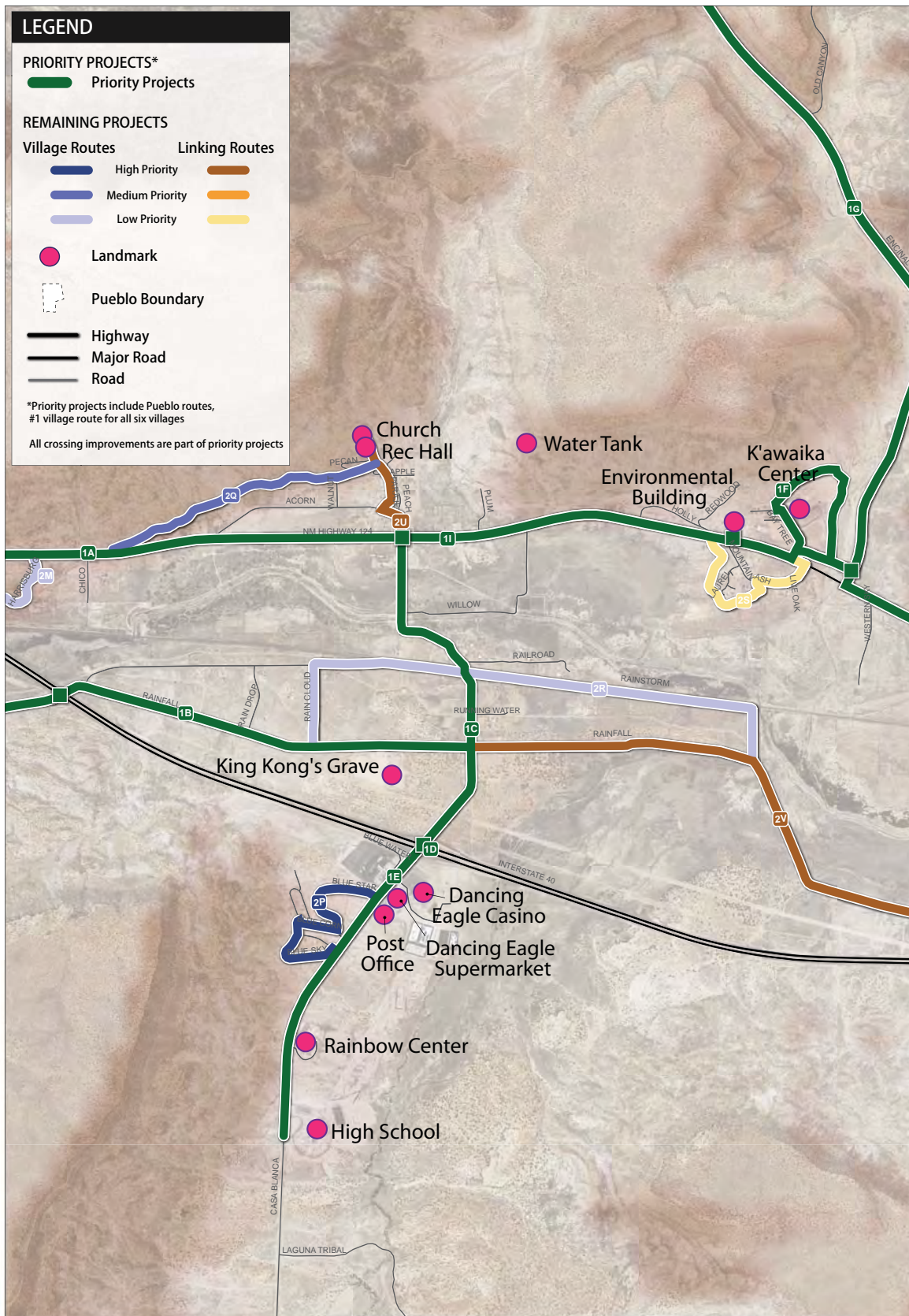


Figure 21. Paraje Project Priorities Map



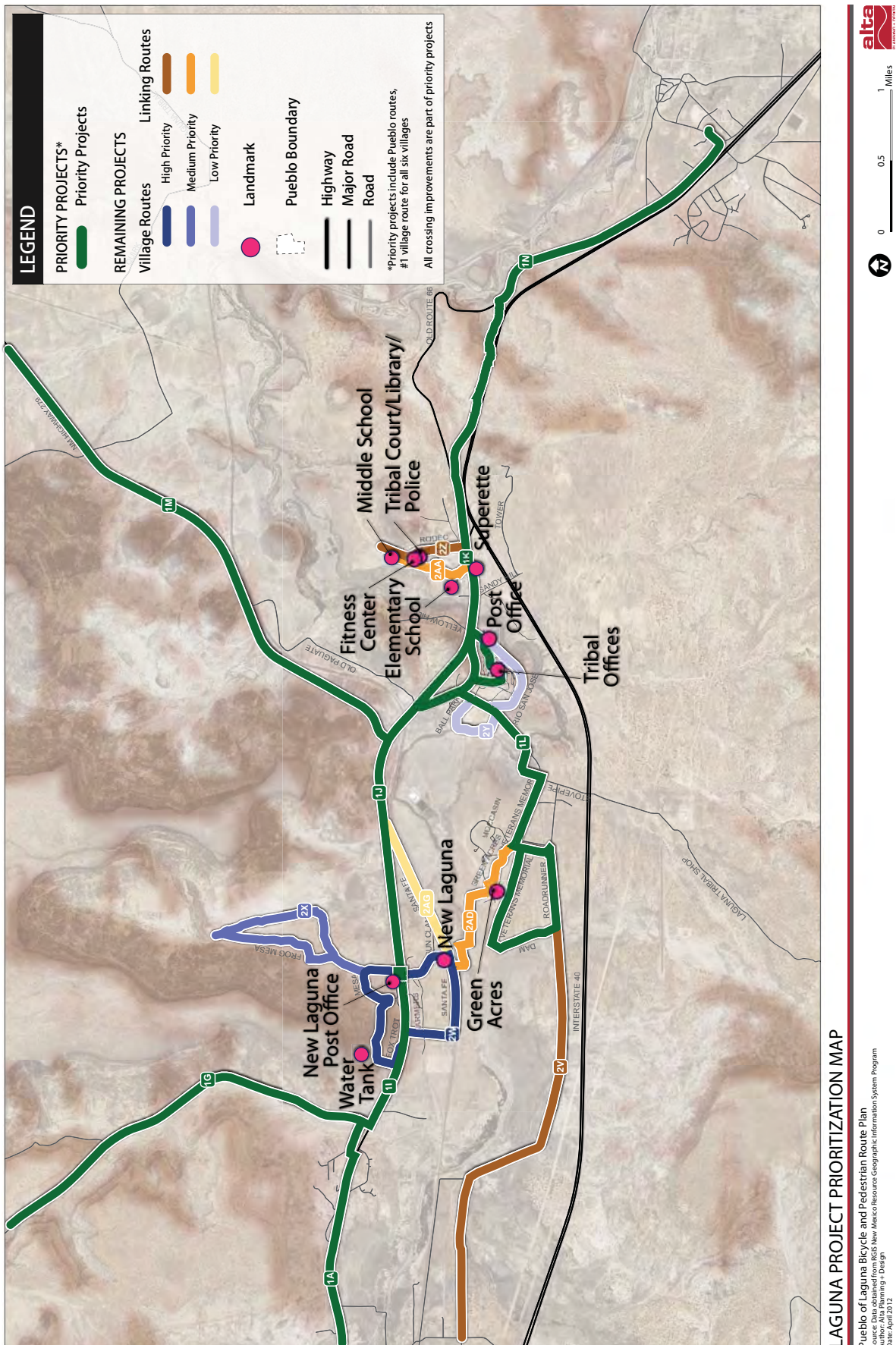


Figure 22. Laguna Project Priorities Map



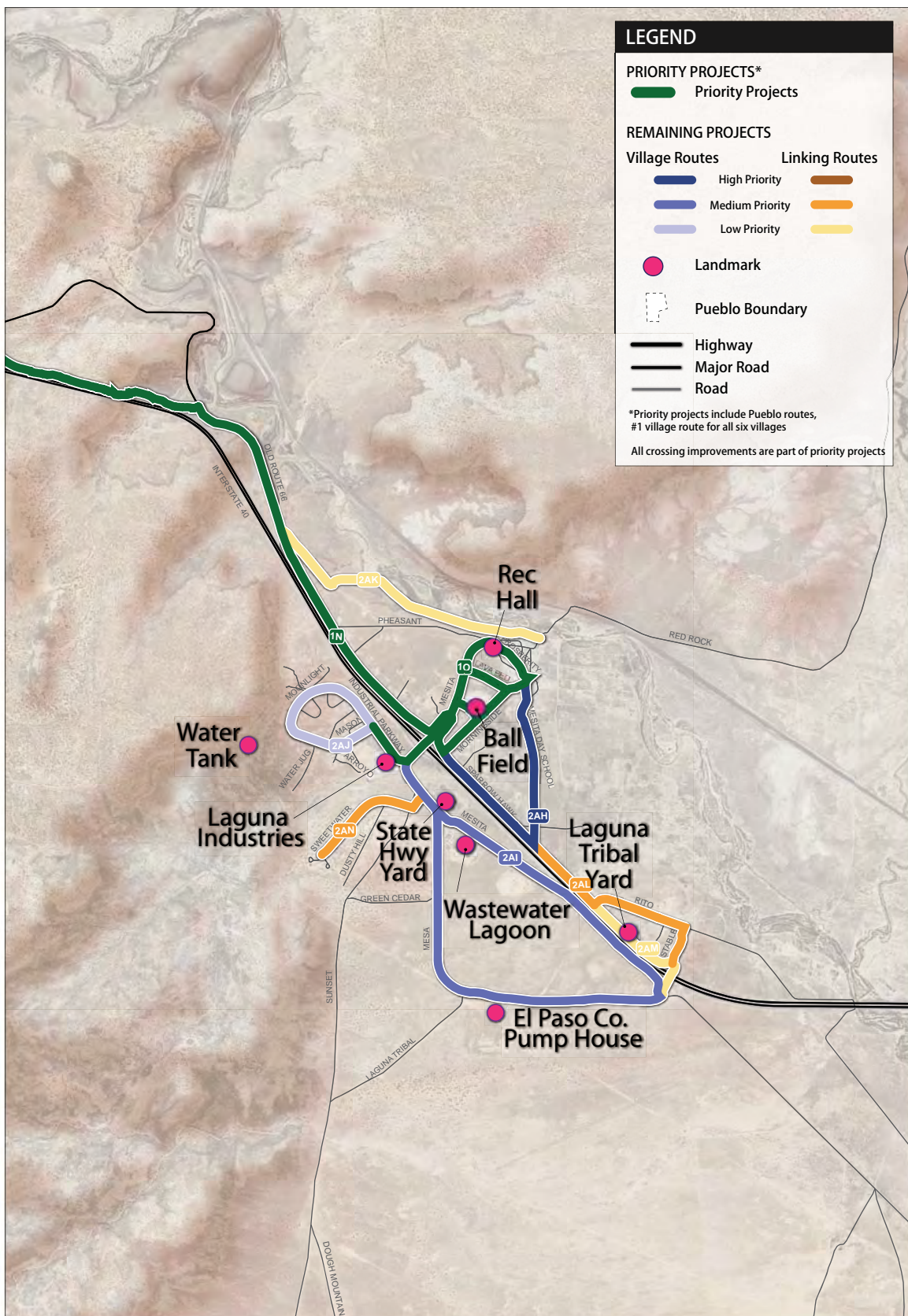


Figure 23. Mesita Project Priorities Map

Table 6. Proposed Projects and Costs

Project ID	Pueblo Routes	Village Routes	Linking Routes	Trail Cost (construction+ project costs)	Crossings Cost (construction+ project costs)	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total cost)
<b>PRIORITY PROJECTS</b>									
1A	Pr-Edge	Se-1		\$1,014,559	\$55,854	\$33,000	\$1,103,413	\$10,505	\$110,341
1B	Se-Pr			\$918,468	\$1,048,740 **	\$33,000	\$2,000,208	\$18,453	\$200,021
1C	Pr-108*			\$904,782	-	\$33,000	\$937,782	\$9,169	\$93,778
1D	Pr-108*			\$6,365,254	-	-	\$6,365,254	\$59,674	\$636,525
1E	Pr-108*			\$63,040	-	\$33,000	\$96,040	\$675	\$9,604
1F		Pr-1		\$108,099	-	-	\$108,099	\$1,260	\$10,810
1G	Pr-En			\$1,422,281	\$422	\$66,000	\$1,488,703	\$30,434	\$148,870
1H		En-1		\$684,643	-	-	\$684,643	\$14,660	\$68,464
1I	Lg-Pr*			\$1,734,100	\$41,013	\$116,800	\$1,891,913	\$19,585	\$189,191
1J	Lg-Pr*			\$664,384	-	\$33,000	\$697,384	\$7,118	\$69,738
1K	Lg-Pr*			\$943,488	-	-	\$943,488	\$7,862	\$94,349
1L		Lg-1, Lg-4*	Lg-C, Lg-D, Lg-F	\$2,357,638	\$871	-	\$2,358,509	\$34,788	\$235,851
1M	Lg-Pg	Pg-1		\$875,857	\$65,572	\$66,000	\$1,007,429	\$10,173	\$100,743
1N	Lg-Ms			\$1,391,633	\$33,475	\$66,000	\$1,491,108	\$13,921	\$149,111
1O		Ms-1	Ms-A	\$118,649	-	-	\$118,649	\$2,440	\$11,865
<b>REMAINING VILLAGE PROJECTS</b>									
<b>#2 ranked village routes (high priority)</b>									
2A		En-2		\$4,054	-	-	\$4,054	\$55	\$405
2E		Pg-2		\$201,377	-	-	\$201,377	\$4,286	\$20,138
2J		Se-2		\$280,145	-	-	\$280,145	\$3,008	\$28,015
2P		Pr-2		\$191,036	-	-	\$191,036	\$2,051	\$19,104
2W		Lg-2		\$29,191	-	-	\$29,191	\$602	\$2,919
2AH		Ms-2		\$1,888	-	-	\$1,888	\$26	\$189
<b>#3 ranked village routes (medium priority)</b>									
2F		Pg-3		\$1,888	-	-	\$1,888	\$26	\$189
2K		Se-3		\$1,621	-	-	\$1,621	\$22	\$162
2Q		Pr-3		\$1,355	-	-	\$1,355	\$18	\$136
2X		Lg-3		\$2,420	-	-	\$2,420	\$33	\$242
2AI		Ms-3		\$4,054	-	-	\$4,054	\$55	\$405
<b>#4 ranked village routes (low priority)</b>									
2G		Pg-4		\$2,154	-	-	\$2,154	\$29	\$215
2L		Se-4		\$1,621	-	-	\$1,621	\$22	\$162
2M		Se-5		\$811	-	-	\$811	\$11	\$81
2R		Pr-4		\$2,819	-	-	\$2,819	\$38	\$282
2Y		Lg-4*		\$787	-	-	\$787	\$11	\$79
2AJ		Ms-4		\$1,355	-	-	\$1,355	\$18	\$136

Table 6. Proposed Projects and Costs

Project ID	Pueblo Routes	Village Routes	Linking Routes	Trail Cost (construction+ project costs)	Crossings Cost (construction+ project costs)	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total cost)
<b>REMAINING LINKING PROJECTS</b>									
<b>High priority linking routes</b>									
2B			En-A	\$545	-	-	\$545	\$7	\$54
2N			Se-A	\$545	-	-	\$545	\$7	\$54
2U			Pr-A	\$82,656	-	-	\$82,656	\$888	\$8,266
2V			LgPr-A	\$3,775	-	-	\$3,775	\$51	\$378
2Z			Lg-A	\$0	-	-	-	n/a	n/a
<b>Medium priority linking routes</b>									
2I			Pg-B	\$303	-	-	\$303	\$4	\$30
2AA			Lg-A.i	\$79,678	-	-	\$79,678	\$1,707	\$7,968
2AD			Lg-B	\$302,350	-	-	\$302,350	\$6,425	\$30,235
2AL			Ms-D	\$2,047	-	-	\$2,047	\$28	\$205
2AN			Ms-B	\$811	-	-	\$811	\$11	\$81
<b>Low priority linking routes</b>									
2C			En-A.i	\$545	-	-	\$545	\$7	\$54
2D	Pg-En			\$270,383	-	-	\$270,383	\$6,671	\$27,038
2H			Pg-A	\$2,225	-	-	\$2,225	\$43	\$222
2O			Se-B	\$1,621	-	-	\$1,621	\$22	\$162
2S			Pr-B	\$15,050	\$40,440	-	\$55,490	\$1,174	\$5,549
2AG			Lg-E	\$1,355	-	-	\$1,355	\$18	\$136
2AK			Ms-F	\$3,151	-	-	\$3,151	\$43	\$315
2AM			Ms-E	\$1,562	-	-	\$1,562	\$42	\$156
<b>Totals:</b>									
Priority Projects				\$19,566,875	\$1,245,947	\$479,800	\$21,292,622	\$638,779	\$2,129,262
Village Projects				\$728,574	\$0	\$0	\$728,574	\$10,313	\$72,857
#2 ranked (high)				\$707,690	\$0	-	\$707,690	\$10,028	\$70,769
#3 ranked (med)				\$11,338	\$0	-	\$11,338	\$155	\$1,134
#4 ranked (low)				\$9,547	\$0	-	\$9,547	\$130	\$955
Linking Projects				\$768,599	\$40,440	\$0	\$809,039	\$17,150	\$80,904
High				\$87,520	\$0	-	\$87,520	\$954	\$8,752
Medium				\$385,188	\$0	-	\$385,188	\$8,175	\$38,519
Low				\$295,891	\$40,440	-	\$336,331	\$8,021	\$33,633
All high				\$795,210	\$0	\$0	\$795,210	\$10,982	\$79,521
All medium				\$396,526	\$0	\$0	\$396,526	\$8,330	\$39,653
All low				\$305,438	\$40,440	\$0	\$345,878	\$8,151	\$34,588
All Projects				\$21,064,049	\$1,286,387	\$479,800	\$22,830,236	\$666,242	\$2,283,024

\*Some routes are broken into multiple projects. Pr-108 and Lg-Pg are broken out into 3 separate priority projects each, due to their complexity. One part of Lg-4 has been added to a priority project for network continuity purposes, while the remaining parts comprise a separate village project. Please keep this in mind when comparing this table to Appendix E, which shows detailed improvements and costs by route, not by project.

\*Project 1B has a grade-separated crossing. All other crossings are at-grade.

For details on improvements, costs, and derivation of O&M costs, see Appendices D & E.

Note that Pueblo Route Pg-En has been included with the linking routes.

Amenities costs do not include costs for signs. Sign costs are included in project construction costs.



## Pueblo of Laguna Internal Projects

Some implementation of the route improvements, such as blading and smoothing road edges and constructing seating and shade structures can be carried out through community-initiated projects and work parties, rather than waiting for public funding.

In addition, the Pueblo can construct many of the trails that do not require paving or special engineering. Table 7 contains a list of trails that meet these criteria.

## Funding Sources

Potential funding sources for implementing route and crossing improvements in the Pueblo of Laguna include:

- The Federal Highway Administration
- NPS Rivers Trails and Conservation Alliance (for the Wagon Trail)
- Scenic Byways (if the Pueblo is considering tourism opportunities along NM 124/Old Route 66)
- Pueblo Funds

The Pueblo of Laguna should research other possible funding sources as well. It is likely that much of the funding for the Pueblo of Laguna bicycle and pedestrian routes will come from strategic use of funding for road repairs, maintenance and redesign on particular routes as it becomes available.

**Table 7. Trail Construction Projects that the Pueblo May Be Able to Implement**

Village Routes		Linking & Pueblo Routes	
Route Number	Project Number	Route Number	Project Number
En-2	2A	En-A	2B
Lg-2*	2W	Lg-A.i	2C
Lg-3	2X	Lg-E	2AG
Lg-4	2Y	Ms-A	10
Ms-1	1O	Ms-B	2AN
Ms-2	2AH	Ms-D	2AL
Ms-3	2AI	Ms-E	2AM
Ms-4	2AJ	Ms-F	2AK
Pg-2	2E	Pg-A	2H
Pg-3	2F	Pg-B	2I
Pg-4	2G	Se-A	2N
Pr-3	2Q	Se-B	2O
Pr-4	2R	Lg-Pr-A	2V
Se-3	2K	Pg-En	2D
Se-4	2L		
Se-5	2M		

\*Except for crossing treatment

# Trail Maintenance and Support Activities

## Trail Maintenance

The Pueblo of Laguna Public Works will manage the Pueblo of Laguna non-motorized route system.

