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Theresa Baca, City Parks and Recreation Department
Jackie Bouker, GARTC
Gran Brodehl, Bernalillo County Parks and Recreation Department
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Clay Campbell, Bernalillo Country Parks and Recreation Department
Craig Dedenhardt, BikeABQ
Ray Gomez, Middle Rio Grande Conservancy District (MRGCD)
Pat A. Hernandez, City Open Space Division
Loren Hines, Albuquerque Metropolitan Area Flood Control Authority
John Kellly, Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)
Julie Luna, Mid-Region Council of Governments (MRCOG)
Steve Mathias, GABAC
Richard Meadows, Bernalillo County Public Works
Yasmeen Najni, MRGCD
Michael Polikoff, UNM Planning & Campus Development
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Executive Summary

Introduction

In an effort to incorporate bicycle facilities and multi-use trails into their long range planning efforts, the City of Albuquerque prepared two separate documents. The Trails and Bikeways Facility Plan (*TBFP*) was prepared in 1993 to update the City's trails network and determine administrative responsibility for development and maintenance. In order to address on-street bicycle facilities, the City prepared the Comprehensive On-street Bicycle Plan (*COSBP*) in 2000. This Albuquerque Bikeways and Trails Master Plan Update was prepared to bring the *TBFP* and *COSBP* together into one document and help the City better manage the growth of the bikeways and multi-use trails system.

Vision

Provide safe and convenient access for bicyclists to all areas of Albuquerque, so that bicycling is a viable transportation option that results in an improved quality of life in the Albuquerque Metropolitan Area.

Goals

1. Bicycle commute mode share of 5% by 2020 and 10% by 2030.
2. Bicycle mode share for all trips of 5% by 2020.
3. Reduce bicycle fatalities and injuries by 50% by 2020.
4. Accommodate trail users other than bicyclists, such as; pedestrians, runners, equestrians and the disabled.
5. Mitigate conflicts between trail users.
6. Develop a safe trail system.

Existing Facilities

This plan consolidated an inventory of existing bicycle and trail facilities from different sources including; the *TBFP*, the *COSBP*, the Mid Region Council of Governments (MRCOG) Long Range Bicycle Facilities Map and field investigations. Three methods were used to evaluate the existing bikeways and trails facilities.

- The Bikeway Quality Index (BQI) method creates a snapshot of current conditions of biking infrastructure using quality and quantity measurements. Beginning on page 29 are Maps of the City, which show the BQI scores for existing facilities.
- The Cycle Zone Analysis (CZA) tool allows the City to better understand what areas of the City would produce the most 'bang for the buck' when it comes to investing in bicycling and trails infrastructure. A CZA map is included in this plan on page 38.
- Gap Closure Analysis was used to identify and evaluate specific locations where there are gaps in the system of either on-street bicycle facilities or multi-use trails.

Proposed Facilities

These three methods were combined with input from the public and bicycling and trail advocacy groups to create a list of proposed 'High Priority' projects. In addition, a full build-out project list was compiled from on-going City and MRCOG planning efforts.

On-street Bicycle Facilities and Multi-use Trails

Facility	Existing (miles)	Proposed High Priority (miles)	Projected Cost for High Priority Projects	Proposed Full Build-out (miles)	Total (miles)
Bike Lanes	170	72.6	$36.3M	189	359
Bike Routes	134	19.6	$108k	78	212
Bicycle Boulevards	6	4.5	$225k	8	14
Multi-use Trails	161	42.0	$14.4M	389	550
Total cost for High Priority Projects			$51M		

Recommended Gap Closure Locations

- East Central Avenue
- Paseo del Norte, North Diversion Channel to I-25
- Bridge Boulevard from Coors to Broadway
- Paseo del Norte/Paradise Blvd Grade Separated Crossing
- Candelaria Road from 12th Street to University
- Wyoming Boulevard/Utah Street Area
- San Pedro Drive from Zuni Road to Claremont Avenue
- San Mateo/Gibson Intersection
- Montano Road/Montgomery Boulevard
- Sequoia Road from Coors Blvd to Ladera Drive
- Dartmouth from Campus Blvd to Silver Ave (Bicycle Boulevard)
- Central Ave/Yale Blvd Intersection
- Indian School Road from Rio Grande Blvd to 12th Street
- Cutler Ave from Washington Street to San Mateo Blvd
- Claremont Ave from Richmond Drive to Moon St (Bicycle Boulevard)
- Lomas Blvd/Easterday Drive
- Alexander Blvd from Comanche Rd to Mission Ave
- Montano Rd from 4th Street to 2nd Street
- Irving Blvd from Universe Blvd to La Paz Dr
- Washington Street/Lomas Blvd Intersection
- Carlisle Blvd from Garfield Ave to Silver Ave
- 2nd Street from Stover to Marquette
- Rio Grande Blvd
- Alameda Drain at 12th Street

Other Recommendations

In addition to project recommendations, this plan contains guidelines for:

- The design of both on-street facilities and multi-use trails. Those are contained in the separate volume Design Guidelines.
- The treatment of end-of-trip facilities.
- Changes to traffic and parking codes and ordinances.
- Education and outreach efforts for both bicycling and multi-use trails.
- Maintenance and operations of on-street facilities and multi-use trails.
- Wayfinding treatments for multi-use trails to make navigation easier for trail users and emergency responders.

Priority Actions for Outreach

- Continue and Expand the Existing Albuquerque Bicycle and Trail Programs
- Create a City 'One-Stop' Bicycling Website
- Continue and Expand University of New Mexico Bike Program
- Provide Driver Education Related to Bicycling
- Host a Family Bicycling and Trail Use Program
- Perform Annual Bicycle and Trail Counts
- Fund and Fill a Bicycle/Trail Coordinator Position
- Host a Mountain Biking Program
- Promote 311 and Online Forums for Reporting Bicycling and Trail Issues
- Expand Safe Routes to School
- Launch a 'Share the Road' Awareness Campaign in Conjunction with Other Agencies and Advocacy Groups
- Apply to Become a Silver-Level Bicycle Friendly Community
- Launch a 'Share the Trail' Campaign
- Promote Trails and Park Facilities Through a 'Bike to Parks' Program
- Hold a Summer Streets Car-Free Street Event
- Coordinate Enforcement Actions
- Host Launch Parties for New Bikeways

Funding and Implementation

Since 2005, Federal transportation policy has been to increase non-motorized transportation to at least 15% of all trips and reduce the number of injuries and fatalities to non-motorized users. This shift in policy has given tremendous flexibility to States and MPOs to fund bicycle and pedestrian improvements

from a wide variety of programs. Virtually all the major transportation funding programs can be used for bicycle and pedestrian related projects. Specifically, States and MPOs are encouraged to:

1. Include bicycle and pedestrian improvements as an incidental part of larger projects.
2. Review and use the most appropriate funding source for a particular project and not rely primarily on transportation enhancements. Many bicycle and pedestrian projects are more suitable for funding under the congestion mitigation and air quality improvement program or the surface transportation program.

This plan provides the guidelines for implementing new projects identified by the needs analysis that was performed. It also provides the tools for updating the plan in the future. All of the projects listed in this plan have been entered into a GIS database, which the City can use to track projects, update future bicycle maps and add new projects. When a portion of the City has been identified for new development or redevelopment, whether by public or private means, this plan should be consulted to identify the need for bicycle or multi-use trails to be incorporated into the improvements. This plan also provides the general guidelines for the design of those facilities. This will help ensure that their development is consistent with the long range goals of the City, which include bicycle and trail use for a transportation alternative and recreational enhancement to quality of life.

Contents

1.0 Introduction

In 1991, Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA). This act mandates that transportation planning address other modes of travel besides motor vehicles. The ISTEA requires that planning organizations incorporate bicycle facilities into all annual and long-range Transportation Improvement Programs (TIPs).

The City of Albuquerque's two current planning documents are *The Trails and Bikeways Facility Plan (TBFP)*, 1993 and the *Albuquerque Comprehensive On-Street Bicycle Plan (COSBP)*, 2000.

The *TBFP* sought to update the City's trails network and determine an administrative home for trails and bikeways. While the Parks and Recreation Department constructs and maintains most of the trails, the department viewed trails as primarily a transportation facility. However, the Public Works Department largely considered trails as a recreational amenity.

During the development of the *TBFP*, the City determined the need for a comprehensive on-street bicycle plan to address the requirements for on-street multi-modal transportation planning and to update the City's previous on-street bikeway system plan, which was over 25 years old at the time.

Gannett Fleming West, Inc. (GFW) and ALTA Planning and Design were retained by the City to prepare this *Albuquerque Bikeways and Trails Master Plan Update*. This plan brings together the *TBFP* and *COSBP* into a single planning document. By combining these plans, the City will be able to better manage the growth of the bikeway and multi-use trail network; thus helping to ensure a well-connected, enjoyable and safe, non-motorized transportation and recreation system throughout the metropolitan area.

2.0 Glossary of Terms

AADT Average Annual Daily Traffic — Is the total volume of vehicle traffic of a highway or road for a year divided by 365 days. AADT is a useful and simple measurement of how busy the road is. It is also sometimes reported as "average annual daily traffic".

Activity Center — Location such as employment center, schools, downtown and uptown, entertainment, museums, ect. that tend to attract cyclist for education, recreation, shopping or employment.

Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) — The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) was created in 1963 by the New Mexico Legislature with specific responsibility for flooding problems in the greater Albuquerque area. AMAFCA's purpose is to prevent injury or loss of life, and to eliminate or minimize property damage. AMAFCA does this by building and maintaining flood control structures which help alleviate flooding.

Americans with Disabilities Act (ADA) — 1990 Federal law establishing the civil rights of people with disabilities. Prohibits discrimination against people with disabilities and requires common places used by the public to provide an equal opportunity for access.

At-grade crossing — A junction where bicycle path or sidewalk users cross a roadway at the same level as motor vehicle traffic, as opposed to a grade-separated crossing where users cross over or under the roadway using an overpass or underpass.

AASHTO — American Association of State Highway and Transportation Officials.

Bicycle — A bicycle is a human-powered vehicle with two wheels in tandem designed to transport by the act of pedaling one or more persons seated on one or more saddle seats on its frame. "Bicycle" includes, but is not limited to, a human-powered vehicle designed to transport by the act of pedaling which has more than two wheels when the vehicle is used on a public roadway, public bicycle path, or other public road or right-of-way, but does not include a tricycle for children.

Bicycle Boulevard — A bike boulevard is a bike route designed to encourage the through movement of bicycles while maintaining local access for motor vehicle travel. Traffic calming devices are used to control motor vehicle speeds and discourage through vehicle trips. These devices may include diverters, speed humps, traffic circles, or pocket parks which allow through access by bicycles. A bicycle boulevard may be constructed with wide curb lanes or with standard travel lanes and bike lanes. Bicycle boulevards should limit bicycle stops to one per quarter-mile or preferably one per half-mile spacing.

Bicycle Facilities — Bicycle facilities are the infrastructure that accommodates or encourages bicycling including bikeways, shared roadways not specifically designated for bicycle use, bicycle parking and storage facilities, and bicycle signal actuation hardware.

Bicycle Network — A system of public bicycle facilities that can be mapped and used by bicyclists for transportation and recreational purposes.

Bike Route — Bike routes are designated roadways with appropriate directional and informational signing, with or without a specific bicycle route number, in accordance with the MUTCD. Bicycle routes shall be primarily located on local streets and low-volume, low-speed collector streets.

Bike Lane — A bike lane is a lane on the roadway that has been designated by striping, signing, and pavement markings for preferential or exclusive use by bicyclists. Bike lanes or paved shoulders are part of the standard arterial and collector cross-section. These lanes provide access to destinations that include parks, schools, shopping and employment centers. Bike lanes at signalized intersections should have bicycle-sensitive actuation capability such as loop detectors, video detection, curbside push buttons, or other detection devices approved by the City Traffic Engineer. Adequate sight distance shall be maintained at all intersections and driveways along a bike lane.

Bikeway — A bikeway is any road or path that is specifically designated for bicycle travel.

Bikeway Quality Index (BQI) — A metric developed to indicate the likely comfort of bicyclists riding on an existing bicycle facility. Bikeway Quality Index factors are variable depending on facility type but typically include surface quality and wayfinding.

Crosswalk — "That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs, or in the absence of curbs, from the edges of the traversable roadway; and in of the lateral lines of the existing sidewalk at right angles to the centerline. (b) Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface."

CROW Manual — 'Design manual for bicycle traffic' - Bicycle facility and design manual from the Netherlands.

Cycle Zone Analysis (CZA) — A zone based system developed to analyze existing bicycling conditions. Zones consists of a more-or-less homogeneous cycling environment based on employment and population density, land use mix, road network density, connectivity, and topography.

Directional or wayfinding signs — Signs typically placed at road and bicycle path junctions (decision points) to guide bikeway users toward a destination or experience.

Federal Highway Administration (FHWA) — The agency under US Department of Transportation responsible for the approval of transportation projects that affect the defined federal highway system.

Grade-separated crossing — An overpass or underpass allowing multi-use trail users to cross a major roadway without conflict.

Greater Albuquerque Bicycling Advisory Committee (GABAC) — is a citizens advisory committee meets every month to review and comment on projects that effect on-street cycling within the Albuquerque metropolitan area.

Greater Albuquerque Recreational Trails Committee (GARTC) — is a citizens advisory committee meets every month to review and comment on policy and projects affecting trails (bike, pedestrian, equestrian, in line skates, etc.) within the Albuquerque metropolitan area.

Highway — A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Level of service (LOS) — Term for the measurement of how well automobile traffic "flows" on a roadway system or how well an intersection functions.

Loop detector — A device placed in the pavement, real or virtual, at intersections to detect a vehicle or bicycle and trigger a signal or provide green time.

Manual on Uniform Traffic Control Devices — Federal Manual on Uniform Traffic Control Devices, which designates standards for signage and pavement markings.

Medians — Area in the center of the roadway that separates directional traffic. Medians may be painted and leveled with the surrounding roadway or "raised" using curb and gutter. Medians may include landscaping, concrete, striping or any combination thereof.

Median Refuge — An area within an island or median that is intended for pedestrians or cyclists to wait safely away from travel lanes for an opportunity to continue crossing the roadway.

Midblock Crosswalk — A legally established crosswalk that is not at an intersection.

Middle Rio Grande Conservency (MRGCD) — was built to control flooding and sediment, an important tool for managing Rio Grande flows to miles of ditches and hundreds of farmers in the Middle Rio Grande Conservancy District.

Mid-region Council of Government (MRCOG) — is a multi-county governmental agency that is helping our region plan responsibly for the future, in light of anticipated growth in New Mexico's mid-region. Representing the counties of Bernalillo, Valencia, Torrance, and Sandoval, MRCOG provides planning services in the areas of transportation, agriculture, workforce development, employment growth, land-use, water, and economic development.

Multi-Use Trail — A multi-use trail is a bikeway physically separated from motorized vehicle traffic by an open space or barrier, and constructed within the street right-of-way or within an independent right-

of-way including shared-use rights-of-way or utility or drainage easements that permits more than one type of non-motorized use.

Paved Shoulder Bikeways — Paved shoulder bikeways are located on uncurbed arterials and collectors and consist of a smooth paved surface that covers all or part of the roadway shoulder.

Pavement Marking — Any marking on the surface of the pavement that gives directions to motorists and other road users in the proper use of the road. The MUTCD determines the standard marking in New Mexico for state and local use.

Pedestrian — One who walks or journeys on foot; a walker.

Right-of-way — A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to transportation purposes. Or, the right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian.

Roadway — The portion of the highway, including shoulders, for vehicle use.

Shared Roadway — A shared roadway is any roadway that may be legally used by both motor vehicles and bicycles and is not specifically designated as a bikeway.

Sharrow (Shared Lane Marking) — A pavement marking used to indicated the preferential lateral positioning of cyclist within a travel lane shared by both bicycle and motor vehicles.

Sidewalk — That portion of a highway, road or street specifically constructed for the use of pedestrians on the outside edge of the vehicular travel way. Sidewalks are typically, but not always, curb-separated from the roadway and made of concrete, brick, asphalt or another hard surface materials.

Shoulder — The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of the subbase, base, and surface courses.

Statewide Transportation Improvement Program — A statewide compilation of local, regional, MPO, and rural TIPs as required by federal regulation.

StreetPlan — A GIS-based street evaluation model that graphically shows where bike lanes or wide curb lanes can be provided based on existing roadway configuration.

Traffic Calming — Changes in street alignment, installation of barriers, and other physical measures employed to reduce traffic speeds and/or cut-through traffic volumes in the interest of street safety, livability, and other public purposes.

Traffic Control Devices — Signs, signals, or pavement markings whether permanent or temporary, placed on or adjacent to a travel way by authority of a public body having jurisdiction to regulate, warn, or guide traffic. MUTCD designates standards.

Utilitarian Trips — Trips that are not for recreational purposes, such as running errands.

Wide Curb Lanes — Wide curb lanes are located on shared roadways with outside lane widths of 14 to 16 feet. Lane widths greater than 16 feet may encourage operation of two motor vehicles in one lane, therefore, consideration should be given to striping a bicycle lane.

3.0 Goals and Objectives

This chapter defines the vision statement, goals and objectives of this *Albuquerque Bikeways and Trails Master Plan Update*, along with methods to measure success in implementing this plan. A project management team (PMT) consisting of members from public agencies and plan development team members recommended that the goals and objectives, with modification, presented in the *Albuquerque Comprehensive On-Street Bicycle Plan* continue to be used with the addition of means to measure progress towards selected goals and objectives.

With input from the PMT, a vision statement was prepared, along with supporting goals, objectives and measurements.

3.1 Vision Statement

Provide safe and convenient access for bicyclists to all areas of Albuquerque, so that bicycling is a viable transportation option that results in an improved quality of life in the Albuquerque Metropolitan Area.

3.2 Goals and Objectives

3.2.1 Goals

1. Achieve a Bicycle Commute Mode Share of 5 percent by Year 2020 and a 10 percent Bicycle Commute Mode Share by Year 2030.
   Measurement:
   The City will conduct an annual bicycle user survey to collect and report mode share data for commuting trips.
2. Achieve a Bicycle Mode Share of 5 percent of All Trips by Year 2020.
   Measurement:
   The City will conduct an annual bicycle user survey to collect and report mode share data for all trips.
3. Reduce by 50 percent the Number of Bicycle Fatalities and Injuries by Year 2020.
   Measurement:
   Obtain and update crash data from The Division of Government Research (DGR) and Albuquerque Police Department records. Compare annual updates to data verifying the reduction of bicycle fatalities and injuries.
4. Accommodate the Following Users in the Trail System, Recognizing that Not All Can Be Accommodated on Every Trail: Cyclists (Mountain and Touring), Pedestrians, Runners, Equestrians, and the Physically Challenged.
5. Develop Strategies to Mitigate Conflict Between Trail User Types.
6. Develop a Safe Trail System.

3.3 Objectives

3.3.1 Objective 1: Develop and promote Albuquerque as a Bicycle Friendly Community

A. Achieve the League of American Bicyclists' Bicycle Friendly Communities award designation and *Bicycling Magazine's* Top Ten Best Cities for Cycling award by institutionalizing bicycling as a legitimate form of transportation in all planning and programming efforts and public awareness campaigns.
   Measurement:
   Report the results of the survey and identify solutions to rectify deficiencies reported by the award.
B. Provide full-time staff positions dedicated to bicycle transportation and appropriate office budgets to promote bicycling within Albuquerque.
C. Support the establishment of designated personnel and appropriate office budgets in other Albuquerque Metropolitan Planning Area jurisdictions to address bicycling concerns.
D. Maintain the dedicated local funding source for construction and maintenance of bikeways and establish specific budget line items in the Albuquerque budget to support the provision of on-street and off-street bicycle networks and programs.

E. Institutionalize bicycling as a legitimate form of transportation through bicycle-friendly roadway design practices and through consistent, routine training of City of Albuquerque, MRCOG, and other jurisdiction staff. Maintain bicycle transportation planning and design. Work with the University of New Mexico and New Mexico State University to develop curricula for bicycle-friendly transportation system design.
F. Support the efforts of the Greater Albuquerque Bicycling Advisory Committee (GABAC) and the Greater Albuquerque Recreational Trails Committee (GARTC) to promote bicycling and improve bicycle safety through effective responses to GABAC and GARTC concerns. Provide staff liaisons from the City, Bernalillo and Sandoval counties and other area departments of transportation to attend GABAC and GARTC meetings and to work on GABAC and GARTC issues on a routine basis.

3.3.2 Objective 2: Develop and Maintain A Continuous, Interconnected and Balanced Bikeway and Multi-Use Trail Network

A. Develop an interconnected network of bikeways on 1) local streets (bike routes and Bicycle Boulevards), 2) arterial streets (bike lanes), 3) along limited access arterials (separated multi-use trails) and 4) along arroyos, drains or utility easements. Encourage developers of walled subdivisions to provide connectivity between their developments and adjacent bikeways.
B. Link existing and proposed trails to form a connected network.
C. Improve bicycle connections between schools (elementary through college) and neighborhoods to encourage bicycling by children, teenagers and young adults.
D. Provide bicycle facilities at half-mile spacing intervals on average throughout the city. Increase on-street bikeway mileage from the current 365 to 500 by the year 2020 and 650 by the year 2030. Increase multi-use trail mileage from the current 175 to 200 in the year 2020 and 240 in the year 2030.
Measurement:
Prepare a biennial report of the bicycle facilities that have been constructed.
E. Give priority to achieving connectivity of the bikeway network when planning and programming all roadway and bikeway improvements.
F. Plan, program and implement special provisions for crossings of high-volume, multi-lane streets. Review successful treatments utilized within other communities for difficult crossings.
G. Concentrate bicycle improvements for a five-mile radius ("hub and spoke") around major employment centers, schools, parks and other activity centers.
H. Coordinate and develop interconnected bikeway improvements and standards between the City and adjacent jurisdictions, including Bernalillo County, Sandoval County, Los Ranchos, Rio Rancho, Corrales, and KAFB.
I. Monitor the implementation of elements within the *Albuquerque Bikeways and Trails Master Plan* and update the Plan at *five* year intervals.

3.3.3 Objective 3: Use Bicycle and Pedestrian Friendly Standards and Procedures For On-Street Bicycle Facilities and Multi-Use Trails

A. Restripe all collector and arterial roadways (where practical) to provide bike lanes, or minimum outside lane width of 14 feet.
B. Provide a striped bicycle lane or shoulder as described in chapter 23, section 5, subsection N of the City's Development Process Manual, in conjunction with AASHTO bicycle facility design guidelines, on all new, rehabilitated or reconstructed roadways, as indicated in the Master Plan.
C. Provide striped lanes/shoulders of at least five feet wide, from face of curb where curb and gutter exist, on all new or reconstructed bridges, underpasses and overpasses.
D. Plan and design for bicycle travel with all intersection improvements - include 5-foot bike lanes or minimum curb lane widths of 15 feet through intersections.
E. Include a through phase for all traffic signal timing plans at signalized intersections on roadways having designated bicycle networks.
F. Modify existing or install new traffic signal detection equipment (i.e., inductive loop, video detection or pushbutton) to make all traffic signals bicyclist-responsive.

G. Implement other design considerations, per the current versions of the *AASHTO Guide for the Development of Bicycle Facilities*, the "Design Guidelines" section of this plan and other appropriate design reference guidelines.
H. Evaluate and adjust traffic signal timing of the vehicle phase change and clearance interval to provide adequate time for bicycles at signalized intersections on designated bicycle networks.
I. On all trails, develop strategies and use design techniques on available right-of-way to minimize conflict of use.

3.3.4 Objective 4: Provide A High-Standard of Maintenance Along Roadways With On-Street Bikeway and Multi-Use Trails

A. Improve and fully fund the street maintenance and sweeping program. Establish the highest priority for allocation of street sweeping resources to sweeping all bike lanes at least once per month and bike routes on local streets a minimum of four times a year. Multi-use trail sweeping should be performed on a regular basis and when requested.
Measurement:
Request the annual data on frequency of scheduled sweeping for the on-street bikeway and multi-use trail network, along with the number and location of spot sweeping requests. Establish a database to track trends and provide data that can be used refine scheduled sweeping and maintenance budget request.
B. Establish weed and vegetation control procedures to reduce the occurrence of noxious weeds (i.e., puncture vine) and plants that block sight lines or grow within two feet of bicycle facilities.
C. Maintain street surfaces on designated bikeway and multi-use trails to a high standard, including elimination of lip between paved surface and gutter, elimination of manhole/water valves in bike lanes and maintenance of bicycle-safe railroad crossings, drain grates and cattle guards. Avoid use of chip seal/coating wherever practicable.
D. Maintain bicycle facility pavement markings and signing. Missing or defective pavement markings and signs shall be replaced or repaired in a timely manner. Retroreflectivity of pavement markings and signs shall be in accordance with current MUTCD requirements.
E. Maintain arterial and collector street surfaces, including those not designated as bikeways, on a routine basis to reduce hazards (e.g., potholes, debris) for bicyclists who use these facilities.
F. Establish timely responsiveness to maintenance requests from citizens through the use of the City's 311 Citizen Contact Center or website or other means for citizens to report concerns. Establish an agency goal of 48 hours to address these requests.
Measurement:
Monitor response time for the maintenance requests and provide follow-up on the type of response. Report annually the number and type of request being made.
G. Maintain bicycle routes and lanes to high standards through construction projects, referring to Chapter 6, "Temporary Traffic Control," of the MUTCD and maximize curb lane widths (i.e., provide lane widths of 14 feet or greater) through construction projects on roadways that do not have bike lanes. Where this is not feasible, provide appropriate bicycle friendly and reasonably direct detours and detour signing.
H. Encourage a bottle deposit program in order to reduce littering of roadways and bike facilities with broken glass.

3.3.5 Objective 5: Implement A Comprehensive Program To Increase Public Awareness of Bicycling

A. Develop and utilize video and audio Public Service Announcements (PSAs) and other means, such as billboards, to promote general public awareness and acceptance of bicycling and to promote bicycle safety. Target use of PSAs on television/local radio stations for specific community events, especially during the annual Bike Month.
B. Provide specific line item agency funding to support public bicycling awareness programs and "Share the Road" campaigns.

C. Encourage wide-spread support and participation by bicycle shops, bicycle clubs, the Greater Albuquerque Bicycling Advisory Committee, Greater Albuquerque Recreational Trails Committee and other bicycle interest groups in efforts to promote public awareness of bicycling.
Measurement:
Monitor membership and/or participation and growth.

D. Increase public outreach efforts, including video and audio PSAs to educate motorists on bicyclists' rights and responsibilities. Encourage the inclusion of bicycling-related questions in motor vehicle driving license tests as a means to raise awareness of bicyclists' rights and responsibilities.
E. Heighten public awareness of bicycle planning efforts and ensure on-going citizen participation and support for bikeway development. Provide periodic news releases for bicycle planning and bicycle system development and actively solicit public input.
F. Work with major employers throughout the Albuquerque to encourage commuting by bicycle among their employees and to increase motorists' awareness to share the road.

3.3.6 Objective 6: Educate All Bicyclists On Legal, Safe and Predictable Behavior

A. Develop, distribute and update annually a bicycle map of the Albuquerque including the communities of Albuquerque, Los Ranchos, Rio Rancho, KAFB and metropolitan areas of Bernalillo County.
B. Distribute a user-friendly Bicycle Commuter Handbook, which includes commuting and safety tips and laws related to bicycling.
C. Develop and fully support a bicycle education program in Albuquerque's elementary and secondary schools as part of current physical education requirements.
D. Encourage and support head injury awareness and helmet usage through awareness of state laws, educational brochures and programs.
E. Provide full support for the Bicycle/Pedestrian Safety Education Program staff in their work on bicycle education and in developing and overseeing a program for bicyclist education.
F. Continue development and use of video and audio PSAs, as well as short instructional safety videos to promote proper and legal bicyclist behavior.
G. Continue and expand Police Bicycle Patrols, and dedicate a distinct percentage of their time to educational efforts on proper bicycling behavior.
H. Provide specific line item funding to support bicyclist education.
Measurement:
Report the annual budget that is used for bicyclist education.

3.3.7 Objective 7: Promote Trail Use and Bicycling As a Non-Polluting, Cost-Effective and Healthy Mode of Transportation and Recreation

A. Continue and expand marketing efforts to promote bicycling as an alternate mode of transportation, especially through cooperative efforts with a regional Travel Reduction/Rideshare Program. Work with businesses to provide bicycle commuting information to employers and employees and to learn how bikeways to and from their locations can be improved.
B. Provide outreach and personal travel cost information that shows how bicycle transportation can be beneficial to both employees and students.
C. Prioritize implementation of multi-use trails, which contribute key linkages to the on-street bikeway network, including interim trail improvements where needed and spot safety trail improvements.
D. Promote air quality benefits of bicycling through public outreach efforts to major public and private sector employers, such as the University of New Mexico (UNM), KAFB, Sandia National Laboratories, Intel and area schools.
E. Develop and support cash incentive programs to promote bicycling, such as parking cash-out allowances (i.e., cash payments to bicyclists in lieu of employer-provided parking) for City, UNM, KAFB and other employees who work for public or private sector employers.

F. Develop and implement bicycle parking ordinances where they do not currently exist. Monitor and fine-tune existing local bicycle parking ordinances based in part on bicyclist and business feedback and recommendations.
G. Continue and expand the interface between bikes and buses, including such features as bicycle racks on all buses and bicycle racks and lockers at park-and-ride lots. Promote bike/bus programs through ABQ Ride literature and PSAs.
H. Develop and implement specific incentive programs to encourage existing businesses and other entities to provide facilities for bicycling, such as bicycle racks, bicycle lockers, changing areas, showers, clothes lockers and guaranteed ride home programs.
I. Develop and distribute to employers short videos that promote bicycle commuting, demonstrate bicycle commuting tips, show legal and safe riding techniques and promote bicycling awareness and acceptance.
J. Promote organized bicycle events and racing on city streets as a means of increasing public awareness of bicycling as a viable sport for public viewing and participation.
K. Promote the health benefits of cycling as a way of reducing stress, increasing daily physical activity, minimizing the risk of coronary heart disease and an effective method of weight control.

