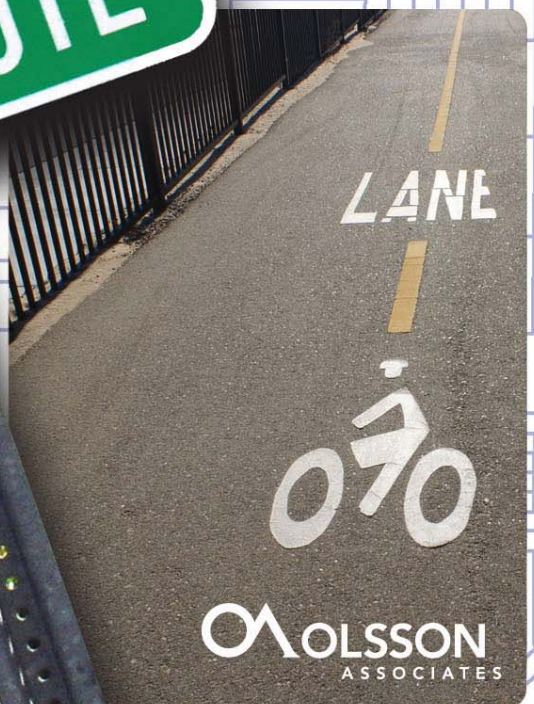


CITY OF YUMA

BICYCLE FACILITIES

MASTER PLAN



RESOLUTION NO. R2009-23

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF YUMA, ARIZONA, AMENDING RESOLUTION R95-010, THE BICYCLE ELEMENT CITY OF YUMA- GENERAL PLAN, BY AMENDING THE BICYCLE FACILITIES STANDARDS AND THE DESIGNATION OF FACILITIES IN THE CITY OF YUMA, THEREBY INSTITUTING THE BICYCLE FACILITIES MASTER PLAN

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WHEREAS, it is necessary to amend the Bicycle Element, 'Facility Plan' to reflect changing development trends and bicycle facility needs and education outreach; and,

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WHEREAS, due and proper notice of the public hearings were given in the time, form, substance and manner as provided by law, including publication of such notice in The Sun on February 17, 2009; and,

WHEREAS, the proposed amendment to the 1995 Bicycle Element, 'Facility Plan' meet the goals and objectives of the General Plan.

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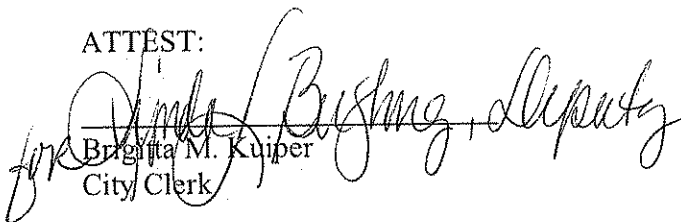
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APPROVED:



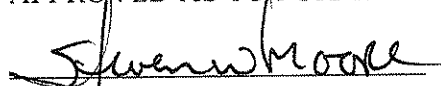
Lawrence K. Nelson
Mayor

ATTEST:



Briggitta M. Kuiper
City Clerk

APPROVED AS TO FORM:



Steven W. Moore
City Attorney



TABLE OF CONTENTS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



ACKNOWLEDGEMENTS	1
1.0 EXECUTIVE SUMMARY	3
2.0 INTRODUCTION	8
Project Overview	8
Regional Context	9
Public Involvement/Key Values and Issues	9
Visions and Goals	14
Summary of Master Plan Chapters	16
Updates to the Master Plan	16
Definition of Plan Terms	16
3.0 BACKGROUND AND EXISTING CONDITIONS	20
Existing Documents and Regulatory Review	21
Existing Economic and Demographic Conditions	21
Existing Bicycle Facilities	23
Bicycle Facility Types	24
Destinations	30
Levels of Service	40
Existing and Future Funding Commitments	40
Capital Improvement Program	43
4.0 ALTERNATIVE ANALYSIS	46
Recreational Bicycle Facility Alternative	46
Cross-Town Bicycle Facility Alternative	47
Destinations Bicycle Facility Alternative	49
Planning Synthesis	53
5.0 MASTER PLAN	55
Master Plan	55
6.0 IMPLEMENTATION	60
Overview of Prioritization	60
Funding Sources	66
Promotion and Information Program	66
Education Program	67
Bicycle Facility Maintenance	67
Enforcement Program	68
7.0 DESIGN STANDARDS	71
Design Standards	71
Bicycle Parking Standards	76
Planning Standards	77
Maintenance Standards	77
BIBLIOGRAPHY	79



TABLE OF CONTENTS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



Figures

1.1 Bicycle Facilities Master Plan	6
3.1 Existing Bicycle Facilities	26
3.2 Employment, Retail and Mass Transit Centers	32
3.3 Education and Recreation Centers	38
3.4 Levels of Service	40
4.1 Recreation Bicycle Facilities Alternative	48
4.2 Cross Town Bicycle Facilities Alternative	51
4.3 Destinations Bicycle Facilities Alternative	52
5.1 Bicycle Facilities Master Plan	57
6.1 High-Priority Bicycle Facilities	62
6.2 Mid-Priority Bicycle Facilities	63
6.3 Low-Priority Bicycle Facilities	64

APPENDIX

Tables

4.1 Existing Facilities Inventory
6.1 High-Priority Facilities Inventory
6.2 Mid-Priority Facilities Inventory
6.3 Low-Priority Facilities Inventory



ACKNOWLEDGEMENTS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



The City of Yuma recognizes the effort and dedication of the many participants who helped develop and design this Bicycle Master Plan. The Community Development Department has prepared this document, along with the input and review of many other city departments and agencies and the help of interested citizens.

Internal Bicycle Working Group

Lesley Zlatev	Project Manager, Senior Planner, Community Development
Becky Chavez	Director, Parks and Recreation
Roberta Ukura	Assistant Director, Parks and Recreation
Damon Chango	Superintendent, Parks and Recreation
Paul Brooberg	P.E., City Engineer, City Engineering
Fred Orcutt	Traffic Engineer, City Engineering
L. Dan Sanders	Traffic Engineer, City Engineering
Jennifer Albers	Principal Planner, Community Development
Tina Clark	Yuma Crossing National Heritage Area
Kevin Eatherly	CIP Project Manager, Yuma Crossing National Heritage Area

Organization Involvement

Foothills Bike Club
Yuma Bike Club
Cibola Track Club
Yuma Metropolitan Planning Organization
Yuma County, Department of Development Services

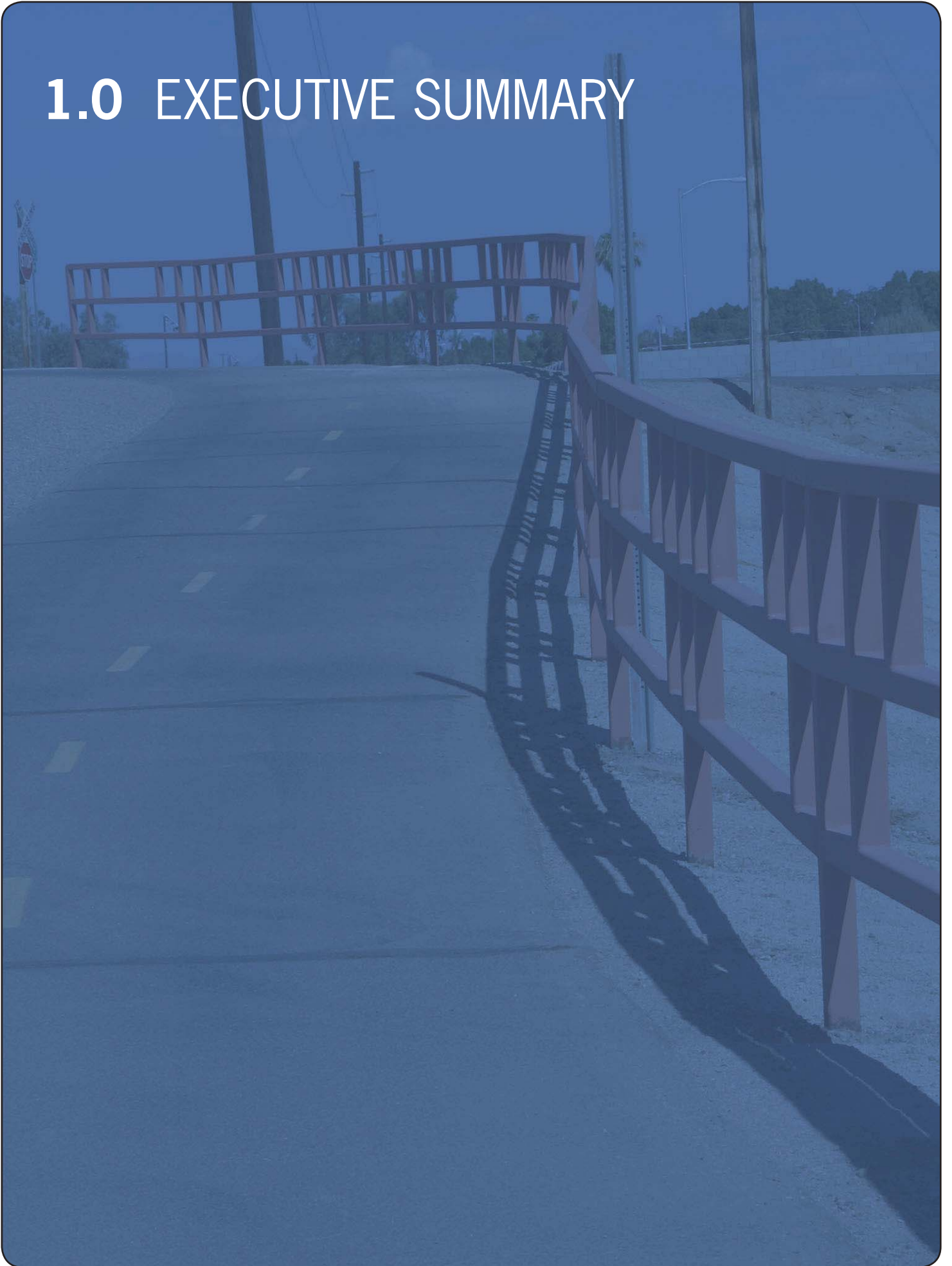
Project Consultant

Olsson Associates
www.oaconsulting.com

Principal Authors:
Avery Oltmans
Joy Dunlap, AICP
Jeff Kratzke, ASLA

Additional Assistance:
Michaela Oltmans, Graphic Design
Chris Downs, Editing

1.0 EXECUTIVE SUMMARY





1.0 EXECUTIVE SUMMARY

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



Bicycling continues to be a popular form of transportation, both for recreation and for everyday travel to and from work, home, school, and other residential and retail destinations. Although bicycling has decreased over the years among some residents (particularly children), rising gas prices and pollution from automobiles and buses could renew the popularity of this motor-less mode of travel if the proper facilities are in place to support bicyclists. Providing choices for citizens will help the community see bicycling as a beneficial way of life.

The City of Yuma Bicycle Facilities Master Plan expands and updates the work of the 1995 Bicycle Element City of Yuma General Plan, providing a strong planning tool for the next few years. The 1995 Bicycle Element City of Yuma General Plan provided the City of Yuma with guidelines, goals, and projects to develop a system of bicycle facilities. Since 1995, many of these facilities have been built. This document will build on the successes of the 1995 plan.



This document intends to accomplish the following:

- Provide an overview of the existing bicycle facilities in Yuma.
- Outline the facilities and programs that form the basis for the new Master Plan, focusing on recreation and transportation.
- Provide phased goals for realistically implementing the Master Plan.
- Provide design standards for future bicycle facilities.



The goal of the Yuma Bicycle Facilities Master Plan is to make bicycling safer and more convenient for bicyclists of all ages and skill levels. Since bicycling is non-polluting and cost-efficient, it is a terrific transportation alternative to vehicular traffic. Making the bicycling improvements identified in the Master Plan and instituting effective education and promotion programs should boost the number of people using a bike for both work and recreational trips.

The Yuma Bicycle Facilities Master Plan is a policy document meant to update the 1995 Bicycle Element City of Yuma General Plan. The project area for this Master Plan is the Urban Boundary of the City of Yuma. The plan took over one year to create, starting in late 2007 and ending with the adoption of the plan in the spring of 2009.

Currently the City of Yuma possesses approximately 44 miles of bicycle facilities. These facilities are separated into four separate types: Bike Route, Bike Lane, Bike Path, and Multi-Use Path. The inventory of existing facilities was generated using aerial photography, site reconnaissance, and evaluated by the general public at open house events. The open house meetings held at the beginning of the project (March, 2008) and again near the completion of the project (June, 2008) allowed Yuma residents to comment on the condition of local bicycle facilities and comment on the proposed alignment of future bicycle facilities. This data collection and input from the public was vital to the planning process allowing the consultant and the Internal Bicycle Working Group to direct improvements to the bicycle facilities. This process was very important to understand the forces at work in the City of Yuma and to identify the needs of the city residents.

To better quantify the needs of the community, specific values and goals were identified. These values and goals are based on input from the general public, and from the Internal Bicycle Working Group. This process helped create quantifiable benchmarks for this Master Plan that will continue to be influenced by the values and concerns of local residents. This process is embodied by the vision statement created for the City of Yuma Bicycle Facilities Master Plan.

Following is the vision for the City of Yuma Bicycle Facilities Master Plan:

City of Yuma Bicycle Facilities Master Plan Bicycling Vision for the Region...

A unified system that provides bicyclists with safe, convenient, accessible facilities. The system promotes bicycling through a well marked, mapped, and publicized bike network.

After defining the values and goals of the community the next step was to evaluate future bicycle facility locations. Three bicycle facility alternatives were identified, each alternative possessed a unique emphasis based on comments received in the initial data collection process. The three bicycle facility alternatives are the following; the Recreational Facilities

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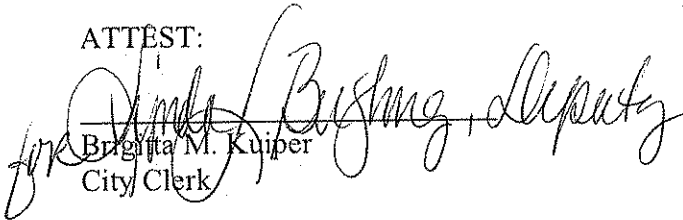
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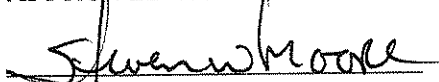
Lawrence K. Nelson
Mayor

ATTEST:



Briggitta M. Kuiper
City Clerk

APPROVED AS TO FORM:



Steven W. Moore
City Attorney



Alternative, the Cross-Town Facilities Alternative, and the Destination Facilities Alternative. These alternatives were presented to and evaluated by, the Internal Bicycle Working Group and further refined into the Bicycle Facilities Master Plan. The Bicycle Facilities Master Plan forms the basis for future bicycle facilities. See Figure 1.1 Master Plan on page 6.

The Master Plan calls for an additional 193 miles of bicycle facilities including 27 miles of bike routes,

115 miles of bike lanes, 26 miles of bike paths, and approximately 25 miles of multi-use paths. The Master Plan calls for the implementation of bike routes in the more densely populated areas of the community, where available rights-of-way are limited. Bike lanes are called for on arterial roadways. Bike paths are called for along canal alignments where possible and along arterial roadways with high traffic volume, and multi-use paths will be implemented in the rural areas of Yuma. In addition to these bicycle facility improvements the Master Plan also calls for bicycle crossing improvements at certain intersections identified by the potential for conflict between vehicular and bicycle traffic as well as potential locations for bicycle stations that are intended to provide amenities to bicycle riders at strategic city locations.

In an effort to prioritize the implementation process, the Master Plan recommendations are separated into three priority levels; high priority, mid priority, and low priority. The priority levels are designated based on input from the general public and from the Internal Bicycle Working Group. The initial implementation of the bicycle facilities is designated as high priority to serve the greatest number of Yuma residents; hence the vast majority of high-priority bicycle facilities are those located in the more densely populated areas of Yuma. The mid-priority and low-priority bicycle facilities radiate outward from the inner city to the more rural parts of the community.

Every new trip that can be made by bicycle improves air quality, congestion and the viability of local business. With the commitment of the city, and the cooperation and involvement of interested citizen groups, Yuma can increase the number of bicyclists while reducing the number of bicycle related accidents. The implementation of this plan is a big step toward bicycling achieving its full potential in Yuma's transportation system.

The City of Yuma Bicycle Facilities Master Plan seeks to provide new and upgraded bicycle facilities to serve the recreation and transportation needs of its residents and visitors of all ages. These facilities will provide a full range of interconnected, well designed, well constructed, and properly maintained bicycle facilities that serve the neighborhood, community, and regional needs of Yuma residents and visitors. This Master Plan is an important form of recreation and transportation for the City of Yuma. Improved bicycle facilities and effective education and promotion programs will allow the City of Yuma to increase bicycle use for all Yuma residents.



Yuma Bicycle Facilities Master Plan

Bicycle Facilities Master Plan

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lanes
- Proposed Bike Lanes
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-Use Path
- Proposed Multi-Use Path
- Existing Bicycle Crossing
- Proposed Bicycle Crossing
- Bike Station

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County



0 0.5 1 2 Miles

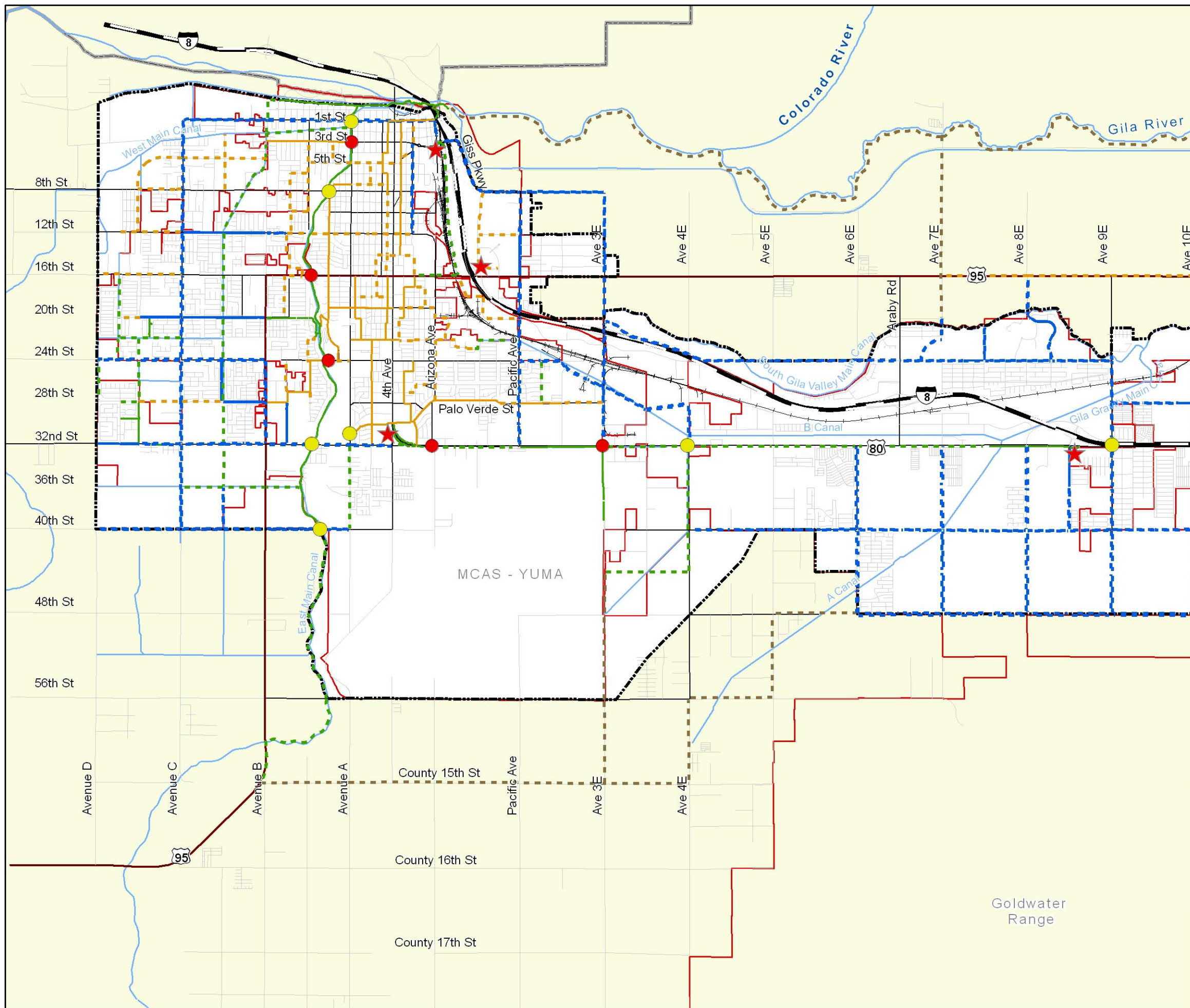


City of YUMA



OLSSON ASSOCIATES

Fig 1.1



2.0 INTRODUCTION





2.0 INTRODUCTION

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



Investing in bicycle facilities creates benefits on many levels, some that can be measured (improved health, positive changes in automobile traffic levels, decreased parking needs), and some that cannot (a sense of community awareness that occurs when travel speeds are 10 miles per hour as opposed to 45).

As gasoline prices rise, bicycling as a means of transportation will gain more converts. An integrated transportation system for the City of Yuma will accommodate this need for transportation and recreation.

Based on gas prices of \$3/gallon, the annual cost of owning, operating, and driving a passenger car is roughly 15,000 miles is nearly \$11,000 (American Automobile Association). Add the health and safety benefits, and bicycling looks more and more attractive.



PROJECT OVERVIEW

In 2007, the City of Yuma issued a Request for Proposal for a consultant to help update the current Bicycle Element City of Yuma General Plan that was developed in 1995. In November of 2007, Olsson Associates was hired to assist the city with this update. Olsson met with the Internal Bicycle Working Group and a number of stakeholders to review and evaluate the existing bicycle facilities. As part of this review and analysis phase, Olsson Associates staff members toured the existing facilities with direction from city staff members. This

inventory and analysis explores the City of Yuma's existing bicycle facilities and the relationship to existing land use and destinations to lay the groundwork for a cohesive, integrated strategy to update the Bicycle Facilities Master Plan. In addition to land use and destinations, levels of service were developed to determine the connectivity of the existing facilities.



REGIONAL CONTEXT

Within and around the City of Yuma Planning Area lie a number of natural and cultural assets: the Colorado and Gila River Corridors, the Ocean to Ocean Bridge, the historic Yuma Territorial Prison, the Chocolate Mountains, and large tracts of undeveloped desert lands, to name just a few. In addition to the City of Yuma, the Yuma region contains the communities of Somerton, San Luis, and the Fortuna/Foothills region. These local features, along with others mentioned later in this document, create a positive environment where the city can identify and encourage new bicycle facility development. However, in many ways, these features exist as isolated elements connected by only vehicular roadways. As new master-planned communities are planned and constructed their relationships to city infrastructure will gain importance because of access issues, views, and connectivity. New bicycle facilities, such as paths, lanes, and crossings can add even more connections between housing communities and city amenities.



According to the Bureau of Transportation Statistics (BTS) Omnibus Survey for 2002, 14.3 percent of the adults who responded rode a bicycle in the previous month. Of those, over half, 59.3 percent, did so for recreation, and 31.2 percent rode for exercise. Another 4.9 percent rode for transportation to work or school, and 7.5 percent ran errands. Of those using a bicycle for transportation, 11 percent rode primarily on bike lanes, and another 5.6 percent used bike lanes for recreation.

The intent of this Bicycle Facilities Master Plan is to provide principles to establish a comprehensive framework for the City of Yuma's bicycle facilities that will accommodate the region's growth. Bicycling will be part of this growth, and this document supports this growth by adding and improving the existing bike facilities.

PUBLIC INVOLVEMENT/KEY VALUES AND ISSUES

Any organization that has a purpose or mission, along with some resources to expend, must plan how it will use its resources to achieve that purpose or mission. The opposite of planning is aimless drift, and few individuals or organizations would want to entrust their futures to such a process when other options are available. The goal of public involvement is to educate the general public





about implementing city infrastructure and to provide a forum for city residents to discuss and evaluate conflicting interests regarding the importance of any city improvement. Public involvement allows citizens to voice ideas and view information about the city that might test their assumptions with the objective of achieving a common goal.

The success of this or any plan depends on commitment by the Mayor and the City Council, the City of Yuma staff, and the community to implement recommendations. This fact has been apparent throughout the planning process.

Community Open House #1 – March 19 and 20

Before receiving input from the Internal Bicycle Working Group, the consultant team conducted an extensive inventory and analysis to present its findings to interested citizens, and stakeholders, at the first open house. A City of Yuma Existing Bicycle Facility Inventory was presented and mapped, and an overview of city features relevant to bicycle travel were reviewed and discussed. The group was presented with varying definitions of active and passive open spaces and a hierarchical overview of the various types of bicycle facilities. In addition to concerned city residents, a number of stakeholder groups were invited to participate in a series of community open house events described above. The following is a list of stakeholder groups, both public and private, that participated in the public involvement process held between March 19 and 20:

- Foothills Bike Club
- Yuma Bike Club
- Yuma Metropolitan Planning Organization
- Yuma County
- City Administrator – Mark Watson
- City of Yuma Engineering Department
- City of Yuma Parks and Recreation Department

The outcome of the March open house events was clear. Yuma residents support the continued expansion of city bicycle facilities. During the reviewing of the city's bicycle facilities, open house attendees helped refine the bicycle facility inventory, identify dangerous areas of town for bike riders, and give suggestions for future bike facility routes. The comments and concerns gathered in the open house meetings provided an excellent basis creating the plan goals and bicycle facility alternatives.

May 7, 2008, Internal Bicycle Working Group, Progress Meeting

The consultant team reviewed the findings from the Community Open House and conducted initial project research on the existing conditions relating to the community's bicycle facilities. The consultant team also reviewed with the Internal Bicycle Working Group the draft Vision and Goals statements that were first identified at the March 19 and 20 Open House. In addition, the consultant reviewed the draft bicycle facilities alternatives with the Internal Bicycle Working Group. They commented on the content provided and directed the consultant to make further revisions.



May 28, 2008, Internal Bicycle Working Group, Progress Meeting

This work session proved to be productive, comprehensively reviewing many draft materials, including projected facility needs, various bicycle facility corridors, and connections for comments and guidance. Internal Bicycle Working Group members were eager to review the materials, offer suggestions to the Preferred Bicycle Facilities Plan, and prompt changes based on their extensive local knowledge. Moreover, the Internal Working Group validated the draft findings for the policy statements that they felt most accurately reflected earlier resident input.

Community Open House #2 – June 16

Key elements of the final plan were presented and reviewed by the Internal Bicycle Working Group, City of Yuma residents, and interested stakeholders. Attendees reviewed and gained a comprehensive understanding of how this Master Plan will unite all policy objectives and the intended development standards, which together define bicycle facility planning in Yuma.

Involvement of Irrigation Districts

Within the Yuma area, a number of irrigation districts operate, maintain, and control access to a system of irrigation canals. The objective of irrigation canals and the irrigation districts that administer them is to provide water to local farms and area residents. The irrigation canals typically follow natural drainage patterns and operate under the power of gravity. The irrigation alignments provide a unique opportunity for bicycle facilities. The construction of canals requires long lengths linear right-of-way. This orientation of irrigation canals creates an opportunity for bicycle facilities that provide longer, unobstructed lengths of bikeway that are separated from automotive traffic. Cooperation between irrigation districts and the City of Yuma to create a longer bike path system will greatly reduce the construction cost due to rights-of-way that will not need to be purchased. In many instances, irrigation canals provide ideal locations for bike paths. Currently only one irrigation canal: the East Main Canal, is used for a bike path within the City of Yuma. The City of Yuma has implemented this bicycle facility through a cooperative agreement with the Yuma County Water Users' Association, which operates and maintains this canal.