### Maintenance Activities

Effective trail maintenance is critical to the overall success and safety of any trail system. Maintenance activities typically include: pavement stabilization, landscape maintenance, sweeping, facility upkeep, sign replacement, litter removal and painting. A successful maintenance program requires continuity and often involves a high level of citizen participation. Routine maintenance on a year-round basis will not only improve trail safety, but will also prolong the life of the trail. The benefits of a good maintenance program are far-reaching, including:

- Good maintenance can be an effective deterrent to vandalism, litter, and encroachments.
- A regular maintenance routine is necessary to preserve positive public relations between the adjacent land owners and managing agency.
- Good maintenance can make enforcement of regulations on the trail more efficient. Local clubs and interest groups will take pride in “their” trail and will be more apt to assist in protection of the trail.
- A proactive maintenance policy will help improve safety along the trail.
- Recommended maintenance vehicles for the trail are light pick-up trucks or a “gator” type vehicles. A mechanical sweeper is recommended to keep the trail clear of loose gravel, “goatheads” and other debris. Care should be taken when operating equipment on the trail and to avoid breaking-down the edge of the trail surface.
- Ongoing trail maintenance includes:
  - Drainage
    - Where drainage problems exist along the trail, concrete construction and drainage pipes may need to be installed. Ditches and drainage structures need to be kept clear of debris to prevent wash outs and maintain positive drainage flow. Maintenance checks should be conducted immediately after each storm that causes localized flooding.
  - Vegetation
    - Basic measures should be taken to protect the trail investment. This includes a bi-annual clearing along both sides of the trail to prevent invasion of plants into the pavement and shoulder areas. The recommended time of year for clearing is fall and spring. Wherever possible, vegetation control should be accomplished by mechanical means or hand labor. Some species may require spot application of state-approved herbicide.
    - Bushes, shrubs and other understory vegetation within the trail right-of-way should not be allowed to grow higher than 2 feet. A 2-foot wide minimum horizontal clearance from the trail edge should be maintained. Trees species selection and placement should be made which minimize vegetative litter on the trail as well as root uplifting of pavement. Vertical clearance along the trail should be periodically checked, and any overhanging branches over the trail should be pruned to a minimum vertical clearance of 10 feet (12 feet for equestrians).

- Surfacing
  - Asphalt is the recommended surface material for most of the multi-use trails. Cracks, ruts and water damage will need to be repaired periodically to prevent more significant and costly damage.
  - The trail surface should be kept free of debris, especially broken glass and other sharp objects, loose gravel, leaves and "goatheads". Trail surfaces should be swept periodically. Soft shoulders should be well maintained to maximize their usability.

## Roadway Surface

Bicycles are more sensitive to subtle changes in roadway surface than motor vehicles. Some paving materials are smoother than others, and compaction/uneven settling can affect the surface after trenches and construction holes are filled. Uneven settlement after trenching can affect the roadway surface nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks. When resurfacing streets, the Pueblo should use the smallest chip size and ensure that the surface is as smooth as possible to improve safety and comfort for bicyclists.

Recommended action items involving maintaining the roadway surface include:

- On all bikeways, use the smallest possible chip for chip sealing bike lanes and shoulders.
- During chip seal maintenance projects, if the pavement condition of the bike facility is satisfactory, it may be appropriate to chip seal the travel lanes only.
- The finished surface on new roadway construction on bikeways should not vary more than ¼ inch.
- Maintain a smooth surface on all bikeways that is free of potholes.
- Maintain pavement so ridge build-up does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.

## Litter and Illegal Dumping

Litter receptacles should be placed at access points such as trailheads. Staff or volunteers should remove litter along the trail on a regularly scheduled basis.

Illegal dumping should be controlled with vehicle barriers, regulatory signage and fines. When illegal dumping does occur, dumped materials should be removed as soon as possible in order to prevent further instances of dumping. Enlisting neighborhood volunteers and "Friends of the Trail" groups should be considered to supplement maintenance staff.

## Signage

Signage is crucial for safe and comfortable use of the bicycle and pedestrian network. Such signage is vulnerable to vandalism or wear, and requires regular maintenance and replacement as needed. The Pueblo should consider:

- Checking regulatory and wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear.
- Replacing signage along the bikeway network as-needed.
- Performing a regularly-scheduled check on the status of signage with follow-up as necessary.



## Frequency and Costs

### Frequency of Maintenance Tasks

Table 8 summarizes maintenance recommendations for the trail system

<b>Table 8. Recommended Maintenance Tasks and Frequency</b>	
Maintenance Task	Suggested Frequency
Inspections	Seasonal – at both beginning and end of summer
Sign repair/replacement	1-3 years, or as needed
Site furnishings; replace damaged components	As needed
Pavement markings replacement	1-3 years
Pavement sweeping/blowing	As needed; before high use season
Pavement sealing; pothole repair	As needed
Lighting repair	Annually, as needed
Introduced tree and shrub plantings, trimming	1-3 years
Shrub/tree irrigation for introduced planting areas	Weekly during summer months until plants are established
Shoulder plant trimming (weeds, trees, branches)	Bi-annual (Fall or Spring)
Major damage response (fallen trees, washouts, flooding)	As needed
Culvert inspection	Before rainy season; after major storms
Maintaining culvert inlets	Inspect before onset of wet season
Trash disposal	Weekly during high use; twice monthly during low use
Litter pick-up	Weekly during high use; twice monthly during low use
Graffiti removal	Weekly; as needed

### Maintenance Costs

Please see Table 6 for estimated maintenance costs for each route (derived from cost estimates in Appendix E).

## Encouragement Programs

Programs should be developed to encourage biking and walking by teaching biking skills and safety, spreading information about biking and walking routes, and bringing the community together to enjoy biking and walking activities. Suggestions include the following:

### Create a Pueblo-Wide Non-Motorized Trail Map

- Helps Pueblo residents know which routes are recommended for walking and bicycling, and raises awareness of non-motorized transportation options
- Can be created before specific trail improvements are implemented
- As trail improvements are implemented the map can be updated to highlight the improvements in safety and comfort

## **Maintain a Pueblo of Laguna Walking and Bicycling Website**

Maintain a walking and bicycling website where interested community members can find information on the following:

- Popular riding and walking routes
- Maps and brochures (e.g., links to online maps and brochures, where to find in person, and how to request mailed materials)
- Information about bicycling events (e.g., rides, classes, volunteer opportunities) and an events calendar
- Information about the specific committees that discuss biking, walking and trail issues (including how to get involved, meeting times and dates, agendas and minutes, etc.)
- List any bicycling and/or walking groups and clubs
- Relevant phone numbers
- Message boards
- Blog featuring stories and news
- Photo galleries from events and submitted by readers

A Pueblo office or department could also be selected as an off-line central source of information for non-motorized Pueblo activities.

## **Walking and Bicycling Safety Programs**

Walking and bicycling safety programs can teach bicycle skills and safety, bike maintenance, and distribute maps and information on non-motorized routes.

- School-based programs teach bicycle skills and safety to children
- Family biking and trail programs can help parents figure out how to safely transport children by bicycle and help children learn bicycling skills. Some events are panel discussions or workshops; others are open-house style events (e.g. at a park or on a trail) or activities at larger local events
- Safe Routes to School is a source of federal funding for encouraging walking and biking to school through physical safety improvements and educational programs

## **Coordinated Motor Vehicle Enforcement Actions**

- Coordinated enforcement can lead to slower traffic, and safer conditions for pedestrians and bicyclists
- Should be targeted at designated bikeways, near schools, and in response to bicyclist and pedestrian complaints

## **Other**

- Additional walk/run/bike events, particularly to celebrate the completion of new trails
- Bike repair clinics
- Bike helmet giveaways
- Purchase a fleet of Pueblo-owned bicycles for youth events
- Bike raffles
- Seeking grant funding to purchase bicycles for community members

## Complete Streets Policy

It is recommended that the Pueblo develop and adopt a complete streets policy. Most of the streets in the Pueblo have been developed without including facilities for non-motorized users. It is recommended that all future projects include the appropriate facilities for these users. Each project will require evaluation to determine the appropriate type of treatment. Street improvements may include sidewalks, bike lanes, wide shoulders, parallel trails and signs. The recommended facilities in this plan can serve as a guide to determine which facilities will be necessary and appropriate to develop a complete street.

## Mode Share Study

A mode share study is recommended to determine the impact of new routes on the mode share of residents in the Pueblo. This should be done over time and include user counts and travel surveys. The following outlines a plan for a recommended mode share study.

## Travel Log and Survey

A travel survey is a common and well established method to evaluate trip making behavior. We recommended a single day trip log. The single day log provides clear information to assess travel behavior and is also short enough to ensure that it is easy to complete for participants. The survey is designed with a trip log, questions regarding attitudes towards walking and bicycling and a brief demographic section to support analysis. See Appendix G for copies of the travel log and survey.

To increase response rates, we recommend providing a tangible reward for participation. A potential raffle prize can be offered as an incentive. The prize should be something that anyone in the community could use, such as a gift certificate to the local grocery store.

As noted, a pre-project survey should be conducted in the fall of 2012 to establish a baseline before implementation of the plan recommendations. The questions for pre-project and ongoing post-project surveys should be nearly identical. Questions could be added to the post-project survey to solicit opinions about specific improvements. The following sections further outline proposed methods for delivery of a resident and employee survey.

### Travel Log

Goal: To evaluate changes in travel behavior over time throughout the Pueblo.

The travel log can be delivered to residents by direct mail or through utility bills. The survey can be scaled as needed to include either all residents or a random number selected sample. Surveys are typically sent with a self-addressed postage paid envelope for return. However, given that all residents must access their mail through the post office, a drop box could be placed at the post offices to collect surveys.

In order to understand the trends in the Pueblo, a response rate equal to 10% of the population should be collected. Mailing to more households initially can ensure enough responses to achieve the desired response rate, but will have higher up-front costs.

General survey steps:

- 3 weeks prior - Acquire mailing list



- 1 week prior - Place drop boxes or determine protocol for receiving surveys in the mail
- 1 week prior to survey - post notices in public places to let residents know the survey is coming
- Mail survey with deadline of two weeks to respond
- Collect surveys and review response rate at two weeks
- Repost reminders regarding the survey
- Either re-mail the survey or provide additional surveys to increase response rate
- Collect surveys
- Enter into database
- Perform analysis and complete annual reporting

Analysis will result in an assessment of the following:

- Trips by trip type (comparing pre and post project trips)
- Change in auto mode share (overall and by trip type)
- Summary of noteworthy findings from demographic and opinion questions

### **Employee Survey**

Goal: To evaluate changes in travel behavior over time and determine if residents that live and work in the Pueblo are choosing to commute by foot or bicycle.

We recommend that the survey for the employees have the same trip log component, questions about attitudes and demographics. However, this survey could be administered in a web based format, such as Survey Monkey, and distributed through email. While some employees may need to fill out a paper form, the data can still be added into the web based system. If paper forms can be limited, the web based survey will require little additional data entry before analysis and not require postage. For successful implementation, it will be critical to work with employers as partners to gain access to employees through internal contact lists.

Potential large employers include:

- Laguna Department of Education
- Laguna-Acoma High School
- Pueblo Government- various offices
- Laguna Development Corporation

### **Bicycle and Pedestrian Counts**

Counts of bicyclists and pedestrians will not provide clear information on mode shift (changes in the way people travel). However, ongoing counts will provide good information on walking and bicycling rates on or near major corridors in the community. The count data will provide the Pueblo with clear benchmarks to understand if rates of walking and bicycling are increasing in areas where infrastructure investments are made. Bicycle and pedestrian counts can be conducted manually or with automatic count technologies. Automatic counters have certain advantages, such as conducting longer-term counts, establishing daily, weekly, or monthly. However, given that the counts will be focused on just a few key locations and there is significant cost associated with purchasing and maintaining the equipment, we recommend manual counting.<sup>8</sup>

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<sup>8</sup> There are advantages and disadvantages to using manual versus automatic counts. For example, manual counts can be included in existing motor vehicle counts or as part of another community effort using

## Suggested Locations

We recommend that the Pueblo conduct counts at the following four locations. Additional locations should be considered as well. These locations were chosen based on the assumption these are the highest activity areas within the Pueblo. The following locations are recommended:

- **Highway 124 near School House Road:** This count location will capture activity in near the elementary and middle schools, the Superette, government offices and fitness center. The count volunteer at this location should be positioned to see travel patterns from Old Route 66 and Rodeo Drive.
- **Highway 124 near Bay Tree Road:** This road segment is the access point to the K'awaika Center.
- **Casa Blanca Road:** Between the Post Office and Dancing Eagle Casino – once there is a trail in place the count location should include the trail.
- Near another one of the post offices.

Note: Locations should be visited prior to the count date to ensure the location will capture the maximum bicycle and pedestrian flows in the area.

Additional count locations can be added if volunteers are available and the routes are identified as having notable numbers of people walking or bicycling.

## Count Dates and Times

As described on the National Bicycle and Pedestrian Documentation Project (NBPD) website [www.bikepeddocumentation.org](http://www.bikepeddocumentation.org), counts should be performed mid-week during the evening peak period:

- Tuesday, Wednesday or Thursday from 5pm to 7pm
- Because there can be significant variation in day to day bicycle and pedestrian volumes, **two or three counts should be performed at each location on consecutive days or weeks**. The multiple counts should then be averaged to develop an average for each count location
- Consider performing an additional count on a Saturday from 9am -12:00

In addition, counts should not be done within a week before or two days after Pueblo feast days.

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volunteers. This approach can reduce costs, ensure (or yield) a higher level of accuracy than automated counts, and allow for collection of other factors such as gender, age and helmet use. Conversely, automatic count technologies are useful in conducting longer-term counts; establishing daily, weekly, or monthly variations; and can significantly reduce labor costs as they typically require fewer person-hours for the actual counting efforts. While manual counts can be performed at any type of location, the most appropriate automatic count technology depends on the count location, purpose, flow densities and modes, accuracies required, and available funding.

For the Pueblo of Laguna both flexibility of location and accuracy in differentiating pedestrians and bicyclists are important factors in selecting count methodology. Manual counting provides the most accurate recording of travel patterns and will allow for counting in the best locations to capture walking and bicycling traffic in the Pueblo. In addition, with the existing relatively low numbers of pedestrian and bicycles, any benefit derived from investing in automated counters is greatly diminished.

Over time, as pedestrian and bicycle traffic increases throughout the Pueblo of Laguna, active infrared sensors could be considered for key trail locations. Non-intrusive active infrared counters detect a break or obstruction in the infrared beam as an object passes and can count both bicycles and pedestrians if two devices are installed. If there is a significant increase in the numbers of bicyclists and walkers it may be worth reconsidering the use of automated counters at a future date.

The CBWAG should review the suggested count times and determine whether a different time period is better to address peak travel in the Pueblo. For example, peak traffic might be more associated with school schedules and the peak may be 3:30pm to 5:30pm.

The National Count Date in mid-September was selected because it represents a peak period for walking and bicycling, both work- and school-related. Weather conditions across the country are generally conducive, schools have been underway for several weeks, and people have returned from vacations and are back at work. At least one weekday and one weekend day should be selected to obtain a sampling of weekday and weekend activity levels. While it is not imperative to count on the designated National Count Days, an annual count in September is recommended to ensure that the following conditions are met for the count period:

- Peak walking and bicycling periods
- School in session
- Not a prime vacation time or holiday time
- Avoid September 12<sup>th</sup> through 21<sup>st</sup> to avoid disruptions due to Laguna's biggest feast day

To provide counts at 4 locations on three separate days the Pueblo should have at a minimum 4 staff or volunteers to cover each of the sites. We recommend soliciting enough volunteers so that each is only required to complete one shift, meaning a total of 12 volunteers will be required to cover the locations and three count days. A staff coordinator should also be available during the count periods.

### **Pre-Count Preparation Steps**

- **Visit count locations** - to identify where each counter will sit and determine the number of counters required for each location. Counters will need to be in a safe, visible location that does not block pedestrians or bicyclists. If at all possible locate the counters in an area that will be comfortable for them: shade in the summer, protection from the wind in winter.
- **Identify any permissions** - It may be necessary to obtain permissions before counting. Consult the mayordomos.
- **Schedule the counts** - Keep in mind issues that may affect the count data, including special events, road closures, weather, etc.
- **Hire and train counters** - Counters should be trained for interaction with the public, the count process and form use. Background information including location, date, time period and weather conditions should be recorded before the count session begins. Users such as skateboarders and rollerbladers are counted in the "Other" category. When counting bicycles, the number of people should be counted, not the number of bicycles. For example, two people on a tandem bicycle are counted as two. Counts should include travel in both directions. Training materials are available on the NBPDP website (see below). Counters should be dressed non-provocatively.
- **Quality Control** - To ensure quality count data, spot field checks can be performed to verify that counters are at the correct location and collecting the correct information. Review/verify data within a day or two of collection so that any discrepancies can be identified and counts can be redone if necessary.
- **Collect and enter data** - Count forms are available on the NBPDP website (see below).F

### **Counts Training**

A template for training volunteers can found on the downloads page of the National Bicycle and Pedestrian Document Project (<http://bikepeddocumentation.org/downloads>). Select the Volunteer Training Presentation - Counts link for a presentation that can be delivered to volunteer counters.



## Glossary of Terms

**Mode:** The means of transportation being used, e.g. by car, bicycle, walking. In transportation planning, mode split is the percentage of each mode of transportation being used in a study area.

**Multi-Use Trail (also known as a shared-use path):** Unless designated otherwise, multi-use trails are shared-use trails, meaning that they can be used by all non-motorized users. Multi-use trails may be designed to have a single user lane for all user types or multiple user lanes to separate uses that might conflict.

**On-street bike facilities:** On-street facilities are part of the roadway network. Facilities include bike lanes, shared lane markings, bicycle boulevards, bike routes, etc.

**Recreation route:** Offers users a varied experience by incorporating scenic opportunities, challenging grade changes and meandering alignments.

**Road Diet:** A technique in transportation planning whereby a road is redesigned to reduce the number of travel lanes and/or its effective width, in order to achieve systemic improvements, often including improved conditions and safety for bicyclists and pedestrians.

**Roundabout:** A roundabout is a circular, unsignalized intersection where entering traffic yields to motorists circulating counterclockwise around a central island. Modern roundabouts are engineered to maximize safety for automobiles, bicyclists, and pedestrians, and reduce overall delay at an intersection.

**Route:** A course between a starting point and a destination.

**Trail (or path):** A designated non-motorized route.

**Trail Loop:** A circular, indirect or roundabout route where the beginning and end point meet.

**Trailhead:** The point where a trail begins.

**Transportation route:** A well-connected direct route that minimizes out-of-direction travel to get users to and from a particular destination in the most direct route possible.

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## **Appendix A**

### **Right-of-Way Information**



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## Laguna Rights-of-Way

Rights-of-way are an integral part of public transportation. Right-of-way, as it pertains to transportation, is land that is held in the public trust for the use of transportation facilities, including railroads, roadways, trails, and pathways to convey people and goods from an origin to a destination. The Pueblo of Laguna (POL) has designated rights-of-way for both railroads and roadways. The underlying ownership of these lands may be with the controlling agency or in the form of an easement granted by the Pueblo of Laguna. Control of the rights-of-way fall to various agencies including the Pueblo of Laguna (POL), Burlington Northern Santa Fe railroad, New Mexico Department of Transportation (NMDOT), and the Bureau of Indian Affairs (BIA). Each of these organizations control lands that are included in the Pueblo of Laguna village non-motorized plan.

Right-of-way was examined for the routes inventoried for the POL village non-motorized plan. The right-of-way information was obtained from Pueblo sources for the BIA and Tribal routes, primarily from the Indian Reservation Road (IRR) inventory and recent mapping. The NMDOT provided mapping for the existing state routes, and a National Register of Historic Places form identified routes that were formerly part of the US Route 66 corridor and are maintained by the NMDOT. Historically, US 66 right-of-way was a minimum of 100', therefore, 100' was assumed where no additional data was available. Data was not specifically gathered for either the BNSF railroad. Interstate 40 is under the jurisdiction of NMDOT and has right-of-way fencing along each route to delineate the right-of-way limits. Implementation of the route between Laguna and Mesita villages will require coordination with NMDOT and FHWA via the NMDOT Access Control Committee because it enters into the I-40 right-of-way (but not the freeway clear zone).

The Indian Health Service, in coordination with the Pueblo of Laguna water utility, has developed plans to improve the water distribution system. Mapping for the improvements was studied to determine if water line easements could be used for the development of new trails. It appears from the plans that there are no easements or right-of-way associated with the water system. In addition, the water lines are generally oriented along the shortest path between service destinations rather than on a tangent alignment with branches to each destination. This results in an alignment with many angle points which would not be conducive to a trail alignment. For these reasons, at this time the water line alignments do not represent routes that would benefit the trail system.

The Pueblo of Laguna does not typically designate rights-of-way for Tribal roads under its jurisdiction. The roads are located primarily along traditional routes and along land assignments within the village boundaries. Many of the Bureau of Indian Affairs (BIA) routes have designated right-of-way. The right-of-way is identified by white angle iron markers and recently by survey markers at each alignment change. Most of the BIA routes with designated right-of-way are paved and many of the markers are recent installations.

The roadways with BIA right-of-way were reviewed in the field to verify if the widths identified in the IRR matched the widths found in the field. Many of these were the same, however, a number of rights-of-way did not agree with the IRR. Also, some roadways had multiple right-of-way widths identified, and these have been designated with a range of widths. Right-of-way was discussed with the POL Public Works Department, and the Department guidance was to use the IRR widths unless the field verification overrides the IRR listing. That procedure was followed for all of the routes with existing right-of-way. These widths are listed in Table A1. All right-of-way widths verified in the field were rounded to the nearest 10'.