3.3.8 Objective 8: Develop and Implement A Traffic Law Enforcement Program For Bicyclists and Motorists and Linked With Education Program Efforts

A. Update or develop materials for use by law enforcement personnel to support education and enforcement efforts.
B. Commit appropriate police time (bicycle and motor vehicle patrols) to target bicyclist and motorist enforcement efforts.
C. Develop and implement a consistent, balanced traffic law education program for law enforcement personnel for improving motorist and bicyclist compliance with traffic laws.

3.3.9 Objective 9: Develop and Maintain Databases Useful For Bicycle Planning, Prioritization of Bicycle Improvements and Accident Prevention

A. Periodically conduct community wide public opinion surveys to: 1) determine reasons why people do or do not ride bicycles; 2) develop bicycle trip patterns and purposes; and 3) gain input on bicycle projects and programs that could improve bicycling in Albuquerque.
B. Routinely conduct and update bicycle counts to estimate usage levels and to help determine progress toward achieving future bicycle mode split goals. Conduct before and after bicycle counts for roadways that are reconstructed or restriped to have bicycle lanes and for other improvements to bikeways to gauge the effect of prioritized improvements.
C. Maintain and update the bikeway and multi-use trail network inventory developed as part of the *Albuquerque Bikeways and Trails Master Plan Update*. The facility information will be provided to AGIS and MRCOG in GIS format. Maintain and update the bicycle accident database. Utilize the database to identify high accident locations and/or high accident severity locations to help in the prioritization of bicycle project and program improvements. Review each bicycle collision/accident in a timely manner to identify system deficiencies and potential improvements.

4.0 Existing Conditions

This chapter describes the current bikeway and trail network in Albuquerque. The first part is an overview of existing facilities, including bike routes, bike lanes, bicycle boulevards, multi-use trails and wide lanes/paved shoulders, as well as support facilities. Finally, the identified constraints are presented.

4.1 Existing Bikeway and Trail Facilities

Several types of bikeways exist, as defined by federal, state and local bicycle planning and design guides and manuals. Bikeways generally are distinguished as preferential roadways accommodating bicycle travel. Bicycle accommodation takes the form of: bicycle route designation, bike lane striping or shared multi-use trails, which physically separate cyclists and other trails users from motorists.

Albuquerque's formalized bikeway system consists of on-street facilities (bike routes, bicycle boulevards, bike lanes, wide lanes/paved shoulders) and off-street facilities (multi-use trails). A significant portion of the City's bicycle facilities are multi-use paved trails, making up nearly one-third, or 161 miles, of the existing bicycle facilities in the area. The City has prepared a map of the bikeways in the immediate metropolitan area, including an insert of the City of Rio Rancho. The *2011 City of Albuquerque Bicycle Map* (see Figure 1) shows the existing bikeway and multi-use trail network in Albuquerque.

4.1.1 Bike Lanes

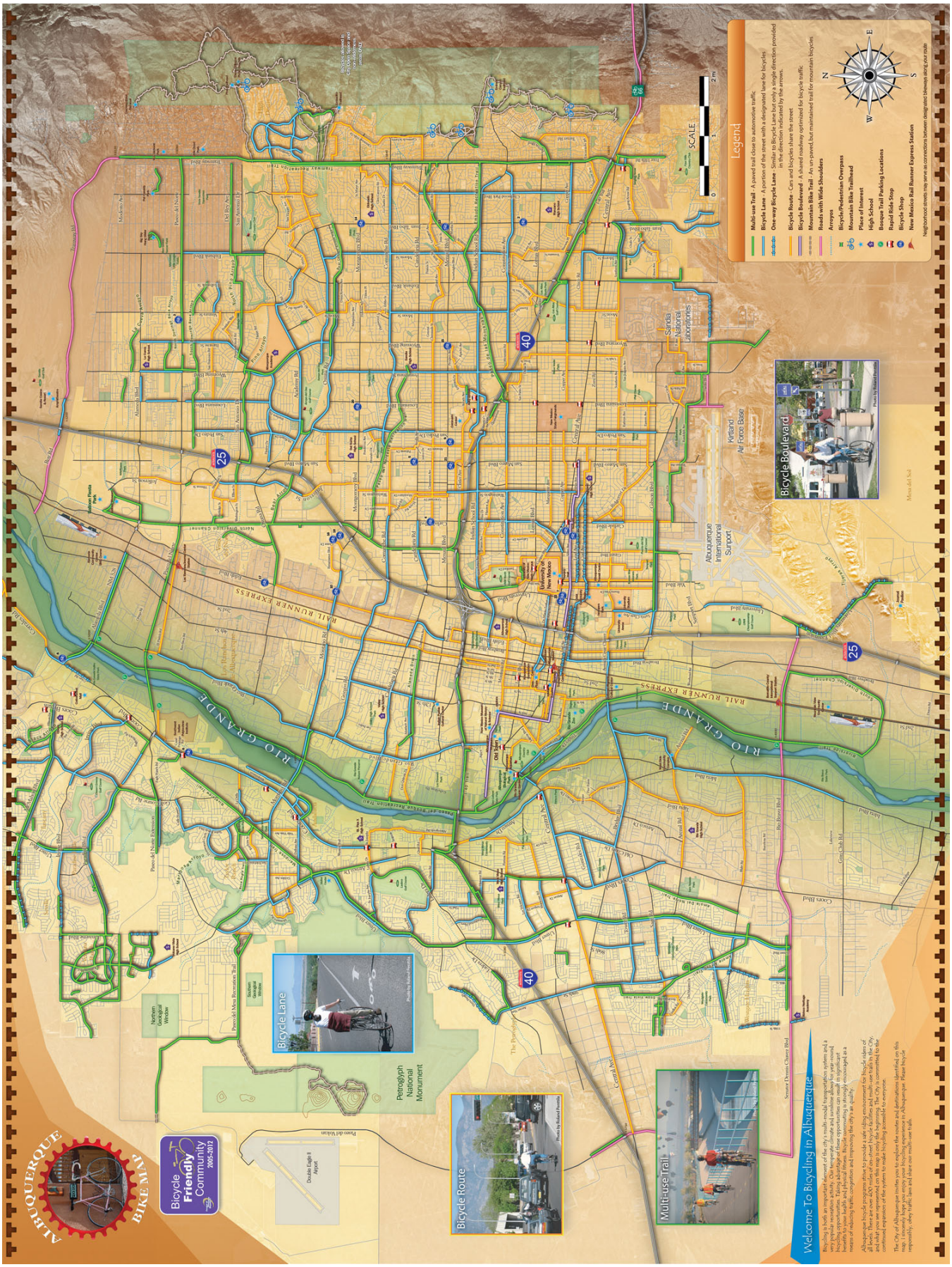
Designated exclusively for bicycle travel, bicycle lanes are separated from vehicle travel lanes with striping and include pavement stencils and signage. Bicycle lanes are most appropriate on arterial and collector streets in urban and rural areas where higher traffic volumes and speeds warrant greater separation. Some of the earliest bike lanes are in the northeast part of the City on Constitution Avenue, Chelwood Boulevard and Kirtland Airforce Base (KAFB). As the City expands to the west, bike lanes are being included as part of new roadway construction. For example, 98th Street and Unser Boulevard. The City has invested in roadway improvements, adding bike lanes to existing streets recently along Jefferson Street, Comanche Boulevard and Academy Road. Bike lanes are added during the construction of new facilities to increase the connectivity of the bikeways system. There are approximately 170 miles of existing bike lanes within the city, most of which are located on collector and minor arterial streets.

Figure 2: Typical bike lane with adjacent parking

Figure 3: Typical bike lane on roadway bridge

Many bicyclists that use their bicycle for trips other than recreation would argue that on-street facilities are the most functional facilities for bicycle transportation. Bicyclists have stated their preference for marked on-street bicycle lanes in numerous national surveys. The fact is that many bicyclists – particularly less experienced riders – are far more comfortable riding on a busy street if it has a striped and signed bike lane. Part of the goal of this plan is to encourage new riders and providing future marked facilities such as bike lanes may be one way of accomplishing that.

This plan takes the approach that, if properly designed, bike lanes can increase safety and promote proper riding habits. For this reason, bike lanes are highly desirable for bicycle commutes and other utilitarian routes along major roadways. Bike lanes help to define the road space for bicyclists and motorists, reduce the chance that motorists will stray into the cyclists' path, discourage bicyclists from riding on the sidewalk and remind motorists that cyclists have a right to the road. One key consideration in designing bike lanes in an urban setting is to ensure that bike lanes and adjacent parking lanes have sufficient width, so


Legend
Multi-use Trail - A paved trail close to automotive traffic.
Bicycle Lane - A portion of the street with a designated lane for bicycles
One-way Bicycle Lane - Similar to Bicycle Lane but only a single direction provided in the direction indicated by the arrows.
Bicycle Route - Cars and bicycles share the street
Bicycle Boulevard - A shared roadway optimized for bicycle traffic
Mountain Bike Trail - An un-paved, but maintained trail for mountain bicycles
Roads with Wide Shoulders
Arroyos
Bicycle/Pedestrian Overpass
Mountain Bike Trailhead
Place of Interest
High School
Bosque Trail Parking Locations
Rapid Ride Stop
Bicycle Shop
New Mexico Rail Runner Express Station
Neighborhood streets may serve as connections between designated bikeways along our route
SCALE
N
E
S
W
Bicycle Boulevard
Bicycle Lane
Bicycle Route
Multi-use Trail
Welcome To Bicycling in Albuquerque
ALBUQUERQUE BIKE MAP
Bicycle Friendly Community 2005-2012
RIO GRANDE
RAIL RUNNER EXPRESS
Petroglyph National Monument
Sandia National Laboratories
Kirtland Air Force Base
Albuquerque International Sunport
University of New Mexico

that cyclists have enough room to avoid a suddenly opened vehicle door (see Figure 2). A design guide for bicycle facilities was developed as part of this plan and information about shared parking and bike lanes is included.

4.1.2 Bike Routes

The most common bikeways in Albuquerque are shared roadways, typically designated as "bike routes", which are designed to accommodate motor vehicles and bicycles in the same travel lane. The most suitable roadways for shared vehicle/bicycle use are those with low posted speeds of 25 MPH or less and low traffic volumes of 3,000 average daily traffic (ADT) or less, many of which are in residential areas. These facilities may include traffic-calming devices such as speed humps to reduce vehicle speeds. A common practice is to designate a system of shared roadways which are signed with bicycle route signs and directional arrows. Approximately 134 miles of bike routes currently exist throughout the city, providing convenient links to other parts of the bikeways network and to destinations throughout the city, including residential areas, transit stops and schools.

Bike routes may also be desirable on certain commuting routes where installing bike lanes is not possible, provided that traffic volumes are acceptable and appropriate signage is installed to alert motorists to the presence of bicycles on the roadway. Bike route signing may also include "Share the Road" signs at regular intervals along the route.

4.1.3 Wide Lanes/Paved Shoulders

A wide outside lane, as shown in Figures 4 and 5, provides accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Typically found in rural areas, shoulder bikeways are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Bike routes with paved shoulders are typically along state highways. Examples within the city are Tramway Boulevard and Rio Bravo Boulevard.

Figure 4: Wide shared outside lane

4.1.4 Bicycle Boulevards

Bicycle Boulevards are low-volume and low speed streets where motorists and bicyclists share the same lane. A motorist will usually have to cross over into the adjacent travel lane to pass a bicyclist unless the shared lane is wide enough for passing in the same lane.

Figure 5: Wide shared lane on Comanche Boulevard along 2nd Street

Traffic calming and other treatments along the corridor may reduce vehicle speeds so that motorists and bicyclists generally travel at the same speed. This creates a safer and more comfortable environment for all users. The first phase for the recently implemented Silver Avenue Bicycle Boulevard did not incorporate traffic calming devices other than reducing the speed limit to 18 miles per hour (Figure 7). Traffic calming treatments such as traffic diverters may be installed where the traffic flow on the Bicycle Boulevards is predominantly using the street as a through street. Bicycle Boulevards also incorporate median refuges to facilitate safe and convenient crossings where bicyclists must traverse major streets such as the University Boulevard and Lomas Boulevard. Bicycle Boulevards work best in well-connected street grids where riders can follow reasonably direct and logical routes with few "twists and turns." Boulevards also work best when higher-order parallel streets exist to serve through

vehicle traffic. Albuquerque has recently designated 6 miles of Bicycle Boulevards along Silver Avenue, 14th Street and Mountain Road. Figure 6 and 7 show examples of signing used by the City on the Bicycle Boulevards.

4.1.5 Multi-Use Trails

Approximately 161 miles of multi-use trails provide bicycle access throughout the City for bicycles, pedestrians, equestrians and other trail users. The Bosque Trail, the Unser Boulevard Trail, the North Diversion Channel Trail and the Tramway Trail are examples of some of the major north/south multi-use trails. These major north/south trails provide connections to the Paseo del Norte, I-40 Trail, Paseo del Nordeste Recreational Trail and Paseo de las Montanas Trail that run predominantly in the east/west direction. Developers are starting to include multi-use trails as part of new subdivisions to accommodate bicycles for transportation and other forms of recreational activity. The I-40 Trail connects the east and west sides of the city, crossing the Rio Grande River on a multi-use bicycle/pedestrian bridge. Albuquerque's west side has fewer multi-use trails and is less well connected than the more mature multi-use trail system of Albuquerque's east side. The existing multi-use trail network is shown in Figure 1.

Figure 8: Typical Multi-use Trail Paralleling an Arterial with Bike Lanes Lanes along Unser Blvd.

4.1.6 Multi-Use Trail Crossings

The City's extensive multi-use trail system intersects streets, highways, arroyos, drainages channels and the Rio Grande . Where these intersections occur, various crossing treatments are used to provide safe and convenient crossing opportunities for the trail user. These crossings can be divided into two basic groups: at-grade and grade separated.

Figure 9: Multi-use Trail along Waterline Utility Easement Easement near Campbell Road

Figure 10: Multi-use Trails Intersecting

4.1.6.1 Grade Separated Crossings

Grade separated crossings are further divided into two distinct categories: overpasses and underpasses.

4.1.6.2 Overpass

Overpasses provide locations where the multi-use trails pass above the obstruction. The multi-use trail may require a dedicated structure to provide this separated crossing. The multi-use trail may be aligned with an existing roadway bridge where the multi-use trail is provided a space on the bridge. Shared roadway/multi-use trail bridges can be found at some of the freeway, drainage channel and river crossings. In locations not having a bridge, one would have to be constructed. Overpasses can range from a simple pre-fabricated truss bridge (Figure 14), typically used to cross the shorter spans of arroyos and drainage channels like those along North Diversion Channel and Paseo del las Montanas, to the more complex bridge structure spanning multi-lane arterials and the Interstates similar to the structures crossing Tramway and I-40 (Figures 11-13).

Figure 11: I-40 Overpass Near Uptown

Figure 12: Paseo del Norte Multi-use Trail Overpass crossing 2nd Street

Figure 13: I-40 Overpass Connecting Residential Neighborhoods

Figure 14: Single Span Pre-fabricated Truss Bridge Crossing Drainage Channel

4.1.6.3 Underpass

An underpass serves a similar purpose as an overpass but differs in that the multi-use trail passes below the barrier. In locations where the multi-use trail is aligned with an existing roadway underpass, the multi-use trail can be provided space adjacent to the roadway for the crossing. At locations of independent trail alignment, a modified culvert large enough to provide safe access for the trail user and maintenance equipment (Figure 15) can be effective. The City has successfully used a technique, termed "notches," where roadway bridges intersect multi-use trails following major drainage channel alignments (Figure 16). A notch in the channel's sloping side provides space for multi-use trail to pass below the bridge.

Figure 15: Concrete Box Underpass Structure beneath an Urban Principal Arterial

4.1.6.4 At-Grade Crossings

At-grade multi-use trail crossings of roadways may occur at controlled or uncontrolled intersections and mid-block locations. Where the multi-use trail is in close proximity to a signalized intersection, the trail alignment may be diverted to the intersection, as shown in the photo of the crossing at Matthew Avenue (Figure 18), where the multi-use trail user crosses at the crosswalk. Mid-block crossings are the most frequent at-grade multi-use trail crossings. Two-lane to six-lane streets with multi-use trail mid-block crossings are located throughout the city's bikeways network.

Figure 16: A Notch along the Drainage Channel Providing Multi-use Trail Access Under I-40

Figure 17: Multi-use Trail with Corrugated Multi-plate Type Underpass crossing 4th St.

Figure 18: Multi-use Trail Diverted to Signalized Intersection Crossing.

Figure 19: Multi-use Trail Mid-block Crossing of a Two-lane Residential Street.

Figure 20: Multi-use Trail Mid-block Crossing of Comanche Rd. a Four-lane Minor Arterial with Bike Lanes.

Figure 21: Multi-use Trail Mid-block Crossing of Wyoming Blvd. a Six-lane Principal Arterial.

4.1.7 Bikeway Supporting Facilities

4.1.7.1 Bikeway Signage

Bikeway signage includes signs to identify a bike route, lane or multi-use trail to cyclists and drivers (e.g., "Bike Lane" signs posted along a roadway with a bike lane), signs that provide regulations or warnings to cyclists or drivers (e.g., "Bike Xing" warning signs or bicycle-sized "Stop" signs) and signs that provide wayfinding to cyclists (e.g., trailhead signage or bike route numbering). Examples of some signs being used in Albuquerque are shown in Figure 22.

In Albuquerque, most on-street facilities have standard bikeway signage and some multi-use trail facilities have entrance monuments. There is currently little directional signage provided along bikeways in Albuquerque. Most local street connections, continuous bikeway routes and destinations are not identified. Wayfinding is difficult on trails that do not parallel roads, since cross streets and familiar landmarks are sometimes difficult to use as reference points. An important area of concern is the inability to readily identify a location on the multi-use trails for emergency response purposes.

Figure 22: Examples of Bike Route, Share The Road, Bike Lane and Multi-use Trail Signs in Albuquerque

4.1.7.2 Bicycle Detectors: Loops, Video Cameras and Pushbuttons

Loop detectors are in-pavement wire sensors or video camera detection systems that activate traffic signals when a vehicle is positioned within or over the loop. The in-pavement wire sensor loops work by sensing the metal in the vehicle and the video cameras detect changes in the background image. The in-pavement loop detectors and video camera detector can be adjusted to be sensitive enough to detect when a bicycle has stopped over the loop, allowing a cyclist to activate a traffic signal. At some intersections that do not have dedicated right turn lanes, the City has installed pushbuttons, located at the stop bar next to the curb, allowing the cyclist to activate the pedestrian call.

4.3 Population Growth in Albuquerque

As the population of Albuquerque continues to grow, the City needs to plan for a truly multi-modal transportation system that serves the needs of all residents. The city's rapid growth is occurring west of the Rio Grande both in the northwest and southwest quadrant. Roughly half the people in New Mexico live in the Albuquerque area.

Population of Albuquerque

Year	Population
2000	448,607
2006	507,789
2010	535,239

Population of Metro Area (includes Bernalillo, Sandoval and Valencia counties)

Year	Population
2000	712,738
2005	766,016
2009	857,903
2020, projected	1,000,000

4.3.1 Land Use and Demand

The concept of "demand" for bicycle facilities can be difficult to comprehend. Unlike automobile use, where historical trip generation studies and traffic counts for different types of land uses permits an estimate of future "demand" for travel, bicycle trip generation methods are less advanced and standardized in the United States. Land use patterns can help predict demand and are important to bikeway planning because changes in land use (and particularly employment areas) will affect average commute distance, which in turn affects the attractiveness of bicycling as a commute mode. The bikeways network will connect the neighborhoods where people live to the places they work, shop, recreateb, or go to school. An emphasis will be placed on regional bikeway connections centered on the major activity centers in Albuquerque, including:

- Major employment centers
- Civic buildings such as libraries
- Transit stations
- Major retail and commercial centers
- Schools
- Parks and regional recreational areas

4.3.2 Existing Network Coverage

The existing bicycle facility network coverage provides an understanding of how accessible the existing bicycle facilities are to the residents of Albuquerque. The goal is to provide a bikeway every half mile, putting a bicyclist a maximum of a quarter-mile from a bicycle facility. Albuquerque is well-served in the northeast quadrant; however, the further west one travels, additional gaps in both the connectivity and accessibility of the bikeway system appear.

4.3.3 Multi-Modal Connections

Multi-modal refers to the use of two or more modes of transportation in a single trip, (i.e., bicycling and riding the bus or train). This section describes bicycle-transit connections. Linking bicycles with Albuquerque's mass transit effectively increases the distance cyclists can travel, provides options in the event of a bicycle breakdown or collision and gives cyclists alternatives to riding at night or in hot or inclement weather.

Making an effective multi-modal connection consists of several key elements:

- Providing bicycle parking facilities at transit stops and bike racks or storage on trains and buses
- Improving bikeways that link with transit facilities and stops
- Encouraging the use of bicycles on transit through education and encouragement programs.

4.3.3.1 Bike & Ride the Bus

Bicycle racks are mounted on the front bumpers of all ABQ Ride buses that can carry most types of non-motorized bicycles. The City's 300 and 400 series buses have a rack that can hold two bikes at a time, while the 700, 900 and Rapid Ride buses can accommodate three bikes. If the bike rack is full the bike policy is as follows:

- Only when the bicycle rack is full, and the bus is not to full capacity with passengers (i.e., there is sufficient space to hold a bike without impeding other passengers), the passenger will be allowed to take the bike on the bus.
- The bicycle will only be allowed in the front portion of the bus in the wheelchair area and only if the space is free.
- The passenger will be required to stand with their bicycle to secure it.

Source http://www.cabq.gov/transit/getting-around/bicycling

4.3.3.2 New Mexico Rail Runner Express

Santa Fe is now connected to Belen by the Rail Runner Express commuter train. The Rail Runner currently has 11 stations, three of which are in Albuquerque. The Alvarado Transportation Center is its busiest station and is a multi modal hub for rail/transit and cycling. Current bicycle use of the Rail Runner far exceeds the anticipated demand, creating some challenges in bicycle storage on the train and long term storage at the stations. The bicycle-on-train counts provided by MRCOG for the year 2009 indicate a higher demand during the warmer months and may also be attributed to an increase in weekend train service.

January 1, 2009 - March 31, 2009

	Bikes On	Average/Day
Weekday Totals	7,094	112
Saturday Totals	789	60
Sunday Totals (one day of operation)	7	7
Grand Totals	7,890	102

April 1, 2009 - June 30, 2009

	Bikes On	Average/Day
Weekday Totals	10,068	154
Saturday Totals	786	60
Sunday Totals (one day of operation)	107	107
Grand Totals	10,961	138

July 1, 2009 - September 30, 2009

	Bikes On	Average/Day

July 1, 2009 - September 30, 2009		
Weekday Totals	12,389	190
Saturday Totals	1,138	87
Sunday Totals	120	24
Grand Totals	13,647	164

October 1, 2009 - December 31, 2009		
	Bikes On	Average/Day
Weekday Totals	8,920	139
Saturday Totals	667	51
Sunday Totals	172	13
Grand Totals	9,759	108

4.3.4 Bicyclist Destinations

It is particularly important for the bikeway and multi-use trail network to provide access to destinations popular among pedestrians and bicyclists. Within Albuquerque, popular destinations include:

- Educational facilities including University of New Mexico, Central New Mexico Community College and elementary, junior high and high schools
- Employment centers including KAFB/Sandia Labs, Intel, Journal Center and Mesa del Sol
- Commercial areas including those along Route 66/Nob Hill, Coronado and Cottonwood malls, ABQ Uptown and neighborhood shopping centers and grocery stores
- Public facilities such as the Bio Park, Albuquerque Public Libraries and museums
- Old Town, Downtown and Uptown Albuquerque
- Rural roadways on the community's outskirts for recreational cyclists
- Nearby communities in the East Mountains and South Valley, Valencia County and Sandoval County
- Natural areas within and outside Albuquerque, including Albuquerque Open Space, Sandia Mountain foothills, National Monuments and Rio Grande Valley State Park.

4.3.5 Connections to Schools

Students, whether in elementary school, high school or at the university level, traditionally are more likely to walk or bike than other demographic groups. It is therefore critical for the bikeway and multi-use trail network to provide safe and convenient access to schools.

4.4 Constraints

Identified below are major constraints that most bicyclists in and around Albuquerque encounter on their bicycle trips. Maps 2 through 5 in Appendix B provide a graphical display of these constraints. To provide a direct, safe and connected bikeway and multi-use trail network, the following constraints should be considered and resolved when possible:

- Rio Grande River
- Expo New Mexico
- Private Neighborhoods
- Drainage and Irrigation Alignments
- Open Space
- I-40 and I-25
- Airports
- Military Base
- West Mesa Escarpment
- Railroad Tracks
- Golf Courses
- Indian Pueblos
- Major Arterials

4.4.1 Topography

Albuquerque is located within the Rio Grande Rift. The valley's alignment is north/south with a gently sloping side to the east meeting the Sandia Mountains with slightly steeper sloping topography on the west side where it encounters the west mesa escarpment. The elevations within the city range from approximately 4,950 feet along the Rio Grande to 6,100 feet in the Sandia foothills and 5,750 feet of the west mesa. Few rolling hills exist except for the crossing of the North Diversion Channel along the west mesa

escarpment and in the Sandia foot hills. The broad central portion of the Rio Grande Rift, especially east of the river, has very little change in elevation and could be considered nearly level. The topography of Albuquerque is well suited for cycling with gentile terrain and the occasional hill.

4.4.2 Geography

According to the United States Census Bureau, Albuquerque has a total area of 181.3 square miles. 180.6 square miles of it is land and 0.6 square miles of it (0.35%) is water. The developed metro area is over 1,000 square miles. The city is bordered to the north by Sandia Pueblo and Rio Rancho, to the east by the Sandia Mountains and to the south by KAFB and Isleta Pueblo, restricting the majority growth to the westerly direction. The Rio Grande River flows in a southerly direction through the central portion of the city dividing the west and east sides of the city.

4.4.3 Wayfinding Tools

Albuquerque's bikeway and multi-use trail network could benefit from signage and other wayfinding tools to orient users and direct them to and through major destinations. Wayfinding is difficult on trails that do not parallel roads, since cross streets and familiar landmarks are sometimes difficult to use as reference points. An important area of concern is the inability to readily identify a location on the multi-use trails for emergency response purposes.

4.4.4 Discontinuous Multi-Use Trail Network

Although the City has made significant progress toward completing a comprehensive bikeways and multi-use trail network, several major gaps remain. One notably discontinuous area includes access to the trails in the northwest region of the city. Some examples are: the Paseo del Norte multi-use trail connection at Coors Boulevard and through or around the Paseo del Norte interchange should be improved by connecting to multi-use trails west of Coors Boulevard. Multi-use trails along Unser Boulevard and 98th Street, south of I-40, should be linked together by additional multi-use trails in the east/west direction. The multi-use trails in Paradise Hills and Taylor Ranch also lack sufficient north/south connections.

Figure 31: Examples of Wayfinding Sign being used in Albuquerque

4.5 Existing Education and Outreach Efforts

The City of Albuquerque, with the support of local bicycling groups, offers a number of valuable materials and programs aimed at bicyclists and trail users. It is recommended that the following efforts continue to be provided to Albuquerque area residents. Where possible, these programs should be expanded in their scope to offer additional services and/or reach more residents.

4.5.1 Existing Materials

- City of Albuquerque Metropolitan Albuquerque Bicycle Map: www.cabq.gov/bike/documents/pdfs/2007ABQBikeMap.pdf
- Bosque Trail Map: www.cabq.gov/openspace/pdf/RGVSP2.pdf
- Sandia Foothills Trails Map: www.cabq.gov/openspace/pdf/foothillsmap.pdf

4.5.2 Existing Committees, Organizations, Clubs and Teams

4.5.2.1 Greater Albuquerque Bicycle Advisory Committee (GABAC) and Greater Albuquerque Regional Trails Committee (GARTC)

The City has both a bicycle advisory committee and a regional trails committee that meet to address the needs of bicyclists and trail users in the Albuquerque area.

4.5.2.2 BikeABQ

This non-profit bicycle advocacy group organizes bicycle education, encouragement and enforcements programs for Albuquerque, in addition to advocating for infrastructure improvements. The organization hosts Traffic Skills 101 and Bicycle Mechanic classes, helps organize annual Bike to Work Day events and other bicycling events and offers resources for bicyclists.

4.5.2.3 Bicycle Coalition of New Mexico

This statewide bicycling organization provides bicycle safety educations classes, events and other resources for bicyclists. Website: www.bikenm.org/.

4.5.2.4 Sandia Bike Commuters Group (SBCG)

This bicycle commuter support group was formed in 1995 for employees of Sandia National Labs, a major area employer with about 8,500 employees, at KAFB. About 600 employees are on the mailing list for the SBCG, by which they receive event updates and other supportive communications. Members can also add content to the group's website, which contains many resources for bicyclists such as information on safety, gear and facilities. The group estimates that about 200 employees commute by bicycle regularly. The group also hosts a Bike to Work Day event annually and offers a Bike Buddy program for employees.

4.5.2.5 Duke City Wheelmen Foundation

This local racing team hosts memorial rides and bicycle rides to highlight bicyclist visibility. Website: www.dukecitywheelmen.org/.

