PART II: RECOMMENDATIONS

The next several chapters describe the recommended bikeway and trail network, including priority bicycle facilities projects that are likely feasible and most capable of providing the greatest community benefit and improvements (Chapter 4), recommended outreach and education programs (Chapter 5), implementation strategies (Chapter 6), and the Design Manual (Chapter 7).

Chapter 4: Recommended Network

The previous chapter reviewed the cyclist, pedestrian, and trail enthusiast needs, existing system components and needs, and current issues. This information was used in conjunction with field visits, input gathered at public meetings, stakeholder interviews, and analysis of the existing bikeways and multi-use trail system to provide future project recommendations. Comments that were received throughout the planning process were catalogued to ensure that they were all considered in the development of this plan. Some comments expressed conflicting desires or recommendations with other responses; other comments are not immediately feasible to include or recommend due to budget, staffing, or resource availability. When public comments and ideas were not possible to achieve in the near-term, they were included as a recommendation for future consideration.

A. Facility Gap Analysis Process

As a city-wide plan, the *Bikeways & Trails Facility Plan* reflects previous planning efforts while focusing on providing a connected on-road bike network and multi-use trail network within Albuquerque. The existing bicycle facilities discussed in this plan were developed from the Albuquerque Bikeways GIS layer, while proposed facilities were found in the MRCOG Long Range Bikeway System Map, the *Trails & Bikeways Facility Plan*, 1993, and adopted plans.

One purpose of the planning process is to refine, augment and prioritize the proposed facility recommendations contained in the MRCOG Long Range Bikeway System Map. The final recommendations are based on facilities recommended in previous planning efforts, needs analysis and level of service provided by existing facilities, input from stakeholders, fieldwork, community comment, and input from other relevant municipal staff and decision makers.

1. Existing Bikeway Evaluation

This section provides an approach to analyzing the quality of existing on-street bicycle routes in Albuquerque. While it is a priority to add new facilities to complete the bicycle network in Albuquerque, it is also important to ensure that the existing facilities are usable. The tables that follow document the approach to evaluating the quality of existing routes. Most facilities in Albuquerque are deemed adequate, though many could use minor improvements, such as more frequent stenciling in the bike lane. Another frequently identified problem is the need to identify bike lanes that do not meet the current width standards. **A future study of the City's on-street bicycle facilities should be completed according to the evaluation criteria identified below.** This action is listed as a short-term priority action in the Implementation Plan.

TABLE 6: INFRASTRUCTURE PROJECT EVALUATION CRITERIA

Criterion	Measurement
Safety	Can the project potentially improve bicycling and walking at locations with perceived or documented safety issues? This criterion takes into account available crash data as well as feedback from the Steering Committee and Albuquerque residents.
System Connectivity	To what degree does the project connect to other bikeways or walkways, shared use paths, and transit routes?
Completeness of Network	Are gaps present along the facility? Gaps are described in more detail following.
Barriers and Constraints	Do barriers prevent free movement along the route? Barriers may include major streets, rivers, steep hills, railroad tracks, and unconnected streets.
Serve Non-Motorized Needs	Does the route serve the needs of different types of bicyclists, pedestrians and other non-motorized users?

A system of "●", "◑", and "○" should be used to rate each alignment. A "●" indicates favorable conditions, a "◑" indicates mixed or neutral conditions, and a "○" indicates unfavorable conditions.

2. System Gap Analysis

This section discusses the identification of gaps within the existing City of Albuquerque bikeway and trail networks. The text first defines common bikeway and trail gap types with respect to streets and trails. Various gap closure measures used throughout the United States and other countries are discussed, including both on- and off-street treatments that could be applied in Albuquerque. The text concludes with a procedure for identifying and correcting Albuquerque's bikeway and multi-use trail network gaps.

This approach was used to inform the bikeway and trail recommendations made in this Plan. **This approach should also be used to analyze newly developing parts of town, gaps created between adjacent jurisdictions, and opportunities for future facilities as they arise.**

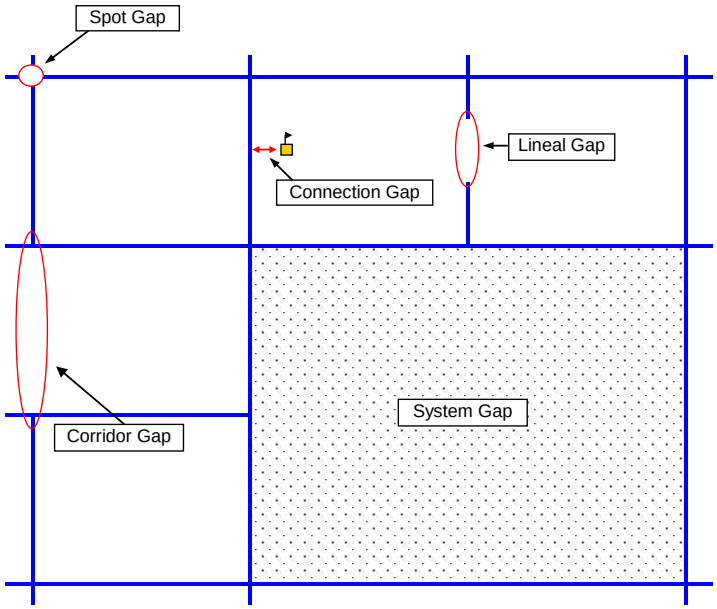
Defining Bikeway and Trail Gaps

Bikeway and trail gaps exist in various forms, ranging from short "missing links" on a specific street or multi-use trail corridor, to larger geographic areas with few or no facilities at all. Determining specifically what constitutes a "gap" requires setting parameters for the bikeway and trail networks and determining which activity centers and major destinations require direct links to the networks. Gaps can then be organized based on length and other characteristics. Gaps can be classified into five main categories:

- **Spot gaps:** Spot gaps refer to point-specific locations lacking dedicated facilities or other treatments to accommodate safe and comfortable pedestrian or bicycle travel. Spot gaps primarily include intersections and other areas with potential conflicts with motor vehicles. Examples include bike lanes on a major street "dropping" to make way for right turn lanes at intersection, or a lack of intersection crossing treatments for pedestrians on a route or sidewalk as they approach a major street.
- **Connection gaps:** Connection gaps are missing segments (¼ mile long or less) on a clearly defined and otherwise well-connected walkway or bikeway. Major barriers standing between destinations and clearly defined routes also represent connection gaps. Examples include bike lanes on a major street "dropping" for several blocks to make way for on-street parking; a discontinuous sidewalk along a street; or a freeway standing between a major pedestrian or bicycle route and a school.

- **Lineal gaps:** Similar to connection gaps, lineal gaps are ½- to one-mile long missing link segments on a clearly defined and otherwise well-connected walkway or bikeway.
- **Corridor gaps:** On clearly defined and otherwise well-connected bikeways, corridor gaps are missing links longer than one mile. These gaps will sometimes encompass an entire street corridor where bicycle facilities are desired but do not currently exist (does not apply for walkway gaps).
- **System gaps:** Larger geographic areas (e.g., a neighborhood or business district) where few or no bikeways exist would be identified as system gaps. System gaps exist in areas where a minimum of two intersecting bikeways would be required to achieve the target network density (does not apply for walkway gaps).

FIGURE 5: DIAGRAM OF GAP TYPES



Gaps typically exist where physical or other constraints impede walkway or bikeway network development. Typical constraints include narrow bridges on existing roadways, severe cross-slopes, and potential environmental damage associated with wider pavement widths. Traffic mobility standards, economic development strategies, and other policy decisions may also lead to gaps in a network. For instance, the City's desire for on-street parking or increased vehicle capacity may hinder efforts to install continuous bike lanes along a major street. Figure 5 presents a theoretical diagram illustrating the five gap types described above.