It is estimated that most remaining BIA and Tribal routes do not have designated right-of-way. It is anticipated that right-of-way has been assigned to paved BIA roads such as Pork Chop Hill Rd and Postal Rd in Paguate, though no documentation was found.

The remaining two routes inventoried are NMDOT state highways, NM 124 and NM 279. NM 124 has 100' of right-of-way through the Pueblo. NM 279 generally has 150' of right-of-way; however, it narrows to 115' where it abuts the BNSF railroad right-of-way. Through discussions with the NMDOT and POL Public Works, it appears that the NM 124 alignment may be within a roadway easement rather than the title of the land transferred to the NMDOT. NM 279 appears to be right-of-way owned by the NMDOT. Table A2 contains a list of all existing routes with ROW, and jurisdiction.

**Table A1. BIA Existing Right-of-Way Widths**

<b>Route</b>	<b>Width</b>	<b>Route</b>	<b>Width</b>
Acorn Rd	60'	Blue Corn Rd	60'
Blue Jay Rd	60'	Blue Sky Rd	60'
Blue Star Loop	40'	Central Park Rd	50'
Coyote Drummer Rd	50'	Deer Dancer Rd	100'
Elizabeth Bender Rd (center)	32'	Elizabeth Bender Rd (east)	28'
Elizabeth Bender Rd (west)	32'/50'	Encinal Rd	150'
Encinal-Cubero Rd	100'	Industrial Pkwy Loop	100'
Laguna 22 (South of I-40)	66'/100'	Laguna 22 (North of I-40)	50'/150'
Lava Bed Rd	100'	Mesa Bottom Rd	100'
Mesa Loop	50'	Mesita Day School Rd	100'
Mesita Rd	100'	Middle Reservoir Rd (paved)	28'
Middle Reservoir Rd (gravel)	28'/50'	Moccasin Rd	100'
Morningside Rd	100'	Mt. Taylor Vista Rd (Subdivision)	50'
Mt. Taylor Vista Rd	100'	Old Route 66 Rd (to Mesita)*	100'
Old Bridge Rd (north)	32'	Old Bridge Rd (south)	50'
Paguate Day School Rd (north)	32'/50'	Pottery Rd	100'
Prosperity Rd	100'	Rain Cloud Rd	80'
Rainfall Rd (east of L-22)	50'	Rainfall Rd (west of L-22)	100'
Rainstorm Rd (west of Rain Cloud)	80'	Rio Moquino	50'
Rio San Jose Rd	40'/80'	Rito Rd	100'
Roadrunner Rd	100'	Rodeo Rd	100'
Salt Cedar Loop	50'	Santa Fe Rd	60'/90'
Sparrow Hawk Rd*	100'	Stable Rd	60'
Stovepipe Rd	100'	Sunset Rd	100'
Sweetwater Rd (Subdivision)	40'	Sweetwater Rd	100'
Tail Feather Loop	50'	Twin Lakes Rd	50'
Veterans Memorial Loop	50'	Veterans Memorial Rd	100'
Vietnam Veterans Rd	150'	Yellow Hill Rd	66'

\* Estimated based upon historic US 66 minimum right-of-way.

Right-of-way was discussed with POL Public Works officials and the village mayordomos concerning new non-motorized routes. Many existing roads have adequate right-of-way to accommodate additional transportation facilities. Official rights-of-way should not be required for new non-motorized routes paralleling existing roads. Routes that are new but cannot be constructed within the existing roadway area or right-of-way may require reallocation of land assignments by the mayordomos to accommodate new facilities. This will require individual meetings with each village's mayordomos to determine feasibility, and should be conducted for each individual route prior to design.



Table A2. Jurisdiction and ROW width for existing POL routes

Road	Village	Jurisdiction	ROW Width	Road	Village	Jurisdiction	ROW Width
Acorn Rd	Paraje	BIA	60	Green Cedar Rd	Mesita	Tribe	-
Ball Park Rd	Paguete	Tribe	-	Harrisburg Lp	Paraje	BIA	-
Baseball Diamond Trail	Laguna	Tribe	-	Hawk Lp	Encinal	Tribe	-
Basket Rd	Paguete	Tribe	-	He Dry Rd	Seama	Tribe	-
Bell Rock Rd	Pueblo	Tribe	-	He Dry Trail	Seama	Tribe	-
Bike Trail	Pueblo	Tribe	-	Hiring Trail	Paraje	Tribe	-
Blue Corn Rd	Paraje	BIA	60	Hunters Rd	Seama	Tribe	-
Blue Jay Rd	Paraje	BIA	60	Industrial Parkway Lp	Mesita	BIA	100
Blue Sky Rd	Paraje	BIA	60	Internal Bus Trail	Laguna	Tribe	-
Blue Star Lp	Paraje	BIA	40	Interstate Ext	Seama	BIA	-
Blue Water Rd W	Paraje	Tribe	-	Irrigation Ditch Rd	Paraje	Tribe	-
Canal Rd	Seama	Tribe	-	Irrigation Ditch Trail	Seama, Paraje	Tribe	-
Canal Rd West	Seama	Tribe	-	Kose Rd	Encinal	Tribe	-
Casa Blanca Rd	Pueblo, Paraje	BIA	100,150	Kose Trail	Encinal	Tribe	-
Central Park Rd	Laguna	BIA	50	Laguna Tribal roads	Pueblo, Mesita	Tribe	-
Cloud View Rd	Mesita	Tribe	-	Laguna-Paraje Rd	Laguna, Paraje	Tribe	-
Corral Rd	Paguete	Tribe	-	Lava Bed Rd	Mesita	BIA	100
Cottonwood Trail	Seama	BIA	-	Marine Corps Rd	Encinal	Tribe	-
Coyote Drummer Rd	Seama	BIA	50	Mesa Bottom Rd	Mesita	BIA	100
Cross Country Lp	Laguna	Tribe	-	Mesa Lp	Laguna	BIA	0,50
Dam Access Trail	Laguna	Tribe	-	Mesa Rd	Mesita	BIA	-
Dam Rd	Laguna	Tribe	-	Mesita Day School Rd	Mesita	BIA	100
Deer Dancer Rd	Seama	Tribe	100	Mesita Rd	Mesita	BIA	100
Dry Dam Rim	Seama	Tribe	-	Middle Reservoir Rd	Paguete	BIA	28,50
Dusty Hill Rd	Mesita	Tribe	-	Middle School Connector	Laguna	Tribe	-
East Irrigation Trail	Paraje	Tribe	-	Moccasin Rd	Encinal	BIA	100
Elizabeth Bender	Paguete	Tribe	32	Morningside Rd	Mesita	BIA, Tribe	100
Elizabeth Bender Rd E	Paguete	BIA	28,32,50	Mount Taylor Vista Lp	Encinal	BIA	-
Encinal Canyon Rd	Encinal	BIA	-	Mount Taylor Vista Rd	Encinal	BIA	50,100
Encinal Cubero Rd	Encinal	BIA	100	NM Hwy 124	Seama, Paraje, Laguna	NMDOT	100
Encinal Paguate Rd	Encinal, Paguate	BIA	-	NM Hwy 279	Paguete, Laguna, Pueblo	NMDOT	150
Encinal Rd	Encinal	BIA	150	North Ditch Rd	Seama	Tribe	-
Encinal Trail	Encinal	Tribe	-	North irrigation Ditch Trail	Paraje, Mesita	BIA	-
Evergreen Rd	Paguete	Tribe	-	North Irrigation Rd	Seama	Tribe	-
Flat Stone Rd	Encinal	Tribe	-	North Railroad Rd	Seama	Tribe	-
Fox Trot Rd	Laguna	Tribe	-	North Rio San Jose Trail	Paraje	Tribe	-
Frog Mesa Rd	Laguna	Tribe	-	North View Rd	Paguete	Tribe	-
Frong Springs Lp	Laguna	Tribe	-	North-South Rd	POL	Tribe	-
Gas Line Rd	Paraje, Laguna, Mesita	Private	-	Old Bridge Rd	Paguete	BIA	32,50

Road	Village	Jurisdiction	ROW Width	Road	Village	Jurisdiction	ROW Width
Old Canyon Rd	Encinal	BIA	-	Seama Dam Rd	Seama	Tribe	-
Old Paguate Rd	Laguna	BIA	-	Seama Rd	Seama	Tribe	-
Old Route 66	Laguna, Mesita	BIA	0,100	South Ditch Rd	Seama	Tribe	-
Paguate Day School Rd	Paguate	Tribe,BIA	0,50	South Fork Rd	Encinal	Tribe	-
Paraje Rd	Paraje	BIA	-	South Mesa Rd	Encinal	BIA	-
Paraje-Canyon Trail	Paraje	Tribe	-	South View Lp	Seama	BIA	-
Plum-Water Tank Trail	Paraje	Tribe	-	Southern Rd	Laguna	Tribe	-
Pork Chop Hill Rd	Paguate	BIA	-	Sparrow Hawk Rd	Mesita	BIA	100
Postal Rd	Paguate	BIA	-	St Elizabeth Rd	Paguate	Tribe	-
Postal Rd Trail	Paguate	Tribe	-	Stable Rd	Mesita	BIA	60
Pottery Rd	Seama	BIA	100	Stovepipe Rd	Laguna	BIA, Tribe	100
Proposed Trail adjacent to I-40	Laguna, Mesita	Tribe	-	Subdivision Access Trail	Laguna	Tribe	-
Prosperity Rd	Mesita	BIA	100	Sun Dial Rd	Laguna	BIA, Tribe	-
Quirk Rd	Pueblo	Tribe	-	Sunset Rd	Mesita	BIA	100
Rain Cloud Rd	Paraje	BIA	80	Sweetwater Lp	Mesita	BIA	-
Rainfall Rd	Seama, Paraje	BIA	0,50,100	Sweetwater Rd	Mesita	BIA	40,100
Rainstorm Rd	Paraje	BIA	0,80	Tail Feather Lp	Seama	BIA	50
Red Mesa Rd	Encinal	Tribe	-	Tower Rd	Laguna	Tribe	-
Red Rock Rd	Mesita	BIA	-	Twin Lakes Rd	Paguate	BIA, Tribe	50
Reservoir Rd	Seama	Tribe	-	Unimproved Trail S of Live Oak	Laguna		-
Reservoir Lp	Paguate	Tribe	-	Veterans Memorial Lp	Laguna	BIA	50
Rio Moquino Rd	Paguate	BIA	50	Veterans Memorial Rd	Laguna	BIA	100
Rio San Jose Rd	Laguna	BIA	80	Veterans Memorial to Southern Rd Trl	Paraje	Tribe	-
Rio-124 Connection	Paraje	Tribe	-	Vietnam Veterans Rd	Paguate	BIA	150
Rito Rd	Mesita	BIA	100	Village Rd	Encinal	BIA	-
River Trail	Laguna	Tribe	-	Wagon Rd	Paraje	Tribe	-
Roadrunner Lp	Laguna	Tribe	-	Walnut Rd	Paraje	Tribe	-
Roadrunner Rd	Mesita	BIA	100	Water Jug	Mesita	Tribe	-
Rodeo Dr	Laguna	BIA	100	Water Tank Rd	Mesita	Tribe	-
Sacred Shield Rd	Seama	Tribe	-	Water Tank Trail	Laguna	Tribe	-
Saddle Rd	Encinal	Tribe	-	Water Tank Trail	Encinal	Tribe	-
Salt Cedar Lp	Seama	BIA	50	Willow Rd	Paraje	Tribe	-
Sandy Hill Rd	Laguna	BIA	-	Yellow Hill Connector	Laguna	Tribe	-
Santa Fe Rd	Laguna	BIA	86	Yellow Hill Rd	Laguna	BIA	66

## **Appendix B**

### **POL Desired Route Characteristics**



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## Desired Route Characteristics

The following desired route characteristics are grouped according to the project goals established by the Pueblo of Laguna. The characteristics listed are a combined result of all of the community involvement activities for the Pueblo of Laguna Bicycle and Pedestrian Route Plan process, including CBWAG meetings, workshops and open houses, focus groups, field tours, and the community survey.

## Connections

“Connections” is a broad term in the context of this report that covers desired destinations and routes.

### Destinations

- Other villages
- The village churches, recreation halls, and water tanks
- The Superette in Laguna and the Dancing Eagle Grocery in the Exit 108 area
- The Pagate Mart is a commercial destination for residents of Pagate
- Commercial area at Exit 108
  - Dancing Eagle Casino
  - Travel Center/Truck Stop
  - Rainbow Center
  - Casa Blanca Post Office
- K'awaika Center
- Schools (Elementary, Middle and High)
- Sports Fields
- Library
- Landmarks and landforms, such as Pagate Canyon, Stove Pipe Rock, Yellow Rock Windmill, the mountains, the mesas and the river
- Friends
- Post Offices (Laguna, New Laguna and Pagate)
- Subdivisions
- Traditional villages
- Laguna Tribal Court
- Tribal Office in Laguna
- Environmental program on NM Highway 124 in Paraje
- Day school (Pagate)
- Encinal plaza
- Dry Lake (Encinal)
- Pagate Lake

### Routes

The routes between housing subdivisions and traditional villages are important in every village. These routes form circuits around most villages as well as some subdivisions. The circuits are made up of roads that are typically on the outer edge of a village. A full list of routes are graphically represented in the “Existing Route”

map. This map will be submitted under separate cover, but will also be included in the final report in the existing conditions section.

There are a number of routes used by bicyclists and pedestrians to travel between the villages. The following routes were identified:

- Laguna to Paguate along Highway 279
- Paguate to Encinal along Encinal Paguate Road
- Encinal to Paraje along Encinal Road
- Seama, Paraje Laguna and New Laguna along New Mexico Highway 124
  - Acorn Road provides a small parallel route in Paraje
- Laguna to Mesita via Old Route 66
- Paguate to Laguna via the old road by the mine on Highway 279
- Laguna to Mesita on the Pipeline road or Old Gas Line road
- Laguna to Acoma cross country trail

Other routes identified:

- Back or older roads in general
- Casa Blanca Road is a major north-south route, which connects Paraje Village to the high school in the Exit 108 area with intermediate destinations at the casino, supermarket, truck stop, post office, and Rainbow Center
- L22, L24, L200
- Frog Springs Road between New Laguna and water tank area
- Rainfall Road
- Trail between King Kong's grave (off of Rainfall Road) in Casa Blanca to underpass near Seama village
- On the bridges
- Paved route between the high school and the post office
- Routes to water tanks in every village except Seama
- The "Hiring Trail" from Deer Dancer Road to the subdivision in Casa Blanca south of the truck stop
- The old wagon trail in Paraje
- Along irrigation ditches
- The berm along the river
- Cottonwood Road to Acoma
- Around dry dam (Seama Reservoir)
- Routes to Flower Mountain
- Seama Road
- Canal Road

New routes identified:

- A hiking route that goes from Encinal and Paguate to Silver Dollar Ranch along Springs Road
- A "Ridge Trail," which would go along the ridge west of the Seama Village
- The Laguna subdivision south via Stovepipe and Laguna Tribal Shop Road to Casa Blanca Road at "Turquoise Springs"



- Route along Gas Line Road (the old Pipeline right-of-way) from Paraje to Mesita
- Route to connect the supermarket in Casa Blanca to the Superette in Laguna
- Nature “trails” for hiking to Red Rock Road from Mesita to Laguna and north of the middle school
- Mountain bike trails on Casa Blanca Mesa behind the grocery store
- Links to the mesas south of Gas Line Road in Mesita
- A new route from the Laguna subdivision to New Laguna would close the following circuit: Santa Fe Road to NM Highway 124; NM Highway 124 to Old Route 66; Old Route 66 south to Old Laguna via Veterans Memorial Road; Veterans Memorial Road to Stovepipe Road, then Roadrunner Loop Road in the Laguna subdivision
- “Historic road” that starts at Highway 124 and Yellow Hill Road in Laguna and goes north connecting to Pagate via Old Pagate Road

There were no routes identified as connections to employment, although connections were identified to the tribal offices and departments in Laguna.

## Recreational and Health Benefits

### Routes

Many routes within and around the villages are currently used for recreation and health. For example:

- An 8-mile bicycling circuit around Pagate
- Walking and bicycling from old Paraje Village along Rainfall and Rainstorm Road and to the areas at Exit 108
- From Rainfall and Reservoir roads north to natural areas
- From Deer Dancer Road south to natural areas
- Along routes and trails north of the middle school in Laguna
- The long loop road on the east side of the Encinal village
- Streets with “rain names” in Paraje could form a recreational route
- Routes within village centers that provide short exercise circuits (e.g. ¼ mile) for elders

One survey respondent asked that mountain bikes be accommodated when trails are developed.

### Destinations

A number of destinations were listed as part of a health/exercise based route:

- Water tanks located:
  - North of Plum Road in Paraje
  - South of I-40 in Mesita
  - North of Hawk Loop Road and east of Encinal Canyon Road in Encinal
  - Northwest of Fox Trot Road in Laguna
  - In Pagate
- K'awaika Center track
- K'awaika Center ball fields
- Fitness Center

- Mesita ball field in old village
- Mesas
- Foothills of Mt. Taylor
- Stove pipe rock
- Yellow Hill/Rock Windmill
- Mountains
- River
- Bell Rock

## Programs

The participants in the middle school focus group recommended creating a recreation program for bikers, walkers, and runners. They suggested making t-shirts for participants and having a bike/running event in a different village each month.

## Safety Concerns

Understanding the real and perceived barriers to walking and biking in a community is an important first step in planning and designing a trail network. The following is a summary of the major safety concerns:

- Snakes
- Dogs
- Motor vehicle traffic and speeds on:
  - Encinal Road
  - Veteran's Memorial Road from Old Laguna to the Laguna subdivision
  - NM Highway 124
  - Old Route 66
  - NM 279 near Paguete Mart
  - All roads connecting Seama to Paraje
  - Deer Dancer and Rainfall Roads into Seama village
  - Vietnam Veterans Road from the Paguete Mart, south to Old Bridge Road
  - Pork Chop Hill Road near Paguete Day School Road
- Narrow roads with no shoulder
  - Specific roads included Acorn, Rainfall, Rainstorm, Casa Blanca and all roads connecting to Seama and Paraje
- Separation of pedestrians and bicyclists routes from roadways
- Unsafe crossings at the intersections of major roads, at the railroad, and in commercial areas. The following areas were specifically mentioned:
  - Intersections that cross Highway 124 are considered dangerous especially at the Superette, the Laguna subdivision, Casa Blanca Road, K'awaika Center, New Laguna, Paraje, and Seama
  - Highway 279 at the Paguete Mart
  - I-40 crossing at:
    - Exit 104 and NM Highway 124, Seama
    - Exit 108 in Paraje
    - Exit 117 in Mesita
  - Dancing Eagle Casino and Travel Center Area

- Casa Blanca Road at
    - Housing subdivision
    - Railroad tracks
    - Exit 108
- No available sidewalks or trails
- Erosion and unstable soils in some places (e.g. Laguna Tribal Road (between Sunset and Mesa Roads) in Mesita)
- Standing water and drainage problems (e.g Rainfall Road in Paraje)
- Potholes and poor surface conditions (e.g. Vietnam Veterans Road in Paguete)
- Blind corners without signage on;
  - Old Route 66 in the canyon between Mesita and Laguna
  - Mesita Road over I-40, at the curve near the state highway maintenance yard
- The need for signage alerting motorists to pedestrians and bicyclists especially along Highway 124 and Old Route 66
- Isolation and the lack of ability to call for help
- Accesses over the freeway. The I-40 overpasses at Exit 117, Exit 108 and Exit 104 are considered unsafe for pedestrians and bicyclists

## **Respect for Cultural Sites**

Members of the CBWAG reaffirmed that cultural sites and sacred areas must be respected. Respecting natural and cultural resources/sites was the second most cited value in the survey after safety from cars, trucks and trains.

## **Access by Nontribal Members**

The CBWAG strongly recommended that future route improvements be designed for the local community and expressed the desire to avoid creating a route system that might attract nontribal people to the Pueblo.

One of the surprises of the survey was that survey respondents were fairly evenly divided on the importance controlling the access to a non-motorized network. This divided view has been supported by comments made to the project team during the mapping field work exercise. In the survey, one Laguna respondent mentioned the development of mountain bike trails such as those in Moab, Utah and Colorado would be an economic opportunity. Some field work participants felt that a non-motorized system should be closed to non-Pueblo residents, but some in Paraje felt that a trail network could be an economic development opportunity.

## **Other Route Characteristics**

### **Surfaces**

In the survey, there were two questions about trail and/or route surfaces. One focused on pedestrian facilities and one on bicycle facilities. For pedestrians, most respondents favored unpaved hard-packed surfaces. For bicyclists, paved surfaces were preferred. There were some variations of preferences when the villages were polled separately as noted under the village name in the “Differences in Goals Among Villages” section of the report. Other comments about surfaces were:

- Have trails accommodate mountain biking

- Trail surfaces and safety measures should accommodate children on bikes, and those who are pushing strollers and pulling wagons

## **Improvements**

The number of busy roadways that both bisect and connect the villages was noted as a problem for pedestrians and bicyclists. In the survey, the number one most desired improvement listed by all survey respondents was safer road crossings (124 responses). The second most favored improvement was [pedestrian scaled] mile marker signs. The third most popular desired improvement was benches, followed closely by shade structures. The full list of improvements, including how those listed in the survey and discovered during the focus group meetings can be found in the Appendix of this document.