4.5.2.6 New Mexico Touring Society

The New Mexico Touring Society (NMTS) is a recreational bicycling club. The group holds numerous weekly rides and helps organize local bicycling programs, such as Bike to Work Day and valet bike parking at local events. The NMTS website also offers resources and information for existing and potential bicyclists. Website: www.nmts.org/.

4.5.2.7 Women's Mountain Bike and Tea Society (WOMBATS), New Mexico Chapter

WOMBATS is a women's mountain biking group in New Mexico. The group offers rides, classes, and other mountain biking activities and resources specifically for women. Website: www.wombats.org

4.5.3 Existing Programs, Events and Campaigns

4.5.3.1 Bicycle Safety Education Classes

The City of Albuquerque offers 150 – 200 bicycle safety education rodeos annually for elementary school students. Since 1996, the program has hosted over 15,000 bike rodeos. The program is aimed at grades 3, 4 and 5, and the program consists of a presentation for the whole grade level followed by individual classes practicing on a skills course. The program brings bikes and all supplies to schools or civic groups.

The League of American Bicyclists (LAB), a national organization, has developed an on-road training curriculum and a series of courses to teach bicycle handling and traffic skills (including Traffic Skills 101, Commuting, Cycling Skills for Kids and more). They certify trainers around the country who may offer these bicycle education sessions. The City offers Traffic Skills 101 classes quarterly. Website: www.cabq.gov/recreation/bicycle.html.

4.5.3.2 Defensive Driving Class

The City requires City employees to take a defensive driving class in order to receive an operator's permit to drive a City vehicle. An employee from the Parks and Recreation Department speaks at each of these classes about bicycle safety, reaching approximately 7000 operators each year.

4.5.3.3 Bike to Work Day

The City and local bicycling groups host Bike to Work Day annually. The 2010 event featured eight commuter stations near major employment areas with breakfast, giveaways such as water bottles and patch kits, prize raffles and a "Bike Buddy" component where beginner bicyclists can ride with more experienced bicyclists. The Bike Buddy program is available on an ongoing basis but is primarily promoted through the Bike to Work Day promotion.

Albuquerque's 2010 Bike to Work Day featured eight commuter stations that offered breakfast, free materials, and prize raffles.

4.5.3.4 Bike Light Giveaway

The City's Safety Program is currently partnering with the Albuquerque Police Bureau (APB) to give away free headlights and taillights to bicyclists. One designated APB officer is responsible for this program, which has given away 150 lights to date.

4.5.3.5 Safe Routes to School

Three Albuquerque public schools are currently using Safe Routes to School funds to implement walking and bicycling programs for students and families: Monte Vista Elementary School, Emerson Elementary School, and Wilson Middle School. The schools have been and will continue implementing encouragement efforts in the next school year. Walking and bicycling education and encouragement programs at these schools include the distribution of suggested route to school maps, International Walk and Bike to School Day, Walk & Roll Day incentive programs, bike rodeos, safety tips in newsletters and walking school buses. Additionally, youth at Wilson Middle School participating in the YMCA after-school program conducted walking assessments and presented their findings and concerns about walking/biking to school at a school/community meeting. Website: www.walkalbuquerque.org/whatwdo.htm#safe_route.

4.5.3.6 "Share the Road" Public Service Announcements

This BikeABQ campaign increases awareness through eight public service announcements that were broadcasted on local television in 2009. The videos are currently available on YouTube. Website: www.youtube.com/user/bikeabq.

A local advocate, Olev Rapido, also coordinated a Share the Road campaign by distributing bumper stickers with bicycle friendly messages. The stickers feature messages such as "Share the Road" and "5 Feet

to Pass: It's the Law." Bumper stickers have been made available at area bicycle shops, sports stores and Whole Foods Market.

Website: bicyclenm.net/OlevRapido/AwarenessInitiative/index.html.

4.5.3.7 Albuquerque Community Bike Recycling Program

This local non-profit volunteer group recycles bicycles by accepting donated parts and bicycles, rebuilding them into working bicycles and donating those bikes to children and adults in need in Albuquerque. The group also hosts bicycle safety and repair demonstrations to public schools and adult groups. Website: www.communitybikerecycling.org/.

4.5.3.8 2010 National and New Mexico Bicycle Rally

This national event was held in Albuquerque on June 3 - 6, 2010 and featured classes, rides, guest speakers and a film. The national event kicked off the first state bike rally in New Mexico. The Bike Coalition of New Mexico plans to hold annual state bike rallies after this year.

4.5.3.9 Valet Bike Parking

Valet bike parking is offered at the Balloon Fiesta and Freedom Fourth as a joint effort of the New Mexico Touring Society, BikeABQ, the City and the event organizers.

4.5.3.10 University of New Mexico Bicycle Programs

The University of New Mexico offers many services for bicyclists on campus, including students, faculty and staff. The campus features many racks and 50 bike lockers, as well as a bike shop, which offers bicycle repair, maintenance, and rental bikes for recreation. Campus-suggested bike route maps are published as part of parking and transportation information, and maps of bicycle racks and lockers are available online.

The Parking and Transportation Services Department also offers a bike sharing program to campus departments. Ten bikes are loaned out to 10 departments on an annual basis for work- or university-related use. In addition to the bike, the department receives appropriate gear and bicycle safety education and agrees to store the bike indoors.

In addition to a campus bike parking map, the University's bicycle program website offers free bike registration, a guide to bicycle security, bicycling safety and maintenance tips and links to other resources. Website: pats.unm.edu/bike_it.cfm.

4.5.3.11 Group Rides

Various bicycling groups in Albuquerque host group road and trail rides, such as Farmers Market tours and the Ride of Silence to honor bicyclists killed and injured in crashes, charity rides, etc. The BikeABQ blog promotes these community rides.

4.5.3.12 Guaranteed Ride Home Program

The City's transit provider, ABQ Ride, offers free guaranteed ride home service for residents who commute to work or school by bike, walking, carpooling, vanpooling or transit at least three times a week. The service is offered within ABQ Ride's bus route service area.

4.5.3.13 Driver Education

Three independent driving schools have signed up for the City's Share the Road presentations. This presentation lasts approximately one hour and teaches new motorists their responsibilities toward cyclists. It also teaches the new motorists the rights and responsibilities for cyclists. The interactions and questions from the new drivers have been priceless.

5.0 Bikeway Quality Index (BQI)

The goal of BQI analysis is to capture a snapshot of the current condition of biking infrastructure using both qualitative and quantitative measures. Studying well-performing bikeways and pinpointing deficient facilities will allow improvements to be carefully targeted to areas that need improvement or areas where minimal improvement will significantly improve the cycling experience.

5.1 Bikeway Segment Definition

Using existing GIS data, project staff surveyed existing bicycle facilities, including trails. The segments range in length from 250 feet to over 6,000 feet. The following graphic shows a typical division of segments.

5.2 Data Collection and Synthesis

The team collected data for all the existing trails within the city. Each route was followed on a bicycle and rated for a number of criteria including pavement quality and width. The data for street routes were taken primarily from the provided GIS data and most of the evaluation factors like speed and pavement quality were estimated based on facility type.

5.3 Bikeway Quality Analysis

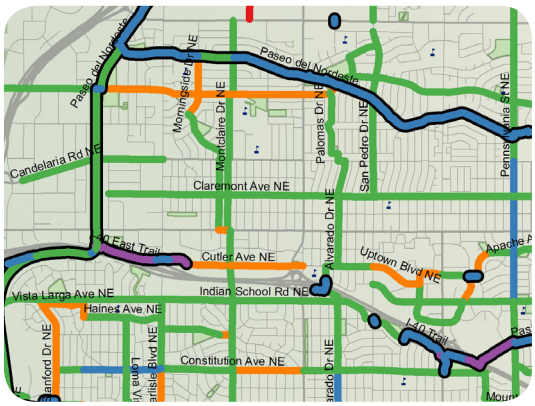
The BQI factors included are:

Auto Speed

Definition
The posted speed of the segment.

Reasoning
Auto travel speed plays a large part in how comfortable cyclists feel while traveling on the road. Generally, increasing auto speeds are associated with decreasing cyclist comfort and quality of the cycling experience.

Basic Methodology
Speed was combined with volume data to create a composite measurement. (See Speed and Volume Integration).



Color changes represent segment changes

Auto Volume

Definition
The average number of cars that pass along a street is called Average Daily Traffic (ADT). The City provided ADT data for most segments, and this number was used when available. When this information was not available or counts were taken before the year 2000, an estimated volume was assigned. This estimate was based on the street's functional classification (local highway, arterial or local street) and number of auto lanes.

Reasoning
As a general rule, increasing auto volumes equate to decreasing cyclist comfort and ride quality.

Basic Methodology
See speed volume integration factor (below) for calculation detail.

Speed and Volume Integration

Definition

The relationship between auto speed and volume plays a significant role in defining the feeling of comfort on a road segment. Four extreme relationships are recognized: low speed-low volume, low speed-high volume, high speed-low volume and high speed- high volume.

The relationship between these variables is not linear: for example, a high speed-low volume street may be worse than a low speed-high volume street. Most cyclists prefer more slow moving vehicles to few fast moving vehicles. By assigning categorical rankings of speed and volume, we can more closely define how cyclists respond to varying combinations of these factors.

Reasoning

Speed and volume each impact cyclist comfort and ride quality, and these factors interact in a non-linear manner. It is appropriate to create a composite measure that captures this interrelationship.

Basic Methodology

Each segment is assigned to a category based on the speed and volumes in Table 1 below. The color key (best – worst) results in a quantitative ranking of 1 (worst) – 5 (best).

Table 1. Speed and Volume Relationship Methodology

Motor Vehicle Daily Volume					
10,000+	2	2	2	1	1
8,000	2	2	2	1	1
6,000	3	3	3	2	1
4,000	4	3	3	2	1
2,000	8	4	3	3	2
1,000	5	8	4	3	2
500	5	5	4	3	2
Posted Speed (MPH)	18	25	30	35	40+

Facility Width

Definition

The width of the bike lane: This is measured from the center of the lane striping on each side. If the bike lane is against a curb, the width is measured from the center of the lane stripe to the edge of the curb. Bike lanes received 1 – 3 points based on the following criteria:

- 1 point if the facility was less than 5 feet wide
- 2 points if the facility was exactly 5 feet wide
- 3 points if the facility was more than 5 feet wide

The width of a trail/path: This is measured from the edge of the pavement on one side to the edge of the pavement on the other side. Multi-use trails received 1 – 3 points based on the following criteria:

- 1 point if the facility was less than 8 feet wide
- 2 points if the facility was exactly 8 feet wide
- 3 points if the facility was more than 8 feet wide

The width of Bike Boulevards/shared roads: This is not measured. Due to the nature of the facility it is assigned the highest width score.

Reasoning

Wider facilities are more comfortable than narrow facilities.

Basic Methodology
The data was added to the GIS from several sources including field checks and City GIS data. There were no calculations performed to get these numbers. They were simply added to the GIS data as width in feet per segment and scored in the overall segment analysis.

Pavement Quality

Definition
Pavement quality was assigned as an overall measure of quality throughout the entire segment. Facilities were assigned 1 – 5 points based on the basic pavement quality.

- 5 - Only new or nearly new pavements are likely to be smooth enough and free of cracks and patches to qualify for this category.
- 4 - Pavement, although not as smooth as described above, provides a smooth ride while exhibiting some signs of surface deterioration.
- 3 - Riding qualities are noticeably inferior to those rated at a 4 or 5. Defects may include rutting, cracking - longitudinal or transversemap cracking, raveling and extensive patching. This is the maximum rating for any pavement that has a ridge height greater than ¼" at gutter lip.
- 2 - Flexible pavement having distress over 50 percent or more of the surface, washboard surface, potholes and pavement shoving. Rigid pavement distress includes joint spalling, patching, etc. Bike lanes that have valve boxes or manholes that have not been adjusted to grade.
- 1 - Pavements that are in an extremely deteriorated condition. Distress occurs over 75 percent or more of the surface.


Good pavement quality

Reasoning
Cyclists are more affected by pavement quality than automobiles. Poor pavement quality can be distracting to a cyclist, potentially dangerous due to potholes and cracks and can decrease the quality of the ride experience.

Basic Methodology
These were qualitative measures gathered in the field or assumed based on facility type. There were no calculations performed to get these numbers. They were simply added to the GIS data as value per segment and scored in the overall segment analysis.


Poor pavement quality

Signing and Marking

Definition
The segment is assigned a score of 1 if it is signed and marked as a trail or bike route.

Reasoning
Signed and marked bikeways improve wayfinding and can increase use.

Basic Methodology

These were qualitative measures gathered in the field or assumed based on facility type. There were no calculations performed to get these numbers. They were simply added to the GIS data as value per segment and scored in the overall segment analysis.

Poor pavement quality

Facility Evaluation and Model Outcomes

The data gathered for each bikeway segment is then used to score each segment using a 0-20 scale, shown in Table 2.

Bicycle Quality Index Factor Weights			
	Scoring	On-Street	Off-Street
Facility Width**	3	Bike Lane 3 - Wider than 5' 2 - 5' Wide 1 - Less than 5' Wide	Multi-Use Trail 3 - Wider than 8' 2 - 8' Wide 1 - Less than 8' Wide
Facility Quality*	5	5 - New 4 - Excellent	
Cyclist Exposure*	5	See Motor Vehicle Speed and Volume	
Facility Type	5	5 - Multi-Use Trail 4 - Bicycle Boulevard	
Signing/Marking*	1	One point if facility is signed and marked to	
Facility Lighting*	1	One point if facility is lit by street lights or trail	
specific segment an average score was assigned.			
** Other facility types received full points for facility width			

Table 2. Bicycle Quality Index Factor Weights

Facilities had the potential to score up to 20 points, with scores ranging from 6 to 19. No facility scored a perfect 20 points. Both multi-use trails and on-street facilities were scored on the same scale to facilitate the comparison of the cycling experience, though in some cases different criteria were used. Multi-use trails generally scored higher than on-street facilities; while the lowest trail segment scored a 13, the lowest scoring on-street facility scored a 6. The average score for multi-use trail segments was a 16.1, while the average score for an on-street facility was 12.4. This is consistent with the most people's perception of relative level of comfort in on-street vs. off-street facilities. Within the on-street facilities, it is useful to sample the variation in average facility quality. Table 3 shows the on-street facility types and associated average segment scores:

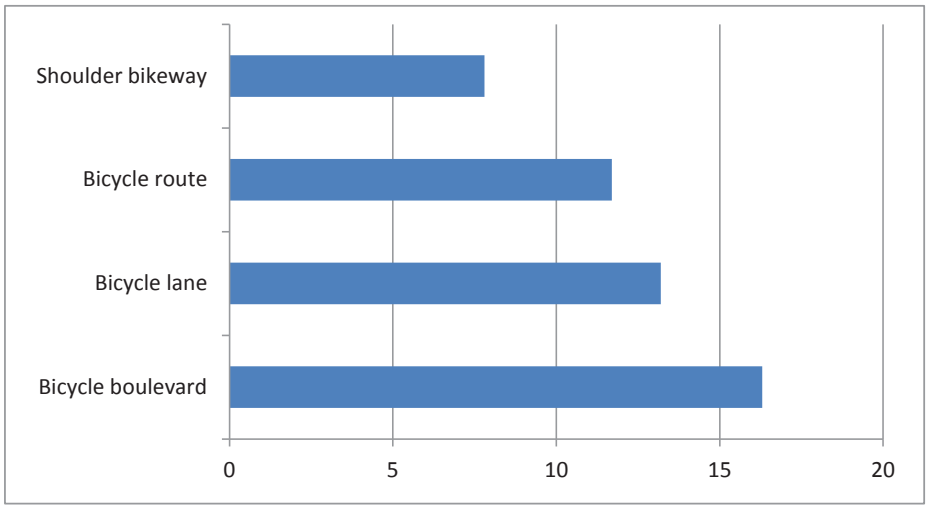
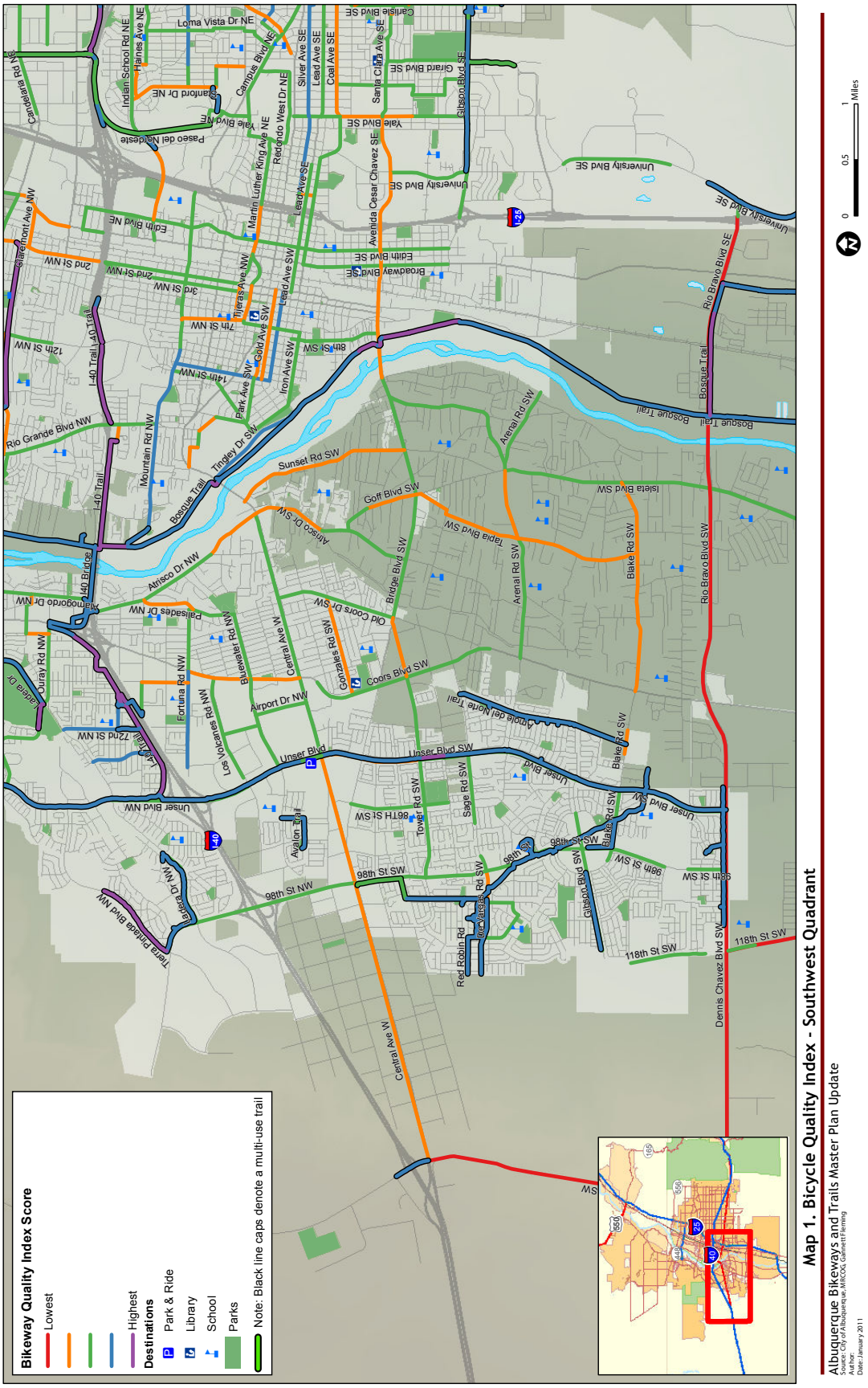


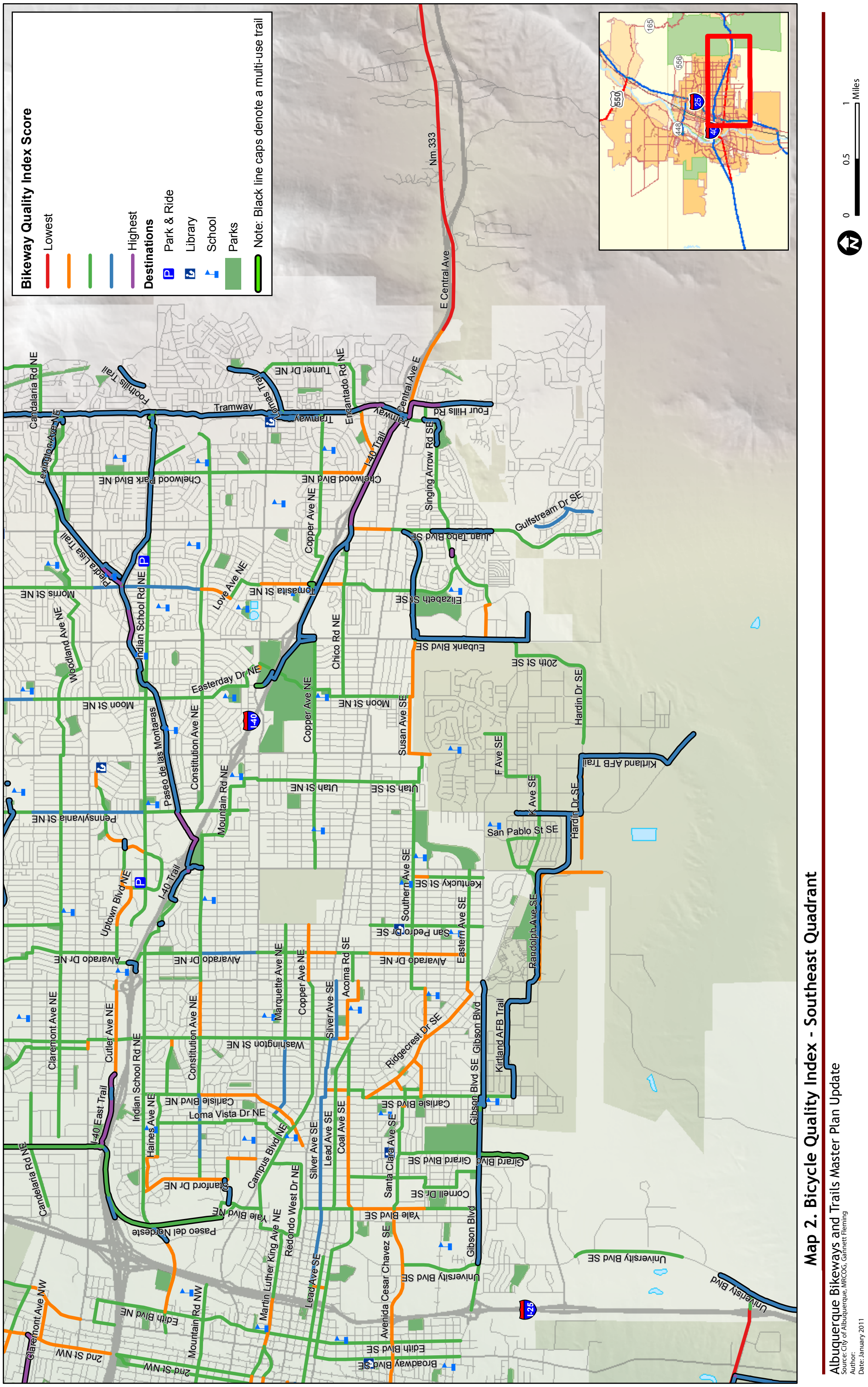
Table 3. Average Scores for On-street Bikeways by Type

These average scores are consistent with the expected variation in the level of quality and comfort most cyclists experience with riding on these types of facilities. Of course, there are some cyclists that prefer on-street riding to cycling on multi-use trails and experience the same quality of ride on all facility types.

This tool has many potential uses beyond the development of project recommendations, one of which is to highlight high performing facilities and quantify the reasons for excellent performance. Once measured, this information can be extracted and applied to other facilities throughout the city. For example, the quality of cycling facilities in the Northwest quadrant of the city is high based on the presence of many multi-use trails that provide many opportunities to bicycle on a network of trails that are separated from motor vehicles. However, looking at the cycle zone factors for land use indicates that many people may not bicycle in this area due to a relatively low population and employment density and a relatively low quality of roadway connections, which decreases the opportunity for cyclists to choose their route. However, the Northwest quadrant performs well in terms of exiting bikeway density and connectivity, indicating that cyclists may find it easier to traverse this part of the city on designated bikeway facilities than the Southwest quadrant or portions of the Southeast quadrant. Examination of the BQI map indicates that the Northwest quadrant can be significantly improved through increased connection of bikeways and roadways.

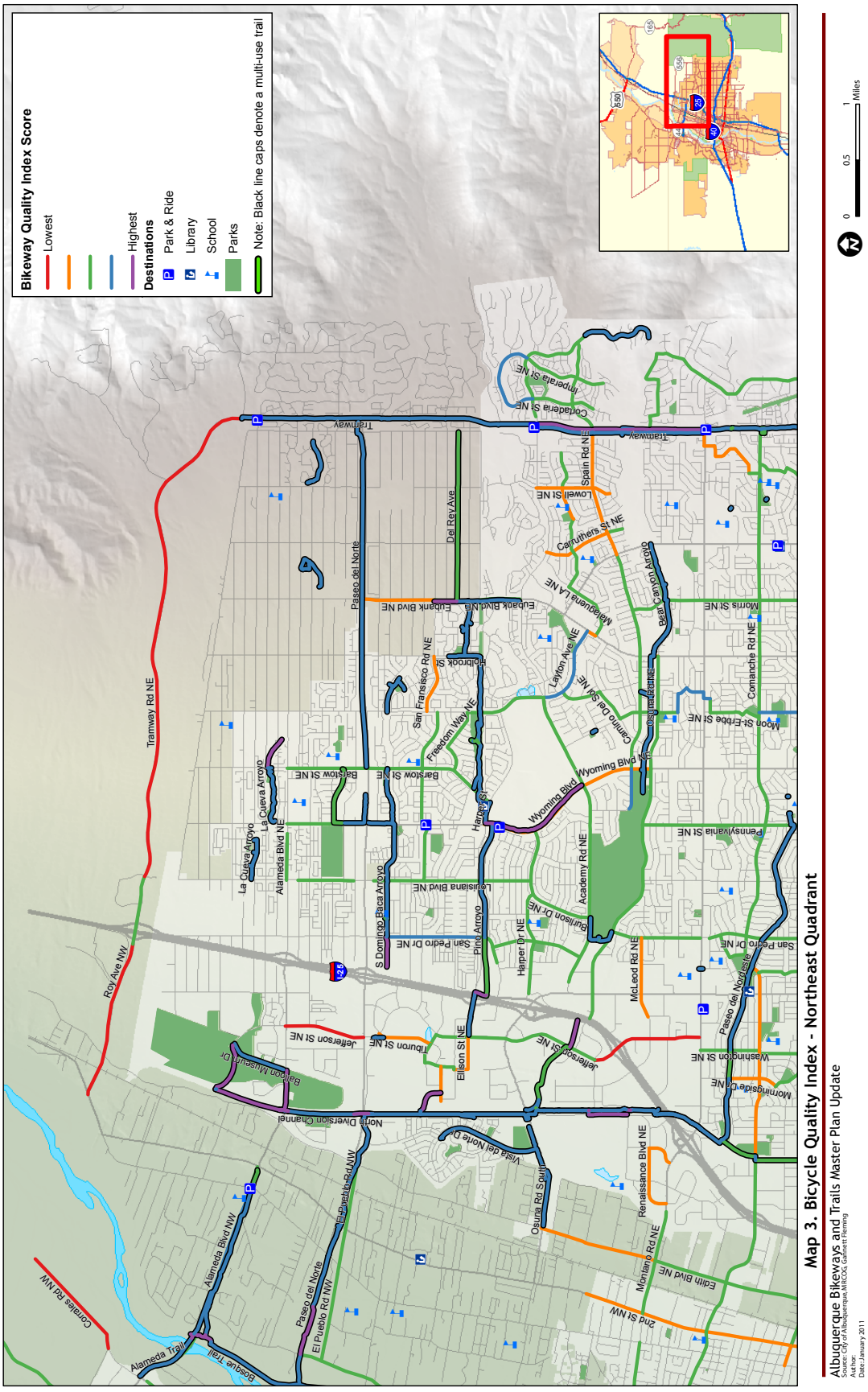
Another use of the BQI tool is the examination of conditions within the facility types to identify priorities for spot improvements. For example, an analysis of surface quality conditions on the multi-use trail system can be used to generate a list of repaving priorities. For example, existing multi-use trail facilities that scored a 1 or 2 for surface quality should be considered priorities for repaving projects. Similarly, bicycle lanes that scored a 1 for facility width should be widened to five feet, especially along bicycle lanes with high roadway speeds and volumes.