During the planning process, the consultant attempted to contact all irrigation districts that operate within the City of Yuma urban boundary regarding the joint use of canal alignments to create future bicycle facilities. Unfortunately, attempts to contact the irrigation districts were unsuccessful. Past meetings and conversations between other irrigation districts and the City of Yuma Community Development staff members indicate that the irrigation districts are resistant to creating bicycle facilities along irrigation canals. Through the planning process,



canal alignments throughout the city were identified by many city residents and City of Yuma staff members as ideal locations for future bicycle facilities creation. It is the opinion of the City of Yuma Community Development Department that, where possible, irrigation canals should be targeted for the implementation of new bicycle facilities. Due to the lack of cooperation between local irrigation districts and the City of Yuma, the recommended future bicycle facilities are located on alternative roadways where irrigation canals have been deemed unavailable.

The following values and considerations were identified through public participation at the public meetings held on March 19 and 20 and were further validated at the open house on June 16, 2008. Comments and input from city staff members and Yuma residents were used to form the basis of the visions, goals, and objectives. The values and considerations, identified through community input, set the framework and grounding point for developing a vision statement for the Bicycle Facilities Master Plan and the objectives and policies that followed. The vision behind these values will lead development into a new era of non-motorized travel, connecting areas of the city and ensuring safety and recreation.

- **VALUE:** A one to two word description that identifies a value the community considers important and identifiable.
- **CONSIDERATION:** A concise statement that describes the broad conditions or objectives the community deems important.

Value 1 - - - - - Safety

- Consideration 1.1* Where bicycle traffic crosses major roadways, special attention is required.
- Consideration 1.2* Where necessary, bike facility lighting should be implemented.
- Consideration 1.3* Bike lanes on specific arterial roadways could offset potential accidents.
- Consideration 1.4* Specific interstate roadway and railway viaducts should be identified to implement bike facilities.
- Consideration 1.5* Where possible, bike traffic should be located to avoid heavy vehicular traffic.

Value 2 - - - - - Convenience and Accessibility

- Consideration 2.1* Bike racks should be located near bus route stops, bike traffic originations/destinations, and all public buildings.
- Consideration 2.2* Bike facilities need to be properly maintained and cleaned.
- Consideration 2.3* When possible, bike facilities should use linear infrastructure (canals, utility easements, etc.).
- Consideration 2.4* All street design should incorporate “Multi-Modal” design concepts to facilitate use by all types of legitimate users (pedestrian, bicycle, and motorized).



Value 3 - - - - - Connectivity

- Consideration 3.1 Bike facilities should facilitate traffic through the entire breadth of the community both north-south and east-west.
- Consideration 3.2 Bike facilities should incorporate a 'looping' pattern to better facilitate recreational users.
- Consideration 3.3 Bike facilities should provide access to major bike traffic originations and destinations.
- Consideration 3.4 Access to bike facilities should be increased by providing access points.
- Consideration 3.5 Bike facilities should promote connections between the Fortuna/ Foothills area and greater Yuma.

Value 4 - - - - - Information

- Consideration 4.1 Accurate mapping should be used to better inform the public of the locations and routes of bike facilities.
- Consideration 4.2 Roadway signage should be located in prominent locations to best inform riders of the bike routes, lanes, and paths.
- Consideration 4.3 City staff members should strive to increase public awareness of the interaction of bicycle and vehicular traffic.

The previous values and considerations were combined to become the basis for the policy goals and objectives of the Master Plan.

Forming a successful Bicycle Facilities Master Plan is based on preparing realistic, accurate goals and objectives that address important community considerations. The vision identifies the future intent of the community relative to providing bicycle facilities. The Vision for the City of Yuma Bicycle Facilities Plan is as follows:

City of Yuma Bicycle Facilities Master Plan Cycling Vision for the Region...

A unified system that provides bicyclists with safe, convenient, accessible facilities. The system promotes bicycling through a well marked, mapped, and publicized bike network.

Creating overall visions and goals, as well as supporting objectives and strategies, effectively sets the foundation for the Bicycle Facilities Master Plan. This vision is founded on identifying key values and considerations, through community input, that complement the vision and themes identified in the City of Yuma 2002 General Plan.



City of Yuma 2002 General Plan Our Vision...

Building on our heritage, our vision for Yuma is a community that is livable and competitive.

*Yuma is a Healthy, Vibrant Community
Yuma has a Sustainable, Diverse Economy
Yuma has Orderly Growth*

GOALS AND OBJECTIVES

Goal 1: Create a system of bicycle facilities that provides for the safety of all types of bicycle users (Value: Safety).

- Objective 1.1* | Increase the number of children and adults who receive bicycle safety and skills training.
- Objective 1.2* | Establish a maintenance program that addresses all elements of existing and future bicycle facilities.
- Objective 1.3* | Provide and maintain adequate sight distances between bicycle facilities and intersecting streets and alleys.
- Objective 1.4* | Where possible, bicycle facilities should be separated from vehicular traffic on high volume urban roadways.
- Objective 1.5* | Provide appropriate grade transitions, levels of lighting, and surveillance where appropriate.

Goal 2: Provide and maintain an attractive, diverse, and accessible system of bicycle facilities that meets the needs of the city's residents, businesses, and visitors (Value: Convenience and Accessibility).

- Objective 2.1* | Establish a program of regularly inspecting and maintaining all bicycle facilities.
- Objective 2.2* | Coordinate bicycle facilities with transit stops and transfer locations.
- Objective 2.3* | Maximize the use of existing and future canals, utility corridors, and other linear easements as rights-of-way for bicycle facilities.
- Objective 2.4* | Preserve adequate rights-of-way for future bicycle facility development.
- Objective 2.5* | Identify the needs and requirements of bicycle facility users (bicycle, pedestrian, equestrian, etc.) to promote compatibility among the various user groups.
- Objective 2.6* | Define the appropriate character and type of bicycle facilities based on adjacent land use, available rights-of-way, natural terrain, and user needs.



Objective 2.7 | Establish development requirements to require all new non-residential projects to provide bicycle parking facilities.

Goal 3: Develop a plan for locating bikeways to link homes, schools, parks, workplaces, and other important city features (Value: Connectivity).

Objective 3.1 | Develop a prioritized list of bicycle facility construction projects.

Objective 3.2 | Define specific funding mechanisms for bicycle facility design, implementation, and maintenance.

Objective 3.3 | Establish bicycle facility linkages that connect bicycle rider destinations and originations.

Objective 3.4 | Develop bicycle facilities connecting to and along historic trails where possible.

Objective 3.5 | Establish development requirements to require all new residential developments to provide bicycle facility connections to any and all city parks, trails, or open spaces within a one-half-mile radius of the development.

Goal 4: Continue to expand and promote public awareness of bicycle related opportunities, laws, and regulations among city residents and visitors (Value: Information).

Objective 4.1 | Increase the knowledge of bicycling opportunities among residents and visitors by publishing highly accurate and regularly updated mapping efforts.

Objective 4.2 | Increase the compliance of bicyclists and motorists with bicycle related laws and regulations through education programs and public service announcements.

Objective 4.3 | Promote a program to use volunteer maintenance for bicycle facilities, such as an “adopt-a-path” program.

Objective 4.4 | Develop public and private partnerships to enhance joint sharing of bicycle facilities.

Objective 4.5 | Conduct attitudinal surveys to measure participant satisfaction and make necessary adjustments to programs and activities.

Objective 4.6 | Encourage bicycling as a daily transportation method for people of all ages.

Summary of Master Plan Chapters

The City of Yuma’s Bicycle Facilities Master Plan is presented in the remaining five chapters of this document, which are summarized below.

3.0 Background and Existing Conditions – Provides a comprehensive analysis of the existing bicycle facilities in the city to determine future needs. The analysis includes assessing the current facilities, land use, destinations, and level of service for the city.



4.0 Alternative Analysis – Reviews the three alternatives considered in forming the Master Plan.

5.0 Master Plan – Provides recommendations to ensure appropriate types and locations of bicycle facilities within the city.

6.0 Implementation – Provides a systematic approach to identify appropriate facility development and sequence of construction.

7.0 Design Standards – Developed as tools to help city agencies and developers implement the Master Plan recommendations. The design guidelines are based on the American Association of State and Highway Transportation Officials (AASHTO) manual “Guide for the Development of Bicycle Facilities 1999” and the “Manual on Uniform Traffic Control Devices” (MUTCD).



Updates to the Master Plan

This document is designed to adapt to the changing needs of the community. Therefore, it will be necessary to evaluate and update this document on a regular basis to accommodate shifting needs and financial realities. This document’s short-term high-priority projects will be updated yearly. Updates to the Master Plan as a whole will occur every five years to keep up with changes in population and land uses. Public input will be considered so that the City of Yuma can continue to support bike travel in the ways best needed by the citizens of Yuma.

Definition of Plan Terms

1. AASHTO

American Association of State Highway and Transportation Officials

2. ADOT

Arizona Department of Transportation

3. Bicycle

Every device, including a racing wheelchair, that is propelled by human power and on which any person may ride and that has either:

- (a) Two tandem wheels either of which is more than 16” in diameter.
- (b) Three wheels in contact with the ground any of which is more than 16” in diameter (Arizona Revised Statute 28-101).

4. Bicycle Facilities

A general term denoting improvements and provisions made by public agencies or others to accommodate or encourage bicycling, including parking facilities, maps, all bikeways, and



shared roadways not specifically designated for bicycle use.

5. Bicycle Lane

A portion of roadway that has been designated by striping, signing, and pavement markings to be preferred for the exclusive use of bicyclists. The minimum bicycle lane shall be five feet. See Chapter 7 Design Standards.



6. Bicycle Path/Multi-Use Path

A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Multi-use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. The minimum bicycle path/multi-use path shall be 10 feet wide and may be paved or unpaved. See Chapter 7 Design Standards.

7. Bicycle Route System

A system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without a specific bicycle route number. Bike routes should establish a continuous routing but may be a combination of any and all types of bikeways.



8. Bikeway

A generic term for any road, street, path, or way that, in some manner, is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.



9. Loop Concept

A bicycle facilities system designed so that the route forms a loop, giving users the option of not traveling the same section more than once on a trip.



10. Multi-Modal Transportation

Refers to trip events where an individual incorporates more than one mode of transportation, i.e., public transit, private automobile, walking, bicycling.

11. Rumble Strips

A texture or grooved pavement sometimes used on or along shoulders of highways to alert motorists who stray onto the shoulder.

12. Shoulder

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

13. Urban Boundary

This area includes the city limits and portions of the Joint Land Use Plan Boundary as defined by the City of Yuma 2002 General Plan. The purpose of this boundary is to demarcate the urban land uses as defined in the City of Yuma 2002 General Plan.

14. Bicycle Crossing

A bicycle facility designed to allow bicyclists to safely cross major intersections. Options to increase the safety of intersections include; unsignalized, signalized, at grade crossings or grade-separated crossing and may, in rare cases, include mid-block crossings.

15. Bicycle Station

A bicycle facility that offers secure bicycle parking and other amenities such as lockers, changing rooms, and shower facilities. These facilities are to be built in conjunction with transit stations and major public destinations.

16: Bike Box (aka. Advanced Stop Line)

A Bike Box is an area on the road typically marked with colored pavement or striping and bicycle symbols. It extends across one or more traffic lanes at the approach of an intersection. When the traffic signal is red, only bicyclists may enter the Bike Box. Motor vehicles must stop at an advanced stop line (ASL) to leave the Bike Box clear for bicyclists.



3.0 BACKGROUND AND EXISTING CONDITIONS





3.0 BACKGROUND AND EXISTING CONDITIONS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



The City of Yuma encourages bicycle use in many ways. Yuma's current bikeway network consists of approximately 44 miles of bicycle routes, bicycle lanes, bicycle paths, and multi-use paths (see table).

Bicycle Facility Type	Miles
Bike Route	16.43
Bike Lane	12.40
Bike Path	13.63
Multi-Use Path	1.58
Total	44.04

The energy and commitment of many organizations and businesses is needed to help improve the bicycle environment of the community. The City of Yuma continues to install miles of bicycle facilities throughout the city. Bicycle facility use is affected by more than just the efforts made by the City Officials. The help and cooperation of private organizations and local businesses is needed to foster an increased desire to use these bicycle facilities. An impressive array of advocacy groups, educational groups, riding groups, and governmental agencies is working to make bicycling a more viable and safe option for people of all ages. These groups and agencies include the Yuma Bike Club, The Foothills Bike Club, The Steps to a Healthier Arizona (Steps) Initiative, the Safe School Healthy Students, local school districts, the Yuma County Department of Development Services, and the City of Yuma.

With this kind of momentum and support for increased bicycle use in the City of Yuma, implementing new bicycle facilities should be easy. However, despite the presence and efforts of the city's bicycle-friendly organizations, the City of Yuma still has a long way to go before bicycle facilities are easily accessible to the entire community. The current state of the city's bicycle network is disjointed and incomplete, creating bicycle facility segments that seem to start and stop without any connection to a city-wide network or grid. Past planning efforts and public sentiment, which have advocated for connecting additional bicycle facilities, have largely been unsuccessful. To ensure that this planning effort succeeds, both public agencies and local residents must continue to advocate for the expansion of bicycle facilities to ensure that City Officials place a high priority on implementing this Master Plan.



EXISTING DOCUMENTS AND REGULATORY REVIEW

Reviewing key area master plans and studies helps determine the direction the city, agencies, and adjacent communities have taken to establish the existing facilities. Evaluating existing development, key plans, and policy criteria was critical to establish a cohesive and integrated Bicycle Facilities Master Plan for the City of Yuma. The following summarizes these key documents and the information provided as it pertains to the Master Plan.

Yuma County Comprehensive Bicycle Plan September, 1987

This Comprehensive Bicycle Plan defines facilities that include bike lanes, paved shoulders, wide curb lanes, and bike paths.

This plan was not implemented, but it provides an excellent basis for connecting areas beyond the city limits to areas like Wellton, Winterhaven, San Luis, and the Yuma Valley.

Bicycle Element City of Yuma General Plan 1995

As part of the Yuma General Plan, this Bicycle Element provides a plan for various paths, lanes, and routes. The element also identifies plans for construction, funding, improved bicycling safety, and information about bicycle facilities. Design guidelines are also provided within the Bicycle Element. The bicycle element was intended to be updated every five years.

City of Yuma 2002 General Plan

The 2002 General Plan references the 1995 Bicycle Element.

City of Yuma Major Roadways Plan 2005

The Major Roadways Plan of 2005 references the 1995 Bicycle Element.

The update to the 1995 plan will provide a practical strategy to improve the bicycle facilities in the Yuma area. Subsequent updates to the Major Roadway Plan 2005 and the 2002 General Plan will occur based on the 2008 Bicycle Facilities Master Plan.

EXISTING ECONOMIC AND DEMOGRAPHIC CONDITIONS

“Overall, American adults travel 25 miles a day in trips of a half-mile or less, of which nearly 60 percent are vehicle trips. If people walked instead of drove for these short trips, we would save 1.2 million gallons of gas and 3.9 million dollars of motor fuel cost a day.” (U.S. Department of Transportation National Household Travel Survey Brief – June 2006)

Over the past decade, the City of Yuma has attracted many new businesses and residents. The 2000 U.S. Census population for Yuma was 77,515 people. The 2007 Arizona Department





Yuma Bicycle Facilities Master Plan

Existing Bicycle Facilities

- Bike Routes
- Bike Lanes
- Bike Path
- Multi-Use Path

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County



0 0.5 1 2 Miles

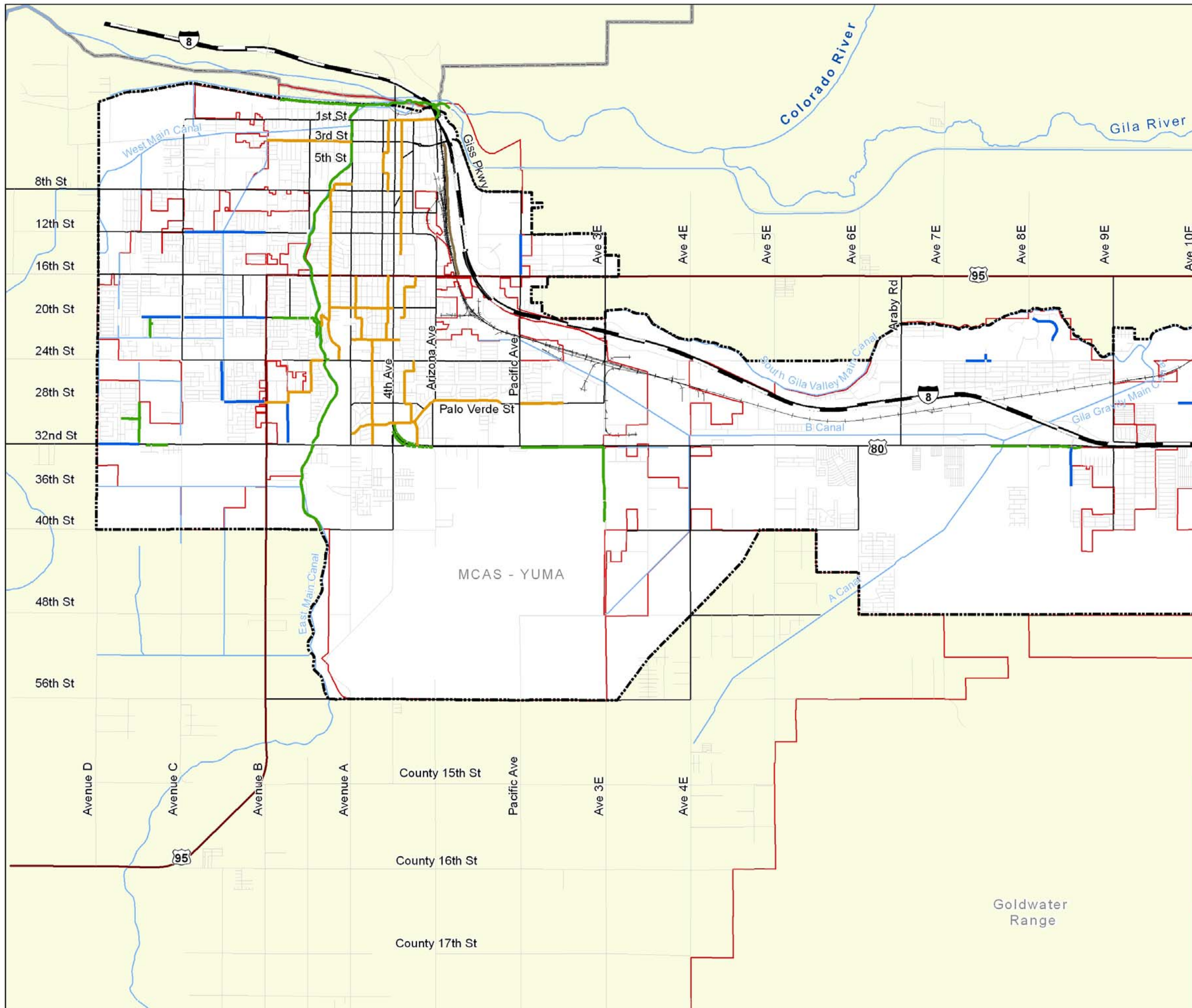


City of YUMA



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Fig 3.1





of Commerce population estimate is 93,212, showing a population growth rate of 24 percent over seven years. Continued growth is expected. Population projections for the city identify a 2040 population of 178,000 (City/County Joint Land Use Plan Build-Out Population Estimates).

About 51 percent of the city population is employed (U.S. Census 2006 Economic Survey). Local colleges and universities, including Arizona Western College, attract over 13,000 students, 4,300 of which are full-time, to the area. In addition, the city is also home to the Marine Corps Air Station (MCAS). This facility employs over 7,600 people, approximately 4,200 of whom live on the base while 3,500 live in the surrounding community.

Baby boomers represent 28 percent of the U.S. population and are between the ages of 44 and 62 years, using the time span of 1946 to 1964 (<http://www.bbhq.com/bomrstat.htm>).

According to the 2004 Del Webb Baby Boomer survey, boomers are more than twice as likely to prefer an active adult community that is part of a multi-generational neighborhood.

“The U.S. bicycle industry sold 6.2 billion in bicycles and equipment (retail value) in 2005.”
– National Sporting Goods Association

The mild winter weather and the proximity to California and Mexico attracts nearly 90,000 winter residents and another 300,000 visitors, all of which adds to potential traffic congestion, and pollution. These winter visitors also bring a huge economic boost to the community; combine that with a wish to lead a more active lifestyle and a comprehensive bicycle system will become one more amenity that draws visitors to Yuma--and one that does not add to the pollution and congestion.

The City of Yuma can expect continued growth and significant increase in population during the winter months. Many of these existing and future residents can be expected to use these bicycle facilities.

EXISTING BICYCLE FACILITIES

The City of Yuma has four different categories of bikeways: Bike Paths, Bike Lanes, and Bike Routes, and Bike Crossings. Each facility serves members of the community that are interested in recreation and transportation. Figure 2.1 Existing Bicycle Facilities displays the location of the City of Yuma bicycle facilities on page 22.



Bicycle paths often become multi-use paths. Bicycle paths are rarely a single use due to the attraction of other recreational users, including joggers, walkers, etc.



The standard size of a bike path is 10 feet if the facility is expected to serve only bicycle traffic. If the facility is expected to become a multi-use path, the width would be increased to 12 to 14 feet to accommodate all users. (American Association of State Highway and Transportation Officials--AASHTO)

Three general configurations are possible for a bike lane, based on the existence of on-street parking and/or the existence of curb and gutter. For all of these configurations, the minimum width for a bike lane is five feet. (Arizona Bicycle Facilities Planning & Design Guidelines, 1988 ADOT)

On bike routes, appropriate direction or information markers are installed with or without a specific route number, but bike routes share the road with motor vehicles. Bike routes are usually designated on low traffic streets. (1995 Bicycle Element City of Yuma General Plan)

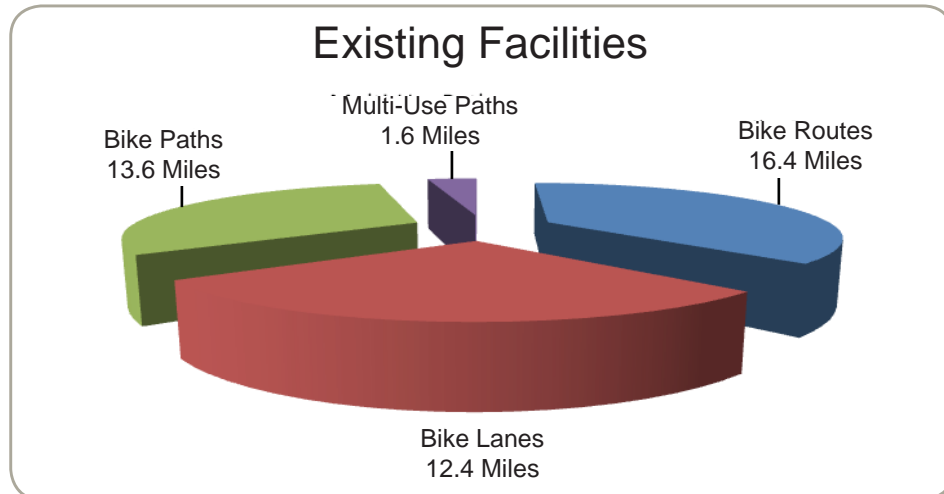
Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	86,727.8	37.3	16.43
Bike Lane	65,462.2	28.2	12.40
Bike Path	71,976.6	30.9	13.63
Multi-Use Path	8,361.0	3.6	1.58
Total	232,527.6		44.04

BICYCLE FACILITY TYPES:

Bike Paths and Multi-Use Paths

Bike paths are separated into two types, paved and unpaved. For the purpose of this planning effort, the paved bike paths are termed “Bike Paths” while unpaved bike paths are termed “Multi-Use Paths”. Within the City of Yuma, 71,977 linear feet, or approximately 13.6 miles, of bike paths and 8,361 feet, or approximately 1.6 miles, of multi-use bike paths currently exist. Bike paths are constructed of concrete and asphalt and are built to the standard width mentioned earlier of eight to 10 feet. Multi-use paths are constructed of crushed rock and do not adhere to the standard width for bike paths.

Most of these bicycle facilities are in good condition. Most bike paths are located adjacent to canal rights-of-way. Other facilities are located in random patterns adjacent to major roadways. Among all bicycle facility types, bike paths provide bicyclists with the least amount of accessibility to the surrounding neighborhood. As mentioned earlier, the current orientation of bike paths is along either canal alignments or major roadways. Using canal alignments for bike paths provides both positive and negative aspects to a typical bicycle trip. Canal rights-of-way provide the necessary space needed for a bike path, limiting the construction cost for land acquisition. Also, canal alignments typically provide a substantial physical separation between bicycle and vehicular traffic, which increases the level of safety for bike riders. A negative aspect of using canal alignments for bike paths is the limited level of accessibility



between canal alignments and the adjoining neighborhoods due to fencing along either side of a canal and the reduced number of intersections between canal alignments and city streets. Major roadways, on the other hand, allow for a high degree of accessibility between bicyclists and surrounding city destinations; however, the cost for land acquisition presents a formidable barrier to the construction process. Bike paths provide a safe biking environment by separating of bicycle riders and vehicular traffic and would be appropriate for riders of all experience levels. The following tables list Bike Path and Multi-Use Path locations:

Bike Paths:

Bicycle Facility Infrastructure Location	Bicycle Facility Duration	Length (feet)
East Main Canal Bike Path	Colorado River Levee South to 40th Street	31,696
West Wetlands Bike Path	Riverside Park Road to Joe Henry Park Road	11,172
20th Street	17th Avenue to 23rd Drive	2,245
44th Avenue Alignment	20th Street to 21st Street Alignment	1,395
45th Avenue Alignment	28th Street to 32nd Street	2,572
29th Lane Linear Park	45th Street Alignment to Barkley Ranch Avenue	1,133
32nd Street	Pinto Way to the West	1,311
4th Avenue	Catalina Drive to 32nd Street	791
32nd Street	4th Avenue to Arizona Avenue	3,760
32nd Street	Pacific Avenue to Avenue 3E	5,127
Avenue 3E	32nd Street to the MCAS Entrance	4,513
32nd Street	Desert Air Boulevard to the West	5,344
Gateway Park Bike Path	Gila Street to West Wetlands Bike Path	1,114



Multi-Use Paths:

Bicycle Facility Infrastructure Location	Bicycle Facility Duration	Length (feet)
Redondo Center Drive	Giss Parkway to 16th Street	8,361



Bike Lanes

The City of Yuma has approximately 65,462 linear feet, or 12.4 miles of bike lanes. City of Yuma construction standards for bike lanes dictate that they be installed one on either side of a single roadway, resulting in two parallel bike lanes. As a result, the combined length of roadway with bike lanes is to approximately 32,731 linear feet, or 6.2 miles. Bike lanes provide a high level of accessibility for bike traffic because these facilities are constructed adjacent to and within city roadways. The facilities are best used by highly experienced bike riders due to the close proximity to vehicular traffic. The following table lists all existing bike lane locations. The length of bike lanes listed below represents the length of lanes on either side of the roadway; therefore, the length of a roadway with installed bike lanes is approximately half of the length reported.