ADA accessibility was identified as being a concern by those attending the persons with disabilities focus group. ADA accessibility should be considered at crossings and on any the trails developed. Access to emergency call boxes or similar technology was mentioned twice in the survey and at the elder focus group meeting.

## **Terrain**

Comments about route terrain were discussed as part of the route and destination discussions. The feedback the project team received was that a variety of routes are desired. Routes on relatively flat paved and unpaved roads (e.g. a trip around the subdivision) have a low level of difficulty. This route type was one of the top priority routes for all of the villages. Challenging routes with steep slopes (e.g. routes to the water tank and the mesas) and that cover long distances are also popular with residents. In the survey, three respondents commented that trails should have mixed levels of difficulty.

Having routes and/or trails with mixed levels of difficulty are key to successful non-motorized systems. Routes or trails with low levels of difficulty can accommodate the elderly, youth, those just starting an exercise program, and those who are commuting to work, school or to run errands. Routes or trails that are more challenging attract fitness enthusiasts, athletes, and explorers. Varied terrain accommodates residents whose fitness level gradually increases. The more challenging routes are often circuitous routes that do not provide the most direct connections between two points, but are more meandering and scenic.

## **Maintenance**

The importance of establishing a routine maintenance plan has been mentioned at CBWAG meetings, in the survey and in the other public forums held as part of this project. Litter, graffiti, infrastructure and vegetation maintenance is an important part of the development of a trail system.

## **Differences in Goals Among Villages**

The results from the community involvement activities show that once safety issues (e.g. safe crossings, traffic conflicts, snakes and dogs) and the overall network connectivity (around the subdivisions and between the subdivisions and the Old Village areas) are addressed, each village has specific preferences and improvements they would like addressed in the Bicycle and Pedestrian Route Plan. The bullets below summarize these goals by village.

## **Encinal**



- There is no clear preferred pedestrian surface
- Wide/marked road shoulders are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - West along Encinal Cubero Road
  - The outer circuit around the traditional village
  - Through the village along Village and Flatstone Roads, which connects to the plaza and Recreation Hall
  - Old Canyon, South Mesa, and Kose Roads
  - The old wagon trail route between Encinal and Paguete
  - Route to the water tank (north of Hawk Loop Road and east of Encinal Canyon Road)
  - Encinal Road to Highway 124
  - Old village to subdivision: Mount Taylor Vista Road and Moccasin Road
- Provide a village-to-village route to the high school, the commercial area at Exit 108, the K'awaika Center and the Post Office. This route is both a challenging recreational route (due to the distance and some elevation changes) and a transportation/commuter route (due to the types of destinations listed)
- Safety
  - Consider potential wild horse conflicts in Encinal
- Provide trail lighting, wayfinding signage and shade

## **Laguna**

- Unpaved hard packed trails are the preferred pedestrian surface
- Paved trails are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - Frog Springs Road between New Laguna and water tank area
  - Laguna to Mesita on the Pipeline Road or Old Gas Line road
  - Old Laguna along Veterans Memorial Road and Roadrunner Roads to the old BIA Road connecting to Rainfall Road in Paraje
  - Highway 124, including the segment between the Superette and the New Laguna Post Office
  - From the north side of Veterans Memorial Loop Road in the Laguna subdivision to Southern Road in New Laguna
  - The old road alignment near the railroad tracks from the old village to New Laguna
  - Old Route 66
  - Utilize the old bridge
  - "Historic road" that starts at Highway 124 and Yellow Hill Road in Laguna and goes north connecting to Paguete via Old Paguete Road
  - Scenic route that starts at Highway 124, heads north on Rodeo Road, and curves back near an old sheep camp to Arrowhead Road connecting to Highway 124
  - From the west edge of the walking circuit and the Old New Laguna Dam to the post office in New Laguna
  - Top of the mesa north of the village
- Improve crossings at the following intersections:
  - Highway 124 at the Superette

- Old Laguna Village at Old Paguete Road
- Highways 279 and 124
- Central Park Road and Highway 124
- Highway 124 and the K'awaika Center in Paraje
- Safety
  - Improve pedestrian access and safety on the bridge on Veterans Memorial Road near where it enters the Laguna subdivision
  - Improve safety on Old Route 66
- Top destinations
  - Library, K'awaika Center, Commercial Area at Exit 108 and the water tank
- Provide wayfinding signage, shade structures, lighting, and parking at trailheads

### **Mesita**

- Unpaved hard packed trail are the preferred pedestrian surface
- Paved trails are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - Gas Line Road or old Pipeline Road from Mesita to Laguna and Exit 108
  - Old Route 66 from Mesita to Laguna
  - Rito Road, then to the village and across the bridge, and around the ball park at Mesita
  - Rec Hall to Laguna Industries Loop Road, which includes Sunset Road, the subdivision, Sweetwater, Dusty Hill, Green Cedar, and Laguna Tribal Roads
  - Back road to the windmill
  - Route along the irrigation ditch
  - From Red Rock Road to Laguna Tribal Road to Quirk Road to Highway 279 to Paguete
  - From Red Rock Road, past the Rec Hall, along Mesita Road to Sunset Road (south of I-40)
- Safety
  - Improve the connection under I-40 through the culverts at Day School Road and River Bed Road
  - Consider potential mountain lion conflicts on Sunset Road in Mesita
- Destinations: Rec Hall, K'awaika Center and river
- Provide wayfinding signage, parking at trailheads, benches, shade structures and lighting

### **Paguete**

- Unpaved hard packed trail are the preferred pedestrian surface
- Paved trails are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - From the post office to the Paguete Mart, then north along Highway 279 to Pork Chop Hill Road
  - Back road between Paguete and Encinal
  - All parts of the village to the Paguete Mart
  - Old road by mine on Highway 279
- Improve crossings at the following locations:

- In front of the Pagate Mart for those coming from the subdivision on the other side of the street
- Top destinations: Post office, Pagate Mart, Pagate Canyon, Pagate Lake
- Provide mileage signs should be installed along Vietnam Veterans Road
- Provide wayfinding signage, benches and shade structures

### **Paraje**

- Unpaved hard packed and paved trails are the preferred pedestrian surface
- Wide marked road shoulders are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - Along the ditch connecting Paraje to the K'awaika Center from its intersection with Highway 124 through the village and east
  - Casa Blanca Road connecting Paraje Village to the commercial areas at Exit 108 and the high school
  - The streets with rain names (Rainfall, Rainstorm, etc.) could form a circuit route
  - The berm along the river
  - Trail along ditch between King Kong's grave (off of Rainfall Road) in Casa Blanca to underpass near Seama village
  - Rainfall Road
  - Trails on Casa Blanca Mesa behind the grocery store
  - The old wagon trail to Encinal
  - Unimproved trail south from Live Oak Road in the housing south of the K'awaika Center, connecting to Rainstorm and Rainfall Roads
- Safety
  - Call boxes along key routes
- Designate trailheads in the village center as well as near the supermarket in the Exit 108 area
- Top destinations: Commercial area at Exit 108, the mesas, water tank, post office, foothills of Mt. Taylor and the Rec Center
- Provide wayfinding signage, benches, shade structures and lighting

### **Seama**

- Unpaved hard packed trails are the preferred pedestrian surface.
- Paved trails are the preferred bicycle facility surface
- The level of difficulty of desired routes range from easy to challenging:
  - Rainfall Road from the village to areas north of the railroad tracks
  - From end of pavement at Seama subdivision on dirt road (washed out/not maintained) to Reservation boundary
  - Canal Road
  - Cottonwood Road to Acoma
  - Routes up Flower Mountain
  - Around dry dam (Seama Reservoir)
  - Along the irrigation ditch
  - Ridge trail along the ridge west of the village that would connect to Cottonwood Road

- From the village south along Deer Dancer Road past the old dumpsite
  - Unpaved road/horse trail from Seama to Casa Blanca Road, south of the high school
- Safety
  - Increase pedestrian and bicyclist safety along routes from Seama to Paraje Village
  - Consider conflicts with wild horses on Red Mesa and South Fork Roads
- Top destinations: Commercial area at Exit 108, water tank, churches, ball field, K'awaika Center, Seama School
- Provide wayfinding signage, benches, shade structures and lighting



## **Appendix C**

### **Pueblo Routes Selection Analysis**

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## Pueblo Route Alternatives Evaluation

### Preferred segment

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

Segment Name	Route	Feasible?	Length (ft)	Trail treatment	Trail Treatment Cost	Other treatment	Other Treatment Cost	Total construction cost	Annual O & M*	Long-term O&M**	Cost score	Safety Notes	Safety score	Connectivity Notes	ConnectivityScore	Total Score	Notes
<b>Laguna to Mesita</b>																	
<b>Segments Analysis</b>																	
LM-1	NM124 from NM 279	Y	2,659	10' Asphalt MUP	\$132,950			\$ 132,950	\$ 1,330	\$ 6,648	2	Separated path & road diet increase safety	3	Flat & direct	3	8	
LM-2a	Old route 66 from paved road near exit 114	Y	10,270	10' Asphalt MUP	\$388,245			\$ 388,245	\$ 3,882	\$ 19,412	2	Blind corners	2	Longer, moderate grade	2	6	
LM-2b	Alt. paved road along stretch of I-40	Y	7,070	10' Asphalt MUP	\$353,500	Trail base construction	\$350,000	\$ 703,500	\$ 3,535	\$ 17,675	1	Off-road path is very safe	3	Shorter, moderate grade	3	7	
LM-3	NM124 from where it nearly meets I-40 to old ditch road	Y	4,078	10' Asphalt MUP	\$154,269			\$ 154,269	\$ 1,543	\$ 7,713	2	Off-road path is very safe	3	direct, moderate grade	3	8	
LM-4a	Old ditch road from NM124 to Red Rock Road	Y	7,549	10' Asphalt MUP	\$285,325			\$ 285,325	\$ 2,853	\$ 14,266	2	Off-road path is very safe	3	Less good connection	2	7	
LM-4b	NM124 from old ditch road to Mesita Road	Y	7,087	10' Asphalt MUP	\$262,219			\$ 262,219	\$ 2,622	\$ 13,111	2	Off-road path is very safe	3	Better connection	3	8	
	Water line ROW parallel to NM124	N		Unsuitable alignment (see ROW memo - Appendix D)													
	Sandy Hill to Gas Line Road	N		Construction infeasible due to terrain & expense; isolated													
<b>Routes Analysis</b>																	
<b>Segments:</b>																	
LM-A1	LM-1, LM-2a, LM-3, LM-4a		24,556		\$960,789			\$960,789	\$9,608	\$48,039	2.0		2.8		2.5	7.3	
LM-A2	LM-1, LM-2b, LM-3, LM-4a		21,356		\$926,044			\$1,276,044	\$9,260	\$46,302	1.8		3.0		2.8	7.5	
LM-A3	1, 2a, 3, 4b		24,094		\$937,683			\$937,683	\$9,377	\$46,884	2.0		2.8		2.8	7.5	
LM-A4	LM-1, LM-2b, LM-3, LM-4b		20,894		\$902,938			\$1,252,938	\$9,029	\$45,147	1.8		3.0		3.0	7.8	

## Pueblo Route Alternatives Evaluation

### Preferred segment

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

Segment Name	Route	Feasible?	Length (ft)	Trail treatment	Trail Treatment Cost	Other treatment	Other Treatment Cost	Total construction cost	Annual O & M*	Long-term O&M**	Cost score	Safety Notes	Safety score	Connectivity Notes	ConnectivityScore	Total Score	Notes
<b>Laguna to Paguate</b>																	
<b>Segments Analysis</b>																	
LPG-1a	NM279 from NM124 to Old Paguate	Y	7,602	Maintain existing 8' shoulder	\$21,837			\$ 21,837	\$ 218	\$ 1,092	3	Wide shoulder, low traffic volumes	3	Shorter but hillier	2	8	
LPG-1b	Old Paguate from NM 124 to NM 279	Y	8,910	10' Crusher fine MUP	\$40,986			\$ 40,986	\$ 410	\$ 2,049	3	More isolated	2	Longer but flatter	2	7	
LPG-2	NM279 from Old Paguate to Vietnam Vets	Y	8,587	Maintain existing 8' shoulder	\$24,663			\$ 24,663	\$ 247	\$ 1,233	3	Wide shoulder, low traffic volumes	3	Somewhat hilly	2	8	
LPG-3a	Vietnam Vets from NM279 to Encinal-Paguate	Y	21,686	10' Crusher fine MUP	\$99,746			\$ 99,746	\$ 997	\$ 4,987	2	More isolated	2	Shorter, hillier, less accessible	2	6	
LPG-3b	NM279 from Vietnam Vets to Postal Rd	Y	33,947	Maintain existing 8' shoulder	\$96,000			\$ 96,000	\$ 960	\$ 4,800	2	Wide shoulder, low traffic volumes	3	Long, flat, better connection	3	8	
	Old railroad bed near NM 279	N		Poor connection, possible uranium contamination (trains used to carry uranium). Testing not cost-effective.													
<b>Routes Analysis</b>																	
Route	Segments																
LPG-A1	LPG-1a, LPG-2, LPG-3a		37,875		\$146,246			\$ 146,246	\$ 1,462	\$ 7,312	2.0		2.0		1.5	5.5	
LPG-A2	LPG-1a, LPG-2, LPG-3b		50,136		\$142,500			\$ 142,500	\$ 1,425	\$ 7,125	2.0		2.3		1.8	6.0	
LPG-A3	LPG-1b, LPG-2, LPG3a		39,183		\$165,395			\$ 165,395	\$ 1,654	\$ 8,270	2.0		1.8		1.5	5.3	
LPG-A4	LPG-1b, LPG-2, LPG3b		51,444		\$161,649			\$ 161,649	\$ 1,616	\$ 8,082	2.0		2.0		1.8	5.8	



## Pueblo Route Alternatives Evaluation

### Preferred segment

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

Segment Name	Route	Feasible?	Length (ft)	Trail treatment	Trail Treatment Cost	Other treatment	Other Treatment Cost	Total construction cost	Annual O & M*	Long-term O&M**	Cost score	Safety Notes	Safety score	Connectivity Notes	ConnectivityScore	Total Score	Notes
<b>Paraje to Seama Segments Analysis</b>																	
PJS-A	NM124 and Pottery (from Casa Blanca to Rainfall)	Y	16,678	10' Asphalt MUP	\$630,410			\$ 630,410	\$ 6,304	\$ 31,521	2	Separated facility	3	Important to overall network	2	7	Recommended for importance to overall network
PJS-B1a	Irrigation ditch trail & Seama Dam Rd (Casa Blanca - Rainfall)	Y	11,515	10' Crusher fine MUP	\$52,969	Expand underpass for pets/bicyclists and MUP	\$1,015,000	\$ 1,067,969	\$ 530	\$ 2,648	1	Somewhat isolated	2	Longer and less direct	1	4	
PJS-B1b	Rainfall (Casa Blanca to Seama Dam Rd)	Y	10,576	10' Crusher fine MUP	\$48,650	New bike/ped I-40 underpass	\$1,016,923	\$ 1,065,573	\$ 487	\$ 2,433	1	Somewhat isolated	2	Key local connection	3	6	
PJS-B2	Rainfall Rd (Seama Dam to Deer Dancer)	Y	5,732	10' Crusher fine MUP	\$26,367			\$ 26,367	\$ 264	\$ 1,318	3	Somewhat isolated	2	Key local connection	3	8	
	Water line ROW (near NM124)	N	Unsuitable alignment (see ROW memo - Appendix D)														
	Water line ROW (near Rainfall)	N	Unsuitable alignment (see ROW memo - Appendix D)														
	Trail w. of exit 108 over mesa to Deer Dancer	N	Unsuitable alignment (see ROW memo - Appendix D) and poor connectivity														
	Arroyo NE of village	N	Unsuitable alignment (see ROW memo - Appendix D)														
<b>Routes Analysis</b>																	
Route	Segments																
PJS-A	PJS-A		16,678		\$630,410		\$0	\$ 630,410	\$ 6,304	\$ 31,521	2.0		3.0		2.0	7.0	Recommended for importance to overall network
PJS-B1	PJS-B1a & PJS-B2		17,247		\$79,336		\$1,015,000	\$ 1,094,336	\$ 793	\$ 3,967	2.0		2.0		2.0	6.0	
PJS-B2	PJS-B1b & PJS-B2		16,308		\$75,017		\$1,016,923	\$ 1,091,940	\$ 750	\$ 3,751	2.0		2.0		3.0	7.0	Preferred alignment due to better connection

## Pueblo Route Alternatives Evaluation

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

Segment Name	Route	Feasible?	Length (ft)	Trail treatment	Trail Treatment Cost	Other treatment	Other Treatment Cost	Total construction cost	Annual O & M*	Long-term O&M**	Cost score	Safety Notes	Safety score	Connectivity Notes	ConnectivityScore	Total Score	Notes
Encinal to Paraje																	
Segments Analysis																	
EP-1a	Encinal Rd (124 - Old Canyon)	Y	10,649	10' Crusher fine MUP	\$48,985	Installation of culvert Pipe	\$591,515	\$ 640,500	\$ 490	\$ 2,449	2	Low traffic volume	3	Good	3	8	
EP-1b	K'awaika Ctr Trail (124- Old Canyon)	Y	14,596	10' Crusher fine MUP	\$67,137	Installation of culvert Pipe	\$500,000	\$ 567,137	\$ 671	\$ 3,357	2	Isolated	1	Good	3	6	
EP-1c/2c	Old wagon trail	Y	17,817	10'Crusher fine MUP	\$100,000	Washed out trail; reconstr. Required	\$9,900,000	\$ 10,000,000	\$ 1,000	\$ 5,000	1	Isolated	1	Good	3	5	
EP-2a/3a	Old Canyon (Encinal Rd to Mt Taylor Vista)	Y	15,629	10' Crusher fine MUP	\$71,894	Installation of culvert Pipe	\$781,450	\$ 853,344	\$ 719	\$ 3,595	2	Somewhat isolated	2	Good	3	7	
EP-2b	Encinal Rd (Old Canyon to Kose)	Y	9,557	10' Crusher fine MUP	\$43,958	Installation of culvert Pipe	\$486,042	\$ 530,000	\$ 440	\$ 2,198	2	Low traffic volume	3	Good	3	8	
EP-3b	Encinal Rd (Kose - Mt Taylor Vista)	Y	7,839	10' Crusher fine MUP	\$36,056	Installation of culvert Pipe	\$259,944	\$ 296,000	\$ 361	\$ 1,803	2	Low traffic volume	3	Good	3	8	
EP-3c	Kose Rd & Trail (Encinal Rd to South Mesa Rd)	Y	8,165	10' Crusher fine MUP	\$37,559	Installation of culvert Pipe	\$350,950	\$ 388,509	\$ 376	\$ 1,878	2	Isolated	1	Good	3	6	
Routes Analysis																	
Route	Segments																
EP-A1	EP-1a, EP2a/3a		26,278		\$120,879		\$1,372,965	\$ 1,493,844	\$ 1,209	\$ 6,044	2.0		2.5		3.0	7.5	
EP-A2	EP-1a, EP-2b, EP-3b		28,045		\$128,999		\$1,337,501	\$ 1,466,500	\$ 1,290	\$ 6,450	2.0		3.0		3.0	8.0	
EP-A3	EP-1a, EP-2b, EP-3c		28,371		\$130,502		\$1,428,507	\$ 1,559,009	\$ 1,305	\$ 6,525	2.0		2.3		3.0	7.3	
EP-A4	EP-1b, EP2a/3a		32,413		\$167,137		\$10,400,000	\$ 10,567,137	\$ 1,671	\$ 8,357	1.0		0.7		2.0	3.7	
EP-A5	EP-1b, EP-2b, EP-3b		31,992		\$147,151		\$1,245,986	\$ 1,393,137	\$ 1,472	\$ 7,358	2.0		2.3		3.0	7.3	
EP-A6	EP-1b, EP-2b, EP-3c		32,318		\$148,654		\$1,336,992	\$ 1,485,646	\$ 1,487	\$ 7,433	2.0		1.7		3.0	6.7	
EP-A7	EP-1c/2c, EP-3b		25,656		\$136,056		\$10,159,944	\$ 10,296,000	\$ 1,361	\$ 6,803	1.0		1.3		2.0	4.3	
EP-A8	EP-1c/2c, EP-3c		25,982		\$137,559		\$10,250,950	\$ 10,388,509	\$ 1,376	\$ 6,878	1.5		1.0		3.0	5.5	

## Pueblo Route Alternatives Evaluation

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

[illegible]

## Pueblo Route Alternatives Evaluation

Segments analysis: each route segment was evaluated independently

Routes analysis: segment scores were aggregated into overall route scores and costs

Segment Name	Route	Feasible?	Length (ft)	Trail treatment	Trail Treatment Cost	Other treatment	Other Treatment Cost	Total construction cost	Annual O & M*	Long-term O&M**	Cost score	Safety Notes	Safety score	Connectivity Notes	ConnectivityScore	Total Score	Notes
Laguna to Paraje																	
Routes analysis***																	
LPI-A	Parallel to NM 124 in NMDOT ROW****	Y	32,359	10' Asphalt MUP	\$1,212,357	Road realign + road diet	\$436,764	\$ 1,649,121	\$ 12,124	\$ 60,618	2	Separated facility	3	Key connection	3	8	
LPI-B	Vietnam Vets - Stovepipe (Rio Sanlose - Rainfall)	Y	25,252	10' Crusher fine MUP	\$116,159			\$ 116,159	\$ 1,162	\$ 5,808	3	Somewhat isolated	2	Longer; minor connection	2	7	
	Water line ROW parallel to NM124	N	Unsuitable alignment (see ROW memo)														
Paraje to Exit 108																	
Routes analysis***																	
PICB-A	Casa Blanca (NM124 to high school)	Y	13,842	10' asphalt MUP	\$512,765			\$ 512,765	\$ 5,128	\$ 25,638	2	Separated facility; difficult I-40 crossing	2	Very important connection	3	7	
PICB-B	Same, but with new 1-40 bike/ped crossing	Y	13,842	10' asphalt MUP	\$512,765	New 1-40 bike/ped crossing	\$1,015,000	\$ 1,527,765	\$ 5,128	\$ 25,638	1	Separated facility	3	Very important connection	3	7	Preferred route for safety benefits.