Bikeway Quality Index Score
Lowest
Highest
Destinations
Park & Ride
Library
School
Parks
Note: Black line caps denote a multi-use trail
0
0.5
1
Miles
Loma Vista Dr NE
Indian School Rd NE
Haines Ave NE
Candelaria Rd NE
Campus Blvd NE
Silver Ave SE
Lead Ave SE
Coal Ave SE
Carlisle Blvd SE
Girard Blvd SE
Gibson Blvd SE
Yale Blvd SE
Yale Blvd NE
Redondo West Dr NE
Martin Luther King Ave NE
Lead Ave SE
Avenida Cesar Chavez SE
University Blvd SE
Edith Blvd NE
Broadway Blvd SE
Claremont Ave NW
2nd St NW
3rd St NW
Tijeras Ave NW
Lead Ave SW
Gold Ave SW
7th St NW
8th St SW
12th St NW
14th St NW
Park Ave SW
Iron Ave SW
I-40 Trail
I-40 Bridge
Rio Grande Blvd NW
Mountain Rd NW
Tingley Dr SW
Bosque Trail
Rio Bravo Blvd SE
Sunset Rd SW
Arenal Rd SW
Goff Blvd SW
Isleta Blvd SW
Atrisco Dr NW
Atrisco Dr SW
Tapia Blvd SW
Blake Rd SW
Bridge Blvd SW
Old Coors Dr SW
Palisades Dr NW
Bluewater Rd NW
Central Ave W
Gonzales Rd SW
Coors Blvd SW
Ouray Rd NW
Fortuna Rd NW
Los Volcanes Rd NW
Airport Dr NW
Arbole del Norte Trail
Unser Blvd
Unser Blvd NW
Unser Blvd SW
Tower Rd SW
Sage Rd SW
86TH St SW
98th St NW
98th St SW
98th St
98th St SW
98th St SW
Gibson Blvd SW
Red Robin Rd
Dennis Chavez Blvd SW
118th St SW
Tierra Pintada Blvd NW
Avalon Trail
Map 1. Bicycle Quality Index - Southwest Quadrant
Albuquerque Bikeways and Trails Master Plan Update
Source: City of Albuquerque, MRCOG, Gallanet Planning
Author:
Date: January 2011



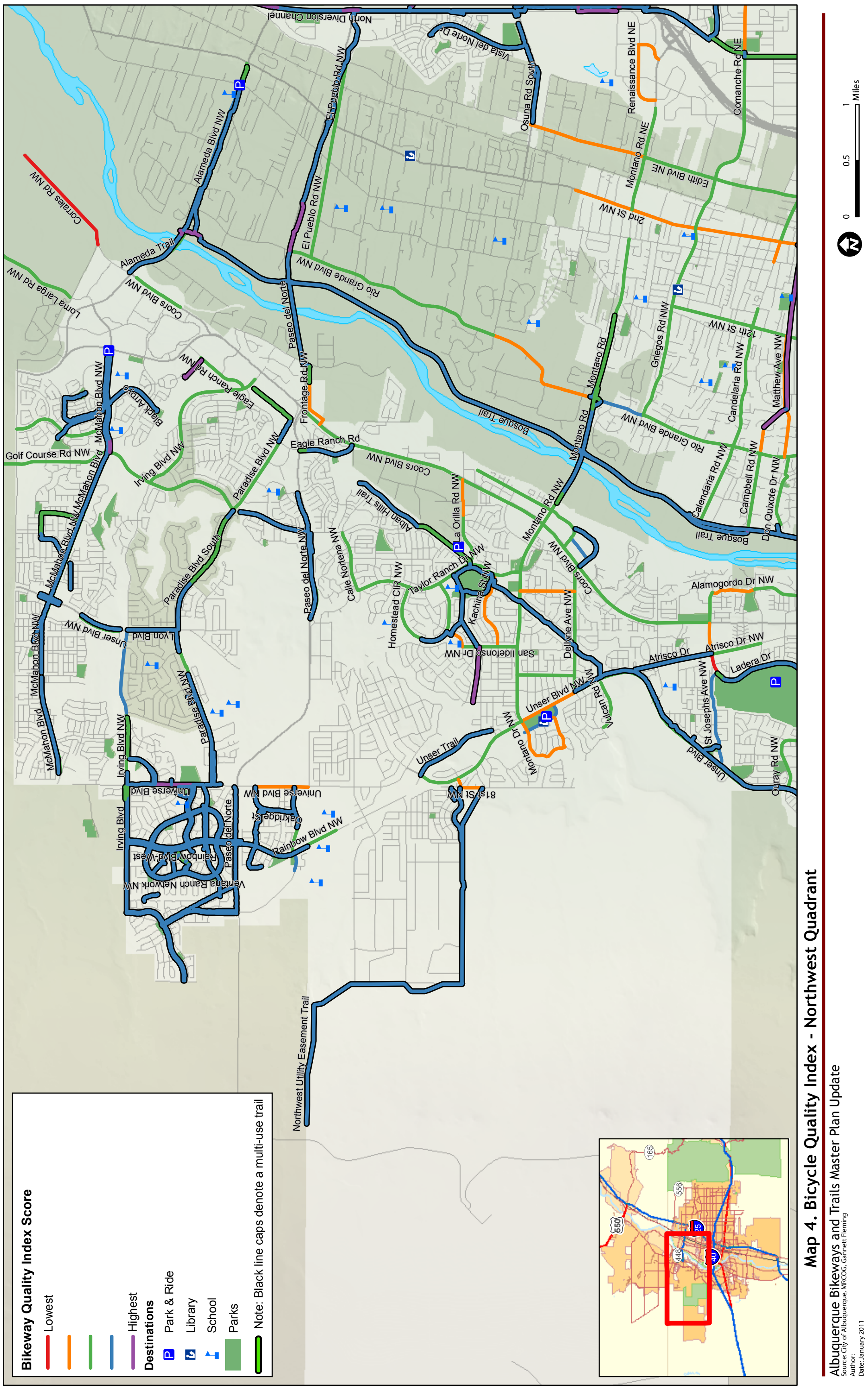
Map 2. Bicycle Quality Index - Southeast Quadrant

Albuquerque Bikeways and Trails Master Plan Update
Source: City of Albuquerque, MRCOG, Gannett Fleming
Author:
Date: January 2011



Map 3. Bicycle Quality Index - Northeast Quadrant

Albuquerque Bikeways and Trails Master Plan Update
Source: City of Albuquerque, MRCOG, Gallanet Planning
Author:
Date: January 2011


Bikeway Quality Index Score
Lowest
Highest
Destinations
Park & Ride
Library
School
Parks
Note: Black line caps denote a multi-use trail
Corrales Rd NW
Alameda Blvd NW
Alameda Trail
Loma Larga Rd NW
Coors Blvd NW
North Diversion Channel
El Pueblo Rd NW
Paseo del Norte
Rio Grande Blvd NW
Vista del Norte D
Osuna Rd South
Renaissance Blvd NE
Comanche Rd NE
Montano Rd NE
Edith Blvd NE
2nd St NW
Griegos Rd NW
12th St NW
Candelaria Rd NW
Matthew Ave NW
Montano Rd
Bosque Trail
Eagle Ranch Rd NW
Eagle Ranch Rd
Frontage Rd NW
Golf Course Rd NW
McMahon Blvd NW
Irving Blvd NW
Paradise Blvd NW
Paradise Blvd South
Unser Blvd NW
Lyon Blvd
Universe Blvd NW
Rainbow Blvd NW
Ventana Ranch Network NW
Oakridge St
Northwest Utility Easement Trail
La Orilla Rd NW
Taylor Ranch Dr NW
Kachina St NW
Homestead CIR NW
Calle Nortena NW
Paseo del Norte NW
Alban Hills Trail
San Ildefonso Dr NW
Delamie Ave NW
Atrisco Dr
Atrisco Dr NW
Ladera Dr
Alamogordo Dr NW
Calendaria Rd NW
Campbell Rd NW
Don Quixote Dr NW
St Josephs Ave NW
Vulcan Rd NW
Montano Dr NW
Unser Trail
81st St NW
Unser Blvd
Ouray Rd NW
Miles
0
0.5
1

Map 4. Bicycle Quality Index - Northwest Quadrant

Albuquerque Bikeways and Trails Master Plan Update
Source: City of Albuquerque, MRCOG, Gannett Fleming
Author:
Date: January 2011

6.0 Albuquerque cycle zones

The cycle zone Analysis (CZA) tool allows the City to better understand which parts of the city are best suited for capturing large numbers of cycling trips (which have greater potential to do so than they are currently), which areas are best suited for strategic investments and which areas may need innovative bikeway treatments to maximize cycling potential. Breaking the city into zones that share similar characteristics allows a comparison and analysis that provides information that can be used to guide future facility investments.

6.1 Cycle Zone Definition

A cycle zone is defined as an area of the city that possesses similar characteristics for cycling. cycle zones are not Transportation Analysis Zones (TAZ), and TAZs cannot be used for cycle zone analysis. Generally, a cycle zone is defined by features that represent significant barriers or crossing difficulties, like I-25, I-40 and the Rio Grande River. They are also defined by neighborhoods and areas that contain places that are desirable destinations for cyclists like parks or neighborhood centers. In addition, cycle zone boundaries reflect a change in the character of a neighborhood (e.g., block size or street connectivity).

The cycle zones and their boundaries were delineated by City and consultant staff familiar with cycling conditions, neighborhoods and features that represent crossing difficulties for cyclists. The City's political limits also served as a boundary for this analysis.

6.2 Data Gathering and Synthesis

The analysis was based on existing data from the City of Albuquerque and Bernalillo County.

The measures that were chosen and the reasoning for their inclusion in the cycle zone analysis equation are discussed in more detail below. In many cases, the selected measures were translated into density units – square acres or linear feet – to account for size variations between zones. The following measures were used for cycle zone analysis:

Road Network Density: (feet per square acre)

Definition

The density in linear feet per square acre of all roads in the cycling zone. This includes roads of all types, including local streets, arterials, highways and freeways.

Example

Reasoning

A zone with a greater density of roads will facilitate a better cycling experience. Riders will be able to go more places and have greater route choice.

Basic Methodology
GIS tools were used to determine the overall length of roads falling within each cycle zone. This was divided by the zone's acreage to obtain an average road network density.

Bike Network Density: (feet persquare acre)

Definition
The density in linear feet per square acre of all the City's bicycle facilities within a specific cycling zone. The facilities used for this analysis include only existing facilities.

Example

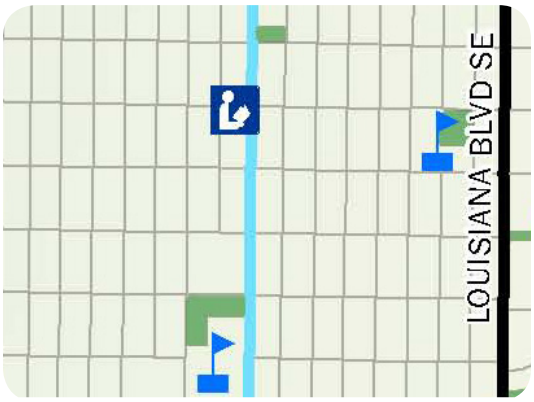
Reasoning
The presence of facilities designed for cyclists increases their comfort and safety. A greater presence of cycle facilities will improve the cycling experience.

Basic Methodology
The bicycle network layer was intersected with the cycle zone boundary and then the lengths of each segment or partial segment that fell within a specific zone were summed. The resulting number was divided by acreage to obtain the average density.

Road Network Connectivity

Definition
A measure of road network connectivity, this number ranging from 0 – 1 represents the ratio of cul-de-sacs and three-way intersections to four-or-more-way intersections. The closer to one, the more grid-like the street pattern. An overall average score was calculated for each zone.

Example



Reasoning
A zone with greater roadway connectivity will facilitate a better cycling experience. Riders will be able to easily go more places and have greater route choice.

General Methodology
GIS was used to determine all points in the city where one road was intersected by at least one other road. The location and number of roads at each intersection point were recorded. For each cycle zone, the overall number of intersections was summed up as well as the number of intersections that were at least four ways. These numbers were used to determine the percentage of intersections that were four-ways or more.

Bike Network Connectivity

Same measure and use as road network connectivity, but applied specifically to the existing on-street bicycle and trail network.

Slope: (percentage greater than 5%)

Definition
The percentage of roads and bikeways with slope greater than 5% for each cycle zone.

Reasoning
Topography can decrease the ease of cycling. A great cycle zone will be relatively flat. Topography is an issue that is difficult or impossible to change and is very important to consider when evaluating the bik-ability of a zone.

General Methodology
Elevation data from the United States Geologic Service was used to determine the elevation at all starting and ending points of the road segments in the city. The elevations were used to calculate the overall slope for each road segment.

Land Use Mix

Definition
This factor combines the degree of concentration of cycling generating land uses in a cycle zone with the residential and employment density in a cycle zone.

Reasoning
Areas with a high population and employment density as well as a good use of bicycle trip generating land uses create a significant number of potential cycling trips.

Calculation

The methodology involves calculating both the overall level of land use mix and combined residential and employment density in each cycle zone. The scores from the land use mix and residential and employment datasets were then integrated as shown in Table 1.

Table 1. Employment Density and Land Use Integration

Residential & Employment Density *(residents and employees per acre)*							
18.1 - 20.9	1G	2G	3G	4G	5G	6G	7G
15.3 - 18.1	1F	2F	3F	4F	5F	6F	7F
12.5 - 15.3	1E	2E	3E	4E	5E	6E	7E
9.7 - 12.5	1D	2D	3D	4D	5D	6D	7D
7.0 - 9.7	1C	2C	3C	4C	5C	6C	7C
4.2 - 7.0	1B	2B	3B	4B	5B	6B	7B
1.3 - 4.2	1A	2A	3A	4A	5A	6A	7A
Land Use Mix *(% Commercial, Institutional, or Mixed Commercial-Residential)*	19 - 25	28 - 31	31 - 36	36 - 42	42 - 47	47 - 51	51 - 56

Ratings Scale	
Violet	Highest (8)
Indigo	(7)
Dark Blue	(6)
Light Blue	(5)
Green	(4)
Yellow	(3)
Orange	(2)
Red	Lowest (1)

Model and Zone Scores

Once the cycle zone analysis is complete, the scoring, normalization and weighting of the data occurs. Positive Z-Scores are calculated for each major metric of the Cycle Zone Analysis and then weighting is applied. Score weighting is shown in Table 2.

Table 2. Composite CZA Factor Weights

Factor	Weight (Percent)
Road Network Connectivity	10
Road Network Density	10
Topography	10
Land Use	20
Existing Bikeway Connectivity	25
Existing Bikeway Density	25

Composite scores showing the relative quality of the cycling experience in each zone are displayed on Map B-1. Higher scores represent areas that have the best existing cycling conditions. These are zones 19, 20, 23 and 24. Zone 4 is the highest scoring zone on the west side of the river due to a dense and well-connected network of bicycle facilities. Zones 8 and 25 generally scored the lowest for most factors including land use, existing roadway network density and connectivity and existing bikeway network connectivity.

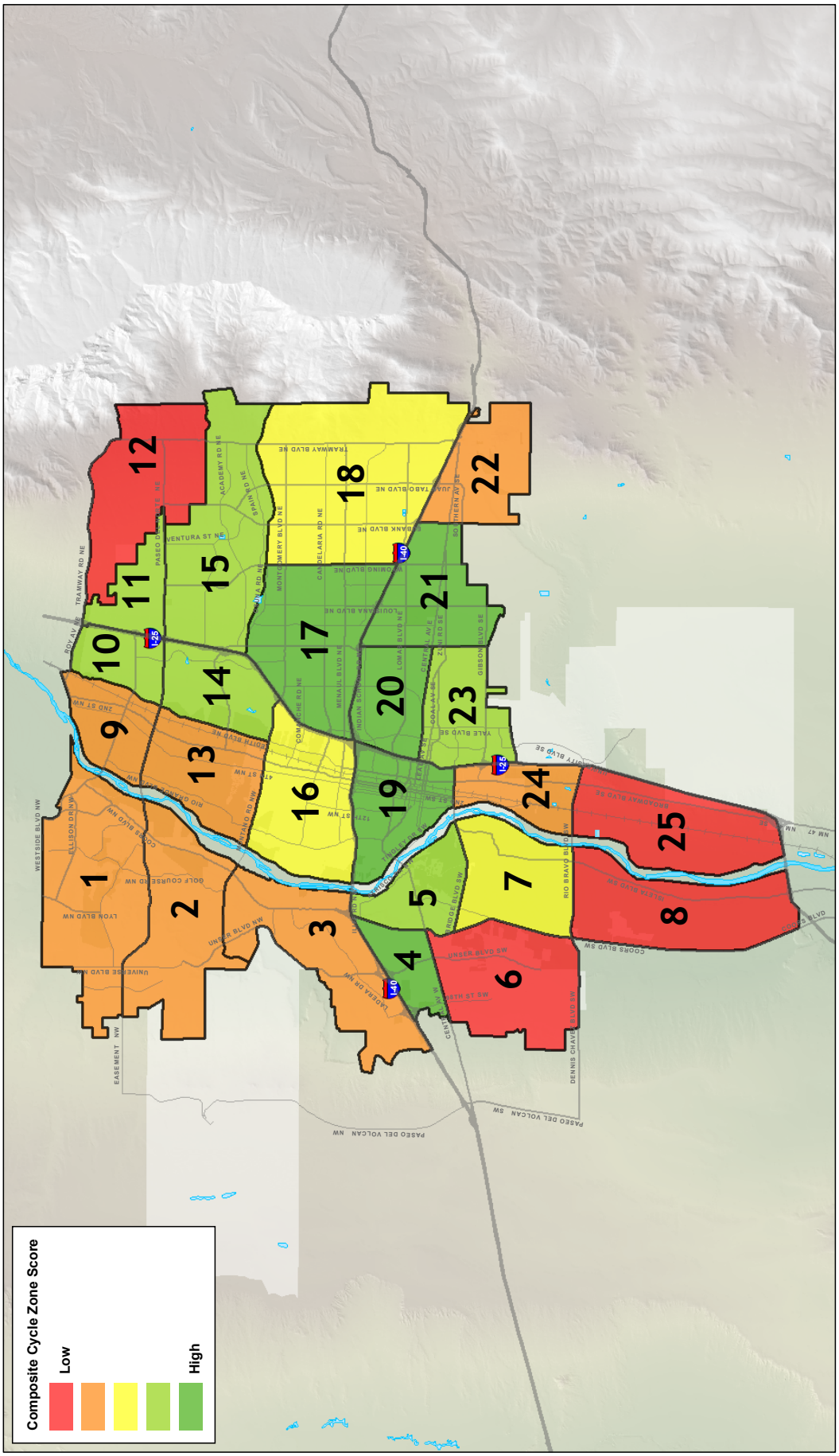
Table 3 shows the scores for each zone by from low to high. This table can be used to understand the existing conditions in each zone, understand the factors that can be changed and develop a strategy to develop each zone to its maximum cycling potential. For example, zone 4 scores poorly for roadway density but well for connectivity. The factors that contribute the highest percentage of the overall score for bikeway density and bikeway connectivity are some of the highest in the city. This contributes to a high over-

all score, but cyclists still may face challenges traversing this zone on roadways that are not part of the designated bikeway network due to lower roadway density and connectivity. These findings indicate that as the roadway network in this zone increases, the relative quality of the cycling network will increase. Any new construction in this zone should include accessways to facilitate bicycle and pedestrian connectivity. These accessways should be signed to increase user's awareness of these facilities. A summary of existing conditions along with suggested strategies to improve the relative cycle zone analysis scores is included in Appendix A. Maps showing the relative score for each factor are included in Appendix B.

Table 3. Summary of CZA Factor Scores

Zone Number	Bikeway Connectivity	Roadway Connectivity	Bikeway Density	Roadway Density	Topography	Land Use	Composite CZA
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Value Key	
Low	
High	



Map 1. Cycle Zone Analysis Composite Existing Conditions

Albuquerque Bikeways and Trails Master Plan Update
Source: City of Albuquerque, MRCOG, Cabinet Planning
Author:
Date: January 2011

7.0 End-of-Trip Facility Evaluations

End-of-trip facilities, including bicycle parking and other facilities such as showers and clothing lockers, can be a determining factor in whether someone decides to make a bicycle trip. They enhance the bicycling experience by providing cyclists with somewhere to park and somewhere to refresh themselves following their trip. Numerous studies have shown the value of these facilities in attracting cyclists to employment and activity centers and in supporting multi-modal trips. In fact, in the online survey conducted earlier in this planning process, nearly 70% of the people who responded indicated that more bicycle parking would likely influence them to bike and/or use the multi-use trail network more often (see Figure 1).

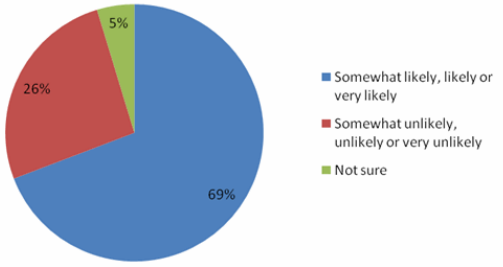


Figure 1 – Question 28 - Would more bicycle parking influence you to bike and/or use the multi-use trail system more often? (916 responses)

Bicycle parking includes both long-term (often referred to as Class A or Class I) and short-term (often referred to as Class B of Class II) parking. These cater to different cycling groups depending largely on their trip duration and desired level of protection from weather and/or theft. Table 1 compares the typical characteristics of short- and long-term bicycle parking.

Other end-of-trip facilities enable cyclists to freshen up following a trip and can include showers, washrooms and clothing lockers, but may also include other services such as a laundry or dry-cleaning and bike-related services.

Table 1. Characteristics of short- and long-term bicycle parking

Criteria	Short-Term (Class B) Bicycle Parking	Long-Term (Class A) Bicycle Parking
Parking Duration	Less than two hours	More than two hours
Typical Fixture Types	Bicycle racks	Lockers or racks provided in a secured area
Weather Protection	Unsheltered	Sheltered or enclosed
Security	High reliance on personal locking devices and passive surveillance (i.e., eyes on the street)	Restricted access and / or active surveillance / supervision *Unsupervised:* "Individual-secure", e.g., ,bicycle lockers "Shared-secure", e.g., bicycle room or cage *Supervised:* Valet bicycle parking Video, CCTV or other surveillance
Typical Land Uses	Commercial or retail, medical/healthcare, parks and recreation areas, community centers	Residential, workplace, transit, schools

End-of-trip facilities for bicycles are currently found throughout Albuquerque. Short-term parking is provided using bicycle racks in many public places as well as outside private buildings, while long-term parking and other end-of-trip facilities are provided at some publicly accessible sites but mostly on private property (e.g., as part of an office building).

The provision, design and placement of bicycle parking facilities varies widely. Local and national best practices can be used to encourage a more consistent approach to end-of-trip facilities to maximize the usefulness of these facilities and minimize maintenance costs.

7.1 Bicycle Parking and other End-of-Trip Facilities

Bicycle parking can be divided into three types: short term, valet and long term, as described below.

7.1.1 Short-Term Parking

Short-term bicycle parking facilities consist of bicycle racks. These facilities are intended to accommodate bicycles of visitors, customers, messengers and others for short periods of time. Racks are relatively low-cost devices that typically hold between two and eight bicycles, allow bicyclists to securely lock their frames and wheels, are secured to the ground and are located in highly visible areas.

Figure 23: Example of Short-Term Bicycle Parking Facilities

Albuquerque zoning code provides the following requirements for bicycle parking:

Parking for bicycles shall be provided on-site or on a site within 300 feet of the use, measured along the shortest public right-of-way, as follows:

(1) Residential use (five or more dwelling units or mobile homes per lot): One bicycle space per two dwelling units.
(2) Dormitory, fraternity or sorority house: One bicycle space for every six persons in residence.
(3) Nonresidential uses: One bicycle space for every 20 parking spaces required for automobiles and light trucks, but no less than two spaces per premise unless otherwise specified below:
    (a) Drive-in theater, mortuary, motel or hotel rental unit: None.
    (b) Elementary and middle school: One bicycle space for every 20 students.
    (c) High school, commercial and trade: One bicycle space for every 50 students.

7.1.2 Valet Parking

Recently the City has experimented with Valet Bicycle Parking during special events that attract people traveling to the event by bicycle. For example, at the 2009 Albuquerque International Balloon Fiesta approximately 200 secure bicycle parking spaces were available. The valet parking area was conveniently located next to a multi-use trail that connects the North Diversion Trail to the nearby balloon launching fields. At peak use times the parking area was at full capacity. The City should be encouraged to continue this type of service at public events.

7.1.3 Long-Term Parking

The City has installed, through the Transportation Demand Program (TDM) Program, over 300 bicycle lockers at over 23 locations. The TDM program encourages the use of alternative modes of transportation to improve air quality and decrease traffic congestion in the Albuquerque area. The TDM programs implemented by the public and private sectors help reduce traffic and sustain Albuquerque's economic vitality and air quality, thereby preserving and strengthening the quality of life in the city.

Figure 24: Example of Bike Lockers that are Available through the TDM Program
Source: http://www.cabq.gov/albuquerquegreen/green-goals/transportation-options/bicycles

The City installs an average of 50 lockers per year. The locations for theses lockers come from request by individuals and employers. The purpose of this program is to provide secure bicycle parking to encourage bicycle commuting. Major employers that have taken advantage of the bike locker program include Intel, Honeywell and the University of New Mexico.

7.1.4 End-of-Trip Facilities

The City has no zoning requirement for end-of-trip facilities other than the bicycle parking requirements. Some businesses provide end-of-trip facilities such as bike lockers, showers and changing rooms for employees who commute to work.

7.2 Summary of Recommendations

This section provides recommendations for improving end-of-trip facilities in Albuquerque. Recommendations include sample policies, incentives, programs and design guidelines. In general, the City should:

- Require bicycle parking and end-of-trip facilities in both newly constructed buildings and redevelopment.
- Consider both long-term and short-term parking requirements.
- Provide incentives to encourage bicycle parking facilities beyond the minimum requirements.
- Provide guidance on the design and placement of these facilities.
- Establish a bike rack program that assists in the location, design and funding of bicycle racks to stimulate retrofitting short-term bicycle parking in the existing network.
- Consider placement of enahcned bicycle facilities (e.g., a bicycle depot) at key transit exchanges, such as the Alvarado Transit Center, if demand analysis indicates adequate potential for facility use.

7.2.1 City Programs

The City has several programs that support bicycling, including the maintenance of a website dedicated to bicycling and the production of a comprehensive bicycle map. The City has installed over 300 bicycle lockers at 23 locations, installing approximately 50 lockers each year. Several major employers have taken advantage of the Bicycle Locker Program, which is designed to encourage bicycle commuting through the provision of secure bicycle parking.

- Bicycle Rack Program - The City does not currently have a bike rack installation program, which would be an excellent way to encourage utilitarian bicycle trips to retail and other destinations.

7.2.2 Recommended Locations for Additional Bicycle Parking Facilities

The online survey, which had over 1200 responses, contained two questions related to the location of additional bicycle parking facilities. The top responses to the question of which types of places should have more bike racks or lockers were grocery stores, shopping centers, work sites, restaurants and parks. Respondents provided specific locations for additional bicycle parking, including throughout the downtown and Nob Hill areas as well as along Central Avenue. Grocery stores (including Albertsons and Whole Foods) and transit stops were other common responses. The University of New Mexico Hospital was the single most common suggestion. The most effective way for the City to increase parking at these and other locations would be through a Bicycle Rack Program. The City could kick off such a program by conducting outreach to businesses in the areas of town and to the types of businesses identified above.

7.3 Bicycle Parking Code

7.3.1 Bicycle Parking Code

Albuquerque's existing bicycle parking standards are elegant in their simplicity. However, they also lack certain desirable elements:

- First, the existing standards do not contain requirements for long-term bicycle parking. While the City clearly understands the importance of secure bicycle facilities, as exemplified by its Bicycle Locker Program, more extensive long-term bicycle parking facilities could encourage more bicycle commuting.
- Second, given the wide range of non-residential land uses that are technically required to provide a minimum of two bicycle parking spaces, it appears that compliance with the bicycle parking requirements is low. The code also lacks a compliance trigger for installing bicycle parking at existing developments.
- Third, it could be highly beneficial if the City provided additional site planning recommendations to ensure proper placement and spacing of bicycle parking facilities to maximize their usability.
- Finally, and for a similar reason as above, the City should also provide guidance on the different types of bicycle racks, as rack types vary in their functionality.

7.3.2 Existing Code

Bicycle parking standards are found in section 14-16-3-1 of the Albuquerque Code of Ordinances (Off-Street Parking Regulations). Section B identifies parking requirements for three types of land uses: 1) Residential; 2) Dormitory, fraternity or sorority house and 3) Non-residential . Four standards for the installation of bicycle parking spaces and lockers are provided in Section G.

The code requires one space per two dwelling units for multi-family units having five or more dwelling units. All non-residential units are required to provide one bicycle space for every 20 parking spaces required and not less than two bicycle spaces per premise. Certain land uses, such as mortuaries or motels, are exempted while separate standards are provided for schools.

The Association of Pedestrian and Bicycle Professionals (APBP) recommend that bicycle parking standards do several things, which are presented in Table 2 below:

Table 2 – APBP Bicycle Parking Standard Recommendations

APBP Recommendation	Albuquerque bicycle parking standards
Specify number of bicycle spaces by land use	Specs by land use are specified, but distinguish between far fewer land uses than those in APBP's sample code..
Require long-term parking for all workplaces, transit stations and multi-unit residential	Do not require long term parking.
Require adequate short-term parking for other land uses	Technically require short-term parking for most land uses, though its standards require the same amount of parking for very different land uses that may warrant different requirements.
Provide site planning requirements	Provide limited site design requirements.
Provide rack and locker design requirements	Provide limited rack and locker design requirements.

7.3.3 Recommended Update to Bicycle Parking Code

As discussed in the previous section, the existing bicycle parking code does not distinguish between non-residential land uses and does not include requirements for long-term parking. The following rates are provided for consideration from the 2010 Bicycle Parking Guidelines produced by the Association of Pedestrian and Bicycle Professionals.