3. Gap Closure Measures

Numerous approaches exist for addressing bikeway system gaps. The following sections discuss various gap closure measures, ranging from minor treatments (e.g., signage) to larger-scale applications (e.g., new trail corridors).

Intersection Improvement Measures

Intersection improvements concentrate on facilitating safe, convenient and comfortable bicycle travel through intersections where minimal or no bicycle facilities exist. While the measures are largely intended for bikeways on major streets, some treatments may be appropriate on bikeways using secondary street corridors, and at multi-use trail/roadway crossings. Although the intersection

improvement measures are most appropriate for addressing spot gaps, they could supplement other measures as part of larger efforts to address lineal, segment, corridor and system gaps.

Treatments for improving intersections for bicyclists include:

- Colored bike lanes
- Shared bicycle/right-turn lanes
- Shared bicycle/double right-turn lanes
- Bike boxes

Interchange Areas

Arterial streets may include free-flowing interchanges with high-speed merge lanes at freeway entrance and exit ramps. These conditions create a challenging bicycle environment for several reasons:

- Merging (especially exiting) motorists do not expect to see cyclists
- Motorists cross the bicyclist's path travelling at high speeds as they transition to/from ramps
- The angle and position of the merging ramp creates visibility challenges, forcing bicyclists to monitor overtaking traffic by looking over their left and right shoulders
- Exiting vehicles may not signal their intent to cross the bicyclist's path
- The design of merge/diverge points typically includes long vehicle/bicyclist conflict zones

Albuquerque should consider solutions to these issues that have been implemented successfully in other major metropolitan areas. The City of Portland, Oregon has addressed this issue with striping or physical elements that encourage bicyclists to cross ramps at or close to a right angle. The treatment shortens the vehicle/bicycle conflict zone while also improving sight distance for bicyclists. Some bicyclists may choose to ignore this treatment however, as this creates a less-direct route through the interchange area and forces them to relinquish right-of-way to exiting motorists.

Interchange area treatments include both signal timing and scrambler signal treatments.

Arterial Bike Lane Retrofit Measures

Most arterial streets in Albuquerque exhibit characteristics (e.g., high vehicle speeds and/or volumes) where dedicated bicycle lanes may better accommodate safe and comfortable riding. Indicating a preferential or exclusive space for bicycle travel, bike lanes are typically five to six feet wide with delineation taking the form of striping and pavement stencils. These facilities create a predictable environment for motorists and bicyclists by clarifying the appropriate position for each user on a roadway. Bike lanes on congested streets also enable cyclists to pass slow or stopped vehicles on the right.

The measures listed below represent various approaches for adding bike lanes to existing streets. Although opportunities to add bike lanes through roadway widening may exist in some locations, most major Albuquerque streets pose physical and other constraints requiring street retrofit measures within existing curb-to-curb widths. As a result, the measures effectively reallocate existing street width through striping modifications to accommodate dedicated bike lanes.

The bike lane retrofit measures listed following are most appropriate for addressing connection gaps and lineal gaps, though they could supplement other measures to address corridor and system gaps. Although largely intended for Arterial streets, these measures may be appropriate on collector streets where bike lanes would best accommodate cyclists.

Treatments for retrofitting arterial streets with bike lanes include:

- Shoulder widening
- Reducing travel lane or on-street parking lane widths
- Removing travel lanes (road diet)
- Removing on-street parking
- Floating or off-peak bike lanes
- Uphill bike lanes
- Left side bike lanes on one-way streets
- Contra-flow bike lanes on one-way streets
- Cycle tracks

Arterial Shared Roadway Measures

Although most arterial streets in Albuquerque have sufficient traffic volumes to warrant dedicated bike lanes, physical constraints or other factors may preclude these facilities. Because arterial streets typically provide the most direct routes to major bicyclist destinations and also serve as destinations in and of themselves, bicycle facility provisions on these corridors still hold great importance.

The measures below represent various approaches for accommodating bicyclists on major streets where bike lanes are desired but not possible. Similar to the bike lane retrofit measures described earlier, the arterial shared roadway measures work within existing curb-to-curb widths and do not impact vehicle or on-street parking capacity. The measures include various signage and pavement marking treatments to inform motorists of bicyclists on the roadway, and to inform all users of appropriate behaviors.

The arterial shared roadway measures described below are most appropriate for addressing connection gaps and lineal gaps, though they could supplement other measures to address corridor and system gaps. Although largely intended for arterial streets, these measures may be appropriate on collector streets.

Treatments appropriate for shared roadways include:

- Wide curb lanes
- Shared lane markings
- Combined bicycle/bus lanes
- Warning signage on shared roadways
- "Share the Road"/"Watch for Bicyclists" Signage
- "Bicyclists Allowed Use of Full Lane" Signage
- "Bike Lane Merges" Signage

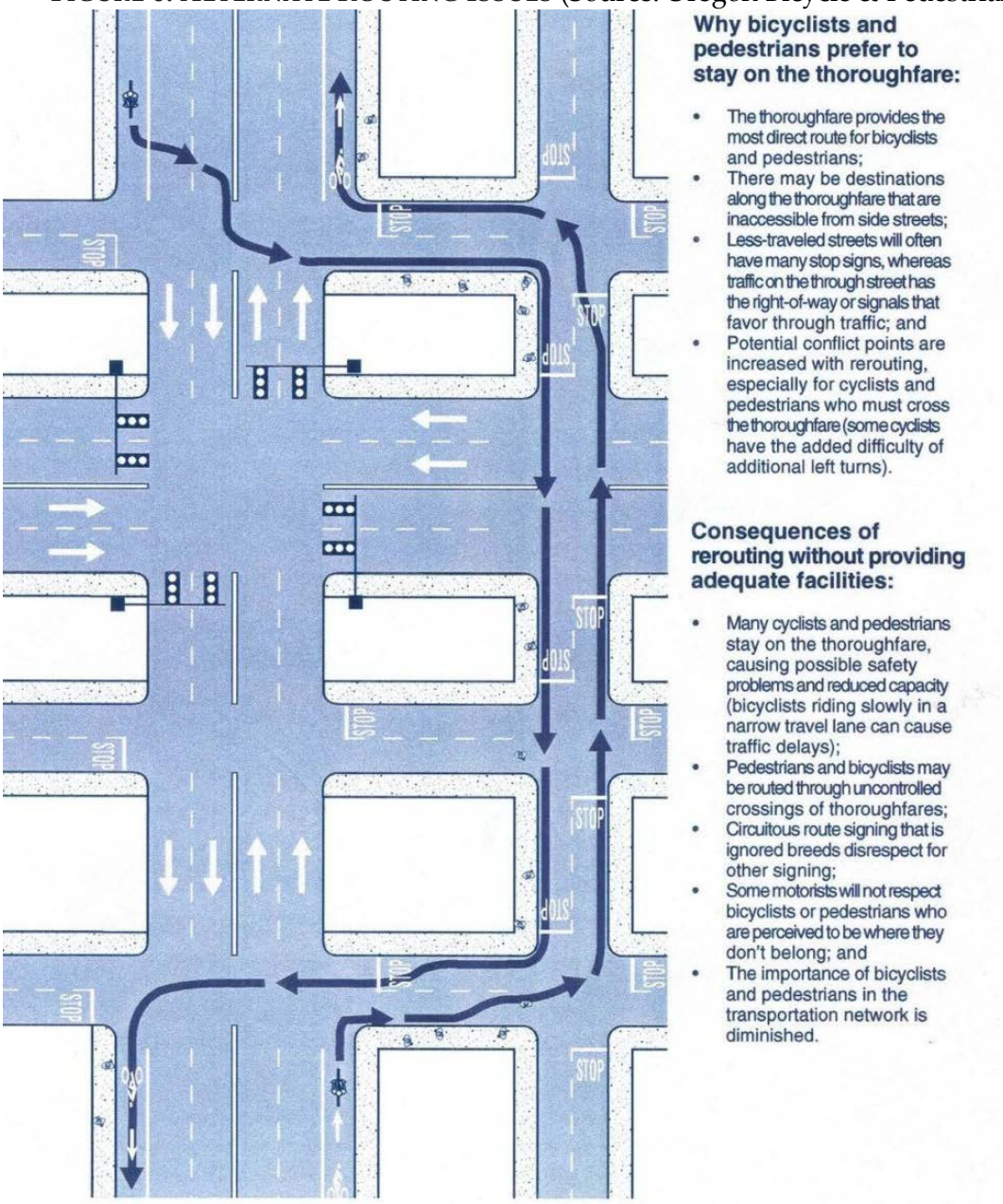
Alternative Routing Measures

Alternative routing on secondary streets may be necessary to address bikeway connectivity needs where constraints preclude bike lanes or other treatments on Arterial roadways. Alternative routing may also be necessary where constraints preclude a continuous multi-use trail corridor. Although these measures can effectively fill on- and off-street bikeway gaps, they should be applied only after careful consideration of several factors, discussed below.