Note that this was a preliminary analysis. Route costs and lengths have subsequently changed, as reflected in other tables.

\*Short-term operations and maintenance cost based on 1% of trail surface construction cost.

\*\* Annualized long-term operations and maintenance cost based on assumption of 20-year life of project.

\*\*\*No segments analysis needed for Laguna - Paraje or Paraje - Exit 108 commercial area - routes analysis is sufficient.

\*\*\*\*This route jogs up to the old bridge near the K'awaika Center, in order to avoid the costly bridge widening where NM 124 crosses a ravine. The route returns to NM 124 at Encinal Rd.

Criteria-	Cost Score:		Safety Score:		Connectivity Score:	
	1-	Greater than \$700,000	1-	Isolated areas; high traffic volume roads without separated facilities	1-	Route is indirect or considered unimportant by residents
	2-	\$90,000 - \$700,000	2-	Somewhat isolated areas; some blind corners or difficult crossings; higher-volume traffic roads	2-	Less direct routes or connect less important destinations
	3-	Less than \$90,000	3-	Low traffic volumes; not as isolated	3-	More direct routes or routes that have been identified by residents as more important than others

Segment scores were averaged to determine route scores



## **Appendix D**

### **Evaluation and Ranking for All Routes**

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## Pueblo Routes Evaluation

Connection	SegID	Segments (from alternatives analysis)	Project(s)	Length (ft)	Length (miles)	Total construction cost (see Pueblo alternatives analysis)	Annual O & M (see Pueblo alternatives analysis)	Long-term O&M (see Pueblo alternatives analysis)	Cost Score	Residents served (notes)	Relative Connectivity Score	Connectivity Score for Tiger Grant	Destinations served (notes)	Improved function score	Total Score	Weighted Score	Priority Rank
<i>Weight</i>									1		2			1			
<b>Pueblo Routes</b>																	
Laguna to Mesita	Lg-Ms	LM-1, LM-2a, LM-3, LM-4b	1N	20,893	4.0	\$ 879,809	\$ 9,608	\$ 48,039	1	31% & 20%	3	3		3	7	10	Med
Laguna to Paguate	Lg-Pg	LPG-1a, LPG-2, LPG 3b	1M	50,940	9.6	\$ 432,084	\$ 4,275	\$ 7,125	3	31% and 10%	2	2		1	6	8	Med
Laguna to Paraje	Lg-Pr		1I, 1J, 1K	33,355	6.3	\$ 2,943,406	\$ 12,124	\$ 60,618	1	31% and 19%	4	4	Most Pueblo-wide destinations in Paraje & Laguna	3	8	12	High
Paguate to Encinal	Pg-En	PGE-1, PGE-2b	2D	36,843	7.0	\$ 82,540	\$ 2,191	\$ 3,652	3	10% and 15%	1	1	Fewest number of Pueblo-wide destinations	1	5	6	Low
Paraje - Exit 108	Pr-108	PICB-B	1C, 1D, 1E	14,791	2.8	\$ 10,983,292	\$ 5,128	\$ 25,638	1	All	4	4	Connects all Pueblo to commercial areas	3	8	12	High
Paraje to W. edge of Pueblo	Pr-Edge	PJS-A	1A	18,378	3.5	\$ 705,648	\$ 18,912	\$ 31,521	2	Less important for local resident needs	1	2		2	5	6	Low
Encinal to Paraje	Pr-En	EP-1a, EP2b, EP-3b	1G	28,043	5.3	\$ 602,457	\$ 3,870	\$ 6,450	1	5% and 19%	1	2		2	4	5	Low
Seama (overlaps w/ Pr-4)	Se-Pr	PJS-B1b, PJS-B2	1B	16,309	3.1	\$2,319,094	\$750	\$3,751	1	19% and 12%	2	3		3	6	8	Med
<b>Total</b>				<b>219,552</b>	<b>41.6</b>	<b>\$18,948,331</b>	<b>\$56,858</b>	<b>\$186,794</b>									

Cost Score:

Costs naturally break into 3 tiers (\$0 - \$90,000,\$200,000; \$200,000 - \$900,000; greater than \$900,000)

Relative Connectivity Score:

Compares connectivity of Pueblo Routes relative to each other. Higher scores for connecting villages with more residents, or connecting residents to Pueblo-wide destinations

Tiger Grant Connectivity Score:

Compares connectivity of route relative to entire network; all Pueblo routes have at least moderately important connectivity, except Paguate - Encinal

Improved Function Score:

Degree to which the proposed improvement will increase route functionality or safety for no motorized transportation

## Village Routes Evaluation

x Meets this criterion      - Partially meets this criterion

SegID	Description	Project	Overlaps with other route	Connects housing to key destinations	Connects key destinations to each other	Connects destinations or housing to Pueblo routes	Particular recreational value	Connections	Length (ft)	Length (miles)	Connectivity Score	Village Ranking	Priority Rank
<b>Encinal</b>													
	Water Tank Trail, Encinal-Cubero, Mt Taylor Vista	1H					x	1. Seama destinations (Plaza, rec hall, village proper, water tank) 2. Encinal destinations to Pueblo rts (south & east) 3. Partial connection to Encinal Subdivision	12,193	2.3	3	1	Priority
En-2	Encinal Loop	2A				x	x	1. Direct route from village to Pueblo route (south)	13,119	2.5	1	2	High
<b>Paguete</b>													
								1. Paguate subdivision to Paguate village 2. Paguate destinations to each other (school, post office, mart) 3. Paguate subdivision to Pueblo route (west)	12,483	2.4	3	1	Priority
Pg-1	Day School Loop	1M		x	x	-	x	1. Paguate village to water tank and key recreational route 1. Seama village to Pueblo route (small segment completion)	17,041	3.2	1	2	High
Pg-2	Paguete Lake Loop	2E			x		x		8,573	1.6	1	3	Med
Pg-3	Vietnam Veterans Loop	2F					x		10,113	1.9	0	4	Low
Pg-4	Old Bridge Loop	2G					x			-			
<b>Seama</b>													
								1. Seama destinations to each other (Seama village, Seama school, reservoir) 2. Seama village to Harrisburg, New York Bronx	5,053	1.0	2	1	Priority
Se-1	Rainfall North	1A		-	x	-							
Se-2	Deer Dancer	2J		x		x		1. Seama subdivision to Seama village 2. Seama subdivision to Pueblo route	5,824	1.1	3	2	High
Se-3	Reservoir	2K					x	-	7,627	1.4	0	3	Med
Se-4	Seama	2L					x	-	7,371	1.4	0	4	Low
Se-5	Harrisburg	2M					x	-	3,723	0.7	0	5	Low
<b>Paraje</b>													
								1. K'awaika Center to Pueblo route	4,818	0.9	1	1	Priority
Pr-1	K'awaika Center	1F				x	x	-	5,146	1.0	0	2	High
Pr-2	Blue Star Loop	2P					x		6,031	1.1	1	3	Me
Pr-3	Paraje village - Pueblo rt (West)	2Q				x	x	1. Paraje village to Pueblo route (west)	21,456	4.1	1	4	Low
Pr-4	Rainfall loop	2R					x	1. Secondary connection for southern route					



## Village Routes Evaluation

x Meets this criterion														- Partially meets this criterion				Priority Rank	
SegID	Description	Project	Overlaps with other route	Connects housing to key destinations	Connects key destinations to each other	Connects destinations or housing to Pueblo routes	Particular recreational value	Connections	Length (ft)	Length (miles)	Connectivity Score	Village Ranking							
Laguna																			
Lg-1	Dam Road & Roadrunner	1L		-			x	1. Laguna subdivision to Exit 108 commercial area (partial)	10,476	2.0	1	1	Priority						
Lg-2	Santa Fe/Water Tank Trail	2W			x	x	x	1. New Laguna destinations (post office) 3. New Laguna to Pueblo route (north)	13,735	2.6	2	2	High						
Lg-3	Frog Springs loop	2X					x	2. Water tank recreational area	11,795	2.2	0	3	Medium						
Lg-4	Rio San Jose/Baseball Diamond	1L, 2Y	Lg-C		x	x	x	1. Laguna destinations to each other (baseball diamond, post office) 2. Laguna village to Pueblo route (east)	11,817	2.2	2	4	Low						
Mesita																			
Ms-1	Mesita Loop	1O		-	x	-		1. Mesita destinations to each other 2. Mesita housing to Mesita village (partial) 3. Mesita housing to Pueblo route (partial)	9,570	1.8	3	1	Priority						
Ms-2	Mesita Day Sch	2AH		-		-	x	-	7,444	1.4	1	2	High						
Ms-3	Mesa Loop	2AI					x	-	18,967	3.6	0	3	Med						
Ms-4	Industr. Parkway	2AJ					x	-	5,413	1.0	0	4	Low						
Total									229,785	44									

Village Criteria- Each village selected approximately four routes that were their top priorities for walking routes in the village, and then ranked them in order of priority, with the top route ranked as 1, the second-priority route ranked as 2, and so forth

Connectivity Criteria- 0 - Doesn't connect-typically recreational, or streets in/around housing subdivisions

1 - Connections of less importance (i.e. duplicate another route or are indirect, or only one or two destinations that are of less general importance as destinations

2 - Connects village proper destinations to other village destinations or Pueblo routes, but not to housing

3 - Connects housing to village proper or other key destinations, or a primary connection to a Pueblo route

## Linking Routes Evaluation

SegID	Project	Overlaps with other route	Length (ft)	Length (miles)	Village Route Score	Description	Rec Value Score	D&[Page]	Connects key destinations to each other key destinations	Connects destinations/housing to Pueblo routes	Connections	Connectivity Score	Weighted Score	Priority Rank	Notes
Weight					1		1					2			
Encinal															
En-A	2B		1,740	0.3		Mount Taylor Vista		x		x	1. Encinal subdivision to Encinal village 2. Encinal subdivision to Pueblo routes (south & east) 3. Encinal subdivision to water tank trail	3	6	High	
En-A.i	2C		1,920	0.4		Old Route from village proper	1	x		x	1. Encinal subdivision to Encinal village 2. Encinal subdivision to Pueblo routes (south & east)	1	3	Low	Good secondary walking connection
Paguete															
Pg-A	2H		2,090	0.4		Paguete Subdivision Loop	1					0	1	Low	
Pg-B	2I		664	0.1		Stone Ridge			x		1. Paguate destinations to each other (village, rec hall)	2	4	Med	
Seama															
Se-A	2N		1,974	0.4		Sacred Shield			x		1. Seama destinations to each other (rec hall) 2. More direct north/south connection through Seama	3	6	High	Community identified as high-priority connector
Se-B	2O		7,728	1.5		Cottonwood	1		x		1. Connects Seama destinations (Cottonwood church)	1	3	Low	Good candidate for walking-only trail

x Meets this criterion

- Partially meets this criterion

## Linking Routes Evaluation

SegID	Project	Overlaps with other route	Length (ft)	Length (miles)	Village Route Score	Description	Rec Value Score	D&[Page]	Connects key destinations to each other key destinations	Connects destinations/housing to Pueblo routes	Connections	Connectivity Score	Weighted Score	Priority Rank	Notes
Weight					1		1					2			
Paraje															
Pr-A	2U		2,653	0.5		Paraje village - Pueblo rts			x	x	1. Paraje village to Pueblo rt (south) 2. Paraje destinations to each other (church, rec hall)	3	6	High	Community identified as high-priority connector
Pr-B	2S	Pr-4	4,317	0.8		Live Oak and Trail	1					0	1	Low	
Laguna															
Lg-A	2Z		3,252	0.6		Rodeo-1			x	x	1. Pueblo rt to school and other key destinations	4	8	High	
Lg-A.i	2AA		3,184	0.6		Rodeo-2			x	x	1. Pueblo rt to school and other key destinations	2	4	Med	Child safety concerns
Lg-B	2AD		6,352	1.2		New Laguna- Laguna Subdiv.				-	1. Laguna subdv. - New Laguna 2. Part of direct Laguna - New Laguna connection	2	4	Med	
Lg-C	1L	Lg-4	7,972	1.5		Laguna Subdiv.- Laguna village		x		-	1. Laguna subdv-Laguna village 2. Part of direct Laguna - New Laguna connection 3. Part of southern Laguna-Exit 108 route	3	6	Priority	Linking segment for prior. Project
Lg-D	1L		1,687	0.3		Laguna Vill - Pueblo rt (west)				x	1. Laguna to Pueblo rt (west)	2	4	Priority	Linking segment for prior. Project
Lg-E	2AG		6,002	1.1		New Laguna - Pueblo rt (east)				x	2. New Laguna - Pueblo rt (east)	1	2	Low	
Lg-F	1L		2,831	0.5		Laguna vill. destinations			x		1. Village destinations (tribal bldg, church, plaza, rec hall)	3	6	Priority	Community identified as high-priority connector

x Meets this criterion

- Partially meets this criterion

## Linking Routes Evaluation

SegID	Project	Overlaps with other route	Length (ft)	Length (miles)	Village Route Score	Description	Rec Value Score	D&[Page]	Connects key destinations to each other key destinations	Connects destinations/housing to Pueblo routes	Connections	Connectivity Score	Weighted Score	Priority Rank	Notes
Weight					1		1					2			
Mesita															
Ms-A	10		2,891	0.5		Mesita - Mesita Subd.		x		-	1. Mesita Subdiv - Mesita village 2. Mesita subdiv - Pueblo rt	3	6	Priority	Linking segment for prior. Project
Ms-B	2AN		3,319	0.6		Sweetwater	1	-		-	1. Mesita hous. to Mesita vill. 2. Mesita hous. to Pueblo rt	2	5	Med	
Ms-D	2AL		5,595	1.1		Rito		-		-	1. Rito to Mesita village 2. Rito to Pueblo route	2	4	Med	
Ms-E	2AM		3,512	0.7		Sparrowhawk - Mesa	1				-	0	1	Low	
Ms-F	2AK		7,548	1.4		Old Ditch Trail	1			x		1	3	Low	Good candidate for walking trail
Other															
LgPr-A	2V	Pr-4	17,125	3.2	1	Laguna-Paraje Rd	1	x	x	x	1. Laguna - commercial area 2. Laguna subdivision to commercial area 3. Laguna to Pueblo route (sw) 4. Laguna subdivision - Pueblo route (sw)	4	10	High	Alternate to Pueblo route that is more attractive, further from the highway
Total			94,355	18											

## Recreation Score Criteria

0 - Not notable for recreational value

1 - Likely to be a useful recreational route based on proximity to housing, safety, or natural beauty

## Village Route Score Criteria

0 - Does not overlap with a village route

1 - Overlaps with a village route

## Connection Score Criteria

0 - Doesn't connect-typically recreational, or streets in/around housing subdivisions

1 - Connections of less importance (i.e. duplicate another route or are indirect, or only one or two destinations that are of less general importance as destination)

2 - Connects village proper destinations to other village destinations or Pueblo routes, but not to housing

3 - Connects housing to village proper or other key destinations, or a primary connection to a Pueblo route

4 - A few routes have been chosen as highest priority based on the importance of destinations that they connect



## **Appendix E**

### **Improvement and Cost Details for All Routes**

## Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
Pr-	From the Rainfall Road and Bronx Road intersection to NM 124; and along NM Edge 124 to Casa Blanca Road	\$ 578,385.09	\$ 341,145.28	\$ 33,000.00	\$ 952,530.37	\$ 95,253.04	\$ 8,882.67
	6' wide graded and compacted path w 2' shoulders, each side, from south side of Exit 104 overpass to cattle guard (660 linear feet, 6,600 square feet). Buffer between path and existing curb and gutter should be 5' wide	\$ 8,646.00					
	10% contingency costs	\$ 864.60					
	<b>Subtotal</b>	<b>\$ 9,510.60</b>					<b>\$ 285.32</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 3,804.24				
	10' Asphalt multi-use path on NM 124 (14,670 linear feet, 146,700 square feet	\$ 396,090.00					
	17 culverts	\$ 21,600.00					
	25% contingency costs	\$ 104,422.50					
	<b>Subtotal</b>	<b>\$ 522,112.50</b>					<b>\$ 7,831.69</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		\$ 313,267.50				
	Fourteen (14) Shared Lane Markings on Exit 104 overpass	\$ 3,532.90					
	10% contingency costs	\$ 353.29					
	<b>Subtotal</b>	<b>\$ 3,886.19</b>					<b>\$ 116.59</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 20% of construction costs		\$ 2,331.71				
	12 wayfinding signs on NM 124, sandcarved rock (every 1/4 mile)	\$ 5,120.00					
	Four (4) metal pedestrian mile marker signs, Bronx Road to NM 124 (every 1/4 mile, both directions)	\$ 450.00					
	Four (4) custom wayfinding signs (one at NM 124 and Casa Blanca; One at NM 124 and Exit 104)	\$ 1,000.00					
	Four (4) Bike Route signs between NM 124 and the Interstate/Rainfall Road intersection, two in each direction	\$ 450.00					
	Two (2) Pedestrian Crossing Assembly Signs at the Interstate and Rainfall Road intersection	\$ 223.00					
	10% contingency costs	\$ 724.30					
	<b>Subtotal</b>	<b>\$ 7,967.30</b>					<b>\$ 119.51</b>
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of construction costs		\$ 796.73				
	<b>Crossing at Interstate and Rainfall Road:</b>						

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost

Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
One (1) High Visibility Marked Crosswalks at the Interstate and Rainfall Road intersection							
		\$ 360.00					
	10% contingency costs	\$ 36.00					
	<b>Subtotal</b>	<b>\$ 396.00</b>					
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 20% of construction costs		\$ 237.60				<b>\$ 11.88</b>
<b>Crossing at NM124 and Casa Blanca Road:</b>							
Two (2) Rectangular Rapid Flashing Beacon Systems (on NM 124 at Casa Blanca Rd)							
		\$ 25,000.00					
10' wide landing with curb ramp for crosswalk over NM 124 at Casa Blanca Road, both sides, connecting to the multi-use paths on NM 124 and Casa Blanca Road.							
		\$ 2,250.00					
One (1) High Visibility Marked Crosswalks at Casa Blanca Road							
		\$ 360.00					
	25% contingency costs	\$ 6,902.50					
	<b>Subtotal</b>	<b>\$ 34,512.50</b>					<b>\$ 517.69</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		\$ 20,707.50				
<b>Amenities: 1 small shade shelter with two benches, a trash receptacle, and water (if available)</b>							
				<b>\$ 33,000.00</b>			
<b>Se-Pr Seama to Exit 108 via Rainfall Road (Deer Dancer Road to Casa Blanca Road)</b>							
		\$ 1,230,217.66	\$ 736,990.60	\$ 33,000.00	\$ 2,000,208.26	\$ 200,020.83	\$ 18,453.26
10' Asphalt multi-use path (16,300 linear feet, 163,000 sq. feet)							
		\$ 440,100.00					
14 culvert pipes							
		\$ 17,880.00					
25% contingency costs							
		\$ 114,495.00					
	<b>Subtotal</b>	<b>\$ 572,475.00</b>					<b>\$ 8,587.13</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		\$ 343,485.00				
26 wayfinding signs, metal (every 1/4 mile, both directions)							
		\$ 2,280.00					
10% contingency costs							
		\$ 228.00					
	<b>Subtotal</b>	<b>\$ 2,280.00</b>					<b>\$ 34.20</b>
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$ 228.00				
<b>Crossing under 1-40 on Rainfall Road</b>							
Construction of a 14' x 9' high box under I-40 for a multi-use path							
		\$ 524,370.13					
	25% contingency costs	\$ 131,092.53					