Bike Lanes:

Bicycle Facility Infrastructure Location	Bicycle Facility Duration	Length (feet)
12th Street	Avenue B to Avenue C	10,232
33rd Drive	24th Street to 28th Street	5,007
24th Street	College Avenue to Laramie Way Alignment	1,508
Avenue 71/2 E	24th Street to the North	777
Avenue 81/2 E	32nd Street to 35th Place	4,702
Otondo Drive	Avenue 8E to Mary A Otondo Elementary School Entrance	5,621
20th Street	Avenue B to 45th Avenue	15,536
28th Street	Avenue 10E to the West	2,312
21st Drive	28th Street to 32nd Street	5,028
Pacific Avenue	12th Street to 16th Street	4,730
32nd Street	45th Avenue to Avenue D	5,089
28th Street	Avenue B to 33rd Drive	5,153

Bike Routes

The City of Yuma contains, approximately 75,580 linear feet, or 14.3 miles, of bike routes. These facilities are identified only by signs that inform bike riders about the route direction and terminus. Most of these facilities are located on streets without high vehicular traffic. Presently, all bike routes are located in the most densely populated parts of the City of Yuma. Typically, these urban areas are harder to serve with either bike lanes or bike paths, as most land adjacent to travelways has already been developed, and purchasing additional right-of-way can be cost prohibitive. Bike routes provide an ambiguous level of safety. These facilities are identified only by signs placed along the side of a road; the roadway receives no striping and/or marks, which limits the visibility of the facilities to vehicular traffic. Conversely, locating these facilities within roadways that typically receive low levels of vehicular traffic tends to reduce the possibility of contact between bicycle and vehicular traffic. The following table lists bike route locations:





Bike Routes:

Bicycle Facility Infrastructure Location	Bicycle Facility Duration	Length (feet)
Palo Verde Street	Catalina Drive to Barbara Avenue Alignment	6,036
3rd Street	Avenue B to Avenue A	5,348
19th Street	14th Avenue to 4th Avenue	3,958
14th Avenue	8th Street to 22nd Street	9,273
28th Street	Avenue B to 21st Drive	1,475
Ridgeview Drive	Parkway Drive to the South	798
6th Avenue	4th Street to 6th Street	1,271
3rd Avenue	1st Street to 14th Street	8,421
5th Avenue	1st Street to 4th Street	1,986
4th Street	5th Avenue to 6th Avenue	308
11th Avenue	16th Street to 20th Street	2,628
22nd Street	3rd Avenue to Avenue A	3,037
3rd Avenue	17th Street to 20th Street	1,928
Catalina Drive	Palo Verde Street to 32nd Street	1,600
Catalina Drive	8th Avenue to Palo Verde Street	2,664
Holly Drive	Avenue A to Park Lane	820
Park Lane	Holly Drive to 8th Avenue	699
8th Avenue	22nd Street to 32nd Street	6,628
Virginia Drive	25th Street to 28th Street	2,041
5th Avenue	16th Street to 22nd Street	4,151
1st Avenue	16th Street to 17th Street	652
20th Street	3rd Avenue to 3rd Avenue	286
17th Street	1st Avenue to 3rd Avenue	662
14th Avenue	8th Street to 7th Street	377
8th Street	14th Avenue to East Main Canal	266
7th Street	14th Avenue to Avenue A	1,138
10th Avenue	20th Street to 22nd Street	1,333
20th Street	10th Avenue to 11th Avenue	378
1st Avenue	24th Street to 25th Street	678
25th Street	1st Avenue to Virginia Drive	581
1st Avenue	28th Street to Catalina Drive	1,193
28th Street	Virginia Drive to 1st Avenue	420
27th Street	18th Avenue to 21st Drive	1,375
21st Drive	27th Street to 28th Street	672



<i>Bicycle Facility Infrastructure Location</i>	<i>Bicycle Facility Duration</i>	<i>Length (feet)</i>
18th Avenue	24th Street to 27th Street	1,951
Palo Verde Street	Pacific Avenue to Avenue 21/2 E	2,729
Elks Lanes	22nd Street to 24th Street	1,598
Parkway Drive	Ridgeview Drive to 14th Avenue	523
1st Street	Gila Street to 5th Avenue	2,881
24th Street	East Main Canal to 18th Avenue	755

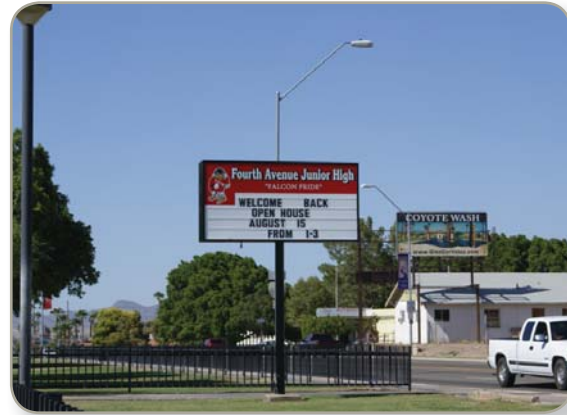
The City of Yuma bicycle facilities total approximately 44 miles in a city of 112 square miles and a population of 93,212 (Arizona Department of Commerce). The bicycle facilities, bike paths, multi-use paths, bike lanes, and bike routes, provide varying levels of safety and accessibility for bike riders.

Bicycle Crossings

The City of Yuma has five intersections of city streets and bicycle facilities that are termed bicycle crossings. These bicycle crossings help increase the safety of bicycle riders trying to cross traffic either by providing a traffic signal or by providing a grade-separated crossing. The bicycle crossings with traffic signals are typified by either a timed or pedestrian/bicyclists triggered crossing signal, providing the bicycle rider ample time to cross the intersection with all automotive traffic stopped. The other type of bicycle crossing is a grade-separated crossing, which, as the name suggests, separates the bicycle and vehicular traffic using a bridge and/or tunnel for either mode of transport. The table below lists the locations of existing bicycle crossings in the city.

<i>Bicycle Crossing Location</i>	<i>Bicycle Crossing Type</i>
3rd Street and Avenue A	Full Traffic Signal
16th Street and East Main Canal	Grade-Separated Crossing
24th Street and East Main Canal	Full Traffic Signal
32nd Street and Arizona Avenue	Full Traffic Signal
32nd Street and Avenue 3E	Full Traffic Signal

Feedback from community members suggests that bike riders have a number of distinct goals. Some desire a long stretch of unbroken bike facilities that can accommodate high bicycle speeds, others desire a more relaxed pace with interesting scenery, others intend to use the bike facilities to commute throughout the city. The current system, although extensive, does not serve all of the desired destinations. Future efforts should be made to extend bike facilities by identifying those city features/destinations that would benefit from bicycle facility access.



DESTINATIONS

Destinations drive the reason to use bike facilities. To that end, the city should understand where bike riders want and need to go before planning for future expansion of the existing bicycle system. Destinations are elements of the city development pattern, and, as such, identifying city destinations should begin by evaluating the city land use.

The existing pattern of urbanized land use generally extends to Avenue D in the west, Avenue 10 E in the east, the Colorado River in the north, and 40th Street in the south. Residential land use accounts for approximately 19 percent of the city. There are two main areas of residential development which exist: the first is located south west of Downtown, and the second is much smaller and is located east of Downtown.

People need to get to and from these destinations and it is the intent of this Master Plan to provide that bike access. With bike access to as many places as possible, citizens can reach their destinations while also obtaining the health, safety, environmental, financial, and emotional benefits of motor-less travel.

The level of service provided by the existing bicycle network is defined in two ways. The proximity between bicycle facilities and urban areas are measured in 1/4 mile intervals while destinations are identified as having either 'direct' or 'indirect' access to a bicycle facility. Direct access is defined by the existence of a bicycle facility located either directly adjacent to or within the area bounded by the property lines of a destination. This evaluation method is represented later in this chapter and illustrated in Figure 3.4, Level of Service on page 41.

The table that follows displays existing land use based upon the county assessor definition of land use categories and confined to the city limits of the City of Yuma. The existing land use figures given are derived from data provided by the City of Yuma Community Development Department and represents the most up-to-date measurement of existing land use.

The largest single land use type within the city limits is public use, which comprises approximately 32 percent of the city and includes, among other properties, the Marine Corps Air Station (MCAS). This installation generally bisects the urban pattern of the city into two



areas, typified by Downtown and the majority of urban development to the west, and suburban development in the east, adjacent to the Fortuna/Foothills area. Commercial/office uses comprise approximately six percent of the city and are generally located along 4th Avenue stretching from Downtown to 32nd Street and continuing along 32nd Street to the east. The main nodes of commercial activity occur at the intersections of 16th Street and Interstate 8, 32nd Street and 4th Avenue, 24th Street and Avenue B, 16th Street and Avenue B, and 32nd Street and Avenue B and Downtown. Industrial uses comprise approximately five percent of the city and are primarily located east of Downtown and adjacent to the Interstate 8 roadway. Like the MCAS, industrial development bisects the community into eastern and western sections. The land use categories of agriculture and vacant land within the city limits comprise approximately 20 percent and 18 percent, respectively.

Existing Land Use

Land Use Type	Acreage	Sq. Miles	Percent of Total
Residential			
Single Family Residential	3,648.8	5.7	13.6
Multi-Family Residential	542.3	0.8	2.0
Mobile Home Park/Subdivision	688.0	1.1	2.6
Recreational Vehicle Park	267.1	0.4	1.0
Employment			
Retail Business	761.6	1.2	2.8
Service Business	193.1	0.3	0.7
Office & Banks	276.7	0.4	1.0
Heavy Business	374.8	0.6	1.4
Light Industry	960.6	1.5	3.6
Heavy Industry	248.9	0.4	0.9
Public/Quasi Public & Open Space			
Agriculture	5,271.5	8.2	19.6
Public Use	8,457.8	13.2	31.5
Quasi Public	257.1	0.4	0.9
Right-of-Way (ROW)	39.6	0.1	0.1
Vacant	4,855.4	7.6	18.1
Undefined	46.6	0.1	0.2
Total	26,889.6	42.0	100



Employment Centers

Employment centers are generally defined as businesses or organizations that employ more than 200 people. These locations generate large amounts of traffic as the employees travel to and from work. The table that follows lists all businesses that qualify as employment centers. These features are graphically displayed in Figure 3.2 Employment, Retail & Mass Transit Centers available on page 33.



Employment Centers

(Source: Greater Yuma Economic Development Corporation)

Name	Employees
Marine Air Corps Station	4,730
*U.S. Army—Yuma Proving Grounds	2,083
Yuma Medical Regional Center	2,033
Yuma County	1,300
*City of Yuma	1,163
*Salyer American Fresh Foods	1,000
*Dole Fresh Vegetables	662
*Quechan Paradise Casino	614
*Shaw Industries	612
NCO Group	600
*Wal-Mart (Pacific Avenue)	550
*Wal-Mart (Avenue B)	455
*Western Newspaper Inc	407
*EMCO Harvesting Co	400
*Gowan Company	335
*Cocopah Bingo & Casino	334
*Pasquinelli Produce	305

*Denotes an employment center with 'indirect' access to the existing bicycle network

Commercial Centers

Commercial and retail businesses provide employment and shopping opportunities for city residents and visitors. These destinations attract people, depending on the amount and the type of business located in the area. After studying the existing land use, a number of



Yuma Bicycle Facilities Master Plan

Employment, Retail & Mass Transit Centers

- Commercial Area
- Employer
- Transit Transfer Station
- Bus Routes
- Bike Routes
- Bike Lanes
- Bike Path
- Multi-Use Path

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Waterways
- City Limits
- Yuma County
- Railroad



0 0.5 1 2 Miles

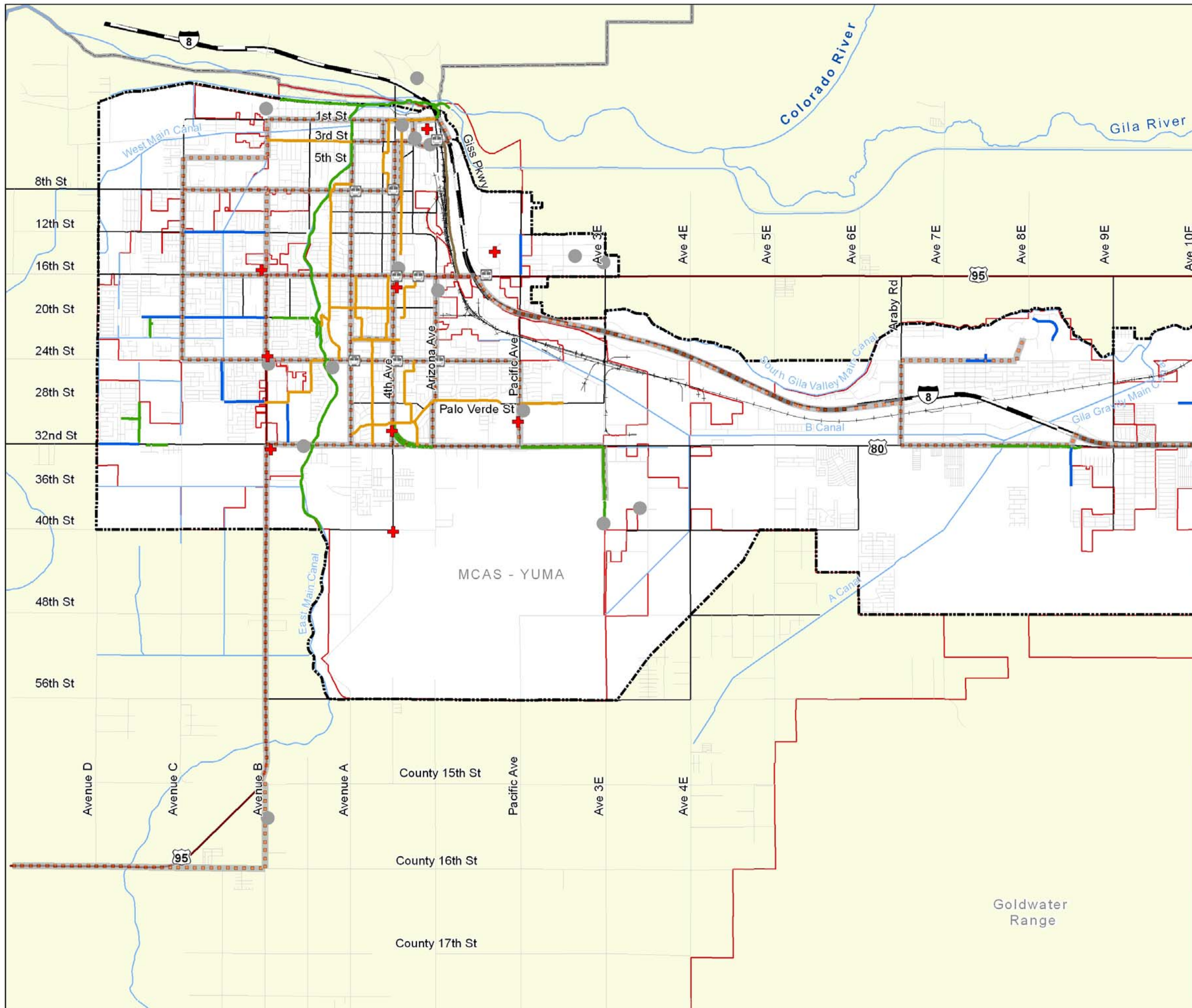


City of YUMA



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Fig 3.2





commercial and retail centers are evident. These land uses are typically located around or near the intersection of one or more major roadways. This planning effort has defined nine commercial and retail centers located near the following street intersections:

Commercial and Retail Centers

*16th Street and Interstate 8
32nd Street and 4th Avenue
*16th Street and 4th Avenue
*16th Street and Avenue B
*24th Street and Avenue B
*32nd Street and Avenue B
*40th Street and Avenue A
*32nd Street and Pacific Avenue
*Downtown Yuma – Generally located near the intersection of 3rd Street and Main Street

*Denotes a commercial/retail center with ‘indirect’ access to the existing bicycle network

Transit Centers

Transit service is an important feature of any growing city. The City of Yuma is served by six bus routes that transport to different portions of the city. The bus system is operated by the Yuma County Area Transit (YCAT). The bus routes are served by eight Transit Transfer Stations. The transit buses are equipped with bike racks that allow bicycle users to access transit routes as they move around the city. See Figure 3.2 Employment, Retail & Mass Transit Centers on page 33 for the graphical location of city transit centers and bus routes in relation to existing bicycle facilities.





Educational Centers

Traditionally, school age children represent the largest group that has most consistently used the bicycle on a regular basis. However, recent trends show a decline in school children using bicycles to get to school.

“In 1969, approximately half of all school children walked or bicycled to or from school, and 87 percent of those living within one mile of school walked or bicycled. Today, fewer than 15 percent of children and adolescents use active modes of transportation....Distance to school was the most commonly reported barrier, followed by traffic related danger.” (Barriers to Children Walking to or from School—United States, 2004, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5438a2.htm>).

To increase the use of bicycles as transportation for school age children, it is important to address the traffic related danger through facility development, student education, and skills training. These measures will require cooperation and collaboration of not only the city, school districts but the county as well.

With this trend in mind, the city needs to provide a safe and efficient system of bicycle facilities to increase the ability to bike to city schools. Figure 3.3 Educational and Recreation Centers, on page 38, graphically displays the location of education centers in relation to existing bicycle facilities. The following table lists the elementary schools, middle schools, high schools, and universities located in Yuma:





Educational Centers

Name	# of Students	Name	# of Students
University		Elementary	
Arizona Western College/NAU	4,300	*George Washington Carver Elementary	452
High School		*Mary E. Post Elementary	267
*Yuma High School	2,370	*OC Johnson School	598
Kofa High School	2,696	*Pecan Grove Elementary	682
Cibola High School	2,278	*Alice Byrne Elementary	289
*Yuma Catholic High School	389	*Gwyneth Ham Elementary	547
*Educational Opportunity Center	111	Calvary Baptist Church School	48
*Vista Alternative School	305	Palmcroft Elementary	657
*Aztec High School	88	*C. W. McGraw Elementary	550
		James B. Rolle School	576
		Desert Mesa Elementary	788
Middle School		Mary A. Otondo Elementary	841
*Castle Dome Middle School	883	*Harvest Preparatory Academy	756
Ron Watson Middle School	429	Rosevelt School	345
*Gila Vista Junior High School	651	Pueblo School Elementary	764
Crane Middle School	819	*Rancho Viejo Elementary	458
*Fourth Avenue Junior High School	469	*Ronald Reagan Fundamental Elementary	584
R. Pete Woodard Junior High School	775	Valley Horizon	721
Centennial Middle School	703	*H.L. Suverkrup Elementary	428
		Sunrise Elementary	568
		*Immaculate Conception Elementary	263
		*Yuma Adventist Christian School	21
		*Desert View Academy	445
		*Gary A. Knox Elementary	625
		*Salida Del Sol Elementary	624
		*Amerischools Academy	198
		*Yuma Lutheran School	243
		*St. Francis of Assisi School	220
		*Southwestern Christian School	89

* Denotes an educational center with 'indirect' access to the existing bicycle network

source: Great Schools, 2007 <www.greatschools.net>



Parks and Recreation Centers

The City of Yuma has a number of different park types: Regional Park, Area Park, Neighborhood Park, and Pocket Park. Each of these park types is intended to provide different types of activities. Both city parks and bicycle facilities provide recreational opportunities for Yuma residents. Providing bicycle access to city parks will allow users of both types of facilities to enjoy more of the city. The table below lists Parks and Recreation Centers in the City of Yuma. These facilities are displayed in Figure 3.3 Education and Recreation Centers, on page 38.



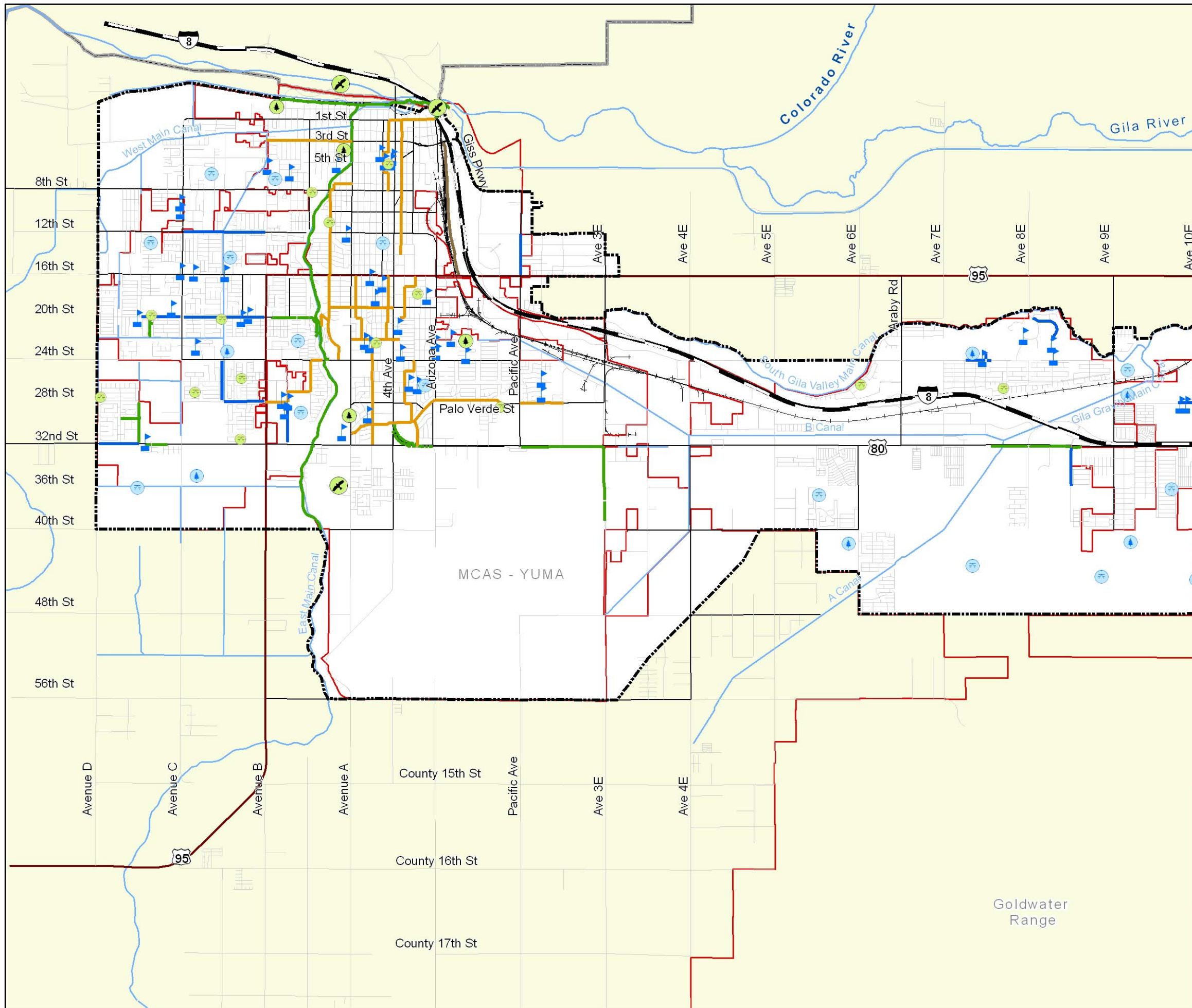
Parks and Recreation Centers

Name	Type
Riverfront Regional Park and Wetlands Area	Regional Park
James P. Deyo Regional Park	Regional Park
Joe Henry Park	Area Park
Carver Park	Area Park
*Kennedy Park	Area Park
*Smucker Park	Area Park
Marcus Park	Neighborhood Park
*Kiwanis Park	Neighborhood Park
Netwest Park	Neighborhood Park
*Joe Henry Optimist Center	Neighborhood Park
Wal-Mart Park	Neighborhood Park
*Ponderosa Park	Neighborhood Park
Winsor Rotary Park	Neighborhood Park
Sunrise Optimist Park	Neighborhood Park
Sanguinetti Park	Neighborhood Park
*Terrace View Park	Neighborhood Park
*Desert Ridge Park	Neighborhood Park
*Las Casitas Park	Neighborhood Park
*Parkway Place	Neighborhood Park
*Barkley Ranch Park	Neighborhood Park
Ocotillo #1 Park	Neighborhood Park
Victoria Meadows Park	Neighborhood Park

*Denotes a park and recreation center with 'indirect' access to the existing bicycle network



Yuma Bicycle Facilities Master Plan



Education and Recreation Centers

Future Parks

- Area Park
- Neighborhood Park

Existing Parks

- Area Park
- Neighborhood Park
- Regional Park
- Schools
- Bike Routes
- Bike Lanes
- Bike Path
- Multi-Use Path

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County



0 0.5 1 2 Miles



Fig 3.3

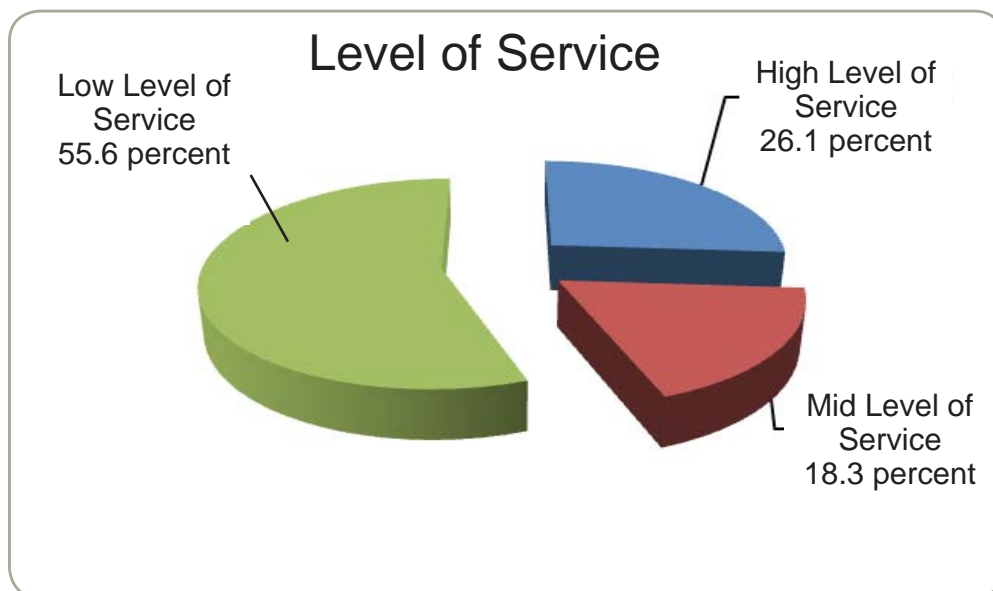


LEVEL OF SERVICE

People typically use the most convenient mode of transportation. If citizens cannot reach their destinations via bike, then they will choose another method (often car or bus service). Giving them bicycle access, and advertising the many benefits, will encourage community residents to choose their bikes over their cars. With this in mind, service level is a crucial aspect of the bicycle plan.

Level of service addresses areas within the city's Urban Boundary and their proximity to existing bicycle facilities. Levels of service are defined by the increasing distance between the existing bicycle facilities. The City of Yuma encourages bicycle use by stating that no residence should be further than one-half of a mile from a bicycle facility. Though not all areas of the City of Yuma have achieved this level of service, it remains a goal. Existing bicycle facility data, land use data, and city destinations were combined in a GIS software application to determine the distance of each land use area and city destination from the existing bicycle facilities.