Bicyclists often gravitate to arterial and other major streets for several reasons:

- Major streets generally offer the most direct routes between bicyclist destinations while providing better connectivity compared with lower-order streets. Consequently, commuter cyclists and those traveling longer distances often gravitate to these routes.
- Major streets usually have the right-of-way or signals favoring through traffic, whereas secondary streets often have numerous stop signs which can slow bicycle travel.
- Major streets include provisions to overcome major barriers such as railroads, freeways and drainage channels.
- The commercial character of major streets (e.g., employment, shopping, etc.) makes these corridors destinations in and of themselves.
- Illustrated in Figure 6, alternative routing measures pose several challenges:
- Bicyclists on major streets may ignore alternative routes if they are used to overcome spot gaps and connection gaps. The relatively short lengths of spot and connection gaps may induce riders to remain on the thoroughfare despite the lack of bicycle accommodations, potentially creating safety issues.
- Bicyclists may perceive the alternative route as too circuitous.
- The alternative route may include uncontrolled crossings of major streets.

FIGURE 6: ALTERNATE ROUTING ISSUES (Source: Oregon Bicycle & Pedestrian Plan)



It should be noted that alternative or parallel routing measures on secondary streets offer some benefits. Some users may not feel comfortable riding on major streets for various reasons (e.g., high traffic volumes and vehicle speeds, conflicts with motorists entering and leaving driveways, and/or conflicts with buses occupying bike lanes while loading and unloading passengers). Children and less-experienced riders might find these environments especially challenging. Secondary streets provide alternate route choices for bicyclists uncomfortable using the major street network.

Albuquerque benefits from a generally well-connected system of collector and local streets in many neighborhoods that – with the addition of relatively small-scale treatments – could be used to overcome bikeway system gaps. These streets (referred to as Bike Routes or Signed Shared Roadways) accommodate bicyclists and motorists in the same travel lanes often with no specific vehicle or bike lane delineation. These corridors include warning signage to alert motorists of bicyclists on the roadway, and may include wayfinding signage to orient cyclists on the route. Alternative routing measures are largely

intended to address lineal, corridor and system gaps, and are less appropriate for addressing spot and connection gaps (spot and connection gaps should be directly addressed on the corridor in which they are located). The measures fit within the overall concept of "Bicycle Boulevards," which incorporate a variety of treatments to enhance bicycle travel on these lower-order streets.

Trail Gap Closure Measures

The measures below largely focus on completing multi-use trail/bikeway gaps (e.g., discontinuous multi-use trail segments), and are most appropriate for addressing connection, lineal, corridor and system gaps on the trail network. It should be noted however that some measures could effectively address some trail or bikeway gaps, especially connection gaps near on-street bikeways (e.g., a bicycle/pedestrian bridge crossing a freeway to connect an on-street bikeway with a nearby school).

Off-street gap closure methods can include:

- **Drainage easements** utilize maintenance easements to complete multi-use trail system gaps. Drainage corridors offer several advantages, including relatively direct routes between major destinations, and following gently sloping terrain.
- **Utility and irrigation corridor trails** typically include power line and water utility easements, as well as canals and drainage ditches. These corridors offer excellent transportation and recreation opportunities for cyclists and trail enthusiasts of all ages and skills. Some safety issues due to proximity to the irrigation ditches or power poles should be understood and appropriate protective fencing/railing and warning signs installed.
- **Trail over-crossings and under-crossings** provide critical multi-use trail system links by joining areas separated by any number of barriers. Over-crossings and under-crossings address real or perceived safety issues by providing users a formalized means for traversing "problem areas" drainage channels, waterways or major transportation corridors.
- **Accessways** provide short connections from roadways or off-street paths to important pedestrian destinations such as schools, parks, transit centers and mixed-use centers.

4. Steps in Addressing Bikeway & Trail System Gaps

This section describes the recommended procedure for addressing gaps on the Albuquerque walkway and bikeway networks. The procedure involves a series of sequential steps incorporating information described throughout this memo. Given the diversity of walkways, bikeways and other conditions, the City should consider the procedure a "living document" and remain open to flexibility to address unique circumstances. Figure 7 graphically depicts the procedure discussed below.

Step 1: Identify Gap Type

Identify the gap type (e.g., spot gap, connection gap, lineal gap, corridor gap, system gap).

Step 2: Identify Appropriate Range of Gap Closure Measure Types

The type of gap determines the initial range of closure measure options. For instance, longer system gaps can be filled using nearly all gap closure measure types described in this chapter, while a limited range of measures are appropriate for shorter gaps such as spot and connection gaps. Using Figure 7, determine the initial range of options.

Step 3: Determine Appropriate Location for Gap Closure Measures

The type of gap also determines the appropriate gap closure location. Due to their relatively short lengths, spot and connection gaps should be addressed specifically where they exist. Mentioned earlier,

alternative routing measures are not an appropriate measure for addressing these gaps. Although addressing spot and connection gaps may prove challenging, they represent the most critical walkway and bikeway links. In general, the majority of bikeway gaps should also be addressed specifically where they exist. Cyclists should not be re-routed further than across a street, and then only temporarily during construction. However, gap closure measures should be prioritized in areas of the City where more cyclists, pedestrians, and trail enthusiasts are expected to be, i.e. along routes to schools or near mixed-use centers.

Lineal, corridor and system bikeway gaps, typically covering longer distances, offer greater implementation flexibility. Bicyclists generally prefer direct travel routes, though they may tolerate route diversions to avoid long bikeway gap segments. Identifying the appropriate gap closure location for lineal, corridor and system gaps involves evaluating the feasibility of adding bicycle facilities to the major street or trail corridor under focus versus the appropriateness of using alternative routes. The feasibility analysis should consider the following:

- Whether compelling safety, operational, environmental, economic, or other reasons preclude bicycle facilities on the major street or multi-use trail corridor under focus
- Proximity of alternate route to the major street of multi-use trail corridor under focus
- Connectivity and continuity provided by the alternate route

The feasibility analysis will determine whether bicycle facilities should be added directly on the major street or multiuse trail corridor under focus, whether alternative routing is necessary, or both.