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost

**Pueblo Route Improvement and Cost Details**

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
Pr-108		<b>Subtotal \$ 655,462.66</b>					<b>\$ 9,831.94</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		<b>\$ 393,277.60</b>				
	<b>Amenities: 1 small shade shelter with two benches, a trash receptacle, and water (if available)</b>			<b>\$ 33,000.00</b>			
Pr-108	Casa Blanca Road from NM 124 to the Post Office	<b>\$ 4,589,532.34</b>	<b>\$ 2,743,543.64</b>	<b>\$ 66,000.00</b>	<b>\$ 7,399,075.98</b>	<b>\$ 739,907.60</b>	<b>\$ 68,842.99</b>
	10' Asphalt multi-use path, NM 124 to Exit 108	\$ 461,000.00					
	7 culvert pipes	\$ 8,900.00					
	20% contingency costs	\$ 93,980.00					
	<b>Subtotal \$ 563,880.00</b>						<b>\$ 8,458.20</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 60% of Construction Costs		<b>\$ 338,328.00</b>				
	10' wide sidewalk from I-40 interchange to existing multi-use path, east side of the road (708 linear feet, 7080 sq. feet)	\$ 37,524.00					
	20% contingency costs	\$ 7,504.80					
	<b>Subtotal \$ 45,028.80</b>						<b>\$ 675.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		<b>\$ 18,011.52</b>				
	12 pedestrian mile marker signs, metal, from NM 124 to Post Office (every 1/4 mile, both directions)	\$ 1,340.00					
	Four (4) custom wayfinding sign	\$ 1,000.00					
	10% contingency costs	\$ 234.00					
	<b>Subtotal \$ 2,340.00</b>						<b>\$ 35.10</b>
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		<b>\$ 234.00</b>				
	Crossing of 1-40 on Casa Blanca Road						
	Exit 108 - I-40 Interchange widening (replacement)	\$ 3,315,236.28					
	20% contingency costs	\$ 663,047.26					
	<b>Subtotal \$ 3,978,283.54</b>						<b>\$ 59,674.25</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 60% of Construction Costs		<b>\$ 2,386,970.12</b>				
	<b>Amenities: 2 small shade shelters with two benches, a trash receptacle, and water (if available) at each</b>			<b>\$ 66,000.00</b>			

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost



Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
Lg-Pr	NM 124 from Casa Blanca Road to Old Route 66, Old Route 66 from NM 124 to Rodeo Drive	\$ 2,274,037.25	\$ 1,108,947.70	#####	\$ 3,532,784.95	\$ 353,278.50	\$ 34,566.12
	Cosmetic rehabilitation to old bridge between the K Center Road and Encinal Road	\$ 25,000.00					
	10' Asphalt multi-use path on NM 124 (33,400 linear feet, 334,000 sq. feet)	\$ 901,800.00					
	10' asphalt multi-use path, Bay Tree Road, between NM 124 and the Old NM 124/bridge alignment (175 linear feet, 1750 square feet)	\$ 4,725.00					
	10' multi-use path, Encinal Road from NM 124 to Old NM 124/bridge alignment: (310 linear feet, 3100 square feet)	\$ 8,370.00					
	18 culvert pipes and 3 box culverts	\$ 42,100.00					
	25% contingency costs	\$ 245,498.75					
	<b>Subtotal</b>	<b>\$ 1,227,493.75</b>					<b>\$ 18,412.41</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$ 490,997.50				
	<b>Road Diet</b>						
	NM 279 to Rio San Jose Road (Road Diet)	\$ 34,280.00					
	Yellow Hill Rd to Old Route 66 (Road Diet)	\$ 203,000.00					
	30% contingency costs	\$ 237,280.00					
	<b>Subtotal</b>	<b>\$ 474,560.00</b>					<b>\$ 7,118.40</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$ 189,824.00				
	<b>Roundabout at NM 124/Old Route 66/School House Road</b>						
	Roundabout at NM 124/Old Route 66/School House Road	\$ 436,800.00					
	20% contingency costs	\$ 87,360.00					
	<b>Subtotal</b>	<b>\$ 524,160.00</b>					<b>\$ 7,862.40</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 80% of Construction Costs		\$ 419,328.00				
	27 pedestrian mile marker signs on NM 124, sandcarved rock (every 1/4 mile)	\$ 12,400.00					
	Two (2) custom wayfinding sign at Encinal Road and NM 124 intersection (both directions)	\$ 500.00					
	10% contingency costs	\$ 1,290.00					
	<b>Subtotal, including 10% contingency costs</b>	<b>\$ 14,190.00</b>					<b>\$ 212.85</b>
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$ 1,419.00				

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost

Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
Crossing over Encinal Road at NM 124:							
	One (1) High Visibility Marked Crosswalk over Encinal Road at NM 124	\$ 360.00					
	10' x 6' wide landing with curb ramp for crosswalk over Encinal Road, both sides, connecting to the multi-use path on NM 124	\$ 2,250.00					
	25% contingency costs	\$ 652.50					
	Subtotal	\$ 3,262.50					\$ 48.94
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$ 1,305.00				
Crossing over NM 124 at Central Park Sun Dial Road:							
	One (1) Rectangular Rapid Flashing Beacon System at NM 124 and Central Park Rd/Sun Dial Rd	\$ 25,000.00					
	One (1) High Visibility Marked Crosswalk over NM 124 at the Central Park Road and Sun Dial Road intersection	\$ 360.00					
	10' wide landing with curb ramp for crosswalk over NM 124, both sides	\$ 2,250.00					
	10% contingency costs	\$ 2,761.00					
	Subtotal	\$ 30,371.00					\$ 911.13
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 20% of Construction Costs		\$ 6,074.20				
	Amenities: 3 small shade shelters with two benches, a trash receptacle, and water (if available) at each			\$ 99,000.00			
	Amenities: 1 Trailhead with a large shelter, two picnic tables, a trash can, two bike racks, a large wayfinding map, and water (if available)			\$ 50,800.00			
L9-MS	Old Route 66 from Rodeo Drive to Mesita Road	\$ 900,158.50	\$ 524,949.20	\$ 66,000.00	\$ 1,491,107.70	\$ 149,110.77	\$ 13,920.82
	10' Asphalt multi-use path (20,900 linear feet, 200,900 square feet)	\$ 542,430.00					
	Gabions	\$ 92,000.00					
	10 culvert pipes	\$ 17,000.00					
	Excavation	\$ 40,000.00					
	25% contingency costs	\$ 172,857.50					
	Subtotal	\$ 864,287.50					\$ 12,964.31
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 60% of Construction Costs		\$ 518,572.50				
	17 pedestrian mile marker signs on NM 124, sancarved rock (every 1/4 mile)	\$ 7,250.00					
	10% contingency costs	\$ 725.00					

Notes:

- 1. Project costs vary due to complexity of project
- 2. There is no consideration of potential right-of-way cost

Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
		Subtotal \$	7,975.00			\$	119.63
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$	797.50			
	Crossing at Old Route 66 and Mesita Road:						
	One (1) Rectangular Rapid Flashing Beacon System at Mesita Rd	\$	25,000.00				
	One (1) High Visibility Marked Crosswalk at Mesita Road	\$	360.00				
	10% contingency costs	\$	2,536.00				
	Subtotal \$	27,896.00				\$	836.88
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 20% of Construction Costs		\$	5,579.20			
	Amenities: 2 small shade shelters with two benches, a trash receptacle, and water (if available) at each			\$ 66,000.00			
Pr-En	Encinal Road from Old NM 124/Bridge alignment to Mount Taylor Vista Road	\$	1,017,616.05	\$	405,087.43	\$	66,000.00
	10' multi-use path, crusher fines,(27,735 linear feet, 277,350 square feet)	\$	576,900.00				
	37 - 36" culvert pipes	\$	47,175.00				
	2 - 120" culvert pipes	\$	21,700.00				
	Gabions	\$	163,000.00				
	25% contingency costs	\$	202,193.75				
	Subtotal \$	1,010,968.75				\$	30,329.06
	Projects costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$	404,387.50			
	44 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$	5,000.00				
	Two (2) custom wayfinding sign	\$	500.00				
	Two (2) Pedestrian Crossing Assembly Signs	\$	223.00				
	10% contingency costs	\$	572.30				
	Subtotal \$	6,295.30				\$	94.43
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$	629.53			
	Crossing at Encinal Road and Mount Taylor Vista Road:						
	One (1) High Visibility Marked Crosswalk over Encinal Road at Mount Taylor Vista Road	\$	320.00				
	10% contingency costs	\$	32.00				
	Subtotal \$	352.00				\$	10.56

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost

Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
Pg-En	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 20% of Construction Costs		\$ 70.40				
	Amenities: 2 small shade shelters with two benches, a trash receptacle, and water (if available) at each			\$ 66,000.00			
	Encinal-Paguate Road from Hawk Loop Road to Cedar Road	\$ 225,912.50	\$ 44,470.25	-	\$ 270,382.75	\$ 27,038.28	\$ 6,670.54
	Grading (7 miles)	\$ 74,200.00					
	32 culvert pipes	\$ 124,700.00					
	10% contingency costs	\$ 19,890.00					
	Subtotal	\$ 218,790.00					\$ 6,563.70
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 20% of Construction Costs		\$ 43,758.00				
	58 wayfinding signage, metal (every 1/4 mile, both directions)	\$ 6,475.00					
	10% contingency costs	\$ 647.50					
Lg-Pg	Subtotal	\$ 7,122.50					\$ 106.84
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$ 712.25				
	NM 279 from NM124 to Postal Road	\$ 593,595.00	\$ 231,290.10	\$ 66,000.00	\$ 890,885.10	\$ 89,088.51	\$ 8,915.81
	Rehab shoulder (9.5 miles), both sides	\$ 376,200.00					
	40% contingency costs	\$ 150,480.00					
	Subtotal	\$ 526,680.00					\$ 7,900.20
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$ 210,672.00				
	Three (3) custom wayfinding signs	\$ 750.00					
	78 pedestrian mile marker signs (every 1/4 mile, metal signs, both directions)	\$ 8,700.00					
	78 Bike Route signs (every 1/4 mile, both directions)	\$ 8,700.00					
	10% contingency costs	\$ 1,815.00					
	Subtotal	\$ 19,965.00					\$ 299.48
	Project costs for signage (surveying, engineering, inspection, permitting, mobilization, traffic control) @ 10% of Construction Costs		\$ 1,996.50				
	Crossing at NM 279 and Postal Road						
	One (1) Rectangular Rapid Flashing Beacon System at the NM 279 and Postal Road intersection	\$ 25,000.00					

Notes:

1. Project costs vary due to complexity of project
2. There is no consideration of potential right-of-way cost



Pueblo Route Improvement and Cost Details

Crossing improvement costs in blue

Amenities costs in brown

No.	Project	Construction Costs	Project Costs	Amenities Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of constr. costs)
	One (1) Advanced Warning Flasher	\$5,000.00					
	10' x 6' landing with curb ramp for crosswalk over NM 279 at Postal Road. Landing would provide connection to the Postal Road sidewalk and the Postal Trail connection	\$ 2,250.00					
	One (1) High Visibility Marked Crosswalks over Paguate Road at the intersection of Postal Road	\$ 720.00					
	40% contingency costs	\$ 13,188.00					
	Subtotal	\$ 46,158.00					\$ 692.37
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 40% of Construction Costs		\$ 18,463.20				
	Crossing over Paguate Road at NM 124:						
	One (1) High Visibility Marked Crosswalks over Paguate Road at the intersection of NM 124	\$ 720.00					
	10% contingency costs	\$ 72.00					
	Subtotal	\$ 792.00					\$ 23.76
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage) @ 20% of Construction Costs		\$ 158.40				
	Amenities: 2 small shade shelters with two benches, a trash receptacle, and water (if available) at each			\$ 66,000.00			

Notes:

- 1. Project costs vary due to complexity of project
- 2. There is no consideration of potential right-of-way cost

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
<b>Seama</b>						
<b>SE-1</b>	<b>Rainfall Road from Pottery Road to Sacred Shield Road</b>	<b>\$ 108,143.18</b>	<b>\$ 42,739.17</b>	<b>\$ 150,882.35</b>	<b>\$ 15,088.24</b>	<b>\$ 1,622.15</b>
	Construct 5' paved shoulder (5,053 linear feet, 25,265 square feet)	\$ 88,680.15				
	20% contingency costs	\$ 17,736.03				
	<b>Subtotal</b>	<b>\$ 106,416.18</b>				
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 42,566.47			<b>\$ 1,596.24</b>
	Six (6) mile marker signs, metal (every 1/4 mile, both directions)	\$ 670.00				
	Eight (8) Bike route signs, both directions	\$ 900.00				
	10% contingency costs	\$ 157.00				
	<b>Subtotal</b>	<b>\$ 1,727.00</b>				
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 172.70			<b>\$ 25.91</b>
<b>SE-2</b>	<b>Rainfall Road from Sacred Shield Road to Deer Dancer Road; Deer Dancer Road from Rainfall Road to Salt Cedar Loop (5,824 linear feet)</b>	<b>\$ 200,528.00</b>	<b>\$ 79,617.20</b>	<b>\$ 280,145.20</b>	<b>\$ 28,014.52</b>	<b>\$ 3,007.92</b>
	Construct a 5' paved shoulder (1079 linear feet, 5,395 square feet) Rainfall Road from Sacred Shield to Deer Dancer Road	\$ 19,000.00				
	2 culvert pipes	\$ 2,540.00				
	20% contingency costs	\$ 4,308.00				
	<b>Subtotal</b>	<b>\$ 25,848.00</b>				
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 10,339.20			<b>\$ 387.72</b>
	10' wide asphalt multi-use path along Deer Dancer Road from Rainfall Road to Salt Cedar Loop (4,745 linear feet, 47,450 square feet)	\$ 128,000.00				
	8 culvert pipes	\$ 10,160.00				
	25% contingency costs	\$ 34,540.00				
	<b>Subtotal</b>	<b>\$ 172,700.00</b>				
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 69,080.00			<b>\$ 2,590.50</b>
	Eight (8) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 900.00				
	Eight (8) Bike route signs, both directions	\$ 900.00				
	10% contingency costs	\$ 180.00				
	<b>Subtotal</b>	<b>\$ 1,980.00</b>				<b>\$ 29.70</b>

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
<b>SE-3</b>	<b>Reservoir Road</b>	\$ 1,474.00	\$ 147.40	\$ 1,621.40	\$ 162.14	\$ 22.11
	12 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,340.00				
	10% contingency costs	\$ 134.00				
	<b>Subtotal</b>	<b>\$ 1,474.00</b>				<b>\$ 22.11</b>
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
<b>SE-4</b>	<b>Seama Road</b>	\$ 1,474.00	\$ 147.40	\$ 1,621.40	\$ 162.14	\$ 22.11
	12 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,340.00				
	10% contingency costs	\$ 134.00				
	<b>Subtotal</b>	<b>\$ 1,474.00</b>				<b>\$ 22.11</b>
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
<b>SE-5</b>	<b>Harrisburg Loop</b>	\$ 737.00	\$ 73.70	\$ 810.70	\$ 81.07	\$ 11.06
	Six (6) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 670.00				
	10% contingency costs	\$ 67.00				
	<b>Subtotal</b>	<b>\$ 737.00</b>				<b>\$ 11.06</b>
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
<b>SE-A</b>	<b>Sacred Shield Road</b>	\$ 495.00	\$ 49.50	\$ 544.50	\$ 54.45	\$ 7.43
	Four (4) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 450.00				
	10% contingency costs	\$ 45.00				
	<b>Subtotal</b>	<b>\$ 495.00</b>				<b>\$ 7.43</b>
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
<b>SE-B</b>	<b>Cottonwood Trail</b>	\$ 1,474.00	\$ 147.40	\$ 1,621.40	\$ 162.14	\$ 22.11
	12 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,340.00				
	10% contingency costs	\$ 134.00				
	<b>Subtotal</b>	<b>\$ 1,474.00</b>				<b>\$ 22.11</b>
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
			\$ 147.40			

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
<b>Paraje</b>						
<b>PR-1</b>	<b>K'awaika Center Loop</b>					
	Bay Tree Road: 6' sidewalk on the west side of the road (1083 linear feet, 6500 square feet)	\$ 77,690.00	\$ 30,409.40	\$ 108,099.40	\$ 10,809.94	\$ 1,260.32
		\$ 34,400.00				
	Bay Tree Road: 6' sidewalk on the east side of the road between the old NM 124 alignment/bridge and the K'Center (730 linear feet, 4380 square feet)	\$ 23,214.00				
	20% contingency costs	\$ 11,522.80				
	<b>Subtotal</b>	<b>\$ 69,136.80</b>				<b>\$ 1,037.05</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 27,654.72			
	6' wide graded and compacted path around baseball field and along river (3,823 linear feet, 22,938 square feet)	\$ 5,276.00				
	20% contingency costs	\$ 1,055.20				
	<b>Subtotal</b>	<b>\$ 6,331.20</b>				<b>\$ 189.94</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 2,532.48			
	Eight (8) Bike Route signs	\$ 900.00				
	Ten (10) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,120.00				
	10% contingency costs	\$ 202.00				
	<b>Subtotal</b>	<b>\$ 2,222.00</b>				<b>\$ 33.33</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 222.20			
<b>PR-2</b>	<b>Blue Star Loop, Blue Corn, Blue Sky</b>					
	4' wide sidewalks (5,146 linear feet, 20,584 square feet)	\$ 136,718.24	\$ 54,317.70	\$ 191,035.94	\$ 19,103.59	\$ 2,050.77
	3 culvert pipes	\$ 109,095.20				
	20% contingency costs	\$ 3,810.00				
		\$ 22,581.04				
	<b>Subtotal</b>	<b>\$ 135,486.24</b>				<b>\$ 2,032.29</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 54,194.50			
	Ten (10) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,120.00				
	10% contingency costs	\$ 112.00				
	<b>Subtotal</b>	<b>\$ 1,232.00</b>				<b>\$ 18.48</b>

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes



Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
PR-3	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs	\$	123.20			
	<b>Irrigation Ditch Road</b>	\$	1,232.00	\$	1,355.20	\$
	10 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$	1,120.00			18.48
	10% contingency costs	\$	112.00			
	<b>Subtotal</b>	\$	1,232.00		\$	18.48
PR-4	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs	\$	123.20			
	<b>Rainfall Road from Raincloud to Casa Blanca Road*; Rainfall Road from Casa Blanca Road to Rainstorm Road**</b> ; Rainstorm Road between Raincloud and Rainfall Road; Raincloud Road	\$	2,563.00	\$	2,819.30	\$
	20 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$	2,330.00			38.45
	10% contingency costs	\$	233.00			
	<b>Subtotal</b>	\$	2,563.00		\$	38.45
*The segment noted in red is duplicated in the #2 Village Priority route						
**The segment noted in red is duplicated in the LG PR-A route						
PR-A	<b>Acorn Road from NM 124 to Paraje Road; Paraje Road from Acorn Road to</b>	\$	59,198.00	\$	82,656.10	\$
	Construct 5' paved shoulder on Paraje Road from Apple Road to Church (1020 linear feet, 5100 square feet)	\$	17,900.00			887.97
	Construct 5' sidewalk on Acorn from NM 124 to Paraje Road; Paraje Road from Acorn to about 260 feet north (1115 linear feet, 5,575 square feet)	\$	29,547.50			
	1 culvert pipe	\$	1,270.00			
	20% Misc. Costs	\$	9,743.50			
	<b>Subtotal</b>	\$	58,461.00		\$	876.92
PR-B	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs	\$	23,384.40			
	Six (6) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$	670.00			
	10% Misc. Costs	\$	67.00			
	<b>Subtotal</b>	\$	737.00		\$	11.06
Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs						
		\$	73.70			
<b>PR-B North Irrigation Ditch Trail and NM 124 connector (4317 linear feet)</b>		\$	44,556.25	\$	55,490.25	\$
		\$	10,934.00	\$	5,549.03	\$
						1,173.84

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	10' asphalt multi-use path connector on south side of NM 124 between Mountain Ash Road and Bay Tree Road (307 linear feet, 3070 square feet)	\$ 8,289.00				
	25% contingency costs	\$ 2,072.25				
	<b>Subtotal</b>	<b>\$ 10,361.25</b>	<b>\$ 4,144.50</b>			<b>\$ 155.42</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs					
	12 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,340.00				
	Four (4) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 450.00				
	10% contingency costs	\$ 45.00				
	<b>Subtotal</b>	<b>\$ 495.00</b>				<b>\$ 7.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 49.50			
<b>Crossing at NM 124 and Basswood Road:</b>						
	10' wide landing with curb ramp for crosswalk over NM 124. Landing would provide continuity	\$ 1,600.00				
	One (1) Rectangular Rapid Flashing Beacon System at NM 124 and Basswood Road	\$ 25,000.00				
	One (1) High Visibility Marked Crosswalk at NM 124 and Basswood Road	\$ 360.00				
	25% contingency costs	\$ 6,740.00				
	<b>Subtotal</b>	<b>\$ 33,700.00</b>				<b>\$ 1,011.00</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 20% of construction costs		\$ 6,740.00			