To better understand the proximity of city land from existing bicycle facilities, all urban areas have been identified as having high, mid, or low level bicycle service. In addition, all destinations are identified as having either 'direct' or 'indirect' access to a bicycle facility. For this project, 'direct' access to a destination is defined by the existence of a bicycle facility either within or immediately adjacent to the area bounded by the property lines that outline a bicycle destination. City areas designated as having high bicycle service are located within one-fourth of a mile from existing bicycle facilities. Areas designated mid level bicycle service are greater than one-fourth of a mile and no more than one-half of a mile from existing facilities. Areas further than one-half of a mile from existing bicycle facilities are designated as low level bicycle service. The result of this analysis is illustrated in the chart titled Level of Service below. Figure 3.4 Level of Service on page 41, graphically displays the distances between bicycle facilities and areas, including those bicycle destinations that are or are not, directly accessed by the city system. Direct access is defined as the area adjacent to the bicycle path, lane, or route.





Level of Service

Land Use Category	High LOS (in acres)	Moderate LOS (in acres)	Low LOS (in acres)	Total
Agricultural	0.10	1.72	244.46	246.29
Agriculture Industrial	10.89	66.07	1,616.80	1,693.76
Estate Residential	0.00	0.35	315.26	315.61
Non-Conformity	0.00	0.00	15.81	15.81
Rural Density Residential	0.00	0.00	94.10	94.10
Business Park	213.43	115.78	421.69	750.91
Commercial	1,008.68	360.07	319.50	1,688.25
High Density Residential	264.41	63.54	172.58	500.52
Industrial	495.12	903.22	3,580.46	4,978.80
Low Density Residential	3,285.54	2,091.72	4,186.45	9,563.71
Medium Density Residential	514.45	723.25	810.53	2,048.23
Mixed Use	632.03	147.64	350.03	1,129.70
Public/Quasi Public	1,279.61	808.27	4,557.62	6,645.50
Resort Recreation/Open Space	556.56	484.82	568.20	1,609.58
Suburban Density Residential	23.56	41.48	413.65	478.70
Total	8,284.39	5,807.93	17,667.15	31,759.47

* All areas measured and reported within this chart are limited to the confines of the “Urban Boundary” set forth by the City of Yuma and defined in the Bicycle Facility Master Plan

* All land use categories are derived from the Joint Land Use Plan published in the City of Yuma 2002 General Plan.

EXISTING AND FUTURE FUNDING COMMITMENTS

In an effort to quantify the estimated costs associated with implementing bicycle facilities, a cost estimate for each bicycle facility type (Bike Route, Bike Lane, Bike Path, and Multi-Use Path) has been generated. The cost estimates for the bicycle facilities are given based on the construction cost of one linear mile and are based on 2008 construction dollars.





Yuma Bicycle Facilities Master Plan

Level of Service

Existing Parks Not Served

- Area Park
- Neighborhood Park
- Regional Park

Future Parks Not Served

- Area Park
- Neighborhood Park

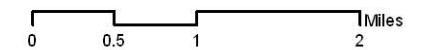
Destinations Not Served

- Commercial Area
- Employer
- School
- Transit Transfer Station

- Bike Routes
- Bike Lanes
- Bike Path
- Multi-Use Path
- 1/4 Mile Buffer of Bicycle Facility
- 1/2 Mile Buffer of Bicycle Facility
- + 1/2 Mile Buffer of Bicycle Facility

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County

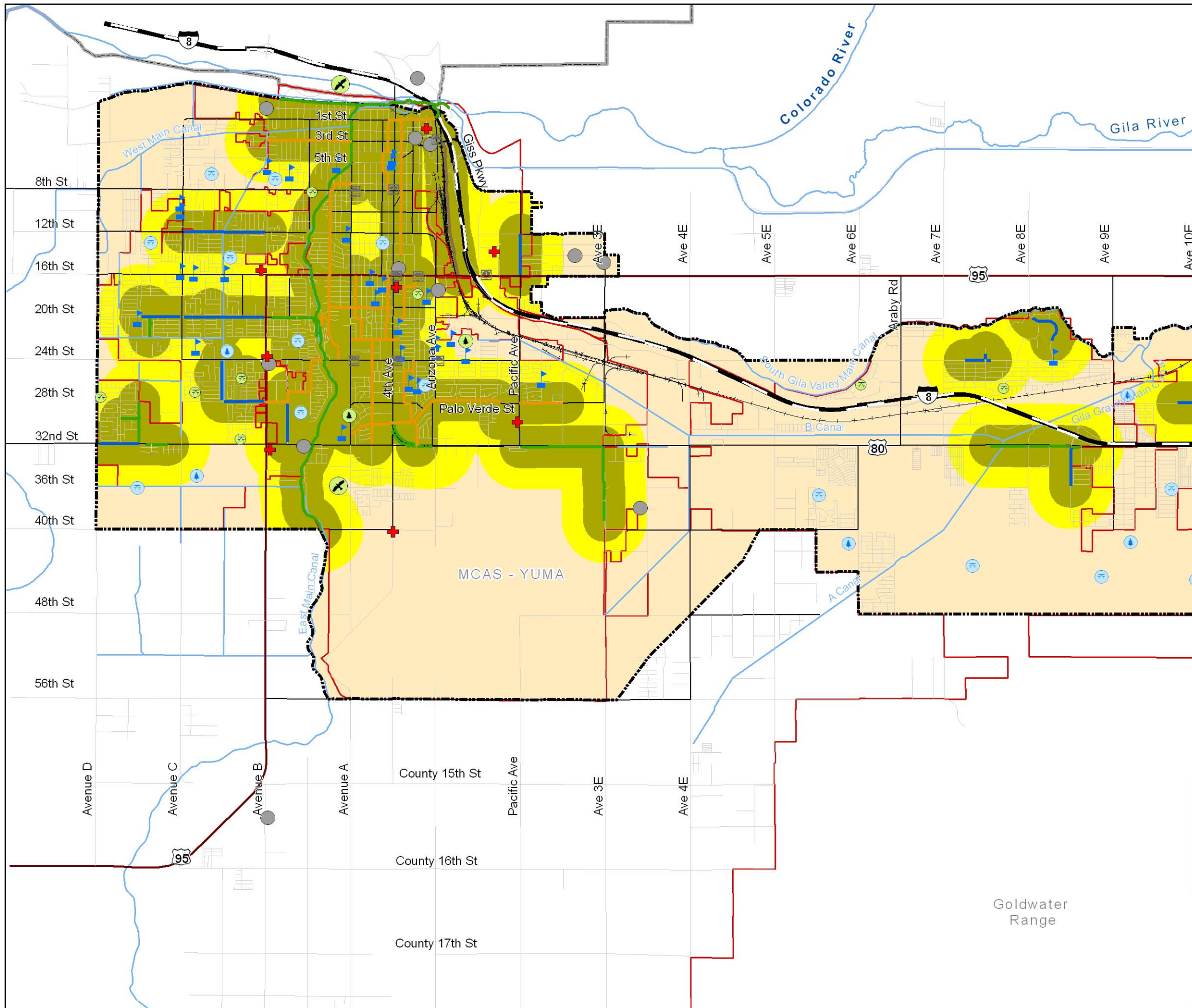


City of YUMA



OLSSON ASSOCIATES

Fig 3.4





Estimated Bicycle Facility Costs

Facility Type	Construction Type	Estimated 2008 Costs (linear mile)	Total per mile cost
Bike Routes	Signage	\$105 per sign (installed)	\$2,100.00
Bike Lanes	Striping/Signage	\$9,500.00	
	Construction*	\$167,000.00	\$176,500.00
Bike Paths	Striping/Signage	\$7,000.00	
	Construction***	\$264,000.00	\$271,000.00
Multi-Use Paths	Material Cost***	\$0.50 per sqft	\$26,400.00

ROW acquisition is not included in cost estimations

*3" Asphaltic Concrete (AC)/7" Aggregate Base Course (ABC) + Subgrade Prep

***10 foot Constructed Path

Constructing a bike route involves no alterations to a roadway. Roads designated as a bike route have only street signs placed along the roadway. Signs should be placed at block intervals and at corners where the bike route changes direction. Using this standard, it is estimated that the typical linear mile of city streets will receive 20 bike signs, with 10 on each side of the street. Bike route signs are estimated to cost \$105, to purchase and install, resulting in an estimated cost of \$2,100 per mile.

Bike lane construction includes two lanes of bike travel, signage, and striping. One bike lane is installed on each side of the road, and the recommended bike lane width is five feet. The estimated cost for constructing bike lanes is \$176,000 per mile. Bike lanes are placed within the street right-of-way and, as such, are constructed to the same standard as a vehicular lane of travel. Bike lane signage is implemented to the same standard as bike routes, resulting in 20 signs per mile. Lastly, roadway striping is needed to identify roadway segments meant for vehicular and bicycle traffic. A potential cost in constructing bike lanes is acquiring additional right-of-way. Cost of right-of-way ranges from \$3.00 to \$10.00 per square foot. This additional cost would greatly increase the cost of a bike lane project from an estimated \$176,000 to approximately \$700,000 per mile. The need for right-of-way will not be known until the facility is designed.

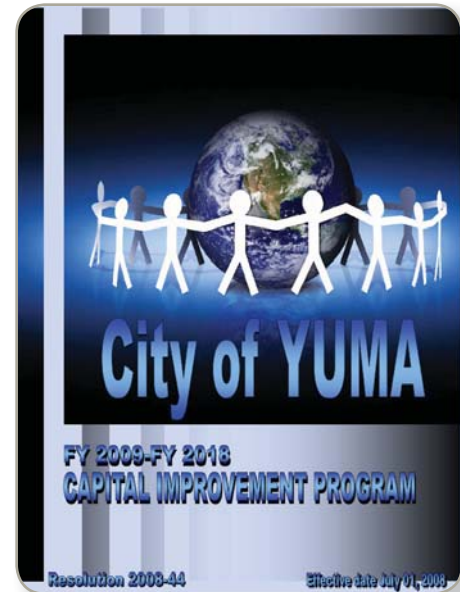
Bike paths consist of a single, paved surface physically separated from vehicular traffic that allows two-way bicycle travel. The City of Yuma has proposed to place most bike paths along canal alignments. This placement is targeted to omit acquiring new right-of-way. Constructing bike paths is similar to constructing bike lanes, with the exception of associated signage and striping. Bike paths are easily identified and require less signage. Also, striping costs are less than for bike lanes because vehicular traffic is prohibited on these facilities.



CAPITAL IMPROVEMENT PROGRAM

“The City of Yuma FY2009-FY2018 Capital Improvement Program (CIP) is a 10-year schedule of public physical improvements to the city’s infrastructure. The CIP sets forth proposed expenditures and schedules for systematically constructing, upgrading, expanding, and replacing the community’s physical plan. Projects usually address major expenditures having a value in excess of \$50,000” (City of Yuma FY 2009-2018 Capital Improvement Program, pg ii).

The table below, 2009 – 2018 CIP Projects & Funding Sources, illustrates the items within the city’s CIP program that involve the construction of bicycle facilities. The city CIP reports the costs relative to constructing the entire project, including bicycle facilities.



2009 – 2018 CIP Projects & Funding Sources

CIP Project	CIP Project No.	Bicycle Facility Type	FY 2009	FY 2011	FY 2012	FY 2013	FY 2014-2018	Total
In \$1,000s								
East Wetlands	1.0002	Multi-Use Path			\$2,800			\$2,800
<i>Fund: Grant</i>					\$2,800			\$2,800
24th Street - Avenue B to Avenue C	5.8325	Lane	\$2,527					\$2,527
<i>Bond</i>			\$150					\$150
<i>ProRata Funds</i>			\$2,377					\$2,377
Magnolia Avenue , et al	5.9105	Route	\$1,090					\$1,090
<i>Bond</i>			\$1,090					\$1,090
32nd Street - 4th Avenue to Avenue B	5.9402	Lane	\$1,250					\$1,250
<i>Bond</i>			\$650					\$650
<i>Surface Transportation Program</i>			\$600					\$600
20th Street - Avenue B to Avenue C	5.9507	Path	\$890					\$890
<i>Bond</i>			\$890					\$890



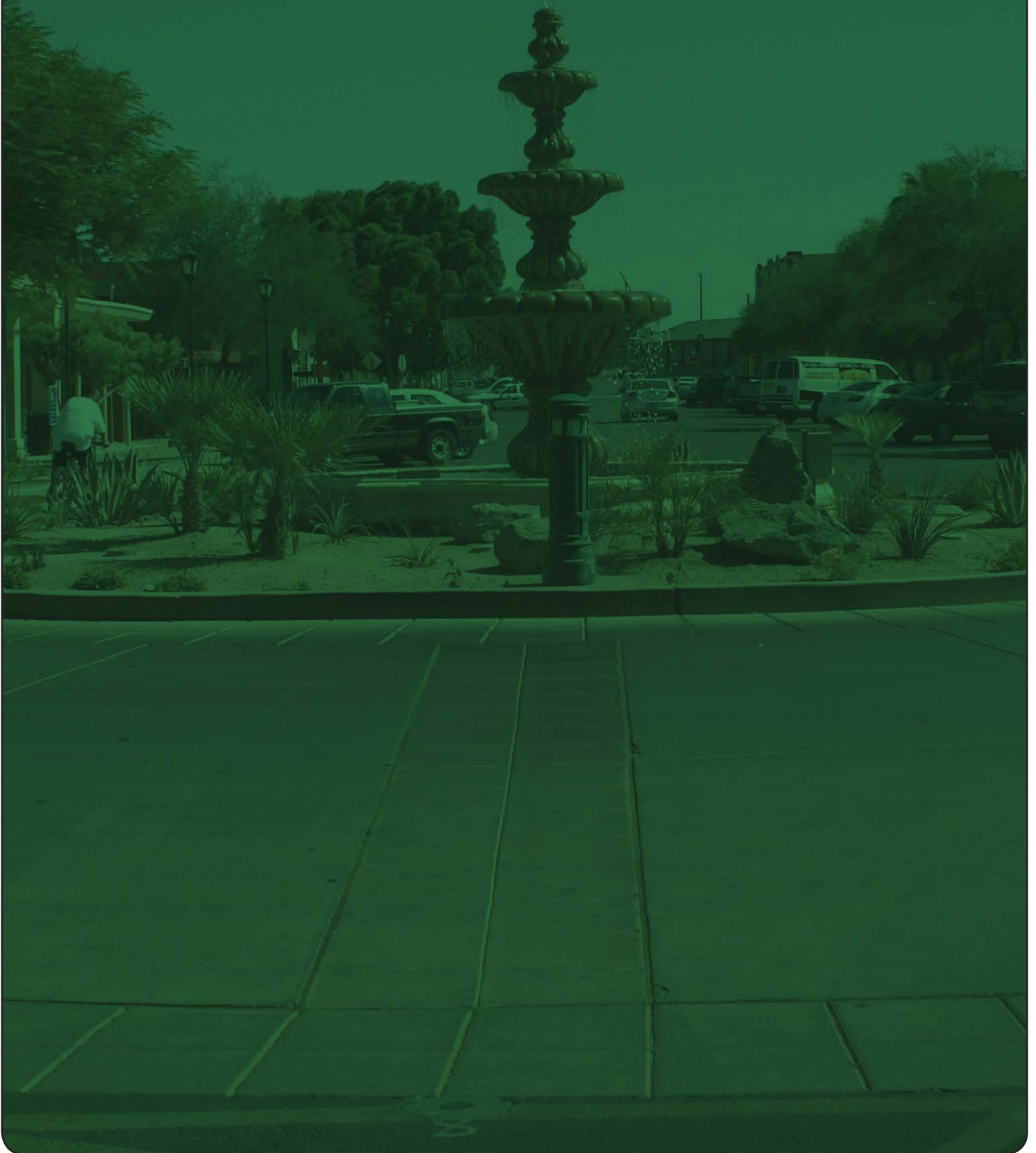
CIP Project	CIP Project No.	Bicycle Facility Type	FY 2009	FY 2011	FY 2012	FY 2013	FY 2014-2018	Total
1st Avenue - 16th Street to 12th Street	5.9602	Route	\$320					\$320
<i>Highway Users Fund/ Lottery Funds</i>			\$320					\$320
Giss Parkway Extension	5.9707	Lane			\$800	\$1,200	\$11,450	\$13,450
<i>City Road Tax</i>					\$800	\$1,200		\$2,000
<i>Community Investment Trust</i>								\$11,450
Avenue B - 24th Street to 32nd Street	5.9731	Lane				\$800	\$9,200	\$10,000
<i>City Road Tax Development Tax</i>						\$800	\$7,070	\$7,870
							\$2,130	\$2,130
12th Street - Avenue A to Avenue B	5.9811	Lane	\$1,600	\$830	\$5,850	\$2,250		\$10,530
<i>Bond</i>			\$1,600		\$3,850	\$2,250		\$7,700
<i>City Road Tax</i>				\$830	\$2,000			\$2,830
24th Street - Avenue 6E to Avenue 9E	5.981	Lane	\$5,150					\$5,150
<i>Bond</i>			\$5,150					\$5,150
Arizona Avenue - 16th Street to Giss Pkwy	5.9913	Lane	\$650					\$650
<i>City Road Tax</i>			\$650					\$650

CONCLUSION

Existing bicycle facilities were evaluated based on destination and level of service to assess the connectivity of these facilities. This assessment shows that many of the major employment centers, commercial and retail centers, parks and recreation centers, education centers, and, to some degree, residential areas are greatly underserved by the existing bicycle facilities.

This evaluation helped to identify types of upgrades and/or facility updates that would enhance and maximize the connectivity of the Yuma Bicycle Facilities. The Master Plan will further define the needs for future bicycle facilities and establish priorities for those facilities. Additionally, the plan will address what facilities should be provided at key locations to increase the usability and connectivity of bicycle facilities. Giving people bicycle access, providing appropriate service, and showing them why riding bicycles may be better for them than driving cars, will encourage and increase bicycle travel in the City of Yuma.

4.0 ALTERNATIVE ANALYSIS





4.0 ALTERNATIVE ANALYSIS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



The Bicycle Facility Master Plan Alternatives are meant to provide options that meet the vision, goals, and objectives of this Master Plan. The alternatives presented are evaluated and synthesized to develop the Preferred Alternative. The following is an overview of the different alternatives for planned development. The purpose of gathering the existing conditions of bicycle facilities and reviewing demographics is to capture an understanding of Yuma's current land use pattern and how city residents traverse the city. Table 4.1 Existing Bicycle Facilities Inventory is provided in the appendix. The existing conditions help identify and develop options for future bicycle corridors.

RECREATIONAL BICYCLE FACILITIES ALTERNATIVE

Overview:

The Recreational Alternative focuses on providing recreational opportunities on the bikeway network and is characterized by extensive use of bike paths. As previously defined, a bike path is physically separated from automotive traffic. The separation from city roadways increases the level of safety for bicycle traffic. Input from public involvement and the Internal Bicycle Working Group indicates that recreational bicycle use is a prevalent trend in Yuma. City infrastructure and natural amenities are targeted for most of these bicycle facilities.

Specifically, the local canal alignments and the Colorado and Gila River corridors have been identified at the public open houses and from the Internal Bicycle Working Group.





The table below illustrates the lengths of proposed bicycle facilities under this development alternative.

Recreational Bicycle Facilities Alternative Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	77,240.3	12.2	14.6
Bike Lane	178,647.6	28.2	33.8
Bike Path	179,717.7	28.4	34.0
Multi-Use Path	197,235.6	31.2	37.4
Total	632,841.2		119.8

The overall network provided by this alternative is meant to create 'looping' bicycle facilities of multiple sizes, accessible throughout the city. Where possible, the bicycle facilities of this plan are intended to connect with existing facilities. Within this concept, smaller looping facilities are proposed in the central area of the city, connecting with the East Main Canal Bike Path to both the east and the west of the city center. Extending bicycle facilities to the east provides a connection between the City of Yuma and the Foothills region of the community. The perimeter of the city's planning area is reached by providing multi-use paths. These bicycle facilities are meant to be similar in size and orientation to the bike facilities mentioned before. However, these facilities differ in that they will not be paved with asphalt or concrete; instead, they will be composed of a material such as crushed rock or decomposed granite.

Figure 4.1 Recreational Bicycle Facilities Alternative is provided on page 48.



CROSS-TOWN BICYCLE FACILITIES ALTERNATIVE

Overview:

The Cross-Town Bicycle Facilities Alternative's primary goal is creating bicycle facilities that provide direct access for the entire community on concentrated corridors that limit any impediments to bicycle traffic. The identified set of bicycle destinations/originations is used to highlight specific areas of the city that would benefit

from bicycle facilities; however, the main goal is to highlight and implement major north to south and east to west corridors within the City of Yuma that will facilitate direct bicycle travel through Yuma. Due to the existing infrastructure and land use pattern, the pre-existing



Yuma Bicycle Facilities Master Plan

Recreational Bicycle Facilities Alternative

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lane
- Proposed Bike Lane
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-Use Path
- Proposed Multi-Use Path

Reference Features

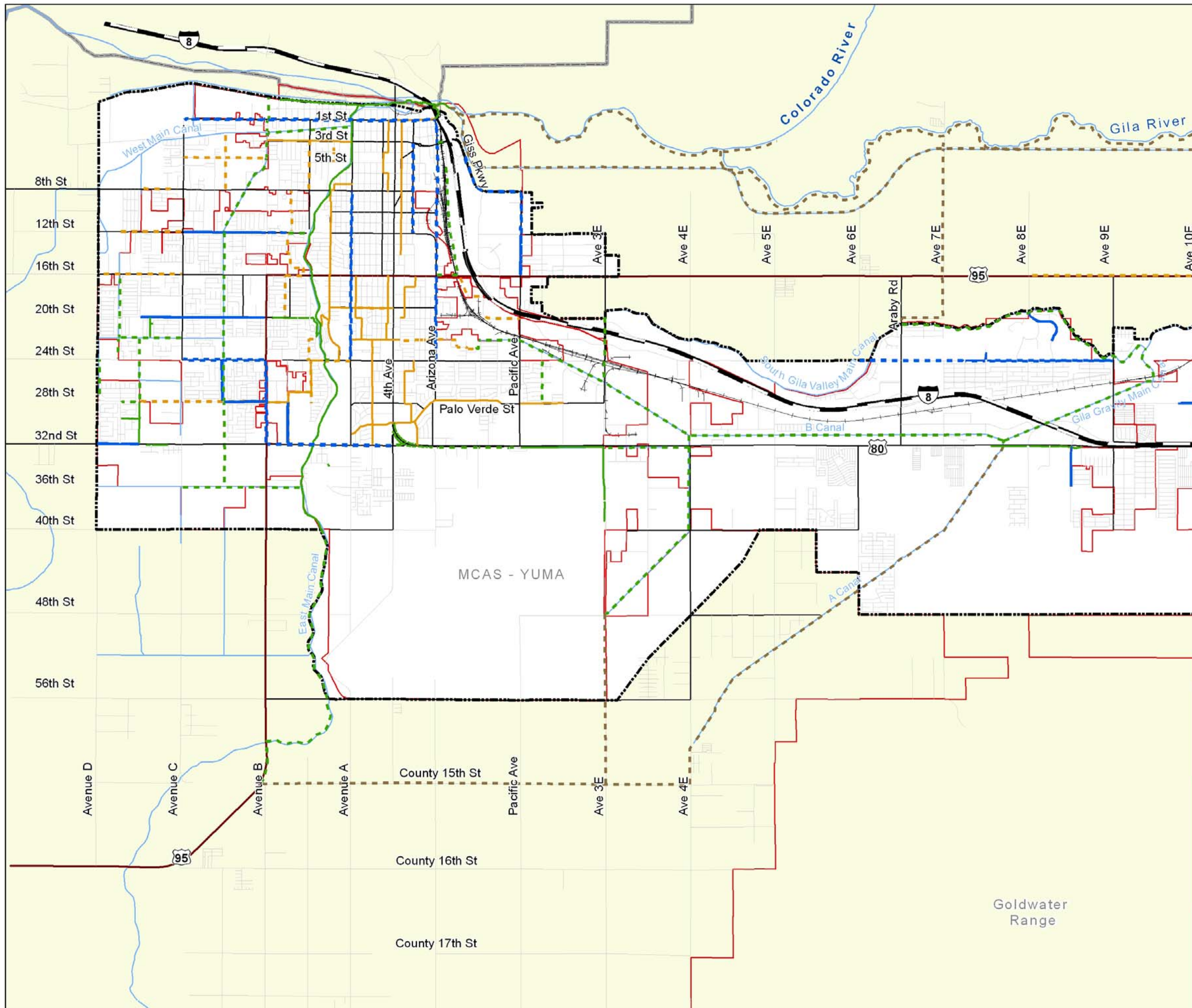
- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County



0 0.5 1 2 Miles



Fig 4.1





automotive roadways seem to be a logical location for a bicycle facility intended to deliver people quickly from one area of the city to another. A drawback of locating bicycle traffic in proximity to vehicular traffic is the danger posed to bicycle riders near faster, automotive traffic. To help avert any danger, the type of bicycle facility chosen for each roadway should be carefully considered. For this concept, the roadways were evaluated for traffic levels, and the appropriate bicycle facility was selected. For instance, for roadways with extremely high traffic levels, a bike path is indicated, while, on roadways with less traffic, a bike lane or bike route is selected.

The table below illustrates the lengths of proposed bicycle facilities under this development alternative.

Cross-Town Bicycle Facilities Alternative Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	75,022.1	12.7	14.2
Bike Lane	262,660.5	44.4	49.7
Bike Path	214,590.2	36.3	40.6
Multi-Use Path	39,235.0	6.6	7.4
Total	591,507.8		111.9

Figure 4.2, Cross-Town Bicycle Facilities Alternative is provided on page 51.

DESTINATIONS BICYCLE FACILITIES ALTERNATIVE

Overview:

The goal of the Destinations Alternative is to provide 'direct' bicycle access to every destination/origination identified previously. In this case, 'direct' access to a destination is defined by a bicycle facility located either within or adjacent to the destination property line. This development concept focuses on facilitating bicycle traffic within the more urbanized areas of the city. The center of the city (characterized by the East Main Canal to the west, 1st Street to the north, Arizona Avenue to the east, and 32nd Street to the south) is serviced almost exclusively by bike routes. This orientation results from limited rights-of-way for creating bicycle facilities.





The table below illustrates the lengths of proposed bicycle facilities under this development alternative.

Destinations Bicycle Facilities Alternative Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	106,086.6	18.1	21.1
Bike Lane	322,458.1	55.1	61.1
Bike Path	133,829.8	22.8	25.3
Multi-Use Path	23,316.6	4.0	4.2
Total	585,691.1		111.7

Bike routes located within the vehicular roadway, requiring no construction beyond the roadway itself, will be the least difficult to implement. In light of this condition, appropriate roadways with low levels of vehicular traffic have been identified for creating bike routes. Beyond the 'center of the city,' bike lanes along arterial roadways and bike paths along irrigation canals will move bicycle traffic.

To connect greater Yuma and the Foothills area via the B Canal from Pacific Avenue to the Avenue 7 ½ E alignment has been identified as a cross-town connector.

Figure 4.3, Destinations Bicycle Facilities Alternative is provided on page 52.