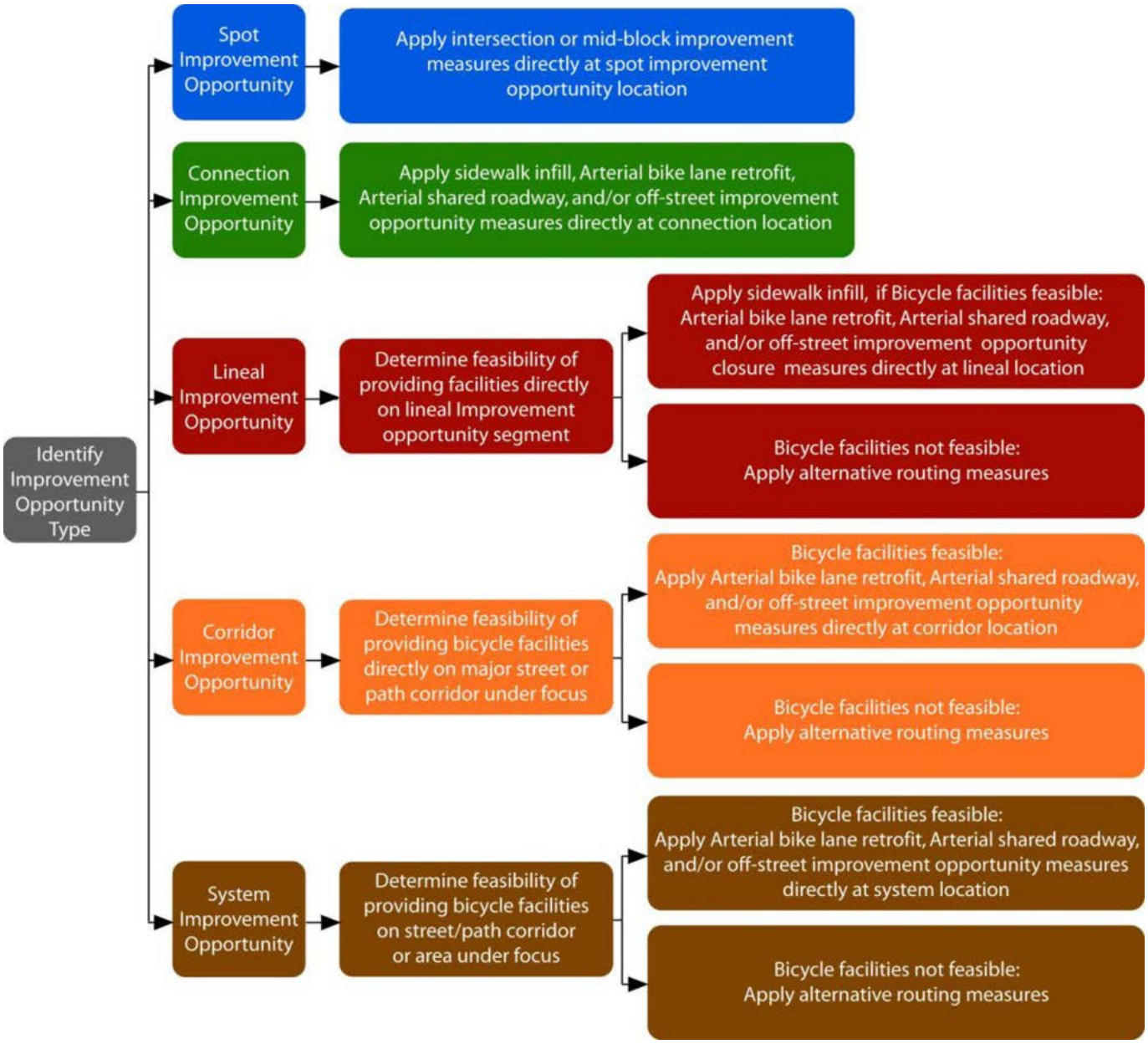
Step 4: Determine Appropriate Gap Closure Measure Type

The appropriate gap closure measure type depends both on the walkway or bikeway gap type and location. Intersection improvement measures or mid-block crossings represent the most appropriate strategy for addressing spot gaps, while sidewalk infill, arterial bike lane retrofit, arterial shared roadway, and off-street gap closure measures represent the most appropriate strategies for closing connection gaps. Appropriate measures for lineal, corridor and system gaps depend on the feasibility analysis referenced in Step 3.

Step 5: Determine Specific Gap Closure Measure

Identification of the appropriate gap closure measure type and specific characteristics of the corridor/location under focus will help determine the appropriate specific gap closure measure.

FIGURE 7: BIKEWAY & TRAIL GAP CLOSURE ANALYSIS PROCEDURE



5. Evaluation of Bikeway Connectivity – Link Connections and Gap Closures

A review of the City's current bikeways and trail system revealed several locations with poor connectivity or gaps between existing facilities. Some of the gaps exist because of limited right-of-way, or other challenges that would not allow a continuous facility. Closure of the gaps is beyond standard planning practice and requires that engineering analysis be incorporated. As a result, 25 locations received further engineering evaluation and recommendations. The full text for these recommendations is included as Appendix C.6. 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. The Paseo del Norte/I-25 interchange area is another location identified as a challenging area that lacks bicycle facilities. It is currently under design by the NMDOT as part of the Paseo del Norte and I-25 Interchange reconstruction project, which includes accommodations for non-vehicular access across I-25.

Spot Gaps - Intersection Improvements (2 locations)

1. Central Avenue and Yale Boulevard
2. Alameda Drain at 12th Street

Lineal Gap Closure Engineering Evaluations (7 locations)

3. Paseo del Norte/Paradise Boulevard
4. Wyoming Boulevard/Utah Street
5. Montano Road/Montgomery Boulevard Corridor
6. Girard Boulevard Corridor
7. Lomas Boulevard/Easterday Drive
8. Lomas Boulevard/San Pedro Drive
9. Rio Grande Boulevard

Corridor Gap Closure Engineering Evaluations (16 locations)

10. East Central Avenue
11. Paseo del Norte (North Diversion Channel to I-25)
12. Bridge Boulevard (Coors to Broadway)
13. Candelaria Road (12th Street to University)
14. San Pedro Drive (Zuni to Claremont)
15. San Mateo (Gibson to Ridgecrest)
16. Sequoia Road (Coors to Ladera Drive)
17. Indian School Road (Rio Grande to 12th Street)
18. Cutler Avenue (Washington to San Mateo)
19. Claremont Avenue as a Bicycle Boulevard (Richmond to Chelwood)
20. Alexander Boulevard (Comanche to Mission)
21. Montano Road (4th Street to 2nd Street)
22. Irving Boulevard (Universe to La Paz)
23. Washington Street (Lomas to Zuni)
24. Carlisle Boulevard (Garfield to Silver)
25. Second Street (Stover to Marquette)

B. Proposed Bikeway and Trail Facilities

The *Bikeways and Trails Facility Plan* provides guidance for the development of an on- and off-street bikeway and trails network to accommodate bicycling and other non-motorized travel and recreation. Albuquerque currently has a well-developed bikeway and trail system which currently contains over 620 miles of trails, lanes, routes, and boulevards. Through implementation of this plan, the city will achieve a fully interconnected system.

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

- *The Trails and Bikeways Facility Plan*, 1993
- *The Albuquerque Comprehensive On-street Bicycle Plan*, 2000
- *The Mid Region Council of Governments (MRCOG) Long Range Bicycle Plan*

- Adopted Plans: Rank II (Area & Facility Plans) and Rank III (Sector Development Plans)
- Input from stakeholder workshops, user and agency interviews, public meetings, and the Greater Albuquerque Bicycling Advisory Group (GABAC) and the Greater Albuquerque Recreational Trails Advisory Committee (GARTC)
- Detailed analysis of the existing bikeway and multi-use trail system
- City of Albuquerque STIP planning & the Decade Plan (CIP 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 systems 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.

Project Prioritization Approach

The City uses an **opportunistic project prioritization approach**. The City recognizes the importance of both extending the network in newly developing parts of the city and also completing the challenging network gaps in the existing system. However, rather than rely on a purely scientific or rational approach to determining the relative priority of projects, the City responds to opportunities as they arise.