Laguna

LG-1	Dam Road; Laguna-Paraje Road and Roadrunner Loop from Laguna-Paraje Road to Dam Road	\$	1,958.00	\$ 195.80	\$ 2,153.80	\$ 215.38	\$ 29.37
	16 pedestrian mile marker signs, metal (every 1/4 mile, both directions)		\$1,780.00				
	10% contingency costs		\$ 178.00				
	<b>Subtotal</b>	<b>\$ 1,958.00</b>					<b>\$ 29.37</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs			\$ 195.80			
LG-2	Santa Fe Road; Central Park Road; Mesa Road; Sun Dial Road from NM 124 to Mesa Road; Water Tank Trail (13,725 linear feet)	\$	18,733.00	\$ 7,762.70	\$ 26,495.70	\$ 2,649.57	\$ 602.42

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	Grade and compact a 5' pathway on Central Park Road (2,600 linear feet, 13,000 square feet). Pathway should be offset 5' from the curb .	17,030.00				
	10% contingency costs	1,703.00				
	<b>Subtotal</b>	<b>18,733.00</b>	<b>\$ 7,493.20</b>			<b>\$ 561.99</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs					
	22 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	2,450.00				
	10% contingency costs	245.00				
	<b>Subtotal</b>	<b>2,695.00</b>				<b>\$ 40.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 269.50			
<b>LG-3</b>	<b>Frog Mesa Road and Frog Springs Loop (11,795 linear feet)</b>	<b>\$ 2,200.00</b>	<b>\$ 220.00</b>	<b>\$ 2,420.00</b>	<b>\$ 242.00</b>	<b>\$ 33.00</b>
	18 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	2,000.00				
	10% contingency costs	200.00				
	<b>Subtotal</b>	<b>2,200.00</b>				<b>\$ 33.00</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 220.00			
<b>LG-4</b>	<b>Veterans Memorial from Rio San Jose Road to Old Route 66; Old Route 66 from Veterans Memorial to Rio San Jose Road; Rio San Jose Road from NM 124 to Veterans Memorial; Ball Park Loop (11,110 linear feet)</b>	<b>\$ 36,443.00</b>	<b>\$ 20,567.80</b>	<b>\$ 57,010.80</b>	<b>\$ 5,701.08</b>	<b>\$ 1,060.29</b>
	6' wide graded and compacted path on Veterans Memorial from Rio San Jose Road to Old Route 66; and on Old Route 66 from Veterans Memorial to Rio San Jose Road (3,745 linear feet, 22,470 square feet)	29,500.00				
	1 culvert pipe	1,270.00				
	10% contingency costs	3,077.00				
	<b>Subtotal</b>	<b>33,847.00</b>				<b>\$ 1,015.41</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		\$ 20,308.20			
	18 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	2,000.00				
	10% contingency costs	200.00				
	<b>Subtotal</b>	<b>2,200.00</b>				<b>\$ 33.00</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 220.00			

### Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

### Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
<b>Crossing at Veterans memorial and Rio San Jose:</b>						
	One (1) High Visibility Marked Crosswalk over Veterans Memorial Road at the Rio San Jose intersection	\$ 360.00				
	10% contingency costs	\$ 36.00				
	<b>Subtotal</b>	<b>\$ 396.00</b>				<b>\$ 11.88</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 39.60			
<b>LG-A</b>	<b>Rodeo Road</b>	\$ -				
<b>A sidewalk is to be constructed here by the Pueblo, not part of this project.</b>						
<b>LG-Ai</b>	<b>Route from the existing Elementary School building and the future Elementary School building site</b>	<b>\$56,912.50</b>	<b>\$ 22,765.00</b>	<b>\$ 79,677.50</b>	<b>\$ 7,967.75</b>	<b>\$ 1,707.38</b>
	10' wide crusher fine path (3,184 linear feet, 31,840 square feet)	\$45,530.00				
	25% contingency costs	\$ 11,382.50				
	<b>Subtotal</b>	<b>\$56,912.50</b>				<b>\$ 1,707.38</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, and drainage), 40% of construction costs		\$ 22,765.00			
<b>LG-B</b>	<b>New Laguna-Laguna Connection. Southern Road over the Rio San Jose, along dirt road above Green Acres, connecting to Pluto Road, Milky Way Road, then Green Acres Road to Veterans Memorial Road (6,351 linear feet)</b>	<b>\$ 216,800.00</b>	<b>\$ 85,550.00</b>	<b>\$ 302,350.00</b>	<b>\$ 30,235.00</b>	<b>\$ 6,424.50</b>
	6' wide graded and compacted path between the Rio San Jose and the Pluto cul-de-sac (2,133 linear feet)	\$ 175,000.00				
	20% contingency costs	\$ 35,600.00				
	<b>Subtotal</b>	<b>\$ 213,600.00</b>				<b>\$ 6,408.00</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 85,440.00			
	Four (4) custom wayfinding signs at the Rio San Jose, both directions	\$ 1,000.00				
	Nine (9) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,000.00				
	10% contingency costs	\$ 100.00				
	<b>Subtotal</b>	<b>\$ 1,100.00</b>				<b>\$ 16.50</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 110.00			

#### Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes



Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
LG-C	Veterans Memorial from Roadrunner Loop to Stovepipe Road; River Trail from Stovepipe Road to Veterans Memorial Road; Veterans Memorial Road from River Trail to Rio San Jose	\$ 194,177.80	\$ 106,207.52	\$ 300,385.32	\$ 30,038.53	\$ 3,570.59
	10' wide graded and compacted multi-use earth path on Veterans Memorial from Roadrunner Loop to Stovepipe Road (2765 linear feet, 27,650 square feet)	36,221.50				
	20% contingency costs	7,244.30				
	Subtotal	\$ 43,465.80				\$ 1,303.97
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 17,386.32			
	Cosmetic rehabilitation of old bridge on River Trail	25,000.00				
	10' wide asphalt multi-use path on River Trail from Stovepipe Road to Veterans Memorial Road; and along Veterans Memorial Road between the River Trail and Rio San Jose Road (3635 linear feet, 36,350 square feet)	98,000.00				
	25% contingency costs	24,500.00				
	Subtotal	\$ 147,500.00				\$ 2,212.50
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 60% of construction costs		\$ 88,500.00			
	Four (4) custom wayfinding signs at both River Trail and Veterans Memorial Road intersections, both directions	1,000.00				
	Fourteen (14) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	1,560.00				
	10% contingency costs	256.00				
	Subtotal	\$ 2,816.00				\$ 42.24
			\$ 281.60			
		\$ 360.00				
		\$ 36.00				
		\$ 396.00	\$ 39.60			\$ 11.88
		\$ 16,407.00	\$ 6,414.30	\$ 22,821.30	\$ 2,282.13	\$ 484.79
		\$13,260.00				
		\$ 2,652.00				
		\$ 15,912.00				\$ 477.36

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
		\$	6,364.80			
		\$	450.00			
	10% contingency costs	\$	45.00			
	<b>Subtotal</b>	<b>\$</b>	<b>495.00</b>			<b>\$ 7.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 49.50			
LG-E	<b>Santa Fe Road from Central Park Road to NM 124 (5,534 linear feet)</b>	<b>\$</b>	<b>1,232.00</b>	<b>\$ 123.20</b>	<b>\$ 135.52</b>	<b>\$ 18.48</b>
	Ten (10) pedestrian mile marker sign, metal (every 1/4 mile, both directions)	\$	1,120.00			
	10% contingency costs	\$	112.00			
	<b>Subtotal</b>	<b>\$</b>	<b>1,232.00</b>			<b>\$ 18.48</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 123.20			
LG-F	<b>Capital Road from St. Josephs Boulevard to Rio San Jose Road, St. Josephs Boulevard from Old Route 66 to Capital Road</b>	<b>\$</b>	<b>1,976,925.00</b>	<b>\$ -</b>	<b>\$ 197,692.50</b>	<b>\$ 29,653.88</b>
	Paved shoulder on St. Josephs Blvd & first 500' of Capital Rd east of St. Josephs^	\$	446,950.00			
	Sidewalks on Capital Rd from 500' east of St Joseph's Blvd to Rio San Jose Rd^	\$	1,529,975.00			
	^Preliminary construction cost estimate comes from Bohannan Huston engineering firm and includes roadway improvements to overcome drainage issues					
	<b>Subtotal</b>	<b>\$</b>	<b>1,976,925.00</b>			<b>\$ 29,653.88</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		-			

Mesita

MS-1	<b>Mesita Road from Old Route 66 to Prosperity Road; Prosperity Road from Roadrunner Road to Morningside Road; Mesa Bottom Road; Lava Bed Road (9,570 linear feet)</b>	<b>\$</b>	<b>73,074.00</b>	<b>\$ 28,560.00</b>	<b>\$ 101,634.00</b>	<b>\$ 2,167.11</b>
	6' wide graded and compacted shoulder on Mesita Road between Old Route 66 and Prosperity Road (7565 linear feet, 45,390 square feet)	\$	59,500.00			
	20% contingency costs	\$	11,900.00			
	<b>Subtotal</b>	<b>\$</b>	<b>71,400.00</b>			<b>\$ 2,142.00</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 28,560.00			

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

[Crossing improvement costs in blue](#)

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	18 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 2,000.00				
	12 Bike Route signs on Mesita Road (both directions)	\$ 1,340.00				
	10% contingency costs	\$ 334.00				
	<b>Subtotal</b>	<b>\$ 1,674.00</b>				<b>\$ 25.11</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 167.40			
<b>MS-2</b>	<b>Mesita Day School Road; Sparrow Hawk from Mesita Day School Road to Morningside Road (7,444 linear feet)</b>					
	14 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,560.00	\$ 171.60	\$ 1,887.60	\$ 188.76	\$ 25.74
	10% contingency costs	\$ 156.00				
	<b>Subtotal</b>	<b>\$ 1,716.00</b>				<b>\$ 25.74</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 171.60			
<b>MS-3</b>	<b>Mesita Road from Sunset Road to Mesa Road (E); Mesa Road from Mesita Road (W) to Mesita Road (E) (18,241 linear feet)</b>					
	30 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 3,350.00	\$ 368.50	\$ 4,053.50	\$ 405.35	\$ 55.28
	10% contingency costs	\$ 335.00				
	<b>Subtotal</b>	<b>\$ 3,685.00</b>				<b>\$ 55.28</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 368.50			
<b>MS-4</b>	<b>Industrial Parkway Subdivision Loop (5,413 linear feet)</b>					
	Ten (10) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,120.00	\$ 123.20	\$ 1,355.20	\$ 135.52	\$ 18.48
	10% contingency costs	\$ 112.00				
	<b>Subtotal</b>	<b>\$ 1,232.00</b>				<b>\$ 18.48</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 123.20			
<b>MS-A</b>	<b>Mesita Road from Old Route 66 to Industrial Parkway; Industrial Parkway from Mesita Road to Industrial Parkway loop around the subdivision (2,891 linear feet)</b>					
	Exit 117 Overpass Improvement (add 3" concrete to existing sidewalk)	\$ 7,900.00	\$ 2,408.60	\$ 17,014.60	\$ 1,701.46	\$ 273.38
	20% contingency costs	\$ 1,580.00				
	<b>Subtotal</b>	<b>\$ 9,480.00</b>				<b>\$ 142.20</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 20% of construction costs		\$ 1,896.00			

### Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	26 Shared Lane Markings on Mesita Road	\$ 3,290.00				
	10% contingency costs	\$ 329.00				
	<b>Subtotal</b>	<b>\$ 3,619.00</b>				
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 361.90			<b>\$ 108.57</b>
	Four (4) Bike Route signs, one in each direction	\$ 450.00				
	Six (6) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 670.00				
	One custom wayfinding sign at Mesita Road and Industrial Parkway intersection	\$ 250.00				
	10% contingency costs	\$ 137.00				
	<b>Subtotal</b>	<b>\$ 1,507.00</b>				<b>\$ 22.61</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 150.70			
<b>MS-B</b>	<b>Sunset Road between Mesita Road and Sweetwater Road; Sweetwater Road</b>	<b>\$ 737.00</b>	<b>\$ 73.70</b>	<b>\$ 810.70</b>	<b>\$ 81.07</b>	<b>\$ 11.06</b>
	Six (6) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 670.00				
	10% contingency costs	\$ 67.00				
	<b>Subtotal</b>	<b>\$ 737.00</b>				<b>\$ 11.06</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 73.70			
<b>MS-D</b>	<b>Sparrow Hawk Road between Mesita Day School Road and Rito Road; Rito Road to Stable Road: Stable Road (5,595 linear feet)</b>	<b>\$ 1,861.20</b>	<b>\$ 186.12</b>	<b>\$ 2,047.32</b>	<b>\$ 204.73</b>	<b>\$ 27.92</b>
	Ten (10) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,692.00				
	10% contingency costs	\$ 169.20				
	<b>Subtotal</b>	<b>\$ 1,861.20</b>				<b>\$ 27.92</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 186.12			
<b>MS-E</b>	<b>Sparrowhawk Road from Rito Road to Mesita Road (3,512 linear feet)</b>	<b>\$ 1,280.00</b>	<b>\$ 281.60</b>	<b>\$ 1,561.60</b>	<b>\$ 156.16</b>	<b>\$ 42.24</b>
	Six (6) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,280.00				
	10% contingency costs	\$ 256.00				
	<b>Subtotal</b>	<b>\$ 2,816.00</b>				<b>\$ 42.24</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 281.60			
<b>MS-F</b>	<b>Old Ditch Trail (7,548 linear feet)</b>	<b>\$ 2,864.40</b>	<b>\$ 286.44</b>	<b>\$ 3,150.84</b>	<b>\$ 315.08</b>	<b>\$ 42.97</b>

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes



Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	14 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 2,104.00				
	Custom wayfinding sign at Old Route 66 junction	\$500.00				
	10% contingency costs	\$ 260.40				
	<b>Subtotal</b>	<b>\$ 2,864.40</b>				<b>\$ 42.97</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 286.44			

Encinal

EN-1	Encinal Cubero Road from South Fork Road to Mount Taylor Vista Road; Mount Taylor Vista Road to Hawk Road; Encinal Canyon Road from Encinal Cubero Road to the Water Tank (12,193 linear feet)					
	10' wide crusher fines multi-use path on Encinal Cubero Road between South Fork Road and Mount Taylor Vista Road (1,740 linear feet, 17,400 square feet)	\$ 80,000.00				
	54" 'split rail' fencing along above section between the path and Encinal Cubero Road (1,740 linear feet)	\$ 30,450.00				
	10' wide crusher fines multi-use path on Encinal Canyon Road from Encinal Cubero Road to the Water Tank, will use existing fencing (6,075 linear feet, 60,750 square feet)	280,000.00				
	25% contingency costs	\$ 97,612.50				
	<b>Subtotal</b>	<b>\$ 488,062.50</b>				<b>\$ 14,641.88</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, and drainage), 40% of construction costs		\$ 195,225.00			
	Ten (10) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,120.00				
	10% contingency costs	\$ 112.00				
	<b>Subtotal</b>	<b>\$ 1,232.00</b>				<b>\$ 18.48</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 123.20			
EN-2	Red Mesa Road; South Fork Road; Village Road; Old Canyon Road from Village Road to South Mesa Road; South Mesa Road (13,119 linear feet)					
	30 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 3,350.00				
	10% contingency costs	\$ 335.00				

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
EN-A	<b>Subtotal \$</b>	<b>3,685.00</b>				<b>\$ 55.28</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 368.50			
	<b>Mount Taylor Vista from Encinal Road, southwest to the subdivision (1740 linear feet)</b>	<b>\$ 495.00</b>	<b>\$ 49.50</b>	<b>\$ 544.50</b>	<b>\$ 54.45</b>	<b>\$ 7.43</b>
	Four (4) pedestrian mile marker signs, metal (every 1/4 mile, both directions) 10% contingency costs	\$ 450.00 \$ 45.00				
EN-Ai	<b>Subtotal \$</b>	<b>495.00</b>				<b>\$ 7.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 49.50			
	<b>Route between subdivision and the old village center (1920 linear feet)</b>	<b>\$ 495.00</b>	<b>\$ 49.50</b>	<b>\$ 544.50</b>	<b>\$ 54.45</b>	<b>\$ 7.43</b>
	Four (4) pedestrian mile marker signs, metal (every 1/4 mile, both directions) 10% contingency costs	\$ 450.00 \$ 45.00				
Paguate	<b>Subtotal \$</b>	<b>495.00</b>				<b>\$ 7.43</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 49.50			
	<b>Postal Road; Elizabeth Bender Road between Postal Road and Old Bridge Road; Old Bridge Road; Pork Chop Hill Road between Old Bridge Road and NM 279; NM 279 between Pork Chop Hill Road and Postal Road; Paguate Day School Road between Pork Chop Hill Road and Elizabeth Bender Road (12,483 linear feet)</b>	<b>\$ 83,823.16</b>	<b>\$ 32,720.76</b>	<b>\$ 116,543.92</b>	<b>\$ 11,654.39</b>	<b>\$ 1,257.35</b>
	Postal Road: 6' sidewalk on the north side of the road from NM 279 to Elizabeth Bender Road (2126 linear feet, 12756 square feet) 20% Misc. Costs	\$ 67,606.80 \$ 13,521.36				
PG-1	<b>Subtotal \$</b>	<b>81,128.16</b>				<b>\$ 1,216.92</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 40% of construction costs		\$ 32,451.26			
	22 pedestrian mile marker signs, metal (every 1/4 mile, both directions) 10% Misc. Costs	\$ 2,450.00 \$ 245.00				
	<b>Subtotal \$</b>	<b>2,695.00</b>				<b>\$ 40.43</b>

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 269.50			
<b>PG-2</b>	<b>Elizabeth Bender Road from Old Bridge Road north to Middle Reservoir Road;</b>					
	<b>Middle Reservoir Road between Elizabeth Bender Road and Pork Chop Hill Road;</b>					
	<b>Pork Chop Hill Road from Middle Reservoir Road to Old Bridge Road (17,041 linear feet)</b>	\$ 144,576.00	\$ 56,800.80	\$ 201,376.80	\$ 20,137.68	\$ 4,285.80
	6' wide graded and compacted path on Pork Chop Hill from Old Bridge Road to Middle Reservoir Road; Elizabeth Bender Road from Middle Reservoir Road to Evergreen Road (13,980 linear feet, 83,880 square feet)					
	6 culvert pipes	\$ 110,000.00				
	20% contingency costs	\$ 7,620.00				
	20% contingency costs	\$ 23,524.00				
	<b>Subtotal</b>	<b>\$ 141,144.00</b>				<b>\$ 4,234.32</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 56,457.60			
	28 pedestrian mile marker signs,metal (every 1/4 mile, both directions)	\$ 3,120.00				
	10% contingency costs	\$ 312.00				
	<b>Subtotal</b>	<b>\$ 3,432.00</b>				<b>\$ 51.48</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 343.20			
<b>PG-3</b>	<b>Vietnam Veterans Road from Postal Road to Paguate Day School Road; Elizabeth Bender Road between Vietnam Veterans Road and Postal Road; Paguate Day School Road between Elizabeth Bender Road and Cedar Road (8,573 linear feet)</b>	\$ 1,716.00	\$ 171.60	\$ 1,887.60	\$ 188.76	\$ 25.74
	14 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,560.00				
	10% contingency costs	\$ 156.00				
	<b>Subtotal</b>	<b>\$ 1,716.00</b>				<b>\$ 25.74</b>
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 171.60			
<b>PG-4</b>	<b>Old Bridge Road from Elizabeth Bender Road to Vietnam Memorial Road;</b>	\$ 1,958.00	\$ 195.80	\$ 2,153.80	\$ 215.38	\$ 29.37
	<b>Evergreen Road (10,113 linear feet)</b>					
	16 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 1,780.00				
	10% contingency costs	\$ 178.00				
	<b>Subtotal</b>	<b>\$ 1,958.00</b>				<b>\$ 29.37</b>

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

## Village and Linking Improvement and Cost Details

Crossing improvement costs in blue

No.	Project	Construction Costs	Project Costs	Total Costs	Design Costs (10% of total costs)	Annual O&M (1.5% of construction costs)
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 195.80			
PG-A	Rio Moquino Road; Postal Road Trail between Rio Moquino Road and NM 279	\$ 1,695.00	\$ 529.50	\$ 2,224.50	\$ 222.45	\$ 43.43
	6' wide graded and compacted a path on Postal Road Trail (125 linear feet, 750 square feet) between Rio Moquino Road and NM 279	\$ 1,000.00				
	20% contingency costs	\$ 200.00				
	Subtotal	\$ 1,200.00			\$ 36.00	
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control, and drainage), 40% of construction costs		\$ 480.00			
	Four (4) pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 450.00				
	10% contingency costs	\$ 45.00				
	Subtotal	\$ 495.00			\$ 7.43	
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 49.50			
PG-B	Stone Ridge Road (664 linear feet)	\$ 275.00	\$ 27.50	\$ 302.50	\$ 30.25	\$ 4.13
	One custom wayfinding sign at Elizabeth Bender Road and Stone Ridge Road	\$ 250.00				
	10% contingency costs	\$ 25.00				
	Subtotal	\$ 275.00			\$ 4.13	
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 27.50			
Other						
LG	Rainfall Road from Casa Blanca Road to Laguna-Paraje Road; Laguna Paraje	\$ 3,432.00	\$ 343.20	\$ 3,775.20	\$ 377.52	\$ 51.48
PR-A	Road from Rainfall Road to Dam Road					
	28 pedestrian mile marker signs, metal (every 1/4 mile, both directions)	\$ 3,120.00				
	10% contingency costs	\$ 312.00				
	Subtotal	\$ 3,432.00			\$ 51.48	
	Project costs (surveying, engineering, inspection, permitting, mobilization, traffic control), 10% of construction costs		\$ 343.20			