Yuma Bicycle Facilities Master Plan

Cross-Town Bicycle Facilities Alternative

- Existing Bike Route
- Existing Bike Lane
- Proposed Bike Lane
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-use Path
- Proposed Multi-Use Path
- Bicycle Crossing
- Interstate Bicycle Access
- Bicycle Station

Reference Features

- Urban Boundary
- Railroad
- Interstate Roadway
- Waterways
- State Highway
- City Limits
- Major Roadway
- Yuma County
- Local Roads



0 0.5 1 2 Miles

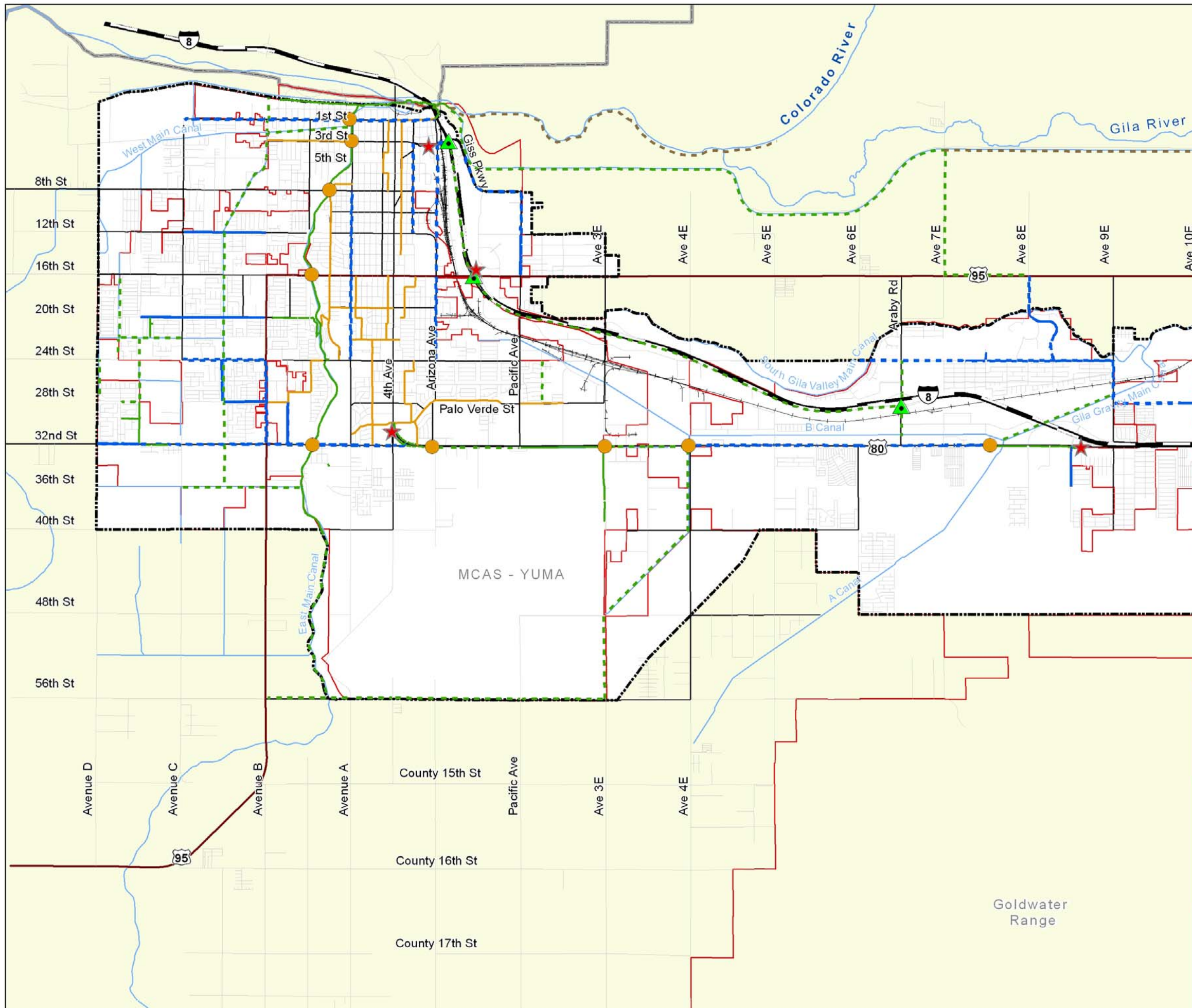


City of YUMA



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ASSOCIATES

Fig 4.2





Yuma Bicycle Facilities Master Plan

Destinations Bicycle Facilities Alternative

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lane
- Proposed Bike Lane
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-Use Path
- Bicycle Crossing

Reference Features

- Urban Boundary
- Railroad
- Interstate Roadway
- Waterways
- State Highway
- City Limits
- Major Roadway
- Yuma County
- Local Roads



0 0.5 1 2 Miles

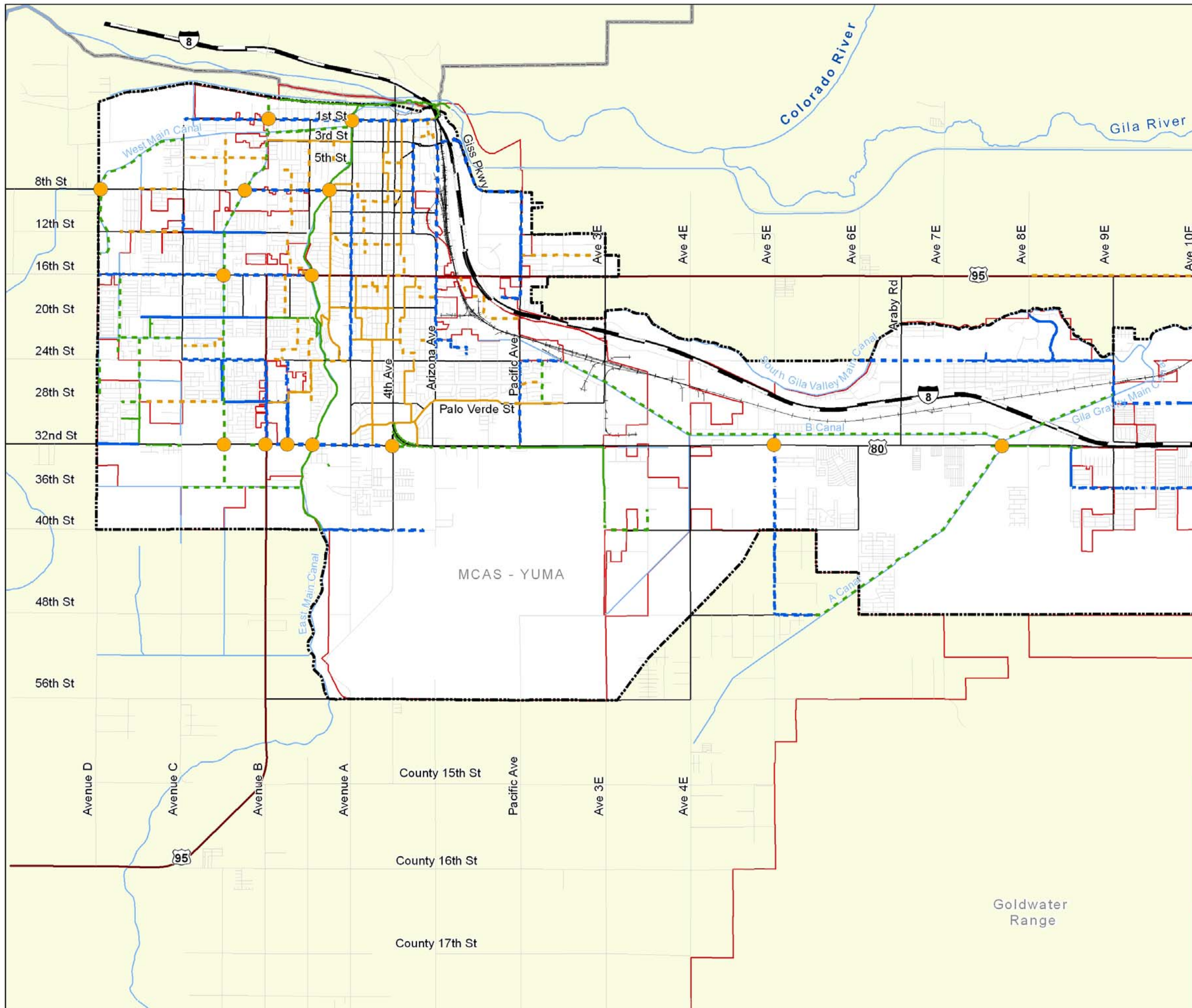


City of YUMA



OLSSON ASSOCIATES

Fig 4.3

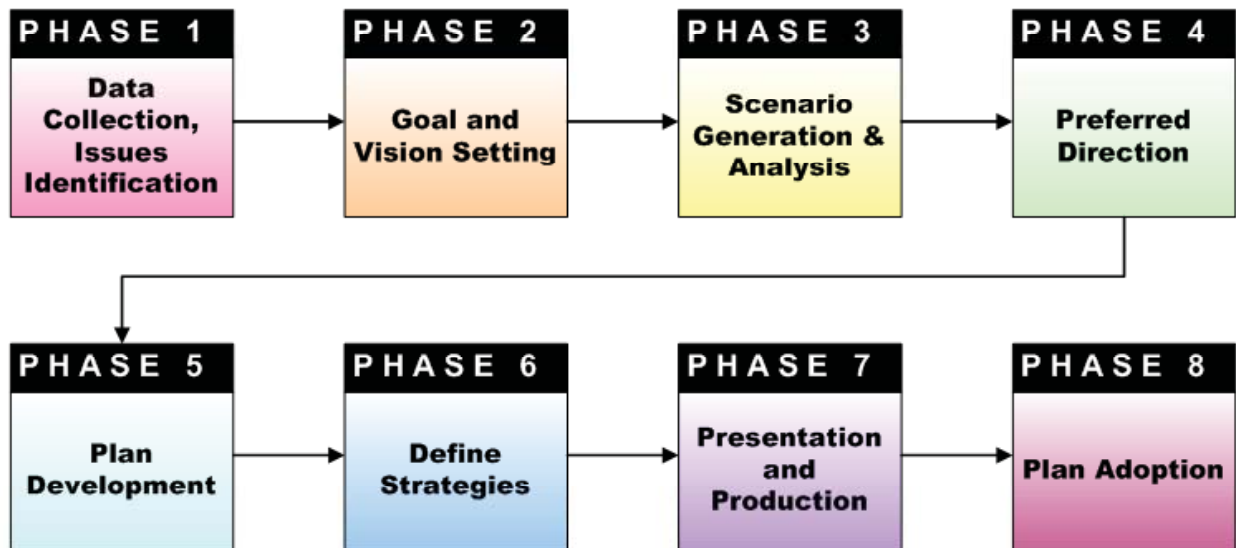




PLANNING SYNTHESIS

Before the final plan was developed, several bicycle facility concepts or alternatives were designed and discussed. Each concept was based on the existing conditions of the City's bicycle facilities, comments from City residents, and comments on the City's bicycle system. The initial data collection process, meetings with the Internal Bicycle Working Group, and public input, provided the basis to formulate three bicycle facility concepts. The three alternative concepts were constructed, evaluated, and reviewed by the Yuma Internal Bicycle Working Group. The Internal Bicycle Working Group includes members of the City of Yuma staff, from the Community Development Department, the Parks and Recreation Department, and the City Engineering Department and Yuma National Heritage Area. Each of the professionals have provided unique insight into the existing condition of the city roads and bicycle facilities as well as the local trends that will affect the future creation of these elements. The product of this process is the Preferred Alternative or Master Plan.

Yuma Planning Process



5.0 MASTER PLAN

NO
MOTOR
VEHICLES



BIKE ROUTE





5.0 MASTER PLAN

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



Based on the three facility alternatives (Recreational, Cross-Town, Destinations) and bicycle facility improvements identified in the 2009-2018 CIP, a Preferred Alternative has been developed by incorporating elements from the Recreational and Destinations Alternatives. The combination of these two alternatives have formed the Master Plan. These proposed bicycle routes, lanes, and paths will provide the community with a comprehensive network of bicycle facilities for years to come.

A Master Plan Inventory is provided in Table 6.1 High-Priority Bicycle Facilities, Table 6.2 Mid-Priority Bicycle Facilities and Table 6.3 Low-Priority Bicycle Facilities in the Appendix. The Bicycle Facilities Master Plan is designed to provide a plan that meets the vision, goals, and objectives previously identified.

MASTER PLAN

Overview:

The Bicycle Facilities Master Plan draws directly from the Recreational Bicycle Facilities Alternative and the Destinations Bicycle Facilities Alternative. This Master Plan provides 'looping' bicycle facilities that build upon the existing bicycle facilities. In addition, arterial roadways within the periphery of the city are targeted for bike lanes. Special attention is paid to the location of all Yuma schools. These destinations are particularly important for access to bicycle facilities to increase ridership of area children and teenagers commuting to and from school. Effort has also been made to connect existing bicycle facilities that are not currently connected to the greater network of bicycle facilities. Figure 5.1, Bicycle Facilities Master Plan is provided on page 57.

The table on the following page illustrates the lengths of proposed bicycle facilities under the Master Plan.





Master Plan Bicycle Facilities Lengths

Bicycle Facilities Type	Length (feet)	Percentage of Total	Miles
Bike Route	144,575.3	14.2	27.4
Bike Lane	607,942.3	59.5	115.1
Bike Path	137,238.5	13.4	26.0
Multi-Use Path	131,298.1	12.9	24.9
Total	1,021,054.2		193.4

The Master Plan includes bicycle crossing improvements. Bicycle crossings are locations where any bicycle facility and a vehicular roadway cross one another. Roadway crossings are critical to the safety and convenience of the Bicycle Facility Network. The City of Yuma has a number of multi-lane streets that carry high-speed, high-volume traffic, such as 32nd Street and 4th Avenue. Many other arterial streets are also challenging to cross, particularly during peak travel periods. To make it possible for bicyclists to travel throughout the city, safe places must exist to cross these major streets. The concept of focusing on particular bicycle/vehicle intersections for bicycle-friendly treatment was introduced in the Bicycle Alternatives and has been included in the Master Plan.

The table below lists the locations for bicycle crossing improvements recommended by the Master Plan.

Proposed Bicycle Crossing Improvements

Bicycle Crossing Location
1st Street and East Main Canal
8th Street and East Main Canal
Holly Drive and Avenue A
32nd Street and East Main Canal
32nd Street and Avenue 4E
32nd Street and Avenue 9E
40th Street and East Main

See Bicycle Facilities Master Plan Figure 5.1 on page 57 for the location of recommended bicycle crossing improvements.

An appropriate combination of physical improvements is recommended for each crossing location. The types of physical improvements that are recommended are described below:

1. **Full Traffic Signals:** Full traffic signals allow bicyclists to cross arterial streets without needing to select an appropriate gap in moving traffic. Traffic signals make it easier to cross the street, though it is important to make bicyclists aware of potential conflicts with turning vehicles and make improvements to reduce these conflicts. In some cases,



Yuma Bicycle Facilities Master Plan

Bicycle Facilities Master Plan

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lanes
- Proposed Bike Lanes
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-Use Path
- Proposed Multi-Use Path
- Existing Bicycle Crossing
- Proposed Bicycle Crossing
- Bike Station

Reference Features

- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Railroad
- Waterways
- City Limits
- Yuma County



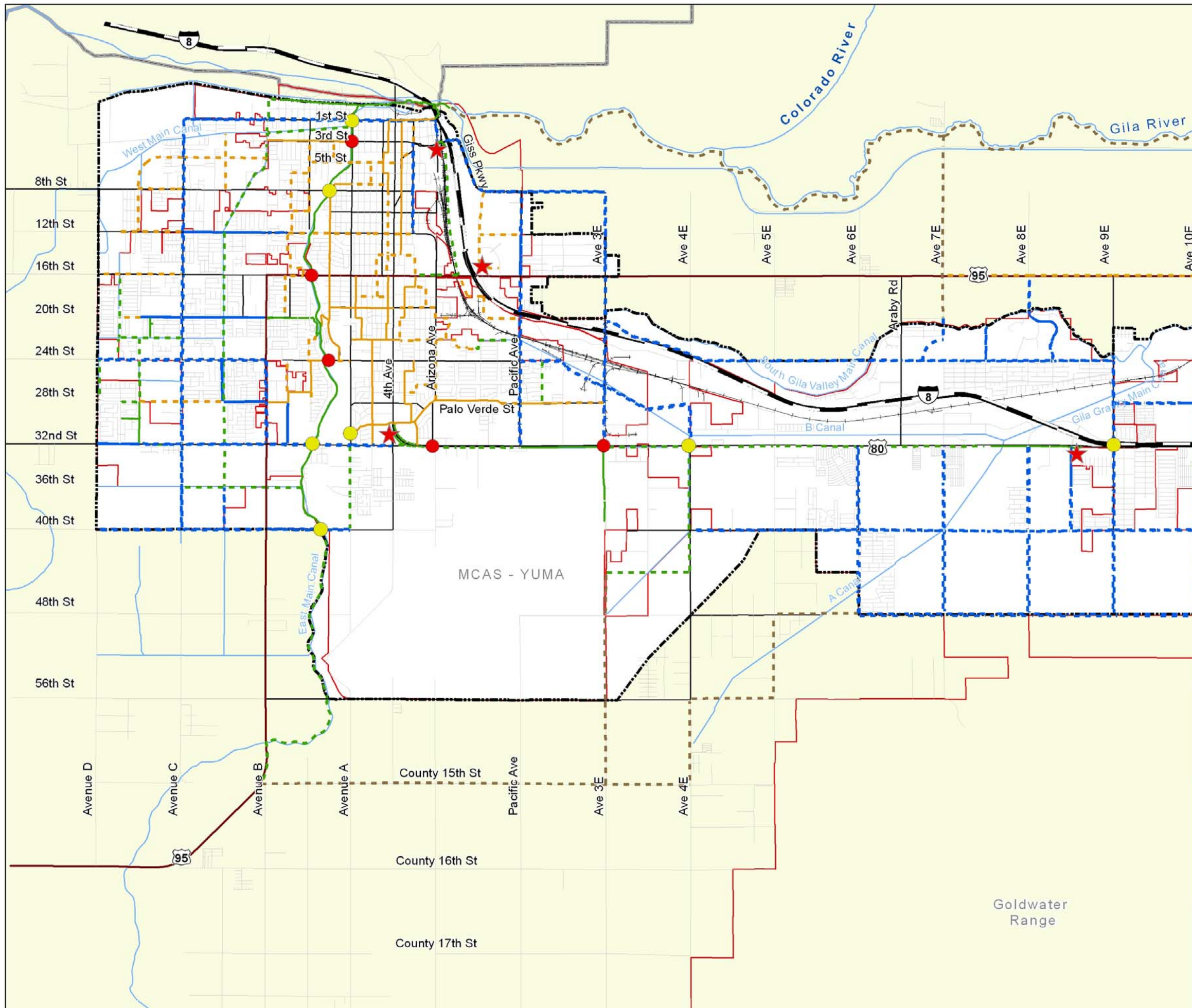
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City of YUMA



Fig 5.1





installing signals that are activated by bicycles via pavement markings may be warranted. These signals stop all traffic, allowing bicyclists to move in any direction through the intersection.

2. **Curb Extensions:** Curb extensions shorten bicycle and pedestrian crossing distance and increase the visibility of non-motorized users at roadway crossings. By narrowing the curb-to-curb width of a roadway, curb extensions may also help reduce motor vehicle speeds and improve bicyclist safety.
3. **Overpasses and Underpasses:** Overpasses and underpasses separate bicycle traffic from vehicular traffic, allowing bicyclists to cross busy streets without potential conflicts. Because they are expensive to construct, they should be reserved for locations with a high demand for bicycle crossings where the danger of crossing the roadway is high. Adequate width, lighting, and surveillance should also be provided to increase security of these crossings.
4. **Sight-Distance Improvements:** Sight-distance obstructions increase the risk of bicyclists being struck by vehicles at roadway crossings. Several of the locations recommended for bicycle crossing improvements have features that obstruct the line of sight between drivers and bicyclists.



Master Plan Estimated Costs

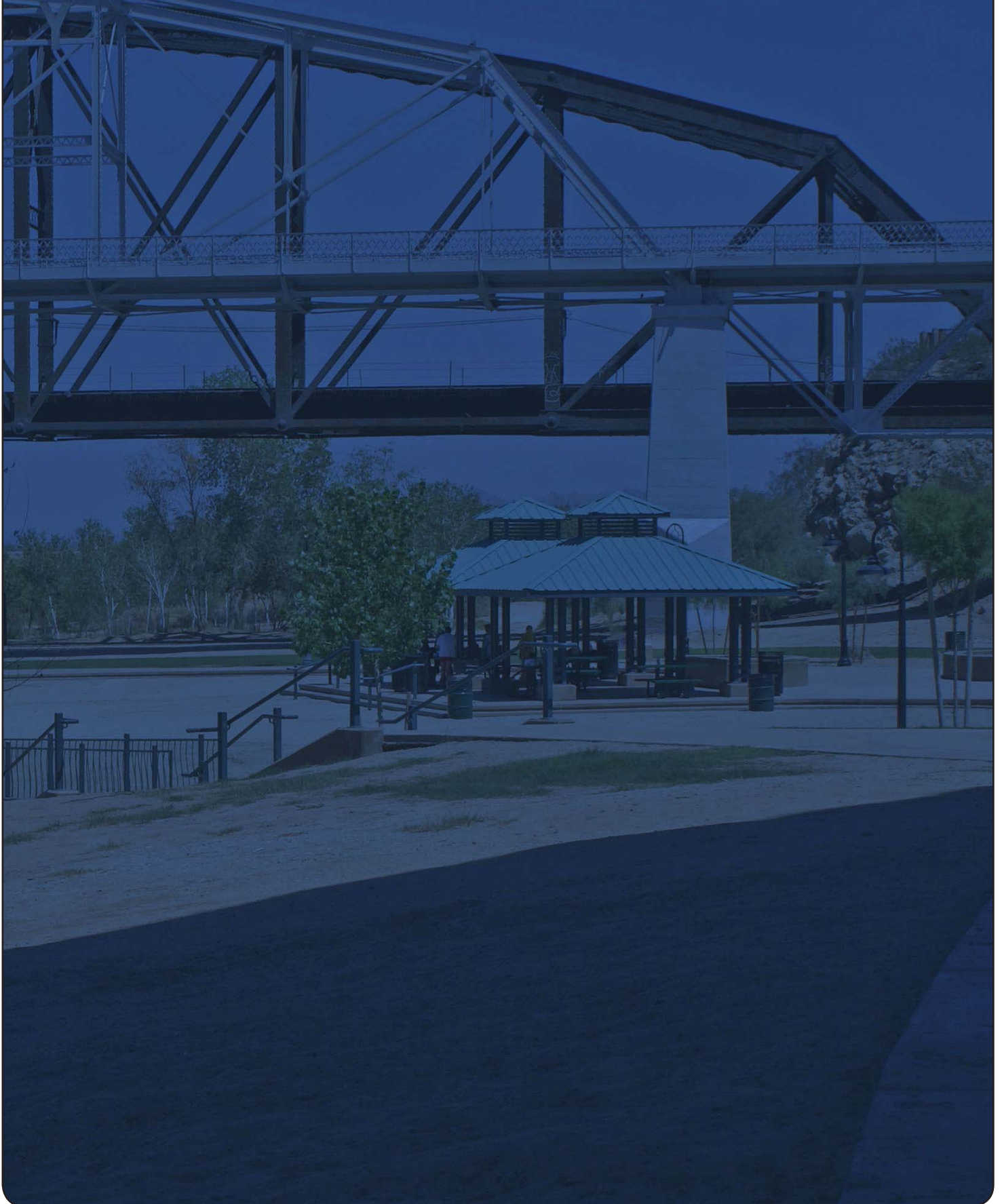
The table below illustrates the estimated costs for implementing all bicycle facilities improvements recommended in the Master Plan. These costs are based upon the total length of future bicycle facility types recommended in the Master Plan multiplied by the estimated per-mile-cost of each facility type listed below; Estimated Bicycle Facility Cost.

Master Plan Estimated Costs

Facility Type	Length (in miles)	Estimated Cost
Bike Routes	27.4	\$57,540
Bike Lanes	115.1	\$20,315,150
Bike Paths	26.0	\$7,046,000
Multi-Use Paths	24.9	\$657,360
Total		\$28,076,050

The cost of signalized crossings varies depending on the style of signal chosen (between \$100,000 and \$150,000). Estimated costs for grade-separated crossings will be significantly higher and depends on the size and design of the roadway.

6.0 IMPLEMENTATION





6.0 IMPLEMENTATION

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



The Yuma Bicycle Facilities Master Plan cannot be implemented in one phase. Therefore, each segment of each route is ranked into three priorities: High-Priority, Mid-Priority and Low-Priority. High-priority bicycle facilities are those that should be completed first, in order to fill gaps in the existing system or improve bicycle access in areas of the city that are densely populated. Prioritization of bicycle facilities is also influenced by comments received during open house events. Finally, after identifying key bicycle facility routes, the Internal Bicycle Working Group further refined bicycle facility locations based on existing city infrastructure constraints and opportunities.

OVERVIEW OF PRIORITIZATION

The Master Plan presented in Chapter 5.0 provides the city with a valuable tool to decide how bicycle facilities should be developed. Establishment of priority levels provides a logical strategy for implementing the Master Plan. The priority levels represent relative levels of need determined through input from the Internal Bicycle Working Group, stakeholder groups, and the public. The levels are intended to provide flexibility, so adjustments may be made over time that respond to changing development patterns, connectivity needs, and available funding. In addition to the priority levels, a promotion and information program, bicycle facilities maintenance and an enforcement program are provided. These programs will enhance the usability and safety of the bicycle facilities.



High-Priority Bicycle Facilities

The foundation of the high priority facilities involves creating a number of looping bicycle facilities that provide access to the most 'central' areas of urbanized Yuma, while at the same time providing excellent recreational opportunities to city residents. This 'loop' can be identified by the Thacker Lateral Bike Path to the west, 32nd Street Bike Paths and Lanes to the south, Pacific Avenue Bike Lanes to the east, and 1st Street Bike Lanes to the north. In addition to these alignments, a number of bike lanes and routes within central Yuma are located to provide the most direct east to west and/or north to south travel. Outside of this general area, 24th street Bike Lanes from the South Gila Valley Main Canal to Avenue 9E, as well as Mary Otondo Drive from 24th



Street to the South Gila Valley Main Canal, provide immediate access to both the Gila Ridge High School and Arizona Western College.

The table below illustrates the lengths of proposed bicycle facilities classified as a high-priority bicycle facility.

High-Priority Bicycle Facility Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	36,977.9	16.8	7.0
Bike Lane	129,890.2	59.1	24.6
Bike Path	33,218.0	15.1	6.3
Multi-Use Path	19,761.7	9.0	3.7
Total	219,847.7		41.6

In addition to bicycle facilities, a number of bicycle crossings and bicycle stations are identified as high-priority. Many of these facilities are located along other high priority facilities or existing facilities. Table 6.1 High-Priority Bicycle Facilities Inventory is available in the Appendix. Figure 6.1 High-Priority Bicycle Facilities is provided on page 62.

Mid-Priority Bicycle Facilities

Two main goals are achieved within mid-priority bicycle facilities. The first is completing all identified bicycle facilities located within the greater Yuma area. The second is connecting the 'greater Yuma' area and the Foothills via bicycle facilities.

The table below illustrates the lengths of proposed bicycle facilities classified as a mid-priority bicycle facility.