Table 3 – APBP Sample Bicycle Parking Code

Type of Activity	Long-Term Bicycle Parking	Short-Term Bicycle Parking
Residential		
Single family dwelling	No spaces required	No spaces required
Multi-family dwelling		
a) With private garage for each unit	No spaces required	0.05 spaces / unit, minimum 2 spaces
b) Without private garage for each unit	0.5 spaces / unit, minimum 2 spaces	0.05 spaces / unit, minimum 2 spaces
c) Senior housing	0.5 spaces / unit, minimum 2 spaces	0.05 spaces / unit, minimum 2 spaces
Civic / Cultural		
Non-assembly cultural (library, government buildings, etc.)	1 space for each 10 employees. Minimum requirement is 2 spaces.	1 space for each 10,000 s.f. of floor area. Minimum requirement is 2 spaces.
Assembly (church, theatre, stadium, park, beach, etc.)	1 space for each 20 employees. Minimum requirement is 2 spaces.	Spaces for 2% of maximum expected daily attendance
Health care/hospital	1 space for each 20 employees or one space for each 70,000 s.f. of floor area, whichever is greater. Minimum is 2 spaces	1 space for each 20,000 s.f. of floor area. Minimum is 2 spaces.
Education		
a) Public, parochial, and private day-care centers for 15 or more children	1 space for each 20 employees. Minimum is 2 spaces.	1 space for each 20 students of planned capacity. Minimum is 2 spaces.
b) Public, parochial, and private nursery schools, kindergartens, and elementary schools (1-3)	1 space for each 10 employees. Minimum is requirement is 2 spaces.	1 space for each 20 students of planned capacity. Minimum is 2 spaces.
c) Public, parochial, and elementary (4-6), junior high and high schools	1 space for each 10 employees plus 1 space for each 20 students of planned capacity. Minimum requirement is 2 spaces.	1 space for each 20 students of planned capacity. Minimum is 2 spaces.
d) Colleges and universities	1 space for each 10 employees plus 1 space for each 10 students of planned capacity; or 1 space for each 20,000 s.f. of floor area, whichever is greater.	1 space for each 10 students of planned capacity. Minimum is 2 spaces.
Transit		
Rail/bus terminals and stations/airports	Spaces for 5% of projected a.m. peak period daily ridership	Spaces for 1.5% of projected a.m. peak period daily ridership
Retail		
General food sales or groceries	1 space for each 12,000 s.f. of floor area. Minimum requirement is 2 spaces	1 space for each 2,000 s.f. of floor area. Minimum requirement is 2 spaces
General retail	1 space for each 12,000 s.f. of floor area. Minimum requirement is 2 spaces	1 space for each 5,000 s.f. of floor area. Minimum requirement is 2 spaces
Office	1 space for each 10,000 s.f. of floor area. Minimum requirement is 2 spaces	1 space for each 20,000 s.f. of floor area. Minimum requirement is 2 spaces
Auto Related		
Automotive sales, rental and delivery, automotive servicing, automotive repair and cleaning	1 space for each 12,000 s.f. of floor area. Minimum requirement is 2 spaces	1 space for each 20,000 s.f. of floor area. Minimum requirement is 2 spaces
Off-street parking lots and garages available to the general public either without charge or on a fee basis	1 space for each 20 automobile spaces, minimum 2 spaces – unattended surface parking lots excepted	Minimum of 6 spaces or 1 per 20 auto spaces – unattended surface parking lots excepted
Industrial/Manufacturing		
Manufacturing and Production	1 space for each 15,000 s.f. of floor area. Minimum requirement is 2 spaces	Number of spaces to be prescribed by the Director of City Planning. Consider minimum of 2 spaces at each public building entrance.

7.3.4 Design Principles

In addition to updating the bicycle parking requirements, the following design principles can be incorporated into the parking code to provide guidance on the placement of bicycle racks:

7.3.4.1 Space Requirements

- Bicycle parking spaces should be at least 6 feet long and 2 feet wide. A common installation error is to leave insufficient space (less than 2 feet) between the rack and a building or other obstacle (see Figure 2).
- A 5 feet aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle parking.
- Bicycle racks should be securely anchored to the surface or a structure.
- Overhead clearance in covered spaces should be at least 7 feet.

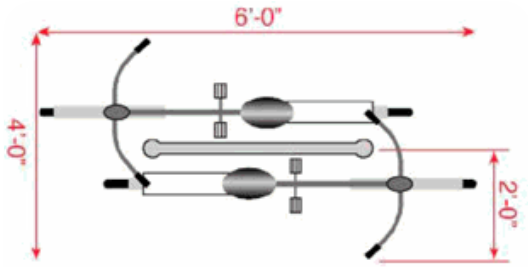


Figure 2 -Bicycle Rack Space Guidelines

Figure 2 -Bicycle Rack Space Guidelines

7.3.4.2 Placement

In order to encourage bicycle use, bicycle parking must be as convenient, if not more so, than motor vehicle parking. The facilities must be located in close proximity to building entrances and elevators. General placement guidelines are provided in section 6.3 of the recommended Design Guidelines document. These guidelines can be incorporated into the existing parking code.

7.4 Recommended City Programs

7.4.1 Bicycle Rack Program

It is recommended that the City develop and implement a Bicycle Rack Program that, similar to its Bicycle Locker Program, distributes racks across the city through a request system. By working with interested land owners to supplement the existing supply of bicycle parking, the City would effectively increase both the quantity and quality of bicycle parking throughout Albuquerque. The City can utilize preferred rack designs and ensure proper rack placement following the bike parking guidelines laid out in existing code or the *Albuquerque Bikeways and Trails Master Plan Update*.

7.4.2 Increased Awareness

The City could raise awareness of the benefits of short- and long-term bicycle parking and end-of-trip facilities to developers, owners and managers of privately-owned commercial properties. The 2010 report, *Bike Corrals: Local Business Impacts, Benefits and Attitudes,* found widespread support for bike corrals from local businesses. The *Employer Guide to Bicycle Commuting: Establishing a Bike-Friendly Workplace for your Baltimore Region Employees* is a good example of information that the City could make available to employers interested in encouraging cycling to work. The document compares the initial cost of 12 automobile parking spaces ($40,000 to $100,000 USD) to the cost of 12 bike rack spaces and one automobile space ($4,600 to $9,600 USD).

7.4.3 Incentives

There are a number of incentives that can be used to encourage improved bicycle parking and end-of-trip facilities. These include:

- Providing motor vehicle parking relaxations where bicycle parking is provided beyond the minimum requirements.
- Providing motor vehicle parking relaxations where complete end-of-trip facilities are provided (i.e., long- and short-term parking, coupled with showers, washrooms and clothing lockers).
- In space-constrained applications, such as the redevelopment of an existing building, allow for the conversion of motor vehicle parking spaces into long-term bicycle parking to meet the bylaw requirement (typically five bicycle parking spaces can be achieved per motor vehicle parking space).
- Extending or introducing payment-in-lieu-of-parking programs to allow funds to be collected in-lieu of vehicle parking and placed in a sustainable transportation infrastructure fund to finance active transportation projects, which may include a centralized bicycle parking and end-of-trip facility (e.g., a bike station). Note: This should not replace bicycle parking and end-of-trip facility requirements.

7.5 Bicycle Parking Standards at Transit Exchanges

End-of-trip facilities create connections with transit and increase the reach of these services by making cycling attractive for the "first and last mile" of the journey.

7.5.1 New Mexico Rail Runner Express

The New Mexico Rail Runner Express has a friendly attitude towards bicycles. Their website says "Bicycles Welcome" and indicates that "Trains come equipped with bicycle racks so you can ride your bike to and from each station. Each train will have space for at least two bicycles, and bike racks can be found at each station."

Bicycle parking at a Rail Runner station

Bicycle parking provided at each station is typically composed of uncovered bicycle parking for approximately 10-12 bicycles. The Rail Runner Express will also soon offer bicycle lockers at each station. There will be room for six to 16 bikes, depending on the station. Lockers will be administered similar to the City's locker program, using a subscription system rather than having lockers for on-demand use. A nominal fee will be charged to cover the administration of the locker program.

Two bicycles in the designated space aboard a Rail Runner train

7.5.2 ABQ Ride

Bicycle racks are available on all buses, with a capacity of two to three bicycles depending on the bus. Bicycle parking is typically not provided at ABQ Ride stops. Two recently developed park and ride facilities have been equipped with wave style bicycle racks with a capacity of approximately 20 bicycles. ABQ Ride also installed 8 lockers at each park and ride facility. Because these lockers were installed as a pilot project, half of the lockers are allocated on a subscription basis and the other half on a first come, first served basis. Thus far, the lockers do not appear to be very well used and there have been security concerns with the first come, first served basis, as people have utilized the lockers for purposes other than that which was intended.

7.5.3 Anticipating Demand at Transit Stations

Providing parking at transit stations is particularly important. The City has expressed interest in placing enhanced bicycle parking facilities at locations with potential high demand, such as the Alamosa Transit Center. Generally, the amount of parking needs to exceed the average demand, as users should be able to depend on facilities being available. Demand determines not only the amount of parking but the type of facility provided as well.

The following are examples of guidelines used by other agencies around the world:

- Bicycle parking at stops should be between one space per 150 entrants and one space per 1,000 entrants, depending on station type and use. (The London Underground)
- Bicycle parking should be 50-80% occupied on average. If parking is at a location that is likely to experience considerable growth or if there are regular overflow periods (i.e., the station would be popular for use during a large event), it should be closer to 50% occupied and built with the ability to expand easily. (The CROW Design Manual for Bicycle Traffic)
- The number of lockers provided should exceed the current demand for lockers (measured by counts of bikes parked at racks and the current usage and wait list for lockers at a station) by 10% to allow for fluctuations and growth. (Bay Area Rapid Transit [BART])

- Bike stations should be considered when the demand for long-term parking exceeds 100 bicycles. (BART)

Other factors to consider when estimating demand for a new station or for providing long-term parking where it previously did not exist include:

- Demographics of the service area
- The extent of the bicycle network in the area surrounding the station
- Current ridership capacity
- Mode share
- Trip destination
- Planning goals for the area
- Current parking use at the station
- Current use of bike-on-bus racks
- Type of transit service (bus, light rail or commuter rail)
- Presence of employment and/or major employer near stop
- Projected regional growth
- Projected bicycle ridership levels.

Table 4. Recommended Adjustment Factors for Estimating Bicycle Parking at Transit

Factor	Adjustment
Based on a parking demand model:	
How many bicyclists are estimated to park at the site?	Facility should provide parking for at least 20% more bicycles than estimated to regularly use the facility.
Will a particular segment of potential market demand be emphasized over others due to the location? (e.g., Near a University, industrial park etc.)	Hours of parking availability should be convenient for likley users in proximity to the site; marketing efforts should be targeted to potential users.
For each station, how reliable is it to find space for bikes at rush hour?	Quantity of parking should be sufficient to meet bicycle-on-bus or -train capacity.
How much does the demand for park-and-ride spaces exceed supply?	In areas where Park and Ride lots are at capacity, improved bicycle parking can capture a proportion of would-be drivers.
Is there evidence of current bike activity (e.g., parked bikes) at the site?	Facility should provide parking for at least 20% more bicycles than regularly use the facility, and more if demand is estimated to increase.
Public transportation	
Does the station connect to a bus route?	Parking should be provided to accommodate riders who may not find space for a bike on their connecting bus.
Does the transit short-cut a hill or other barrier to bicycling?	People are more likely to take transit with their bicycles if they can avoid a large hill or if transit is significantly faster than bicycling. Increased parking facilities should be provided. In addition, the transit agency may want to work with the responsible agency to remedy the barrier.
Does the transit line offer a time savings as compared with bicycling (e.g., connecting distant destinations with few stops)?	Transit lines offering travel time savings over bicycling should provide more long-term parking.
Surrounding employment and commercial density	
How many jobs fall within biking distance of the site?	Accommodate transit users who may be interested in storing an additional bicycle at the non-home trip-end.
Will the number of jobs within biking distance of the site grow in the future?	Ensure that there is space for expansion in locations that are likely to be close to future employment.
Potential to generate operating revenue	
Is there a need for bicycle repair and accessory sales in the immediate vicinity?	People will use the resources available at the bicycle parking if the community does not have them available otherwise; this is likely to increase the use of bicycle parking and bike-to-transit trips.
Is there a need for some other complementary business activity in the immediate vicinity?	It is possible to recoup some of the expenses of providing bicycle parking by linking complimentary uses, such as bicycle rentals/fleets and food sales.

7.6 Bicycle Parking Standards at Schools

According to a representative, Albuquerque Public Schools installs bike racks at new schools and existing schools when they are remodelled. Within the next six years, all schools will have bicycle racks.

7.7 Review of Existing Parking

Bicycle parking racks have been installed by various agencies and businesses throughout the City. The different types of bicycle racks found in Albuquerque are reviewed below.

7.7.1 Inverted U and Inverted U Series

The inverted U type rack can be installed individually or in a connected series. Examples of both are provided in the photos below. The inverted U type rack and the U series rack are both recommended in the *Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines*. These racks are typically secured to a concrete base, support the bicycle in two places and are easy to park a bicycle in when they are adequately spaced.

University of New Mexico

Bank

University of New Mexico Library

7.7.2 Post and Ring

The post and ring style rack is the third style of bicycle rack recommended in the *APBP Bicycle Parking Guidelines*. Like the inverted U and inverted U series rack, the post and ring style is intuitive, supports the bicycle in two places and is easy to park. This style of rack can be retrofitted to unused parking meters, which has been done in Albuquerque.

Retail

7.7.3 Undulating, or Wave-Style, Rack

The wave-style rack is a very common rack type and is present at many locations throughout Albuquerque. This type of rack is not endorsed by the *ABPB Bicycle Parking Guidelines* for a couple of reasons. First, to properly use this rack the cyclist places the bicycle through the wave pattern where it is only supported at one point. Bicycles parked in these racks are unstable and frequently tip over. Second, many cyclists park their bicycle sideways in this rack to gain stability, thereby reducing the capacity by 60-80 percent. Furthermore, due to the narrow space between waves, it is difficult to accommodate the stated rack capacity (two per wave) even when bicycles are parked properly. This does not mean that these racks should be replaced, but the City could work to educate businesses or institutions looking to install bike racks on the pros and cons of different rack types and could recommend the installation of either the inverted U or the ring and post style racks.

Restaurant

Library

City Park

7.7.4 Other Rack Types

The first rack type presented in the photos to the right only holds the bicycle's wheel and does not support the use of a U-shaped lock. They can also cause damage to the bicycle wheels. The next two photos show examples of what are known as comb racks or toaster racks. Designed to roll bicycles into wheel slots, these types of racks also lack stable support and can cause damage to the bicycle wheels. For these reasons, these rack types are not recommended.

University of New Mexico

Parking Garage

Elementary School

7.7.5 Artistic Racks

Artistic racks, like the ones shown at right, can add interest the urban environment. Artistic racks are appropriate, provided that they support the bicycle in two places.

Apartment

Restaurant

Restaurant

7.7.6 Visibility

The location of the bicycle rack impacts the actual and perceived security of the bicycle. Several online survey respondents expressed concern about the possibility of their bicycle being stolen. Regarding visibility, ABPB suggests that short term bicycle parking should be:

- Visible from the destination to reassure cyclists about the security of the rack.
- Located in a high traffic area with passive surveillance or eyes on the street.

The top photo on the right shows bicycle parking located where parked bicycles are not visible from the adjacent building. Compare this to the photo below, where the bicycle parking has been provided directly in front of a large window near the library entrance.

Church

Library

7.7.7 Informal Bicycle Parking

When bicycle parking is not provided, people will park/lock their bicycles to other objects such as parking meters, railings or sign posts. Providing bicycle parking is beneficial not only to bicyclists but can improve the pedestrian environment by consolidating the bikes and keeping them off of rails and signs which potentially block sidewalks and ramps.

University of New Mexico

University of New Mexico

7.7.8 Lockers and Bike Covers

Bicycle lockers are large metal or plastic stand-alone boxes that offer a high level of bicycle parking security. Over 300 bicycle lockers have been installed in Albuquerque as part of the City's Bicycle Locker Program.

An array of bike lockers on UNM campus

Individual "Bike Lid" bike locker near Downtown Albuquerque

8.0 Recommendations

8.1 Bicycle Education and Outreach Programs

There are many existing efforts to encourage bicycling in Albuquerque, including efforts by local agencies, active community groups and individual residents. The City, with the support of local bicycling groups, offers a number of valuable materials and programs aimed at bicyclists and trail users. Eight established groups have been identified as being actively involved in bicycle education, outreach and encouragement in the city: Greater Albuquerque Bicycle Advisory Committee (GABAC), Greater Albuquerque Regional Trails Committee (GARTC), Bicycle Coalition of New Mexico, BikeABQ, Sandia Bike Commuters Group, Duke City Wheelmen Foundation, New Mexico Touring Society and Women's Mountain Bike and Tea Society.

This plan has identified thirteen existing programs, events and campaigns that focus on education and encouragement. For example: bicycle safety education classes for elementary school children provided by the City, League of American Bicyclist Traffic Skills 101, Bike to Work Day, ABQ Ride's guaranteed ride home and valet bike parking. These programs should be continued and expanded as recommended with the inclusion of 12 new programs. These new programs address driver education related to bicycling and share the trail campaign, annual bicycle counts, coordination of law enforcement actions and a consolidated online "one-stop" Albuquerque bicycle information website.

Improvements to bikeway and trail facilities in Albuquerque should be complemented by programs and activities designed to promote bicycling and trail use. There are many existing efforts to encourage bicycling in Albuquerque, including efforts by local agencies, active community groups and individual residents. The *Albuquerque Bikeways and Trails Master Plan Update* recognizes these efforts and encourages the City to support, promote and build upon them.

The following describes existing education and outreach efforts around bicycling and trail use in Albuquerque and presents a menu of recommended new and expanded programs to continue to promote bicycle and trail use:

8.1.2 Public Input from Interviews and Open Houses

From stakeholder interviews conducted by the project team and feedback collected from the open houses in May 2010, the following themes emerged relating to bicycle program needs and interests:

- To encourage bicycling on streets, roads should feel safer.
- The Albuquerque area has a great trail system that should continue to be promoted.
- Existing programs should be continued and expanded with the help of more staff and resources.
- There is interest in getting "interested but concerned" potential bicyclists riding.
- Strong support exists for driver and bicyclist education, Share the Road and Share the Trail campaigns and Summer Streets events. Open house participants also expressed support of Safe Routes to School programs, bicycling and trail counts and enforcement programs.

8.1.3 Program Recommendations

Based on the interviews, public input and existing programs listed above, the Project Team presents the menu of recommended education and outreach programs below. The initial programs listed are those that already exist; we recommend that these programs be continued and expanded. The second section describes new bicycle programs recommended for Albuquerque.

8.1.3.1 Existing Programs to Continue and Expand

Continue and Expand Existing Albuquerque Bicycle and Trail Programs	
Target audience	Bicyclists and trail users of all ages, potential bicyclists and the general public
Primary agency	City of Albuquerque
Potential partners	Local bicycling groups, Albuquerque Public Schools, local volunteers
Purpose	Encourage bicycling and trail user and promote safety by continuing and expanding existing bicycling and trail programs
Time frame	Ongoing

The City of Albuquerque, led by the efforts of Parks and Recreation's Bicycle Safety and Education Program, currently offers a number of bicycling programs for youth and adult bicyclists. It is recommended that the City continue and expand the following bicycle and trail programs:

- Youth Bike Safety Education
- Bike Rodeos
- Cycling skills courses and curriculum
- Greater Albuquerque Bicycle Advisory Committee (GABAC) and Greater Albuquerque Regional Trails Committee (GARTC)
- Bike Light Giveaways
- Bike to Work Day - Consider expanding to Bike to Work Month in May to include more activities, such as a commute ride to or from City Hall with the Mayor/City Council, commute classes, bike commute challenge contests and celebratory events.

Expand Safe Routes to School Programs

Target audience	School-aged children; parents; administrators, faculty and staff; city planners and engineers
Primary agency	Albuquerque Public Schools
Potential partners	Local non-profit groups, parent groups at schools, school neighbors
Purpose	Encourage and educate students and their parents about walking and biking to school; improve safety through physical improvements and programs
Time frame	School year
Sample program	Marin County National Model Program: www.saferoutestoschools.org/index.shtml

Helping children walk and bicycle to school is good for children's health and can reduce congestion, traffic dangers and air pollution caused by parents driving children to school. Safe Routes to School programs use a "5 Es" approach using Engineering, Education, Enforcement, Encouragement and Evaluation strategies to improve safety and encourage children walking and biking to school. The programs are usually run by a coalition of city government, school district officials and teachers, parents, students and neighbors.

Safe Routes to School programs educate school children on safe walking and bicycling habits and encourage active ways to get to school through events and activities.

Safe Routes to School programs currently serve three schools in Albuquerque: Monte Vista Elementary School, Emerson Elementary School and Wilson Middle School. Walking and bicycling education and encouragement programs at these schools include the distribution of suggested route to school maps, International Walk and Bike to School Day, Walk & Roll Day incentive programs, bike rodeos, safety tips in newsletters and walking school buses. These activities should be continued, and new programs, such as bicycle, pedestrian and trail use safety training; helmet use promotion and helmet giveaways; or bicycle mechanic training for middle or high school students, should be introduced at these three schools. The Safe Routes to School program should also be expanded to other schools in Albuquerque.

Consolidate Existing Online Resources into a "One-Stop" Albuquerque Bicycling Website

Target audience	Current and potential bicyclists
Primary agency	City of Albuquerque
Potential partners	BikeABQ, Bicycle Coalition of New Mexico, large local employers
Purpose	Make bicycling information easier to find by providing resources, maps, safety information, events, group listings and more in one central place.
Time frame	Ongoing
Sample program	Vélo Québec website: www.velo.qc.ca/english/index.php

The City, BikeABQ and other local groups already have many bicycling resources available online, but existing and potential bicyclists do not have one exclusive place to turn for information about laws, route planning, tips, groups and events. Using the resources found on existing websites, the City, in partnership with BikeABQ and other groups, should consolidate resources into a one-stop shop website aimed at bicyclists.

The consolidated Albuquerque bicycling website should contain existing and new elements, which may include:

- A list of all bicycling groups, including clubs, racing teams and advocacy groups
- Information about the specific committees that discuss bicycle and trail issues (including how to get involved, meeting times and dates, agendas and minutes, etc.)
- Information about current projects and how to get involved (e.g., public meetings, comment periods)

- Maps and brochures (e.g., links to online maps and brochures, where to find in person and how to request mailed materials)
- Links to laws and statutes relating to bicycling
- Information about bicycling events (e.g., rides, classes, volunteer opportunities) and an events calendar
- A list of local bike shops, including phone number and address
- Relevant phone numbers and online request services (e.g., links to 311 forms)
- Request form for route planning assistance
- Message boards
- Blog featuring stories and news
- Photo galleries from events and submitted by readers
- Popular riding routes

Launch a Unified "Share the Road" Awareness Campaign

Target audience	General public
Primary agency	City of Albuquerque
Potential partners	BikeABQ, Bike Coalition of New Mexico, New Mexico Department of Transportation
Purpose	Creating awareness of bicycling and promoting safety
Time frame	Late spring or early summer, or in conjunction with Bike to Work Day or back to school
Sample program	Sonoma County Transit: www.sctransit.com/bikesafe/bikes.htm

A marketing campaign that highlights bicyclists' safety is an important part of creating awareness of bicycling. This type of campaign is an effective way to reach the general public and reinforce other education and outreach messages. It is recommended that the City create a unified safety campaign building off of existing work by BikeABQ and other groups, placing safety messages near high-traffic corridors (e.g., on billboards, in bus shelters and in print publications).

Safety campaigns increase the general public's awareness of bicycling and can be used to promote safe bicycling and driving behavior.

A well-produced safety campaign will be memorable and effective. One stellar example is the Sonoma County Transit "You've got a friend who bikes!" campaign. It combines compelling ads with an easy-to-use website focused at motorists and bicyclists. This type of campaign is particularly effective when kicked off in conjunction with Bike to Work Day in May or back to school in the fall.

Continue and Expand University of New Mexico Bike Program

Target audience	UNM students, faculty and staff
Primary agency	University of New Mexico, Parking and Transportation Services
Potential partners	City of Albuquerque, local bicycling groups
Purpose	Promote safe bicycling and encourage bicycles for transportation to and around campus
Time frame	Ongoing, particularly during the school year
Sample programs	Stanford University Bike Program: transportation.stanford.edu/alt_transportation/BikingAtStanford.shtml

University students are ideal candidates for bicycling outreach programs; many students live near campus and may not own a car or choose not to drive. Furthermore, campuses provide ideal bicycle trip distances for students, faculty and staff.

The University of New Mexico should continue their bicycling projects and programs, such as providing racks and lockers, improving facilities and bike shop services. Additional programs should be considered, including:

- Free or low-cost helmets and bike lights available at the campus bike shop to address safety concerns

- Events and workshops such as flat clinics, bike legal clinics and guided rides, advertised through flyers, email, bulletin boards and campus newspaper
- Information tabling at campus events and prominent locations
- Further research into a campus bike sharing program

Apply to Become a Silver-Level Bicycle Friendly Community	
Target audience	League of American Bicyclists
Primary agency	City of Albuquerque
Potential partners	Local bicycling groups
Purpose	Highlight bicycling initiatives and get national recognition for implementing the *Albuquerque Bikeways and Trails Master Plan Update*
Time frame	One-time, with regular updates; can happen at any time
Program information	www.bikeleague.org/programs/bicyclefriendlyamerica/

As the Albuquerque bicycling community knows, the League of American Bicyclists has a well-respected Bicycle Friendly Communities (BFC) award program. Communities fill out a detailed application that covers bike-related facilities, plans, education efforts, promotion initiatives and evaluation work that has been completed by the jurisdiction. The award is designed to recognize progress that has been made, as well as assist communities in identifying priority projects to improve bicycling conditions. Receiving the award is a media-worthy event and may give elected officials the opportunity to receive media coverage for the positive work they are doing.

Albuquerque currently holds an award for Bronze BFC status. It is recommended that the City apply for Silver bicycle-friendly community status upon making strides to implement the bicycle and trail improvements recommended in this plan. As part of the planning process, the project team is working with the City to develop a bicycle-friendly action plan, based on the BFC application. This action plan will provide the City with a checklist of past, current and future actions that will move Albuquerque towards Silver, Gold and ultimately Platinum BFC status. The City should assess accomplishments, target high priority activities from the checklist and apply for updated BFC status within two years of the adoption of the *Albuquerque Bikeways and Trails Master Plan Update*.

8.1.3.2 New Programs

Provide Driver Education Related to Bicycling	
Target audience	Motorists, both new and continuing
Primary agency	City of Albuquerque
Potential partners	Local law enforcement, Albuquerque MVD, NMDOT
Purpose	Educate motorists on the rules and responsibilities of both bicyclists and motorists driving near bicyclists
Time frame	Ongoing through classes and resources made available to all motorists
Sample program	League of Illinois Bicyclists: www.bikelib.org/safety-education/motorists/driver-education/

Improving driver awareness of bicyclists helps to make a safer and more comfortable road environment for bicycling. Outreach through drivers' education classes is a good way to reach beginning drivers, while a diversion class can be offered to first-time offender violations that endanger bicyclists.

A diversion class can be aimed at motorists and bicyclists. In lieu of a citation and/or fine, individuals can take a one-time, free or inexpensive class instead. In Marin County, interested citizens can take the class even if they did not receive a ticket. This program is a good way to educate road users about bicycle rights and responsibilities and can also increase public acceptance of enforcement actions.

Launch a Share the Trail Campaign

Target audience	All trail users including, bicyclists, pedestrians, equestrians and the disabled.
Primary agency	City of Albuquerque
Potential partners	Local bicycling or trail groups, local volunteers
Purpose	Encourage responsible, respectful behavior by trail users
Time frame	Can be done anytime, particularly during nice weather months
Sample program	Share the Path (Portland, OR): www.bta4bikes.org/btablog/2007/07/24/path-users-share-300-bike-bells-and-50-scoops-of-ice-cream-on-saturday/

Conflicts between trail users can be a major issue on popular, well-used trail systems like the Bosque Trail. Some communities have launched successful "share the trail" events to help educate users about safety and courtesy. Share the Trail campaigns can be run by agencies, nonprofits or any user group (equestrian, hikers, etc.). These programs educate users about expected behavior and how to limit conflicts. Volunteers often give out brochures and engage with users in a non-confrontational way. Volunteers can also report back to trail agencies about trail damage, erosion or vandalism. Media outreach should be included as well. Common strategies include a bicycle bell giveaway, handing out maps and information, posting signs, tabling and 'stings' that reward good behavior.

A Share the Trail campaign encourages the safe and courteous use of trails.

Host a Family Bicycling and Trail Use Program

Target audience	Parents and families
Primary agency	City of Albuquerque
Potential partners	Local bicycling and trail users groups
Purpose	Encourage and educate parents about how to bicycle and use trails with children; educate children about how to bicycle and use trails safely
Time frame	One time/ annual events or ongoing clinics
Sample program	San Francisco Bicycle Coalition's Family Day: www.sfbike.org/?family_day. This annual event, held in Golden Gate Park, includes a bike rodeo, a "freedom from training wheels" training, family bike games and safety clinic, a family biking showcase with vendors and equipment, bike scavenger hunt, a basic bike maintenance workshop and a family bike parade.

Family bicycling/trail programs help parents figure out how to safely transport children by bicycle and help children learn bicycling skills. The format can vary. 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, such as the New Mexico State Fair.