The City's budget is allocated for specific departments to accomplish projects, programs, or capital infrastructure construction/rehabilitation. This is broadly allocated through the Decade Plan, also known as the Capital Implementation Plan (CIP). To maximize the investment in bikeways and trails, projects will be prioritized when there is the opportunity to leverage funds from different budgets, such as City Council set-asides or Metropolitan Redevelopment street improvement funds. A similar process would occur when there is the opportunity to collaborate with a project that is led by another agency, such as AMAFCA or NMDOT.

A final process where bikeways and trails are constructed is concurrently with adjacent development. Most of the network extensions are constructed through this process. The adjacent land owner is required to dedicate land and/or construct bikeway or trail facilities where they are identified on the map that is included in this Plan. The benefit of this process is that the system gets extended as new development occurs. A negative outcome of this development approach is that it sometimes leads to a fragmented network, such as along Irving Blvd. or Snow Vista Blvd. The City may initiate a road improvement project in cases like these to complete the final road section. Without an adopted plan in place, the project may neglect to include facilities that would complete a regional non-motorized transportation and recreation network.

High Priority Projects

To best guide the opportunistic project prioritization that is applied, this plan identifies two types of high priority projects. The first is **"Programmed Projects,"** those that the City currently has funding to design or construct, and projects that are programmed in the Transportation Improvement Plan (TIP). The TIP is a process facilitated by MRCOG that allocates State Department of Transportation funds to local

governments. These are the projects that have a high likelihood of being constructed in the next 5-10 years.

The second type of high priority projects is classified as **"Critical Links."** The planning consultants identified 94 critical link projects based on input from City staff, stakeholder interviews, and three public open house meetings. These project priorities were re-evaluated in 2014 by the planning team that consists of representatives from the Planning Department, Department of Municipal Development, and Parks and Recreation. This team reviewed the most up-to-date existing facilities map to identify gaps in the network. The community identified critical links was combined with the current gap analysis. **The project team then reviewed these to narrow down the projects that would bring the highest system value and that could be constructed with the next 10 years with our current rates of funding.**

It is also important to point out that in each of the two high priority categories there are both projects for new connections as well as enhancements and improvements to existing facilities. An example of this type of projects includes the Irving Blvd. road improvements, which will make a continuous bicycle lane, and the Claremont Bicycle Boulevard, which would upgrade an existing bicycle route into a bicycle boulevard.

1. Full Build-Out of the Bikeways & Trails Facility Plan

This *Facility Plan* proposes 458 miles of new bikeways and trails within the City of Albuquerque. They were developed through the detailed analysis of the existing bikeway and multi-use trail system, projects recommendations of previous plans, public input, stakeholder's recommendations and the *Facility Plan's* Goal to develop an interconnected and balanced bikeway system. All projects that were identified from the sources listed above are included in the *Full Build-Out of the Bikeways & Trails Facility Plan*. At current levels of funding for capital projects, which is approximately $3 million per year, the full build-out of the network will take approximately 50 years. These projects consist of the following:

- Bike Boulevards – 8 Miles
- Bike Lanes – 206 Miles
- Multi-use Trails - 163 Miles
- Bike Routes - 81 Miles
- Intersection Improvements – 87
- Grade-separated Crossings – 15

A complete listing of these projects is included reporting **Appendix A**. A map of the complete build-out of the *Bikeways & Trails Facility Plan* is also included in the back of this report.

The present-day cost for the full build-out of these proposed projects based on the cost estimation assumption, described in Section 4.B.3 below, is $133,014,000.

2. High-Priority Projects

Programmed Projects

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 below. A map of these projects is also included in the back of this report.

TABLE 7: HIGH-PRIORITY PROGRAMMED PROJECTS

Type	Name	From	To	Length
Bicycle Blvd	Alvarado Dr.	Central Ave.	Zimmerman	2.40 mi.
Bicycle Lane	Paseo del Norte	W. City limit	Rainbow	1.12 mi.
Bicycle Lane	Singer Blvd.	Jefferson St.	Chappel Dr.	0.49 mi.
Bicycle Lane	Zuni Rd.	Washington St.	Central Ave.	2.95 mi.
Bicycle Lane	University Blvd.	Avenida Cesar Chavez	Las Lomas Rd.	1.34 mi.
Bicycle Lane	Osuna Rd.	Jefferson St.	Edith Blvd.	1.75 mi.
Bicycle Lane	Central Ave.	Sunset	Atrisco Dr.	0.14 mi.
Bicycle Lane	Black Arroyo Blvd.	Unser Blvd.	W. City limit	1.75 mi.
Bicycle Lane	Carlisle Blvd.	Indian School Rd.	Claremont Ave.	0.43 mi.
Bicycle Lane	Alameda Blvd.	Barstow St.	Edith Blvd.	1.17 mi.
Bicycle Lane	2nd Street	Claremont Ave.	Marquette	4.22 mi.
Bicycle Lane	San Pedro Dr.	Zuni Rd.	Claremont Ave.	1.75 mi.
Bicycle Lane	Central Ave.	City limit	Coors Blvd.	1.16 mi.
Bicycle Lane	Fair Heights Bike Blvd	Dakota	Zuni Rd.	2.07 mi.
Bicycle Lane	Channel Rd.	El Pueblo	Osuna Blvd.	2.43 mi.
Bicycle Lane	Alameda Blvd.	Barstow St.	Edith Blvd.	0.34 mi.
Bicycle Lane	12th Street	Bellamah Ave.	Menaul Blvd.	0.25 mi.
Bicycle Lane	Quail Rd.	Alamogordo	57th Street	0.38 mi.
Bicycle Lane	El Pueblo Rd.	Jefferson St.	Edith Blvd.	1.20 mi.
Trail	I-40 Overpass	1st Street	North Diversion Channel	1.55 mi.
Trail	Paseo del Norte	North Diversion Channel	Domingo Baca Arroyo	1.97 mi.
Trail	Bear Canyon Arroyo Trail Extension	Brentwood	West end Arroyo del Oso GC	0.84 mi.
Trail	Osuna Widening	North Diversion Channel	Sandia Prep HS	0.54 mi.
Trail	University Blvd.	Gibson Blvd.	Rio Bravo Blvd.	2.58 mi.
Trail	Unser Blvd.	Dellyne Ave.	Montano Rd.	0.55 mi.
Trail	Corrales Main Canal	Frontage Rd.	Eagle Ranch Rd.	0.34 mi.
Trail	Alameda Drain/2nd St.	Alameda Drain (E/W)	Osuna Rd.	2.00 mi.
Trail	Corrales Main Canal	Piedras Marcadas Arroyo	Paseo del Norte	0.15 mi.
Trail	Paseo del Norte	All Saints	Coors	0.44 mi.
Trail	Westside Rd.	Golf Course Rd.	NM 528	0.81 mi.

The 50 Mile Activity Loop

The 50 Mile Activity Loop is part of ABQ the Plan, Mayor Berry's long term plan to invest in the future of Albuquerque. ABQ the Plan is about large scale public projects that will increase quality of life for residents, enhance economic development opportunities, promote tourism, and spur private sector investments. By leveraging the City's on-going investments in our approximately 177-miles of trails and 343-miles of bike lanes, routes and boulevards, the 50 Mile Activity Loop aims to bridge the gaps that have been challenging to complete.

The *50 Mile Loop Plan* establishes an alignment for the 50 Mile Activity Loop and evaluates the existing infrastructure along the alignment. The Plan proposes improvements and enhancements to the existing

infrastructure in need of improvement and gaps along the alignment in need of completion for all types of users. Approximately 17-miles of improvements are needed to complete the loop; the Plan describes an implementation approach and key stakeholders for each segment. The plan also proposes smaller "mini-loops" or connector trails that access local neighborhoods and increase overall connectivity and choices in transportation and recreation.