Mid-Priority Bicycle Facility Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	107,597.6	20.5	20.4
Bike Lane	305,849.1	58.5	58.1
Bike Path	78,893.0	15.0	14.9
Multi-Use Path	31,504.9	6.0	6.0
Total	523,844.6		99.4



Yuma Bicycle Facilities Master Plan

High-Priority Bicycle Facilities

High-Priority Facility

Bicycle Facilities Master Plan

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lanes
- Proposed Bike Lanes
- Existing Bike Path
- Proposed Bike Path
- Existing Multi-Use Path
- Proposed Multi-Use Path
- Existing Bicycle Crossing
- Proposed Bicycle Crossing
- Bicycle Station

Reference Features

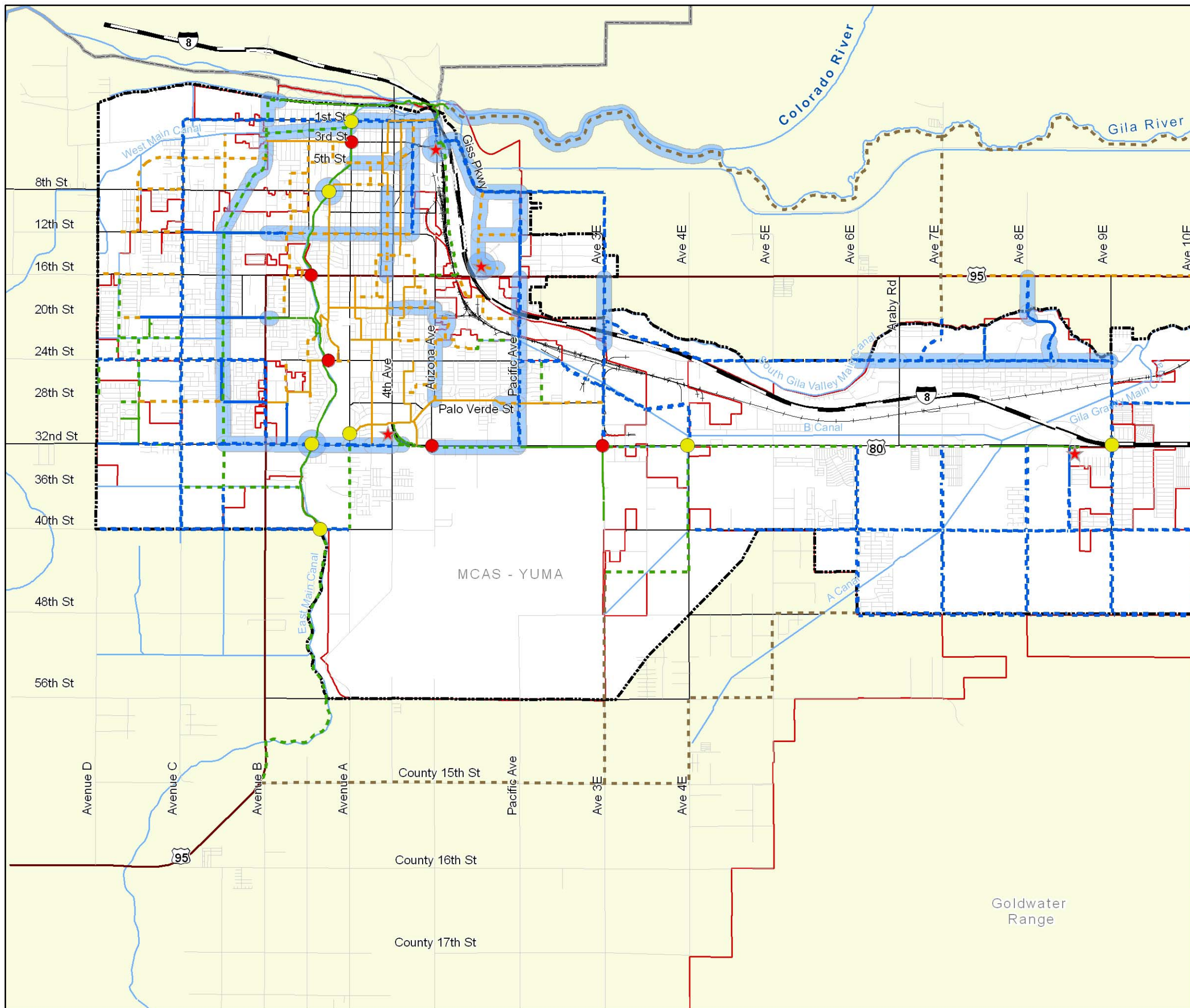
- Urban Boundary
- Interstate Roadway
- State Highway
- Major Roadway
- Local Roads
- Waterways
- City Limits
- Yuma County
- Railroad



0 0.5 1 2 Miles



Fig 6.1





Yuma Bicycle Facilities Master Plan

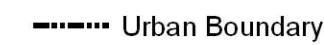


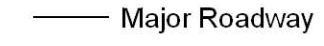




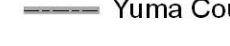
Mid-Priority Bicycle Facilities

 Mid-Priority Facility

Bicycle Facilities Master Plan

-  Existing Bike Route
-  Proposed Bike Route
-  Existing Bike Lanes
-  Proposed Bike Lanes
-  Existing Bike Path
-  Proposed Bike Path
-  Existing Multi-Use Path
-  Proposed Multi-Use Path
-  Existing Bicycle Crossing
-  Proposed Bicycle Crossing
-  Bicycle Station

Reference Features

-  Urban Boundary
-  Interstate Roadway
-  State Highway
-  Major Roadway
-  Local Roads
-  Railroad
-  Waterways
-  City Limits
-  Yuma County



0 0.5 1 2 Miles

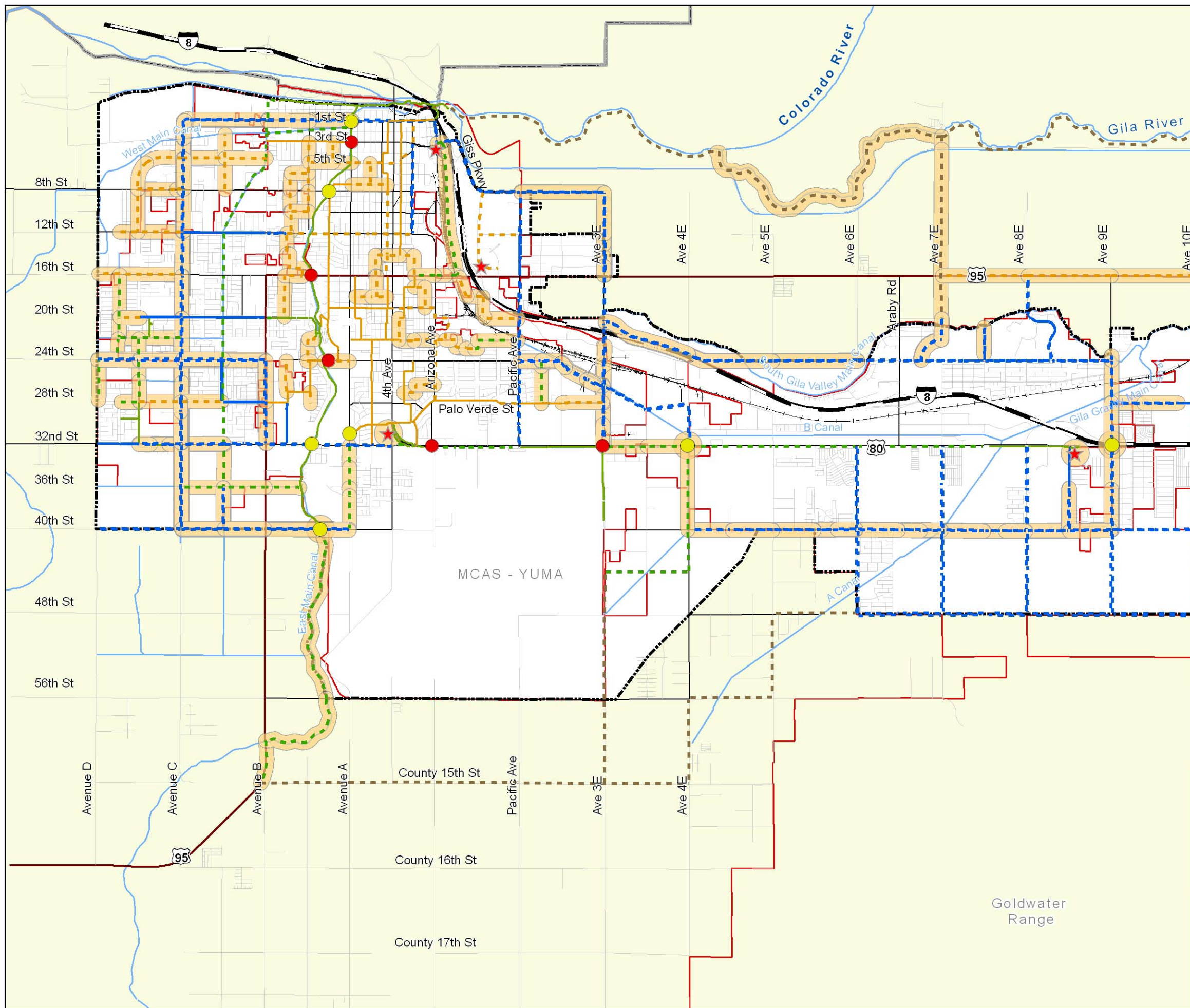


City of YUMA



OLSSON ASSOCIATES

Fig 6.2
















Yuma Bicycle Facilities Master Plan










Low-Priority Bicycle Facilities

 Low-Priority Facility

Bicycle Facilities Master Plan

-  Existing Bike Route
-  Proposed Bike Route
-  Existing Bike Lanes
-  Proposed Bike Lanes
-  Existing Bike Path
-  Proposed Bike Path
-  Existing Multi-Use Path
-  Proposed Multi-Use Path
-  Existing Bicycle Crossing
-  Proposed Bicycle Crossing
-  Bicycle Station

Reference Features

-  Urban Boundary
-  Interstate Roadway
-  State Highway
-  Major Roadway
-  Local Roads
-  Railroad
-  Waterways
-  City Limits
-  Yuma County



0 0.5 1 2 Miles

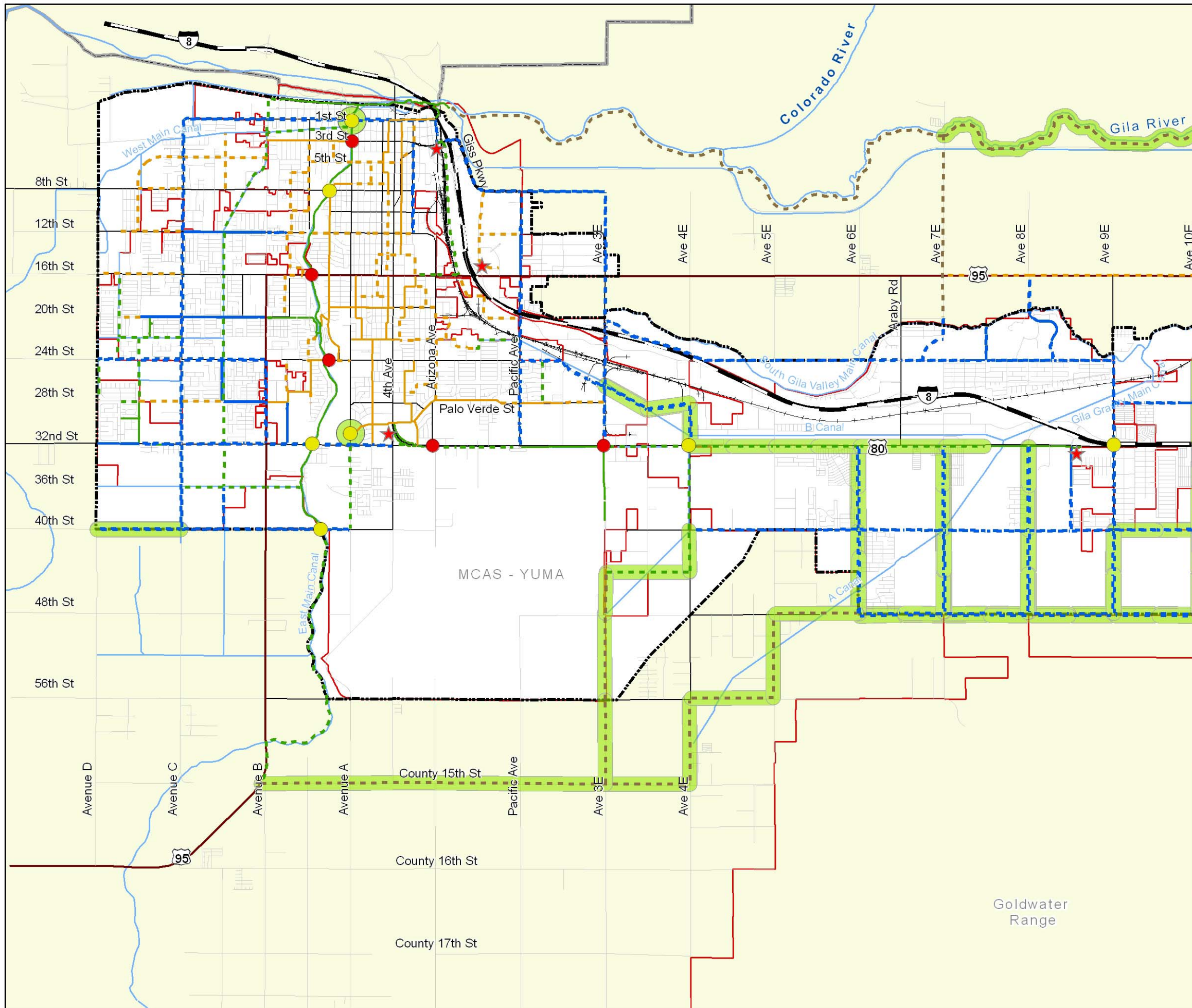


City of YUMA



OLSSON ASSOCIATES

Fig 6.3





In addition to bicycle facilities, a number of bicycle crossings and bicycle stations are identified as mid-priority. Many of these facilities are located along other mid-level priority facilities or existing facilities. Table 6.2 Mid-Priority Bicycle Facilities Inventory is available in the Appendix. Figure 6.2, Mid-Priority Bicycle Facilities is also provided on page 63.

Low-Priority Bicycle Facilities

The low-priority facilities, as the third classification, work to complete the identified bicycle facilities. Most facilities in this category are those within the primarily undeveloped East Mesa area. Also, many of the multi-use paths near the perimeter of the urban area are identified as a low priority due to population density in the city center and the need for inter-agency agreements.

The table below illustrates the lengths of proposed bicycle facilities classified as a low-priority bicycle facility.

Low-Priority Bicycle Facility Lengths

Bicycle Facility Type	Length (feet)	Percentage of Total	Miles
Bike Route	0.0	0.0	0.0
Bike Lane	172,203.0	62.7	32.4
Bike Path	24,954.2	7.9	4.1
Multi-Use Path	80,031.8	29.4	15.2
Total	277,189.0		51.7



In addition to bicycle facilities, a number of bicycle crossings are low-priority. Many of these facilities are located along other low-priority facilities or existing facilities. Table 6.3 Low-Priority Bicycle Facilities Inventory is available in the Appendix. Figure 6.3, Low-Priority Bicycle Facilities has also been provided on page 64.



Implementation Bicycle Facilities Projects

The recommended implementation strategy for new bicycle facilities recognizes the dynamic character of the city, existing development patterns, activity centers, population densities and growth patterns. The high-priority facilities that have been identified here will not only enhance the existing bicycle facilities but will provide valuable new facilities that will address the most immediate needs throughout the city.

Bicycle Facilities

Facility Type	Existing (mi)	High Priority Master Plan (mi)	Total Master Plan (mi)
Bike Routes	16.43	7.0	27.4
Bike Lanes	12.40	24.6	115.1
Bike Paths	13.63	6.3	26.0
Multi-Use Paths	1.58	3.7	24.9
Total	44.04	41.6	193.4

FUNDING SOURCES

Funding sources for bicycle facilities exist on five levels -- federal government, state government, regional entities, local government, and private grants -- and are administered by the city's Capital Improvement Projects.

Bicycle facilities that fall under the category of transportation are eligible for funding from most of the federal-aid programs. The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is the program that provides the funding for bicycle facilities. The state provides funds through a variety of programs. These funds can help expand the City of Yuma's bicycle facilities, improving quality of life for residents.

PROMOTION AND INFORMATION PROGRAM

1. Programs

Develop an Adopt-A-Path program. Develop a community bike task force. Develop a spot maintenance program to respond to bicycle facility maintenance needs.

2. Web Site

Establish a web site with up-to-date mapping and construction information. Provide bicycle facility maintenance forms on-line. Provide information on an Adopt-A-Path program





3 Information

Provide updated mapping to the public on a regular basis through various city departments and bicycle shops.

4. Public Opinion

Change public opinion of bicycling for recreation and transportation through City sponsored Bike to Work weeks; bicycle rodeos, or other bicycle centered projects that will have a large turnout from civic leaders. Conduct surveys to measure participation at events and facility use in general.

5. Bike Groups

Work with bike groups to form a community bike task force, and include the bike groups in the Adopt-A-Path program.

EDUCATION PROGRAM

1. Motorists

Make motorists aware that bicycles are legal road vehicles and emphasize safe passing distance and correct turning procedures.

2. Bicyclists

Make bicyclists aware that, as legal road vehicles they are responsible for adhering to the laws governing traffic; i.e. signaling, etc.

3. Train Young Bicyclists

Develop repetitive training courses through the school system to teach basic skills for riding in traffic and the laws that apply to bicyclists. Also training for proper safety equipment and bicycle adjustment. Promote the Safe Routes to Schools Program.

4. Programs

Participate in the ADOT Bicycle Education Plan.

BICYCLE FACILITY MAINTENANCE

Properly maintaining on-street riding surfaces is a key factor in bicycle safety and an important consideration in people's decisions to ride bicycles. Designing bikeways to reduce maintenance, giving priority to sweeping the sides of streets where bicyclists ride, and ensuring that riding surfaces are relatively smooth are all requisites in attracting more of the general public to bicycling.



Bicycles are more sensitive to irregularities and road debris than are cars. Roadway features that cause minor discomfort to motorists can cause serious problems and accidents for



bicyclists. Potholes and improper drain grates can cause bicyclists to lose control. Traffic signals that detect automobiles but fail to respond to cyclists encourage bicyclists to ignore red lights. Repaired patches and railway crossings at acute angles to the roadway often divert a cyclist's front wheel and cause serious falling accidents due to rough surfaces. Even some normal features of road design can cause an inconvenience or danger for cyclists. Safety features such as large closely spaced rumble strips designed to alert motorists leaving the roadway create barriers and hazards for cyclists.

The following maintenance issues will be addressed by city staff members:

1. A spot improvement program should be established that will give cyclists a routine channel for notifying the city of hazards to be addressed by city staff.
2. Regular maintenance, especially sweeping, should be performed on all bicycle facilities to encourage bicycle use.
3. Responsibility for on-going maintenance for each bicycle facility should be assigned and assumed prior to its construction or official designation.
4. Maintain all bicycle signs and marking to sustain the usability of the bikeways.

ENFORCEMENT PROGRAM

The role of law enforcement is an important element of the Master Plan. It is important to emphasize that bicyclists have the same status as motorists on the public roadways, and the responsibility falls to law enforcement officials to ensure the safety of both bicyclists and motorists on shared roadways. This can be done by educating, both bicyclists and motorists, and by consistently enforcing of the rules. Enforcement can take a variety of forms:

- Positive reinforcement (food coupons, safe rider trinkets, etc.)
- Verbal warnings
- Written warnings and notifications
- Citations or arrests

All enforcement efforts support the goal of making the bicycle facilities in the City of Yuma a safe efficient system for transportation and recreation. The following are goals of the enforcement program:

1. Enforcement

Target enforcement toward bicyclist and motorist behavior that is a threat to safety.

2. Education - Adult

Create an education program that targets attitudes and behavior of both bicyclists and motorists.

3. Education - Youth

Help shape the habits of future drivers through school programs by teaching rules of the road to all grade levels.



4. Training

Conduct training sessions with the police department to explain the intent of the plan and how they fit into it.

Bicyclists in Arizona are granted the rights and duties of a vehicle under the Arizona Revised Statutes. These Arizona Revised Statutes, which govern the use of bicycles on public roadways are provided below:

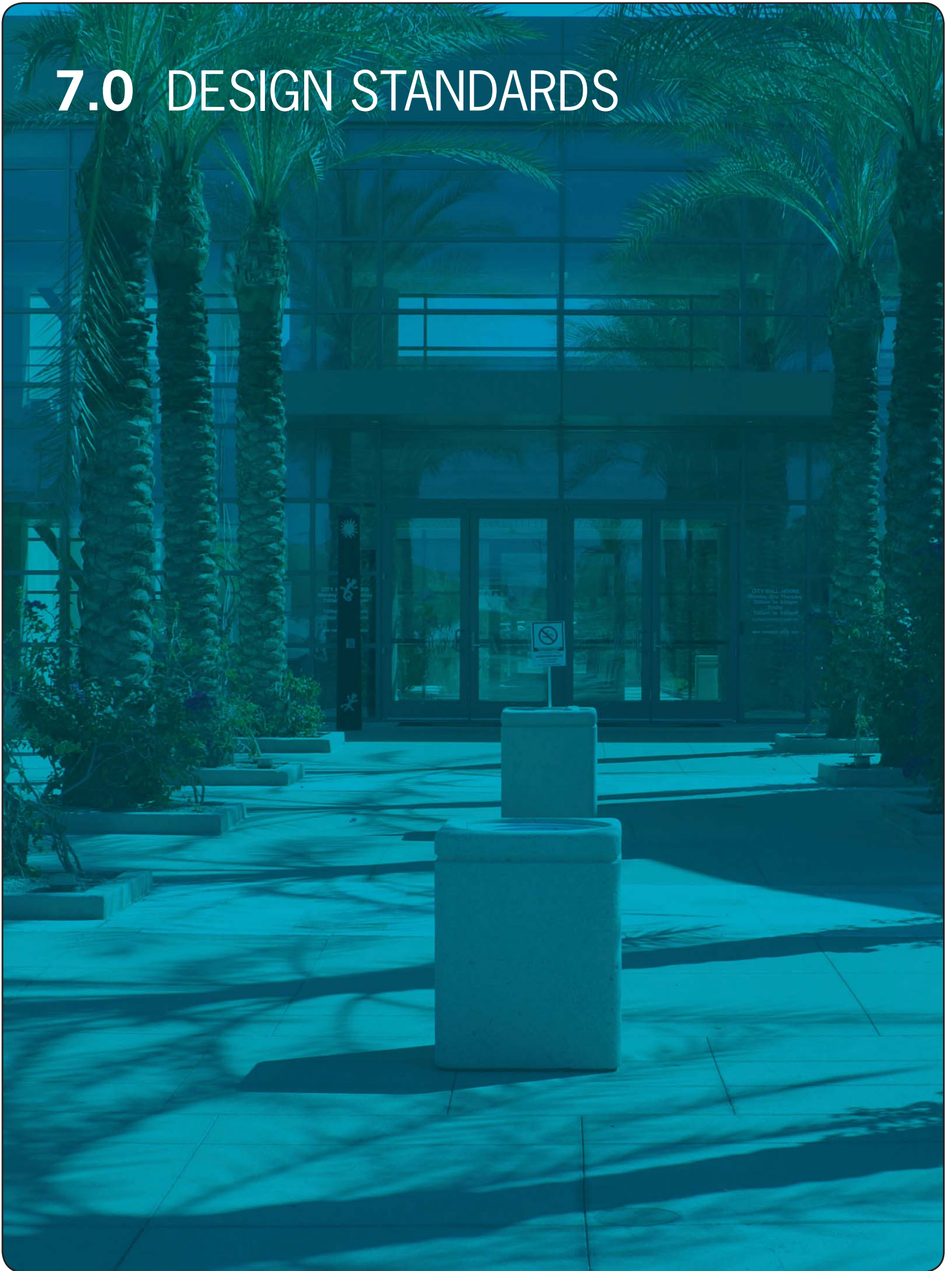
A person riding a bicycle on a roadway or on a shoulder adjoining a roadway is granted all of the rights and is subject to all of the duties applicable to the driver of a vehicle by this chapter and chapters 4 and 5 of this title, except special rules in this article and except provisions of this chapter and chapters 4 and 5 of this title that by their nature can have no application.

(Arizona Revised Statute 28-812)

- A.** A person riding a bicycle on a roadway at less than the normal speed of traffic at the time and place and under the conditions then existing shall ride as close as practicable to the right-hand curb or edge of the roadway, except under any of the following situations:
 - 1. If overtaking and passing another bicycle or vehicle proceeding in the same direction.
 - 2. If preparing for a left turn at an intersection or into a private road or driveway.
 - 3. If reasonable necessary to avoid conditions, including fixed or moving objects, parked or moving vehicles, bicycles, pedestrians, animals or surface hazards.
 - 4. If the lane in which the person is operating the bicycle is too narrow for a bicycle and a vehicle to travel safely side by side within the lane.
- B.** Persons riding bicycles on a roadway shall not ride more than two abreast except on paths or parts of roadways set aside for the exclusive use of bicycles.
- C.** A path or lane that is designated as a bicycle path or lane by state or local authorities is for the exclusive use of bicycles even though other uses are permitted pursuant to subsection D or are otherwise permitted by state or local authorities.
- D.** A person shall not operate, stop, park, or leave standing a vehicle in a path or lane designated as a bicycle path or lane by a state or local authority except in the case of emergency or for crossing the path or lane to gain access to a public or private road or driveway.
- E.** Subsection D does not prohibit the use of the path or lane by the appropriate local authority. (Arizona Revised Statute 28-815)



7.0 DESIGN STANDARDS





7.0 DESIGN STANDARDS

CITY OF YUMA | BICYCLE FACILITIES MASTER PLAN



The current editions of the following publications shall be used when designing and detailing all bicycle facilities:

1. **Guide for the Development of Bicycle Facilities, The American Association of State Highway and Transportation Officials, (AASHTO)**
2. **Manual on Uniform Traffic Control Devices (MUTCD), U.S. Department of Transportation, as amended and approved by the Arizona Department of Transportation**
3. **The Yuma City Standard of Construction**
4. **Arizona Bicycle Facilities Planning and Design Guidelines (ADOT 1988)**

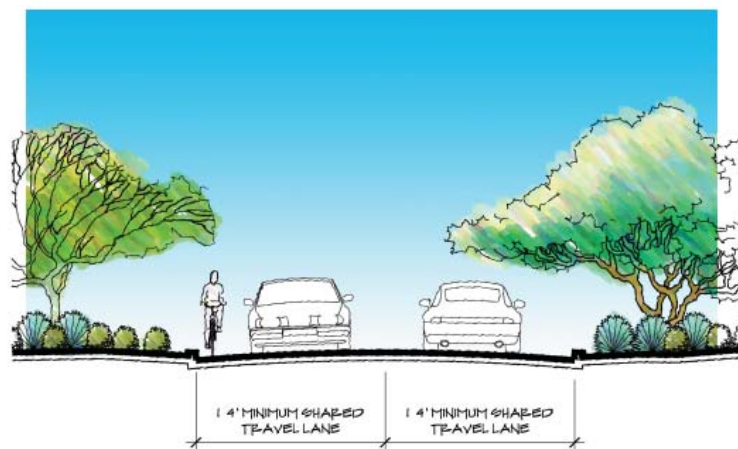
Nine basic types of bicycle facilities will be used:

- Shared Lane
- Wide Outside Lane
- Bike Lane
- Shoulder
- Separate Bike Path
- Mixed-Use Path
- Bicycle Crossing
- Bicycle Station
- Bicycle Parking

Details for the nine types of bicycle facilities are provided below:

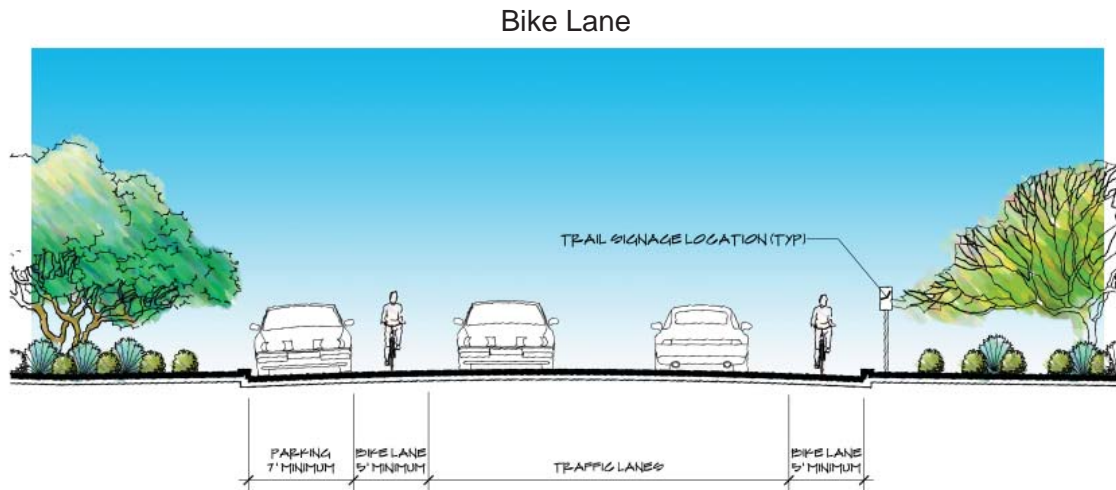
1. **Shared Lane** – A street or highway with no special provisions for bicyclists. Twelve-foot lanes (or less) are typical with no shoulders. Cars can only pass bicyclists safely by crossing the center line or by moving into another traffic lane (speeds of 30 mph or less). Bike route signage shall be in accordance with the Manual on Uniform Traffic Control.