Family biking and trail programs provide bicycling skills, tools for transporting small children, and fun bicycling and trail activities

Activities may include:

- Training for children on how to ride a bicycle without training wheels
- Bicycle skills/safety course for children (e.g., rodeo)
- Information about options to transport children (e.g., trailers, cargo bicycles, child seats, family tandems) and the opportunity to test ride these devices
- Group ride or parade (possibly with bicycle decorating station)
- Bicycle safety check
- Basic bike maintenance course
- Distribution of bicycling maps & brochures

Promote Trails and Park Facilities through a Bike to Parks Program

Target audience	General public
Primary agency	City of Albuquerque
Potential partners	Local bicycling groups, trail users groups, Parks and Recreation Department
Purpose	Encourage bicycling to and in Albuquerque parks
Time frame	Nice weather months

Encouraging bicycling on trails and to parks is a great way to increase community health, decrease motor vehicle congestion and parking issues at parks and maximize the use of public resources. A "bike to parks" program will distribute information about how and why to bike to parks. Elements may include:

- Distributing route information through maps, brochures and online outreach
- Guided rides on trails and to parks
- Information kiosks
- Improved bicycle parking at trailheads and parks
- Outreach to existing groups (e.g., BikeABQ, senior and youth groups, Safe Routes to School programs, etc.)

By encouraging bicycling to parks, the City can improve community health, reduce motor vehicle congestion and parking demand at parks, and promote their use.

Perform Annual Bicycle and Trail Counts

Target audience	N/A
Primary agency	City of Albuquerque
Potential partners	Local bicycling groups, local volunteers
Purpose	Track bicycling and trail use trends and measure success of *Albuquerque Bikeways and Trails Master Plan Update*
Time frame	Annually
Model program	National Bicycle & Pedestrian Documentation Project: www.fhwa.dot.gov/environment/bikeped/study/

Many jurisdictions, including the City of Albuquerque, do not perform regular bicycle or trail counts. As a result, they do not have a mechanism for tracking bicycle or trail use trends over time, or for evaluating the impact of projects, policies and programs.

It is recommended that the City perform and/or coordinate annual counts of bicyclists and trail users according to national practices. The National Bicycle and Pedestrian Documentation Project has developed a recommended methodology and survey, count and reporting forms, and this approach may be modified to serve the needs and interests of individual jurisdictions.

Conducting bicycle and trail counts will provide a mechanism for tracking bicycle and trail use trends in Albuquerque over time.

The City should take the lead role in standardizing a regional approach to counts and surveys. City staff may perform the counts themselves, or assist local groups or volunteers in performing the counts. The City of Albuquerque should also handle tracking, analysis and reporting. The *Albuquerque Bikeways and Trails Master Plan Update* establishes baseline counts at approximately 40 locations for morning and afternoon peak times. The locations of these initial counts should be considered for annual counts.

Hold a Summer Streets Car-Free Street Event

Target audience	General public
Primary agency	City of Albuquerque
Potential partners	Local bicycling groups, local volunteers
Purpose	Encourage walking and biking by providing a car-free street event
Time frame	Generally in the summer and on a Sunday; can be one time event, annual or multiple times per year
Sample programs	New York City Summer Streets: www.nyc.gov/html/dot/summerstreets/html/home/home.shtml www.streetsblog.org/2008/08/11/streetfilms-summer-streets-2008/ (video) Portland Sunday Parkways: www.portlandonline.com/Transportation/index.cfm?c=46103 www.streetfilms.org/portlands-sunday-parkways/ (video)

These programs have many names: Summer Streets, Sunday Parkways, Ciclovias or Sunday Streets. Summer Streets are periodic street closures (usually on Sundays) that create a temporary park that is open to the public for walking, bicycling, dancing, hula hooping, roller skating, etc. They have been very successful internationally and are rapidly becoming popular in the United States. They promote health by creating a safe and attractive space for physical activity and social contact and are cost-effective compared to the cost of building new parks for the same purpose. These events can be weekly events or one-time events and are generally very popular and well-attended. Summer Streets events also often included guided rides and walks with themes, such as walks for seniors, women's or family rides or bike rides with the Mayor/City Council.

Closing streets for a car-free community event creates a temporary park for walking, cycling, skating, dancing, and other healthy recreational activities.

Fund and Fill a Bicycle/Trail Coordinator Position

Target audience	N/A
Primary agency	City of Albuquerque
Potential partners	NMDOT
Purpose	Create a full-time equivalent position to manage bicycle and trail-related policies, programs and projects
Time frame	Ongoing

Albuquerque does not currently have a full-time bicycle or trail coordinator position. The *1993 Trails and Bikeways Facility Plan* recommended both bicycle/pedestrian coordinator and trail coordinator positions to take on the major responsibilities of implementing the elements with the plan. Likewise, to take full advantage of current bicycle and trail planning efforts and to assist with implementation of the many projects and programs recommended in this plan, the City may wish to consider expanding the bicycle program to at least one full-time equivalent (FTE) staff bicycle and trail coordinator position. The work should be divided between the Transportation and Parks and Recreation departments, bridging the gap between bicycling and trail use as transportation and as recreation.

In addition to existing bicycle safety education activities, job duties for this staff position may include:

- Monitor the design and construction of bikeways and trails, including those constructed in conjunction with private development projects
- Ensure bicycle facilities identified in specific plans are designed appropriately and constructed expediently
- Staff GABAC and GARTC meetings
- Continue the implementation of existing programs and projects
- Coordinate implementation of the recommended projects and programs listed in this plan
- Identify new projects and programs that would improve the City's environment for bicycling
- Coordinate evaluation of projects and programs
- Pursue funding sources for project and program implementation

Coordinate Enforcement Actions

Target audience	Motorists and bicyclists
Primary agency	Albuquerque Police Department
Potential partners	NMDOT
Purpose	Deter unsafe behaviors by motorists and bicyclists by enforcing traffic laws
Time frame	Can be ongoing or concentrated into short "stings" or campaigns
Sample program	Bike light enforcement, Portland Police Bureau - Portland, OR: bikeportland.org/2005/09/10/portland-police-to-distribute-bike-lights-safety-brochures/

Enforcement actions can include motor vehicle speed enforcement, speed reader board deployment, bicycle light enforcement, trail crossing enforcement and other actions.

Speeding vehicles endanger cyclists and discourage cycling. Targeted speed enforcement activities can address both of these issues. Law enforcement agencies can enforce speed limits on designated bikeways, near schools and in response to bicyclist complaints. These campaigns are ideal for a Safe Routes to School Program. A speed reader board request program will deploy speed reader boards at the request of neighborhood associations and schools. The boards should be mounted temporarily (e.g., for two weeks) and then be moved to another location to keep motorists from becoming inured to the speed reader board effect.

A bike light enforcement program can issue "fixit" tickets or warnings to bicyclists without lights and distribute safety brochures. The actual installation of free lights on the spot is a common alternative where everybody wins. The City should continue and consider expanding its bike light giveaway program.

Host a Mountain Biking Program

Target audience	Those interested in mountain biking
Primary agency	City of Albuquerque Parks and Recreation
Potential partners	Local mountain biking groups
Purpose	Teach mountain biking skills and encourage safe mountain biking
Time frame	One-time or ongoing events, on their own or as part of existing events
Sample program	Share the Trail – Marin County, CA: www.sharethetrail.org

A program to encourage mountain biking for adults and/or children can include safety education, skills training, group rides and events. For example, the program can host introductory clinics to teach mountain biking skills and techniques.

Temporary riding courses can be set up at events, such as a Summer Streets car-free event, or a permanent course can be built. Class based courses could also be offered. The Share the Trail program in Marin County, Calif., hosts workshops and group rides and provides safety and wayfinding information to mountain bikers.

A mountain biking program can teach mountain biking skills and encourage safe trail use.

Launch Parties for New Bikeways

Target audience	General public, particularly residents living near a newly-completed bicycle facility
Primary agency	City of Albuquerque
Potential partners	BikeABQ and other local bicycling groups
Purpose	Inform residents about new bicycle facilities to encourage use and promote awareness
Time frame	As new bikeways are built
Sample program	When a new bikeway is built, the City of Vancouver throws a neighborhood party to celebrate. Cake, t-shirts, media and festivities are provided and all neighbors are invited as well as city workers (engineers, construction staff, planners) who worked on it.

When a new bicycle facility is built, some residents will become aware of it and use it, but others may not realize that they have improved bicycling options available to them. A launch party/campaign is a good way to inform residents about a new bikeway and can also be an opportunity to share other bicycling information (such as maps and brochures) and answer resident questions. It should be a media-friendly event, with elected official appearances, ribbon cuttings and a press release that includes information about the new bikeway, other bicycle facilities and any timely information about bicycling (such as Silver-level Bicycle Friendly Community designation, any increase in bicycle mode share or user counts, etc.).

Opening a new bikeway facility presents an opportunity for education, awareness, and encouragement through a launch party or campaign.

Promote 311 and Online Forms for Reporting Bicycling and Trail Issues

Target audience	Bicyclists and trail users
Primary agency	City of Albuquerque
Potential partners	Local law enforcement
Purpose	Designate a hotline for reporting bicycle facility maintenance and other safety issues
Time frame	Ongoing
Similar program	Portland, Oregon: www.portlandonline.com/TRANSPORTATION/INDEX.CFM?c=40515

The City has in place a centralized reporting system "Citizen Contact Center" that can be used effectively to report problems and request maintenance. Several methods for reporting are available: call 311 by telephone, using Twitter and by visiting http://www.SeeClickFix.com. Comments are then routed to the appropriate people. This service can be used to collect and address bicycling and trail maintenance and safety concerns, including bikeway and trail maintenance, bike rack installation requests, pothole repair, parking enforcement, sweeping requests, dangerous grates, pruning, etc. These reporting services are currently promoted on the City website and the Albuquerque Area bicycling map. The 311 hotline and online reporting services should be promoted further, on all area bicycling maps, on the City's bicycling website, at events such as Bike to Work Day and through related bicycling and trail programs. Reported issues should be addressed in a timely manner.

Currently, the pothole or street problem online form can be used to address road bicycling issues, but there is no mechanism for reporting trail issues. A trail reporting form or a bicycling and trails reporting form is recommended.

8.2 Evaluation of Gap Closure and Intersection Improvements

A review of the City's current bikeways and multi-use trail network revealed several locations with poor connectivity or a gap between existing facilities. Closure of the gaps is beyond standard practice and requires that engineering analysis be incorporated. As a result, 26 locations received further engineering evaluation and recommendations. One location of concern is the East Central Avenue area, which has been studied by the City, and recommendations from the *East Gateway Sector Development Plan* helped form the recommendations. Identified as a challenging area that lacks bicycle facilities is the Paseo del Norte/I-25 interchange area that is currently under study by the NMDOT and includes accommodations for bicycle facilities in its alternatives. *A Prototypical Multi-lane Arterial Intersection Improvements* recommendation was developed that incorporates traffic signal bicycle detection and a color enriched bike lane in motor vehicle/bicycle conflict areas.

8.2.1 East Central Avenue

The *East Gateway Sector Development Plan* recommends public improvements throughout the East Gateway area, but emphasizes policies, regulations and projects to improve area function and appearance along Central Avenue and Wyoming, Eubank and Juan Tabo boulevards. Plan area boundaries include Interstate Highway 40 on the north, properties abutting the west side of Wyoming Boulevard and municipal boundaries on the east and south.

The *East Gateway Sector Development Plan* recommends the creation of safe pedestrian crossings at all signalized street intersections and bicycle street crossings of Central Avenue. No other bicycle related improvements to Central Avenue are recommended.

8.2.1.1 Long-term Recommendations for Central Avenue

Long-range redesign and phased redevelopment of Central Avenue could provide space for on-street bicycle lanes, an improved walking environment and more efficient vehicle movement at major street intersections. It could establish the framework for private reinvestment in a more vibrant setting. Reducing the number of lanes on Central Avenue would be needed to accomplish the improvements presented for consideration.

8.2.1.2 Central Avenue Street Cross Section

Central Avenue's conversion from six-lanes to four-lanes would include a median, left turning lanes at major street intersections, bicycle lanes, improved street crossing design for pedestrians and flat sidewalks set back from the curb all within existing public rights-of-way. On-street parking could also be introduced between Tramway and Western Skies to serve businesses in the proposed Community Activity Center if desired.

Central Avenue is the focus of the City's proposed Bus Rapid Transit (BRT) plan. The plan calls for a BRT line in the median of Central Avenue. Therefore, any cross section improvements to Central Avenue will have to take this into account. Close coordination with the City Transit Department will be necessary when planning and designing bicycle improvements.

8.2.2 Paseo del Norte, North Diversion Channel to I-25.

I-25/Paseo del Norte Interchange Study has been recently conducted by the NMDOT. Two alternatives include recommendations for bicycle facilities in this corridor.

A goal of regional bicycle system planning is to improve the east-west connectivity with a bicycle crossing of I-25 in the vicinity of Paseo del Norte. The *MRCOG Long Range Bikeway System Map* proposes an east-west bike/pedestrian connection across I-25 in the vicinity of Paseo del Norte and the South Domingo Baca Arroyo. This would allow a continuation of the existing trail along Paseo del Norte west of the North Diversion Channel to the existing trail along the Domingo Baca Arroyo at San Pedro Drive. It would also link to the existing trail along the North Diversion Channel. Bike lanes are proposed on Jef-

ferson Street north of Paseo del Norte and Jefferson is designated as a Bikeway Corridor from Masthead to El Pueblo.

The long-range bikeway system plans are accommodated in each of the proposed build alternatives. The following describes how each of the alternatives provides for improved east-west bicycle and pedestrian connectivity through the study area:

8.2.2.1 Alternative 7

As part of the multimodal element of Alternative 7, a comprehensive system of bicycle and pedestrian facilities would be implemented. The bicycle and pedestrian facilities included with this alternative would facilitate north-south travel within the employment district west of I-25 and would provide safe east-west access across I-25. The principal bicycle and pedestrian elements included in Alternative 7 are:

- A grade-separated bridge across I-25 along the south side of Paseo del Norte. This facility would connect to the South Domingo Baca Arroyo Trail east of I-25. On the west side of I-25, this trail would connect to a new trail parallel to the Domingo Baca Arterial and to an on-street bicycle route and sidewalks along Headline Boulevard south of Paseo del Norte.
- A bicycle trail parallel to Domingo Baca Arterial from I-25 west to Channel Road. This trail would follow Channel Road south to connect with El Pueblo Road.
- On-street bicycle lanes and sidewalks would be constructed on the Domingo Baca Arterial, Jefferson Street (from El Pueblo Road to the Domingo Baca Arterial) and El Pueblo Road.

8.2.2.2 Alternative 16

With the exception of the crossing over I-25, the bicycle and pedestrian facilities proposed with Alternative 16 are the same as described for Alternative 7. With Alternative 16, the grade-separated structure over I-25 would be located north of the I-25/Paseo del Norte interchange. This structure would connect the existing trail along the South Domingo Baca Arroyo with new facilities west of I-25. South of Paseo del Norte, an extension to the west would be constructed to provide a direct connection to Headline Boulevard.

Additional Opportunities for Bicycle and Pedestrian Facilities
Additional opportunities are provided in Alternatives 7 and 16 along the Domingo Baca Arroyo arterial. Approximately 170 feet of right-of-way exists in the Domingo Baca Arroyo corridor, which provides sufficient width for the roadway requirements along with pedestrian and bicycle facilities.

8.2.3 Bridge Boulevard (Coors to Broadway)

1. Widen Bridge Boulevard, from Coors Road to Tower Road, adding bike lanes.
2. Align bike to left side of westbound right turn lanes at Old Coors
3. Bike Box at Old Coors eastbound, Goff Boulevard, Atrisco Drive, Sunset Road, Isleta Boulevard and La Vega Drive

8.2.4 Paseo del Norte/Paradise Boulevard (Gap closure - new route)

1. Construct grade separated crossing of Coors Boulevard at the Canal Frontage Road/Coors Boulevard intersection.
2. Add multi-use trail from Coors Boulevard/ Canal Frontage Road intersection on west side of Coors Road. The multi-use trail will parallel Coors Boulevard towards the Paseo del Norte interchange staying south of the Paseo del Norte/Coors southbound ramp. Continue the multi-use trail along the south side of Paseo del Norte up to the Paseo del Norte /Golf Course Road intersection.
3. Pave multi-use trail along AMAFCA between Canal Frontage Road and the proposed Coors Trail.
4. Designate the proposed Coors Trail as a bike route between Canal Frontage Road and Coors Boulevard
5. Add bike lanes to Eagle Ranch Road from Coors Boulevard to Paseo del Norte.

8.2.5 Candelaria Road (12th St to University Boulevard)

1. Add share the road signs between 12th Street and 4th Street
2. Add bike lanes between 4th Street and 2nd Street
3. Revise the crossection of Candelaria Road between Edith Boulevard and Pan American Frontage Road from three driving lanes in each direction to two driving lanes and a bike lane in each direction. The bike lanes can be striped 8-feet wide with a 4-foot wide buffer between the driving lane and bike lane.
4. At the Pan American Frontage Road South intersection, add guide signs directing cyclists to use the sidewalk on the north side of Candelaria Road between Pan American Frontage Road South and University Boulevard Add similar guide signs at Pan American Frontage Road North, directing cyclists to use the sidewalk on the north side of Candelaria Road
5. Improve the pedestrian crossings at Candelaria Road and University Boulevard

8.2.6 Wyoming Boulevard/Utah Street area (Gap Closure - New Connections)

1. Convert the bike route connecting the Paseo del Montanos trail to the Utah Street/Southern Avenue intersection to a Bicycle Boulevard.

- Constitution Ave: Louisiana Boulevard to San Pablo Street
- San Pablo Street: Constitution Avenue to Mountain Road
- Mountain Road: San Pablo Street to Texas Street (short segment on Dallas Street)
- Texas Street: Mountain Road to Marble Avenue
- Marble Avenue: Texas Street to Utah Street
- Utah Street: Marble Avenue to Southern Avenue

8.2.7 San Pedro Drive, Zuni Road to Claremont Avenue (Gap closure)

1. Alvarado Drive, approximately 1/4 mile west of San Pedro Drive, provides existing bicycle facilities complete with a signalized intersection at Lomas and a grade separated crossing at I-40 at the Palomas Drive overpass.

- Unsignalized crossings:
  - Constitution Avenue
  - Indian School Road
  - Menaul Boulevard.

2. San Pedro corridor modification to striping only: Turning the existing four lanes into three lanes with bike lanes (corridor volumes are between the 15,000 to 20,000 threshold):

- Unbalanced section – two lanes in the heaviest direction; one lane in the opposite direction
- Two-way left turn lane in the center
- Reversible center lane.

3. A San Pedro corridor modification is needed to add bike lanes without reducing the number of lanes:

- Zuni to Acoma: Width expansion possible outward from roadway center line; sidewalks will abut adjacent buildings; some impacts to overhead utilities
- Acoma to Central: Width expansion possible; shift center line west; expansion through existing parking lot consumption; parking variances may be necessary
- Central to Domingo: Width expansion possible; shift center line west; expansion through commercial lot fronts; parking variances may be necessary
- Domingo to State Fair Grounds entrance: Width expansion possible; shift center line east
- State Fair Grounds entrance to Lomas: Expansion not possible without re-configuring State Fair Grounds or commercial land acquisition; roadway section is four lanes; no median separation; existing lanes are narrow
- Intersection of Lomas and San Pedro: Commercial land will need to be acquired to accommodate bike lanes
- Lomas to Constitution: Width expansion possible; shift center line west; expansion through commercial lot fronts and parking; parking and landscaping variances may be necessary

- Constitution to I-40: Width expansion possible; maintain center line; expand outward; may need to relocate property walls and acquire right of way from residence
- I-40: Bridge widening will be necessary in order to add bike lanes
- I-40 to Indian School Road: Width expansion possible; shift center line west (box culvert prevents any easterly expansion); expansion through commercial lot fronts; landscaping variances may be necessary; overhead utilities will be impacted
- Indian School to Menaul: Width expansion possible; shift center line east; expansion through commercial lot fronts and parking lots; parking and landscaping variances may be necessary
- Menaul to Phoenix: Width expansion possible; shift center line west; expansion through commercial lot fronts; landscaping variances may be necessary.
- Phoenix to Claremont: Bike lanes exist.

8.2.8 San Mateo/Gibson Intersection connect to Ridgecrest

1. Wayfinding signs directing cyclists to use the existing short trail that connects the San Mateo/Gibson Intersection to Ridgecrest Drive and Ridgecrest to the San Mateo/Gibson intersection.

8.2.9 Montano Road/Montgomery Boulevard (Gap Closure)

1. Bike route from Renaissance Boulevard to Chappell Drive
2. Bike route on Culture Drive from Renaissance Boulevard to Mission Avenue
3. Bike route on Mission Avenue between Culture Drive and Chappell Drive, connecting to the existing multi-use trail that parallels Chappell Drive from the route connects to the North Diversion Channel Trail, Bear Arroyo Trail and the Paseo del Norte Recreational Trail.
4. Add bike lanes on Singer Boulevard from Chappell Road to Jefferson Street

8.2.10 Sequoia Road (Coors Boulevard to Ladera Drive)

1. Coors Boulevard to Atrisco Drive: Convert cross section to have a two-way left-turn center lane between the intersections, adding bike lanes.
2. Atrisco Drive to Ladera Drive: Mark as shared lane bike route.

8.2.11 Girard Boulevard (Gap Closure)

1. Convert Dartmouth Drive to a Bicycle Boulevard from Campus Boulevard to Silver Avenue

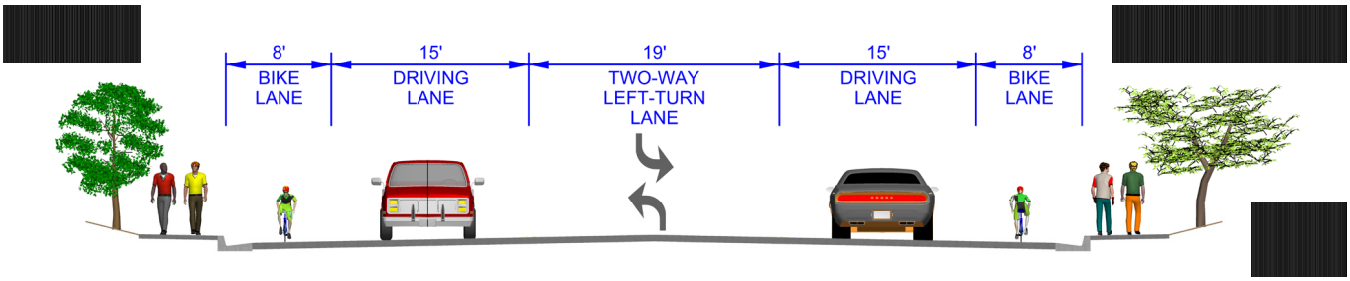
8.2.12 Central Avenue, Yale Boulevard (Intersection Improvements)

1. Central Avenue does not and will not have any bicycle facilities.
2. Yale Boulevard is a bicycle route. Movement north or south through the intersection with Central Ave should proceed with the through movement of vehicular traffic. Adding bike lanes would confuse the movements north of Central Avenue and may potentially be a life safety issue.
3. Engineering judgment – do not change the intersection.

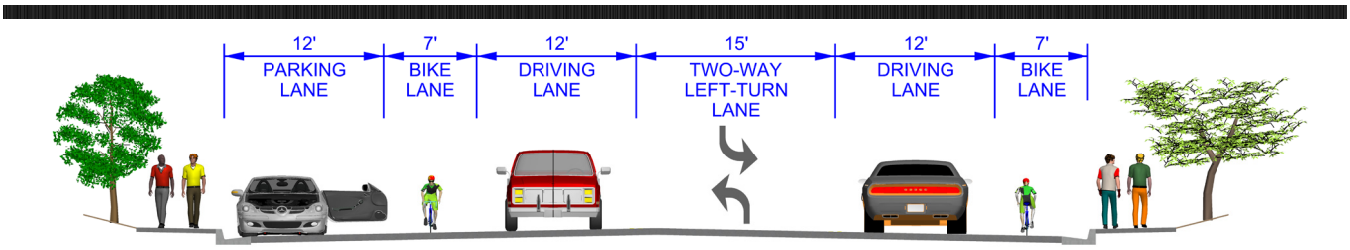
8.2.13 Indian School Road, Rio Grande Boulevard to 12th Street (Gap Closure)

1. Existing Indian School Rd is approximately 65 feet in width, which supports two driving lanes in each direction and a central two-way left turn lane with intermittent single side on-street parallel parking. Existing traffic volumes for 2009 were in the 10,000 to 12,000 AADT.
2. Adding bike lanes is possible without widening by instead reducing the number of vehicle lanes.

- Remove one lane in each direction and
  - Have two 7-foot to 8-foot bike lanes, two 15-foot driving lanes and a 19-foot wide two-way left turn lane (where on-street parking is not warranted).



- Have two 7-foot bike lanes, two 12-foot driving lanes, a 15-foot wide two-way left turn lane and a 12-foot wide parallel parking lane.



8.2.14 Cutler Avenue, Washington Street to San Mateo Boulevard (Gap Closure)

1. The existing corridor is already a designated as a route. No change necessary.
2. Prospect Avenue to the north of Cutler Avenue is a bike route with a signalized crossing of San Mateo Boulevard.

8.2.15 Claremont Avenue as a Bicycle Boulevard (Richmond Drive to Moon Street)

1. Designate Richmond Drive as a bike route/shared route from Candelaria Road to Claremont Avenue.
2. Sign and mark approaches to signalized intersection at Carlisle Boulevard with a R4-11 (see right) and shared route marking.
3. Convert two-way left-turn along San Mateo to a raised median with left turn bays at Claremont Avenue
4. Louisiana Boulevard and Wyoming Boulevard have raised medians. No change necessary.

8.2.16 Lomas Boulevard/Easterday Drive (Gap Closure)

Lomas Blvd. does not have existing or proposed bicycle facilities. Easterday Drive is a low-volume, low-speed street with speed humps that is near Lomas Boulevard South of Lomas Boulevard, Easterday Drive dead ends at a pedestrian bridge over I-40. Only service vehicles utilize this portion of Easterday Drive.

Recommendation: Add route signs or bicycle warning signs to increase the awareness of bicycle presence.

8.2.17 Lomas Boulevard/San Pedro Dr (Gap closure)

Lomas Boulevard does not have existing or proposed bicycle facilities; therefore, there is no gap. No change necessary. See San Pedro Dr recommendations for north/south accommodations.

8.2.18 Cutler Avenue, Washington Street to San Mateo Boulevard (Gap Closure)

1. The existing corridor is already designated as a route. No change necessary.

8.2.19 Alexander Boulevard, Comanche Road to Mission Avenue (Gap Closure)

1. Widen Alexander Blvd. from Comanche Rd. to Carmony Road to add bike lanes by consuming the spur rail line to American Furniture. If the spur line is removed, remove crossing, as well, as it is a safety hazard for bicycles. If the spur line is not removed, install skewed crossing (W10-12-36) signs at the approach to the rail crossing.
2. Carmony Rd. to Mission Ave.: Initiate a road diet on the existing four-lane section by removing one vehicle lane in each direction, widening center driving lanes, adding bike lanes and converting median to a wide two-way left turn lane (or paint a buffer two feet from the raised medians). Keep median and metal barrier at Montano Rd. underpass.

8.2.20 Montano Road, 4th Street to 2nd Street (Gap Closure)

1. The existing Montano Road is approximately 65 feet in width, which supports two driving lanes in each direction and a central median.
2. Adding bike lanes is possible by the expansion of the facility to the south. Several private lots have extra frontage, which could be narrowed or eliminated.
3. Existing eastbound lanes at 4th Street are approximately 10 feet wide, but expansion to the north by 8 feet may be possible.
4. Relocate westbound bike lane on the 2nd Street approach to be between the through and right-turn lane. Paint or delineate the full width of the bike lane in high-conflict areas.

8.2.21 Irving Boulevard, Universe Boulevard to La Paz Drive (Gap Closure)

1. The existing Irving Boulevard has two vehicle lanes in each direction with a center raised median and a westbound bike lane. Traffic is restricted to the eastbound lanes with one lane in each direction until the developer on the northeast corner of Universe Boulevard and Irving Boulevard builds the rest of the intersection (City of Albuquerque impact fees evolution).
2. The existing eastbound direction is approximately 24 feet in width.
3. Narrowing the median is possible in order to obtain the additional 6 feet necessary for eastbound bike lanes.

8.2.22 Washington Street, Lomas Boulevard to Zuni Road (Intersection Improvements)

1. Washington Street south of Central Avenue is a bike route and has bike lanes north of Central Avenue. No change necessary.
2. Washington Street south of Lomas Boulevard is a low-volume road with through-right combinations. Providing a bicycle lane at the intersection would force bicycles to be right of potential right turns and is contradictory to standard practice. No change necessary.

8.2.23 Carlisle Boulevard, Garfield Avenue to Silver Avenue (Gap Closure)

1. Hermosa Drive, approximately 1/10 mile east of Carlisle Blvd., provides existing bicycles facilities.

- Unsignalized crossings:
  - Lead Avenue
  - Coal Avenue

2. Remove two-way left-turn lane and add bike lanes (i.e., convert the three-lane section into a two-lane section with bike lanes).
3. Acquire residential right-of-way strips along the corridor – enough to add bike lanes and reduce width of two-way left-turn lane. Existing sidewalks are narrow and driveways are short.