The *50 Mile Loop Plan* provides a proposed marketing plan for promoting the 50 Mile Activity Loop for health and wellness benefits for the residents of Albuquerque, identifying the 50 Mile Activity Loop as a way for tourists and residents to enjoy the City's unique destinations, and to stimulate tourism and economic development. Finally, the Plan proposes a strategy and budget for implementation of the improvements and enhancements.

The full text of the *50 Mile Loop Plan* is incorporated by reference as part of the *Trails & Bikeways Facility Plan*; the executive summary is included as Appendix B.

Fair Heights Bicycle Boulevard

The City is currently working on a plan for a bicycle boulevard through the Fair Heights Neighborhood. The proposed route is from Zuni, north along Jefferson and Madison to Mountain. From Mountain the route continues east to California and Dakota, which connect to the Tom Bolack Urban Forest existing trail. The design plans to be developed will coincide with the development of the San Pedro Dr. Road Diet Assessment.

The project will take into account the findings obtained and recommendations produced from the Silver Ave. Bicycle Boulevard Evaluation. Design elements will include permanent signage and pavement markings, median improvements, and construction of a bicycle median refuge on principal arterials or other critical locations as recommended by the consultant.

Critical Links

During stakeholder workshops and the public comment phase, a list of projects was created that reflect routes that are considered critical links in the City's bikeways system. The gap analysis process described in section 4.A.2 of this Plan was also completed to identify other key gaps in the system. **The following list identifies the high-priority critical link projects that can possibly be completed within the next 10 years.**

TABLE 8: HIGH-PRIORITY CRITICAL LINKS PROJECTS

Type	Name	To	From	Length
Bicycle Blvd	Richmond Dr. NE	Candelaria Rd. NE	Claremont Ave. NE	0.25 mi.
Bicycle Blvd	Claremont Ave. NE	Richmond Dr. NE	Moon St. NE	3.95 mi.
Bicycle Lane	Sage	82nd Street	Unser	0.20 mi.
Bicycle Lane	Sage	86th Street	82nd Street	0.21 mi.
Bicycle Lane	Sage	90th Street	86th Street	0.21 mi.
Bicycle Lane	Coors	Huseman	S. City limit	0.08 mi.
Bicycle Lane	Coors Blvd. Bypass	Ellison DR NW	Eagle Ranch RD NW	0.74 mi.
Bicycle Lane	Edith Blvd. NE	Paseo Del Norte	Alameda RD NE	1.29 mi.
Bicycle Lane	Indian School Rd. NW	Menaul Extension NW	Rio Grande Blvd. NW	0.63 mi.
Bicycle Lane	12th ST NW	NW Bellamah AV	NW Menaul Blvd.	0.63 mi.
Bicycle Lane	Carlisle Blvd. SE	Silver AV SE	Garfield AV SE	0.34 mi.
Bicycle Lane	Coal AV SW	SE Broadway BLVD	6th ST SW	0.53 mi.

Bicycle Lane	Lead AV SW	SW 8th ST	SW 2nd ST	0.41 mi.
Bicycle Lane	Menaul Blvd. NW	NW 6th ST	12th ST NW	0.55 mi.
Bicycle Lane	Eubank Blvd. SE	Southern AV SE	Central AV E	0.34 mi.
Bicycle Lane	Rio Grande Blvd. NW	Central AV W	Mountain RD NW	0.25 mi.
Bicycle Lane	Gibson Blvd. SE	I-25 Ramp SE	Broadway Blvd. SE	0.33 mi.
Bicycle Lane	Carlisle Blvd. NE	Central AV E	Lomas Blvd. NE	0.53 mi.
Bicycle Lane	University Blvd. SE	George RD SE	Randolph RD SE	0.32 mi.
Bicycle Lane	University Blvd. SE	Rio Bravo Blvd. SE	Spirit DR SE	0.50 mi.
Bicycle Lane	Montano RD NW	Gallegos Lateral NW	4th ST NW	0.26 mi.
Bicycle Lane	San Pedro DR NE	San Bernardino AV NE	I25 Ramp / City Limits	2.11 mi.
Bicycle Lane	University Blvd. SE	Spirit DR SE	North of Spirit DR SE	0.20 mi.
Bicycle Lane	Sage RD SW	90th ST SW	West of Sunspot RD SW	0.30 mi.
Bicycle Lane	Blake RD SW	Arenal Main Canal SW	Unser Blvd. SW	0.33 mi.
Bicycle Lane	Jefferson ST NE	Masthead ST NE	San Francisco DR NE	0.86 mi.
Bicycle Lane	Carlisle BLVD SE	Silver AV SE	Central AV E	0.05 mi.
Bicycle Lane	Woodmont AV NW	Paseo Del Norte NW	Valle Prado LA NW	0.67 mi.
Bicycle Lane	Unser Blvd. NW	Montano RD NW	Dellyne Ave NW	0.54 mi.
Bicycle Lane	Rio Bravo Blvd. SE	West of Empresa DR SE	I25 SE	0.11 mi.
Bicycle Lane	Carlisle Blvd. SE	Carlisle PL SE	Gibson Blvd. SE	0.56 mi.
Bicycle Lane	Averida Cesar Chavez SE	Edith Blvd. SE	Yale Blvd. SE	1.32 mi.
Bicycle Lane	Washington ST SE	E Central AV	SE Zuni RD	0.26 mi.
Bicycle Lane	La Orilla RD NW	Sumac DR NW	Coors Blvd. NW	0.10 mi.
Bicycle Lane	Chappell DR NE	Singer BLVD NE	Pan American Frwy.	0.32 mi.
Bicycle Lane	Unser Blvd. NW	Black Arroyo Blvd.	Bandelier DR NW	0.65 mi.
Bicycle Lane	NW Atrisco Dr./NW Rainbow Blvd.	NW Unser Blvd.	Existing bike lanes on Rainbow Blvd.	0.88 mi.
Bicycle Lane	86th ST SW	Camino San Martin SW	Sapphire St. SW	0.42 mi.
Bicycle Lane	Eubank	Central Ave	Chico	0.56 mi.
Bicycle Lane	Bridge Blvd. SE/Avenida Cesar Chavez SE	W. Central AV	Old Coors Dr	2.10 mi.
Bicycle Lane	Coors Blvd. NW	Paseo Del Norte NW	Paseo Del Norte Ramp NW	0.08 mi.
Bicycle Lane	Ellison DR NW	Coors Blvd. Bypass NW	Cabazon RD NW	0.71 mi.
Bicycle Lane	Coors Blvd. NW	Paseo Del Norte NW	Alameda Blvd. NW	1.37 mi.
Bicycle Lane	Ladera Dr. NW	Unser Blvd. NW	Ouray RD NW	1.08 mi.
Bicycle Lane	Irving Blvd. NW	Rio Los Pino Dr NW	Unser Blvd. NW	0.77 mi.
Bicycle Lane	8th ST SW	Bridge Blvd. SW	Lead AV SW	0.85 mi.
Bicycle Lane	Unser Blvd. NW	Ladera DR NW	Ouray RD NW	1.02 mi.
Bicycle Lane	Candelaria Rd	2nd St	10th St	0.50 mi.