Wide Outside Lane





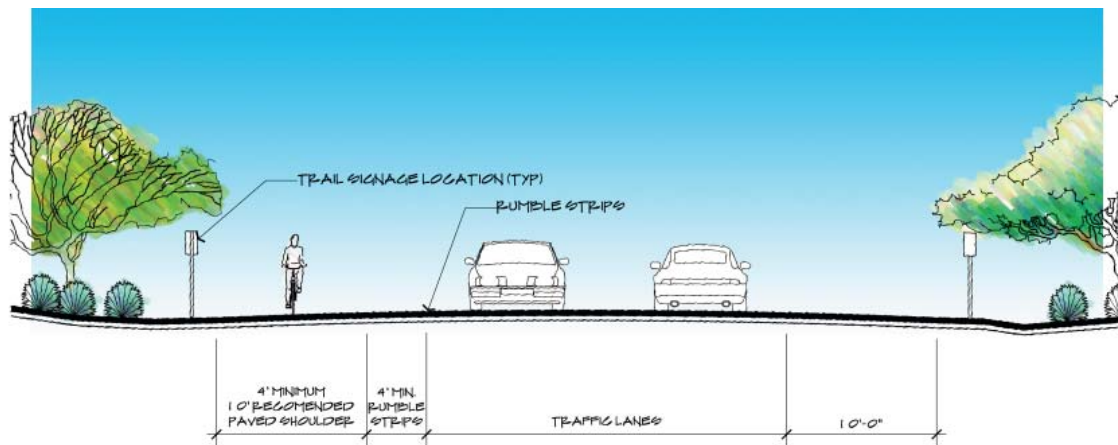
2. **Wide Outside Lane** – The rightmost through traffic lanes that are substantially wider than 12 feet. Fourteen feet, measured from the lane stripe to the edge of the gutter pan, is generally considered the minimum width necessary to allow a bicyclist and motorist to share the same lane without coming into conflict, changing lanes, or potentially reducing the motor vehicle capacity of the lane (speeds exceeding 40 mph).



3. **Bike Lane** – A bikeway separated from motorized vehicular traffic by striping.
- a. Bike lanes shall always be one-way facilities that carry traffic in the same direction as the adjacent motor vehicle lane. Two-way bicycle lanes on one side of the roadway are unacceptable.
 - b. Bike lanes on one-way streets shall be placed on the right edge of the road, except in areas where placing them on the left will significantly reduce conflict.
 - c. The minimum bike lane width on urban (curbed) roadways where parking is prohibited shall be four feet, measured from the edge of the vehicle lane to the longitudinal joint between the roadway surface and the gutter pan. When the gutter pan is less than 12 inches wide, the minimum distance from the edge of the vehicle lane to the face of the curb shall be five feet. The Yuma City Standard of Construction Standard No. 2-010 and 2-020 requires six feet of usable pavement.
 - d. The minimum bike lane width on non-curbed streets with no parking is five feet of usable pavement width per AASHTO. The Yuma City Standard of Construction Standard No. 2-010 and 2-020 requires six feet of usable pavement.
 - e. The minimum bike lane striped width for a curbed street where a parking lane is provided is five feet to the left of a minimum eight-foot wide parking area. Bicycle lanes shall always be placed between the parking lane and the through traffic lane. If the parking volume is substantial or turnover is high, an additional one or two feet of width is recommended for safe bicycle operation.

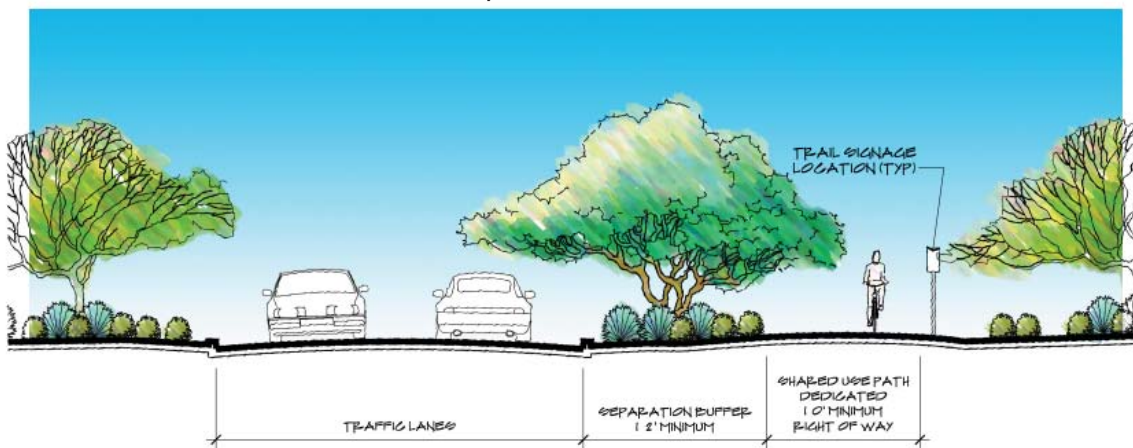


Shoulder



4. **Shoulder** – The portion of the roadway contiguous with the traveled way to accommodate stopped vehicles; to be used in emergencies, and to provide lateral support of the sub-base, base, and surface courses. Shoulders should be a minimum of four feet wide when designed to accommodate bicycle travel. As traffic speed increases (over 40 mph), shoulder widths should be increased to six feet or up to as much as 10 feet.

Separate Bike Path



5. **Separate Bike Path** – A bikeway physically separated from motorized vehicular traffic by an open space or barrier and falling within the highway right-of-way or within an independent right-of-way (AASHTO 1999). Two-way bike paths should be a minimum of 10 feet wide and, where possible, 12 - 14 feet.

- a. The minimum width for a two-directional separate bike path is 10 feet. Twelve to fourteen feet is recommended where high use is expected.
- b. A minimum two-foot wide stabilized surface area shall be provided adjacent to both



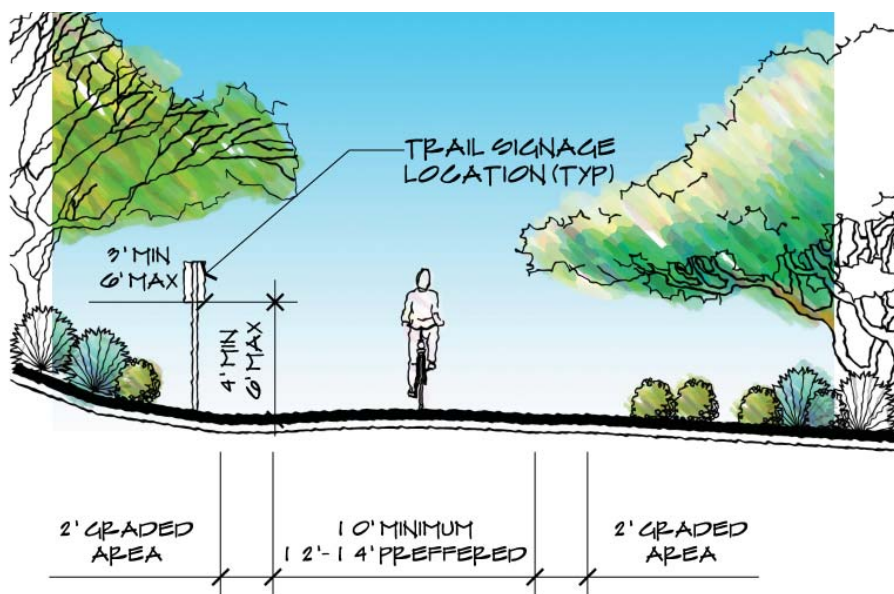
sides of the pathway pavement. This area shall remain free from obstructions and will serve as a two-foot clear zone, and will be included within the designated right-of-way.

- c. The separate bike path vertical clear distance shall be 10 feet minimum.
- d. Separate bike paths adjacent to streets or roadways are not recommended. If a separate bike path is planned adjacent to highway developments, strict separation distances shall be adhered to unless an AASHTO recommended barrier is provided. The minimum distance, from the back of the curb to the inside edge of the separate bike path, is five feet.
- e. One-way separate bike paths are unacceptable.

6. Multi-Use Path – A bikeway physically separated from motorized vehicular traffic by an open space or barrier and within an independent right-of-way (AASHTO 1999). Two-way bike paths should be a minimum of 10 feet wide and, where possible, 12 - 14 feet.

- a. The minimum width for a two-directional multi-use path is 10 feet. Twelve feet to fourteen feet is recommended where high use is expected.
- b. A minimum two-foot wide stabilized surface area shall be provided adjacent to both sides of pathway pavement. This area shall remain free from obstructions, will serve as a two-foot clear zone, and will be included within the designated right-of-way.
- c. The multi-use path vertical clear distance shall be 10 feet minimum.
- d. Multi-use paths adjacent to streets or roadways are not recommended. If a multi-use path is planned adjacent to highway developments, strict separation distances shall be adhered to unless an AASHTO recommended barrier is provided. The

Multi-Use Path





minimum distance, from the back of the curb to the inside edge of the multi-use path, is five feet.

- e. One-way multi-use paths are unacceptable.
- f. The path may be either paved or unpaved.

7. Bicycle Crossing – A bikeway for the purpose of crossing collector and arterial streets at mid-block locations or at intersections.

- a. Grade separated crossings (overpass or underpass)
- b. Signalized at-grade crossings
- c. Un-signalized at-grade crossings

8. Bicycle Station – A bicycle facility designed for the purpose of providing support at bicycle destinations will include the following items with approval of the Community Development Department.

- a. Bike racks
- b. Lockers – bicycle and gear lockers
- c. Shower facilities
- d. Water fountains

9. Bicycle Parking – A bicycle facility amenity designed to provide bicyclist with options to secure bicycle at destination.

The inverted “U” type bicycle rack is the preferred style of bicycle rack. Other types of bicycle racks that can accommodate two parked bikes per rack and the use of a “U” bolt type lock may be approved by the City of Yuma Community Development Department.



BICYCLE PARKING STANDARDS

Use Category	Specific Use	Spaces Required
Residential		
	Hotels, Motels	5 minimum or 1 per 25 employees
	Apartments	1 per 4 units to be covered + 5 spaces in front of each building
Commercial/Industrial		
	Retail Sales/Service	5 minimum + 1 space per 10 vehicle spaces 50 percent covered
	Office Buildings	5 minimum or 1 per 25 employees
	Museum/Libraries	5 minimum or 1 per 25 parking spaces
	Movie Theaters	5 minimum + 1 space per 10 vehicle spaces 50 percent covered
	Restaurants	1 space per 5 employees + 1 space per 10 vehicle spaces 50 percent covered
	Recreation Centers	1 space per 5 employees + 1 space per 10 vehicle spaces 50 percent covered
	Manufacturing	5 minimum or 1 per 25 employees
	Warehouse	5 minimum or 1 per 25 employees
Institutional		
	Medical Center	5 minimum + 1 per 25 employees
	Transit stop	2
	Municipal Building	5 minimum + 1 per 25 employees
	Schools - Elementary	1 for every 25 students above second grade to be covered
	Schools - Middle	1 for every 25 students to be covered
	Schools - High	1 per 10 employees +1 for every 25 students to be covered
	Colleges	1 per 10 employees +1 for every 25 students to be covered



PLANNING STANDARDS

1. Grade-separated crossings

Incorporate grade separated crossings into new development drainage or other infrastructure needs.

2. End use facilities

Encourage supporting facilities located at bicyclist destinations and in all new development.

- a. Bicycle racks
- b. Bicycle lockers
- c. Shower facilities
- d. Water fountains
- e. Rest areas
- f. Benches
- g. Ramadas

3. Bike parking

Provide bike parking at all public facilities and YCAT transit stations and new commercial and retail development.

4. Lighting

Review lighting for all new and existing bicycle facilities for adequate levels.

5. New road projects

Review all new road projects not on the Master Plan for bicycle facility opportunities.



MAINTENANCE STANDARDS

Pavement Surface

1. Pavement surfaces shall be designed free from irregularities, and the edges of the pavement shall be uniform width.
2. When chip sealing is used to recondition roadway surfaces, the cover material shall limit the maximum stone size to 3/8-inch on bike lanes and shoulders.

Drainage Grates and Utility Covers

1. When a new roadway is designed, all drainage grates and utility covers should be kept out of the bicyclists' expected path.
2. Drainage grates and utility covers shall be adjusted flush with the pavement surface on all new construction and reconstruction.
3. On new construction where bicyclists will be permitted, curb inlets rather than drainage grates should be used.
4. Bicycle safe drainage grates shall be used on all roadways.

Railroad Crossings

1. A railroad-highway grade crossing should ideally be at a right angle to the rails.
2. Pavement surfaces at railroad crossings shall be designed, constructed, and maintained to permit safe, smooth crossings for all roadway users. If the crossing angle is less than approximately 45 degrees, consideration should be given to widening the outside lane,



shoulder, or bicycle lane to allow bicyclists adequate room to cross the tracks at a right angle. Where this is not possible, commercially available compressed flange-way fillers can enhance bicyclists' safety. If cost is a factor, these need only be installed across the bike lane portion of the total pavement width.

Additional Roadway Hazards

1. Cattle guards, gutters, manholes, and all cut and patch sites on roadways shall have smooth transitions.
2. Bridge Treatments:
The design of roadway widths for bridges shall allow on-road bike lanes to be continuous across the bridge.

Traffic Control Signals

1. Timing of traffic signals and the placement of traffic detection devices shall be calibrated to include bicyclists.
2. All signals shall be checked to ensure that they are visible to a bicyclist who is properly positioned on the road.

(Maricopa County Department of Transportation Roadway Design Manual, Revised 2004 pg.8-6 & 8-7)

These design standards will ensure high-quality facilities, providing access to more destinations for Yuma's bicycling population. Connecting city locations will increase bike travel and improve quality of life for residents, giving people a reason to choose the bicycle. As convenience and access increase and as people recognize the health, safety, environmental, financial, and emotional benefits of hopping on their bikes rather than in their cars, residents will find themselves asking: Why drive when I can ride?



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APPENDIX

Table 4.1
Yuma Bicycle Facilities Master Plan
Existing Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW
BIKE ROUTES	EXISTING BICYCLE FACILITIES			
	1ST ST: GILA ST TO 5TH AVE	2,880.6	100.0%	75FT
	3RD ST: AVE A TO MAGNOLIA AVE	2,662.8	100.0%	55 FT
	3RD ST: MAGNOLIA AVE TO AVE B	2,685.2	100.0%	60 FT
	4TH ST: 5TH AVE TO 6TH AVE	308.2	100.0%	60 FT
	6TH ST: 6TH AVE TO 5TH AVE	306.1	100.0%	60 FT
	7TH ST: AVE A TO 14TH AVE	1,137.8	83.4%	45 FT
	8TH ST: 14TH AVE TO EAST MAIN	265.5	100.0%	75 FT
	17TH ST: 1ST AVE TO 3RD AVE	662.2	77.1%	55 FT
	19TH ST: 14TH AVE TO 11TH AVE	1,590.9	100.0%	40 FT
	19TH ST: 11TH AVE TO 4TH AVE	2,366.9	100.0%	55 FT
	20TH ST: 3RD AVE TO 3RD AVE	285.6	100.0%	50 FT
	20TH ST: 11TH AVE TO 10TH AVE	378.1	100.0%	50 FT
	PARKWAY DR: 14TH AVE TO RIDGEVIEW DR	522.3	90.2%	45 FT
	22ND ST: AVE A TO 10TH AVE	659.5	100.0%	55 FT
	22ND ST: 10TH AVE TO 5TH AVE	1,544.4	100.0%	50 FT
	22ND ST: 5TH AVE TO 3RD AVE	832.9	100.0%	55 FT
	24TH ST: EAST MAIN CANAL TO 18TH AVE	755.3	100.0%	80FT
	25TH ST: 1ST AVE TO VIRGINIA DR.	581.2	100.0%	50 FT
	PALO VERDE DR: CATALINA DR TO ARIZONA AVE	1,848.6	100.0%	45 FT
	PALO VERDE DR: ARIZONA AVE TO BARBARA AVE ALIGNMENT	4,187.4	100.0%	40 FT
	PALO VERDE DR: PACIFIC AVE TO AVE 2 1/2E	2,729.1	66.6%	60 FT
	27TH ST: 18TH AVE TO 21ST DR	1,375.4	100.0%	50FT
	28TH ST: 21ST DR TO AVE B	1,474.8	78.0%	85FT
	28TH ST: VIRGINIA DR TO 1ST AVE	420.0	100.0%	50 FT
	CATALINA DR.: 1ST AVE TO PALO VERDE DR	193.6	100.0%	60 FT
	CATALINA DR: 1ST AVE TO 4TH AVE	1,139.3	100.0%	60 FT
	CATALINA DR: 8TH AVE TO 4TH AVE	1,330.9	100.0%	70 FT
	CATALINA DR.: PALO VERDE DR TO 32ND ST	1,599.9	100.0%	50 FT
	HOLLY DR: AVE A TO PARK LN	819.7	100.0%	35 FT
	PARK LN: HOLLY DR TO 8TH AVE	698.9	100.0%	35 FT
	1ST AVE: 16TH ST TO 16TH PL	268.0	100.0%	70 FT
	1ST AVE: 16TH PL TO 17TH ST	384.2	100.0%	60 FT
	1ST AVE: 24TH ST TO 24TH PL ALIGNMENT	418.9	100.0%	50 FT
1ST AVE: 24TH PL ALIGNMENT TO 25TH ST	258.7	100.0%	40 FT	
1ST AVE: 28TH ST TO CATALINA DR.	1,193.2	100.0%	50 FT	
3RD AVE: 1ST ST TO 2ND ST	618.1	100.0%	70 FT	
3RD AVE: 2ND ST TO 13TH ST	7,023.8	83.5%	80 FT	

Table 4.1
Yuma Bicycle Facilities Master Plan
Existing Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW
BIKE ROUTES	EXISTING BICYCLE FACILITIES			
	3RD AVE: 13TH ST TO 14TH ST	716.4	100.0%	70 FT
	3RD AVE: 17TH ST TO 20TH ST	1,927.8	95.7%	50 FT
	VIRGINIA DR: 25TH ST TO 26TH ST	708.4	100.0%	50 FT
	VIRGINIA DR: 26TH ST TO 28TH ST	1,332.8	100.0%	55 FT
	5TH AVE: 1ST ST TO 4TH ST	1,985.6	96.2%	80 FT
	5TH AVE: 6TH ST TO 8TH ST	1,168.7	100.0%	80 FT
	5TH AVE: 16TH ST TO 20TH PL	3,039.2	100.0%	60 FT
	5TH AVE: 20TH PL TO 22ND ST	1,112.0	100.0%	40 FT
	6TH AVE: 4TH ST TO 6TH ST	1,271.0	100.0%	80 FT
	8TH AVE: 22ND ST TO 23RD ST	850.4	100.0%	55 FT
	8TH AVE: 23RD ST TO 25TH ST	1,162.9	100.0%	70 FT
	8TH AVE: 25TH ST TO 26TH ST	684.0	100.0%	45 FT
	8TH AVE: 26TH ST TO 27TH ST	684.2	100.0%	60 FT
	8TH AVE: 27TH ST TO 28TH ST	657.1	100.0%	75 FT
	8TH AVE: 28TH ST TO CATALINA DR	1,391.6	100.0%	55 FT
	8TH AVE: CATALINA DR TO 32ND ST	1,260.9	100.0%	70 FT
	10TH AVE: 20TH ST TO 21ST ST	1,059.9	100.0%	70 FT
	10TH AVE: 21ST ST TO 22ND ST	273.1	100.0%	50 FT
	11TH AVE: 16TH ST TO 20TH ST	2,628.2	100.0%	60 FT
	14TH AVE: 7TH ST TO 8TH ST	376.9	100.0%	45 FT
	14TH AVE: 8TH ST TO 11ST	1,991.5	96.9%	50 FT
	14TH AVE: 11ST TO 22ND ST	7,280.8	98.2%	50 FT
	ELKS LN: 22ND ST TO 23RD ST ALIGN	936.7	100.0%	40 FT
	ELKS LN: 23RD ST ALIGN TO 24TH ST	661.8	100.0%	65 FT
	RIDGEVIEW DR: PARWAY DR TO 21ST ST ALIGNMENT	797.9	100.0%	45 FT
18TH AVE: 24TH ST TO 27TH ST	1,950.5	100.0%	55FT	
21ST DR: 27TH ST 28TH ST	671.6	100.0%	75FT	
	SUBTOTAL	86,990.0		
BIKE LANES	EXISTING BICYCLE FACILITIES			
	12TH ST: AVE B TO AVE C	10,232.0	87.8%	70 FT
	20TH ST: AVE B TO AVE C	10,234.0	94.9%	100 FT
	20TH ST: AVE C TO 45TH AVE	5,301.5	100.0%	100 FT
	24TH ST: AVE 7 1/2 E TO COLLEGE AVE	1,233.5	100.0%	130 FT
	24TH ST: AVE 7 1/2 E TO EAST APPROX 274.8 FT	274.8	0.0%	130 FT
28TH ST: AVE B TO 33RD DR	5,153.0	85.6%	100 FT	

Table 4.1
Yuma Bicycle Facilities Master Plan
Existing Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW
BIKE LANES	28TH ST: AVE 10E TO WEST APPROX 1238 FT	2,311.6	100.0%	108 FT
	32ND ST: 45TH AVE TO AVE D	5,088.5	50%	90FT
	21ST DR: 28TH ST TO 32ND ST	5,028.4	28.2%	100 FT
	PACIFIC AVE: 16TH ST TO 12TH ST	4,730.1	100%	100FT
	AVE 7 1/2 E: 24TH ST TO NORTH APPROX. 475 FT	777.2	50.0%	110 FT
	OTONDO DR: AWC LOOP TO TELEGRAPH ST ALIGNMENT	5,621.4	31.6%	90 FT
	33RD DR: 28TH ST TO 24TH ST	5,006.7	100.0%	90 FT
	AVE 8 1/2 E: 32ND ST TO 36TH ST	4,701.7	27.1%	100 FT
	SUBTOTAL	65,694.4		
BIKE PATHS	EXISTING BICYCLE FACILITIES			
	GATEWAY PARK BIKE PATH: GATEWAY PARK TO 1ST ST	1,113.5	N/A	N/A
	WEST WETLANDS BIKE PATH: EAST WETLANDS TO 4TH AVE	3,900.0	N/A	N/A
	WEST WETLANDS BIKE PATH: 4TH AVE TO EAST MAIN CANAL	2,369.4	N/A	N/A
	WEST WETLANDS BIKE PATH: EAST MAIN CANAL TO 12TH AVE	711.2	N/A	N/A
	WEST WETLANDS BIKE PATH: 12TH AVE TO JOE HENRY PARK	4,191.3	N/A	N/A
	20TH ST: 17TH AVE TO 20TH DR	691.6	100.0%	95 FT
	20TH ST: 20TH DR TO 23RD DR	1,553.2	100.0%	95 FT
	32ND ST: RANCHO WAY TO WEST APPROX. 296 FT	296.0	72.0%	100 FT
	32ND ST: RANCHO WAY TO PINTO WAY	1,014.5	50.0%	100 FT
	32ND ST: 4TH AVE CURVE TO CATALINA DR.	1,139.4	100.0%	150 FT
	32ND ST: CATALINA DR TO ARIZONA AVE	858.8	100.0%	150 FT
	32ND ST: PACIFIC AVE TO AVE 3E	5,126.6	50.0%	160 FT
	32ND ST: AVE 7 1/2 E ALIGNMENT TO AVE 8 E	2,268.6	72.7%	150 FT
	32ND ST: AVE 8E TO CIELO VERDE DR	1,196.7	50.0%	165 FT
	32ND ST: CIELO VERDE DR TO AVE 8 1/2 E	1,295.2	0.0%	185 FT
	SOUTH FRONTAGE ROAD: AVE 8 1/2 E TO DESERT AIR BLVD	583.8	N/A	N/A
	4TH AVE: CATALINA DR. TO 32ND ST	791.3	100.0%	150 FT
	4TH AVE CURVE: 4TH AVE TO 32ND ST	1,761.8	100.0%	150 FT
	EAST MAIN CANAL: WEST MAIN CANAL TO 1ST ST	1,072.8	N/A	N/A
	EAST MAIN CANAL: 1ST ST TO 3RD ST	1,272.1	N/A	N/A
	EAST MAIN CANAL: 3RD ST TO 5TH ST	1,275.9	N/A	N/A
	EAST MAIN CANAL: 5TH ST TO 8TH ST	2,269.4	N/A	N/A
	EAST MAIN CANAL: 8TH ST TO 20TH PL ALIGNMENT	9,014.9	N/A	N/A
	EAST MAIN CANAL: 20TH PL ALIGNMENT TO 21ST LN ALIGNMENT	963.0	N/A	N/A
	EAST MAIN CANAL: 21ST LN ALIGNMEN TO 24TH ST	1,938.2	N/A	N/A
EAST MAIN CANAL: 24TH ST TO 32ND ST	5,798.2	N/A	N/A	

Table 4.1
Yuma Bicycle Facilities Master Plan
Existing Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW
BIKE PATHS	EAST MAIN CANAL: 32ND ST TO DESER LAKES DR. ALIGNMENT	4,516.2	N/A	N/A
	EAST MAIN CANAL: DESERT LAKES ALIGNMENT TO 40TH ST	1,635.5	N/A	N/A
	EAST MAIN CANAL: 21ST LN ALIGNMENT TO 20TH ST	1,277.2	N/A	N/A
	EAST MAIN CANAL: CROSSING CANAL ALONG 21ST STREET ALIGNMENT	466.8	N/A	N/A
	44TH AVE ALIGNMENT: 20TH ST TO 21ST LN ALIGNMENT	1,395.3	N/A	N/A
	45TH AVE: 32ND ST TO 29TH LN ALIGNMENT	1,516.2	45.3%	60 FT
	45TH AVE ALIGNMENT: 29TH LN ALIGNMENT TO 28TH ST	1,056.1	46.7%	60 FT
	29TH LN ALIGNMENT: BERKLEY RANCH AVE TO 45TH AVE ALIGNMENT	1,132.9	N/A	N/A
	AVE 3E: 32ND ST TO MCAS ENTRANCE	4,513.3	88.0%	160 FT
	SUBTOTAL	71,976.9		
MULTI-USE PATHS	EXISTING BICYCLE FACILITIES			
	REDONDO CENTER DR: GISS PKWY TO 16TH ST	8,361.0	N/A	N/A
	GRAND TOTAL	233,022.3		