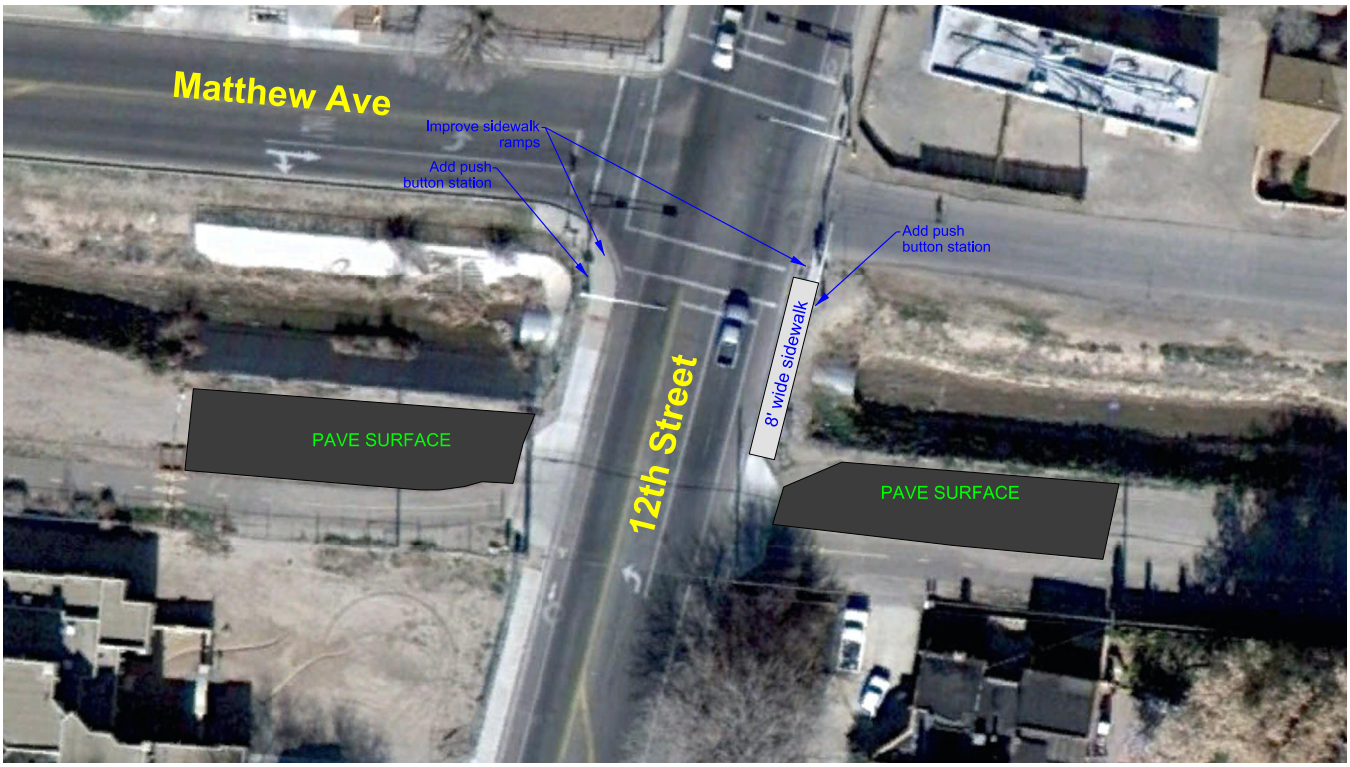
8.2.24 Second Street, Stover to Marquette (Gap Closure)

1. Need description.
2. Designate First Street as a bike route between Hazeldine Avenue and Gold Avenue/Alvarado Transportation Center.

8.2.25 Rio Grande Boulevard (Gap Closure)

1. Bike route Mountain Road to Alhambra Avenue
2. 19th Street: Mountain Road to Old Town Road
3. Old Town Road: 19th Street to San Pasquale Avenue
4. Cross Central Ave at San Pasquale Avenue using pedestrian crossings. Improvements to accommodate bicycles should be part of the redesign of the Central Avenue/ San Pasquale Avenue intersection.
5. Continue on San Pasquale Avenue to Alhambra Avenue

8.2.26 Alameda Drain at 12th Street (Intersection Improvement)



1. Widen the sidewalk on east side of 12th Street to 8 feet wide between the Matthew Avenue and the Alameda Drain multi-use trail.

• Improve the sidewalk ramps on the southeast and southwest corners of 12th Street and Matthew Avenue to make it easier for cyclists to make turns.

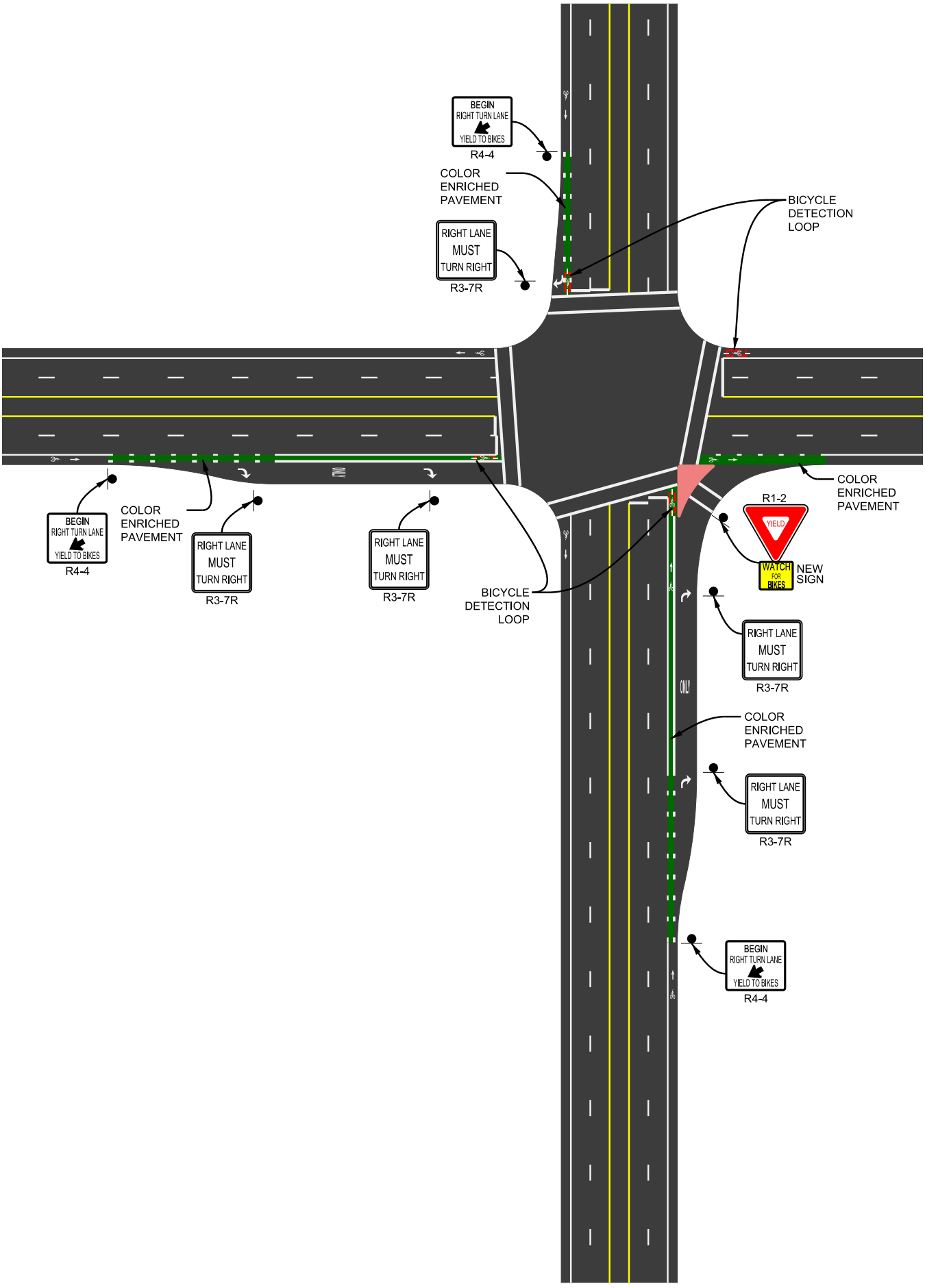
2. Pave the dirt surface between the multi-use trail and the edge of the drain from the sidewalk back 100 feet. This will help eliminate loose soil from accumulating at the multi-use trail/sidewalk interface.
3. Relocate or add pedestrian pushbuttons so that they are easily accessible to cyclists using the crosswalk.

8.2.27 Prototypical Multi-lane Arterial Intersection Improvements

The following diagram shows potential treatments to accommodate bicycle lanes on multi-lane arterial streets. Four different intersection approaches are shown:

- Dedicated right-turn bay (1)
- Right-turn slip lane with yield (3) condition (2)
- Shared bike/right-turn lane
- Combination right-turn/through lane with bike lane on the right side (4)

Traffic signal bicycle detection is a part of each treatment, as is color enriched bike lanes in locations where motor vehicle traffic crosses over the bike lane.


BEGIN
RIGHT TURN LANE
YIELD TO BIKES
R4-4
COLOR
ENRICHED
PAVEMENT
RIGHT LANE
MUST
TURN RIGHT
R3-7R
BICYCLE
DETECTION
LOOP
BEGIN
RIGHT TURN LANE
YIELD TO BIKES
R4-4
COLOR
ENRICHED
PAVEMENT
RIGHT LANE
MUST
TURN RIGHT
R3-7R
RIGHT LANE
MUST
TURN RIGHT
R3-7R
BICYCLE
DETECTION
LOOP
COLOR
ENRICHED
PAVEMENT
R1-2
YIELD
WATCH
FOR
BIKES
NEW
SIGN
RIGHT LANE
MUST
TURN RIGHT
R3-7R
ONLY
COLOR
ENRICHED
PAVEMENT
RIGHT LANE
MUST
TURN RIGHT
R3-7R
BEGIN
RIGHT TURN LANE
YIELD TO BIKES
R4-4

8.3 Code Review and Recommendations

The City's Development Process Manual (DPM), State of New Mexico Code and Albuquerque Code of Ordinances were reviewed where they address the design and use of bicycle and trail facilities. In most cases these documents provide adequate information for developers, users and law enforcement. However, to meet the goals set forth in this plan the following changes are recommended: Include an additional method for the hand signaling of a right-turn movement, add parking restriction in bicycle lanes and marked bicycle boxes, improve reporting of bicycle crashes by law enforcement, remove bicycle front fork size restriction and redefine the way a bike lane width is referenced in the DPM.

These three documents have extensive sections that pertain to the design and use of bicycle and trail facilities. In most cases these documents provide adequate information for developers, users and police; however to meet the goals set forth in the *Albuquerque Bikeways and Trails Master Plan Update* the following changes are recommended:

8.3.1 New Mexico State Motor Vehicle Code

New Mexico Code Chapter 66 contains statutes describing legal uses of roadways for all system users (e.g., cyclists as well as motorists). The following statute describes legal hand and arm signals:

66-7-327. Method of giving hand and arm signals
All signals herein required given by hand and arm shall be given from the left side of the vehicle in the following manner and such signal shall indicate as follows:

A. left turn: hand and arm extended horizontally;
B. right turn: hand and arm extended upward; and
C. stop or decrease speed: hand and arm extended downward.

Proposed Change:
Amend subsection B to allow bicyclists to signal a right turn by extending their right hand and arm horizontally. Example language can be found in Oregon's statute ORS 811.395.2.A, which reads, "To indicate a right turn either of the following:

(a) Hand and arm extended upward from the left side of the vehicle. A person who is operating a bicycle is not in violation of this paragraph if the person signals a right turn by extending the person's right hand and arm horizontally.
(b) Activation of front and rear turn signal lights on the right side of the vehicle."

Discussion
While enclosure within a motor vehicle prohibits the use of the right hand for signaling in many situations, a cyclist has the potential freedom to signal turning movements with either the left or right hand. In addition to having this potential freedom, many youth educators recommend that signaling a right hand turn with the right arm can be less confusing for youthful riders.

The city can work with legislative advocates to amend the existing state law during a future legislative phase.

8.3.2 Albuquerque Code of Ordinances

8-5-1-1 Stopping, Standing or Parking Prohibited – No Signs Required
No person shall stop, stand or park a vehicle except when necessary to avoid conflict with other traffic or in compliance with the law or the directions of a police officer or traffic control device, in any of the following places:

Add the following:

(O) In a marked bicycle lane
(P) In a marked bicycle box

Discussion:
Bicycle lanes are travel lanes. It can potentially increase conflicts for cyclists using a lane to have to weave in and out of motor vehicle traffic to avoid cars parked in the bike lane. The DPM, in section N.3.c.2., also states the following:

> *"Bike lanes are traffic lanes, therefore, automobile parking or motor vehicle use of a bike lane as a driving or passing lane should be prohibited."*

8.2.9 Accidents, Reports
Each of the items in this section should be re-worded to clearly include bicycle crashes.

Discussion
Bicycle crashes are under-reported and a complete record of bicycle related crashes in the City will be a valuable tool for future planning, identification of roadway conflicts and identification of areas in need of better enforcement of traffic laws.

8.3.3.2.28 F Bicycle Equipment – Front Fork
Suggestion
Remove the requirement that a modified bicycle may not have a front fork that exceeds the diameter of the front wheel.

Discussion
Modified bicycles have not been shown to impact the safety of operators or other roadway users.

8.3.3 Albuquerque Development Process Manual

N1.2.a. Development of Bike Lanes on New or Reconstructed Roadways
Cross section diagrams show the bike lane measured from edgeline of the outside lane to the face of the curb. The language in the manual indicates the measurement should be from edgeline to the edge of gutter. The diagrams should be updated to match the text.

Discussion
The guidance given is contradictory and should be consistent to ensure the desired outcome.

8.4 Maintenance and Operations

Properly maintaining the City's bikeways and multi-use trail network is vital to the longevity and usefulness of these facilities. This plan addresses issues concerning pavement preservation, sweeping, pavement marking and signs, vegetation control, drainage, crack sealing/filling and a Spot Improvement Program for bikeways and multi-use trails. Recommendations include monitoring the frequency of sweeping requests and the identification of areas that typically require more than the normally scheduled sweeping, puncture vine control using biological and herbicidal methods and proper use of landscape materials next to multi-use trails.

8.4.1 On-Street Bikeways

8.4.1.1 Pavement preservation

The surface condition of on-street bicycle facility pavement has a significant effect on the quality of the riding experience. Ride comfort and safety depends on a smooth, crack-free paved surface without longitudinal ridges between pavement lifts or along gutter edges. Longitudinal pavement cracking or separation between adjacent surfaces wider than half an inch can potentially be hazardous, trapping bicycle wheels and causing crashes.

Figure 1: Crack sealed pavement.

Transverse cracking, while less hazardous than longitudinal cracks, degrades the ride quality. In areas where motor vehicles normally do not travel, such as bike lanes and shoulders, transverse cracking can degrade further resulting over time into ridges along the edges of the crack a condition that cyclist tend to avoid riding on choosing to use the driving lane instead of the designated bike lane or shoulder.

Figure 2: Pavement overlay with smooth gutter transition.

8.4.1.1.1 Types of pavement preservation

Crack sealing

Crack sealing is used as a first defense against further pavement deterioration because it offers important benefits. Effective crack sealing keeps water from entering and weakening the base or sub-base. It helps preserve the pavement adjacent to the cracks and extends pavement life by minimizing crack growth. Cracks are typically sealed using rubberized hot pour material that can be problematic for cyclists to ride over. Caution should be used when sealing cracks that run in the direction of travel, as this material can cause loss of handling and lead to loss of control of the bicycle. Sealing transverse cracks often creates a ridge, degrading the ride quality. Crack sealing, shown in Figure 1, should be used as a temporary means of pavement preservation.

Figure 3: Pavement overlay showing excessive pavement ridge at gutter lip.

Overlay

Slurry Seal: A mixture of emulsified asphalt, fine aggregate, mineral filler and water. The slurry seal is placed on the surface of the existing pavement adding ¼ of an inch to the pavement thickness.

Micro-Surfacing: A composition of polymer asphalt emulsion and selected fine aggregate. It is applied cold and can be placed in thicknesses up to 1.5 inches.

Properly applied Slurry Seal and Micro-Surfacing can provide a smooth riding surface extending the pavement life. Care must be exercised to minimize the ridge along the gutter lip at the pavement/gutter interface.

Chip Seal: Chip Seal is an application of a binder in the form of an emulsion or hot spray and an application of an aggregate as close to single size as possible. Chip seal should not be used for bikeways.

Heater Scarification: Heater scarification is a process of heating the surface of the existing pavement with either natural gas fired burners or infrared heaters, scarifying the softened surface with ripper teeth and spraying it with a rejuvenating agent. This material is all mixed together in an auger chamber and leveled with a screed. Pneumatic rollers compact the loose mixture in preparation for the overlay.

Heater Repaving
This process is similar to the heater scarification process. First the pavement is heated, then scarified and a rejuvenating agent is then added and it is mixed. At the same time that this process is performed, a layer of hot mix asphalt is placed over the heated recycled surface. A screed is then used to level the pavement. The pavements are then compacted. The scarification is usually between 3/4 to 1 1/2 inches deep.

Care must be exercised when using pavement overlays to minimize the ridge along the gutter lip. Examples of pavement overlays with acceptable pavement/gutter interface can be seen in Figure 2 and unacceptable ridge along the gutter lip at the pavement/gutter interface can be seen in Figure 3.

Mill and inlay
Milling of an asphalt concrete pavement surface refers to the mechanical removal of a part of the pavement surface. There are several applications of the milling process. The most common is to remove an unstable surface that exhibits excessive distresses, such as roughness, cracking, rutting or raveling, and reduce pavement build up to eliminate the need to raise drainage structure elevations and to have paved surfaces match gutter elevations. After milling the asphalt pavement surface, a lift of asphalt is placed on the milled surface to provide a new roadway surface. Again, as when using pavement overlays, care must be exercised to minimize the ridge along the gutter lip at the pavement/gutter interface.

8.4.1.1.2 Sweeping

Accumulation of debris on streets comes from many different sources. This includes natural sources, such as plan material and road kill; systemic sources, such as debris from adjacent driveways and improperly used landscaping; and human generated debris, such as crash debris, litter and broken glass. Reduction, prevention and management are important in keeping a clean and safe facility. Loose debris on a bicycle facility can cause loss of traction, flat tires and hazardous conditions for the cyclist.

Figure 4: Unwanted Gravel and sand on a bike route from unpaved driveway.

Bicycles have a lower tolerance than motor vehicles for objects on the roadway surface. Broken glass, small gravel, sand and twigs can easily be driven over by most motor vehicles without causing problems. A small object on the roadway can be big problems for bicycles. Those objects can result in an unsuitable riding condition for a bicycle. Additionally, the aforementioned debris tends to migrate from the wheel paths of driving lanes to the bike lane. With this in mind sweeping requirements for bicycle facilities differ from those needed for motor vehicles. The frequency of bicycle facility sweeping may need to be increased over what is normally scheduled for roadways. Gravel and sand coming from an unpaved driveway shown in Figure 4 can easily be driven over by motor vehicles but can cause problems for cyclists. It may be advantageous to collect data on the condition of the bicycle facility during scheduled sweeping and when requests are made for additional sweeping. This data could be used in determining

the areas that require more attention, providing supporting data when requesting maintenance budgets and the development of effective bicycle facility sweeping schedules.

8.4.1.1.3 Pavement markings

Several methods of pavement marking are available: Paint, hot thermoplastic and preformed plastic. All of these methods have similar requirements for retroreflectivity and color while the cost and durability depends on the specific type of marking material. Bicycle facility pavement markings should be maintained with emphases on retroreflectivity, legibility and discoloration. When the pavement markings are determined to be deficient replacement or repainting of the marking is required.

Repaving of a roadway can provide an opportunity for the City to reconfigure the roadway crossection to include bicycle facilities. In many cases this can be done inexpensively and quickly in the restriping process by including bicycle facilities where feasible. On repaved roadways with bicycle facilities the pavement markings shall be replaced to match the pavement marking configuration as they were prior to the repaving.

8.4.1.1.4 Signs

Signs have a finite life span due to the degradation of the reflectivity and fading and should be replaced when they no longer are legible or meet the retroreflectivity requirements. Signs that are missing or damaged from graffiti and/or crashes should be cleaned or replaced. Care in cleaning must be exercised as to not degrade the retroreflectivity of the sign, erase the sign message or change the sign color. In locations were graffiti is more common anti-graffiti coatings on sign faces or sign face materials that can withstand graffiti removal should be considered.

8.4.1.1.5 Vegetation control

Encroaching vegetation shall be kept away from the bicycle facility and roadways in general. Vegetation shall not block signs or line of sight at intersections and provide at least 8 feet of vertical clearance above the bicycle facility. Periodic trimming of vegetation, especially when leaves are on the plants, may be required.

Mowing of weeds and grasses along the roadway edges should be done before they encroach into the bikeway. Sweeping after mowing may be needed to remove debris from the bikeway.

8.4.1.1.6 Drainage

Drainage on roadways with curbs and gutters is normally conveyed along the outside edge of the roadway where the bike lanes typically are. During significant rain events the bike lanes will usually be inundated by the drainage, making them difficult or impossible for cyclist to use. After rain events debris that has accumulated due to runoff will need to be removed from the bicycle facilities (Figure 5). In locations where this happens frequently due to runoff, increased sweeping of the bikeway may be needed and the drainage system should be modified to prevent the debris accumulation. Catch basin grates should be bicycle-safe and replaced with the appropriate grate if not.

Figure 5: Debris from storm water runoff deposited in bike lane.

8.4.1.2 Multi-use Trails

8.4.1.2.1 Pavement preservation

As asphalt pavement ages, it tends to shrink, creating transverse cracks. Thermal expansion and contraction cause cracks to become wider, creating an unsuitable riding surface. Multi-use trails are typically not susceptible to longitudinal cracking, as the width of the trail allows for it to be paved in a single pass by the asphalt lay-down machine. However, new designs and full depth reclamations shall take care to avoid creating an edge of pavement drop-off of more than 1.5 inches. This can be achieved by using a tapered asphalt section.

8.4.1.2.2 Types of pavement preservation

Crack sealing
Crack sealing of multi-use trail asphalt pavement is similar to that of the on-street facility. In addition to the rubberized hot pour material, a ridged crack fill for cracks wider than half and inch has been used with limited success. Over time shrinkage of the asphalt pavement can cause the ridged crack fill material to pull away from the crack edges, thus producing another crack, figure 6. Narrow crack should not be repaired using rigid material (Figure 7) because it will not enter the crack and remain on the pavement surface creating a ridge.

Figure 6: Pavement crack repair using rigid material pulling away from pavement.

Full Depth Reclamation
(Bomag®) Cold Mix-In-Place-Recycling, Full depth reclamation is an in-situ process that grinds up the existing asphalt pavement and aggregate base course, mixes both together and replaces it back on the sub-grade soil. This homogeneous mixture is then re-compacted and ready for a new asphalt pavement.

Figure 7: Rigid crack fill material used on a narrow longitudinal pavement crack.

8.4.1.2.3 Sweeping

Keeping the trail surface clear of debris is important for the safety and comfort of trail users. Trails should be swept on a schedule basis and when requested. Locations that historically require more frequent sweeping should be noted and investigated as to what may be causing this problem and fix if practical. Locations that need immediate sweeping (Figure 8) should be reported to the City.

8.4.1.2.4 Pavement markings

Generally, trails have a few simple markings (e.g., a yellow center line); however, these should be repainted or replaced when necessary.

Figure 8: Multi-use trail needs sweeping to remove broken glass.

8.4.1.2.5 Signs

Signs have a finite life span due to the degradation of the reflectivity and fading and should be replaced when they no longer are legible or meet the retroreflectivity requirements. Signs that are missing or damaged from graffiti and/or vandalism should be cleaned or replaced. Care in cleaning must be exercised, so as to not degrade the retroreflectivity of the sign, erase the sign message or change the sign color (See Figure 9). In locations where graffiti is more common anti-graffiti coatings on sign faces or sign face materials that can withstand graffiti removal should be considered.

Figure 9: Degraded sign face due to graffiti and graffiti removal.

8.4.1.2.6 Vegetation control

Trimming

Vegetation shall not block signs or line of sight at intersections. Additionally, ground level vegetation shall not protrude beyond the edge of the trail shoulder. Periodic trimming of vegetation especially when leaves are on the plants may be required.

Mowing of weeds and grasses along the trail edges should be done before they encroach beyond shoulder of the trail. Sweeping after mowing may be needed to remove debris from the trail surface.

Figure 10: Asphalt pavement damage from root heave.

Root Control

Root heave seriously degrades pavements, which are characterized by a sharp hump and cracking along a sporadic path (Figure 10). When the pavement is damaged by root heave the pavement in the immediate area will need replacement along with removal of the offending roots.

8.4.1.2.7 Noxious Weed Control

Control of weeds like Puncture Vine (*Tribulus terrestris*), more often referred to as Goat Heads, can be difficult. Three commonly used methods of Goat Head control can keep the troublesome plant under control. Two methods are currently used by the City: mechanical and herbicidal. The third, biological, should be considered for experimentation.

Figure 11: Puncture Vine with dozens of mature "Goat Head" seeds.

Mechanical

This involves the cutting and removal of the growing, ground hugging vine. It is a time consuming process that should be performed before the plant's seeds mature. If the cut plants have mature seeds care in handling should be used so as to not drop and distribute the seeds.

Herbicidal

There are pre-emergent herbicides that are effective. Products containing oryzalin, benefin, or trifluralin will provide partial control of germinating seeds. These must be applied late winter to mid-spring prior to germination. After plants have emerged from the soil (post-emergent), products containing 2,4-dichlorophenoxyacetic acid ("2,4-D"), glyphosate and dicamba are effective on puncture vine. Like most post-emergents, they are more effectively maintained when caught small and young. Some people have sensitivities to these herbicidal chemicals and prefer that they be used limitedly or not at all. Temporary

warning sign indicating when herbicides are being applied may be helpful to inform the public of their use.

Biological
Two weevils, *Microlarinus lareynii* and *M. lypriformis*, native to India, France and Italy, were introduced into the United States as biocontrol agents in 1961. Both species of weevils are available for purchase from biological suppliers.

- *Microlarinus lareynii* is a seed weevil that deposits its eggs in the young burr or flower bud. The larvae feed on and destroy the seeds before they pupate, emerge, disperse and start the cycle over again. Its life cycle time is 19 to 24 days.
- *Microlarinus lypriformis* is a stem weevil that has a similar life cycle, excepting the location of the eggs, which includes the undersides of stems, branches and the root crown. The larvae tunnel in the pith where they feed and pupate. Adults of both species overwinter in plant debris. Although the stem weevil is slightly more effective than the seed weevil when each is used alone, the weevils are most effective if used together and the puncture vine is moisture-stressed.

Source http://en.wikipedia.org/wiki/Tribulus_terrestris

8.4.1.2.8 Landscape

Trails being enhanced via landscape projects shall take care that landscape amenities such as gravel slope stabilization and other mulch ground cover material not be placed on steep slopes near the trail. When landscape ground cover material is used a two-foot wide shoulder next to the trail's edge should be keep free of this material. Uncontained ground cover on a steep slope will migrate onto the trail creating a hazard for trail users (Figure 12). In locations that have experienced ground cover spilling onto the trail, the ground cover material should be replaced with a more stable material, the side slope near the trail re-graded to prevent material from spilling onto the trail or more frequent maintenance be preformed at these locations to keep the trail free of debris.

Figure 12: Landscape gravel on trail side slope migrating onto multi-use trail.

8.4.1.2.9 Drainage

Drainage on trails is generally less of an issue than street facilities, as trails have a tapered or blunt edge without the confinement of a curb, which confines drainage and thus debris to the pavement. However, trails typically are designed with tapered shoulders and parallel ditches. Where storm runoff drains off a side slope it should be directed away from the trail. Debris that is deposited on the trail from runoff should be removed as soon as possible (Figure 13). At locations where this occurs frequently, additional trail maintenance will be needed until the drainage problem is corrected.

Figure 13: Sand from storm runoff deposited on multi-use trail.

8.4.2 Spot Improvement Program

The city should consider implementing a spot improvement identification program. Soliciting comments from users can help the City identify specific problem locations. Institutionalizing this process in the form of a spot improvement program can provide ongoing input and, in many cases, help identify problems before someone gets hurt. In addition, such a program can dramatically improve the relationship between an agency and the bicycling public. The City's 311 Citizen Contact Center would be ideal for this type of program.

8.5 Wayfinding and Emergency Responders

Wayfinding for cyclists and other trail users can be a challenge and knowing where you are on the multi-use trails sometimes is difficult due to the lack of a standardized location identification system. Marking of the on-street bikeways and multi-use trails with wayfinding will provide the users an effective way of identifying where they are and direct them to where they wish to go. A standardized facility naming and marking program was developed for this plan, which is contained in the Design Guidelines volume of this plan. The criteria for laying out this program was based on the needs of pedestrians and other trail users as well as bicyclists. Law enforcement and emergency responders can use this information in finding locations of incidents on the multi-use trails accurately. The existing multi-use trail system can be upgraded to include wayfinding and all newly constructed facilities can include wayfinding as part of their design.

8.6 Projects and Intersections

It is recognized that all of the project recommendations contained in this plan will require further detailed study and design. On-street facilities will have to be designed with their impacts to intersections and road networks in mind and coordination with City Traffic Engineering would be required. Some of the multi-use trails recommended in this plan would be contained within property owned by either the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) or the Middle Rio Grande Conservancy District (MRGCD). Detailed analysis would be required to determine the feasibility of locating these trails within the rights-of-way for either entity. Furthermore, the design and construction of these trails would require considerable coordination and would have to go through the permitting and approval process for each respective entity.

The projects proposed by this plan originate from many different sources, which are detailed below:

- *The City's Trails and Bikeways Facility Plan*
- *The City's Comprehensive On-street Bicycle Plan*
- *The Mid Region Council of Governments (MRCOG) Long Range Bicycle Plan*
- Input from stakeholder workshops
- Detailed analysis of existing bicycle facilities
- City of Albuquerque STIP planning

The proposed projects were divided into two categories: High Priority Projects and Full Build-Out. A detailed explanation of each of these categories is contained in the following sections.