Bicycle Lane	Snow Vista Blvd. SW	Camino San Martin SW	Benavides RD SW	0.22 mi.
Bicycle Lane	Irving Blvd. NW	Golf Course RD NW	Rio Los Pino Dr. NW	0.63 mi.
Bicycle Lane	Tierra Pintada Blvd. NW	Windward Dr NW	Unser Blvd. NW	0.32 mi.
Bicycle Lane	Ladera Dr. NW	South of Tessa DR NW	Unser Blvd. NW	0.73 mi.
Bicycle Lane	Eagle Ranch RD NW	Coors Blvd. NW	Irving Blvd. NW	0.62 mi.
Bicycle Lane	Coors Blvd. NW	Central Ave	Saint Joseph Dr. NW	3.38 mi.
Bicycle Lane	University Blvd.	Bobby Forster	Stryker	1.35 mi.
Bicycle Lane	Candelaria RD NE	University Blvd. NE	Edith Blvd. NE	0.53 mi.
Bicycle Lane	Eubank Blvd. NE	Osuna Rd NE	Academy RD NE	1.33 mi.
Bicycle Lane	Comanche RD NE	Carlisle Blvd. NE	Drainage Easement	1.20 mi.
Bicycle Lane	Montano Rd. NE/Mercantile AV NE/Commerce DR NE	West of Renaissance Blvd. NE	Chappell DR NE	0.87 mi.
Bicycle Lane	Paseo Del Norte	Calle Nortena NW	Rainbow Blvd. NW	1.76 mi.
Bicycle Lane	NM 528 NW	Coors Blvd. NW	Cottonwood DR NW	0.78 mi.
Bicycle Lane	Golf Course RD NW	Taylor Ranch Rd	Paseo Del Norte	1.55 mi.
Bicycle Lane	Constitution AVE NE	Stanford Dr NE	Girard Blvd. NE	0.26 mi.
Bicycle Lane	Gibson Blvd. SE	I-25 SE	I-25 Ramp SE	0.10 mi.
Bicycle Lane	Tierra Pintada Blvd NW	Unser Blvd. NW	Arroyo Vista BLVD NW	0.65 mi.
Bicycle Lane	NW Atrisco Dr/NW Rainbow Blvd.	NW Unser Blvd.	Existing bike lanes on Rainbow Blvd.	1.22 mi.
Bicycle Lane	Indian School	Monte Largo	Embudo Trail	0.85 mi.
Bicycle Lane	San Francisco	Holbrook	Eubank Blvd.	0.50 mi.
Bicycle Lane	Louisiana Blvd.	San Antonio	Burtson	0.44 mi.
Bicycle Lane	Louisiana Blvd. NE	Signal AV NE	San Diego AV NE	0.10 mi.
Bicycle Lane	Wyoming Blvd. NE	Alameda Blvd. NE	Beverly Hills/ City limits	0.16 mi.
Bicycle Lane	Alameda Blvd.	Barstow St	Edith Blvd.	0.09 mi.
Bicycle Lane	<Null>	<Null>	<Null>	0.40 mi.
Bicycle Lane	Central Ave	Tingley	San Pasquale	0.81 mi.
Bicycle Lane	Broadway Blvd.	Inidan School	Coal	1.74 mi.
Bicycle Lane	Atrisco	Iliff	Juniper	0.21 mi.
Bicycle Lane	Paradise	<Null>	Universe	0.51 mi.
Bicycle Lane	University Blvd. SE	George RD SE	Randolph RD SE	0.40 mi.
Bicycle Lane	2nd ST	Near Lagunitas Ditch	Marquette AV NW	1.07 mi.
Bicycle Lane	Carlisle Blvd. NE	Indian School RD NE	Claremont AV NE	0.32 mi.
Bicycle Lane	San Pedro Dr	Zuni Rd	Claremont Ave	1.00 mi.
Bicycle Lane	Unser Blvd. NW	Central AV W	Los Volcanes RD NW	0.32 mi.
Bicycle Lane	Old Coors	Bridge	Coors	0.01 mi.
Bike Route	Mackland AV NE	Lafayette DR NE	NE Montclaire DR	0.50 mi.
Bicycle Lane	Marble AV NE	Vassar DR NE	Summit DR NE	0.22 mi.
Bicycle Lane	Mackland AV/Summit	Summit DR NE	Lafayette DR NE	0.09 mi.

	DR NE			
Bicycle Lane	Avenida La Resolana NE	Montclaire DR NE	Morningside DR NE	0.07 mi.
Bicycle Lane	Alcalde PL/Lead AV SW	SW Abq Riverside Drain	SW 8th ST	0.72 mi.
Bicycle Lane	Coal AV SW	SW 6th ST	Alcalde PL SW	0.65 mi.
Bicycle Lane	University Blvd. SE	Randolph RD SE	Gibson Blvd. SE	0.33 mi.
Bicycle Lane	Morningside/Marble Dr. NE	Utah NE	NE I40 Ramp	0.18 mi.
Bicycle Lane	Morningside/Marble Dr. NE	San Pedro	Texas	1.29 mi.
Bike Route	Morningside/Marble Dr. NE	Avenida La Resolana NE	San Pedro	1.34 mi.
Bike Route	University Blvd. SE	Randolph RD SE	Gibson Blvd. SE	0.09 mi.
Trail	Paseo Del Norte Trail	Kimmick	Calle Nortena	0.37 mi.
Trail	Paseo Del Norte Trail	Kimmick	Universe	1.45 mi.
Trail	La Orilla	Coors	City Limits	0.24 mi.
Trail	Paradise Trail	Calle Chamisa	Unser	1.15 mi.
Trail	Domingo Baca Drainage	Barstow ST NE	Ventura ST NE	0.52 mi.
Trail	Unser Blvd. NW	Bandelier	Contess	0.23 mi.
Trail	Unser Blvd. NW	Mojave ST NW	Montano RD NW	0.39 mi.
Trail	Unser Blvd.	Artisco	Parasise	2.66 mi.
Trail	JUAN TABO BL Blvd.	NE Tramway Blvd.	NE Juan Tabo Blvd.	1.04 mi.
Trail	I-40 Westbound	Unser Blvd	City Boundary	0.85 mi.
Trail	NE Ventura St	NE Academy RD	Paseo Del Norte	0.72 mi.
Trail	NE Ventura St	Freedom	Paseo Del Norte	0.90 mi.
Trail	Paseo Del Norte	<Null>	Barstow	0.25 mi.
Trail	Pennsylvania	G	<Null>	0.48 mi.
Trail	Calle Cuervo	Coors Blvd. Bypass	Cabezon	0.69 mi.
Trail	Corrales Main Canal/La Orilla Outlet	Piedras Marcadas Arroyo	Paseo Del Norte	0.10 mi.

3. Estimated Costs

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 2014 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.

Multi-use Trails: Trail paving; signs; pavement markings; minor landscaping; way-finding signs/pavement marking. Right-of way acquisition has not been factored in. ***$195,000/mile***

Bicycle Boulevard: No anticipated change in roadway surface or cross-section; some traffic calming; Bicycle Boulevard signs/pavement markings; stop sign relocation; way-finding signs. ***$50,000/mile***

Bike lanes: Cost depending on the existing/proposed cross-section 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 cross-sections is used. ***$374,000/mile***

Bike Routes: No anticipated change in roadway surface or cross-section; bike route signs; way finding sign/pavement markings. ***$5,000/mile***

Grade separated crossings: Cost of these crossings vary depending on the length and type chosen. ***$1,500,000/crossing***

Enhanced intersection: May include pavement marking; signs; traffic signal detection; colored bike lanes. ***$10,000/intersection***

Right-of-Way: The costs related to acquisition of right-of-way will vary depending on the relative cost of land and the amount of right-of-way needed. Recent costs in 2014 generally have ranged from $4 - $8 per square foot. Using this range, a mile of right-of-way could cost between $100,000 and $425,000. Right-of-way acquisition **is not included** in the above estimates for each facility type. Because many of the missing gaps are due to limited right-of-way, it is understood that the following cost estimate is more reflective of the minimum possible expense.