Notes:

1. There is no consideration of potential right-of-way cost
2. There are no amenities locations proposed for linking and village routes

Appendix F

Detailed Project Prioritization Table



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## Project List with Prioritization

Project ID	Description	Pueblo Routes	Village Routes	Linking Routes	Length (ft)	Length (miles)	Project overlap	Connectivity Score	Trail Cost	Crossings Cost	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total)
<b>PRIORITY PROJECTS</b>														
1A	Paraje to western Pueblo edge + <i>Seama 1</i>	Pr-Edge	Se-1		23,431	4.4		2	\$1,014,559	\$55,854	\$33,000	\$1,103,413	\$10,505	\$110,341
1B	Paraje-Seama on Rainfall	Se-Pr			16,309	3.1	2R	3	\$918,468	\$1,048,740	\$33,000	\$2,000,208	\$18,453	\$200,021
1C	Casa Blanca North of I-40	Pr-108*			7,530	1.4		4	\$904,782 -	-	\$33,000	\$937,782	\$9,169	\$93,778
1D	Casa Blanca I-40 Crossing	Pr-108*			534	0.1		4	\$6,365,254 -	-	-	\$6,365,254	\$59,674	\$636,525
1E	Casa Blanca South of I-40	Pr-108*			6,727	1.3		4	\$63,040 -	-	\$33,000	\$96,040	\$675	\$9,604
1F	K'awaika Loop ( <i>Paraje 1</i> )		Pr-1		4,818	0.9		1	\$108,099 -	-	-	\$108,099	\$1,260	\$10,810
1G	Paraje-Encinal on Encinal Rd	Pr-En			28,043	5.3		2	\$1,422,281	\$422	\$66,000	\$1,488,703	\$30,434	\$148,870
1H	Encinal Loops ( <i>Encinal 1</i> )		En-1		12,193	2.3		3	\$684,643 -	-	-	\$684,643	\$14,660	\$68,464
1I	Laguna-Paraje on NM 124	Lg-Pr*			24,963	4.7		4	\$1,734,100	\$41,013	\$116,800	\$1,891,913	\$19,585	\$189,191
1J	NM124 Road Diet	Lg-Pr*			7,575	1.4		4	\$664,384 -	-	\$33,000	\$697,384	\$7,118	\$69,738
1K	Roundabout	Lg-Pr*			817	0.2		4	\$943,488 -	-	-	\$943,488	\$7,862	\$94,349
1L	Laguna Loops ( <i>Laguna 1</i> )		Lg-1, Lg-4*	Lg-C, Lg-D, Lg-F	26,087	4.9	2Y	2	\$2,357,638	\$871 -	-	\$2,358,509	\$34,788	\$235,851
1M	Laguna-Paguete and Local													
	Paguete Loops ( <i>Paguete 1</i> )	Lg-Pg	Pg-1		63,423	12.0		3	\$875,857	\$65,572	\$66,000	\$1,007,429	\$10,173	\$100,743
1N	Laguna-Mesita on NM 124	Lg-Ms			20,893	4.0		3	\$1,391,633	\$33,475	\$66,000	\$1,491,108	\$13,921	\$149,111
1O	Mesita Loops ( <i>Mesita 1</i> )		Ms-1	Ms-A	12,461	2.4		3	\$118,649 -	-	-	\$118,649	\$2,440	\$11,865
	<b>Total Priority Projects</b>					<b>48.4</b>			<b>\$19,566,875</b>	<b>\$1,245,947</b>	<b>\$479,800</b>	<b>\$21,292,622</b>	<b>\$638,779</b>	<b>\$2,129,262</b>

## Project List with Prioritization

Project ID	Description	Pueblo Routes	Village Routes	Linking Routes	Length (ft)	Length (miles)	Project overlap	Connectivity Score	Trail Cost	Crossings Cost	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total)
<b>REMAINING VILLAGE PROJECTS</b>														
<b>#2 ranked village routes (high priority)</b>														
2A	Encinal Loop		En-2		13,119	2.5		1	\$4,054 -	-	-	\$4,054	\$55	\$405
2E	Pork Chop Hill/Elizabeth Bender		Pg-2		17,041	3.2		1	\$201,377 -	-	-	\$201,377	\$4,286	\$20,138
2J	Deer Dancer		Se-2		5,824	1.1		3	\$280,145 -	-	-	\$280,145	\$3,008	\$28,015
2P	Blue Jay/Blue Star Loop		Pr-2		5,146	1.0		0	\$191,036 -	-	-	\$191,036	\$2,051	\$19,104
2W	Santa Fe/Mesa Loop		Lg-2		13,735	2.6		2	\$29,191 -	-	-	\$29,191	\$602	\$2,919
2AH	Sparrowhawk/Mesita Day School		Ms-2		7,444	1.4		1	\$1,888 -	-	-	\$1,888	\$26	\$189
<b>Total</b>									<b>\$707,690</b>	<b>\$0 -</b>	<b>\$0 -</b>	<b>\$707,690</b>	<b>\$10,028</b>	<b>\$70,769</b>
<b>#3 ranked village routes (medium priority)</b>														
2F	Vietnam Vet./Paguete Day School/Elizabeth Bender		Pg-3		8,573	1.6		1	\$1,888 -	-	-	\$1,888	\$26	\$189
2K	Reservoir Loop		Se-3		7,627	1.4		0	\$1,621 -	-	-	\$1,621	\$22	\$162
2Q	Walnut		Pr-3		6,031	1.1		1	\$1,355 -	-	-	\$1,355	\$18	\$136
2X	Frog Mesa Loop		Lg-3		11,795	2.2		0	\$2,420 -	-	-	\$2,420	\$33	\$242
2AI	Mesa Loop		Ms-3		18,967	3.6		0	\$4,054 -	-	-	\$4,054	\$55	\$405
<b>Total</b>									<b>\$11,338</b>	<b>\$0 -</b>	<b>\$0 -</b>	<b>\$11,338</b>	<b>\$155</b>	<b>\$1,134</b>
<b>#4 ranked village routes (low priority)</b>														
2G	Evergreen, Twin Lakes, Ball Park, Old Bridge Loop		Pg-4		10,113	1.9		0	\$2,154 -	-	-	\$2,154	\$29	\$215
2L	Seama		Se-4		7,371	1.4		0	\$1,621 -	-	-	\$1,621	\$22	\$162
2M	Harrisburg Loop		Se-5		3,723	0.7		0	\$811 -	-	-	\$811	\$11	\$81
2R	Rainstorm/Rainfall		Pr-4		21,456	4.1	1B, 2S, 2V	1	\$2,819 -	-	-	\$2,819	\$38	\$282
2Y	Rio San Jose/Baseball Diamond Loop		Lg-4*		7,134	1.4		2	\$787 -	-	-	\$787	\$11	\$79
2AJ	Industrial Parkway Loop		Ms-4		5,413	1.0		0	\$1,355 -	-	-	\$1,355	\$18	\$136
<b>Total</b>									<b>\$9,547</b>	<b>\$0 -</b>	<b>\$0 -</b>	<b>\$9,547</b>	<b>\$130</b>	<b>\$955</b>
<b>Total Village Projects</b>									<b>\$728,574</b>	<b>\$0</b>	<b>\$0</b>	<b>\$728,574</b>	<b>\$10,313</b>	<b>\$72,857</b>

## Project List with Prioritization

Project ID	Description	Pueblo Routes	Village Routes	Linking Routes	Length (ft)	Length (miles)	Project overlap	Connectivity Score	Trail Cost	Crossings Cost	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total)
<b>REMAINING LINKING PROJECTS</b>														
<b>High priority linking routes</b>														
2B	Mount Taylor Vista			En-A	1,740	0.3		3	\$545 -	-	-	\$545	\$7	\$54
2N	Sacred Shield			Se-A	1,974	0.4		2	\$545 -	-	-	\$545	\$7	\$54
2U	Paraje and Acorn			Pr-A	2,653	0.5		2	\$82,656 -	-	-	\$82,656	\$888	\$8,266
2V	Roadrunner/Rainfall			LgPr-A	17,125	3.2	2R	4	\$3,775 -	-	-	\$3,775	\$51	\$378
2Z	Rodeo			Lg-A	3,252	0.6		4	\$0 -	-	-	-	n/a	n/a
	<b>Total</b>					<b>5.1</b>			<b>\$87,520</b>	<b>\$0 -</b>		<b>\$87,520</b>	<b>\$954</b>	<b>\$8,752</b>
<b>Medium priority linking routes</b>														
2I	Stone Ridge			Pg-B	664	0.1		2	\$303 -	-	-	\$303	\$4	\$30
2AA	Mousetown			Lg-A.i	3,184	0.6		2	\$79,678 -	-	-	\$79,678	\$1,707	\$7,968
2AD	Southern and Green Acres			Lg-B	6,352	1.2		3	\$302,350 -	-	-	\$302,350	\$6,425	\$30,235
2AL	Sparrowhawk to Rito			Ms-D	5,595	1.1		2	\$2,047 -	-	-	\$2,047	\$28	\$205
2AN	Sweetwater			Ms-B	3,319	0.6		2	\$811 -	-	-	\$811	\$11	\$81
	<b>Total</b>					<b>3.6</b>			<b>\$385,188</b>	<b>\$0 -</b>		<b>\$385,188</b>	<b>\$8,175</b>	<b>\$38,519</b>
<b>Low priority linking routes</b>														
2C	Trail from center of village			En-A.i	1,920	0.4		1	\$545 -	-	-	\$545	\$7	\$54
2D	Encinal-Paguete Road	Pg-En			36,843	7.0		1	\$270,383 -	-	-	\$270,383	\$6,671	\$27,038
2H	Paguete Subdivision Loop			Pg-A	2,090	0.4		0	\$2,225 -	-	-	\$2,225	\$43	\$222
2O	Cottonwood Trail			Se-B	7,728	1.5		1	\$1,621 -	-	-	\$1,621	\$22	\$162
2S	Live Oak			Pr-B	4,317	0.8	2R	0	\$15,050	\$40,440 -	-	\$55,490	\$1,174	\$5,549
2AG	Santa Fe (East)			Lg-E	6,002	1.1		1	\$1,355 -	-	-	\$1,355	\$18	\$136
2AK	Old Ditch Trail			Ms-F	7,548	1.4		1	\$3,151 -	-	-	\$3,151	\$43	\$315
2AM	Sparrowhawk, across I-40 to Mesa			Ms-E	3,512	0.7		0	\$1,562 -	-	-	\$1,562	\$42	\$156
	<b>Total</b>					<b>13.3</b>			<b>\$295,891</b>	<b>\$40,440 -</b>	-	<b>\$336,331</b>	<b>\$8,021</b>	<b>\$33,633</b>
	<b>Total Linking Projects</b>					<b>21.9</b>			<b>\$768,599</b>	<b>\$40,440</b>	<b>\$0</b>	<b>\$809,039</b>	<b>\$17,150</b>	<b>\$80,904</b>

## Project List with Prioritization

Project ID	Description	Pueblo Routes	Village Routes	Linking Routes	Length (ft)	Length (miles)	Project overlap	Connectivity Score	Trail Cost	Crossings Cost	Amenities Cost	Total Cost	Annual O&M Costs	Design Costs (10% of Total)
<b>Totals:</b>														
	Priority Projects					48.4			\$19,566,875	\$1,245,947	\$479,800	\$21,292,622	\$638,779	\$2,129,262
	Village Projects					32.3			\$728,574	\$0	\$0	\$728,574	\$10,313	\$72,857
	#2 ranked (high)					11.8			\$707,690	\$0 -		\$707,690	\$10,028	\$70,769
	#3 ranked (med)					10.0			\$11,338	\$0 -		\$11,338	\$155	\$1,134
	#4 ranked (low)					10.5			\$9,547	\$0 -		\$9,547	\$130	\$955
	Linking Projects					21.9			\$768,599	\$40,440	\$0	\$809,039	\$17,150	\$80,904
	High					5.1			\$87,520	\$0 -		\$87,520	\$954	\$8,752
	Medium					3.6			\$385,188	\$0 -		\$385,188	\$8,175	\$38,519
	Low					13.3			\$295,891	\$40,440 -		\$336,331	\$8,021	\$33,633
	All priority					48.4			\$19,566,875	\$1,245,947	\$479,800	\$21,292,622	\$638,779	\$2,129,262
	All high					16.9			\$795,210	\$0	\$0	\$795,210	\$10,982	\$79,521
	All medium					13.7			\$396,526	\$0	\$0	\$396,526	\$8,330	\$39,653
	All low					23.7			\$305,438	\$40,440	\$0	\$345,878	\$8,151	\$34,588
	All Projects					102.7			\$21,064,049	\$1,286,387	\$479,800	\$22,830,236	\$666,242	\$2,283,024

\*Some routes are broken up amongst multiple projects. Pr-108 and Lg-Pg are both broken out into 3 separate priority projects, due to their complexity. One part of Lg-4 has been added to a priority project, for network continuity purposes, while the remaining parts comprise a village project. Please keep this in mind when comparing this table to Appendix E, which shows detailed improvements and costs by route, not by project.

\*\*Project 1B has a grade-separated crossing; all other crossings are at-grade.

## Notes:

For details on improvements, connectivity scores, costs, and derivation of O&M costs, see Appendices D & E.

Note that Pueblo route Pg-En has been included with the linking routes.

There is no consideration of potential right-of-way cost.

Amenities costs do not include costs for signs. Signs costs are included in project construction costs.



## **Appendix G**

### **Mode Share Study Travel Log and Employee Survey**

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## PUEBLO OF LAGUNA TRAVEL SURVEY

*The Pueblo of Laguna is conducting a survey on travel habits of residents. All responses will be kept strictly confidential and anonymous, and will be used for research purposes only.*

*This survey should take approximately five minutes to complete.*

**Trip Log** - Please fill out the trip log below for all the trips you made yesterday, using the following steps:

1. For each time that you left a place and arrived at a place yesterday, record a trip in the log.  
*(As in the example below, if you left home and went to work, this is one trip. Coming home from work would be a separate trip – record home as the reason for the trip. For most people the last trip of the day should have home as the reason for the trip)*
2. Circle the reason you took the trip.
3. Circle the type of transportation you used to make the trip.
4. Continue entering trips until you have recorded all the trips you made yesterday.

### ***Description of the reasons to travel:***

- **Work**, or work related  
(including meetings at other sites)
- **School**, or education
- **Recreation** (going to a movie, exercise, recreational bike ride, etc.)
- **Shopping/Errand**  
(visit post office, buy groceries, clothes, gas, etc.)
- **Social** (visit family or friends , etc.)

**My trip log for for yesterday – please give date** \_\_\_\_/\_\_\_\_/\_\_\_\_

Trip	Why did you take the trip? (circle one)						How did you get there? (circle one)					
<b>SAMPLE</b>	<u>Work</u>	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	<u>Walk</u>	Bicycle	Other: _____
<b>SAMPLE</b>	Work	School	Shopping /Errand	Recreation	Social	<u>Home</u>	Drive alone	Carpool	Bus	<u>Walk</u>	Bicycle	Other: _____
Trip 1	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 2	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 3	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 4	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 5	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 6	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 7	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 8	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 9	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 10	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____

1. Please rank the following statements according to how strongly you agree or disagree:

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Don't Know/ No Opinion
There are good places to walk in my village.	<i>Strongly Agree</i>	<i>Somewhat Agree</i>	<i>Somewhat Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know/ No Opinion</i>
The trails in my village are safe and clean.	<i>Strongly Agree</i>	<i>Somewhat Agree</i>	<i>Somewhat Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know/ No Opinion</i>
I get 20 minutes or more of light to moderate exercise most days of the week.	<i>Strongly Agree</i>	<i>Somewhat Agree</i>	<i>Somewhat Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know/ No Opinion</i>

2. Do you think you are driving to places more often, less often, or about the same number of times each month as you were four months ago? (check one)

☐ More often      ☐ Less often      ☐ About the same number of times

3. If you are driving less often than you were four months ago, to what do you attribute the change? (check all that apply)

☐ Change in job/residence    ☐ Change in social habits    ☐ Better weather    ☐ Improved trails

☐ I am traveling less overall    ☐ Fuel costs    ☐ Trying to improve my health    ☐ Car broke down    ☐ No change  
(walking and bicycling more often)

☐ Other: \_\_\_\_\_

4. How many working cars, trucks, SUVs, or vans, if any, do you have at your residence?

\_\_\_\_ # of vehicles at my residence

5. Do you personally own at least one bicycle?

☐ Yes      ☐ Yes, I have one, but it is currently broken      ☐ No      ☐ No, but I have one available to ride

6. How many people live in your household?

\_\_\_\_ Adults (18 years or older)      \_\_\_\_ Children (17 years or younger)

7. What is your age?

☐ Under 18      ☐ 18-29      ☐ 30 – 44      ☐ 45 – 64      ☐ 65+

8. What is the name of the village where you live?

☐ Encinal      ☐ Laguna      ☐ Mesita      ☐ Paguate      ☐ Paraje

☐ Seama      ☐ Other: \_\_\_\_\_

***The Pueblo of Laguna thanks you for participating in this survey!***

## PUEBLO OF LAGUNA TRAVEL SURVEY

The Pueblo of Laguna is conducting a survey on travel habits of people who work in the area. *All responses will be kept strictly confidential and anonymous*, and will be used for research purposes only. This survey should take approximately five minutes to complete.

### **Trip Log - Please fill out the trip log below for all the trips you made yesterday, using the following steps:**

1. For each time that you left a place and arrived at a place yesterday, record a trip in the log.  
*(As in the example below, if you left home and went to work, this is one trip. Coming home from work would be a separate trip – record home as the reason for the trip. Or if you went home for lunch or out to a restaurant for lunch and then back to work – that would be two trips. For most people the last trip of the day should have home as the reason for the trip)*
2. Circle the reason you took the trip.
3. Circle the type of transportation you used to make the trip.
4. Continue entering trips until you have recorded all the trips you made yesterday.

#### ***Description of the reasons to travel:***

- **Work**, or work related  
(including meetings at other sites)
- **School**, or education
- **Recreation** (going to a movie, exercise, recreational bike ride, etc.)
- **Shopping/Errand**  
(visit post office, buy groceries, clothes, gas, etc.)
- **Social** (visit family or friends , etc.)

**My trip diary for yesterday – please give date** \_\_\_\_/\_\_\_\_/\_\_\_\_

Trip	Why did you take the trip? (circle one)						How did you get there? (circle one)					
<b>SAMPLE</b>	<u>Work</u>	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	<u>Walk</u>	Bicycle	Other: _____
<b>SAMPLE</b>	Work	School	Shopping /Errand	Recreation	Social	<u>Home</u>	Drive alone	Carpool	Bus	<u>Walk</u>	Bicycle	Other: _____
Trip 1	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 2	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 3	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 4	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 5	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 6	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 7	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 8	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 9	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____
Trip 10	Work	School	Shopping /Errand	Recreation	Social	Home	Drive alone	Carpool	Bus	Walk	Bicycle	Other: _____



1. Please rank the following statements according to how strongly you agree or disagree:

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Don't Know/ No Opinion
There are safe routes where I can walk or bike to work.	<i>Strongly Agree</i>	<i>Somewhat Agree</i>	<i>Somewhat Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know/ No Opinion</i>
I get 20 minutes or more of light to moderate exercise most days of the week.	<i>Strongly Agree</i>	<i>Somewhat Agree</i>	<i>Somewhat Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know/ No Opinion</i>

2. Do you think you are driving alone to work more often, less often, or about the same number of times each month as you were four months ago? (check one)

☐ More often      ☐ Less often      ☐ About the same number of times

3. If you are driving less often than you were four months ago, to what do you attribute the change? (check all that apply)

☐ Change in job/residence    ☐ Change in social habits    ☐ Better weather    ☐ Improved trails    ☐ Fuel costs  
☐ Trying to improve my health    ☐ I am traveling less overall    ☐ Car broke down    ☐ No change  
☐ Other: \_\_\_\_\_

4. How many working cars, trucks, SUVs, or vans, if any, do you have at your residence?

\_\_\_\_ # of vehicles at my residence

5. Do you personally own at least one bicycle?

☐ Yes      ☐ Yes, I have one, but it is currently broken      ☐ No      ☐ No, but I have one available to ride

6. How many people live in your household?

\_\_\_\_ Adults (18 years or older)      \_\_\_\_ Children (17 years or younger)

7. What is your age?

☐ Under 18      ☐ 18-29      ☐ 30 – 44      ☐ 45 – 64      ☐ 65+

8. What is the name of the community where you live?

☐ Encinal      ☐ Laguna      ☐ Mesita      ☐ Paguata      ☐ Paraje  
☐ Seama      ☐ Albuquerque      ☐ Grants

☐ Other: \_\_\_\_\_

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*The Pueblo of Laguna thanks you for participating in this survey!*