8.6.1 High Priority Projects

During stakeholder workshops and the public comment phase, a list of projects was created, which are considered 'critical links' in the City's bikeways system. In addition the City of Albuquerque provided a short list of projects, which are currently programmed or may already be in the design and/or construction phase. These projects include approximately 4.5 miles of bike boulevards, 72 miles of bike lanes, 42 miles of multi-use trails and 20 miles of bike routes. The estimated total cost for these projects is $51.1 million. A detailed list of these projects is shown following Section 9 and a map of these projects is also included in the back of this report.

8.6.3 Full Build-Out of the Long Range Bicycle Plan

All projects that were identified from the sources listed above are included in the *Full Build-Out 2030 Bicycle Plan*. This list includes those projects identified as High Priority. These projects consist of the following:

- Bike Boulevards 8 Miles
- Bike Lanes 189 Miles
- Multi-use Trails 389 Miles
- Bike Routes 78 Miles

A complete listing of these projects is included at the end of this report. A map of the complete build-out of the *2030 Bicycle Plan* is also included in the back of this report.

8.6.4 Intersection and Crossing Improvements

This plan makes recommendations for improvements to intersections. A listing of intersections in the City, which require improvement for bicycle facilities, was considered too numerous to mention. Therefore, an evaluation of each intersection, which is slated for roadway improvements, is left to a case by case basis for the inclusion of bikeway improvements.

9.0 Implementation

Achieving the goals of the *Albuquerque Bikeways and Trails Master Plan Update* requires the coordination of staff time with available funding and public input. While the City of Albuquerque can directly implement infrastructure investments, implementation of education, outreach, enforcement and evaluation programs will necessarily involve numerous community partners. This chapter identifies goals, programs, outreach efforts and priority bicycle facilities project that are likely feasible and most capable of providing the greatest community benefit and improvements. This implementation plan is an important component of the overall planning effort. It helps ensure a structured approach to project development that involves the bicycling community, the general public, elected officials, city staff, partner organizations and funding agencies. Additionally, the implementation plan serves as a measure of Albuquerque's progress on achieving these goals through the completion of particular projects, education, encouragement and measurement with each passing year. As a result, implementation should be seen as an ongoing process rather than a finite task. Below we offer guidance for a strategy to implement recommended programs.

9.1 Goals and Objectives

- Achieve a Bicycle Commute Mode Share of 5 percent by Year 2020 and a 10 percent Bicycle Commute Mode Share by Year 2030. The City's Engineering Group will conduct an annual bicycle user survey to collect and report mode share data for commuting trips.
- Achieve a Bicycle Mode Share of 5 percent of All Trips by Year 2020. The City's Engineering Group will conduct an annual bicycle user survey to collect and report mode share data for all trips.
- Reduce by 50 percent the Number of Bicycle Fatalities and Injuries by Year 2020. The City's Engineering Group will obtain and update crash data from The Division of Government Research (DGR) and Albuquerque Police Department records. Compare annual updates to data verifying the reduction of bicycle fatalities and injuries.
- Achieve the League of American Bicyclists "Bicycle Friendly Communities" highest award status designation and Bicycling Magazine's "Top Ten Best Cities for Cycling" award by institutionalizing bicycling as a legitimate form of transportation in all planning and programming efforts and public awareness campaigns. The City's Engineering Group will report the results of the survey and identify solutions to rectify decencies reported by the award.
- Provide bicycle facilities at half-mile spacing intervals on average throughout the metropolitan area. Increase on-street bikeway mileage from the current 365 to 500 (year 2020) and 650 (year 2030). Increase multi-use trail mileage from the current 175 to 200 (year 2020) and 240 (year 2030). The City's Engineering Group will prepare a biennial report of the bicycle facilities that have been constructed.
- Improve and fully fund the street maintenance and sweeping program. Establish the highest priority for allocation of street sweeping resources to sweeping all bike lanes at least once per month and bike routes on local streets a minimum of four times a year. Multi-use trail sweeping should be performed on a regular basis and when requested. The City's Street Maintenance department and The City's Parks and Recreation Maintenance department will provide the annual data on frequency of scheduled sweeping for the on-street bikeways and the multi-use trail network along with the number and location of spot sweeping requests. This information will be used to establish a database to track trends and provide data that can be used in refining the scheduled sweeping frequency and provide supporting evidence for future maintenance budget request.
- Establish timely responsiveness to maintenance requests from citizens through the use of the City's 311 Citizen Contact Center or website or other means for citizens to report concerns. Establish an agency goal of 48 hours to address these requests. The City's Street Maintenance department and The City's Parks and Recreation Maintenance department will monitor response time for the maintenance requests and provide follow-up on the type of response. Report annually the number and type of request being made.
- Encourage wide-spread support and participation by bicycle shops, bicycle clubs, the Greater Albuquerque Bicycling Advisory Committee, Greater Albuquerque Recreational Trails Committee and other bicycle interest groups in efforts to promote public awareness of bicycling. The City's Engineering Group will monitor membership and/or participation and growth.

- Provide specific line item funding to support bicyclist education. The City's Engineering Group will report the annual budget that is used for bicyclist education.

9.2 Education

Albuquerque residents already have a number of education options available to them. The City's Bicycle Safety Education Classes are a national model. In addition, City staff are already working with the Defensive Driving Class for City employees and on a trial basis with three Driver's Education Programs, as well as partnering with the Albuquerque Police Department on Bike Light Giveaways. It should be a top priority to continue, strengthen and expand these programs. Seeking additional funding and staff capacity will be a key strategy, possibly through grant funding sources or local partners.

Developing a Driver Diversion Class will be a longer-term effort, as they will require coordination with many community partners. The Diversion Class will require the support and participation of local courts, and working with lawyers, traffic safety professionals and educators to prepare the curriculum will help the program launch on a firm footing. This program may need start-up funding to develop the course, but it should be self-sustaining on a long-term basis as the fee for participation can be set to cover the costs of the program.

Likewise, launching a Unified "Share the Road" Awareness Campaign will be a longer-term priority as well. A media partner should be identified who can donate ad space/time and a steering committee formed to develop messages and a campaign strategy. A professional graphic design and/or marketing firm would be able to elevate the effectiveness of the campaign.

Finally, starting a Mountain Biking Program should be viewed as a long-term strategy that will be particularly valuable as more soft-surface trails are developed.

9.3 Outreach

The top near-term outreach priority should be the "One-Stop" Albuquerque Bicycling Website. It can be hosted on the City's existing website, incurring no additional expenses, and can largely be assembled by City staff, with the support and participation of GABAC and GARTC. Information gathered for this plan about existing groups, maps, safety information, 311 hotline and online forms and other online resources can be used to jump-start the process, while community liaisons such as BikeABQ members can assist with event calendar listings. The website should be used to share information with the public about progress in implementing this plan. Once the website is established, it should be reviewed on at least a monthly basis to add updates and remove outdated information. Providing bicycle planning staff with the tools to updated the website will help keep information relevant.

Another top priority should be continued support of Bike to Work Day in May. The 2010 event was a huge success, with multiple commuter stations, raffles and prizes and a Bike Buddy program. The City and other event partners (such as BikeABQ) should continue to support the event at the same level, and if possible expand the event to include components such as such as a commute ride to or from City Hall with the Mayor/City Council, commute classes, bike commute challenge contests and celebratory events.

Expanding the existing Albuquerque Safe Routes to School program will offer great benefits to children's health and safety. The statewide Safe Routes to School program, run by the New Mexico Department of Transportation, offers funding assistance for developing an action plan, implementing infrastructure projects and offering non-infrastructure projects. It should be noted that funding for this program is currently on hold pending Congressional reauthorization of the federal transportation bill. The City should track availability of statewide funding and consider it a priority to apply for funding when the application process is re-opened.

Several family-oriented outreach programs have been recommended, including a Family Bicycling and Trail Use Program, a Bike to Parks Program and a Summer Streets Car-Free Street Event. These all should be seen as medium-priority actions and the City should select which program they would like to focus on

first. A Share the Trail Campaign is not a first-tier priority, but may be implemented sooner if a community group like BikeABQ is willing to take primary responsibility for it.

The recommendation to host Launch Parties for New Bikeways should be implemented in coordination with bikeway implementation projects. It is a low-cost strategy that publicizes new facilities and builds public awareness of bicycling. As a low-cost/high-benefit program, it should become part of the City's standard bikeway implementation procedure.

Finally, because the City has no direct influence over the University of New Mexico Bike Program recommendation, it should be viewed as a relatively low priority. The City should nevertheless encourage UNM to proceed and offer their staff expertise and materials to support the program.

9.4 Enforcement and Evaluation

For evaluation efforts, the City's top priority should be to perform Annual Bicycle and Trail Counts. The resources needed to support this effort will primarily be staff time, so a lead city staff person should be identified who is able to set aside sufficient time to manage the count effort. Many communities seek volunteers to do the counts. It is recommended that the City follow the National Bicycle and Pedestrian Documentation Project (NBPDP) methodology, which recommends counts in September. The advantages of starting with the NBPDP approach is that a) count forms, training materials and instructions are ready for use and b) the results can be compared with communities around the US.

For enforcement, all efforts will need to be coordinated with the Albuquerque Police Department (APD). The City should enter into discussions with the APD and seek to jointly agree to proceed with Law Enforcement Education trainings and Community Enforcement Actions (such as targeted speed enforcement near schools, speed reader board deployment, bicycle light giveaways, etc.). Several APD officers have already worked with GABAC and the City on bicycle and trails enforcement issues, so it is suggested that the City initiate contact through these officers.

9.5 User Needs

9.5.1 Counts

9.5.1.1 Annual or semi-annual counts

The City should consider participating in the annual National Bicycle and Pedestrian Documentation Project. This will help to better estimate existing and future bicycle and pedestrian demand and activity. This nationwide effort provides consistent model of data collection and ongoing data for use by planners, governments and bicycle and pedestrian professionals. Annual counts are normally conducted in mid September. Additional a second set of counts, possibly in April, could be conducted at the same locations and time period of the September counts to better understand seasonal fluctuation in the number of cyclists.

9.5.1.2 Day long counts.

The City should conduct day long (sunrise to sunset) counts at selected locations to better understand the off-peak user patterns and to accurately identify the peak user time of day. This data can reveal the recreational and utilitarian usage of the bikeways in the city.

9.5.1.3 Counts at high crash location

At locations identified as having experienced greater than normal crashes with motor vehicles the City should conduct bicycle user counts. These counts can provide data to help in the determination of the greater than normal crash rate. Evidence has shown that as ridership increases, crash rates decrease. It has been speculated that this can be attributed to the expectation of cycling activity.

9.5.1.4 Permanent count locations

Permanent, automated bicycle count locations can be established where the City would like to record daily bicycle use. The location selected can be based on the type of target user group such as commuters,

recreational, utilitarian and students. The information gathered can be used in determining commute mode share, provide a fuller understanding of variation of use by time-of-day, season, weather and special events and provide supporting evidence of the change in use of the targeted facility.

9.5.2 Crash Related

9.5.2.1 Detailed Crash Analysis

The detailed crash analysis presented in this report should be repeated every few years to identify high crash locations and solutions to improve safety for non-motorized transportation users. This could be done as a part of a periodic bikeway and multi-use trails 'report card' that documents relevant metrics, including new bikeway miles, new trails and crossings, major completed projects, number of bicycles and other trail users, crash analysis, user satisfaction, public perception of safety, etc. This periodic review could be used to create updates to the *Albuquerque Bikeways and Trails Master Plan Update* that can tune the plan's implementation strategies to respond to changing safety, walking and bicycling patterns.

The City should consider education or enforcement programs that address specific causes of crashes involving bicycles and other non-motorized transportation users. The most frequent type of crashes were instances where a car hit a bicycle at an angle

The City should consider a detailed analysis of conditions along top crash corridors and at top intersections. This analysis should help the city determine whether the higher numbers of crashes are related to difficult conditions or higher numbers of cyclists using the corridor.

The majority of reported bicycle crashes have occurred on major roadways with four to six travel lanes, no dedicated bicycle facilities and posted speeds of at least 35 mph. Future roadway design and corridor retrofit of these corridors should focus on increasing safety by through increased separation and enhanced crossing treatments.

9.5.3 Survey

The City should consider conducting a survey of the bicycle and trail users. This survey could be led by a local advocacy organization under the direction of the City. The survey results could be used to evaluate the City's progress and identify areas of concern and evolving needs of the users.

9.6 Wayfinding

9.6.1 Marking

Marking of the on-street bikeways and multi-use trails wayfinding will provide the users an effective way of identifying where they are and direct them to where they wish to go. Marking and maintenance of the markings for the existing bikeway and trail system will be combined effort undertaken by Street Maintenance for the on-street portion and by Parks and Recreation Maintenance for the multi-use trail portion. Newly constructed facilities will include wayfinding as part of their design and be included as part of the facility construction.

9.6.1 Emergency Responders

Coordination between the City and emergency responders with regards to the wayfinding system needs to be established. This effort would best be done by Parks and Recreation due to the fact that a greater part of this will involve the multi-use trail system

9.7 Maintenance

9.7.1 On-Street

Pavement preservation, signs, pavement markings and sweeping are the responsibilities of Street Maintenance Group.

9.7.2 Multi-use Trail

Pavement preservation, signs and pavement markings, vegetation control and sweeping are the responsibilities of Parks and Recreation Maintenance Group.

9.7.3 Citizen Maintenance Requests

The City has in place a centralized reporting system, "Citizen Contact Center," that can be used effectively to report problems and request maintenance. Several methods for reporting are available: call 311 by telephone, using Twitter and by visiting www.SeeClickFix.com. Comments are then routed to the appropriate people. To increase utilization of this service the City should promote its use by informing bike clubs and organizations and bicycle advocacy groups and consider developing a Public Service Announcement.

9.8 Bicycle Friendly Community

The League of American Bicyclist/Bicycle Friendly Community Program (BFC) provides incentives, hands-on assistance and award recognition for communities that actively support bicycling. A Bicycle Friendly Community welcomes cyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation. In 2005 the City of Albuquerque was awarded the Bronze level recognition and is currently the only city in New Mexico to be recognized as a Bicycle Friendly Community.

The City's Engineering Group is responsible for preparing and submitting application for this award along with community input and assistance from local advocacy groups. The application is an audit of the five Es: Engineering, education, encouragement, enforcement and evaluation efforts in the city. This comprehensive inquiry is designed to yield a holistic picture of the community's work to promote bicycling. There are two application deadlines per year: one in February and the other in July. To assist with completing the BFC application, a BFC checklist was developed and is located on appendix H of the plan.

9.9 Funding

9.9.1 Federal

On August 10, 2005, President Bush signed into law the Safe Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU). The legislation updated Titles 23 and 49 of the United States Code (U.S.C.) and built on the significant changes made to Federal transportation policy and programs by the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and the 1998 Transportation Equity Act for the 21st Century (TEA-21). The legislation had a number of provisions to improve conditions for bicycling and walking and increase the safety of the two modes. This document describes the range of opportunities to improve conditions for bicycling and walking.

Policy: Mainstreaming Nonmotorized Transportation
Federal transportation policy is to increase nonmotorized transportation to at least 15 percent of all trips and to simultaneously reduce the number of nonmotorized users killed or injured in traffic crashes by at least 10 percent. This policy, which was adopted in 1994 as part of the *National Bicycling and Walking Study*, remains a high priority for the U.S. Department of Transportation (DOT). SAFETEA-LU continued to provide the funding opportunities, planning processes and policy language by which states and metropolitan areas can achieve this ambitious national goal.

Improving conditions and safety for bicycling and walking embodies the spirit and intent of Federal surface transportation law and policy to create an integrated, intermodal transportation system which provides travelers with a real choice of transportation modes. State and local agencies are challenged to work together cooperatively with transportation providers, user groups and the public to develop plans, programs and projects which reflect this vision. At the Federal level, the Federal Highway Administration (FHWA) is working with the National Highway Traffic Safety Administration (NHTSA), the Federal Transit Administration (FTA), the Federal Railroad Administration (FRA) and other agencies, to implement the

bicycle and pedestrian provisions of Federal surface transportation law. This guidance document provides additional information on this important subject.

SAFETEA-LU confirmed and continued the principle in Federal surface transportation law that the safe accommodation of nonmotorized users shall be considered during the planning, development and construction of all Federal-aid transportation projects and programs. To varying extents, bicyclists and pedestrians will be present on all highways and transportation facilities where they are permitted and it is clearly the intent of Federal surface transportation law that all new and improved transportation facilities be planned, designed and constructed with this fact in mind.

- The long range metropolitan and statewide transportation plans and the Metropolitan and Statewide Transportation Improvement Programs shall "provide for the development and integrated management and operation of transportation facilities (including accessible pedestrian walkways and bicycle transportation facilities) that will function as an intermodal transportation system... "(23 U.S.C 134(c)(2) and 135(a)(2))
- The process in developing the long-range statewide and metropolitan transportation plans and transportation improvement plans is to consider "...all modes of transportation..." (23 U.S.C.134(c)(3) and 135(a)(3))
- The long-range metropolitan and statewide transportation plans are to "provide for the development and implementation of the intermodal transportation system." (23 U.S.C. 134(i)(2) and 135(f)(1))
- SAFETEA-LU added "representatives of users of pedestrian walkways and bicycle transportation facilities" to the list of "interested parties" with whom metropolitan areas and States must include in the development of the long range metropolitan and statewide transportation plans. (23 U.S.C 134(i)(5) and 135 (f)(3)(A))
- "Bicyclists and pedestrians shall be given due consideration in the comprehensive transportation plans developed by each metropolitan planning organization and State..." (23 U.S.C. 217(g)(1))
- "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction and transportation facilities, except where bicycle and pedestrian use are not permitted." (23 U.S.C. 217(g)(1))
- "Transportation plans and projects shall provide due consideration for safety and contiguous routes for bicyclists and pedestrians." (23 U.S.C. 217(g)(2))
- "In any case where a highway bridge deck is being replaced or rehabilitated with Federal financial participation and bicyclists are permitted on facilities at or near each end of such bridge, and the safe accommodation of bicyclists can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations." (23 U.S.C. 217(e))
- "The Secretary shall not approve any project or take any regulatory action under this title that will result in the severance of an existing major route or have significant adverse impact on the safety for nonmotorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists." (23 U.S.C. 109(m))

While these sections stop short of requiring specific bicycle and pedestrian accommodation in every transportation project, Congress clearly intends for bicyclists and pedestrians to have safe, convenient access to the transportation system and sees every transportation improvement as an opportunity to enhance the safety and convenience of the two modes. "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities. In the planning, design and operation of transportation facilities, bicyclists and pedestrians should be included as a matter of routine, and the decision to not accommodate them should be the exception rather than the rule. There must be exceptional circumstances for denying bicycle and pedestrian access either by prohibition or by designing highways that are incompatible with safe, convenient walking and bicycling.

TEA-21 Section 1202(b) required FHWA to undertake a design study to "develop guidance on the various approaches to accommodating bicycles and pedestrian travel" and to report back to Congress by

December 9, 1999. The guidance clarified those "exceptional circumstances" where bicyclists and pedestrians may not be accommodated. This Design Guidance language can be found at www.fhwa.dot.gov/environment/bikeped/design.htm. Supplementary guidance to clarify a number of issues in the original design guidance can be found at www.fhwa.dot.gov/environment/bikeped/supdesgn.htm. Even where circumstances are exceptional and bicycle use and walking are either prohibited or made incompatible, States, MPOs and local governments must still ensure that bicycle and pedestrian access along the corridor served by the new or improved facility is not made more difficult or impossible. For example, there may be ways to provide alternate routes on parallel surface streets that are still safe and convenient or to provide shuttle bus service on major bridge crossings.

Maintaining access to the transportation system for nonmotorized users is not an optional activity. Section 109(m) of Title 23, United States Code, states that "The Secretary shall not approve any project or take any regulatory action under this title that will result in the severance of an existing major route or have significant adverse impact on the safety for nonmotorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists."

Bicyclists and pedestrians have the same origins and destinations as other transportation system users and it is important for them to have safe and convenient access to airports, ports, ferry services, transit terminals and other intermodal facilities as well as to jobs, services, recreation facilities and neighborhoods. Federal surface transportation law places a strong emphasis on creating a seamless transportation system that all users can enjoy and use efficiently and safely.

9.9.2 General Funding Requirements

a) Flexibility.
Federal surface transportation law provides tremendous flexibility to states and MPOs to fund bicycle and pedestrian improvements from a wide variety of programs. Virtually all the major transportation funding programs can be used for bicycle and pedestrian-related projects. When considering ways to improve conditions for bicycling and walking, states and MPOs are specifically encouraged to:

- Include bicycle and pedestrian improvements as an incidental part of larger projects, as described above and
- To review and use the most appropriate funding source for a particular project and not rely primarily on the Transportation Enhancement activities. Many bicycle and pedestrian projects are more suitable for funding under the Congestion Mitigation and Air Quality Improvement Program, Surface Transportation Program or one of the other programs listed in Appendix 2.

b) Transportation Purpose.
Section 217(i) of Title 23 requires that bicycle projects be "principally for transportation rather than recreation purposes," with the exception of the Recreational Trails Program under which projects should be for recreational use. FHWA has determined that to meet the "transportation purpose" requirement, a bicycle facility must be more than a closed loop trail within a park that can only be used for recreational purposes - users must be able to get somewhere other than back to their starting point. Beyond this, any bicycle facility providing access from one point to another can and will be used for transportation purposes and is therefore eligible for Federal-aid funding. Section 217(i) only applies to bicycle projects, not to projects to accommodate pedestrians and other users.

c) Motorized Vehicle Use.
In general, motorized vehicles are not permitted on nonmotorized trails and pedestrian walkways funded under Title 23. Exceptions to this general rule exist for maintenance vehicles; motorized wheelchairs; when State or local regulations permit, snowmobiles; and electric bicycles (weighing under 100 pounds and a top speed of less than 20 miles per hour); "and such other circumstances as the Secretary deems appropriate" (except the Recreational Trails Program which specifically provides funds for motorized trails). In 2008, FHWA developed a *Framework for Considering Motorized Use on Nonmotorized Trails and Pedestrian Walkways* to implement the "other circumstances" provision.

Figure F-1 provides an overview of the availability of Federal transportation funds for a wide variety of bicycle and pedestrian projects and offers guidance as to the most appropriate potential funding category for a range of typical projects and programs.

Figure F-1 Bicycle/Pedestrian Funding Opportunities

	NHS	STP	HSIP	SRTS	TEA	CMAQ	RTP	FTA	TE	BRI	402	PLA	TCSP	JOBS	FLH	BYW
Bicycle and pedestrian plan		●				●						●	●			
Bicycle lanes on roadway	●	●	●	●	●	●		●	●	●					●	●
Paved Shoulders	●	●	●	●	●	●				●					●	●
Signed bike route	●	●		●	●	●									●	●
Shared use path/trail	●	●		●	●	●	●			●					●	●
Single track hike/bike trail							●									
Spot improvement program		●	●	●	●	●										
Maps		●		●		●					●					
Bike racks on buses		●			●	●		●	●							
Bicycle parking facilities		●		●	●	●		●	●							●
Trail/highway intersection	●	●	●	●	●	●	●								●	●
Bicycle storage/service center		●		●	●	●		●	●				●	●		
Sidewalks, new or retrofit	●	●	●	●	●	●		●	●	●					●	●
Crosswalks, new or retrofit	●	●	●	●	●	●		●	●						●	●
Signal improvements	●	●	●	●	●	●										
Curb cuts and ramps	●	●	●	●	●	●										
Traffic calming		●	●	●									●			
Coordinator position		●		●		●							●			
Safety/education position		●		●		●					●					
Police Patrol		●		●							●					
Helmet Promotion		●		●	●						●					
Safety brochure/book		●		●	●	●	●				●					
Training		●		●	●	●	●				●					

KEY

NHS	National Highway System
STP	Surface Transportation Program
HSIP	Highway Safety Improvement Program
SRTS	Safe Routes to School Program
TEA	Transportation Enhancement Activities
CMAQ	Congestion Mitigation/Air Quality Program
RTP	Recreational Trails Program
FTA	Federal Transit Capital, Urban & Rural Funds
TE	Transit Enhancements
BRI	Bridge
402	State and Community Traffic Safety Program
PLA	State/Metropolitan Planning Funds
TCSP	Transportation & Community and System Preservation Pilot Program
JOBS	Access to Jobs/Reverse Commute Program
FLH	Federal Lands Highway Program
BYW	Scenic Byways

9.9.3 State and Local Sources

9.9.3.1 New Mexico Department of Transportation

The Department of Transportation provides funds to match Federal-aid projects on New Mexico and U.S. highways within Albuquerque.

9.9.3.2 New Mexico Legislature

During its annual legislative sessions, funds can be provided for bicycle projects through special appropriation bills (e.g., capital requests or memorials).

9.9.4 Local Sources

9.9.4.1 Capital Implementation Program (CIP)

Funding for capital improvement projects is provided through the General Obligation (GO) bond program and Urban Enhancement Trust Fund (UETF). Both the City of Albuquerque and Bernalillo County have set aside 5 percent of the Public Works Streets portion of their GO bonds to be used exclusively for bicycle projects, beginning in 1995. The City set aside is equally distributed between the on-street (2.5 percent) and trails (2.5 percent) programs. The GO bonds are obligated in 2-year cycles, generating $600,000 for the on-street system biennially. Additional monies from the CIP (e.g., major pavement rehabilitation or specific roadway construction projects) may be used for bicycle projects.

9.9.4.2 Gross Receipts Tax

A 1/4-cent gross receipts tax for fixing existing streets, building new roads, expanding transit and constructing bikeways/trails was approved by voters in 1999. A set percentage (4 percent) of this revenue is earmarked for trails used for both commuting and recreational travel; however, no dedicated funds were specifically identified for on-street bikeway improvements. On-street bikeways will be incorporated into new roadway construction and street rehabilitation/resurfacing projects wherever feasible. There also exists an opportunity to work with the private sector to implement bicycle projects. This could be accomplished through right-of-way dedications, infrastructure improvements and/or impact fees.

9.10 Proposed Projects

9.10.1 Cost Estimate

The construction costs of the proposed projects are to be considered "planning level" estimates. Unknown or unanticipated aspects unique to a specific facility may not have been accounted for and may increase the estimated cost. For planning purposes these costs indicate what the typical project can be reasonably expected to cost in terms of 2011 dollars. To reduce implementation costs, efforts should be made to include bicycle facilities in all new and rehabilitation projects. This has been an on-going City practice that should continue.

- **Bike Routes**: No anticipated change in roadway surface or crossection; bike route signs; way finding sign/pavement markings. ***$5,000/mile***
- **Bicycle Boulevard**: No anticipated change in roadway surface or crossection; some traffic calming; Bicycle Boulevard signs/pavement markings; stop sign relocation; wayfinding signs. ***$50,000/mile***
- **Multi-use Trails**: Trail paving; signs; pavement markings; minor landscaping; wayfinding signs/pavement marking. Right-of way acquisition has not been factored in. ***$130,000/mile***
- **Bike lanes**: Cost depending on the existing/proposed crossection can vary greatly. For estimation purposes a blended or averaged cost for roadways that require moving of curb line or a "road diet" to obtain the required crossections is used. ***$500,000/mile***
- **Grade separated crossings**: Cost of these crossings vary depending on the length and type chosen. ***$1,500,000/crossing***
- **Enhanced Crossing May include**: Pavement marking; signs; traffic signal detection; colored bike lanes. ***$10,000/intersection***

9.10.2 Proposed Project List

The projects proposed by this plan originate from many different sources, which are detailed below:

- *The City's Trails and Bikeways Facility Plan*
- *The City's Comprehensive On-street Bicycle Plan*
- *The Mid Region Council of Governments (MRCOG) Long Range Bicycle Plan*
- Input from stakeholder workshops
- Detailed analysis of existing bicycle facilities
- City of Albuquerque STIP planning

It is recognized that all of the project recommendations contained in this plan will require further detailed study and design. On-street facilities will have to be designed with their impacts to intersections and road networks in mind and coordination with City Traffic Engineering will be required. Additionally, some of the multi-use trails recommended in this plan would be contained within property owned by either AMAFCA or the MRGCD. A detailed analysis will be required to determine the feasibility of locating each of these trails within the rights-of-way for either entity. This analysis must consider operation and maintenance activities and the primary purpose of AMAFCA and MRGCD facilities. Furthermore, the design and construction of these trails would require considerable coordination and would have to go through the permitting and approval process for each respective entity.

The proposed projects were divided into three categories: Top priority projects, Critical Link Projects and Full Build-out. A detailed explanation of each of these categories is contained in the following sections.

9.10.2.1 High Priority Projects

During stakeholder workshops and the public comment phase, a list of projects was created, which are considered 'critical links' in the City's bikeways system. In addition, the City has projects that are either currently programmed, in the design phase or under construction. These projects include approximately 4.5 miles of bike boulevards, 72 miles of bike lanes, 42 miles of multi-use trails and 20 miles of bike routes. The estimated total cost for these projects is $51.1 million. A detailed list of these projects is shown below. A map of these projects is also included in the back of this report.

9.10.2.2 Full Build-Out of the Long Range Bicycle Plan

All projects that were identified from the sources listed above are included in the *Full Build-Out 2030 Bicycle Plan*. This list includes those projects identified as Top Priority or Critical Links. These projects consist of the following:

Bike Boulevards	8 Miles
Bike Lanes	189 Miles
Multi-use Trails	389 Miles
Bike Routes	78 Miles

A complete listing of these projects is included below. A map of the complete build-out of the *2030 Bicycle Plan* is also included in the back of this report.

9.10.2.3 Intersection and Crossing Improvements

This plan makes recommendations for improvements to intersections. A listing of intersections in the City, which require improvement for bicycle facilities, was considered too numerous to mention. Therefore, an evaluation of each intersection, which is slated for roadway improvements, is left to a case by case basis for the inclusion of bikeway improvements.