TABLE 9: FULL BUILD-OUT COST ESTIMATE

Bikeways & Trails	Proposed	Cost/Mile	Total
Multi-Use Trails	163 miles	$195,000	$31,785,000
Bike Boulevards	8 miles	$50,000	$400,000
Bike Lanes	206 miles	$374,000	$77,044,000
Bike Routes	81 miles	$5,000	$405,000
Grade-Separated Crossings	15 each	$1,500,000	$22,500,000
Enhanced Intersection	88 each	$10,000	$880,000
Total System	458 miles	n/a	$133,014,000

C. Existing Facility Enhancements

1. Intersection and Crossing Improvements

This *Facility Plan* recommends improvements to intersection and crossing for the existing and proposed bikeways and multi-use trails. This *Facility Plan* recommends the construction of 15 grade separated crossings, improvement of one mid-block crossing and the improvement of 87 existing intersections. The cost for these proposed intersection and crossing improvements based on the cost estimation assumption described above is $23,380,000.

Funding available over the next 20 years will not be sufficient to construct all of the proposed projects, intersection, and crossing improvements. The list of projects and improvements that this *Facility Plan* recommends should be used as guidance for the City when, planning future projects, requesting funding and be included when expanding the City's roadway system. The City should complete a detailed study and prioritization plan to address the 87 intersections that were identified in the engineering study associated with this *Facility Plan*.

A "Prototypical Multi-lane Arterial Intersection Improvements" design recommendation was developed that incorporates traffic signal bicycle detection and a color enriched bike lane in motor vehicle/bicycle conflict areas. The City will apply this prototypical design to all of the 87 intersections identified in this planning process and will continue addressing other intersections where bicycle facilities "disappear" as funding allows. Each intersection that is adjacent to new bicycle facilities should be designed to accommodate a continuous facility through the intersection, as proposed in the Design Guidelines, and described below.

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.

Four different intersection approaches are shown:

[Insert Prototypical Multi-lane Arterial Intersection Designs]

2. Retrofitting Trails to be Universally Accessible

The City of Albuquerque has begun a major program to evaluate trails along with parks to assess the current level of accessibility of these facilities. There is not yet a definite timeline for completion of the analysis as the program requires new training efforts. Additionally, the quantity of parks and miles of trails to evaluate is extensive.

The City's goal is to make as many facilities accessible as possible. There will be parks and trails that are not suitable to be accessible for physical, financial, property ownership, or other reasons. Therefore, not every park and not every trail will be fully accessible throughout the City's trails system.

The proposed Architectural and Transportation Barriers Compliance Board (Access Board) Guidelines for Shared Use Paths are unique as the Shared Use Paths are designed for recreational as well as for transportation use. The proposed guidelines will apply to the design, construction and alterations of pedestrian and bicycle facilities in the Public Right-of-way and were not addressed in the previous Access Board rulemaking.

The Guidelines will be adopted as City Standards for accessible trails and will be incorporated into the City's design process once they are approved and available.

3. Bollard Assessment & Remediation

In 2013, the City commissioned a report to identify relevant design criteria for bollards on multi-use trail facilities, review the installation of bollards on multi-use trails at several locations identified by the City, and develop best practices for implementation by the City of Albuquerque. The report performed bollard evaluations at 4 specific locations along the Bear Canyon Arroyo Trail and at the Gail Ryba Bridge, and recommended design changes to improve consistency with AASHTO and MUTCD recommendations.

Common problems associated with bollards and multi-use trail facilities in Albuquerque include the following:

- Bollards present a collision hazard when placed on a multi-use trail.
- Inconsistent installations lead to user confusion and do not meet a consistent user expectation.
- Inadequate spacing between bollards results in users being unable to access facilities and do not comply with ADA guidance.
- Removable bollards are illegally removed from their locations when not locked.
- When not in place, removable bollards have a collar that becomes a trip hazard.
- When bollards are not in place, unauthorized motorized vehicles may utilize multi-use facilities.

The assessment noted that bollards are a commonly used method of controlling vehicular access to multi-use trails. However, according to the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, 2012 (Fourth Edition):

> The routine use of bollards and other similar barriers to restrict motor vehicle traffic is not recommended. Bollards should not be used unless there is a documented history of unauthorized intrusion by motor vehicles. Barriers such as bollards, fences, or other similar devices create permanent obstacles to path users.

The goal of bollards should be to balance the need to discourage unauthorized motorized vehicle access on a trail with the need to provide the trail users a facility without unnecessary obstructions. Therefore, developing a series of best practices for the installation of bollards on the City of Albuquerque trail system is critical for the purpose of not only providing consistency within the trail system, but also establishing a level of expectancy with the trail users that will result in less confusion and improvements in accessibility for all types of users.

There are no standards or recommended guidelines that have been established to identify a threshold for what constitutes a history of unauthorized motorized vehicular use on a multi-use trail, and the City does not have a policy for when bollards should be considered. The City of Albuquerque has installed bollards at numerous locations throughout the City's trail system to control vehicular access on trails. Currently, standards or recommended practices to ensure consistent application are not fully established by the City of Albuquerque to govern the design and installation of trail bollards. The only City Standard Drawing established for bollard installation pertains to an installation for access to a drainage facility.

The assessment identifies national and local recommended design practices, but does not provide or recommend design standards. These best practice recommendations have been incorporated into this *Facility Plan's* Chapter 7, Design Manual.

4. Facility Upgrades

Claremont Road – Bicycle Route to Bicycle Boulevard

Claremont Road is a road proposed to be upgraded from a Bicycle Route to a Bicycle Boulevard. The City is currently in the process of evaluating the success of the Silver, Mountain, and 14th Street Bicycle Boulevards to inform future installations. The Claremont route is a future project, and it is not currently under study or design.

Trail Amenities

Trail amenities shall be equitably distributed City-wide where feasible and as funding is available. Amenities shall be prioritized by standards to be established. Typical amenities to be provided include:

- Bike racks at trailheads and rest stops
- Rest stops along paths with seating; shade structures at key locations
- Water fountains where feasible
- Signage to identify location within the trail system, directions to community centers and facilities, and historic and interpretive signage
- Mile markers for wayfinding
- Bike parking and bike lockers at destinations and connection points to other transportation modes, i.e.: bus stops, train stations, employment centers
- Appropriate landscaping shall be developed along trails

The Parks and Recreation Department will review and approve plans for landscaping along the trails. Installation of trail amenities and landscaping should be consistent with the recommendations provided in Chapter 7, Design Manual.

D. Way-finding

Way-finding for cyclists and other trail users can be a challenge. 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 way-finding 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 Manual, Chapter 7.F.2, Trail Wayfinding.** The criteria for laying out this program are 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 way-finding and all newly constructed facilities can include way-finding as part of their design.

1. Signage and Marking

Marking of the on-street bikeways and multi-use trails way-finding 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 a combined effort undertaken by Street Maintenance Division for the on-street portion and by Parks and Recreation Maintenance for the multi-use trail portion. Implementation of signage requires coordination with Street Maintenance for consistency of the Bikeways and Trails system. Newly constructed facilities will include way-finding as part of their design and be included as part of the facility construction.

The City is developing a Bicycle Corridor and Wayfinding Sign Implementation Plan currently, in 2014. The goal of the project is to improve wayfinding and navigability for non-motorized travelers throughout the city. The City's consultant first identified bicycle destination sites, such as the North Diversion Channel, Bosque Trail, University of New Mexico, Balloon Fiesta Park, and hospitals. This list of destinations was reviewed and discussed with GABAC members to gain input on any additional bicycle destination sites or corridors. Once the prioritized list of destination sites and corridors has been developed, the consultant will develop wayfinding signs for the destination sites and corridors. The

product of this study is a geographic database that identifies proposed wayfinding sign locations along the various corridors.

2. Emergency Responders

Coordination between the City and emergency responders with regards to the way-finding system needs to be established. This effort would best be done by the Trails Coordinator due to the fact that a greater part of this will involve the multi-use trail system. As part of this Facility Planning process, the Trails Coordinator developed a trail responsibility map. This map will eventually be shared with the City's 311 phone service and with emergency responders, after all trails have been given names and orientation features. Implementing on the ground signage or trail markings will be critical for the trail users to be able to communicate to emergency responders about their location.