Table 6.1
Yuma Bicycle Facilities Master Plan
High Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE ROUTES	PREFFERED ALTERNATIVE				
	5TH ST: AVE A TO 6TH AVE	1,859.1	100%	60 FT	H
	5TH ST: 6TH AVE TO ORANGE AVE	1,079.3	94%	60 FT	H
	12TH ST: 1ST AVE TO 8TH AVE	2,648.3	97%	60 FT	H
	12TH ST: 8TH AVE TO AVE A	1,165.5	100%	50 FT	H
	12TH ST: AVE A TO 14TH AVE	1,294.7	100%	70 FT	H
	12TH ST: 14TH AVE TO EAST MAIN CANAL	1,229.9	50%	70 FT	H
	12TH ST: CASTLE DOME AVE TO PACIFIC AVE	2,494.1	46%	120 FT	H
	12TH ST: EAST MAIN CANAL TO 21ST DR.	1,375.1	100%	60 FT	H
	19TH ST: 4TH AVE TO ARIZONA AVE	2,625.2	100%	55 FT	H
	20TH ST: ARIZONA AVE TO FACTOR AVE	824.1	100%	60 FT	H
	22ND ST: ARIZONA AVE TO FACTOR AVE	624.6	100%	60 FT	H
	PALO VERDE ST: PACIFIC AVE TO BARBARA AVE ALIGN	1,180.8	100%	60 FT	H
	1ST AVE: 1ST ST TO 3RD ST	1,298.5	100%	70 FT	H
	ORANGE AVE: 1ST AVE TO 3RD AVE	855.0	84%	75 FT	H
	5TH AVE: 8TH ST TO 12TH ST	2,609.6	100%	80 FT	H
	5TH AVE: 12TH ST TO 14TH ST	1,300.2	100%	80 FT	H
	5TH AVE: 14TH ST TO 16TH ST	1,306.6	100%	60 FT	H
	ARIZONA AVE: 19TH ST TO 20TH ST	616.3	80%	60 FT	H
	ARIZONA AVE: 22ND ST TO 26TH PL	2,738.6	77%	60 FT	H
	ARIZONA AVE: 26TH PL TO PALO VERDE ST	950.7	100%	65 FT	H
FACTOR AVE: 20TH ST TO 22ND ST	1,321.9	79%	60 FT	H	
CASTLE DOME AVE: 8TH ST TO 12TH ST	2,592.1	23%	120 FT	H	
CASTLE DOME AVE: 12TH ST TO YUMA PALMS PKWY	2,987.7	100%	120 FT	H	
	SUBTOTAL	36,977.9			

Table 6.1
Yuma Bicycle Facilities Master Plan
High Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE LANES	PREFERRED ALTERNATIVE				
	GILA ST: 1ST ST TO 3RD ST	1,781.8	100%	55 FT	H
	GILA ST: 3RD ST TO GISS PKWY	1,026.7	100%	65 FT	H
	1ST ST: GILA ST TO 4TH AVE	4,936.2	88%	90 FT	H
	1ST ST: 4TH AVE TO AVE A	5,355.7	100%	90 FT	H
	8TH ST: GISS PKWY TO PACIFIC AVE	4,614.7	14%	70 FT	H
	12TH ST: AVE B TO 21ST DR	2,339.4	100%	80 FT	H
	24TH ST: AVE 6E TO ARABY RD.	5,227.0	41%	100 FT	H
	24TH ST: ARABY RD TO COLLEGE AVE	7,874.8	47%	150 FT	H
	24TH ST: COLLEGE AVE TO AVE 7 1/2 E	1,222.7	100%	150 FT	H
	24TH ST: AVE 7 1/2 E TO OTONDO	7,881.3	36%	120 FT	H
	24TH ST: OTONDO DR TO AVE 9E	7,320.3	67%	120 FT	H
	32ND ST: 8TH AVE TO 4TH AVE	2,517.7	100%	100 FT	H
	32ND ST: AVE A TO 8TH AVE	2,652.5	86%	65 FT	H
	32ND ST: AVE B TO AVE A	10,391.0	70%	120 FT	H
	32ND ST: AVE B TO THACKER LATERAL	5,076.3	50%	90 FT	H
	1ST AVE: 3RD ST TO 8TH ST	5,957.3	100%	80 FT	H
	1ST AVE: 8TH ST TO 12TH ST	5,232.4	100%	80 FT	H
	GISS PKWY: I-8 RAMP TO CASTLE DOME AVE	8,691.3	0%	140 FT	H
	PACIFIC AVE: 8TH ST TO 11TH ST ALIGNMENT	4,099.1	54%	70 FT	H
	PACIFIC AVE: 11TH ST ALIGNMENT TO 12TH ST	1,131.0	83%	150 FT	H
	PACIFIC AVE: 16TH ST TO 20TH ST	4,973.0	70%	100 FT	H
	PACIFIC AVE: 20TH ST TO 24TH ST	4,820.6	100%	80 FT	H
	PACIFIC AVE: 24TH ST TO PALO VERDE ST	4,961.0	100%	110 FT	H
	PACIFIC AVE: 28TH ST TO 32ND ST	4,867.5	100%	110 FT	H
	AVE 3E: US HWY 95 TO 24TH ST	5,437.8	0%	60 FT	H
	AVE 3E: 20TH ST TO GILA RIDGE RD	2,155.3	31%	140 FT	H
	OTONDO DR: 24TH ST TO N. APPROX. 1205FT	2,395.6	50%	80 FT	H
	OTONDO DR: AVE 8 E TO ADOBE RIDGE DR	294.8	100%	100 FT	H
	AVE 8E: US HWY 95 TO S. GILA VALLEY MAIN CANAL	4,310.5	0%	65 FT	H
	AVE 8 E: S. GILA VALLEY MN CNL TO OTONDO DR	344.9	100%	100 FT	H
	SUB TOTAL	129,890.2			

Table 6.1
Yuma Bicycle Facilities Master Plan
High Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE PATHS	PREFERRED ALTERNATIVE				
	WEST MAIN CANAL BIKE PATH: EAST MAIN CANAL TO MAGNOLIA AVE	2,480.3	N/A	N/A	H
	WEST MAIN CANAL BIKE PATH: MAGNOLIA AVE TO AVE B	2,582.7	N/A	N/A	H
	JOE HENRY PARK BIKE PATH: COOPER LATERAL TO 1ST ST	2,009.4	N/A	N/A	H
	AVE B: 1ST ST TO 3RD ST	1,146.5	62%	80 FT	H
	AVE B: 3RD ST TO 5TH ST	962.6	100%	120 FT	H
	THACKER LATERAL: 5TH ST TO 8TH ST	2,401.8	N/A	N/A	H
	THACKER LATERAL: 8TH ST TO 12TH ST	2,921.1	N/A	N/A	H
	THACKER LATERAL: 12TH ST TO 16TH ST	2,586.1	N/A	N/A	H
	THACKER LATERAL: 16TH ST TO 20TH ST	2,591.8	N/A	N/A	H
	THACKER LATERAL: 20TH ST TO 24TH ST	2,532.7	N/A	N/A	H
	THACKER LATERAL: 24TH ST TO 28TH ST	2,544.5	N/A	N/A	H
	THACKER LATERAL: 28TH ST TO 32ND ST	2,575.5	N/A	N/A	H
	EAST WETLANDS TRAIL: GATEWAY PARK TO EAST APPROX 19,700 FT	19,761.6	N/A	N/A	H
	20TH ST: 23RD DR TO AVE B	280.0	100%	90 FT	H
	32ND ST: 4TH AVE TO 32ND ST CURVE	647.5	100%	75 FT	H
32ND ST: ARIZONA AVE TO PACIFIC AVE	4,955.4	100%	120 FT	H	
	SUB TOTAL	33,218.0			
MULTI-USE PATHS	PREFERRED ALTERNATIVE				
	EAST WETLANDS TRAIL	19,761.6	0%	N/A	N/A
	GRAND TOTAL	219,847.7			

Table 6.2
Yuma Bicycle Facilities Master Plan
 Mid Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE ROUTES	PREFERRED ALTERNATIVE				
	5TH ST: AVE A TO 14TH AVE	1,110.8	100.0%	60 FT	M
	5TH ST: 14TH AVE TO MAGNOLIA AVE	1,458.5	100.0%	60 FT	M
	5TH ST: AVE B TO MAY AVE	2,576.4	100.0%	35 FT	M
	5TH ST: MAY AVE TO AVE C	2,588.8	94.4%	35 FT	M
	5TH ST: AVE C TO PIMA LN	2,358.2	57.3%	55 FT	M
	6TH PL: MAGNOLIA AVE TO 21ST AVE	1,068.0	100.0%	50 FT	M
	7TH ST: 5TH AVE TO AVE A	2,224.1	100.0%	60 FT	M
	8TH ST: AVE C TO PHILLIPS AVE	388.2	100.0%	80 FT	M
	8TH ST: PIMA LANE TO PHILLIPS AVE	2,396.7	66.7%	55 FT	M
	10TH ST: MAGNOLIA AVE TO DORA AVE	1,090.8	100.0%	35 FT	M
	12TH ST: 47TH AVE ALIGNMENT TO AVE C	3,921.0	67.0%	60 FT	M
	14TH ST: 1ST AVE TO 3RD AVE	846.1	100.0%	50 FT	M
	14TH ST: 3RD AVE TO 5TH AVE	752.9	100.0%	60 FT	M
	14TH ST: 5TH AVE TO 7TH AVE	679.1	100.0%	60 FT	M
	15TH PL: HETTEMA ST TO GATEWAY PL	805.7	100.0%	35 FT	M
	16TH ST: AVE C TO AVE D	5,176.7	95.8%	90 FT	M
	16TH ST: GATEWAY PL TO PENDERGAST AVE	1,122.7	100.0%	80 FT	M
	17TH ST: 1ST AVE TO MAPLE AVE	657.8	100.0%	60 FT	M
	18TH ST: 5TH AVE TO 8TH AVE	953.3	100.0%	55 FT	M
	18TH ST: 8TH AVE TO 11TH AVE	976.4	100.0%	60 FT	M
	18TH ST: REDONDO CENTER DR TO 20TH ST	1,015.6	50.0%	65 FT	M
	20TH ST: PACIFIC AVE TO MARY AVE ALIGNMENT	2,146.9	100.0%	55 FT	M
	20TH ST: 47TH AVE TO 45TH AVE	1,299.4	100.0%	70 FT	M
	21ST ST: 6TH PL TO 8TH ST	1,028.0	70.0%	60 FT	M
	22ND ST: ARIZONA AVE TO 1ST AVE	1,271.9	100.0%	60FT	M
	22ND ST: 1ST AVE TO 3RD AVE	966.5	100.0%	40 FT	M
	22ND ST: KENNEDY LOOP TO FACTOR AVE	294.9	100.0%	50 FT	M
	KENNEDY LOOP: 22ND ST TO KENNEDY PARK	1,491.2	100.0%	40 FT	M
	23RD ST: KENNEDY LAND TO CAROL AVE	557.6	100.0%	55 FT	M
	24TH ST: EAST MAIN CANAL TO AVE A	1,547.8	100.0%	70 FT	M
	24TH ST: CAMINO ALAMEDA TO 18TH AVE	202.5	100.0%	80 FT	M
26TH PL: ARIZONA AVE TO MADISON AVE	1,162.5	100.0%	40 FT	M	
27TH ST: MADISON AVE TO VIRGINIA DR	749.6	100.0%	50 FT	M	

Table 6.2
Yuma Bicycle Facilities Master Plan
 Mid Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE ROUTES	PREFERRED ALTERNATIVE				
	PALO VERDE ST: AVE 2 1/2 E TO AVE 3	2,534.3	53.2%	80 FT	M
	28TH ST: 33RD DR TO AVE C	2,433.1	50.0%	50 FT	M
	28TH ST: AVE C TO 45TH AVE	2,568.4	12.3%	90 FT	M
	US HWY 95: AVE 8E TO AVE 7E	5,332.8	4.3%	100 FT	M
	US HWY 95: AVE 8E TO AVE 9E	5,210.7	1.4%	100 FT	M
	US HWY 95: AVE 9E TO AVE 10E ALIGNMENT	5,940.8	1.7%	100 FT	M
	MADISON AVE: 26TH PL TO 27TH ST	479.9	100.0%	40 FT	M
	MARY AVE: 18TH ST TO 20TH ST	1,287.3	92.5%	50 FT	M
	MAPLE AVE: 17TH ST TO 19TH ST	1,280.4	100.0%	50FT	M
	REDONDO CENTER: 16TH ST TO 20TH ST	1,311.1	0.0%	65 FT	M
	1ST AVE: 16TH ST TO 14TH ST	1,219.2	100.0%	60 FT	M
	3RD AVE: 22ND ST TO 20TH ST	1,376.7	100.0%	50 FT	M
	7TH AVE: 14TH ST TO 16TH ST	1,350.0	100.0%	75FT	M
	7TH AVE: 16TH ST TO 18TH ST	1,275.4	100.0%	60 FT	M
	8TH AVE: 5TH ST TO 7TH ST	1,292.4	100.0%	75 FT	M
	14TH AVE: 3RD ST TO 5TH ST	604.9	100.0%	60 FT	M
	18TH AVE: 27TH ST TO 28TH ST	709.8	100.0%	55 FT	M
	MAGNOLIA AVE: 3RD ST TO 8TH ST	3,000.9	100.0%	50 FT	M
	MAGNOLIA AVE: 8TH ST TO 10TH ST	1,251.5	78.9%	60 FT	M
	DORA AVE: 8TH ST TO 10TH ST	1,287.7	100.0%	50 FT	M
	DORA AVE: 10TH ST TO 12TH ST ALIGNMENT	1,208.6	100.0%	40 FT	M
	GATEWAY ST: 15TH PL TO 16TH ST	447.4	100.0%	35 FT	M
	HETTEMA ST: 13TH LN ALIGN TO 15TH PL	1,073.8	100.0%	35 FT	M
	21ST DR: 12TH ST TO 13THLN ALIGN	1,296.4	100.0%	50 FT	M
	21ST DR: 24TH ST TO 27TH ST	1,903.7	100.0%	110 FT	M
	PIMA LN: 5TH ST TO 8TH ST	1,802.7	8.6%	45 FT	M
	PIMA LN: 8TH ST TO 12TH ST	2,622.7	100.0%	45 FT	M
	PENDERGAST AVE: 16TH ST TO 20TH ST	2,563.9	100.0%	40 FT	M
	CAMINO PRUDURA: CAMINO TIERRA TO CAMINO ALAMEDA	575.3	100.0%	45 FT	M
	CAMINO ALAMEDA: CAMINO TIERRA TO 24TH ST	2,014.7	100.0%	65 FT	M
	MAY AVE: 5TH ST TO WEST MAIN CANAL	1,493.2	93.0%	40 FT	M
	MAY AVE: 5TH ST TO 8TH ST	1,961.6	67.3%	40 FT	M
	SUBTOTAL	107,597.6			

Table 6.2
Yuma Bicycle Facilities Master Plan
 Mid Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE LANES	PREFERRED ALTERNATIVE				
	1ST ST: AVE A TO MAGNOLIA AVE	5,285.2	100.0%	90 FT	M
	1ST ST: MAGNOLIA AVE TO AVE B	5,259.9	100.0%	90 FT	M
	1ST ST: AVE B TO AVE C	10,405.8	62.1%	60 FT	M
	8TH ST: PACIFIC AVE TO AVE 3E ALIGN.	10,314.5	N/A	N/A	M
	24TH ST: AVE D TO AVE C	10,013.5	26.1%	90 FT	M
	24TH ST: AVE 2 1/2 E TO PACIFIC AVE	4,948.5	100.0%	90 FT	M
	24TH ST: AVE 2 1/2 E TO INDUSTRIAL AVE	3,692.8	45.8%	90 FT	M
	24TH ST: INDUSTRIAL AVE TO AVE 3E	2,017.7	0.0%	90 FT	M
	24TH ST: AVE 3E TO AVE 4E	11,304.6	0.0%	80 FT	M
	24TH ST: AVE B TO AVE C	10,224.4	53.6%	90 FT	M
	24TH ST: AVE 4E TO AVE 5E	10,584.8	0.0%	80 FT	M
	24TH ST: AVE 5E TO AVE 6E	10,554.1	0.0%	60 FT	M
	28TH ST: AVE 9E TO CLEMENTINE AVE ALIGN.	3,813.1	40%	75 FT	M
	28TH ST: CLEMENTINE AVE ALIGN. TO EAST APPROX 2,193FT	4,147.9	29%	85 FT	M
	32ND ST: THACKER LATERAL TO AVE C	5,236.3	0.0%	70 FT	M
	32ND ST: AVE C TO 45TH AVE ALIGN.	4,995.3	55.1%	115 FT	M
	40TH ST: AVE C TO AVE B	10,272.4	0.0%	65 FT	M
	40TH ST: AVE B TO AVE A	10,303.7	30.4%	65 FT	M
	40TH ST: AVE 4E TO AVE 5E	9,943.1	6%	80 FT	M
	40TH ST: AVE 5E TO AVE 6E	9,858.3	55%	80 FT	M
	40TH ST: AVE 6E TO AVE 7E	9,899.4	48%	110 FT	M
	40TH ST: AVE 7E TO AVE 8E	10,001.4	13%	110 FT	M
	40TH ST: AVE 8E TO AVE 9E	10,173.7	25%	110 FT	M
	AVE B: 24TH ST TO 28TH ST	5,076.7	96.3%	90 FT	M
	AVE B: 28TH ST TO 32ND ST	5,217.0	96.5%	90 FT	M
	33RD DR: 40TH ST TO 36TH ST ALIGN	5,146.1	N/A	N/A	M
	AVE C: 1ST ST TO WEST MAIN CANAL	2,226.6	50.0%	55 FT	M
	AVE C: WEST MAIN CANAL TO 8TH ST	6,175.1	100.0%	65 FT	M
	AVE C: 8TH ST TO 12TH ST	5,117.9	100.0%	80 FT	M
	AVE C: 12TH ST TO 16TH ST	5,127.7	100.0%	100 FT	M
	AVE C: 16TH ST TO 20TH ST	5,095.6	86.4%	120 FT	M
AVE C: 20TH ST TO 24TH ST	5,070.2	89.8%	100 FT	M	
AVE C: 28TH ST TO 32ND ST	5,009.8	6.2%	70 FT	M	

Table 6.2
Yuma Bicycle Facilities Master Plan
 Mid Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE LANES	PREFERRED ALTERNATIVE				
	AVE C: 32ND ST TO 40TH ST	10,378.3	5.9%	80 FT	M
	AVE 3 E: 8TH ST TO BURR ST ALIGN.	5,144.6	N/A	N/A	M
	AVE 3 E: BURR ST ALIGN. TO US HWY 95	4,865.9	91.6%	60 FT	M
	AVE 3 E: GILA RIDGE RD TO 24TH ST	4,825.5	33%	110 FT	M
	AVE 3 E: 24TH ST TO PALO VERDE DR.	2,053.5	37%	110 FT	M
	AVE 3 E: PALO VARDE DR TO 30TH ST	2,600.5	40%	100 FT	M
	AVE 3E: 30TH ST TO 32ND ST	2,400.6	64%	100 FT	M
	AVE 7 E: 24TH ST TO 21ST ALIGNMENT	4,023.5	N/A	N/A	M
	AVE 7 E: 21ST ALIGNMENT TO COUNTY 9 1/2 E ST	2,653.0	70%	65 FT	M
	AVE 7 1/2 E:S. GILA VALLEY MN CNL TO SOUTH AP. 1688 FT	3,275.0	N/A	N/A	M
	AVE 8 1/2 E: 36TH ALIGN. TO 40TH ST	5,114.5	25%	85 FT	M
	AVE 9 E: S GILA VALLEY MN CNL TO 28TH ST	5,667.6	44%	90 FT	M
	AVE 9E: 28TH ST TO SOUTH FRONTAGE RD.	5,549.7	50%	110 FT	M
	AVE 9E: SOUTH FRONTAGE RD. TO 40TH ST	9,916.3	52%	85 FT	M
	SUBTOTAL	300,981.7			
BIKE PATHS	PREFERRED ALTERNATIVE				
	REDONDO CENTER DR: GISS PKWY TO 16TH ST	8,361.0	77.0%	115 FT	M
	GISS PKWY: REDONDO CENTER DR TO GILA ST	327.2	50.0%	125 FT	M
	16TH ST: 1ST AVE TO ARIZONA AVE	1,228.8	100.0%	95 FT	M
	16TH ST: ARIZONA AVE TO REDONDO CENTER DR	1,347.0	100.0%	95 FT	M
	KENNEDY PARK PATH: CAROL AVE TO 22ND ST ALIGN.	685.8	N/A	N/A	M
	21ST LN: 47TH AVE TO AVE C	3,877.1	83.5%	115 FT	M
	22ND ST : KENNEDY PARK TO PACIFIC AVE	2,549.4	N/A	N/A	M
	28TH ST: 45TH AVE TO BARKLEY RANCH AVE	1,137.6	100.0%	80 FT	M
	32ND ST: AVE 3E TO AVE 4E	5,071.0	50.0%	135 FT	M
	36TH ST: AVE B TO EAST MAIN CANAL	2,095.9	N/A	N/A	M
	36TH ST: AVE C TO AVE B	5,208.8	N/A	N/A	M
	US HWY 95: EAST MAIN CANAL TO COUNTY 15TH ST	2,691.7	0.0%	125 FT	M
	AVE A: 32ND ST TO 40TH ST	5,043.4	85.2%	85 FT	M
	EAST MAIN CANAL BIKE PATH: 40TH ST TO COUNTY 14TH ST	11,211.3	N/A	N/A	M
EAST MAIN CANAL BIKE PATH: CTY 14TH ST TO US HWY 95	6,175.7	N/A	N/A	M	

Table 6.2
Yuma Bicycle Facilities Master Plan
 Mid Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE PATHS	PREFERRED ALTERNATIVE				
	45TH AVE: 21ST ALIGN. TO 24TH ST	1,258.3	N/A	N/A	M
	45TH AVE: 24TH ST TO 26TH ALIGN.	1,295.1	N/A	N/A	M
	45TH AVE: 26TH ST ALIGN TO 28TH ST	1,272.6	50.0%	70 FT	M
	47TH AVE: 16TH ST TO 24TH ST	5,081.8	N/A	N/A	M
	THACKER LATERAL: 32ND ST TO 36TH ST ALIGN.	2,619.8	N/A	N/A	M
	AVE D: 24TH ST TO 28TH ST	2,519.7	51.7%	90 FT	M
	AVE 4E: 32ND ST TO 40TH ST	5,266.6	81.9%	110 FT	M
	ENGLER AVE: 24TH ST TO PALO VERDE ST	2,567.5	100.0%	60 FT	M
	SUB TOTAL	78,893.0			
MULTI-USE PATHS	PREFERRED ALTERNATIVE				
	GILA RIVER PATH: COLO R. & GILA R. CONFLUENCE TO AVE 7E	20,274.5	N/A	N/A	M
	AVE 7E: GILA R. TO LEVEE RD	667.0	N/A	N/A	M
	AVE 7E: LEVEE RD TO COUNTY 9 1/2 ST	10,563.4	N/A	N/A	M
	SUBTOTAL	31,504.9			
	GRAND TOTAL	518,977.2			

Table 6.3
Yuma Bicycle Facilities Master Plan
Low Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
BIKE LANES	PREFFERED ALTERNATIVE				
	24TH ST: AVE 3E TO AVE 1/2E ALIGN.	6,012.9	N/A	N/A	L
	28TH ST: AVE 3 1/2E TO AVE 4E	5,200.3	N/A	N/A	L
	COUNTY 12TH ST: AVE D TO AVE C	10,450.3	12.1%	65 FT	L
	40TH ST: AVE 9E TO AVE 10E	10,298.1	12.2%	55 FT	L
	48TH ST; AVE 6E TO AVE 7E ALIGN.	9,701.7	22.9%	120 FT	L
	48TH ST: AVE 7E ALIGN TO AVE 8E ALIGN	9,251.1	0.0%	N/A	L
	48TH ST: AVE 8E ALIGN. TO AVE 9E ALIGN.	9,369.0	0.0%	N/A	L
	48TH ST: AVE 9E ALIGN. TO AVE 10E ALIGN.	9,615.8	0.0%	N/A	L
	AVE 4E: 28TH ST TO 32ND ST	4,962.6	50.0%	105 FT	L
	AVE 6E: 32ND ST TO 40TH ST	9,724.1	37.2%	100 FT	L
	AVE 6E: 40TH ST TO 48TH ST	9,815.9	33.1%	100 FT	L
	AVE 7E: 32ND ST TO 36TH ST ALIGN	4,893.5	66.7%	120 FT	L
	AVE 7E: 36TH ST ALIGN TO 40TH ST	5,035.6	0.0%	N/A	L
	AVE 7E: 40TH ST TO 48TH ST	9,577.5	0.0%	N/A	L
	AVE 8E: 32ND ST TO 40TH ST	10,014.2	50.0%	130 FT	L
	AVE 8E: 40TH ST TO 48TH ST	9,406.0	0.0%	N/A	L
	AVE 9E: 40TH ST TO 48TH ST	9,829.6	0.0%	N/A	L
	AVE 10E: 24TH ST TO 28TH ST	5,060.8	50.0%	75 FT	L
	AVE 10E: 28TH ST TO NORTH FRONTAGE RD	4,708.4	76.7%	85 FT	L
AVE 10E: SOUTH FRONTAGE RD TO 40TH ST	9,838.8	68.5%	95 FT	L	
AVE 10E: 40TH ST TO 48TH ST	9,436.9	0.0%	N/A	L	
	SUBTOTAL	172,203.0			
BIKE PATHS	PREFFERED ALTERNATIVE				
	32ND ST: AVE 4E TO AVE 5E	4,936.9	58.7%	115 FT	L
	32ND ST: AVE 5E TO AVE 6E	4,801.2	57.0%	150 FT	L
	32ND ST: AVE 6E TO AVE 7E	5,091.1	58.5%	165 FT	L
	32ND ST: AVE 7E TO AVE 7 1/2 E ALIGN.	2,381.7	25.9%	115 FT	L
	44TH ST: AVE 3E TO AVE 4E	5,189.3	0.0%	N/A	L
	AVE 4E: 44TH ST ALIGN. TO 40TH ST	2,554.0	29.7%	90 FT	L
	SUBTOTAL	24,954.2			

Table 6.3
Yuma Bicycle Facilities Master Plan
Low Priority Facilities Inventory

Type	DESCRIPTION	LENGTH (FT)	% DEVELOPED	ROW	PRIORITY
MULTI-USE PATHS	PREFFERED ALTERNATIVE				
	COLORADO RIVER PATH: AVE 7E TO AVE 10E ALIGN.	19,645.2	N/A	N/A	L
	48TH ST: AVE 5E TO AVE 6E	5,047.5	43.1%	80 FT	L
	COUNTY 14TH ST: AVE 4E TO AVE 5E	5,117.9	27.3%	50 FT	L
	COUNTY 15TH ST: US HWY 95 TO AVE 4E	26,777.5	N/A	N/A	L
	AVE 3E: 44TH ST ALIGN TO 48TH ST	2,451.8	0.0%	90 FT	L
	AVE 3E: 48TH ST TO COUNTY 14TH ST	5,420.7	0.0%	80 FT	L
	AVE 3E: COUNTY 14TH ST TO COUNTY 15TH ST	5,256.3	N/A	N/A	L
	AVE 4E: COUNTY 14TH ST TO COUNTY 15TH ST	5,211.0	N/A	N/A	L
	AVE 5E: COUNTY 13TH ST TO COUNTY 14TH ST	5,104.0	45.8%	55 FT	L
	SUBTOTAL	80,031.8			
	GRAND TOTAL	277,189.0			